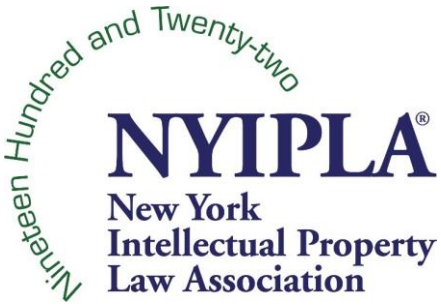

2021 NYIPLA Transactions Bootcamp
Day 1: October 7, 2021
In-House Counsel
Introduction to IP Transactions

CHERYL WANG
JOY GOUDIE

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Know Your Client

- You have made the jump from law firm to in-house. Day 1, who is your client?
- R&D pays for all matters related to the patent portfolio, your direct reports are paid through the law department, who is your client?
- The company is traded on the NASDAQ, the CEO asks you for support in a matter involving the sale of a patent family covering a critical product line, who is the client?
- The company is a large privately owned company, the main control falls to 2 brothers, they both say they are the sole inventor on a patent, who is the client?

Standard In-House IP Counsel Responsibilities

- Clearance
  - Product design, naming, and other collateral
- Portfolio prosecution and maintenance
  - Copyright, Trademark, Patent (design & utility), Domain, etc.
- IP agreements and provisions
  - Licensing, influencer, model, and more
- Marketing and consumer facing communications
- Brand protection
- Strategies – industry-market/budget/defensive/offensive

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Typical Day to Day Responsibilities

- There's never a dull day!

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Inventorship

The most contentious of battles

- American Cyanamid
- Boehringer Ingelheim
- Revlon

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University of Colo. Found., Inc. v. American Cyanamid Co. 196 F.3d 1366

- Cross-appellants and appellant sought review from the district court, which held appellant liable for fraudulent nondisclosure and unjust enrichment, denied appellant's claims of patent infringement, and granted summary judgment to appellant on copyright infringement, concerning prenatal multivitamin/mineral supplements. The court first determined that federal patent law preempted states from dictating standards for **inventorship**, in view of the objectives of rewarding inventors and supplying uniform patent law standards. Consequently, the court vacated the district court's conclusion based on state common law that cross-appellant doctors were the inventors of the supplements, and, without a correct finding of **inventorship**, also vacated the district court's finding that appellant had a duty to disclose the filing of the application to cross-appellants. The court vacated the district court's conclusion that appellant was liable for fraudulent nondisclosure for the same reason, and the associated damages, punitive damages, and awards.
- **Outcome**
  The court vacated the district court's decision on **inventorship**, the fraudulent nondisclosure and unjust enrichment decisions and damages awards, and the summary judgment in favor of appellant on the correction of **inventorship** and equitable patent title claims, and affirmed the copyright damages and affirmative defense decisions.
- University of Colo. Found., Inc. v. American Cyanamid Co., 1999 U.S. App. LEXIS 30117, 52 U.S.P.Q.2D (BNA) 1801, Copy. L. Rep. (CCH) P28,095

American Inventors at a German Company

- In Germany the Employee Invention Act (EIA) protects employee-inventors' interests through rights of reasonable compensation when the inventors transfer the ownership to their employees.

- Bayh-Dole Act in the US has resulted in a widely used pre-employment assignment

- Article: Serious Flaw of Employee Invention Ownership Under the Bayh-Dole Act in Stanford v. Roche: Finding the Missing Piece of the Puzzle in the German Employee Invention Act, 20 Tex. Intell, Prop, L.J.281 Author Toshiko Takenaka, PhD.

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Who Determines Inventorship

The definition for inventorship can be simply stated: "The threshold question in determining inventorship is who conceived the invention. Unless a person contributes to the conception of the invention, he is not an inventor. … Insofar as defining an inventor is concerned," MPEP 2109.

Freedom to Operate

- Do you provide freedom to operate opinions or not?
- What are the implications for an NPE letter regarding

  US Patent 6,311,231 – "Click to Chat"
- What are the implications for new product development?

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Negotiating Licenses and Other Deals

- Who are the parties and what do they really want?
- Who has the bargaining power?
- What are the financial terms?
  - Upfront payments, royalties, etc.

Other Aspects of Licenses and Other Deals

- More than just financial terms (although those are important!)
- What are your client's key "must-have" aspects of the deal?
- What protections do you need? What protections are you willing to give?
  - Warranties, indemnification, etc.
- If work is done, who owns it?
  - Works for hire under the Copyright Act

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Thank You

Questions?

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ADDITIONAL MATERIALS

To view 2109 Inventorship [R-10.2019], visit:
https://www.uspto.gov/web/offices/pac/mpep/s2109.html

To view 2138 Pre-AIA 35 U.S.C. 102(g) [R-10.2019], visit:
https://www.uspto.gov/web/offices/pac/mpep/s2138.html

ARTICLE: Serious Flaw of Employee Invention Ownership Under the Bayh-Dole Act in Stanford v. Roche: Finding the Missing Piece of the Puzzle in the German Employee Invention Act

Spring, 2012

Reporter
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Length: 29065 words

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Text

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Introduction

In Stanford v. Roche, the Supreme Court took a very textualist approach and refused to read the text of the Bayh-Dole Act as guaranteeing ownership of federally funded inventions for contractors of the federal government through an automatic transfer from the contractors' employees. [1] This interpretation effectively eliminated the federal government's rights under the Act in federally funded inventions if its contractors failed to secure ownership of invention from their employees because these rights are provided through the contractors' ownership of such inventions. [2] The Bayh-Dole Act aims to implement a uniform policy in the ownership of federally funded inventions and sets out important objectives reflecting specific public interests unique to such inventions. [3] These objectives are achieved through the government's rights in federally funded inventions to promote commercialization and

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[1] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc. 563 U.S. ___, 131 S. Ct. 2188, 2197 (2011).

[2] Id. at 2201 (Breyer, J., dissenting).

[3] Id. at 2200-01.

collaboration between industries and academia. [4] Accordingly, the Stanford dissent argued that the majority's interpretation was inconsistent with the Act's basic purpose. [5]

Due to lack of resources at technology transfer offices and the complexity of ownership issues involved in academic-industry collaboration at universities, it is not easy for universities to secure the ownership of all inventions made by their **[*283]** employees. [6] This is even more true with respect to inventions made by visiting researchers and student interns who are working under informal relationships with universities that do not fall into the traditional notion of employment. [7] Stanford highlights the complexity of ownership issues in inventions resulting from a high-tech environment where researchers and innovations inter-flow beyond the boundaries of firms. [8]

Many legal and economic scholars cite Silicon Valley's information sharing environment as the key to its success. [9] Interaction of researchers from multiple-firms and the high mobility of such researchers enhance information diffusion and inter-firm relations among firms in a region. [10] Researcher interaction improves industrial outputs, as well as economic growth in the high-tech district. [11] Despite the numerous benefits praised by economists, such an information sharing culture presents a serious challenge for university technology transfer offices managing intellectual property, particularly controlling the ownership of inventions and procuring patents based on the ownership. [12] The Stanford majority's interpretation of the Bayh-Dole Act substantially increases administration costs at universities associated with promoting practices to secure pre-invention assignments from anyone involved in federally funded research activities. Moreover, universities face due diligence challenges because they cannot prevent their researchers from executing inconsistent assignment contracts when different aspects of research projects are conducted in different institutions in the private and academic sectors. [13]

Contrary to steady changes in the working environment, the U.S. Patent Act remains relatively unchanged with respect to provisions controlling ownership and inventorship (which is the starting point for determining ownership). [14] The statute has a chapter dedicated to the ownership and assignment; however, that chapter includes **[*284]** only two sections. [15] Although the overwhelming majority of inventions are made by employee-inventors through

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[4] *Id. at 2201.*

[5] Id.

[6] See Margo E.D. Reder, Board of Trustees v. Roche Molecular Systems, Inc.: Negotiating the Web of Competing Ownership Claims to Inventions Arising from Government-Funded Academic-Industry Collaboration, 44 Business Law Review 1, 10-13 (2011), available at *http://ssrn.com/abstract=1701706e* (detailing complications faced by parties involved with government funded research).

[7] Id. at 17.

[8] Id.

[9] See, e.g., Yuval Feldman, Experimental Approach to the Study of Normative Failures: Divulging of Trade Secrets by Silicon Valley Employees, *2003 U. Ill. J.L. Tech. & Pol'y 105, 105 (2003).*

[10] Walter W. Powell, Trust-Based Forms of Governance, in Trust Organization: Frontiers of Theory and Research 51 (Roderick M. Kramer & Tom R. Tyler eds., 1996).

[11] See Edmund W. Kitch, The Law and Economics of Rights in Valuable Information, 9 J. Legal Stud. 683, 718 (1980) (explaining how a social loss occurs when firms refuse to share information).

[12] Reder, supra note 6, at 1-2.

[13] Id. at 16.

[14] *Univ. Patents Inc. v. Kligman, 762 F. Supp. 1212, 1218 (E.D. Pa. 1991).*

[15] U.S. Patent Act, *35 U.S.C. §§261*-262 (2006).

their pre-invention assignment duty under an employment contract, [16] the U.S. Patent Act is silent on the ownership of inventions resulting from employment, except for invention ownership resulting from federally funded research under the Bayh-Dole Act. [17]

In contrast, patent statutes in major foreign patent jurisdictions include provisions for controlling the ownership of employee inventions. [18] In Germany, a separate law, the Employee Invention Act (EIA), was enacted to provide detailed rules for balancing interests of employee-inventors and their employers; in other words, to balance competing policies under the patent law and labor and employment law. [19] The EIA incorporates a mechanism for employers to secure the ownership of inventions made by their employees; that mechanism protects employers' interests by giving employers the priority right for claiming to secure the ownership of inventions made by their employee-inventors [20] while protecting employee-inventors' interests through rights of reasonable compensation when the inventors transfer the ownership to their employers. [21] Many other jurisdictions have adopted a similar mechanism from the EIA. [22] The U.S. Congress also once made an attempt to adopt a similar mechanism by introducing a series of bills based on the German EIA.

This article argues that the current Bayh-Dole Act is incomplete because the Act fails to provide a mechanism for contractors to secure the ownership of federally funded inventions from their employees. Part I of this Article discusses this flaw in the current Bayh-Dole Act, highlighted by Stanford v. Roche, and argues that a historical accident resulted in this flaw due to Congress's failure to pass a series of bills based on the German EIA. Passages in the Bayh-Dole Act suggest that the **[*285]** Act assumes a transfer by operation of law to secure the ownership of federally funded inventions through a mechanism provided by the German EIA based bills. Without such a mechanism, many federal funded inventions will fall outside of the Bayh-Dole Act if contractors fail to execute written assignments with inventors. Common law ownership rules do not provide any help to contractors because they can guarantee only non-transferable, royalty-free, nonexclusive licenses for the contractors. Many of the contractors, particularly universities, do not practice patents by themselves. Differing state laws and state legislative actions prevent assignment contracts between the contractors and their employee-inventors from securing the ownership of all federally funded inventions, thereby preventing the federal government from implementing a uniform policy.

In order to propose a mechanism for contractors to secure the ownership of federally funded inventions, Part II of this article examines a statutory model based on federal laws for handling inventions closely related to national security. These Acts provide an effective mechanism for securing rights in the ownership of inventions by operation of law. However, the increased administrative costs on both the United States Patent and Trademark Office ("USPTO") and applicants would not justify adopting a similar mechanism for the Bayh-Dole Act.

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[16] See Scott Shane, Patents Granted to Small Entities in Decline, Small Business Trends (July 19, 2010, 11:39 AM) *http://smallbiztrends.com/2010/07/how-smart-is-the-average-entrepreneur.htm* (referring to USPTO statistics, patents issued to small entities recently declined to less than 20%, with "small" entities including both independent inventors and small firms).

[17] Bayh-Dole Act, Pub. L. No. 96-517, *94 Stat. 3015 (1980)* (codified at *35 U.S.C. §§202*-12 (2006 & Supp. IV 2010)).

[18] See, e.g., Tokkyoho [Patent Act], Law No. 121 of 1959, art. 35 [Japan]; Code de la Propriete Intellectuelles [C.P.I.] art. L611-7(Fr) (providing statutory guidance for employee invention in Japan and France).

[19] Arbeitnehmererfindungesetz, [ArbEG] [Employees' Inventions Act] [hereinafter German EIA]. English translation available at *www.wipo.int/clea/docs_new/pdf/en/de/de039en.pdf*; See Michael Trimborn, Employees' Inventions in Germany: A Handbook for International Businesses (2009); Helmut Reitzle, et al, Act on Employees" Inventions (3d ed., 2007) (providing insight to the German EIA in English).

[20] German EIA, supra note 19, § 6.

[21] Id. § 9.

[22] See Code de la Propriete Intellectuelles [C.P.I.] art. L611-7(Fr) (providing language similar to the German EIA).

Part III of this article examines the German EIA and compares it with the Bayh-Dole Act. Congress's interest in the EIA resulted in the overall structure of Bayh-Dole Act sharing key features with the EIA and thus it should be easy for the Bayh-Dole Act to adopt an ownership transfer mechanism developed under the EIA. The comparison also reveals the lack of a mechanism in the current Bayh-Dole Act for protecting inventors' rights to compensation when ownership is transferred to employers, although the Bayh-Dole Act does provide inventors a similar right to compensation.

Part IV of this article discusses which aspects of the German EIA should be adopted in the Bayh-Dole Act and how that adoption should take place. It will also propose adopting, from the EIA, a mechanism to protect inventors' rights to compensation. Moreover, today's university research environment makes it necessary for the federal government to apply the Bayh-Dole restrictions and conditions to federally funded inventions created by students and visiting researchers, regardless of employment status with the contractors. With just compensation through royalty sharing, the Bayh-Dole Act should be revised to allow contractors to secure the ownership of inventions from these nontraditional employees as long as their inventions resulted from federally funded research activities.

[*286]

I. Lack of Ownership Transfer Mechanism: Significant Flaw in the Bayh-Dole Act

1. Stanford v. Roche

The invention at issue in Stanford was a technology based on the polymerase chain reaction (PRC) technique for detecting and quantifying HIV - the virus that causes AIDS - in human blood samples (HIV measurement technology). [23] A Stanford researcher, Dr. Holodniy, completed this invention with other Stanford researchers. [24] In June 1988, Dr. Holodniy executed a pre-invention assignment contract which included the term "I agree to assign or confirm in writing to Stanford and/or Sponsors" with respect to his future inventions. [25] Because he had no prior experience with the PRC technique, he was instructed by his boss to visit a private biotech firm, Cetus, and learn the technique. [26] In February 1989, Dr. Holodniy executed another pre-invention assignment agreement with Cetus when he began his regular visits to Cetus. [27] The contract with Cetus included the term "I will assign and do hereby assign to Cetus" with respect to his future inventions. [28]

After receiving enough training at Cetus, Dr. Holodniy returned to Stanford and completed the HIV measurement technology. [29] Stanford received government funding for its HIV research through the National Institute of Health. [30] On May 14, 1992, Stanford filed a patent application which resulted in three separate patents covering different

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[23] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2192 (2011);* Nicholas Wade, Scientist at Work/Kary Mullis; After the "Eureka,' a Nobelist Drops Out, N.Y. Times, Sept. 15, 1998, available at *http://www.nytimes.com/1998/09/15/science/scientist-at-work-kary-mullis-after-the-eureka-a-nobelist-drops-*out.html?scp=1&sq=kary%20mullis&st=cse (stating that the polymerase chain reaction (PCR) was developed by a researcher, Dr. Kary Mullis).

[24] *Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 583 F.3d 832, 837 (Fed. Cir. 2009),* aff'd, 563 U.S. ___, *131 S. Ct. 2188 (2011).*

[25] *Id. at 841* (emphasis in original).

[26] *Id. at 837.*

[27] *Id. at 842.*

[28] Id. (emphasis in original).

[29] *Id. at 837.*

aspects of the HIV measurement technology. [31] However, Dr. Holodniy did not execute an assignment of the ownership of his invention in the 1992 patent application until May 4, 1995. [32] All three patents included a notation that the invention was made with the aid of federal funding. [33]

[*287] Meanwhile, Roche purchased all PRC related assets from Cetus in December 1991. [34] Roche began to sell HIV detection kits, which are widely used in hospitals and clinics. [35] In April 2000, Stanford and Roche began contesting Roche's ownership through the 1989 Holodniy assignment and negotiating possible licensing conditions; the negotiation led to no agreement. [36] On October 14, 2005, Stanford filed suit against Roche, asserting infringement of the three patents by Roche's HIV detection kits. [37] Roche answered and counterclaimed against Stanford, alleging that Stanford lacked standing to maintain the suit because Roche possessed ownership of the invention with respect to all three patents. [38]

The U.S. Court of Appeals for the Federal Circuit (Federal Circuit) agreed with Roche that it secured the ownership of Holodniy's invention when it acquired Cetus's PRC assets. [39] The Federal Circuit applied its own case law to the question of whether contractual language affects a present assignment of patent rights or an agreement to assign rights in the future inventions, and found the Cetus assignment contract to constitute the former and the Stanford assignment contract to constitute the latter. [40] Under its precedents, the terms "I … hereby assign" in the Cetus assignment contract triggered an automatic transfer of the ownership upon the completion of invention in contrast to the terms "I agree to assign" in the Stanford assignment which needs an additional step to consummate the promise and trigger transfer of the ownership. [41] Once the invention was completed, the Cetus contract trumped the Stanford contract, although the Stanford contract originated prior to the execution of the Cetus contract. [42] In denying Stanford's ownership, the Federal Circuit effectively eliminated the federal government's rights in the invention expressly provided in the Patent Act. [43]

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[30] *Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 583 F.3d 832, 838 (Fed. Cir. 2009),* aff'd, 563 U.S. ___, *131 S. Ct. 2188 (2011).*

[31] *Id. at 838, 842.*

[32] *Id. at 842.*

[33] *Id. at 838.*

[34] *Id. at 837-38.*

[35] *Id. at 838.*

[36] *Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 583 F.3d 832, 838 (Fed. Cir. 2009),* aff'd, 563 U.S. ___, *131 S. Ct. 2188 (2011).*

[37] Id.

[38] Id.

[39] *Id. at 841-42.*

[40] Id.

[41] Id.

[42] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2202 (2011)* (Breyer, J., dissenting).

[43] The Government has a nonexclusive, nontransferable, irrevocable, paid up license to use the invention. See *35 U.S.C. § 202*(c)(4) (2006). It also has a right to require the patentee to grant a license to a third party and may have direct control of the invention under certain circumstances. *35 U.S.C.§§203,* 202(c)(1), 202(c)(2)-(3) (2006 & Supp. IV 2010).

In a seven-to-two vote, the Federal Circuit's conclusion was upheld by the U.S. Supreme Court, rejecting the view that the ownership provisions for federally funded inventions in the Bayh-Dole Act override state contract laws and common **[*288]** law rules controlling invention ownership. [44] Authored by Chief Justice Roberts, Stanford reemphasized the common law ownership rule under precedent by holding that the ownership of an invention belongs to the inventor and rejected Stanford's position that the ownership of federally funded inventions vested in the inventor's employer - the federal contractor. [45] The Supreme Court compared federal laws, which vest the ownership of inventions to the federal government contrary to the common law rule, and found no texts in the Bayh-Dole Act supporting the contractor's ownership. [46]

The majority also examined the text defining "subject invention" and rejected Stanford's interpretation that would include all inventions made by the contractor's employee with the aid of federal funding, contrary to the rule to avoid redundancy in statutory terms. [47] Instead, the majority adopted an interpretation including only inventions owned by the contractor through a valid and enforceable assignment contract because this interpretation makes every word in the definition meaningful and consistent with a dictionary definition of the word. [48] This interpretation is further supported by the text of other provisions in the Bayh-Dole Act. [49] The majority found that the scope of subject inventions under Stanford's interpretation was overbroad because it included any invention resulting from federally funded research activities, regardless of the inventor's employment relationship with the contractor or the amount of federal funds used to support the activities. [50]

The majority's statutory interpretation followed a traditional, formalistic approach in trying to ascertain the ordinary meaning of the words and phrases that the parties disputed in context of the structure of the statute and use of the words and phrases in other provisions. Even though basic policies and objectives were expressly set out in the Bayh-Dole Act, they played no role in its interpretation. Such an interpretation based on textualism often leads to results that Congress did not intend. [51] For these reasons, the Stanford dissent, authored by the strongly purposivist Justice Breyer, criticized the majority's interpretation as being inconsistent with the Bayh-Dole Act's basic purposes and undercutting the Act's ability to implement its objectives. [52]

[*289]

2. Losing an Essential Piece of the Puzzle of the Bayh-Dole Act: Historical Accident

Although the Stanford majority's statutory interpretation was technically correct in restraining its role to confirming plain meaning or resolving ambiguity, Justice Breyer was correct that it led to a result that Congress did not intend or expect, by letting inventors lawfully assign federally funded inventions and taking them out of the scope of the Bayh-Dole Act controls. The majority's interpretation also leads to a conclusion that the common law rule controls the ownership of federally funded inventions if the federal contractors fail to secure the ownership through an

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[44] Stanford, 563 U.S. ___, *131 S. Ct. at 2197.*

[45] *Id. at 2198.*

[46] *Id. at 2195-96.*

[47] Id.

[48] *Id. at 2196.*

[49] *Id. at 2197-98.*

[50] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2198-99 (2011).*

[51] See *id. at 2201* (Breyer, J., dissenting) (stating that the majority's conclusion undermines the purpose of the Bayh-Dole Act).

[52] Id.

assignment contract. [53] Moreover, it suggests that state contract laws and special legislation control the ownership of such inventions even if the contractors diligently try to secure the ownership through an assignment contract. [54] Such a conclusion subjects the ownership of federally funded inventions to a risk of a technical drafting trap. [55] Also, it allows many federally funded inventions out of the Bayh-Dole Act's restrictions, conditions, and allocation rules and makes it impossible for the federal government to implement a uniform ownership rule. [56]

Congress did not intend to bring such results. Justice Breyer offered two solutions for avoiding the results: (1) interpreting the contractors' assignment contract to be consistent to the Bayh-Dole Act's purpose; [57] and (2) interpreting the Bayh-Dole Act as applying the ownership rule under Executive Order 10096, [58] which requires transfer of the ownership of invention by the federally funded employees to the federally funded employers. [59] The first solution cannot avoid the result brought by contractors' failure to execute an assignment contract. [60] The second solution can avoid all unintended results, but the executive order provides no basis to apply its rule to inventors who are not employees of the federal government. [61] Further, the Bayh-Dole Act does not provide a procedure to protect inventors and third-parties.

[*290] However, a mechanism for contractors to secure the ownership of all federally funded inventions from their employee-inventors is an essential part of the Bayh-Dole Act for implementing a uniform policy. Without the mechanism, many federally funded inventions would fall out of the Act's governing scope. As the Stanford majority admitted, reading the definition of "subject invention" to mean all inventions made by the contractor's employees, requiring transfer of the invention ownership to the contractor is plausible enough in the abstract. [62] If Congress intended contractors to secure ownership by operation of law, why did it fail to include an ownership transfer mechanism for their contractors? One can find a possible answer in the Act's legislative history: Congress lost a chance to adopt an ownership transfer mechanism from the German EIA when it failed to pass bills for controlling the ownership of inventions under the employment relationship in the private sector.

Chapter 18 of the U.S. Patent Act was introduced through the enactment of the Bayh-Dole Act to implement multiple goals through a uniform patent policy for ownership allocation and licenses with respect to federally funded inventions. [63] Among the goals, promoting commercialization of federally funded inventions has been the most

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[53] *Id. at 2203.*

[54] See infra Part I.4.

[55] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2203 (2011)* (Breyer, J., dissenting).

[56] *Id. at 2201-02* (Breyer, J., dissenting).

[57] *Id. at 2202-03* (Breyer, J., dissenting).

[58] Stanford, 563 U.S. ___, *131 S. Ct. at 2203-04* (Breyer, J., dissenting). See Exec. Order No. 10096 *15 Fed. Reg. 389* (Jan. 25, 1950), reprinted as amended in 37 C.F.R. § 501 (2011) (carrying the title "Providing for a uniform patent policy for the Government with respect to inventions made by Government employees and for the administration of such policy").

[59] Id. at 2203 (Breyer, J., dissenting).

[60] See infra, Part I.3.B.

[61] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2197 n.4 (2011).*

[62] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2196 (2011).*

[63] There are numerous publications on the Bayh-Dole Act. See Sean O'Connor, et al., Legal Context of University Intellectual Property and Technology (2010), available at *http://sites.nationalacademies.org/PGA/step/PGA_058712* (last visited Aug. 21, 2011) [hereinafter O'Connor, et al.]; Rebecca S. Eisenberg, Public Research and Private Development: Patents and Technology

successful; it is achieved by giving ownership of the inventions to universities and encouraging academic-industry collaboration through ownership. [64]

Interestingly, a review of legislative history reveals that U.S. and German legislators began their efforts leading to the current Bayh-Dole Act and German EIA at the same historical point: the pre-WWII era. [65] The need for spurring scientific and technological development for warfare increased government sponsored research and development in both academic and private sectors and led legislators to adopt **[*291]** new patent policies for the ownership of patents resulting from the research and development by the end of WWII. [66]

However, the two Acts developed very differently because of different focuses and social backgrounds. Acts and regulations, which were the roots of Bayh-Dole, aimed to balance rights of the federal government against rights of their employees and contractors; in contrast, regulations leading to the German EIA aimed at balancing rights of employers against rights of their employees regardless of their employment in the private or government sector. At the beginning of efforts to develop a uniform invention ownership allocation policy, the main concern of Congress was to give the federal government access to federally funded inventions, because the U.S. Supreme Court had previously developed a common law rule that employers do not have any rights in the ownership of inventions even if the inventions resulted from the performance of duty under a contract with their employees and contractors. [67] To remedy the ownership problem, U.S. employers in the private sector developed the practice of having their employees execute pre-invention assignment contracts. [68] Following the trend of acknowledging freedom of contract, U.S. Courts upheld and enforced such contracts. [69] U.S. employees were unable to develop a collective power sufficient to enact a law reversing this trend. [70] Acknowledging the industry practice, Congress enacted a series of laws to secure the ownership of national security related inventions. [71] To modify the common law ownership rule, these Acts adopted clear language taking the ownership of federally funded inventions away from federal employees and contractors and giving it to the federal government. [72] The President also issued an Executive Order for the federal government to secure ownership of inventions made by federal employees. [73]

In contrast, German law had already addressed the need to provide government access to inventions owned by its employees or private persons through the operation of a compulsory license provision in the German Patent Act. [74]

Transfer in Government-Sponsored Research,*82 Va. L. Rev. 1663, 1669 (1996);* Mark A. Lemley, Are Universities Patent Trolls?, 18 Fordham Intell. Prop. Media & Ent. L.J. 611, 614 (2008).

[64] Stanford, 563 U.S. ___, *131 S. Ct. at 2201* (Breyer, J., dissenting). Howard Bremer, et al., The Bayh-Dole Act and Revisionism Redux, 78 Pat. Trademark & Copyright J. 483 (2009). Congress recently celebrated the Act's positive impact on the U.S. economy at its 30th anniversary, citing numerous companies, products, and technologies developed on the basis of federally funded inventions. H. R. Con. Res. 328, 111th Cong. (2010); House Resolution Honors 30th Anniversary of the BayhDole Act, Newswise (Nov. 16, 2010, 11:00 AM) *http://www.newswise.com/articles/view/570842/*.

[65] O'Connor, et al., supra note 63, at 6.

[66] Id. at 7.

[67] For further discussions see infra Part I.3.B.

[68] Jay Dratler Jr., Incentives for People: The Forgotten Purpose of the Patent System,16 Harv. J. on Legis. 129, 141-42 (1979).

[69] Id.

[70] Id. at 157.

[71] Id. at 150-51.

[72] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2195 (2011).*

[73] Dratler, supra note 68, at 151-52; Exec. Order No. 10096 *15 Fed. Reg. 389* (Jan. 25, 1950), reprinted as amended in 37 C.F.R. § 501 (2011).

[74] German Patent Law § 13.

A more serious need was the removal of a conflict between labor and employment law and **[*292]** the patent law. [75] German employee-inventors were able to develop a significant collective bargaining power well before the pre-WWII era and pressed German legislators to enact a law confirming their rights. [76] The German EIA was enacted to address this need as well as the need to enhance the Nazi policy of advancing technology to develop high-tech weapons, including atomic bombs. [77]

Despite these different focuses, the Bayh-Dole Act and the German EIA share key features for transferring the ownership of invention. [78] Since preceding acts and regulations developed in similar time frames, it is very likely that the German EIA strongly influenced the ownership allocation rules and transfer mechanism between contractors and the federal government under the Bayh-Dole Act. [79] Moreover, this influence is evidenced by Congress's attempts to pass a series of bills based on the German EIA. [80] In the 1970s, Congress introduced a series of bills to implement a federal policy for controlling the employee invention ownership in the private sector. [81] These German EIA based employee invention bills could have introduced a mechanism for contractor-employers to secure the ownership of inventions from their employees as an operation of law. [82] Accordingly, it is likely that the Bayh-Dole Act intentionally left the ownership rules under the contractor-employee relationship to the German EIA based bills. Congress lost an important piece of the puzzle for developing a system for implementing a uniform federal policy in federally funded inventions when it failed to pass the bills. As will be discussed below, some texts in the Bayh-Dole Act support Congress's assumption of incorporating the missing piece with the German EIA based bills. This historical accident brought unintended results, as highlighted in Stanford.

[*293]

3. Unintended Results: Common Law Ownership Rules

The Stanford majority confirmed that the common law governs the ownership of federally funded inventions. [83] Under this rule, the ownership of an invention belongs to the inventor. [84] An employer does not have ownership of the invention made by his employee unless there is an express agreement to transfer the ownership to the employer. [85] Without a mechanism to secure the ownership as an operation of law, the Bayh-Dole Act pre-

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[75] Dietmar Harhoff & Karin Hoisl, Univ. of Munich, Institutionalized Incentives for Ingenuity - Patent Value and the German Employees' Inventions Act 8 (2006), available at epub.ub.uni-muenchen.de/1262.

[76] Id. at 7.

[77] The Bayh-Dole Act at 25, 8 n.11 (2006), available at *http://bayhdolecentral.com/BayhDole25_WhitePaper.pdf*.

[78] See infra, Part III.1 (discussing similarities between German EIA and the Bayh-Dole Act).

[79] See id. (postulating that German EIA influenced the Bayh-Dole Act).

[80] Robert L. Gullette, State Legislation Governing Ownership Rights in Inventions Under Employee Invention Agreements, 62 J. Pat. Off. Soc'y 732, 739 (1980); H.R. 15512, 91st Cong. (1969), reintroduced as H.R. 1483, 92d Cong. (1971) ("Moss Bills"). A similar bill was introduced again in 1982. H.R. 6635, 97th Cong. (1982).

[81] H.R. 1483, supra note 80.

[82] Id. § 412; William P. Hovell, Patent Ownership: An Employer's Rights to His Employee's Invention, *58 Notre Dame L.Rev. 863, 883-86 (1983);* O'Connor, et al., supra note 63, at 29.

[83] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2195 (2011).*

[84] *Gayler v. Wilder, 51 U.S. 477, 493 (1850).*

[85] *United States. v. Dubilier Condenser Corp., 289 U.S. 178, 187 (1933).*

supposes an expressive contract between the contractor and its employees to assign all rights of inventions once the inventions are complete. [86]

However, limited resources at university technology transfer offices may prevent execution of pre-invention contracts with every employee and researcher who engages in federally funded research activities because different teams of researchers, including visiting researchers and student-interns, engage in different aspects of research projects in today's academic-industry collaboration. [87] If contractors failed to execute an express assignment contract, federally funded inventions remain with inventors unless the exception of "specially hired to invent" applies to the employment relationship between the inventor and employer-contractor. [88] It is unlikely that the employment relationship between contractors and their employee-inventors fall into the exception. [89] The "shop rights" common law rules provide equity for employers but have no value to university-contractors because universities do not practice patents by themselves. [90]

A) Fundamental Rule: Inventors as Original Owners

In the United States, only a natural person or natural persons can be the sole inventor or joint inventors; non-human legal entities, such as corporations, are excluded from inventorship. [91] It is a fundamental rule that ownership of invention is **[*294]** originally vested in the inventor. [92] Thus, the examination of ownership always starts from the determination of inventorship. [93] Although the ownership issue is often intertwined with the inventorship issue, it is important to note that the inventorship issue - who is a true and original inventor - is a separate question from the ownership issue of who owns property rights in the invention made by the inventor. [94]

Texts in the Bayh-Dole Act are unclear on whether it follows this fundamental rule and thus made it necessary for the Stanford Court to clarify the meaning of these phrases in terms of the fundamental rule of invention ownership. [95] The Act defines subject invention as "any invention of the contractor conceived or first actually reduced to practice." [96] Nothing in the definition touches upon contractor-employees who conceived or reduced the invention. [97] It is unclear whether any "invention of the contractor" includes all inventions by such employees. [98] In the

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[86] Regulations issued by the Administrator of the General Services Administration assumed pre-invention assignment agreements between the contractors and their employees. Bayh-Dole implementation Regulations provides a model patent contract. A clause of the contract requires the contractor to agree to secure the ownership of federally funded inventions that the contractor elects to retain title for the Federal agency. *37 CFR § 401.14(a)*, clause (f)(1); Mary LaFrance, LaFrance on Employee Ownership of Federally-Funded Inventions, 2010 Emerging Issues 4809 at 6 (2010).

[87] Reder, supra note 6, at 16.

[88] See infra Part I.3.B.

[89] See infra Part I.3.B.

[90] See infra Part I.3.B.

[91] See 1 Donald S. Chisum, ***Chisum on Patents § 2.02*** (2011) (providing a general discussion of inventorship under U.S. patent law).

[92] E.g., Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2195 (2011).*

[93] 8 Donald S. Chisum, *Chisum on Patents § 22.02* (2011).

[94] Id.

[95] Stanford, 563 U.S. ___, *131 S. Ct. at 2196.*

[96] Bayh-Dole Act, *35 U.S.C. § 201*(e) (2006).

provision for allocating the ownership of subject invention, the Act adopts the phrase "elect to retain title" to describe the contractor's right. [99] This suggests the ownership as being vested in contractors because contractors cannot retain the ownership of invention unless they already received it. [100] In another provision, the term "retention of rights" is used for an employee-inventor to file an application on its own. [101] This suggests that the Act follows the initial ownership rule exclusive to the inventor. [102] These phrases seem inconsistent because they suggest entitlement of the ownership for both parties in operation of law.

The rule that the ownership of invention is assignable is another important rule. [103] Although the Patent Act applies to determine inventorship, federal law **[*295]** plays a very small role in the determination of ownership before filing a patent application with the USPTO when rights in the ownership of invention are transferred from the original inventor. [104] An inventor may contract to transfer rights in future inventions before completion of the inventions; nevertheless, rights and obligations for the transfer under such a contract is controlled by state law. [105] Unlike the German EIA, Bayh-Dole has no express provision to limit inventors' abilities to transfer their rights in the ownership of federally funded inventions to a party other than their employers. [106] Such transfer may occur before or after patent filing. [107]

Texts in the Bayh-Dole Act may read to conflict with another fundamental rule: in principle, a patent should be issued only to an applying inventor although it may be issued to an inventor's assignee because interests in invention are assignable in law by an instrument in writing. [108] This rule that applications can be assignable by an instrument in writing is codified in the Patent Act. [109] The statute makes clear that a patent application must be filed

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[97] See Stanford, 563 U.S. ___, *131 S. Ct. at 2200 (2011)* (Breyer, J., dissenting) ("Since the "contractor' (e.g., a university or small business) is unlikely to "conceive' of an idea or "reduce' it "to practice' other than through its employees, the term "invention of the contractor' must refer to the work and ideas of those employees.").

[98] Id.

[99] *35 U.S.C. § 202*(a) (2006).

[100] Stanford, 563 U.S. ___, *131 S. Ct. at 2190.*

[101] *35 U.S.C. § 202*(d) (2006).

[102] Stanford, 563 U.S. ___, *131 S. Ct. at 2198 n.6 (2011)* (distinguishing "title" to be retained by contractors from "rights" to be retained by inventors. "That argument has some force. But there may be situations where an inventor, by the terms of an assignment, has subsidiary rights in an invention to which a contractor has title, as § 202(d) suggests.").

[103] *Id. at 2196.*

[104] Mary LaFrance, Nevada's Employee Inventions Statute: Novel, Nonobvious, and Patently Wrong, *3 Nev L.J. 88, 90-91 (2002).*

[105] 8 *Chisum, supra note 93, § 22.03*.

[106] See Stanford, 563 U.S. ___, *131 S. Ct. at 2201 (2011)* (Breyer, J., dissenting) (expressing his opinion that there should be a limitation to prevent inventors from unilaterally terminating their assignment agreements their employer-contractors through a separate assignment to transfer the ownership of federally funded invention to a third party).

[107] See *id. at 2202-03* (Breyer, J., dissenting) (explaining how an assignee receives an equitable title when interests in invention is assigned from the inventor before filing a patent application: the assigner secures title of the invention when an application is filed by the inventor).

[108] *Id. at 2194-95.*

by the inventor, even if rights in the invention are transferred to a third-party. [110] In contrast, the Bayh-Dole Act requires contractor-employers, instead of their employee-inventors, to file domestic and foreign patent applications. [111] This conflict with the fundamental rule also makes unclear who is the original owner, because the right of the contractor is defined as one to "elect to retain title to a subject invention" throughout the Act. [112]

These texts, inconsistent with the fundamental rules, would make sense if Congress enacted Bayh-Dole with an assumption that contractors would secure ownership of inventions through the mechanism found in the German EIA based bills. [113] The phrase "any invention of the contractor" should be read to mean those for which the employer-contractor secures ownership by exercising the right to claim the invention while preventing any disposition of federally funded inventions **[*296]** to a party prior to the contractor's exercise of the right. [114] When the contractor fails to exercise the right, the ownership remains with the employee-inventor. Thus, the term "retain" is used for both contractor and inventor. [115]

Further, the contractor's duty of filing a patent application is parallel to the employer's duty of patent application in the bills. [116] However, the bills made clear that the application must be filed in the name of the inventor, and thus the text in the Bayh-Dole Act should also read the same way. [117] In short, these texts tend to support Congress's intent to introduce a mechanism for employer-contractors to secure the ownership made by their employees though the German EIA bills.

B) Employers' Rights in Employee Inventions Under U.S. Common Law

U.S. common law gives employers very limited rights in inventions made by their employees even if they are hired to invent. [118] This is particularly true with respect to university researchers because many of them are hired to teach and conduct basic research. Without any written assignment contract, the majority of inventions fall out of the scope of the Bayh-Dole Act, even if they resulted from federally funded research activities.

As the Stanford majority noted, it is often true that property rights in fruits of labor belong to his employer. [119] This rule does not apply to patents because mere employment is not sufficient to transfer the ownership of employee inventions to the employer. [120] In general, the ownership of inventions belongs to inventors and does not transfer to their employers unless the inventors expressly agree to assign the inventions. [121] As early as 1843, the

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[109] *35 U.S.C. § 261* (2006).

[110] See, e.g., *35 U.S.C. § 111* (2006).

[111] *35 U.S.C. § 202*(c)(3) (2006).

[112] *35 U.S.C. § 202*(d) (2006) (emphasis added).

[113] H.R. 1483, 92d Cong. (1971) (also known as the "Moss Bills").

[114] Id. § 412.

[115] Id. § 413.

[116] Id. § 421.

[117] Id.

[118] See 8 *Chisum, supra note 93, § 22.03* (providing a general discussion of employer's rights in employee inventions under U.S. patent law).

[119] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2196 (2011).*

[120] Id.

[121] *Id. at 2195.*

Supreme Court had assumed that ownership of employee inventions went to the inventor. [122] However, the Supreme Court tried to account for the interests of employers by giving royalty free, non-exclusive licenses known as "shop rights." [123]

[*297] Beginning from the first Patent Act in 1790, the U.S. patent system has granted patents only to applications filed by the first and true inventors. [124] The same first Patent Act presupposes an invention made by multiple joint-inventors. [125] The employer of an inventor, however, cannot be qualified as a co-inventor. Regardless of financial contributions or instructions given by a natural person-employer, such employer cannot obtain any rights in the ownership of an invention unless she is a joint inventor of a technology that resulted from joint labors with her employee-inventor. [126] To qualify as a joint-inventor, she must make a contribution to the conception of the invention. [127] This is in stark contrast to the ownership of authorship under U.S. Copyright Law, which gives the ownership directly to employers under the work-for-hire doctrine. [128]

Therefore, universities cannot be co-inventors, and thus, can secure the ownership of invention only when they receive the ownership from inventors through an express assignment agreement. To protect interests of employers who fail to execute an express agreement, U.S. courts developed common law rules to give some rights to such employers: (1) if an employee is specially hired to make the particular invention or (2) if an employee is hired to make inventions in general. [129] As employers, universities should also obtain these rights when their employment with inventors meets these conditions; however, as will be discussed below, it is unlikely that the employment relationship between universities and their inventors meets the second condition. Thus, the common law rule does not help universities secure ownership of federally funded inventions.

Interestingly, the foundation of the current common law rule of ownership allocation was developed through the federal government's struggles over the ownership of its employees' inventions. One of the earliest cases disputing the ownership of an employee invention was United States v. Burns. [130] In this case, the inventor was a Major in the United States Army, and his duty had nothing to do with making inventions. [131] He invented a tent during his employment and obtained a patent on the invention. [132] Although the Army initially agreed to pay a royalty for a license **[*298]** to use his patented tent, it later attempted to avoid payment. [133] While affirming the Court of Claims's judgment to order the payment, the Supreme Court commented in dictum as to the government's rights in

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[122] 8 *Chisum, supra note 93, § 22.03*.

[123] Id.

[124] Patent Act of 1790, § 6. Since patent applications were not examined under 1790 Act, a patentee needed to produce evidence that he was the first and true inventor to enforce his patent in court.

[125] Id. § 1; see also 1 Chisum, supra note 91 (providing a general discussion on multi-inventor patents).

[126] 1 Chisum, supra note 91 (citing *Steams v. Barret, 22 F.Cas. 1175, 1181 (C.C.D. Mass. 1816)).*

[127] *Stern v. Trs. of Columbia Univ., 434 F.3d 1375, 1378 (Fed. Cir. 2006);* see also 1 ***Chisum, supra note 91, § 2.02***[2][a].

[128] *17 U.S.C. § 101* (2006 & Supp. IV 2010); see also LaFrance, supra note 104, at 100 (comparing the ownership rules between copyright and patents).

[129] 1 *Chisum, supra note 91, § 2.03*.

[130] *79 U.S. 246, 251 (1870).*

[131] *Id. at 252.*

[132] Id.

[133] *Id. at 253.*

the ownership of invention: "if an officer in the military service, not specially employed to make experiments with a view to suggest improvements, devises a new and valuable improvement in arms, tents, or any other kind of war materials, he is entitled to the benefit of it, … the government cannot, after the patent is issued, make use of the improvement any more than a private individual, without license of the inventor or making compensation to him." [134]

In dicta, the Court likewise commented on the applicability of the ownership rule to private employee-inventors. [135] This ownership rule, exclusive to inventors, was further reinforced in Solomons v. United States, [136] another case involving a federal government employee in which the Court held that the mere presence of an employment contract with an inventor does not give rise to any rights in the invention for his employer. As a result, the ownership rule, exclusive to inventors, took a firm root as a common law rule in U.S. case law.

Although U.S. courts have consistently denied any rights in the ownership to non-inventors, based solely on the invention resulting from the performance of an employment contract, they have been concerned about fairness and equity with respect to interests to employers who provided physical facilities and financial support for making the invention. [137] Such concerns led to the development of two exceptions to the ownership exclusive to the inventor rule: (1) non-exclusive, personal, non-transferable licenses called shop rights and (2) a duty of assignment based on the contract to hire inventors for inventing particular subject matter. [138] The McClurg case, decided in 1843, involved an invention made by an employee of a private firm. [139] In that case, the Supreme Court affirmed a circuit court's finding that presumed a license with respect to an improvement made by the inventor in the course of his employment. [140]

Relying on McClurg, the Court endorsed the presence of an implied license in another case involving an employee-inventor of a private firm, Hapgood v. Hewitt. [141] However, the Court clearly distinguished the nature of employment giving **[*299]** rise to a license from that of employment giving rise to a duty to assign rights in the ownership of invention. [142] Although the inventor was hired to invent in general, such employment gave rise only to a personal and non-transferable license. [143] The Court denied the plaintiff's claim to transfer the ownership of invention. [144]

The concept of an implied license was further elaborated in the context of the employment law rule in the government employer case discussed above, Solomons. [145] The Court made it clear that if an employee was hired to invent something, he had thereby given his employer an irrevocable license to use his invention. [146] The Court

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[134] *Id. at 252.*

[135] Id.

[136] *137 U.S. 342 (1890).*

[137] 8 *Chisum, supra note 93, § 22.03*[1][d].

[138] Id. § 22.03.

[139] *McClurg v. Kingsland, 42 U.S. 202, 205 (1843).*

[140] *Id. at 204.*

[141] *119 U.S. 226, 233 (1886).*

[142] Id.

[143] Id.

[144] Id.

[145] *Solomons v. United States, 137 U.S. 342 (1890).*

justified the implied license by relying on the fact that the inventor "recognized [his] obligations of service flowing from his employment and the benefits resulting from his use of property, and the assistance of the co-employees, of his employer." [147] In short, the Supreme Court acknowledged the fundamental employment rule.

Nevertheless, the Court decided to maintain the supremacy of the ownership-exclusive-to-the-inventor rule while granting a license to compensate employers for their loss of rights in the ownership of inventions, a type of property resulting from their employees' labor. [148] The Court later called this royalty free non-exclusive license a shop right stating that "where a servant, during his hours of employment, working with his master's materials and appliances, conceives and perfects an invention for which he obtains a patent, he must accord his master a nonexclusive right to practice the invention." [149] Since employee-inventors receive federal funds from universities, as well as assistance of co-workers and access to facilities, universities are clearly entitled to a "shop right" for federally funded inventions made by their employees; however, such right has no value to universities because universities do not practice inventions by themselves and a shop right is non-transferable. [150]

In addition to being subject to shop rights, U.S. employees are under a duty to transfer rights in the ownership of their inventions if the nature of employment indicates that the employees are specially hired to invent a specific machine or process. [151] **[*300]** It is unlikely that the employment relationships between universities and their employees fall into this category. In Standard Parts Co. v. Peck, the employment contract between a private employer and its employee expressly indicated that the inventor was hired to develop a process and the associated machinery for the production of a part used in a particular product of the employer. [152] Although the contract was silent with respect to patents resulting from the development, the Court affirmed the district court's decree ordering the employee to transfer the ownership of patents to his employer. [153] Even if a researcher is hired to conduct a particular research project identified in a funding agreement, it is unlikely that the employment contract with the university satisfied the degree of subject matter specification, with respect to a particular invention, that would give rise to an ownership assignment duty.

U.S. common law requires employers to give full notice during employment contract negotiations to their employee-inventors regarding the transfer of invention ownership subject to the employment contract, because the "specially hired to invent" doctrine is an exception to the ownership rule exclusive to inventors. U.S. courts have repeatedly held that an employment contract to hire an employee for inventing something in general does not give rise to a duty of assignment. [154] In another case involving a government employee, United States v. Dubilier Condenser Corp., the Supreme Court emphasized the distinction between the contract of hiring an inventor for conducting research and making inventions in general, and that of hiring an inventor for making a particular invention. [155] According to the majority in Dubilier, hiring an employee to create an invention gives rise to an ownership assignment duty with respect to that employee's inventions only if such inventions are the precise subject of the

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[146] Id.

[147] Id.

[148] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2195 (2011).*

[149] United States v. Dubilier Condenser Corp., 289 U.S.178, 188 (1933).

[150] *Hapgood v. Hewitt, 119 U.S. 226, 233 (1886);* 8 *Chisum, supra note 93, § 22.03*[1][c].

[151] 8 *Chisum, supra note 93, § 22.03*[2].

[152] *264 U.S. 52, 59 (1924).*

[153] *Id. at 59-60.*

[154] 8 *Chisum, supra note 93, § 22.03*[2]; ***Aetna-Standard Eng'g Co. v. Rowland, 493 A.2d 1375, 1377 (Pa. Super. Ct. 1985).***

[155] *289 U.S. 178, 187 (1933).*

employment contract. [156] Accordingly, the terms of an employment contract must be clear enough to define which invention the employer paid for so that the ownership of that invention can be transferred to the employer. The Court highlighted the distinction between rights in the ownership of inventions and other types of properties resulting from regular labor; only the former was said to result from inventive activities showing an exercise of unique creativity beyond ordinary skill. [157]

Due to this special nature of inventions, rights in the ownership of the invention do not transfer to employers unless employees specially bargained for and **[*301]** agreed to the compensation for the inventions when they entered into the employment contract. It is rare for universities to have an employment contract detailing tasks for university researchers. Further, university researchers engage in basic research, which usually results in inventions that need further investment prior to commercialization. [158] University inventors do not have opportunities to bargain for such inventions when they are first employed by universities because their inventions are unforeseeable at the initial time of employment. [159]

The Court also used this special nature of invention to define the scope of shop rights. [160] Employers are entitled to a license to use the invention, but have no right to demand a transfer of the ownership of invention because the invention is the original conception of the employee; thus, it should remain the property of the employee. [161] In Dubilier Condenser Corp., the employment contract only stipulated that the inventor was hired to conduct research in general. [162] This finding led to the Court's refusal to transfer patents held by the employee-inventor to the federal employer. [163] Thus, Dubilier also implies that universities can only obtain a shop right.

This reluctance to infer a contract to assign rights in the ownership of an invention is supported by the patent policy of promoting innovations through inventions. To preserve incentives to invent, U.S. case law prevents employers from taking away property rights in the invention and secures opportunities for employee-inventors to bargain with their employers for the fair value of their inventions. [164] In other words, the patent policy of promoting innovation through rewards to inventors is supported through the bargaining between inventors and their employers over a transfer of property rights in inventions.

The Bayh-Dole Act touches upon neither shop rights nor the "specially-hired doctrine." Under the common law ownership rule, in addition to the contractors, the government may have a shop right with respect to inventions made by its contractors' employees, depending on the nature of the contract. Some may view the provision to require an agreement in the contract with respect to the government's right to use the invention as simply confirming the common law shop rights.

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[156] Id.

[157] *Id. at 189-190.*

[158] See *Ariad Pharm., Inc. v. Eli Lilly & Co., 598 F.3d 1336, 1358 (Fed. Cir. 2010)* (discussing the difficulties facing universities arising from their focus on basic research).

[159] *United States. v. Dubilier Condenser Corp., 289 U.S. 178, 188 (1933).*

[160] Id.

[161] *Id. at 188-89.*

[162] *Id. at 193.*

[163] *Id. at 189-90.*

[164] LaFrance, supra note 104, at 93; 8 *Chisum, supra note 93, § 22.03*[2].

The Bayh-Dole Act's legislative history rejects such a view and instead supports a view that the right is created only through an express license with the contractor. **[*302]** In an early effort to develop a uniform patent policy concerning federal employees, the government issued an executive order defining the types of employment that give rise to the duty to transfer the ownership of invention and to a "shop right." [165] An Attorney General report leading to the executive order also included a recommendation for the ownership of federally funded inventions developed by government contractors. [166] It did not recommend using the definitions for deciding the ownership of contractor inventions; instead, it adopted a general rule to retain government ownership of such inventions with some exceptions. [167] The recommendation required inclusion of a clause granting the government a right to use the invention and "March-in Rights" in a contract between a federal agency and its contractor when an exception applies and the government allows the contractor to retain ownership of federally funded inventions. [168] This recommendation was implemented by the Kennedy Administration in 1963. [169] Since the Bayh-Dole Act codified the government's rights, the rights to use the invention under the Act should be viewed separately from a shop right under the common law ownership rule. Thus, these rights should be available only through an express license from the contractors who hold the ownership of inventions and patents.

Throughout the legislative history of the Bayh-Dole Act, Congress paid very little attention to contractor-employee relationships during the development of the best practice of ownership allocation because this exercise focused on the allocation between the government and its contractors. [170] This relationship was only discussed with respect to the German EIA based bills. [171] In other words, implementation of the best ownership allocation relied on the assumption that contractors are able to secure ownership of all inventions that fall into the definition of "subject invention" through pre-invention assignment contract practice until the bills introduce an ownership transfer mechanism in operation of law. Unfortunately, this assumption has not always proven true, as illustrated in Stanford. Moreover, Congress has never been able to pass the contemplated bills. The common law rule is not helpful for contractors, particularly universities, in securing the ownership of invention if they fail to execute an assignment contract. If a contractor fails to secure ownership of a federally funded invention, the federal government loses rights in that invention **[*303]** because government rights in inventions can only be secured through agreements with its contractors.

4. Unintended Results: Non-Uniform Assignment under State Contract Law and Special Legislations

Even if contractors execute an express assignment contract with their employees, it is unclear whether the assignment duty is enforceable if the duty includes assignments of all inventions which fall into the definition of subject inventions: "conceived or first actually reduced to practice in the performance of work under a funding agreement." [172] The Stanford majority suggested that such an assignment duty is overbroad. [173] Moreover, the enforceable scope of such assignment agreements may differ from one state to another. This non-uniformity in

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[165] Exec. Order No. 10096, *15 Fed. Reg. 389* (Jan. 25, 1950), reprinted as amended in *37 C.F.R. § 501.6 (2011)*.

[166] 1 Dept of Justice, Final Rep. of the Att'y Gen. to the President on Gov't Patent Practices & Policies, Summary of Findings, Conclusions & Recommendations of the Att'y Gen. 4 (1947).

[167] Id. at 5; O'Connor, et al., supra note 63, at 8.

[168] O'Connor, et al., supra note 63, at 8.

[169] Memorandum for the Heads of Exec. Dep't and Agencies, *28 Fed. Reg. 10943, 10943* (Oct. 12, 1963); O'Connor, et al., supra note 63, at 10.

[170] O'Connor, et al., supra note 63, at 15.

[171] H.R. 1483, 92d Cong. (1971) (known as "Moss Bills").

[172] Bayh-Dole Act, *35 U.S.C. § 201*(e) (2006).

[173] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2198 (2011).*

securing the ownership of federally funded inventions through pre-invention assignment contracts hinders the goals of the Bayh-Dole Act.

Despite the important role played by pre-invention assignment contracts in implementing federal policy, U.S. courts leave interpretation and enforceability of contract terms to the governance of state policies through the application of state contract law. [174] The Supreme Court empowered state courts to develop their own laws governing state questions regarding such invention issues as ownership and transfer of patents. [175] However, state courts in general acknowledge the significance of federal case law and follow the precedent of the Supreme Court. [176] This has led to a development of fairly uniform common law rules in ownership and assignment enforceability throughout state and federal courts in the United States.

Although the uniform common law requires an express agreement to transfer ownership, state law generally governs such an agreement, with some exceptions. [177] One such exception arises when there is a question as to whether a patent assignment clause created an automatic assignment. [178] This issue is governed by federal law because it closely relates to the question of standing in patent cases governed by federal laws. [179] Under Federal Circuit case law, the contract language "agree to assign" indicates a mere promise to assign; thus, the assignment of future inventions does not occur unless a subsequent written instrument executes the assignment. [180] **[*304]** In contrast, the language "do hereby assign" or "will assign" indicates a present assignment and rights in the inventions are automatically transferred to the employer as soon as the inventions are completed. [181] Accordingly, whether a contractor secures a transfer of ownership of a federally funded invention depends on the terms used in the pre-invention assignment contract that the contractor and its employees agreed upon, leaving contractors to easily fall into a technical drafting trap. [182] Although it is likely that state courts also follow Federal Circuit case law, they may apply their own law, which may lead to a different conclusion with respect to the ownership of a federally funded invention.

Furthermore, differing state public policies regarding the ownership of an assignment agreement in employment contracts lead to non-uniformity in the scope of inventions for which contractors can secure ownership of federally funded inventions from their employees. In general, employers are not required to pay any additional compensation as a consideration for a transfer of rights in an invention. [183] This is because U.S. courts view the payment of

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[174] 8 *Chisum, supra note 93, § 22.03*[4].

[175] *Erie R. Co. v. Tompkins, 304 U.S. 64, 78 (1938).*

[176] See, e.g., *Farmland Irrigation Co., v. Dopplmaier, 308 P.2d 732, 740 (Cal. 1957).*

[177] See, e.g., *Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 583 F.3d 832, 837 (Fed. Cir. 2009),* aff'd, 563 U.S. ___, *131 S. Ct. 2188 (2011).*

[178] *DDB Techs., L.L.C. v. MLB Advanced Media, L.P., 517 F.3d 1284, 1290 (Fed. Cir. 2008).*

[179] *Roche, 583 F.3d at 841.*

[180] Id.

[181] *Id. at 842;* see also Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2198 (2011)* (Breyer, J., dissenting) (criticizing this interpretation distinguishing two equitable claims based on the terms in pre-assignment contracts and urging the application of the previous rule that treated two claims equally and gave the ownership of invention to Stanford because the Stanford contract came first and then subsequently obtained a post-invention assignment).

[182] Stanford, 563 U.S. ___, *131 S. Ct. at 2203* (Breyer, J., dissenting).

[183] Henrik D. Parker, Reform for Rights of Employed Inventors, *57 S. Cal. L. Rev. 603, 608 (1984);* Ann Bartow, Inventors of the World, Unite! A Ca11 for Collective Action by Employee-Inventors, *37 Santa Clara L. Rev. 673, 673 (1997).*

salary, assistance of co-employees, and right to use an employer's facility as constituting sufficient consideration. [184] Legal scholars have criticized the case law endorsing U.S. industry pre-invention assignment practice without any compensation and some argue that lack of additional compensation dampens incentive to invent and contradicts the federal patent system policy under the Copyright and Patent Clause. [185] These academic views are not persuasive to U.S. courts, which refuse to find any right that the constitutional clause gives to inventors. [186] Since the common law ownership rules require pre-invention assignment agreements to be not only expressive, but also clear (in order to give a notice to inventors with respect to what they give up in exchange for their **[*305]** salary) courts consider the inventor's salary as sufficient consideration to enforce the agreement. [187]

Although U.S. courts favor enforcing an express assignment contract, if an employee's duties of assignment are overbroad, they may decline to enforce an agreement literally. [188] Courts may reinterpret the overbroad agreement to limit the duties within a reasonable scope. [189] In some states, an employment contract including an overbroad assignment agreement is void and unenforceable. [190] In general, legislation enacted in these states prevents employers from enforcing a contract obligating a transfer of rights in the ownership of the invention that is developed entirely on the employee's own time unless (1) the invention relates to employer's business or to the employer's actual or "demonstrably anticipated" research and development or (2) the invention results from work performed by the employee for the employer. [191] In contrast, only one state, Nevada, has enacted legislation which allows transfer of rights in the ownership of invention automatically without any express agreement if the invention is made during the term of employment and falls within the scope of the employee's job description. [192] In some states, a contract to transfer rights in the ownership of any invention made during the term of employment may be valid and enforceable regardless of the invention's relation to the inventor's duties or the employer's business, as long as the invention resulted from work the employee conducted for his employer. [193]

In short, the ownership of an invention may or may not transfer to contractors depending on the state law which governs the employment relationship. There is no uniform federal law to govern the enforceable scope of an employee invention assignment agreement. When Congress failed to pass the German EIA based bills, it also lost a chance to develop a uniform policy to govern assignment contracts for employee inventions, including federally funded inventions. [194] Furthermore, the Stanford majority's comment on the scope of subject invention suggests its interest in overriding state contract laws and special legislations while preventing the enforcement of overbroad

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[184] E.g., *Goodyear Tire & Rubber Co. v. Miller, 22 F.2d 353, 355 (9th Cir. 1927).*

[185] See, e.g., Parker, supra note 183, at 604-05; Bartow, supra note 183, at 683-84; Mark B. Baker & Andre J. Brunel, Restructuring the Judicial Evaluation of Employed Inventors' Rights, 35 St. Louis U. L.J. 399 (1991); Steven Cherensky, A Penny for Their Thoughts: Employee-Inventors, Pre-Invention Assignment Agreements, Property, and Personhood, *81 Cal. L. Rev. 597 (1993).*

[186] *Teleflex Info. Sys. Inc. v. Arnold, 513 S.E.2d 85, 87 (N.C. Ct. App. 1999).*

[187] ***Aetna-Standard Eng'g Corp. v. Rowland, 493 A.2d 1375, 1379 (Pa. 1985).***

[188] Dratler, supra note 68, at 142.

[189] Id. at 142-44 (dicussing *Guth v. Minn. Mining & Mfg. Co., 72 F.2d 385, 387-88 (7th Cir. 1934));* see also Universal Winding Co. v. Clarke, 108 F. Supp. 329 (D. Conn. 1952).

[190] These states currently include California, Minnesota, North Carolina, Washington and Nevada. O'Connor, et al., supra note 63, at 85.

[191] LaFrance, supra note 104, at 96.

[192] Id. at 88

[193] *Cubic Corp. v. Marty, 229 Cal Rptr. 828, 836 (Cal. Ct. App. 1986).*

[194] H.R. 1483, 92d Cong. (1971).

assignment duties. [195] This leads to another uncertainty: **[*306]** whether the ownership of a federally funded invention may or may not transfer to contractors.

Finally, the Stanford majority's interpretation of the Bayh-Dole Act does not prevent employee-inventors from transferring the ownership of federally funded inventions to a party other than their employer-contractors. [196] Stanford could not have avoided its loss of ownership even if it had executed an automatic assignment with the inventor because the inventor already executed an assignment contract with a third-party prior to the Stanford assignment. In academic-industry collaborations, researchers move back and forth between universities and industry partners and conduct different aspects of research projects in various locations with different research teams. [197] Researchers contract for multiple assignments with a variety of terms throughout projects, which often leads to inconsistent duties, as highlighted in Stanford. With limited resources, it is impossible for contractors to conduct due diligence on all researchers with respect to their prior assignments.

II. Ownership Transfer Mechanism Under Federal Laws for Handling National Security Related Inventions

Since a uniform policy could be implemented through contractors' ownership of federally funded inventions, the Bayh-Dole Act should adopt a mechanism for transferring such ownership to contractors. Congress has already incorporated such a mechanism in federal laws for handling inventions closely related to national security. [198] Statutes and regulations dealing with such inventions provide mechanisms for securing the government's ownership through an automatic transfer by operation of law. [199] They also provide procedures for inventors and their assignees to challenge the federal government's ownership and protect their interests. [200] Stanford urged the Supreme Court to read the Bayh-Dole Act to implicitly adopt a similar mechanism. [201] The Court rejected Stanford's interpretation because the Act does not include language that clearly negates the common law ownership rules and lacks procedures to protect inventors and third-parties who did not receive federal funds. [202] This suggests that the Bayh-Dole Act could be revised to adopt the **[*307]** mechanism from these federal laws by including language that vests the ownership in contractors and adopts a procedure to protect third-parties; however, such a revision may not be feasible because it would substantially increase the administration costs of both the USPTO and contractors.

1. Atomic Energy Act

The Atomic Energy Act of 1954 (AEA) was enacted by Congress to secure the government's ownership of subject inventions by operation of law. [203] A "subject invention" under the AEA is an invention that relates to the utilization of special nuclear material or atomic energy in atomic weapons ("NMAE invention"), and thus, is closely related to national security. [204] The AEA includes a declaration of the strong federal policy for using the invention to improve

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[195] See Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2198 (2011)* ("Stanford's reading suggests that the school would obtain title to one of its employee's inventions even if only one dollar of federal funding was applied toward the invention's conception or reduction to practice.").

[196] *Id. at 2201.*

[197] Reder, supra note 6, at 16.

[198] See infra Part II.1-2.

[199] See infra Part II.1-2.

[200] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2191 (2011).*

[201] *Id. at 2195-96.*

[202] *Id. at 2196-98.*

[203] Atomic Energy Act of 1954, Pub. L. No. 83-703, *68 Stat. 919* (codified as amended at *42 U.S.C. § 2011* et seq. (2006)).

the general welfare and avoid its use in an atomic weapon. [205] Reflecting this policy, the AEA prevents the USPTO from issuing a patent to a NMAE invention as long as it is used in an atomic weapon. [206] It makes it clear that the federal government's ownership of the invention falls into the definition of an NMAE invention by operation of law. The AEA defines the government's ownership of a subject invention using language that is very different from that in the Bayh-Dole Act defining ownership. Under the AEA, any NMAE invention is "vested in and … the property of the [Atomic Energy] Commission if the invention is made or conceived in the course of or under any contract … or arrangement entered into with or for the benefit of the Commission." [207]

In order to secure the federal government's ownership of an NMAE invention by operation of law, the AEA provides a mechanism for discovering any NMAE inventions included in a patent application filed by an inventor, regardless of whether the inventions resulted from federal funds. [208] Like the Bayh-Dole Act with respect to contractors, the AEA imposes an obligation on all applicants to file statements explaining the full facts surrounding the making and conceiving of the inventions when they file patent applications for NMAE inventions. [209] The AEA requires the USPTO to forward copies of the application and the statement to the Atomic Energy Commission (AEC) as soon as the USPTO concludes that the invention is in the condition of allowance. [210] The USPTO must then issue a patent **[*308]** directly to the AEC, if the Commission so directs. [211] The AEA also provides applicants with the right to challenge the Commission's ownership of invention if applicants believe that the invention was not made or conceived in the course of any contract or arrangement with the AEC. [212]

The AEA imposes a duty on inventors to file either a report of an invention with the AEC or a patent application with the USPTO if they have made an NMAE invention. [213] Ownership disputes are resolved through interference procedures at the USPTO. [214] The AEA reinforces the government's ownership by negating any potential waiver and by giving authority to the AEC to request that the USPTO transfer ownership of the patent in the NMAE invention to the AEC if an applicant is found to have submitted a statement containing materially false statements. [215]

It should be noted that NMAE inventions are different from other inventions because the federal government is able to prevent the USPTO from issuing a patent even if the government does not have any rights in the ownership of the inventions. [216] Both the AEA and the Invention Secrecy Act give the government the authority to dispose of an inventor's rights in any patent deriving from a particular invention. [217] Under the Invention Secrecy Act, the USPTO screens patent applications to find those associated with NMAE inventions and may issue an order to keep the

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[204] *42 U.S.C. § 2181*(a) (2006).

[205] *42 U.S.C. § 2201* (2006 & Supp. IV 2010).

[206] Id. § 2181.

[207] Id. § 2182.

[208] Id.

[209] Id.

[210] Id.

[211] Id.

[212] Id.

[213] Id. § 2181.

[214] Id. § 2182.

[215] Id.

[216] 1 ***Chisum, supra note 91, § 1.06***[4].

[217] Invention Secrecy Act of 1951, *35 U.S.C. § 181* (2006).

invention secret, regardless of government ownership, if disclosure of such invention might be detrimental to national security regardless of government ownership. [218] If such an order is issued, the grant of the patent is withheld as long as the disclosure is deemed to be detrimental to national security. [219] The only remedy for an applicant's loss of patent rights is monetary compensation. [220] Further, whenever a patent is issued on an NMAE invention, the AEA provides the AEC with the right to use the invention, as well as the right to issue a compulsory license for a third party to use the invention. [221]

2. National Aeronautics and Space Act

Inventions relating to aeronautical and space activities are another type of invention closely related to national security. Congress felt it necessary to promote **[*309]** such activities in order to improve general welfare and national security; thus, it enacted the National Aeronautics and Space Act (NAS Act). [222] Under the NAS Act, aeronautical and space activities include (1) research into and the solution of problems related to flight within and outside the earth's atmosphere; (2) the development, construction, testing, and operation of aeronautical and space vehicles for research purposes; and (3) such other activities as may be required for the exploration of space. [223] Due to a strong federal policy in favor of promoting national security, the NAS Act, like the AEA, clearly transfers the ownership of federally funded inventions to the government by operation of law via the following provision: "such invention shall be the exclusive property of the United States … ." [224]

The NAS Act provides a mechanism, similar to the mechanism found in the German EIA, for securing government ownership of subject inventions. The NAS Act requires all applicants to file a statement surrounding the circumstances under which the invention was made so that the National Aeronautics and Space Administration ("NASA") can determine whether the invention resulted from the performance of any contract work with NASA. [225] The NAS Act also gives NASA the authority to request that the USPTO issue a patent directly to NASA on behalf of the federal government. [226] Finally, the NAS Act also provides an applicant with the ability to challenge NASA's decision regarding ownership through interference procedures at the USPTO. [227]

It is likely that many aeronautical and space activity related inventions fall into the category of those inventions that would, if disclosed, be detrimental to national security. Thus, through the Invention Secrecy Act, the government has a right of disposition with respect to such inventions, so long as it provides fair compensation to applicants.

3. Applicability of the Ownership Transfer Mechanism to the Bayh-Dole Act

Unfortunately, the mechanisms included in the AEA and NAS Acts that secure the government's ownership of federally funded inventions are an ill fit to the Bayh-Dole Act. Both the AEA and the NAS Acts impose heavy burdens on the USPTO to screen inventions and to inform the government if any invention falls within the scope of

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[218] Id.

[219] Id.

[220] Id. § 183.

[221] *42 U.S.C. § 2183* (2006).

[222] National Aeronautics and Space Act (NAS Act) of 1958, 85 Pub. L. No. 85-568 § 102, ***72 Stat. 426*** (codified as amended in scattered sections of 42 U.S.C.).

[223] 42 U.S.C. § 103(a) (2006).

[224] *42 U.S.C. § 305*(a) (2006).

[225] *42 U.S.C. § 305*(c) (2006).

[226] *42 U.S.C. § 305*(d) (2006).

[227] Id.

the Acts so that the related federal agencies can determine if the **[*310]** government has any right in the ownership of an invention. [228] The Acts also require applicants to submit a statement regarding the circumstances under which the invention was made. [229] This screening process is feasible at the USPTO only because the categories of inventions to which the Acts apply are narrowly tailored and the number of applications relating to inventions falling within the categories is relatively small. Expanding the categories of inventions to cover all types of inventions that contractors could create during research and development is impossible. Imposing on contractor-applicants a duty to file a statement reporting inventive activities unnecessarily increases administrative burden on both the USPTO and applicants. In short, the increased administrative burden makes it impractical for the Bayh-Dole Act to adopt the ownership transfer mechanism from the AEA or NAS Acts.

III. Ownership Transfer Mechanism Under the German EIA

As Congress has done in the past, it can reasonably look for an ownership transfer mechanism in foreign employee invention systems, such as the German EIA, which is already a model for many Asian and European countries. This is particularly true with the Bayh-Dole Act because texts in the Act suggest that the Act assumed that the ownership rules for employee inventions in the failed bills, which were based on the German EIA, would be enacted. [230] Overall, the German EIA's mechanism for securing rights in the ownership of invention is very similar to the one in the Bayh-Dole Act, sharing the following five key features: (1) inventor's duty to report; [231] (2) employer's rights to claim the ownership of an invention resulting from the performance of an employment or research contract; [232] (3) duty to file domestic and foreign patent applications; [233] (4) retention of the ownership of an invention by its inventor if no one exercises a superior right to claim; [234] and (5) right of reasonable compensation for transfers of rights in the ownership of inventions. [235] Moreover, the fundamental ownership rules under German Patent Law are the same as the rules under U.S. Patent Law. [236] Legislative histories of these Acts reveal a cornerstone event in one country followed by a similar event in the other, which suggests that U.S. and German governments were aware that they **[*311]** were engaging in similar exercises. Reflecting the risk adverse German culture that prefers written rules and detailed codes of conduct, the German EIA contains more detailed procedures for transferring ownership and more specific mechanisms to protect employee interests than the Bayh-Dole Act. [237]

1. Origin of Common Key Features: Possible Legislative Interaction

The German EIA provides a comprehensive mechanism for employers to secure all property rights in the ownership of inventions made by employees. [238] Due to Germany's unique practice of compromising between public interests based on employment and patent law, the German legislature enacted a law independent from

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[228] Atomic Energy Act of 1954, Pub. L. No. 83-703, *68 Stat. 919* § 152 (1954) (codified as amended at *42 U.S.C. § 2011* et seq. (2006)); National Aeronautics and Space Act (NAS Act) of 1958, 85 Pub. L. No. 85-568 § 305(c), ***72 Stat. 426 (1958).***

[229] Id.

[230] See supra Part I.2.

[231] German EIA supra note 19, § 5.

[232] Id. § 6.

[233] Id. §§13-14.

[234] Id. § 8.

[235] Id.

[236] See infra Part III.2.A.

[237] See infra Part III.2.B.

[238] See infra Part III.2.B.

German Patent Law that included both details for rights and obligations between employees and their employers and procedures to transfer rights in the ownership of inventions from employee-inventors to their employers. [239]

In Germany, the effort to clarify ownership and compensation started at the beginning of the 20th Century as the number of employee-inventors increased. [240] This was also the time when Congress began to examine the government's rights to use inventions made by private persons, as well as those made by federal employees, eventually leading to the Bayh-Dole Act. [241] During WWI, German employee-inventors were able to develop a collective bargaining power that led to the first collective labor agreement in the chemical industry in 1920, which dealt with ownership and compensation for employee inventions. [242] Other industry sectors followed this example. [243] In 1942, during WWII and after several failed attempts to replace the collective labor agreements with a generally applicable law, the Minister of Armament, motivated by the necessity of promoting technological advancement, issued a regulation to handle employee inventions. [244] The 1942 regulation already included a number of the key features of the ownership transfer mechanism that would later be contained in the modern German EIA. [245] The regulation was revised in 1943 to add guidelines for calculating the amount of remuneration based on a list of factors. [246]

[*312] That same year, President Roosevelt requested that the United States Attorney General develop a uniform patent policy for federal employees and contractors. [247] A report was published by the Attorney General a few years later in response to the President's request. [248] The report recommended a mechanism that decided the ownership by classifying inventions developed by federal employees into three categories, which are somewhat similar to the categories of inventions under the German EIA. [249]

As soon as it recovered from the aftermath of WWII, the German government resumed its effort to enact a law that would allocate ownership rights in employee inventions and provide for inventor compensation. [250] Although introduced in 1952, the first bill failed to be enacted into law due to overly lengthy discussions. [251] The current

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[239] Harhoff & Hoisl, supra note 75, at 8.

[240] Id. at 7.

[241] O'Connor, et al., supra note 63, at 4.

[242] Harhoff & Hoisl, supra note 75, at 7 n.6 (stating the name of the landmark agreement of April 27, 1920: Reichstarifvertragfur die akademischgebildetenAngestellten der chemischenIndustrieas).

[243] Id. at 7.

[244] Id. (stating the name of the regulation: Verordnunguber die Behandlung von Erfindungen von Gefolgschaftsmitgliedern ("Provisions on the Handling of Inventions of Subordinates")).

[245] Id.

[246] Id. (stating the name of the revised regulation: Richtslinien fur die Vergutung von Gefolgschftserfindungen ("Guidelines for Subordinate Inventions")).

[247] O'Connor, et al., supra note 63, at 6.

[248] Id. at 6-7 (referring to the Dep't of Justice, Investigation of Government Patents and Practices and Policies, Reports and Recommendations of the Attorney General to President of 1947).

[249] Id.

[250] Germany was divided into West Germany (Federal Republic of Germany) and East Germany (German Democratic Republic) over the period between 1949 and 1990. East Germany had its own employee invention system during the period.

[251] Harhoff & Hoisl, supra note 75, at 7-9.

German Employee Inventions Act became effective in 1957, including all five key features. [252] The Act was revised in 1959 to incorporate official guidelines for calculating the amount of inventor remuneration. [253]

It is also interesting to note that in 1963, only a few years after the enactment of the German EIA, the U.S. government published the Kennedy Patent Policy, which was most influential with respect to the Bayh-Dole Act as it recommended all of the key features in that Act's current provisions. [254] Although the Kennedy Patent Policy was never implemented as a government-wide patent policy, many federal agencies adopted their own policies incorporating a few or all of its key features. [255] The key features of the Kennedy Patent Policy survived modification by the Nixon Administration [256] and were finally codified when the Bayh-Dole Act was enacted in 1980. [257]

[*313] Likewise, all five key features in the German EIA have remained the same since its enactment in 1957. [258] The EIA was recently revised in 2002 and 2009, but these revisions did not significantly affect the key features. [259]

In parallel to the above exercise leading to the Bayh-Dole Act, the U.S Congress also examined a series of bills starting the 1970s [260] followed by the last bill in 1982. [261] Many provisions of these bills are effectively translations of the German EIA. These bills confirm Congress's strong interests in the German EIA, which would have resulted in a clear influence on the overall structure of the Bayh-Dole Act.

2. Ownership Rules Under the German EIA

A) Fundamental Rule: Inventors as Original Owners

Under German patent law, a right to patent is initially vested only in the sole inventor or co-inventors who have made creative contributions to the invention. [262] An employer cannot be an inventor or co-inventor unless he or she makes such a contribution. Additionally, only a natural person can make such a contribution; thus, a legal entity cannot be an inventor. [263] This fundamental rule is universal to all branches of intellectual property, including copyright, in the German legal system. There is no "work for hire" exception to the rule as there is in U.S. copyright law.

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[252] Id. at 8.

[253] Id. at 9.

[254] See Memorandum for the Heads of Exec. Dep'ts and Agencies, *28 Fed. Reg. 10943, 10943-46* (Oct. 12, 1963) (listing the provisions proposed for U.S. patent policy).

[255] O'Connor, et al, supra note 63, at 11.

[256] Memorandum for the Heads of Exec. Dep't and Agencies on Gov't Patent Policy, *36 Fed. Reg. 16,887,* Aug. 23, 1971.

[257] O'Connor, et al, supra note 63, at 11.

[258] Trimborn, supra note 19, at 2.

[259] Id.; Anja Petersen-Padberg & Markus Georg Muller, Reform of the German Act on Employees' Inventions as of 1 October 2009: Companies' Rights to Inventions Have Been Expanded, Newsletter (Hoffman Elite) Feb 17, 2010, at 2, available at *http://195.30.228.55/media/he_downloads/datei/0/141/* HE_Newsletter_05-2009.pdf.

[260] H.R. 1483, 92d Cong. (1971).

[261] Kastenmeier Bill, H.R. 6635, 97th Cong. (1982).

[262] Patentgesetz [PatG] [Patent Act], Dec. 16, 1980, Bundesgesetzblatt [BHBl] at 501, § 6 (Ger.) [hereinafter German Patent Act].

[263] Id.

Because ownership in both German and U.S. patent law always originates from the inventor, an examination of inventorship is a sensible starting point for determining ownership. While patent law applies to determine who is the inventor, unlike U.S. patent law, German patent law plays a very limited role in determining the ownership of an invention before the patent application is filed. [264] In general, the property and contract principles found in the German Civil Codes govern the assignment of property rights, including those in the ownership of an invention. [265] Regarding the ownership of property rights resulting from the performance of duty under an employment contract, German labor and employment law may provide a **[*314]** special rule governing contracts between employers and their employees that reflects public policy regarding the ownership of property rights resulting from the performance of duty under an employment contract. [266] German labor and employment law makes it clear that the fruits of employees' labor belong to their employers. [267] This ownership rule conflicts with the patent law rule, which vests original ownership in inventors. To remove this conflict while achieving the public policies of both patent law and labor and employment law, German legislators enacted the EIA, which governs the assignment of invention ownership rights between employers and employees. [268]

B) Employers' Rights in Employee Inventions Under the German EIA

Under the German EIA, the patent law rule that inventors are original owners prevails over the employer-friendly rule of employment law. [269] Thus, the German EIA's rule is perfectly in-line with U.S. law in vesting original ownership rights in employee-inventors. [270] However, the German EIA differs from the U.S. rule by guaranteeing employers a right to claim either the transfer of ownership of employees' inventions or an exclusive license to use those inventions. [271] In other words, the German EIA limits the parties' freedom of contract and makes any contract conflicting with a provision of EIA void. [272]

Due to the mandatory nature of the German EIA, and the strong public policies it reflects, the German EIA clearly defines the scope of inventions that it governs. The Act covers any technical subject matter, regardless of its patentability, as long as it is made by an employee-inventor. [273] Under German employment law, an employee is a person who is bound by instructions on the grounds of an employment relationship and obliged in personal dependence on another, the employer. [274] The technical subject matter that the German EIA governs is classified into inventions and technical improvement proposals. [275] Inventions are distinguished from technical improvement proposals in that inventions qualify for protection under either **[*315]** German patent law or utility model

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[264] Id.; Patent Act, *35 U.S.C. § 102*(g) (2006).

[265] Krabetaer, Patentrecht, § 40(III) (6th ed. 2009).

[266] Id. § 21(I)(a).

[267] BAG [Federal Labour Court] 1961 NJW 1509; Burgerliches Gesetzbach [BGB] [Civil Code], Jan. 2, 2002, Bundsgesetzblatt, Teili [BGBl.I] 42, §§611, 613 (Ger.) [hereinafter German Civil Code].

[268] Trimborn, supra note 19, at 2.

[269] See generally German EIA, supra note 19.

[270] German Patent Act, supra note 262, § 6; Trimborn, supra note 19, at 1.

[271] German EIA, supra note 19, § 6.

[272] Id. § 22.

[273] Id. § 1; Harhoff & Hoisl, supra note 75, at 9.

[274] Trimborn, supra note 19, at 12.

[275] German EIA, supra note 19, §§2-3.

registration. [276] Subject matter that maybe not the subject of a patent falls into the category of technical improvement proposals and is not subject to various duties relating to patent applications. [277]

Patentable inventions are further classified into two types: service inventions (also known as "tied" inventions) and free inventions. [278] An invention made during a term of employment is a service invention if (1) it resulted from the employee's tasks in the employer's business or public administration, or (2) it is essentially based upon the experience or activities of the employer's business or public administration. [279] Any inventions that do not fall into the definition of service invention are free inventions. [280]

The German EIA guarantees employers the right to claim ownership of all property rights in service inventions. [281] Before the 2009 revision, an employer had to submit a document that met certain formality requirements under the Civil Code. [282] The revision eliminated the formality requirement and made it possible for employers to make a declaration by an e-mail or facsimile. [283] Accordingly, ownership transfer under the German EIA was not automatic; thus, the German EIA was different from the U.S. AEA and NAS Acts, in which assignment of invention ownership rights was automatic as an operation of law. Like an assignment based on the "agree to assign" term in Stanford, an assignment under the German EIA is executed only when the inventor's employer exercises its right to claim ownership. [284] This pre-2009 requirement of a written instrument to execute an assignment is also similar to the practice widely adopted by U.S. employers of using "agree to assign" terms in pre-invention assignment contracts. [285]

Failing to exercise the claiming right may forfeit the employer's right in the ownership of service inventions under the German EIA. [286] The EIA lets employee-inventors retain ownership rights and gives freedom to assign ownership to a third-party, including the employer's competitor, if their employers do not exercise their **[*316]** claiming rights within the "four months from the receipt of proper report." [287] The 2009 revision remedied this problem by introducing a presumption of employers' proper exercise of their claiming right unless they send out a declaration negating their claim and releasing their rights to the invention within four months of receiving an invention report from the employee. [288] This assumption made the EIA's ownership transfer mechanism complete in terms of protecting employers from loss of their rights in service inventions because of their negligence or ignorance of EIA provisions.

The German EIA further protects employers' rights by voiding any transactions that transferred ownership of a service invention prior to the employer's exercise of its claim if those transactions affect the employer's right. [289] As

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[276] Id. § 2.

[277] Id. § 3.

[278] Id. § 4(1).

[279] Id. § 4(2).

[280] German EIA, supra note 19, § 4(3).

[281] Id. § 6(1).

[282] German Civil Code, supra note 267, § 126b.

[283] Petersen-Padberg & Muller, supra note 259, at 3.

[284] *IpVenture, Inc. v. Prostar Computer, Inc., 503 F.3d 1324, 1327 (Fed. Cir. 2007).*

[285] See *Arachnid, Inc. v. Merit Industries, Inc., 939 F.2d 1574, 1576 (Fed. Cir. 1991)* (providing an example of an "agree to assign" clause).

[286] German EIA, supra note 19, § 8.

[287] Id. § 6.

[288] Id. § 6(2).

of the 2009 revision, any prior transactions become void when the four month period for declaring the release of a service invention expires. [290] After an employee submits a report, the employer has two months to request supplemental information for the report. [291] Upon the expiration of this two month period, a report is deemed to be complete and triggers the four month period for declaring the release of the invention. Without a timely declaration of release, all property rights in the ownership of service inventions transfer to the employer. [292]

Although the Bayh-Dole Act adopted the same default rule and claiming right, the Bayh-Dole Act lacked any mechanism to secure the transfer of ownership rights between contractors and their employees. Even though the Act gives contractors a claiming right with respect to their federal funding employer, it provides no express right to claim ownership of inventions made by the contractors' employee-inventors. [293] Whether contractors can secure ownership of such inventions depends on state contract law and special legislation that may limit the enforceability of pre-invention assignments, despite contractors' duties under the current default rule to transfer rights in such inventions to the federal funding agency if contractors do not exercise their right to elect title.

Under the German EIA, the complete ownership transfer mechanism functions only with respect to service inventions. To distinguish free inventions from service inventions, the EIA imposes a duty on employees to prepare a report on all inventions as soon as they complete them, unless such inventions are obviously unrelated **[*317]** to the employers' business. [294] A report regarding a service invention must include information sufficient to understand and describe the technical problem, its solution, and how the invention was made. [295] To meet this duty, German inventors are required to keep records, similar to those necessary to establish first-to-invent priority under the U.S. patent system. [296]

If an employer decides that an invention is a free invention, the employee does not need to prepare a detailed report showing inventive activities. [297] However, the report must always include sufficient information for the employers to confirm that the nature of the invention is actually outside of the definition of a service invention. [298] Accordingly, the German EIA incorporates language clarifying the scope of inventions that are governed by the mandatory ownership transfer mechanism from employees to employers.

The Bayh-Dole Act also imposes a duty on contractors to disclose each subject invention to the federal funding agency within a reasonable time. [299] However, the scope of inventions under the duty of disclosure is not clear from the definition of "subject invention." [300] The Stanford Court interpreted the scope of subject invention to include "those owned by or belonging to the contractor." [301] It follows that contractors fall out of the duty to disclose

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[289] Id. § 7.

[290] Id. § 6(2).

[291] German EIA supra note 19, § 5(3).

[292] Id. § 7.

[293] See generally id.

[294] Id. §§5(1), 18.

[295] Id. § 5(2).

[296] Id.

[297] See Trimborn, supra note 19, at 22-24 (providing a general discussion of the duty to report).

[298] German EIA supra note 19, § 18(1).

[299] *35 U.S.C. § 201*(C)(1) (2006); Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2193 (2011).*

[300] *35 U.S.C. § 201*(e) (2006).

if they fail to secure ownership of federally funded inventions due to the lack of written assignment or enforceability of such assignment due to the state contract policy. [302] Moreover, the Bayh-Dole Act does not impose any duty of disclosure on contractor employee-inventors , but instead solely relies on contracts between inventors and contractors. [303] Because state law also controls here, it is unclear whether these contracts are enforceable with respect to the same scope of inventions for all contractors' technical employees who might be involved in federally funded research activities.

Under the German EIA, the transfer of ownership rights through exercising a claiming right also results in a variety of obligations on employers. First, the EIA imposes a duty on employers to pay a reasonable remuneration by providing employees **[*318]** a right to compensation from the transfer of invention ownership to the employers. [304] However, an employee cannot enforce his right unless his employer starts utilizing the patent. [305] The EIA requires employers to take into account multiple factors for calculating compensation. [306] Due to the complexity of considering multiple factors, the EIA recommends consulting with established guidelines for calculating the amount of remuneration. [307]

Second, the EIA imposes a duty on employers to file a German patent or utility model application without delay. [308] Employers are not released from this duty unless their employee-inventors agree to forego the patent application or the employer protects the invention as a trade secret. [309] However, employers can only choose the latter option if they inform the employee-inventor of their decision to use trade secret protection while acknowledging patentability of the disclosed invention under German patent or utility model law. [310] If an employer fails to file a patent application within a reasonable time, the EIA authorizes employees to file applications under the name of the employer at the expense of the employer. [311] However, the Act does not give an option that allows employees to file applications in their own names even if their employers fail to file an application. [312]

Third, the EIA provides a right for employers to file foreign applications based on ownership of inventions acquired through claiming rights in employee inventions. [313] However, that right functions to impose a duty on employers to file foreign applications. Otherwise, the employees can request a release to file foreign applications on their own, if the employers are not interested. [314] Employers must inform their employees of their intent to release foreign applications early enough to allow employees to file an application within the priority period under the Paris

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[301] Stanford, 563 U.S. ___, *131 S. Ct. at 2196.*

[302] See supra Part I.4.

[303] See *37 C.F.R. § 401.14(f)(2)* (containing a model patent contract included in Bayh-Dole Implementation Regulations that includes a clause to require contractors to impose a duty on their employees, except for clerical and nontechnical employees, to disclose their inventions).

[304] German EIA, supra note 19, § 9(1).

[305] Reitzle, et al., supra note 19, § 9.

[306] German EIA supra note 19, § 9(2).

[307] Id. § 11.

[308] Id. § 13.

[309] Id. § 13(2).

[310] Id. § 17(1).

[311] German EIA, supra note 19, § 13(3).

[312] See id. (providing employee rights but not the right to file in one's own name).

[313] Id. § 14(1).

[314] Id. § 14(2).

Convention. [315] Although it is very unlikely that employees are interested in securing patents in foreign countries where their employers are not interested in exploiting the invention, if an employee-inventor does file and secure a patent in a foreign country, the resulting rights and licenses may be assigned and granted to any person, **[*319]** including the employer's competitors. For equity purposes, the EIA provides a compulsory license for the employer if its employee obtains a foreign patent on the employee's invention. [316]

Fourth, the EIA imposes a duty on employers to communicate with employee-inventors regarding patent prosecution. [317] This communication is particularly critical if the employer decides to abandon a patent application or patent right, which subsequently gives rise to employees' right to continue the patent application or maintain the patent right. [318] To avoid this cumbersome duty, employers in major German companies often offer a lump-sum payment to their employees to compensate for waiving this communication right. [319]

The Bayh-Dole Act imposes similar obligations on contractors when they elect to retain rights in the ownership of federally funded inventions. [320] However, the Bayh-Dole Act does not include a mechanism to effectively enforce these obligations. For example, the Act requires non-profit organizations to compensate employee-inventors through royalty sharing. [321] The Act provides neither methods of calculation nor sanctions for violations. Because the Act gives broad discretion to contractors-employers, it is very difficult for inventors to dispute their share of royalties.

The Bayh-Dole Act also requires contractors to file domestic and foreign patent applications prior to any statutory bar date. [322] The Act provides a sanction for failing to meet this requirement, but that sanction is simply to return ownership of the invention to the federal agency so that that agency can file a patent application. [323] Bayh-Dole regulations require elections to retain rights to be made 60 days prior to the date of the statutory bar; however, the Act does not require that there be notice to the agency with respect to a patent application. [324] Without any notice, it is very unlikely that the federal agency would discover the contractor's failure to file a patent application early enough to prepare a patent application on its own and file it prior to a statutory bar date. Even if the federal agency discovers the violation, it **[*320]** is unlikely that the agency would file a patent application because federal agencies are very reluctant to interfere with contractors' technology transfer activities. [325]

Finally, the Bayh-Dole Act does not create any duty on the part of either the federal government or contractors to communicate with inventors about a patent filing or prosecution of their inventions. There is no mechanism for inventors to exercise their rights and request to retain ownership of inventions if their employers choose not to file

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[315] Paris Convention for the Protection of Industrial Property art. 4, Mar. 20, 1883, *24 U.S.T. 2140.*

[316] German EIA, supra note 19, § 14(3).

[317] Id. § 15.

[318] Id. § 16.

[319] See Trimborn, supra note 19, at 31 (explaining that in general German companies pay 50 to 300 euros for buying out the rights of foreign patent applications and the rights of patent prosecution communication).

[320] *35 U.S.C. § 202*(c) (2006).

[321] Id. § 202(c)(7).

[322] Id. § 202(c)(3).

[323] Id.

[324] Standard Patent Rights Clauses, *37 C.F.R. § 401.14 (c)(2)*.

[325] Richard Li-Dar Wang, Biomedical Upstream Patenting and Scientific Research: The Case for Compulsory Licenses Bearing Reach-Through Royalties, *10 Yale J.L. & Tech. 251, 309 (2008).*

for patent protection. [326] If a patent application is not filed, inventors are deprived of their rights for compensation from the transfer of invention ownership, even if contractors elect to retain title of their inventions.

In contrast, the German EIA incorporates a mechanism to protect employees' compensation rights by allowing them to file domestic and foreign patent applications in a timely fashion if their employers fail to file a patent application. [327] Since these rights of compensation are supported by employers' ownership of exclusive rights to practice the invention, employees do not have any compensation right unless a patent application is filed. The EIA further protects employees' compensation rights by giving them opportunities to continue prosecution and maintain patents if their employers decide to abandon a patent application or patent right. [328] Employees lose their rights to compensation if a patent application does not result in a patent grant or a granted patent is invalidated. The EIA is based on the clear principle that in the absence of compensation, ownership should be returned to employees, because there is no longer justification for employers to retain ownership.

The Bayh-Dole Act includes none of these mechanisms that guarantee inventors' rights to compensation. Since contractors' technology transfer offices for many non-profit organizations are understaffed, many inventors are frustrated with delays in filing patent applications and loss of patent rights. Moreover, Stanford forces these contractors to adopt the practice of using contract terms to trigger assignments as soon as inventions are completed. Such practice should substantially increase the number of inventions that contractors secure through pre-invention assignments. [329] It is impossible for contractors to file applications for all inventions. Federal agencies obtain ownership in many of these inventions because contractors either refrain from electing to retain title or violate the duty of timely filing. [330] It is **[*321]** very unlikely that the agencies would file patent applications for such inventions prior to the statutory bar dates.

IV. Finding the Missing Piece of the Puzzle: Making the Bayh-Dole Act Complete

1. Adoption of Ownership Transfer Mechanism Under the German EIA

Unlike the ownership transfer mechanisms under the AEA and NAS Acts, the ownership transfer mechanism under the German EIA does not increase the administrative burden of the USPTO or applicants. The mechanism fits well within the Bayh-Dole Act because it was examined by Congress for adoption in the 1970s and 1980s and the German EIA and Bayh-Dole share common features for allocating ownership. [331] It is unlikely that U.S. industries and the legal community would oppose introducing the EIA ownership transfer mechanism because the introduction of the mechanism was not a factor that caused the past bills to be rejected by Congress; the bills failed because of opposition to imposing a duty on employers to pay a mandatory compensation. [332] Industry representatives criticized the mandatory compensation as being unfair to employers and impossible to administer. [333]

Adopting an ownership transfer mechanism in the Bayh-Dole Act should be relatively simple and easy. The current Bayh-Dole provision for contractors' rights to retain title of federally funded inventions [334] is textually very similar to

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[326] *35 U.S.C. § 202*(d) (2006).

[327] German EIA supra note 19, § 14(1)(2).

[328] Id. § 16.

[329] Hogan Lovells, Stanford v. Roche: Highlighting the Importance of Best Practices for Employee Assignments, Intellectual Property Report (Apr. 21, 2011), available at *http://ehoganlovells.com/ve/a918luVr9198Ztc/vT=1*.

[330] Bayh-Dole Act, *35 U.S.C. § 202*(c)(2)(3) (2006).

[331] See supra Part I.2.

[332] Dratler, supra note 68, at 184 n.204.

[333] Id.

the German EIA provision protecting employers' claiming rights. [335] Thus, the Bayh-Dole Act can be revised to clarify that an employee-inventor's ownership rights to any subject invention automatically transfers to the employer-contractor when the contractor elects to retain title in the invention under the current provision. [336] At this time, the Act only requires contractors to send written election notice to the federal funding agency. [337] This written notice executes a contractor's right to retain title to a subject invention when received by the federal agency unless one of the exceptions allows the agency to receive title of the invention. [338] The current provision can be revised to require contractors sending notice to employee-inventors to execute **[*322]** transfers of the ownership of subject inventions upon the receipt of notice by the employee-inventor.

To clarify the effect of an employer's election to retain ownership of an invention, Congress may recycle a provision from the employee invention bills, modeled after the German EIA, and prevent inventors from assigning their inventions to third-parties. [339] Such a provision would make it clear that a contractor's right to elect to retain title of federally funded inventions cannot be terminated unilaterally by an inventor through separate agreements to assign the ownership of his invention to third-parties during the statutory two year period in which contractors are required to elect title of the inventions. [340] This would give priority to contractors' election rights over any other rights arising from private contracts and prevent inventors from assigning their inventions to third-parties. Once the statutory time period expires without a contractor's exercise of its election right, inventors should retain ownership of the invention and be free to assign such ownership to third-parties for commercialization. The current Bayh-Dole Act provides inventors a right to request retention of invention ownership from federal agencies [341] and such requests must be granted unless the agency itself files a patent application within a reasonable time and prosecutes the application for commercialization.

For the mechanism to function effectively, the Bayh-Dole Act should be revised to clarify the scope of subject inventions in which the ownership is transferred by contractor's election. The Stanford majority's decision that "subject inventions" excludes inventions that contractors failed to secure because of contract drafting traps or limitations on state legislation undermines the Act's basic objective for implementing a uniform federal policy and conflicts with Congress' intent to incorporate a mandatory compensation provision into the Bayh-Dole Act for non-profit organizations. [342] It is likely that Congress included the mandatory compensation provision - despite strong criticism, a major reason for the failed bills - because it viewed the provision as necessary to justify taking invention ownership through contractors from inventors. The definition of subject inventions must be revised to include all

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[334] *35 U.S.C. § 202*(a) (2006) ("Each nonprofit organization or small business firm may, within a reasonable time after disclosure as required by paragraph (c)(1) of this section, elect to retain title to any subject invention … .").

[335] German EIA, supra note 19, § 6 ([1] The employer can claim the right to a service invention on an unrestricted or restricted basis. [2] The claiming of right occurs by written declaration to the employee. The declaration shall be submitted as soon as possible, and no later than four months from the receipt of the proper report.).

[336] *35 U.S.C. § 202*(a).

[337] Id. § 202(c)(2).

[338] Id. § 201(a).

[339] H.R. 5605 § 412(b)(c) (1975) ("Any disposition of a service invention by the employee prior to the time of the declaration of a claim by the employer which impair the employer's rights under this section is invalid to the extent that it impairs such rights."); German EIA, supra note 19, § 7.

[340] *35 U.S.C. § 202*(c)(2); Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2200-01 (2011).* (Breyer, J., dissenting) (asserting that the current Bayh-Dole Act also guarantees the priority of contractors' election right over any rights arising from private contracts).

[341] *35 U.S.C. § 202*(d) (2006).

[342] Id. § 202(c)(7).

inventions made by contractors' employees so that contractors can secure ownership of such inventions through the ownership transfer mechanism.

[*323] Moreover, Congress could use the mandatory compensation provision to endorse contractors securing ownership of inventions made by inventors outside the employment relationship. Congress may have assumed a pre-invention assignment between contractors and their employees, including faculty members and students who do not fall into the category of hired-to-invent, and provided the mandatory compensation to justify employers taking ownership of those inventions, regardless of the common law. However, it may not have anticipated today's research environment where researchers inter-flow beyond the rational notion of a single legal entity and interact with students throughout the invention process. [343] Obviously, the Stanford Court rejected such a broad scope of invention to be governed by the Bayh-Dole Act when it excluded from "subject invention" an invention which was conceived and reduced to practice when the inventor was not an employee of a contractor or when the inventor received an insignificant amount of federal funding toward the invention. [344] However, such a restrictive interpretation of subject inventions will exclude many inventions which the federal government funded and which should be under the Bayh-Dole conditions and restrictions to promote special public interests for commercialization. To reflect the research environment resulting from academic-industry collaboration, Congress should consider applying the Bayh-Dole Act to any inventions resulting from the performance of work under a funding agreement or the Bayh-Dole Act by revising the definition of subject invention to include any invention made by any inventor, regardless of employment status, as long as the invention resulted from the performance of work under a funding agreement.

To ensure that such inventions are subjected to the ownership transfer mechanism, the revised Bayh-Dole Act must require any inventors involved in federally funded research to disclose their inventions. [345] It is not sufficient to impose such duties through contracts between contractors and inventors because inventors may not be employees. Further, state contract laws may prevent enforcement of the disclosure duty for non-employees.

The Stanford Court indicated a concern over the lack of procedures for protecting rights of inventors and third-parties that have been involved in federally funded research but did not receive funds from a federal agency. [346] To address a **[*324]** similar concerns over disputes between inventors and their employers with respect to the scope of inventions that employers can claim through transfer of the ownership, the past employee invention bills incorporated judicial review and arbitration at the USPTO. [347] The Bayh-Dole Act may be revised to include these procedures to protect the interests of inventors and third-parties. For employers of visiting researchers who used federal funding and received ownership of invention, the common law rules guarantee a shop right, which will give employers bargaining power to negotiate with the researchers for an exclusive license.

2. Adoption of Compensation Right Protection Mechanism Under the German EIA

The Bayh-Dole Act should also be revised to adopt a mechanism similar to the one found in the German EIA that would protect employee-inventor's rights for compensation by allowing employee-inventors to file patent applications if their employer-contractors fail to file. Guaranteeing compensation to employee-inventors is essential for securing the ownership of all federally funded inventions. Since the term "subject invention" should be redefined

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[343] Reder, supra note 6, at 17 (noting that in academic-industry collaborations, employee status of researchers is often unclear because many of them work as consultants, temporary staffs, interns and contract workers).

[344] Stanford, 563 U.S. ___, *131 S. Ct. at 2198.*

[345] It can use provisions from the past bills with respect to the content and procedures for disclosing subject inventions. H.R. 5605 § 411(a) (1975) ("An employee who has made a service invention must give written notice of the service invention to his employer without undue delay...."). However, the definition of employee must be expanded to reflect the modern research environment at universities.

[346] Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. ___, *131 S. Ct. 2188, 2198 (2011).*

[347] H.R. 5605 §§435-36 (1975).

to include all inventions made by any researchers who engage in the research with federal funding, the scope of subject inventions under the new definition would be much broader than the scope of inventions suggested by the Stanford Court [348] or covered by the common law and state contract laws, both of which allow automatic transfer of invention ownership upon the completion of invention, regardless of express assignment agreements. [349] The Bayh-Dole Act's strong federal policy of promoting important public interests justifies such takings regardless of inventors' employment status, [350] while the Fifth Amendment requires the federal government to compensate inventors. [351] Accordingly, the Act provides inventors a right of compensation when the ownership of invention is transferred to their employer-contractors.

However, the current Bayh-Dole Act is incomplete because it lacks a mechanism to protect inventors' right to compensation. The Act only allows inventors to exercise their rights to compensation if contractors license their employee-inventor's inventions and receive royalty revenues. [352] If contractors elect to retain title in an invention but fail to file a patent application, employees' rights to compensation are effectively eliminated. Without compensation, neither the federal agency nor the employer-contractor have justification for receiving ownership of **[*325]** inventions from inventors who did not have a chance to bargain for the ownership of their inventions and failed to receive salaries reflecting compensation for such.

Thus, the Bayh-Dole Act should be revised to impose a duty on contractors to send notice to the relevant federal agencies, as well as the employee-inventors when patent applications are filed with the USPTO. As provided in the German EIA, [353] if an employee does not receive notice that the employer is pursuing a patent application within a reasonable time after the employer has elected to retain title of the invention, the employee should be able to file a patent application on behalf of the contractor. A similar mechanism should be also incorporated with respect to foreign patent applications.

Contractors may have concerns over the costs of reimbursing inventors for filing. However, such costs would be marginal and basically involve the cost of a provisional application if the patent application is abandoned before any additional costs are incurred. To allow employee-inventors to continue the patent prosecution, the Bayh-Dole Act should be revised to give ownership of inventions back to inventors if neither the federal agency nor the contractor is interested in prosecuting patents, as provided in the German EIA. [354] Ownership should be returned to the employee-inventor if the contractor wants to abandon the patent. Once the patent prosecution or patent is abandoned, the government and contractors lose justification for retaining ownership because employee-inventor's rights of compensation are eliminated. Thus, if inventors are interested in pursuing patent prosecution and commercializing their own inventions, the ownership of invention should be returned to the employee-inventor. However, the government should retain rights to use the invention and "March-in Rights" once the employee obtains patents as provided in the current provision. [355] If inventors are willing to invest their time and money to successfully commercialize the invention, this mechanism will contribute to the goals of the Bayh-Dole Act instead of wasting all of the efforts and investments already made by the government and contractors.

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[348] Stanford, 563 U.S. ___, *131 S. Ct. at 2198-99.*

[349] See supra Part I.3-4.

[350] See Stanford, 563 U.S. ___, *131 S. Ct. at 2201* (Breyer, J., dissenting) (emphasizing important public interests the Bayh-Dole Act aims to promote).

[351] *U.S. Const. amend. V*.

[352] *35 U.S.C. § 201*(c)(7)(B) (2006).

[353] German EIA, supra note 19, § 13.

[354] Id. § 16.

[355] *35 U.S.C. § 202*(d) (2006).

Conclusion

While the Stanford Court's interpretation of the Bayh-Dole Act is technically correct, it is - as the dissent points out - inconsistent with the Act's basic purpose. Stanford highlights a serious flaw in the current Act. Under the current system, Stanford could not have avoided the result even if the inventor had executed an assignment contract with the private firm prior to its own assignment contract. U.S. courts should have given priority to the private firm. As illustrated in Stanford, it is difficult for a university to argue that it was a bona fide purchaser if the private firm is a research partner and the university is aware of the collaboration. The Act **[*326]** should adopt a mechanism from the German EIA that allows contractors to secure ownership of federally funded inventions.

Such mechanisms will avoid a result that Congress did not intend: many federally funded inventions falling outside the scope of the Bayh-Dole Act due to contractors' failures to secure ownership of such inventions. Instead, contractor-employers would be able to secure ownership of federally funded inventions automatically from inventors when they elect to retain title. The mechanism effectively prevents inventors from lawfully assigning the ownership of federally funded inventions to third-parties. The Bayh-Dole Act should also be revised to protect inventors' rights to compensation so that the government can take the ownership of federally funded inventions from its contractors with just compensation.

Moreover, the Act should be revised to expand the scope of "subject invention" to include any invention resulting from federally funded research, regardless of the inventor's employment status with the contractors. In today's academic-industry collaborative research environment, researchers move from one institution to another with informal employment statuses. Unless the government can reach out to those inventions made by inventors without any formal employment contract, it cannot implement a uniform policy for federally funded inventions. Strong public interests involved in the Bayh-Dole Act should justify the government reaching out to all inventors involved in federally funded research while guaranteeing compensation with the inventors through royalty sharing.

Texas Intellectual Property Law Journal

Texas Intellectual Property Law Journal

University of Colo. Found., Inc. v. American Cyanamid Co.

United States Court of Appeals for the Federal Circuit

November 19, 1999, Decided

97-1468, 98-1113

Reporter

196 F.3d 1366 *; 1999 U.S. App. LEXIS 30117 **; 52 U.S.P.Q.2D (BNA) 1801 ***; Copy. L. Rep. (CCH) P28,095

THE UNIVERSITY OF COLORADO FOUNDATION, INC., THE UNIVERSITY OF COLORADO, THE REGENTS OF THE UNIVERSITY OF COLORADO, ROBERT H. ALLEN, and PAUL A. SELIGMAN, Plaintiffs-Cross Appellants, v. ***AMERICAN CYANAMID*** COMPANY, Defendant-Appellant, and LEON ELLENBOGEN, Defendant.

Subsequent History: [1]** Rehearing Denied December 17, 1999, Reported at: *1999 U.S. App. LEXIS 34478*.

Certiorari Denied May 22, 2000, Reported at: *2000 U.S. LEXIS 3441*.

Prior History: Appealed from: United States District Court for the District of Colorado. Senior Judge John L. Kane, Jr.

Disposition: AFFIRMED IN PART, VACATED IN PART, AND REMANDED.

Case Summary

Procedural Posture

Cross-appellants and appellant sought review from he United States District Court for the District of Colorado, which held appellant liable for fraudulent nondisclosure and unjust enrichment, denied appellant's claims of patent infringement, and granted summary judgment to appellant on copyright infringement.

Overview

Cross-appellants and appellant sought review from the district court, which held appellant liable for fraudulent nondisclosure and unjust enrichment, denied appellant's claims of patent infringement, and granted summary judgment to appellant on copyright infringement, concerning prenatal multivitamin/mineral supplements. The court first determined that federal patent law preempted states from dictating standards for ***inventorship***, in view of the objectives of rewarding inventors and supplying uniform patent law standards. Consequently, the court vacated the district court's conclusion based on state common law that cross-appellant doctors were the inventors of the supplements, and, without a correct finding of ***inventorship***, also vacated the district court's finding that appellant had a duty to disclose the filing of the application to cross-appellants. The court vacated the district court's conclusion that appellant was liable for fraudulent nondisclosure for the same reason, and the associated damages, punitive damages, and awards.

Outcome

The court vacated the district court's decision on ***inventorship***, the fraudulent nondisclosure and unjust enrichment decisions and damages awards, and the summary judgment in favor of appellant on the correction of ***inventorship*** and equitable patent title claims, and affirmed the copyright damages and affirmative defense decisions.

Counsel: Michael E. Tigar, Haddon, Morgan & Foreman, P.C, of Denver, Colorado, argued for Plaintiffs-Cross-Appellants. With him on the brief were Harold A. Haddon, Saskia A. Jordan, and Ty C. Gee. Of counsel on the brief were Robert N. Miller, of Denver, Colorado; Frederick T. Winters, and Stephanie E. Dunn, LeBoeuf, Lamb, Green & MacRae, L.L.C., of Denver, Colorado Of counsel was Mark A. Lemley, Fish & Richardson, of Washington, DC.

Donald R. Dunner, Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., of Washington, DC, argued for Defendant-Appellant. With him on the brief was Thomas H. Jenkins. Also on the brief were Daniel J. Thomasch, and Lauren J. Elliot, Orrick, Herrington & Sutcliffe, LLP, of New York, New York.

Judges: Before RICH, [1] RADER, and BRYSON, Circuit Judges.

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[1] Circuit Judge Rich heard oral argument in this case, but died on June 9, 1999. This case was decided by the remaining judges in accordance with Fed. Cir. Rule 47.11.

Opinion by: RADER

Opinion

[*1802] [*1369]** RADER, *Circuit Judge*.

The United States District Court **[**2]** for the District of Colorado held ***American Cyanamid*** Co. (***Cyanamid***) liable for fraudulent nondisclosure and unjust enrichment. *University of Colorado Found., Inc. v. **American Cyanamid** Co., 974 F. Supp. 1339, 44 U.S.P.Q.2D (BNA) 1231 (D. Colo. 1997)* (***Cyanamid*** *III*). In addition to compensatory damages, the district court awarded Drs. Robert H. Allen and Paul A. Seligman (the Doctors) $ 1,000,000 in punitive damages.

The district court also declined to substitute the Doctors as the named inventors on U.S. Patent No. 4,431,634 (the '634 patent) and declined to name the University of Colorado Foundation, Inc., the University of Colorado, and the Regents of the University of Colorado (collectively, the University) as the equitable title holder of that patent. Finally, the district court refused to award damages to the University and the Doctors for infringment of Doctors' copyright in a journal article. Because the district court used an incorrect standard for determining ***inventorship*** of the '634 patent, this court vacates the liability judgments against ***Cyanamid*** and the other judgments, which rely on the ***inventorship*** determination.

I.

Materna 1.60 (Materna) is a prenatal **[**3]** multivitamin/mineral supplement produced and sold by Lederle Laboratories, a division of ***Cyanamid***. In 1981, ***Cyanamid*** began selling a reformulation of Materna. The reformulated product improved iron absorption over the previous version of the product. ***Cyanamid*** filed a patent application claiming the reformulation. The application named Dr. Leon Ellenbogen, a ***Cyanamid*** chemist, as the inventor. The '634 patent issued from this application in 1984.

Reformulated Materna contained, *inter alia*, 250 mg of calcium carbonate and 25 mg of magnesium oxide per dose. The '634 patent covered a broad range of formulaions, as shown by claim 1:

> 1. A method of enhancing the absorption of iron in multimineral, iron-supplement **[***1803]** preparations comprising the use of limited quantities of oxides and carbonates of calcium and magnesium administered in said preparations to not more than 300 mg and 75 mg respectively per unit dosage based upon the weight of elemental calcium and magnesium in said oxide and carbonate salts.

'634 patent, col. 5, ll. 42-50.

The Doctors first learned of the '634 patent in 1993. The University and the Doctors then brought suit in federal district court against **[**4]** ***Cyanamid*** and Dr. Ellenbogen. That lawsuit alleged (1) that the Doctors (who were medical researchers at the University of Colorado Health Sciences Center) invented the reformulation of Materna covered by the '634 patent claims and communicated the invention to Dr. Ellenbogen, (2) that Dr. Ellenbogen intentionally omitted the Doctors as co-inventors in the patent application, and (3) that ***Cyanamid*** intentionally hid the patent from the Doctors. The University sought damages for fraudulent nondisclosure, patent infringement, and copyright infringement. The University and the Doctors sought restitution and disgorgement of ***Cyanamid***'s profits from sales of reformulated Materna. The University also sought equitable title to the '634 patent and sought to have the Doctors named as **[*1370]** the inventors in the '634 patent under *35 U.S.C. § 256 (1994)*.

In response, ***Cyanamid*** asserted that Dr. Ellenbogen hired the Doctors to perform research that convinced ***Cyanamid*** to reformulate Materna. According to ***Cyanamid***, the Doctors transmitted the results of their research to ***Cyanamid*** with the intention that ***Cyanamid*** would reformulate Materna and thereby profit. ***Cyanamid*** further asserted **[**5]** that Dr. Ellenbogen was the true inventor. Consequently, ***Cyanamid*** argued that it had no duty to notify the Doctors of the patent and denied any liability to the University. As affirmative defenses, ***Cyanamid*** asserted that the doctrines of preemption by federal patent law, laches, and limitations under relevant statutes barred the University's claims.

The parties filed cross-motions for summary judgment. The district court granted summary judgment to ***Cyanamid*** on the *§ 256* claim refusing to substitute the Doctors as the named inventors on the '634 patent. *University of Colorado Found., Inc. v. **American Cyanamid** Co., 880 F. Supp. 1387, 1399, 35 U.S.P.Q.2D (BNA) 1737, 1746 (D. Colo. 1995)* (***Cyanamid*** *I*). The district court also granted summary judgment to ***Cyanamid***, denying the University's claims of patent infringement and ownership of equitable title to

the '634 patent. *See University of Colorado Found., Inc. v. **American Cyanamid** Co., 902 F. Supp. 221, 222-23, 37 U.S.P.Q.2D (BNA) 1406, 1407-08 (D. Colo. 1995)* (***Cyanamid*** *II*). The district court also granted summary judgment to the University on copyright infringement. Specifically, the district court found that four **[**6]** bar graphs and a table in the Doctors' published article were copyrightable subject matter and copied by ***Cyanamid*** into the patent application. *See **Cyanamid** I 880 F. Supp. at 1400-02*.

Following a bench trial, the district court found that the Doctors invented the Materna reformulation and that Dr. Ellenbogen was not an inventor of that composition. To determine ***inventorship***, the district court applied state common law, rather than federal patent law. Based on its ***inventorship*** finding, the court held ***Cyanamid*** liable to the University for both fraudulent nondisclosure and unjust enrichment. *See **Cyanamid** III, 974 F. Supp. at 1339*.

The district court assessed damages equivalent to a royalty on net sales of reformulated Materna "from the time of the fraud in 1981 through the life of the Patent." Thus, the district court arrived at total damages of $ 44,396,159. On the fraudulent nondisclosure claim, the court found ***Cyanamid*** liable for punitive damages of $ 500,000 to each of the Doctors. On the copyright claim, the court concluded that ***Cyanamid*** did not owe damages to the University. Finally, the court rejected all of ***Cyanamid***'s affirmative defenses. **[**7]** *See id.*

Cyanamid appeals the liability judgments on the fraudulent nondisclosure and unjust enrichment claims, the associated monetary awards, and the court's rejection of its statute of limitation and laches defenses. The University appeals the court's denial of its correction of ***inventorship*** and equitable patent title claims as well as the denial of damages for copyright infringement.

II.

Summary judgment requires an absence of genuine issues of material fact and a showing that the moving party deserves judgment as a matter of law. *See Fed. R. Civ. P. 56(c)*. This court reviews a grant of summary judgment *de novo*, with all justifiable factual inferences drawn in favor of the party opposing the motion. *See Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 255, 91 L. Ed. 2d 202, 106 S. Ct. 2505 (1986)*. This court reviews a bench trial *de novo* for errors of law, and under the clearly erroneous standard for findings of fact. *See Gjerlov v. Schuyler Labs., Inc., 131 F.3d 1016, 1019, 1997 U.S. App. LEXIS 35105, 44 U.S.P.Q.2D (BNA) 1881, 1885 (Fed. Cir. 1997)*. **[***1804]**

[*1371] A.

Two types of preemption are asserted in this case. First, this court must determine **[**8]** whether federal patent law preempts the University's claims under state law of fraudulent nondisclosure and unjust enrichment. Second, this court must determine whether federal patent law preempts the district court's use of a state common law standard of ***inventorship*** to find that the Doctors were the inventors of the Materna reformulation. This court applies its own law to determine whether federal patent law preempts state law. *See Midwest Indus., Inc. v. Karavan Trailers, Inc., 175 F.3d 1356, 1360, 50 U.S.P.Q.2D (BNA) 1672, 1676 (Fed. Cir. 1999)* (en banc).

"Under the *Supremacy Clause*, it has been settled that state law that conflicts with federal law is without effect." *Hunter Douglas, Inc. v. Harmonic Design, Inc., 153 F.3d 1318, 1331, 47 U.S.P.Q.2D (BNA) 1769, 1778 (Fed. Cir. 1998)* (quotations and citations omitted). Field preemption is found when state law regulates conduct in a field that Congress intends the federal government to occupy exclusively. Conflict preemption is found when the application of state law produces a conflict with the requirements, protections, prohibitions, or policies of federal law. *See id. at 1332*.

A Colorado fraudulent **[**9]** nondisclosure claim requires:

> (1) concealment of a material existing fact that in equity and good conscience should be disclosed; (2) knowledge on the part of the party against whom the claim is asserted that such a fact is being concealed; (3) ignorance of that fact on the part of the one from whom the fact is concealed; (4) the intention that the concealment be acted upon; and (5) action on the concealment resulting in damages.

Cyanamid *III, 974 F. Supp. at 1353*. A Colorado unjust enrichment claim requires:

(1) at plaintiff's expense (2) defendant received a benefit (3) under circumstances that would make it unjust for defendant to retain the benefit without paying. *DCB Constr. Co. v. Central City Dev. Co., 965 P.2d 115, 119-20 (Colo. 1998)*. The fraudulent nondisclosure and unjust enrichment causes of action cover a broad range of conduct that does not bear on federal patent policies,

and those causes of action are therefore not preempted by federal patent law. Nor are the state law causes of action preempted as applied in this case, because the two state law causes of action do not impose requirements that are inconsistent with **[**10]** federal law, nor do they "stand[] as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress." *Hunter Douglas, 153 F.3d at 1332* (quotation and citation omitted).

The University alleged that ***Cyanamid*** acted in bad faith in the marketplace by withholding from the Doctors knowledge of the patent application for the Materna reformulation. Similarly, the University alleged that Dr. Ellenbogen and ***Cyanamid*** knew that the Doctors invented the Materna reformulation and intentionally omitted them from the application that matured into the '634 patent - a charge that ***Cyanamid*** perpetrated fraud on the Patent and Trademark Office (PTO) to obtain the patent.

Significantly, the Doctors made no attempt to patent the Materna reformulation, which they purport to have invented. Although the Doctors had no patent rights to reformulated Materna at the time of the suit, their state law claims are not simply an attempt to enforce property rights. Instead, the fraudulent nondisclosure claim springs from ***Cyanamid***'s alleged duty to inform the Doctors of the patent application. Similarly, the unjust enrichment claim springs not from an attempt to enforce **[**11]** intellectual property rights, but instead from ***Cyanamid***'s alleged wrongful **[*1372]** use of the Doctors' research results. Therefore, as stated earlier, federal patent law does not preempt these state law claims.

Nonetheless, the University's fraudulent nondisclosure and unjust enrichment claims depend on the Doctors' status as inventors. As the district court correctly noted, "whether ***Cyanamid*** had a duty to disclose its intention to and filing of the Patent application depends on who was the inventor of the reformulated version of Materna patented." ***Cyanamid*** *I, 880 F. Supp. at 1395*. In determining that the Doctors invented reformulated Materna, however, the district court applied state common law. *See* ***Cyanamid*** *III, 974 F. Supp. at 1353 n.2* ("Plaintiffs are not required to establish ***inventorship*** or ownership under the patent statute to state a common law claim for fraud or unjust enrichment. . . . [A] higher level of ***inventorship*** or ownership is required to state a claim for patent infringement."). Thus, this court must determine whether federal patent law preempts states from dictating standards for ***inventorship***.

Field preemption describes exclusive regulation **[**12]** of a legal subject by federal law. *See English v. General Elec. Co., 496 U.S. 72, 78, 110 L. Ed. 2d 65, 110 S. Ct. 2270 (1990)*. To preempt a field, federal law must **[***1805]** evince "a scheme of federal regulation so pervasive" that no room remains for a state to supplement. *Id. at 79* Alternatively, federal law preempts a field by addressing a "federal interest . . . so dominant that the federal system will be assumed to preclude enforcement of state laws on the same subject." *Id.*

A primary purpose of patent law is to reward invention. *See Kewanee Oil. Co. v. Bicron Corp., 416 U.S. 470, 480, 40 L. Ed. 2d 315, 94 S. Ct. 1879 (1974)*. The law of ***inventorship***, which has heretofore developed solely under federal law, supports this purpose by identifying the actual inventors of an invention eligible for patent protection. With its advent in Article 1 of the Constitution, patent law has developed under federal law to achieve the objective of national uniformity. *See Florida Prepaid Postsecondary Educ. Expense Bd. v. College Savings Bank, 527 U.S. 627, 144 L. Ed. 2d 575, 51 U.S.P.Q.2D (BNA) 1081, 1088, 119 S. Ct. 2199 (1999)* **[**13]** ("The need for uniformity in the construction of patent law is undoubtedly important.").

An independent ***inventorship*** standard under state law would likely have different requirements and give rise to different remedies than federal patent law. A different state ***inventorship*** standard might grant property rights to an individual who would not qualify as an inventor under federal patent law, or might grant greater relief to inventors than is afforded by federal patent law. Either situation might frustrate the dual federal objectives of rewarding inventors and supplying uniform national patent law standards.

The federal Patent Act leaves no room for states to supplement the national standard for ***inventorship***. Title 35 contains explicit and detailed standards for ***inventorship***. *See*, *e.g.*, *35 U.S.C. §§ 101-03*, 116-20, 254-56, 261-62 (1994). Moreover, federal law has provided this court with jurisdiction to enforce these comprehensive provisions to provide a uniform national standard for ***inventorship***. *See In re Snap-On Tools Corp., 720 F.2d 654, 655, 220 U.S.P.Q. (BNA) 8, 9 (Fed. Cir. 1983)*. Therefore, the field of federal patent law preempts any state **[**14]** law that purports to define rights based on ***inventorship***. Consequently, this court vacates the district court's conclusion that the

Doctors were the inventors of reformulated Materna and that Dr. Ellenbogen was not the inventor. Upon remand, the court must apply federal patent law principles to determine whether the Doctors and/or Dr. Ellenbogen were inventors of the technology of the '634 patent.

[*1373] B.

We set forth above the elements of a fraudulent nondisclosure claim in Colorado. The district court concluded that ***Cyanamid*** was liable to the University for fraudulent nondisclosure. The district court found that the Doctors were the inventors of the Materna reformulation. Thus, ***Cyanamid*** had an equitable duty to disclose the patent application to the true inventors, the Doctors. Further, the district court found that ***Cyanamid*** knew, and the Doctors were unaware, of the concealment of the patent filing. The district court found that ***Cyanamid*** concealed the application to induce the Doctors to continue to work with Dr. Ellenbogen. Because of this concealment, the district court found, the Doctors did not either seek recognition as inventors on the application or prevent the issuance **[**15]** of the patent with Dr. Ellenbogen named as the inventor. *See* ***Cyanamid*** *III, 974 F. Supp. at 1353*.

The district court's chain of reasoning hinges on the finding that the Doctors were inventors of the Materna reformulation. Because the district court used an incorrect standard to determine ***inventorship***, this court vacates that finding. Therefore, without a correct finding of ***inventorship***, this court must also vacate the district court's finding that ***Cyanamid*** had a duty to disclose the filing of the application to the Doctors. Finally, this court vacates the district court's conclusion that ***Cyanamid*** was liable to the University for fraudulent nondisclosure for the same reason. These actions necessarily vacate as well the associated damages, punitive damages, and awards.

However, this court notes the following errors in the district court's damages determination. The district court found that ***Cyanamid***'s fraudulent nondisclosure "deprived [the University] of financial opportunities and prestige [it] would have enjoyed had their doctors been credited with the invention, and harmed Drs. Allen and Seligman both personally and professionally." *Id*. However, the record **[**16]** shows that the doctors intended to, and did, freely share their research results to allow ***Cyanamid*** to make and sell an improved Materna formulation. Neither the doctors nor the University sought to obtain a patent covering the Materna reformulation, and the University has never been in the business of manufacturing or marketing prenatal vitamins. Finally, ***Cyanamid*** did not attempt to enforce the '634 patent against the University. Therefore, even assuming that the Doctors were the sole inventors of the Materna reformulation (a fact to be determined upon remand), **[***1806]** the only financial opportunity that the University could have lost was the payment for an assignment of ownership rights in the '634 patent or a license from the University to sell the reformulated product at the time the patent issued.

If the court finds that the Doctors jointly invented the reformulated product with Dr. Ellenbogen, the financial opportunity that the University could have lost was the payment that ***Cyanamid*** would have made to secure the Doctors' cooperation in filing the required documents with the PTO, such as oaths and declarations. Because federal patent law allows joint owners to practice a patented technology **[**17]** without accounting to the other co-owners, ***Cyanamid*** would not have needed to acquire ownership of the patent or licenses thereunder. *See* *35 U.S.C. § 262 (1994)*. However, in that case, the University would have been within its rights to license others under the '634 patent or to produce and sell products thereunder. *See id*. Thus, the district court could find that ***Cyanamid*** would have also paid the University for either an assignment of the University's ownership interest in the '634 patent or an exclusive license thereunder. Either arrangement would have assured ***Cyanamid*** the exclusivity, which they enjoyed during the life of the '634 patent.

By declining to seek a patent in their own right, the Doctors and the University **[*1374]** chose to forego the opportunity to gain prestige associated with the ***inventorship*** of such a patent. Instead they presumably were satisfied with the prestige associated with publication of a journal article detailing their research. Furthermore, the University submitted no evidence showing that the Doctors suffered any loss of prestige as a result of Dr. Ellenbogen being named as the inventor in the '634 patent. Therefore, the University **[**18]** did not prove that by naming Dr. Ellenbogen as the inventor in the '634 patent, ***Cyanamid*** deprived the Doctors or the University of any prestige.

Consequently, even if the Doctors were inventors of reformulated Materna under federal patent law, ***Cyanamid*** may be held liable pursuant to the fraudulent nondisclosure claim, but only for the payment that ***Cyanamid*** would have made to secure the Doctors'

cooperation in filing the required documents with the PTO, an assignment of ownership rights and/or an exclusive license from the University.

In setting the amount of damages (if any) on remand, the district court should consider the usual and customary arrangements at the time of the filing of the patent application. In particular the court should consider that university licensing barely existed as of the filing date of the '634 patent in 1981. In fact, the Bayh-Dole Act, which set the stage for modern university licensing went into effect less than six months before the '634 patent's filing date. *See* *35 U.S.C. § 200 (1994)*.

The district court also held ***Cyanamid*** liable to the University for unjust enrichment. ***Cyanamid*** does not argue that the district court erred **[**19]** in any findings under its unjust enrichment analysis. Therefore, this court does not review those findings. This court notes, however, that a defendant who uses a benefit provided by the plaintiff in an unauthorized and unfair manner may be liable in Colorado for unjust enrichment. *See*, *e.g.*, *Cablevision of Breckenridge, Inc. v. Tannhauser Condominium Ass'n, 649 P.2d 1093 (Colo. 1982)* (en banc) (holding defendant liable for unauthorized use of cable signal, i.e., installing equipment to provide cable service to unsubscribed condominium units). However, as noted before, federal patent law preempts the district court's common law ***inventorship*** standard. Like the fraudulent nondisclosure claim, unjust enrichment hinges on the finding that the Doctors invented reformulated Materna. Thus, this court vacates the unjust enrichment liability as well.

C.

The district court granted summary judgment in favor of ***Cyanamid*** on the University's request to have the Doctors substituted as the named inventors of the '634 patent under *35 U.S.C. § 256 (1994)*. The district court concluded that correction of ***inventorship*** under *§ 256* "is not applicable **[**20]** here where Plaintiffs seek correction based on ***Cyanamid***'s alleged fraud and deception." ***Cyanamid*** *I, 880 F. Supp. at 1399*. However, after the district court's decision in ***Cyanamid*** *I*, this court held:

> *Section 256* allows deletion of a misjoined inventor whether that error occurred by deception or by innocent mistake. As well, the section allows addition of an unnamed actual inventor, but this error of nonjoinder cannot betray any deceptive intent by that inventor. In other words, the statute allows correction in all misjoinder cases featuring an error and in those nonjoinder cases where the unnamed inventor is free of deceptive intent.

Stark v. Advanced Magnetics, Inc., 119 F.3d 1551, 1555, 43 U.S.P.Q.2D (BNA) 1321, 1324 (Fed. Cir. 1997); *see also* *Pannu v. Iolab Corp., 155 F.3d 1344, 1350, 47 U.S.P.Q.2D (BNA) 1657, 1662 (Fed. Cir. 1998)* **[***1807]** ("[*Section 256*] is a savings provision. If a patentee demonstrates that ***inventorship*** can be corrected as provided for in *section 256*, a district court must order correction of the patent, thus saving it from being rendered invalid."). **[*1375]** Thus, the district court's premise -- that the actual inventors could **[**21]** not be substituted for a fraudulently-named inventor in a patent without thereby invalidating the patent -- was incorrect. This court therefore vacates **[***1808]** the district court's grant of summary judgment in favor of ***Cyanamid*** on the correction of ***inventorship*** issue. Upon remand, the district court will have the opportunity to reconsider the University's *section 256* claim.

D.

The district court granted summary judgment in favor of ***Cyanamid*** on the University's equitable title argument. The court reasoned that the patent would be invalid if the University was the equitable owner of the '634 patent. This conclusion sprang from the district court's belief that the fraudulent deletion from the patent document of the true inventors, i.e., the Doctors, would render the patent invalid. Because no party enjoys any equitable rights in an invalid patent, the district court denied this claim. *See* ***Cyanamid*** *II, 902 F. Supp. at 222-23* (*citing* *Kennedy v. Hazelton, 128 U.S. 667, 32 L. Ed. 576, 9 S. Ct. 202 (1888))*.

To the contrary, substitution of the Doctors as named inventors in the '634 patent under *35 U.S.C. § 256*, if warranted, would not **[**22]** invalidate the patent and would establish the University's equitable title to it. As noted above, correction of nonjoinder of entitled inventors does not invalidate a patent. Therefore, this court vacates the district court's summary judgment on the University's equitable title claim. Upon remand, the court will have the opportunity to consider the merits of this claim.

E.

The district court found that ***Cyanamid*** copied Figures 1-4 and Table 1 of the Doctors' journal article into the patent application. Because these depictions of data in the Figures and Table were protectable expressions

under the copyright statute, the district court determined that ***Cyanamid*** infringed the Doctors' copyright in the article. *See* ***Cyanamid*** *I, 880 F. Supp. at 1401-02*. However, the district court concluded that the University did not prove any damages from the copyright infringement. *See* ***Cyanamid*** *III, 974 F. Supp. at 1356-57* ("Plaintiffs are entitled only to those damages and profits attributable to copying the Figures and Table into the patent application, not the reformulation depicted by them. Plaintiffs made no effort at trial to distinguish between damages attributable **[**23]** to the infringement and those attributable to the Patent itself.").

The University argues that its proof of ***Cyanamid***'s gross revenues from sales of reformulated Materna shifted the burden of proof to ***Cyanamid*** under *17 U.S.C. § 504(b) (1994)* to prove deductible expenses and to prove those elements of its profits that were attributable to factors other than copyright infringement. [2] The University's argument presumes that the sales of reformulated Materna were due to ***Cyanamid***'s copyright infringement. The University had the burden to show this connection. *See* 4 Melville B. Nimmer and David Nimmer, *Nimmer on Copyright § 14.03[A]* (1999) (noting that plaintiff's claims for indirect profits rarely succeed). The district court found that the University did not meet this burden. This court detects no clear error in this finding. This court therefore affirms the district court's decision.

[24]** ***Cyanamid***'s Affirmative Defenses

Cyanamid appeals the district court's rejection of its statutes of limitations and **[*1376]** laches defenses. For the reasons stated in the district court's opinion, ***Cyanamid***'s arguments fail.

CONCLUSION

This court vacates the district court's decision that the Doctors, and not Dr. Ellenbogen, invented the reformulation of Materna, and consequently vacates the court's fraudulent nondisclosure and unjust enrichment decisions. Because these liability decisions cannot stand, the damages awards are necessarily also vacated. This court also vacates the district court's summary judgment in favor of ***Cyanamid*** on the University's correction of ***inventorship*** and equitable patent title claims. Finally, this court affirms the district court's copyright damages and affirmative defense decisions.

AFFIRMED IN PART, VACATED IN PART, AND REMANDED

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[2] *17 U.S.C. § 504(b) (1994)* reads as follows:

> The copyright owner is entitled to recover the actual damages suffered by him or her as a result of the infringement, and any profits of the infringer that are attributable to the infringement and are not taken into account in computing the actual damages. In establishing the infringer's profits, the copyright owner is required to present proof only of the infringer's gross revenue, and the infringer is required to prove his or her deductible expenses and the elements of profit attributable to factors other than the copyrighted work.

US006311231B1

(12) **United States Patent**
Bateman et al.

(10) **Patent No.: US 6,311,231 B1**
(45) **Date of Patent: Oct. 30, 2001**

(54) **METHOD AND SYSTEM FOR COORDINATING DATA AND VOICE COMMUNICATIONS VIA CUSTOMER CONTRACT CHANNEL CHANGING SYSTEM USING VOICE OVER IP**

(76) Inventors: **Thomas Howard Bateman**, 903 Mollins Dr., Saint John, New Brunswick (CA), E2M 4L7; **Bruce Edward Kierstead**, 9 Wasson Ct., Saint John New Brunswick (CA), E2K 2K6; **William Alexander Noble**, 516 Champlain St., Saint John New Brunswick (CA), E2M 1S3; **Timothy Lee Curry**, 115 Lancelot Dr., Gondola Pt. New Brunswick (CA), E2E 1R8; **John Alan Lockett**, 102 Islandview Dr., Saint John New Brunswick (CA), E2M3Z8; **Laurie Edward Mersereau**, 22 Lecroix Dr., Westfield New Brunswick (CA), E0G 3J0; **Robert James Ouellette**, 132 Josselyn Rd., Saint John New Brunswick (CA), E2J 3B5

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/239,701**

(22) Filed: **Jan. 29, 1999**

Related U.S. Application Data

(62) Division of application No. 08/532,537, filed on Sep. 25, 1995, now Pat. No. 5,884,032.

(51) **Int. Cl.**[7] **G06F 13/10**; G06F 13/14

(52) **U.S. Cl.** **710/5**; 710/6; 710/36; 710/39; 709/203; 379/67

(58) **Field of Search** 710/1, 5, 6, 36, 710/39; 709/203; 379/67

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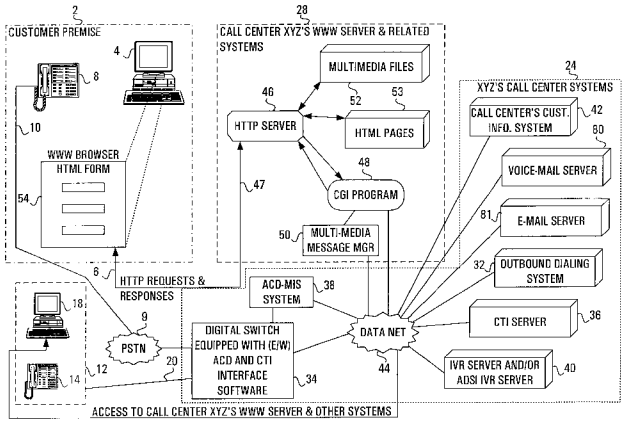
(57) **ABSTRACT**

This invention (The Customer Contact Channel Changer) enables the integration of different Customer Contact Channels such as live call centre ACD (Automatic Call Distribution) agents, ADSI (Analog Display Services Interface) enhanced IVR (Interactive Voice Response) systems and WWW (World Wide Web) servers. The world wide web servers are used to allow customers with computer equipment to access information from an organizations databases in a self service mode. Frequently these customers have questions best answered by human ACD agents. With this invention the connection between the customer with the question and the agent with the answer is done quickly and efficiently with both parties sharing screens of common information. Also control is retained by the customer to make the call happen when they want it.

16 Claims, 11 Drawing Sheets



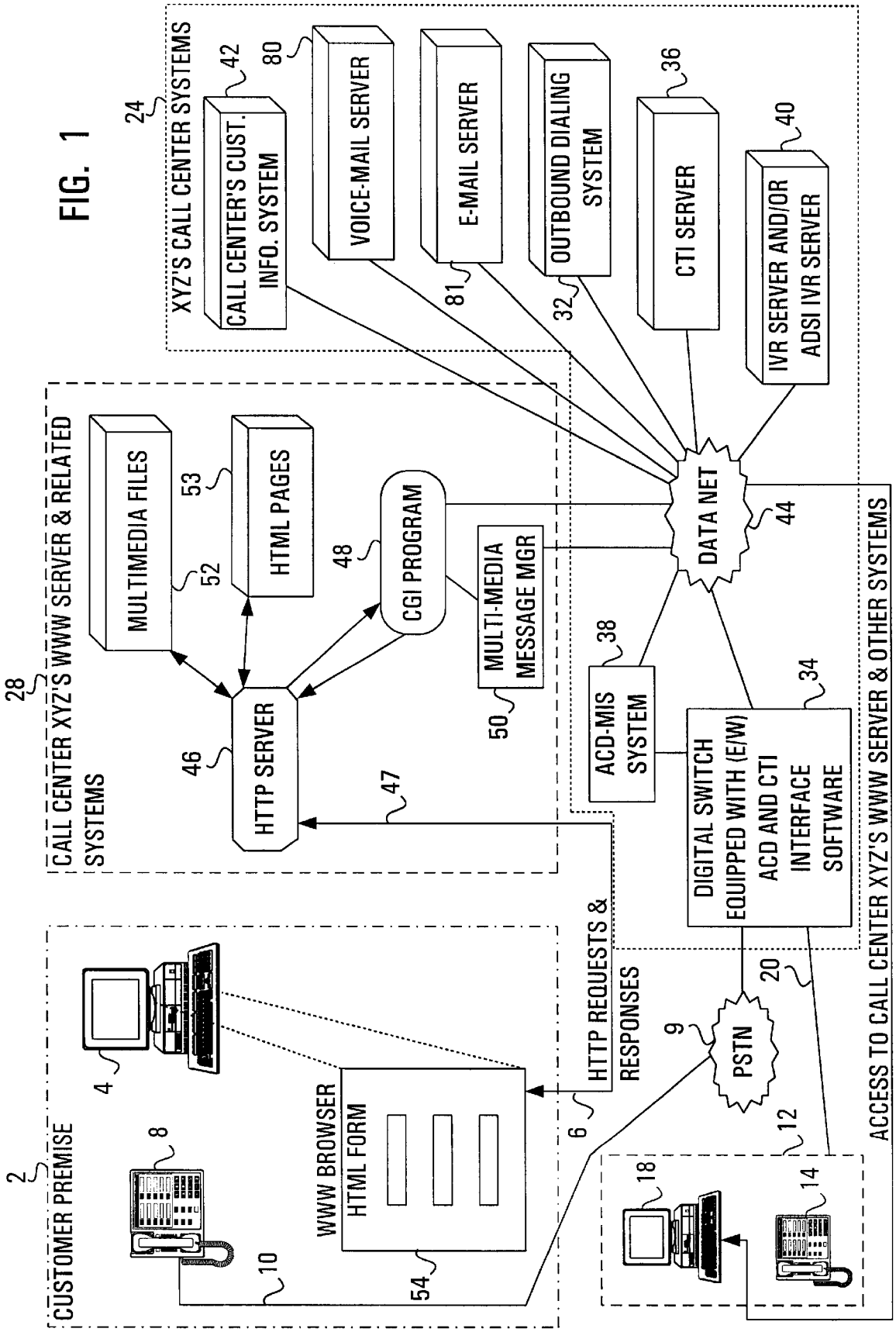

XYZ'S CALL CENTER SYSTEMS
24
CALL CENTER'S CUST. INFO. SYSTEM
42
VOICE-MAIL SERVER
80
E-MAIL SERVER
81
OUTBOUND DIALING SYSTEM
32
CTI SERVER
36
IVR SERVER AND/OR ADSI IVR SERVER
40
DATA NET
44
CALL CENTER XYZ'S WWW SERVER & RELATED SYSTEMS
28
MULTIMEDIA FILES
52
HTML PAGES
53
CGI PROGRAM
48
MULTI-MEDIA MESSAGE MGR
50
HTTP SERVER
46
47
ACD-MIS SYSTEM
38
DIGITAL SWITCH EQUIPPED WITH (E/W) ACD AND CTI INTERFACE SOFTWARE
34
HTTP REQUESTS & RESPONSES
6
PSTN
9
20
ACCESS TO CALL CENTER XYZ'S WWW SERVER & OTHER SYSTEMS
CUSTOMER PREMISE
2
4
8
10
WWW BROWSER
HTML FORM
54
12
18
14

FIG. 1

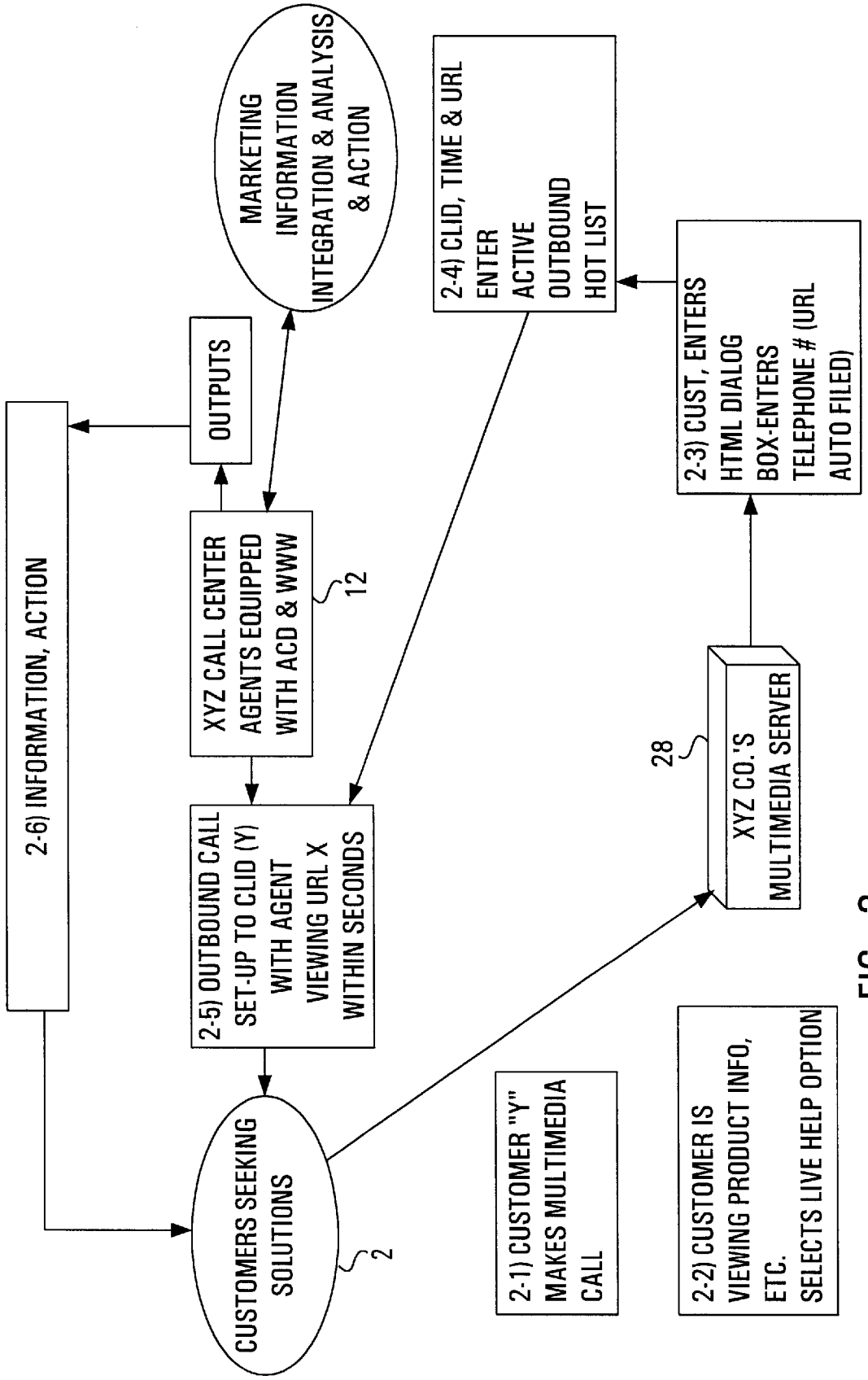

MARKETING INFORMATION INTEGRATION & ANALYSIS & ACTION
2-4) CLID, TIME & URL ENTER ACTIVE OUTBOUND HOT LIST
2-3) CUST, ENTERS HTML DIALOG BOX-ENTERS TELEPHONE # (URL AUTO FILED)
OUTPUTS
2-6) INFORMATION, ACTION
XYZ CALL CENTER AGENTS EQUIPPED WITH ACD & WWW
12
28
XYZ CO.'S MULTIMEDIA SERVER
2-5) OUTBOUND CALL SET-UP TO CLID (Y) WITH AGENT VIEWING URL X WITHIN SECONDS
CUSTOMERS SEEKING SOLUTIONS
2
2-1) CUSTOMER "Y" MAKES MULTIMEDIA CALL
2-2) CUSTOMER IS VIEWING PRODUCT INFO, ETC. SELECTS LIVE HELP OPTION

FIG. 2

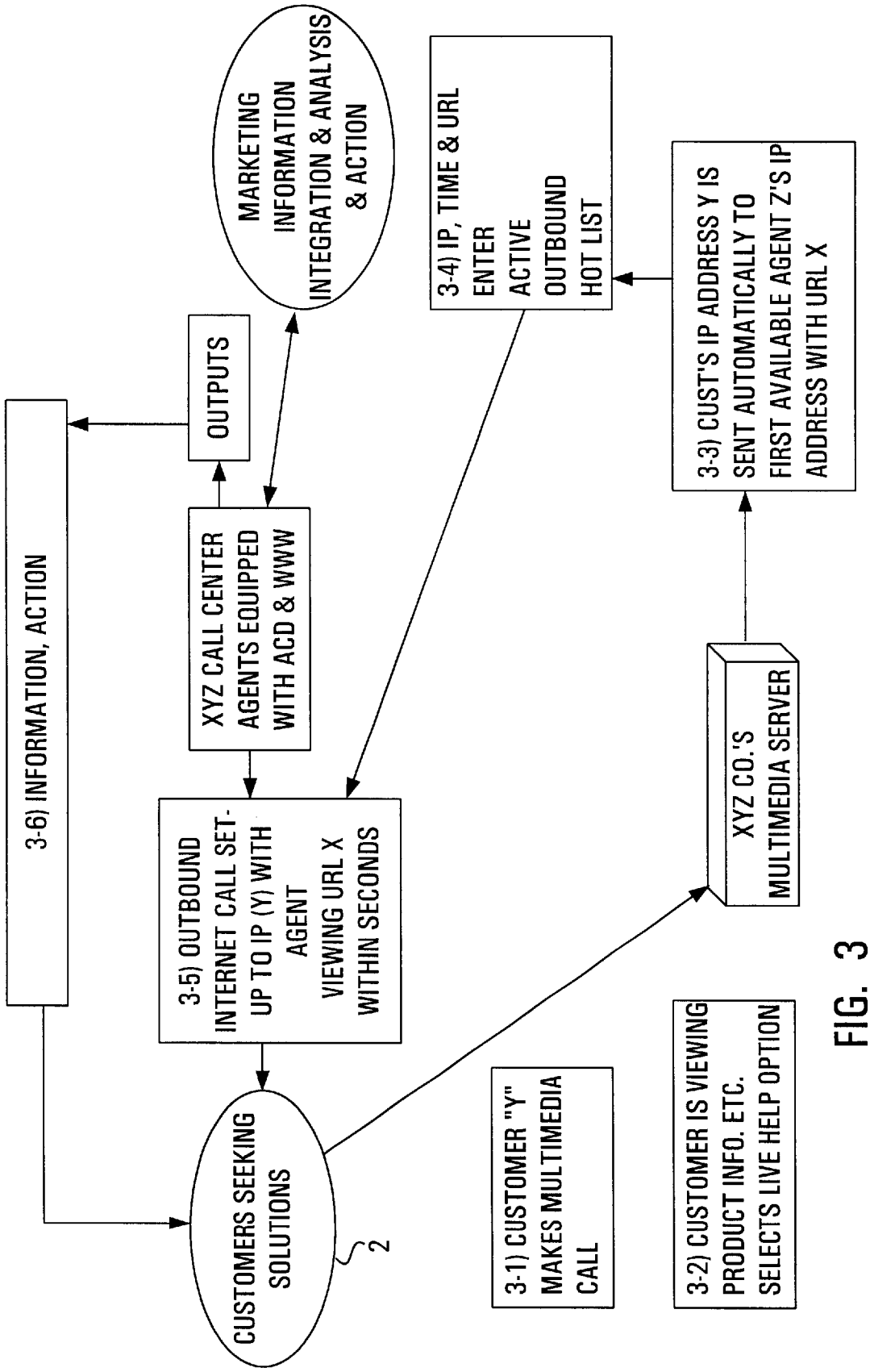

MARKETING INFORMATION INTEGRATION & ANALYSIS & ACTION
3-4) IP, TIME & URL ENTER ACTIVE OUTBOUND HOT LIST
3-3) CUST'S IP ADDRESS Y IS SENT AUTOMATICALLY TO FIRST AVAILABLE AGENT Z'S IP ADDRESS WITH URL X
OUTPUTS
3-6) INFORMATION, ACTION
XYZ CALL CENTER AGENTS EQUIPPED WITH ACD & WWW
XYZ CO.'S MULTIMEDIA SERVER
3-5) OUTBOUND INTERNET CALL SET-UP TO IP (Y) WITH AGENT VIEWING URL X WITHIN SECONDS
CUSTOMERS SEEKING SOLUTIONS
2
3-1) CUSTOMER "Y" MAKES MULTIMEDIA CALL
3-2) CUSTOMER IS VIEWING PRODUCT INFO. ETC. SELECTS LIVE HELP OPTION

FIG. 3

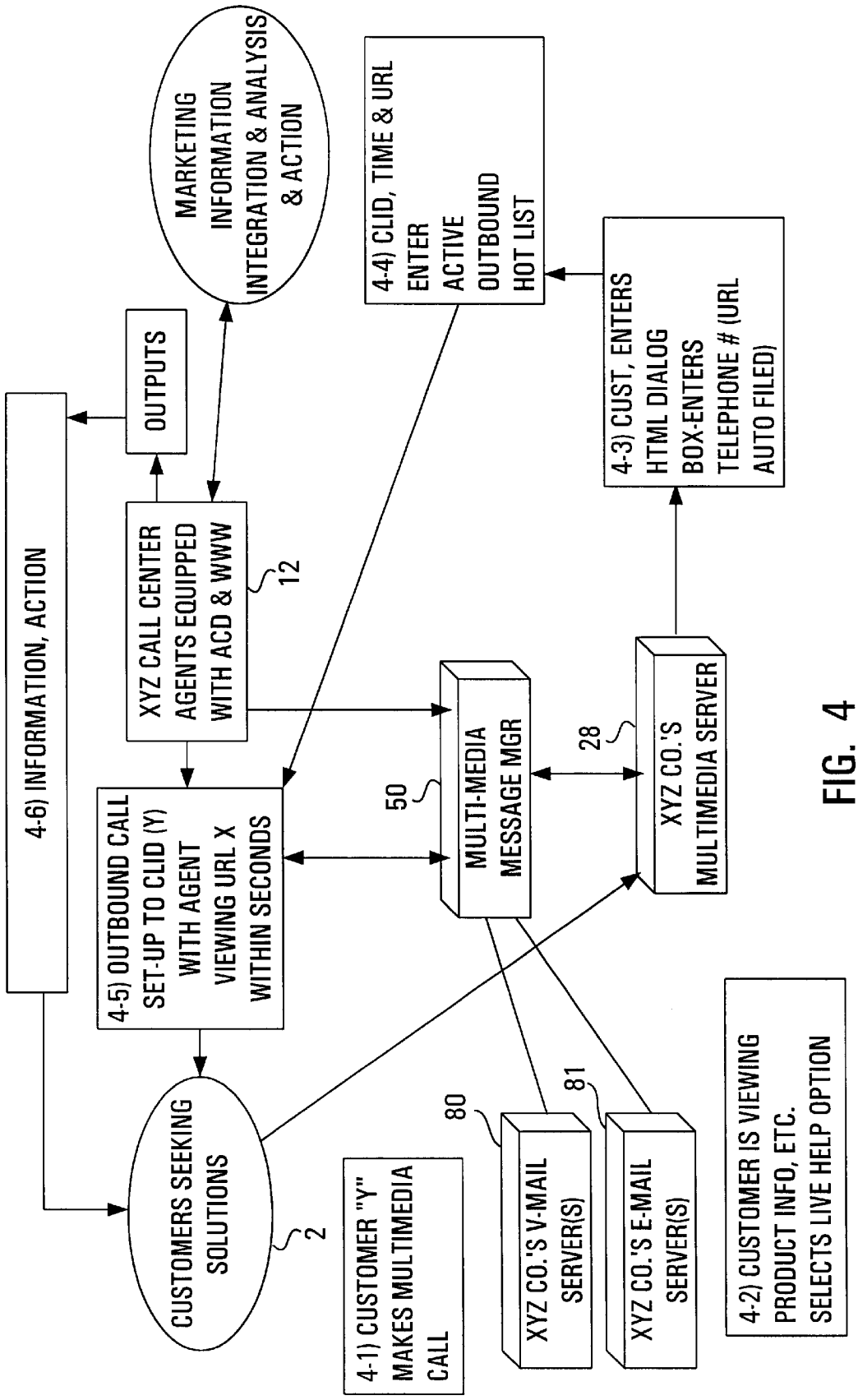

MARKETING INFORMATION INTEGRATION & ANALYSIS & ACTION
4-4) CLID, TIME & URL ENTER ACTIVE OUTBOUND HOT LIST
4-3) CUST, ENTERS HTML DIALOG BOX-ENTERS TELEPHONE # (URL AUTO FILED)
OUTPUTS
4-6) INFORMATION, ACTION
XYZ CALL CENTER AGENTS EQUIPPED WITH ACD & WWW
12
MULTI-MEDIA MESSAGE MGR
50
28
XYZ CO.'S MULTIMEDIA SERVER
4-5) OUTBOUND CALL SET-UP TO CLID (Y) WITH AGENT VIEWING URL X WITHIN SECONDS
CUSTOMERS SEEKING SOLUTIONS
2
80
81
XYZ CO.'S V-MAIL SERVER(S)
XYZ CO.'S E-MAIL SERVER(S)
4-1) CUSTOMER "Y" MAKES MULTIMEDIA CALL
4-2) CUSTOMER IS VIEWING PRODUCT INFO, ETC. SELECTS LIVE HELP OPTION

FIG. 4

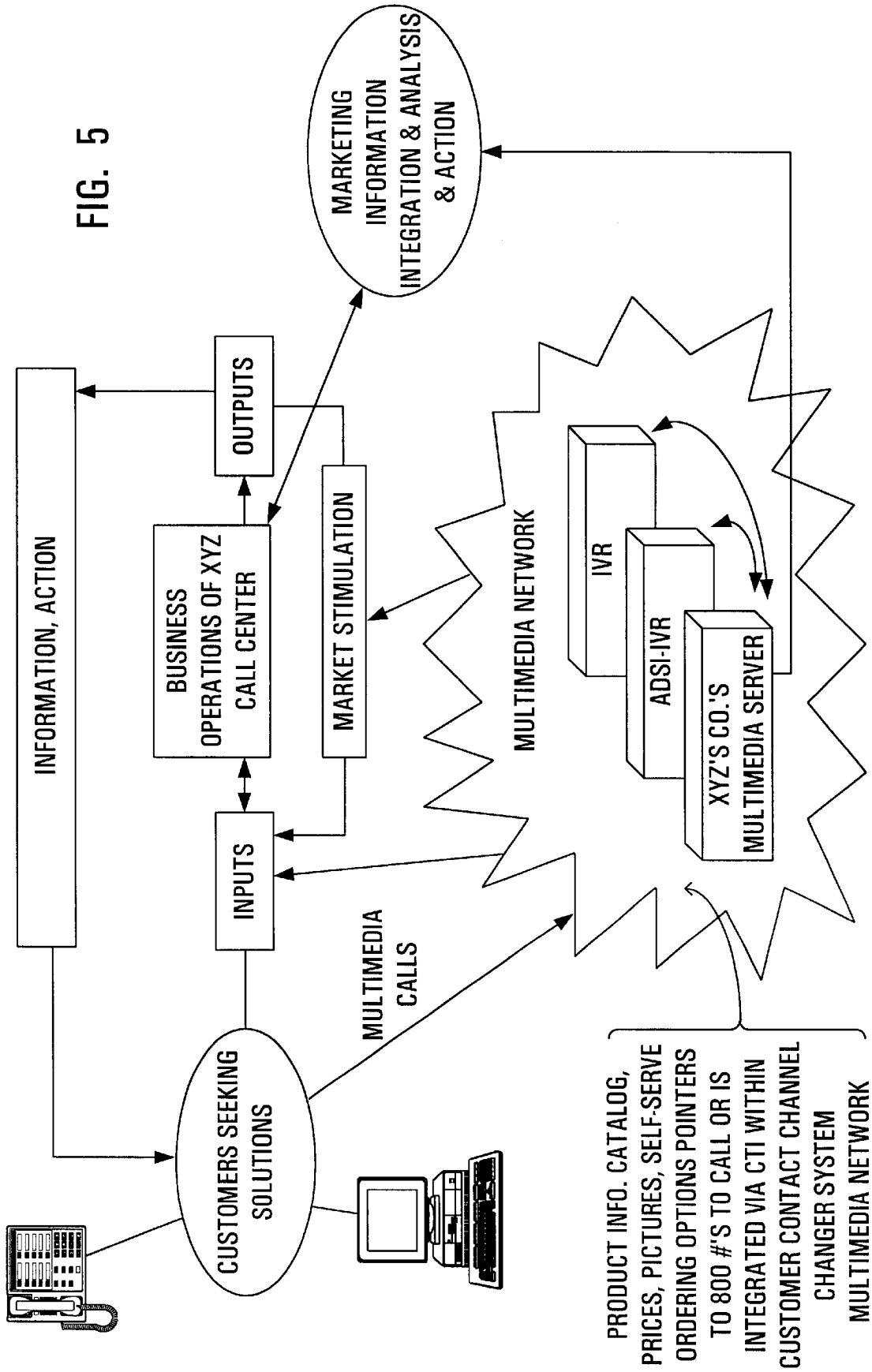

MARKETING INFORMATION INTEGRATION & ANALYSIS & ACTION
INFORMATION, ACTION
OUTPUTS
BUSINESS OPERATIONS OF XYZ CALL CENTER
MARKET STIMULATION
INPUTS
MULTIMEDIA NETWORK
IVR
ADSI-IVR
XYZ'S CO.'S MULTIMEDIA SERVER
MULTIMEDIA CALLS
CUSTOMERS SEEKING SOLUTIONS
PRODUCT INFO. CATALOG, PRICES, PICTURES, SELF-SERVE ORDERING OPTIONS POINTERS TO 800 #'S TO CALL OR IS INTEGRATED VIA CTI WITHIN CUSTOMER CONTACT CHANNEL CHANGER SYSTEM MULTIMEDIA NETWORK

FIG. 5

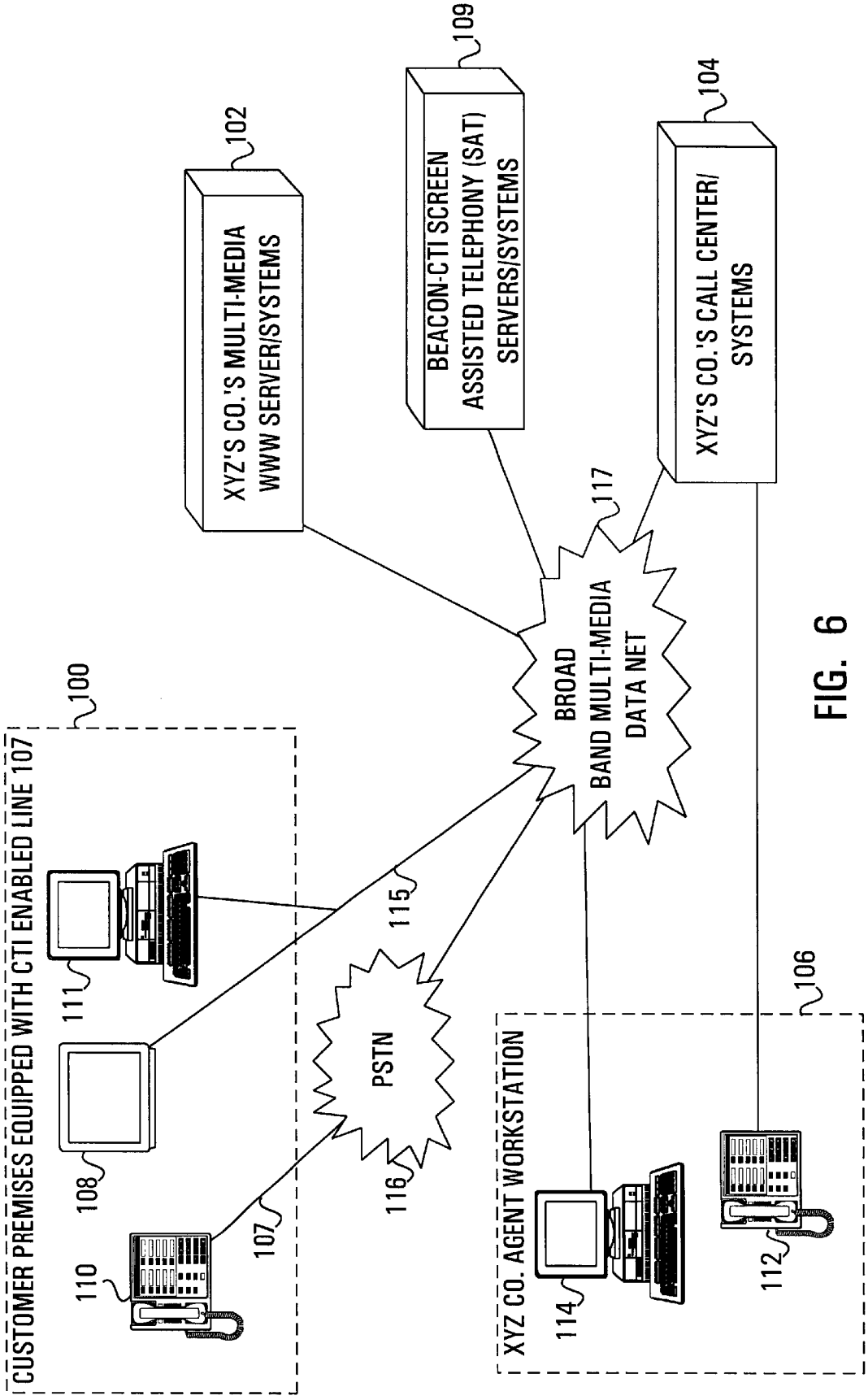

XYZ'S CO.'S MULTI-MEDIA WWW SERVER/SYSTEMS
102
BEACON-CTI SCREEN ASSISTED TELEPHONY (SAT) SERVERS/SYSTEMS
109
XYZ'S CO.'S CALL CENTER/ SYSTEMS
104
BROAD BAND MULTI-MEDIA DATA NET
117
CUSTOMER PREMISES EQUIPPED WITH CTI ENABLED LINE 107
100
111
108
110
107
PSTN
115
116
XYZ CO. AGENT WORKSTATION
106
114
112

FIG. 6

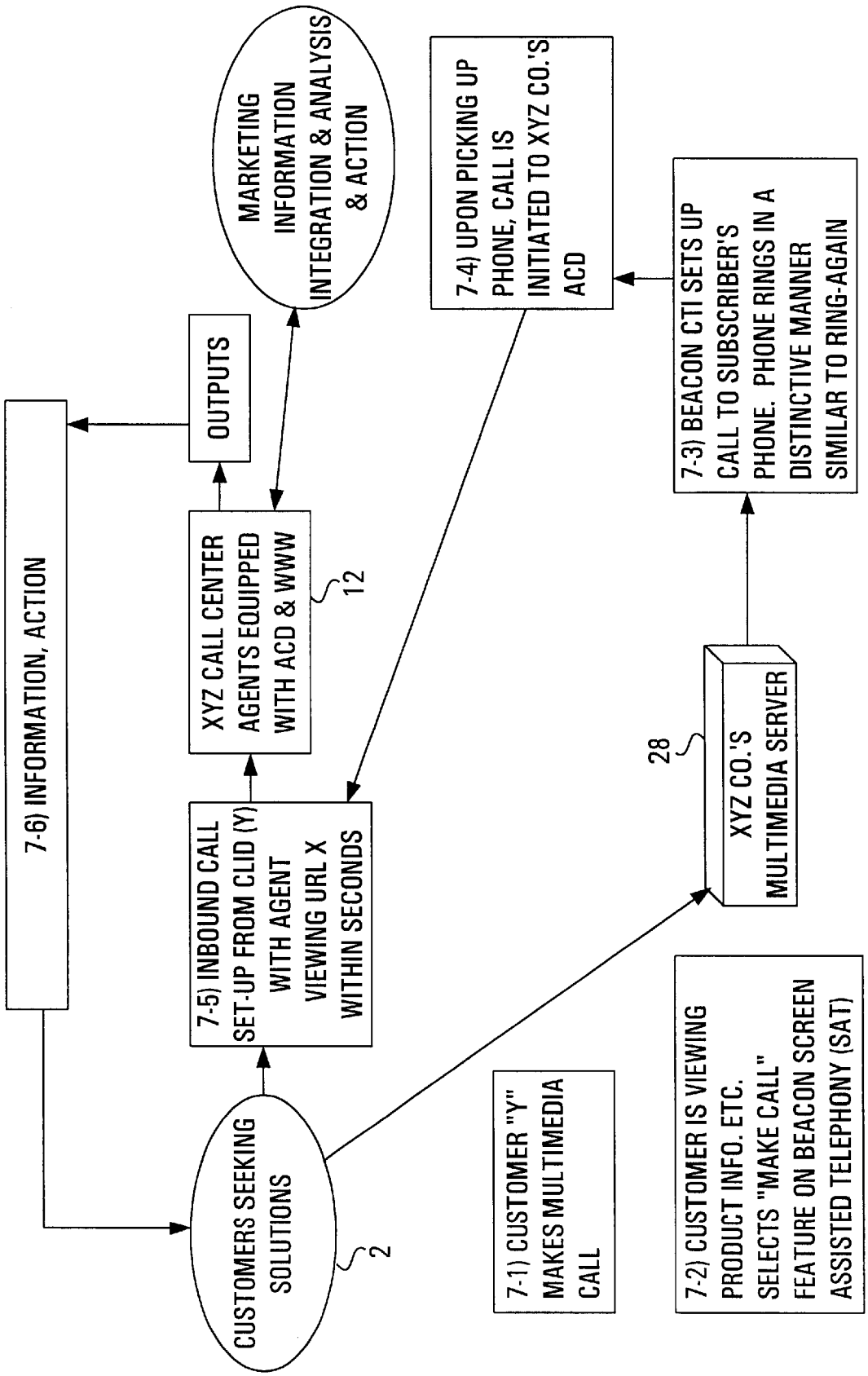

7-6) INFORMATION, ACTION
OUTPUTS
MARKETING INFORMATION INTEGRATION & ANALYSIS & ACTION
7-4) UPON PICKING UP PHONE, CALL IS INITIATED TO XYZ CO.'S ACD
7-3) BEACON CTI SETS UP CALL TO SUBSCRIBER'S PHONE. PHONE RINGS IN A DISTINCTIVE MANNER SIMILAR TO RING-AGAIN
XYZ CALL CENTER AGENTS EQUIPPED WITH ACD & WWW
12
7-5) INBOUND CALL SET-UP FROM CLID (Y) WITH AGENT VIEWING URL X WITHIN SECONDS
28
XYZ CO.'S MULTIMEDIA SERVER
CUSTOMERS SEEKING SOLUTIONS
2
7-1) CUSTOMER "Y" MAKES MULTIMEDIA CALL
7-2) CUSTOMER IS VIEWING PRODUCT INFO. ETC. SELECTS "MAKE CALL" FEATURE ON BEACON SCREEN ASSISTED TELEPHONY (SAT)

FIG. 7

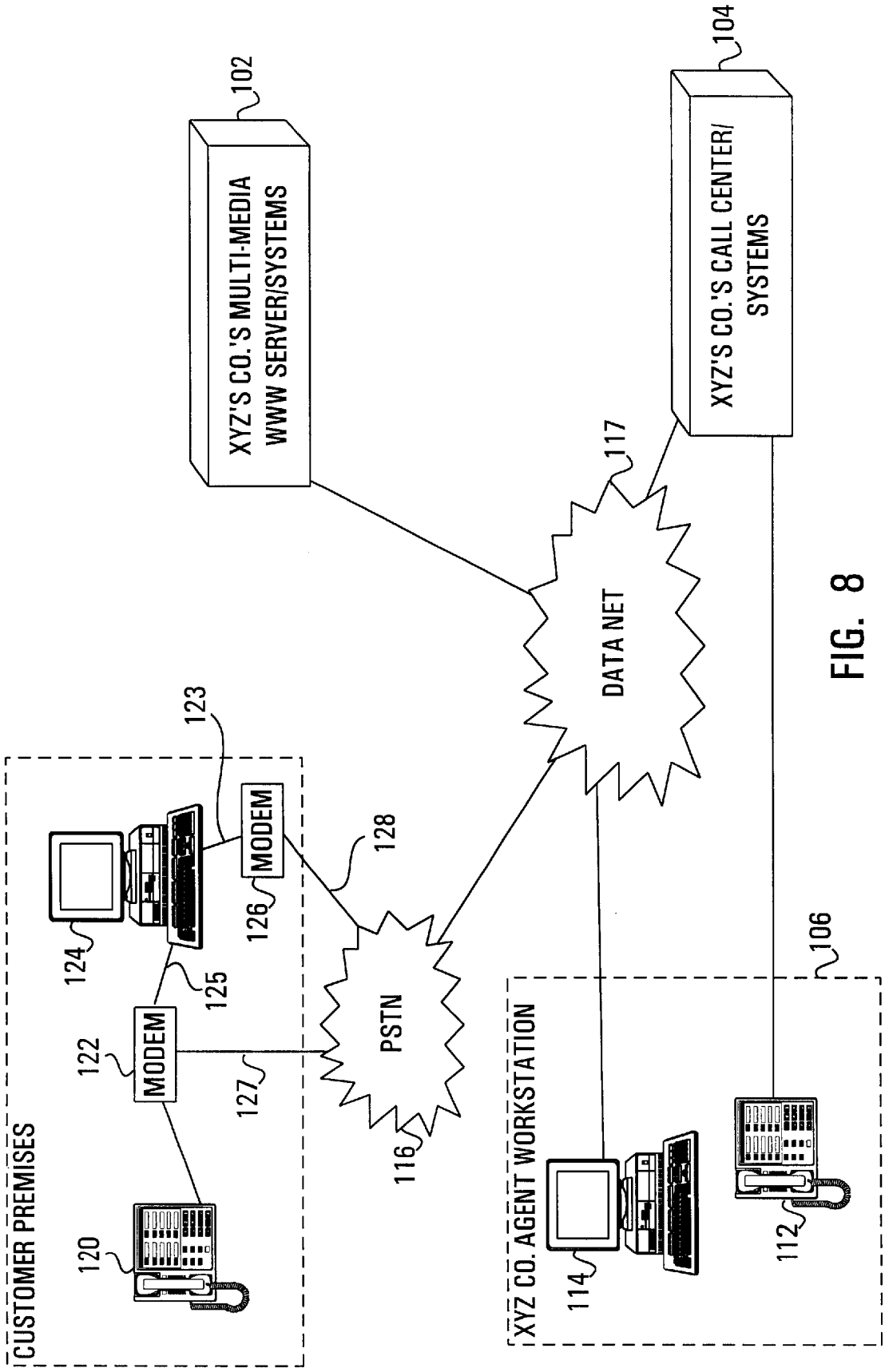

XYZ'S CO.'S MULTI-MEDIA WWW SERVER/SYSTEMS
102
XYZ'S CO.'S CALL CENTER/ SYSTEMS
104
DATA NET
117
CUSTOMER PREMISES
MODEM
MODEM
PSTN
XYZ CO. AGENT WORKSTATION
106
112
114
116
120
122
123
124
125
126
127
128

FIG. 8

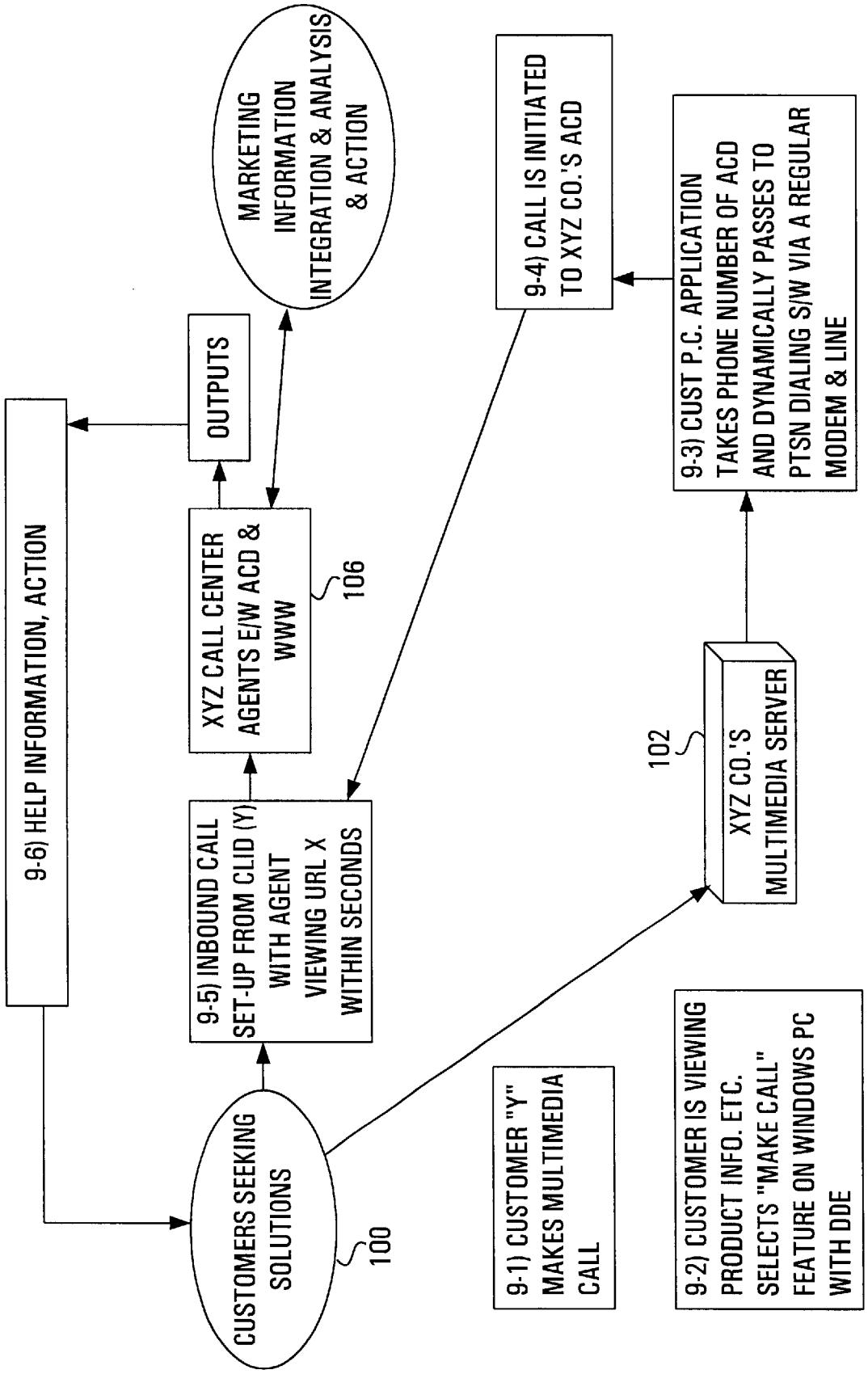

MARKETING INFORMATION INTEGRATION & ANALYSIS & ACTION
9-4) CALL IS INITIATED TO XYZ CO.'S ACD
9-3) CUST P.C. APPLICATION TAKES PHONE NUMBER OF ACD AND DYNAMICALLY PASSES TO PTSN DIALING S/W VIA A REGULAR MODEM & LINE
OUTPUTS
9-6) HELP INFORMATION, ACTION
XYZ CALL CENTER AGENTS E/W ACD & WWW
106
102
XYZ CO.'S MULTIMEDIA SERVER
9-5) INBOUND CALL SET-UP FROM CLID (Y) WITH AGENT VIEWING URL X WITHIN SECONDS
CUSTOMERS SEEKING SOLUTIONS
100
9-1) CUSTOMER "Y" MAKES MULTIMEDIA CALL
9-2) CUSTOMER IS VIEWING PRODUCT INFO. ETC. SELECTS "MAKE CALL" FEATURE ON WINDOWS PC WITH DDE

FIG. 9

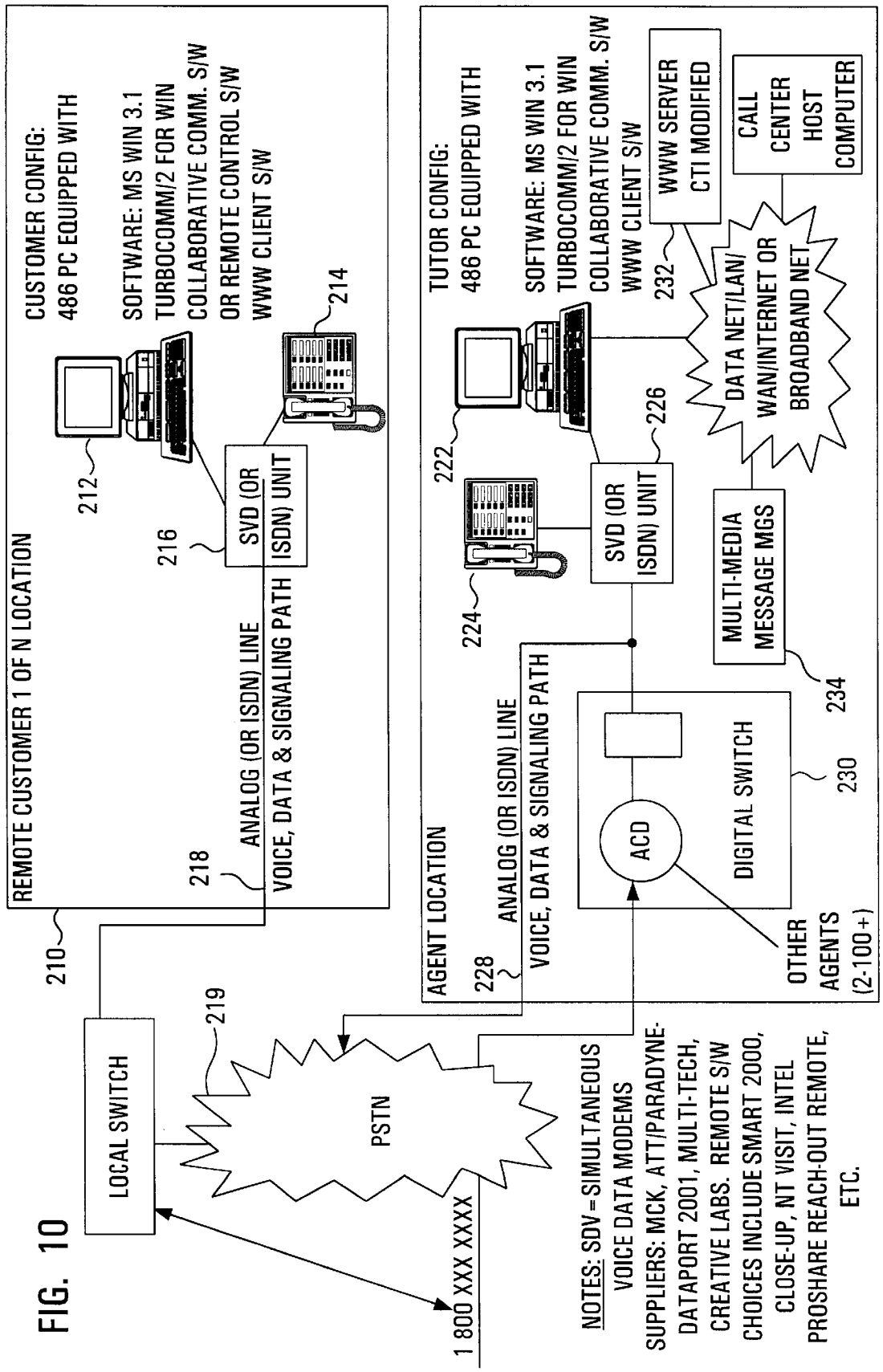

REMOTE CUSTOMER 1 OF N LOCATION
CUSTOMER CONFIG:
486 PC EQUIPPED WITH
SOFTWARE: MS WIN 3.1
TURBOCOMM/2 FOR WIN
COLLABORATIVE COMM. S/W
OR REMOTE CONTROL S/W
WWW CLIENT S/W
212
214
216
SVD (OR ISDN) UNIT
ANALOG (OR ISDN) LINE
VOICE, DATA & SIGNALING PATH
218
210
219
LOCAL SWITCH
PSTN
1 800 XXX XXXX
AGENT LOCATION
TUTOR CONFIG:
486 PC EQUIPPED WITH
SOFTWARE: MS WIN 3.1
TURBOCOMM/2 FOR WIN
COLLABORATIVE COMM. S/W
WWW CLIENT S/W
WWW SERVER
CTI MODIFIED
CALL CENTER HOST COMPUTER
232
DATA NET/LAN/
WAN/INTERNET OR
BROADBAND NET
222
224
226
SVD (OR ISDN) UNIT
MULTI-MEDIA MESSAGE MGS
234
ANALOG (OR ISDN) LINE
VOICE, DATA & SIGNALING PATH
228
ACD
DIGITAL SWITCH
230
OTHER AGENTS (2-100+)
NOTES: SDV = SIMULTANEOUS VOICE DATA MODEMS
SUPPLIERS: MCK, ATT/PARADYNE-DATAPORT 2001, MULTI-TECH, CREATIVE LABS. REMOTE S/W CHOICES INCLUDE SMART 2000, CLOSE-UP, NT VISIT, INTEL PROSHARE REACH-OUT REMOTE, ETC.

FIG. 10

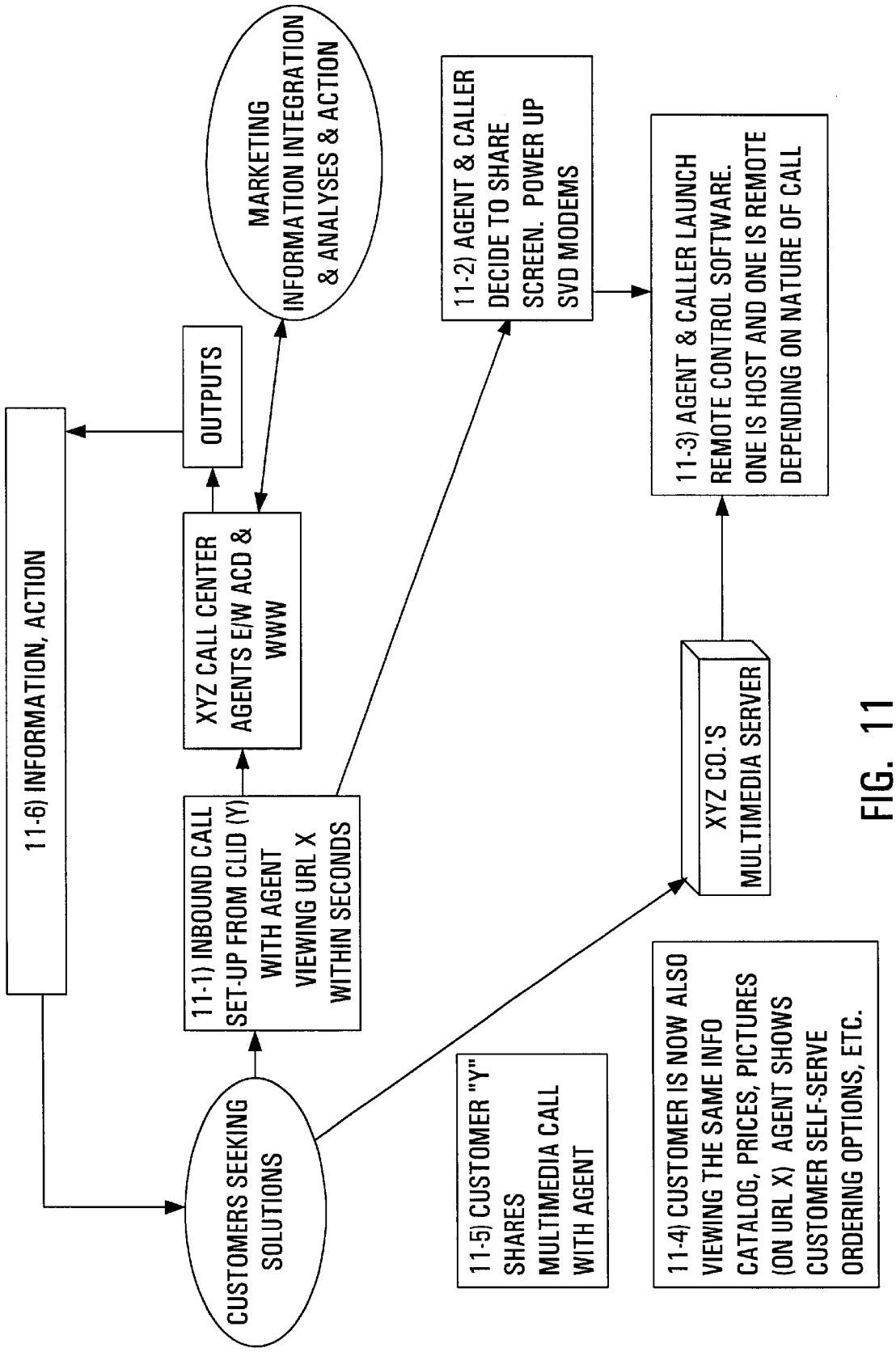

CUSTOMERS SEEKING SOLUTIONS
11-1) INBOUND CALL SET-UP FROM CLID (Y) WITH AGENT VIEWING URL X WITHIN SECONDS
XYZ CALL CENTER AGENTS E/W ACD & WWW
OUTPUTS
MARKETING INFORMATION INTEGRATION & ANALYSES & ACTION
11-6) INFORMATION, ACTION
11-2) AGENT & CALLER DECIDE TO SHARE SCREEN. POWER UP SVD MODEMS
11-3) AGENT & CALLER LAUNCH REMOTE CONTROL SOFTWARE. ONE IS HOST AND ONE IS REMOTE DEPENDING ON NATURE OF CALL
XYZ CO.'S MULTIMEDIA SERVER
11-5) CUSTOMER "Y" SHARES MULTIMEDIA CALL WITH AGENT
11-4) CUSTOMER IS NOW ALSO VIEWING THE SAME INFO CATALOG, PRICES, PICTURES (ON URL X) AGENT SHOWS CUSTOMER SELF-SERVE ORDERING OPTIONS, ETC.

FIG. 11

METHOD AND SYSTEM FOR COORDINATING DATA AND VOICE COMMUNICATIONS VIA CUSTOMER CONTRACT CHANNEL CHANGING SYSTEM USING VOICE OVER IP

This application is a divisional, of Application Ser. No. 08/532.537, filed Sep. 25, 1995, U.S. Pat. No. 5884032.

FIELD OF THE INVENTION

This invention relates to accessing remote information network services such as those of the WWW (World Wide Web) and particularly, but not exclusively to the manner in which help is enlisted when needed.

BACKGROUND OF THE INVENTION

Some telephone companies (e.g., NBTel, New Brunswick, Canada) have been heavily involved with the development and use of both call centre services and Internet services. More specifically, efforts have been underway to utilize CTI (Computer Telephony Integration) within call centres to improve the productivity and service levels within call centres. CTI uses integration capabilities in various manners to assist telephone users who have access to computer equipment to improve the process of making or receiving phone calls. Call centre technology generally uses both computer equipment and telecommunications equipment with CTI being a key element of productive call centres.

The use of new Internet services such as WWW servers to allow organizations to interact with their customers in a self service mode is also being promoted. These WWW servers utilize hypertext and multimedia content to allow customers to see text, images, etc. associated with products and services. Due to human nature and other factors these customers frequently need human assistance to completely satisfy their needs and would likely jot down an 800 telephone number with a pencil and paper. They would then call the 800 number to gain access (if the 800 zone coverage was appropriate) to an ACD (Automatic Call Distribution) centre belonging to that organization. Under many circumstances today they would then sit frustrated in an ACD queue awaiting the availability of a live agent. Thus, there are at least two disadvantages of current systems. First, the need for the customer to physically record and dial the 800 number is a disincentive to making the call. Secondly, the likelihood of waiting in long ACD queues is also a disincentive to making the call. Once the call is made, the queue may also result in the call being a terminated before successful completion because of the delay experienced.

A recent improvement in the integration of computers and telephones is disclosed in U.S. Pat. No. 5,001,710. A system is disclosed which lets telemarketing agents who are answering calls for multiple campaigns simultaneously, to be set up automatically in their computing environment at the correct campaign based upon the phone number dialed by the customer, and to receive caller related information automatically. However, the user is required to physically dial an 800 number, and likely must wait in an ACD queue. Furthermore, although the agent is set up at the correct campaign, a more accurate initial setup, which for example incorporates the specifics of the customer's queries, is not possible. Finally, this system is not designed for helping users of the Internet.

SUMMARY OF THE INVENTION

It is an object of the invention to provide a means for integrating WWW services with live ACD agents in a manner that mitigates the above mentioned disadvantages.

It is another object of the invention to make this process faster and simpler so as to improve the likelihood of a successful connection to a live agent.

The invention provides a method of quickly enabling the changing of customer contact channels under control of the calling customer. A customer contact channel is a specific means of communication between the customer and a sales/service provider. Examples of customer contact channels include verbal phone conversations between customers and human ACD agents of the service/sales organization, IVR (interactive voice response) interactions between customers and IVR servers associated with the service/organization, ADSI (analog display services interface) enhanced IVR interactions between customers and associated servers, and WWW interactions between customers and associated WWW servers. These channels use various communications appliances or terminals such as a regular touch tone telephone, ADSI enhanced telephone (such as Nortel Vista 350), multimedia PC's or multimedia set-top boxes (such as Philips/Zenith/CLI Media Access Terminals) and television sets.

The invention provides a series of methods for integrating WWW services with live ACD agents. These methods include establishment of two-way voice connectivity between a customer and a human ACD agent while sharing common screens of information on a WWW page. This connectivity provides requested "LIVE HELP" when a problem is encountered or when an alternate channel is preferred for various reasons. These methods deploy CTI, IVR and related techniques involving the use of computer software and hardware working in conjunction with telephone systems. The specific methods best suited for an individual customer will depend on a number of factors such as the call centre's telephony architecture, the call centre's computing architecture and organizational philosophy and approaches regarding inbound and outbound calling and customer contact concepts.

IVR allows for automated handling of scripted or routine telephone conversations. The customer, once connected to an IVR system, is verbally provided with information and options by a computer generated or recorded voice. The customer is able to make selections with the telephone keypad. An ADSI (analog display services interface) enhanced IVR system (e.g., NBTel Express or NBTel CallMall) also provides a text screen that allows easier navigation to the user. These are accessed by ADSI capable telephone sets equipped with a screen.

The invention provides methods for integrating and connecting a human ACD agent and a customer who is using the WWW and wishes human assistance. Furthermore, the invention provides a customer in voice conversation with an ACD agent an option to enhance that conversation with shared screens of information (images, text, etc.). The invention is intended to be used by organizations or individuals with WWW servers and ACD agents. The invention was initially developed to illustrate the joint use of two powerful marketing channels (WWW and ACD agents) and that their combination produces an even more powerful channel than either alone. The main features of this invention are the ability to link and integrate customers (who may have obtained product awareness information or directory information via a WWW server) and appropriate ACD agents or individuals to provide supplementary information or assistance.

According to a first broad aspect, the invention provides in a communications system comprising a server on a ic

network, means for connecting the server to at least one computer in a remote customer premises, a help channel and a call centre connected to the help channel connectable through the public switched telephone network to a telephone in the customer premises, an apparatus and method for the customer to obtain help in relation to a page from the server displayed by the computer comprising the steps of the customer selecting a remote help option from the page; the customer preparing a help request form comprising the number of the customer's telephone; the system transferring the help request to the call centre; and the call centre setting up a call over the public switched telephone network between the customer telephone and the help channel.

According to a second broad aspect, the invention provides in a communications system comprising a server on a network, means for connecting the server to at least one computer in a remote customer premises, a help channel and a call centre connected to the help channel connectable through the information network to the computer, an apparatus and method for the customer to obtain help in relation to a page from the server displayed by the computer comprising the steps of the customer selecting a remote help option from the page; the customer computer automatically preparing a help request form comprising a network address; the system automatically transferring the help request to the call centre; and the call centre setting up a virtual audio channel on the data network between the channel and the customer computer.

According to a third broad aspect, the invention provides in a communications system comprising a server on a network, means for connecting the server to at least one of either a computer or a set-top box and television in a remote customer premises, a help channel and a call centre connected to the help channel connectable through the public switched telephone network to a telephone in the customer premises, an apparatus method for the customer to obtain help in relation to a page from the server displayed by the computer comprising the steps the customer selecting a remote help option from the page; the customer set-top box or computer signalling a telephone switch to ring the customers telephone line (with a normal ring or a distinctive ring) in response to the customer selecting the help option; the telephone switch dialing the call centre automatically when the customer the picks up the handset; and the call centre transferring the call to the help channel.

According to a fourth broad aspect, the invention provides in a communications system comprising a server on a network, means for connecting the server to at least one computer in a remote customer premises, a help channel and a call centre connected to the help channel connectable through the public switched telephone network to a telephone in the customer premises, an apparatus and method for the customer to obtain help in relation to a page from the server displayed by the computer comprising the steps of the customer selecting a remote help option from the page; the customer computer automatically passing a help phone number listed within the page to communications software running on the customer's computer; and the communications software dialing the help phone number with a modem and line connected to the customer's computer and telephone; whereby a voice connection is established between the customer telephone and the help channel.

According to a fifth broad aspect, the invention provides in a communications system comprising a server on a network, means for connecting the server to at least one computer equipped with an SVD (simultaneous voice data) modem in a remote customer premises, a help channel comprising a live agent workstation equipped with at least one computer equipped with an SVD modem, and a call centre connected to the help channel, an apparatus and method for the customer to obtain help in relation to a page from the server displayed by the computer comprising the steps: establishing a voice connection between a customer telephone and an agent telephone over the PSTN; the agent connecting the agent computer to the server if not already connected; the customer disconnecting the customer computer from the server if connected unless equipped to handle more than one connection; both the customer and ACD agent activating their SVD (Simultaneous Voice Data) Modems (or ISDN units) such that data and voice connections are established where previously only a voice connection existed in such a way that the agent who is already connected to the desired server acts as a host and the caller acts as a remote connected to the agent's host and in communication with the host over the data portion of the connection and the caller is able to view the same pages as the agent, and the agent can provide the caller with assistance by walking the customer through the information from the server, and discuss it over the voice connection.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** shows a block diagram of the first embodiment of the invention;

FIG. **2** shows a process flow diagram for the first embodiment of the invention;

FIG. **3** shows a process flow diagram for a variation of the first embodiment of the invention;

FIG. **4** shows a process flow diagram for another variation of the first embodiment of the invention;

FIG. **5** shows a process flow diagram for another variation of the first embodiment of the invention;

FIG. **6** shows a block diagram of the second embodiment of the invention;

FIG. **7** shows a process flow diagram for the second embodiment of the invention;

FIG. **8** shows a block diagram of the third embodiment of the invention;

FIG. **9** shows a process flow diagram for the third embodiment of the invention;

FIG. **10** shows a block diagram of the fourth embodiment of the invention; and

FIG. **11** shows a process flow diagram for the fourth embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

In a first preferred embodiment of the invention, illustrated schematically in FIG. **1**, a method and apparatus, herein referred to as the Customer Contact Channel Changer, is provided for automatically providing a live telephone connection between a customer using an organization's multimedia services to the organization's ACD agent. Four main components are illustrated, these being the customer premises **2**, an ACD agent workstation **12**, a call centre **24** and the call centre's multimedia server **28**. The multimedia server **28** may be a WWW server **28**, and will be referred to herein as such. The call centre's **24** WWW server **28** may actually be located at the call centre, or it could be located remotely. Likewise, the ACD agent workstation **12** may be located in the call centre. Alternatively, the ACD agent workstation may be in locations remote from the call centre such as in an individual agent's home or remote workplace.

The components of a customer premises **2** are illustrated in FIG. **1**. This includes a PC **4** capable of supporting a graphical WWW HTML (Hypertext Markup Language) browser and supporting generation of a URL (Uniform Resource Locator) of the organization's product and service database, an Internet line **6** (either via LAN or WAN-dial-up via modems), and a telephone **8** connected to the PSTN (public switched telephone network) **9** via a telephone line **10**. The URL provides a snapshot indication of where in the hypertext environment of the organization's WWW services the user is at a given time.

Numerous commercial WWW browsers are available to assist in navigation through the Internet and WWW servers. These browsers use HTML and HTTP (Hypertext Transport Protocol). In a typical page received via the Internet from an organization providing information or services on a WWW server, words or key phrases may be underlined or bolded to indicate that more information is available. This is referred to as hypertext. If the user is interested in obtaining this additional information, he can click on the word with a mouse, and the additional information is displayed.

The typical configuration for an agent workstation **12** is also shown in FIG. **1**. An agent workstation **12** is equipped with an ACD telephone set **14** from which a variety of calls can be answered, a Personal Computer **18** capable of supporting a graphical WWW/HTML browser, a telephone line **20** and computer communications line **22** for communicating with the call centre **24** and the WWW **28** via a data network **44** comprised of either a LAN (local area network) or via a dedicated or dial-up WAN (Wide Area Network). Typically a plurality of agent workstations **12** would be employed, depending on the volume of business to be handled.

The call centre **24**, which handles requests for help from customers after they are received by the WWW server **28**, subsequent call back of customers, and live connections with ACD agent workstations **12**, is also depicted in FIG. **1**. The call centre **24** includes an outbound dialing system **32** capable of setting up a blended inbound/outbound call environment. This outbound dialing system **32** contains a HOTLIST of telephone Numbers of HOT leads (qualified or interested leads) which are to be called as soon as an agent becomes available or at a time preferred by the customer. The call centre **24** also includes an ACD system **34** (on a digital switch—either PBX, centrex or computer based) which makes the actual calls and via line **20** connects the calls from the agent **12** to the customer via the PSTN **9** and line **10**. It may also include a CTI server **36**, an ACD-MIS (ACD management information system) system **38** connected to the ACD system **34**, an IVR server **40**, a call centre customer information system **42** and a data network **44** for interconnecting various components of the call centre **24**.

The WWW server **28** (complying to HTTP and HTML) is equipped with information pertaining to an organizations products and services, directory information, etc. The server **28** includes an HTTP server **46** connected to an Internet access line **47** for receiving requests for help, and CGI (Common Gateway Interface) programs **48** for communicating with the call centre **24**. It may also include a multimedia message management system **50** which will be described in detail below, and a store of numerous text, graphics and multimedia files **52** in various multimedia file formats (such as GIF, JPEG, MPEG, WAV, AUPCX, PDF, POSTSCRIPT). Not shown between the customer's Internet access line **6** and the WWW server's Internet access line **47** is the Internet itself.

A typical session will be described with reference to FIGS. **1** and **2**. Process steps are contained in boxes in FIG. **2**. The session starts when a customer **2** calls via its Internet access line **6** into the WWW server **28** and commences a self-serve session with an organization which subscribes to Customer Contact Channel Changer service (box **2-1**). The customer browses through information regarding products and services with the graphical WWW browser. This browsing is often achieved by viewing HTML pages **53** and associated multimedia files **52**. There may be on-line help which addresses some questions which may arise. At some point additional details or assistance are needed and the customer chooses a "Live Help" option from within an HTML page (box **2-2**). This may be done by using a mouse to click on a "Live Help" button on the screen, or by entering a command at the keyboard. This prompts an additional HTML form **54** to pop up which the customer must fill in (box **2-3**). The form **54** asks the caller for the phone number at which they can be reached at that time. The URL which the customer was viewing (prior to selecting help) is automatically filled in to indicate the page from which help was requested, but the customer also has the option of providing a different URL. In one embodiment, the customer also has an option of specifying a preferred time to be called back with the default being to request call back as soon as possible. The customer then sends this completed HTML help request off to the WWW server **28** where it is received by the HTTP server **46** and time-stamped. The request may be sent by either E-mail or TCP/IP (transmission control protocol/Internet protocol) client to server HTTP interaction etc.

At the call centre **24**, the help request messages are received and initially processed by the HTTP server **46**. The telephone number, time stamp and URL are passed to the outbound preview dialing system **32** in the call centre **24** via the CGI interface **48** and data net **44**. Should agents not be available, messages may be sent back via the CGI interface **48** and HTTP server **46** to the customer with anticipated wait time (derived from the ACD-MIS system **38**) and call setup and scheduling options may be presented to the customer in conjunction with the multimedia message management system **50** to be described further below. An active time-stamped HOTLIST is maintained to feed the outbound dialing system **32** with numbers to call while also providing the next available agent the URL of where the question arose. The information received from the customer, including a CLID (caller identity) which is the 10 digit customer phone number, and the URL is entered on this HOTLIST (box **2-4**). The agent workstation computer **18** is set up to preview the HTML page associated with the caller's URL before or while the outbound call is being made. This allows the agent to be better prepared to answer the question(s) which may arise. The call is then made to the customer automatically without any need for the agent to key any telephone numbers into either their phone **14** or computer **18** (box **2-5**). After the customer answers the phone call from the agent, the two parties will be in full voice communication and will be viewing the same multimedia screen which prompted the customers question. The agent can then assist or guide the caller to the solution or answer sought, or can take orders and/or provide technical support (box **2-6**).

In a modification of this embodiment, the customer is not required to fill out an HTML page. Upon selection of the "Live Help" option, default values together with the relevant URL are filled in automatically, and the request is immediately sent off.

When it is desired to establish voice communications over the data network rather than the PSTN, instead of sending a telephone number at which the user can be reached, an

HTML form including the user's IP (internet protocol) address and URL is filled in automatically and forwarded to the outbounding system through the same channels as before. The process diagram for this is shown in FIG. **3**. The rest of this process is similar to that described above except that the outbound call is placed over the Internet using IP based voice communications packages running on the user's PC enabling voice communications. These use originating and terminating IP addresses to set up virtual (packet based) circuits for use as voice channels for the duration of the call. This assumes that the caller and agent have compatible hardware and software configurations on their PC's.

When the option is provided to the customer of selecting a time preferred for call-back, a more sophisticated message management system is required. For this purpose, the invention provides a method of managing the integration or connection of customers using various services (WWW servers, voice-mail, IVR, e-mail, etc) to an ACD call centre agent. This multimedia message management system **50** will be referred to herein as the "Multimedia Message Manager" (MMM) **50**.

A process flow diagram which incorporates the MMM **50** is shown in FIG. **4**. This figure is very similar to FIG. **2** with the exception of the addition of the MMM which is connected to the organization's V-mail servers **80** and E-mail servers **81** and the WWW server **28**.

The MMM **50** acts as an intermediary between the traditional call centre related systems and the new WWW related server systems. Specifically, it communicates with the call centre ACD-MIS system **38** to get estimated anticipated caller wait times (or other parameters) and passes this information to the caller via the HTTP server **46** and related CGI programs **48**. It may be used to allow Web browsing of information sources related to the call centre such as the voice mailbox associated with a call centre agent. Overflow calls may be routed to voice mail. The MMM **50** allows the agent or supervisor to scan large volumes of voice-mail messages, E-mail messages, WWW form request etc. and prioritize and schedule call backs from a combined HOTLIST.

The MMM **50** acts as a clearing house point to assist in scheduling calls between customers and ACD agents and vice versa. This allows customers who may not be able or willing to converse with an agent at Time T0 to schedule the call for Time T2 which is the customer's preferred time. The HOTLIST is then updated to include both calls which are to be completed as soon as possible and calls which are due to be completed in the very near future. There are many ways in which the HOTLIST may be maintained. Calls requesting immediate call back can be ordered according to the time stamp of when they were received, which will always be in the immediate past. Calls with future time stamps may be appended to the list prior to the arrival of the time indicated by the future time stamp, or alternatively, they can be given priority and placed at the top of the list when the time arrives. The MMM **50** also handles the notification through the E-mail servers **81** of customers of the fact that delays are expected, and is able to provide an indication of when a return call might be expected.

Alternative to connecting a multimedia user to a live agent, with a slight modification of the first embodiment described above the invention can be used to connect a multimedia user (WWW, voice mail, IVR, E-mail) to an IVR call back system, in which help is available on a variety of topics, and in which the user further has the option of being connected to other ADSI enhanced IVR applications such as home shopping systems. This is illustrated in FIG. **5**. This is particularly useful in situations where a portion of the call centre's business may have self service options in different mediums. For example, both IVR self service channels and WWW self service channels might be available, and this aspect of the invention allows a quick change from one medium to the other. By selecting the IVR channel, the customer is connected to the IVR channel in an outbound manner as above.

FIG. **6** illustrates a second embodiment of the invention. While the first embodiment and its modifications described above are directed towards call centres equipped with outbound calling capabilities, in this second embodiment, the call centre is equipped with inbound call processing capabilities, handling calls as they come in from customers. This provides a method for integrating or connecting a customer who has a SAT (screen assisted telephony) capable configuration and wishes to be connected to a live agent **106**. The figure is very similar to FIG. **1**, but with much of the detail of the call centre and WWW server removed. There are again four main components illustrated, one of these being the customer premises **100** equipped with a telephone (or a screen assisted telephone set) **110** and line **107**, a set-top box (a special purpose computing device which allow access to network services through the television set with user input being achieved through the television remote control) and TV **108** or PC **111**, and a CTI/SCAI (switch to computer application interface) enabled line **107**. The other main components include the multimedia or WWW server **102**, call centre **104** and an agent workstation **106** equipped with a computer **112** and a telephone **114**, or a screen assisted telephone. Also shown is the PSTN **116**, a broad band multimedia data network **117** and a SAT server **109**.

The interconnections between the customer premises **100**, WWW server **102**, call centre **104**, agent workstation **106** and PSTN **116** are the similar to before with the exception that all customer PC connections are via a broadband data network **117**, and the customer telephone **110** connection is implemented with a line **107** to the PSTN **116** and a subsequent connection to the broadband data network **117**.

The process followed in the second embodiment will be described with reference to FIGS. **6** and **7**. The box numbers refer to boxes shown in FIG. **7**. Initially, the customer makes a "multimedia call" in order to be connected to XYZ's multimedia server **102** and to run a multimedia application on the set-top box/TV **108** or PC **111** (box **7-1**). The user selects on the set-top box remote or the PC mouse a "MAKE CALL" feature from within the multimedia application (box **7-2**). This selection initiates a series of steps to set up a call to either an ACD group or an individual. The request first signals through the broadband multimedia data net **117** to a PSTN telephone switch **116** specially equipped with CTI techniques (such as SCAI) to ring the customer's line **107** (with a distinctive ring similar to ring-again) prompting the customer to pick up the handset (box **7-3**). The PSTN based switch **116**, having sensed that the customer has indeed picked up the set, then dials the destination party automatically, which in this case is the call centre **104**, where an ACD system distributes the call to an ACD agent workstation **106** (box 74).

When an ACD agent answers the call, the customer's URL and/or CLID are forwarded so that a customer relevant screen is appearing on the agent's PC or terminal **114** at the same time (box **7-5**).

The customer relevant screen is set up on the agent's screen via one of several known CTI techniques. These

include first party call control techniques and third party call control techniques. First party call control techniques use various CLID (Calling Line Identification—not shown) boxes and associated screen-pop software. The CLID is transmitted over the telephone line and the CLID box detects this and passes it to the agent's PC over a serial RS**232** communications port. The CLID box may be integrated as a part of the telephone, or it may be a standalone unit connected to the telephone line together with the telephone. Screen-pop software takes the telephone numbers provided by the CLID box and looks up the corresponding customer records in a database, and displays them on the screen. Alternatively, using third party call control techniques, the digital switch has a shared data circuit to a "Third Party" CTI server which understands a common protocol such as SCAI. This server then associates various calls with various agents and delivers CLID and/or customer relevant data to the agents workstation as the phone is ringing.

Under either of the scenarios described above for transmitting the CLID, the URL information is transmitted in one of two ways. Firstly, upon answering the call and viewing the customer relevant data simultaneously (obtained by looking up the CLID in a customer database), the agent greets the caller and the caller verbally mentions the associated product or subject matter area which causes the agent to hot key to the relevant or related HTML page. A more sophisticated alternative to this is for the WWW server to sense all users querying it in real time (i.e. which URL's are being read and from which IP addresses or E-mail addresses) and then do a look-up into its database to determine corresponding CLID's. As calls from CLID's come in, the database can correlate the associated caller and URL.

Should all agents be busy, an IVR system can be used to provide additional information options to the customer while an agent becomes available. This method does not avoid ACD queues, but does make placing the call easier. In addition, the use of the URL and/or CLID makes the provision of help by the agent more efficient. As in the first embodiment, the agent is now in a position to help the customer with the WWW server or other multimedia application with which they require assistance (box **7-6**).

As in the first embodiment, instead attempting to put the call through to a live agent, the call can be automatically connected to an IVR system. Screen-based telephony and associated SAT telephone switches may be employed in this case, allowing the customer to interact with an ADSI enhanced IVR system.

FIG. **8** illustrates a third embodiment of the invention which is quite similar to that shown in FIG. **6**, with the exception of the configuration at the customer premises. Again, an inbound call processing capability is required at the call centre, as in the second embodiment. This embodiment provides a method for integrating or connecting a customer **100** who has a telephone **120**, a PC **124** with DDE (dynamic data exchange) capabilities and two modems **122**, **126** and lines **127**, **128** and wishes to be connected to a live agent **104**. DDE allows data to be passed dynamically between different applications running on the PC. In this embodiment, the PC **124** is equipped with communications software and modems **122**, **126** able to place the call between the customer's telephone **120** and the ACD agent itself, automatically, instead of requiring the telephone switch to set up the call as in FIG. **6**.

FIG. **9** shows a process diagram showing the steps which occur when this method is used. Initially, the customer makes a multimedia call to connect to company XYZ's multimedia server (box **9-1**). The customer then selects the "MAKE CALL" or "HELP" button which may appear on an HTML page (box **9-2**). The customer request initiates a PC based DDE whereby the telephone number in the HTML page to be called is passed dynamically to another PC based communications software package where an outbound call is dialed over a regular modem **122** and line **127** (boxes **9-3** and **9-4**). When an ACD agent answers, a voice connection between the customer's telephone **120** and the ACD agent's telephone **112** is completed, and a customer relevant screen is appearing on the agent's PC **114** or terminal at the same time (box **9-5**) based on incoming CLID and using first part or third party CTI techniques as described previously.

As before, an IVR connection could be established instead of using live agents, and screen assisted telephones and associated servers could be employed to enhance this type of connection.

FIG. **10** illustrates a fourth embodiment of the invention in which a method and apparatus is provided for integrating WWW information from a caller who is already talking to a live ACD agent. In this embodiment either an inbound call processing capability or an outbound call processing capability is required at the call centre.

The customer site **210** is equipped with a computer **212** and a telephone **214** both connected to a SVD (simultaneous voice data) modem **216** with external connections **218** to the PSTN **219** which may be analog, or ISDN (integrated services digital network) format. SVD modems allow both voice and data to be transmitted over the same standard telephone line at the same time.

The agent site **220** is similarly equipped with a computer **222**, telephone **224** and SVD **226** and connections to the PSTN **219**. It is also connected to a digital switch **230** with ACD functionality for distributing calls to various agents. The agent's computer **222** is also connected to a WWW server **232** and may be connected to a multimedia message management system **234**.

The process flow diagram for this embodiment is shown in FIG. **11**. The customer has been previously connected to an ACD agent either according to the traditional method wherein the customer physically dials an 800 number, or according to one of the methods described above (box **11-1**). This includes all of the inbound and outbound call set-up methods and associated hardware described in the first three embodiment and their variants, although it is assumed that a live agent exists, and not an IVR system. Both parties are conversing and desire to be viewing identical screens of information simultaneously, and so decide to go into collaborative mode (box **11-2**). This may be due to the fact that simple verbal explanations are insufficient to solve the caller's problems. If the calling party is not yet WWW connected, the two parties activate their SVD Modems **216**, **226** (or ISDN units) and activate their remote control software packages (box **11-3**). This sets up a data connection over the same telephone line as they were previously using for voice. Then voice and data can be transmitted over the same telephone line. The agent who is already connected to the desired WWW server **132** acts as HOST and the caller acts as a REMOTE allowing the caller to view the same WWW pages (or other Information Systems) as the agent (box **11-4**). The agent can then walk the customer through information and supplement it verbally, thereby sharing a multimedia call with the customer (box **11-5**). Screens appearing on the agents computer appear on the customer's computer, as what the customer sees is an exact duplicate of what the agent sees. This may result in immediate sales and

service or assist in further sales and service. The next time the caller, having become more comfortable and familiar with the system, may opt to use the self serve channel with no human assistance for increased likelihood of repeat business. The above combining of ACD, SVD and WWW building blocks allows collaborative screen sharing between customers and ACD agents. In addition, agent integration via the MMM **234** allows increased agent productivity.

If the caller is already logged onto the WWW server, he must disconnect before being able to go into collaborative mode, unless he is equipped to handle two connections at once.

In order to implement this embodiment, several configuration (hardware and software) modifications to existing ACD setups would be required. Most current PC's will not successfully support high speed (14.4 KBPS) communications on their serial ports due to the older UART (Universal Asynchronous Receiver Transmitter) chips. Communications with these units is error prone and unreliable. PC's need a smarter faster UART to make this configuration reliable. These are supplied by installing high speed serial input/output boards in the ISA (Industry Standard Architecture) slots on the motherboard of the PC. Software reconfiguration is required to disable the lower speed communications ports. An alternative here it to use new simultaneous voice and data modem technology which utilizes the parallel port of the PC which (for most PC's) currently supports speeds equal to or greater than 28.8 KBPS.

At the agent end, the type of line choice (2500-type analog ACD line or digital ACD line) must be made and depending on this additional hardware and software is required. If a digital ACD line is used, a hardware adaptor is required to convert the digital signaling which may be proprietary in nature into signals recognized by analog based SVD modems. Also, these adaptor units must be modified to handle high speed (14.4 KBPS) data transmission. If 2500-type analog lines are used, software is required on the PC to allow easy access and use of sophisticated feature activation codes. The line choice here depends largely on which features the call centre agent would be using.

We claim:

1. In communications systems comprising a server connected to the Internet-, customer premises equipment in a remote customer premise comprising a customer computer connectable to the Internet and having a customer IP addres, a call center having a plurality of help agent computers connected to the Internet, a method for the customer to obtain help in relation to a WWW page having a URL (universal resource lacator) from the server displayed by the customer computer comprising the steps:

a) the customer selecting a remote help option from the page;

b) the customer computer automatically preparing a help request form comprising the customer IP address;

c) the system automatically transferring the help request to the call center; and

d) the call center setting up a virtual audio channel on the Internet between one of said help agent computers and the customer computer using IP based voice communications.

2. The method according to claim **1** wherein the request form further comprises a field for filling in a customer preferred time for call-back and wherein the call center further comprises means for recording the help request forms and associated preferred call-back times, and is adapted to place calls at specified times according to the times in the recorded requests.

3. The method according to claim **1** wherein the means for transferring the request to the call center is one of TCP/IP HTTP or E-mail.

4. The method according to claim **1** further comprising the step of the call center sending a message back to the customer with an anticipated wait time when no help agent is available for immediate help.

5. The method according to claim **1**, wherein said one of said help agent computers is also provided with customer relevant information.

6. The method according to claim **1** in which said agent computer is further provided with a URL indicating from which page the customer has requested help and with which the agent computer can be set up at the same page.

7. A method according to claim **1** further comprising:

providing for the selection between a plurality of contact channels.

8. A method according to claim **7** wherein the plurality of contact channels include voice over IP and PSTN channels.

9. An automated call distribution system comprising a server and a call center, the server being for providing network service to a customer terminal, the server comprising one or more pages downloadable to the customer terminal operable to provide a remote help option selectable by a user of the customer terminal, and upon selection of the remote help option, send a help request to the call center identifying a contact channel through which the user of the customer terminal can be reached;

the call center comprising means operable to receive the help request and to contact the user of the customer terminal using the contact channel identified in the help request.

10. An automated call distribution system according to claim **9** wherein said means operable to receive the help request and contact the user of the customer terminal using the contact channel identified in the help request comprises a live agent workstation.

11. An automated call distribution system according to claim **9** wherein said means operable to receive the help request and contact the user of the customer terminal using the contact channel identified in the help request comprises an IVR callback system.

12. An automated call distribution system according to claim **9** wherein:

the server is operable to receive an identification of a web page the user is visiting and to provide this to the call center;

the call center is operable to set up the live agent workstation to the web page the user is visiting.

13. An inbound call processing system for processing calls from customer premises equipment comprising a telephone with a telephone line, and a network access device connected with a CTI enabled line, the inbound call processing system comprising:

a multimedia server, a call center;

at least one an agent workstation;

a CTI enabled switch:

a broad band multimedia data network wherein customer network access devices are connectable to the multimedia server are over the broadband data network to run a multimedia application provided by the server, and the customer telephone connections are over the PSTN and a subsequent connection to the broadband data network;

the multimedia application comprising a make call option which when selected initiates a series of steps to set up a call to an ACID system by signaling to the CTI enabled switch to ring the customer's telephone line

prompting the customer to pick up the handset, and upon sensing that the customer has indeed picked up the set, then dials the call center automatically, where an ACD system distributes the call to an ACD agent workstation.

14. The inbound call processing system of claim **13** wherein I the CTI enabled switch is SCAI (switch to computer application interface) or other third party call control enabled.

15. The inbound call processing system of claim **13** comprising:

in each agent workstation, a calling line ID system for identifying a telephone number of an inbound call;

a customer information database queriable on the basis of the telephone number for information related to a customer which is then made available to the agent.

16. The inbound call processing system of claim **15** further comprising screen pop-up software in the agent work station which presents said customer information.

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(12) EX PARTE REEXAMINATION CERTIFICATE (9754th)

United States Patent
Bateman et al.

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(45) **Certificate Issued: Jul. 17, 2013**

(54) **METHOD AND SYSTEM FOR COORDINATING DATA AND VOICE COMMUNICATIONS VIA CUSTOMER CONTACT CHANNEL CHANGING SYSTEM USING VOICE OVER IP**

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G06F 13/14 (2006.01)

(52) **U.S. Cl.**
USPC **710/5**; 710/6; 710/36; 710/39; 709/203; 379/67.1

(58) **Field of Classification Search**
None
See application file for complete search history.

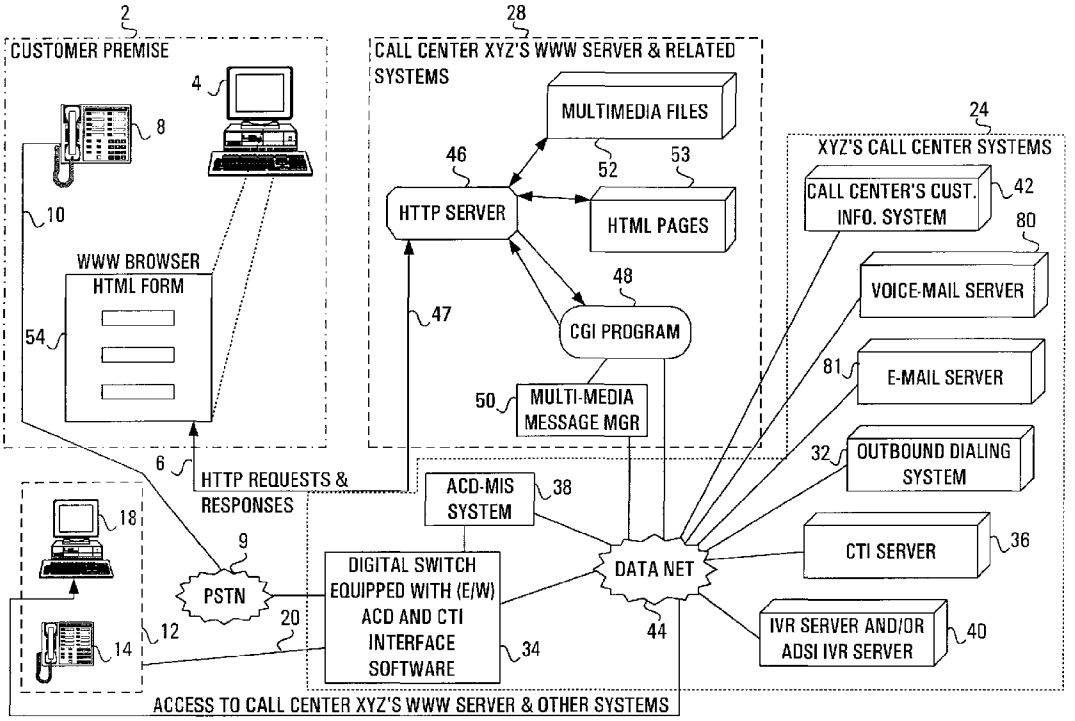
(56) **References Cited**

To view the complete listing of prior art documents cited during the proceeding for Reexamination Control Number 90/012,617, please refer to the USPTO's public Patent Application Information Retrieval (PAIR) system under the Display References tab.

Primary Examiner — Robert Scheibel

(57) **ABSTRACT**

This invention (The Customer Contact Channel Changer) enables the integration of different Customer Contact Channels such as live call centre ACD (Automatic Call Distribution) agents, ADSI (Analog Display Services Interface) enhanced IVR (Interactive Voice Response) systems and WWW (World Wide Web) servers. The world wide web servers are used to allow customers with computer equipment to access information from an organizations databases in a self service mode. Frequently these customers have questions best answered by human ACD agents. With this invention the connection between the customer with the question and the agent with the answer is done quickly and efficiently with both parties sharing screens of common information. Also control is retained by the customer to make the call happen when they want it.



EX PARTE REEXAMINATION CERTIFICATE ISSUED UNDER 35 U.S.C. 307

NO AMENDMENTS HAVE BEEN MADE TO THE PATENT

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **9-12** is confirmed.

Claims **1-8** and **13-16** were not reexamined.

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