

# The Surprising Value of Abandoned Applications to the Patent System

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## Abstract

*Some patent applicants abandon their applications after publication without ever receiving a patent. The conventional wisdom is that an abandoned patent application is deficient in some way and consequently worthless. This Article empirically studies abandoned patent applications, finding they are more valuable on average than issued patents across a number of dimensions. For example, abandoned applications are more likely to be used as prior art by the USPTO when rejecting claims of others. There are even numerous abandoned patent applications in the list of the USPTO's most highly cited pieces of prior art in office actions. Our results present an enigma for both patent scholars and economists: abandoned published applications, widely considered worthless, appear more valuable than issued patents and play a larger role in the patent system than previously thought. This high use of abandoned applications in rejecting other applications and thus preventing broader patent rights for others is arguably a public service, and potentially a huge private loss, that has not been previously recognized in the literature.*

*Our findings also have important implications for patent law and doctrine. Many scholars claim that scientific researchers ignore patents, rendering the disclosure portion of the patent bargain as an illusion. Our study exposes a yet unrecognized beneficial disclosure—an administrative disclosure where the USPTO relies upon abandoned applications as a significant source of prior art for rejections and improving issued patent quality. Our findings also raise questions about the effectiveness of the patent granting process. Why are there applications that go abandoned but are also amongst the most important pieces of prior art? We empirically study these most cited abandoned applications to attempt to discover the answer.*

## Introduction

Some patent applicants never receive a patent. After disclosing how to make and use their invention in a formal patent application, and after the application is published and available to the public, these applicants fail. They abandon their applications, leaving them without any patent protection and, in most cases, no trade secret protection. The conventional wisdom is

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that an abandoned published patent application is deficient in some way, and consequently worthless. Certainly, the theory goes, these abandoned applications are worthless to the applicant who jettisoned them without ever obtaining the benefit of the patent bargain. Through the act of publication, trade secret protection for the invention was forgone. The patent bargain – trading public disclosure of an invention in exchange for exclusive rights – was never fully consummated for abandoned applications since they provide no rights whatsoever to the applicant. But do abandoned applications have hidden value to the patent system? The popular view that abandoned applications are worthless has not been tested. To date, no one has carefully studied abandoned published patent applications. This article reports the results of such a study.

Using the recently released United States Patent & Trademark Office (“USPTO”) Patent Examination Database with millions of observations, we study abandoned published patent applications.<sup>1</sup> The USPTO Patent Examination Database has granular information on every paper filed or generated during patent prosecution.<sup>2</sup> Using this dataset, we carefully investigate both how abandoned published applications were examined themselves and how the USPTO treated these publications when they were disclosed as potentially relevant to the examination of other applications. We compare abandoned published patent applications to applications that were granted a patent by the USPTO, patents on which applicants paid an issuance fee and are presumed valid.

Surprisingly, we find that abandoned applications are more valuable on average than issued patents across a number of dimensions. For example, abandoned applications are more likely to be used as prior art by the USPTO when rejecting claims of others. Patent examiners use abandoned published applications more often than issued patents when issuing anticipation and obviousness rejections in an office action.<sup>3</sup> Beyond just rejections, abandoned applications are more likely to be cited as relevant by patent examiners during patent prosecution than issued patents.<sup>4</sup> For many years, economists have used citation metrics such as these as measures of value.<sup>5</sup> Our results present an enigma for both patent scholars and economists: abandoned

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<sup>1</sup> Stuart J. Graham, Alan C. Marco, & Richard Miller, *The USPTO Patent Examination Research Dataset: A Window on the Process of Patent Examination*, 27 J. ECON. MGMT. STRATEGY 554 (2018) (describing data issues including selection issues and the representativeness of the nearly 9.2 million US patent application records contained in the USPTO Patent Examination Research Dataset.).

<sup>2</sup> *Id.* at 557-58.

<sup>3</sup> We recently studied the usage of patents in anticipation and obviousness rejections. See Christopher A. Cotropia & David L. Schwartz, *Patents Used in Office Actions as Indicators of Value*, available at <https://ssrn.com/abstract=3274995>.

<sup>4</sup> While no one has looked at published applications, others have studied citations to issued patents and examiner citations appear more valuable than applicant citations. See Deepak Hegde & Bhaven Sampat, *Examiner Citations, Applicant Citations, and the Private Value of Patents*. 105 ECONOMICS LETTERS 287 (2009) (finding that examiner citations to a patent are stronger predictors than applicant citations of a widely used measure of patent value).

<sup>5</sup> See, e.g., Adam B. Jaffe & Gaetan de Rassenfosse, *Patent Citation Data in Social Science Research: Overview and Best Practices*, 68 J. OF THE ASS’N FOR INFO. SCI. AND TECH. 1360 (2017); Adam B. Jaffe & Manuel Trajtenberg, *PATENTS, CITATIONS, AND INNOVATIONS: A WINDOW ON THE KNOWLEDGE ECONOMY*. (2002 MIT Press, Cambridge; Jean O. Lanjouw, Ariel Pakes, and Jonathan Putnam, *How to Count Patents and Value Intellectual Property: Uses of Patent Renewal and*

published applications, widely considered worthless, appear more valuable on average than issued patents and play a larger role in the patent system than previously thought.

Furthermore, there are numerous abandoned patent applications in the list of the USPTO's most highly cited pieces of prior art in office actions. The office actions require applicants to narrow and amend their claims or include specific arguments for why the USPTO is incorrect that the claims are anticipated or obvious. Given the large number of applications rejected by the published yet abandoned art, a significant quantity of patent scope was narrowed because of abandoned applications. These abandoned published applications appear to be among the most valuable disclosures, at least from the USPTO's perspective, yet the applicants received no patent reward. The highly cited applications prevented future applicants from obtaining broader claim scope, preserving information in the public domain. Preventing broader patent rights for others is a public service, and potentially a huge private loss, that has not been previously recognized in the literature.

Our findings have important implications for patent law and doctrine. First and most importantly, our findings are relevant to policy debates about patent disclosure. Scholars have debated whether patents serve any technical teaching component at all. Many scholars claim that scientific researchers ignore patents, rendering the disclosure portion of the patent bargain as an illusion. We find that the USPTO relies upon abandoned applications as a significant source of prior art for rejections. The USPTO patent examiners are not scientific researchers in the field. They have the relevant technical background but do not conduct original research and are vitally important to the operation of the patent system. The USPTO decides whether to grant private patent rights to researchers. The USPTO patent examiners cite to disclosures, even abandoned patent applications, for prior art. Thus, the patent examiners are reading and using disclosures in patent applications, and the abandoned patents serve a key technical teaching component.

Second, our findings raise questions about the effectiveness of the patent granting process. Why are there applications that go abandoned but are also amongst the most important pieces of prior art? Is it because these applications were filed by companies who were ahead of their time and failed in the market before obtaining patent rights? Did the applications have broad and useful disclosures but poorly drafted claims? Was bad lawyering responsible for the abandonment? Did these patent applicants decide that public dedication of their inventions was actually more beneficial than obtaining a narrow patent? Or did the USPTO err in denying these applications? We hope to unpack the characteristics of the highly cited yet abandoned published patent applications.

The remainder of this article proceeds in four parts. In Part I, we outline the background literature about published patent applications. We also discuss various theories about patent

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*Application Data*, 46 J. INDUS. ECON. 405 (1998); Miguel Trajtenberg, *A Penny for Your Quotes: Patent Citations and the Value of Innovations*, 21 RAND J. OF ECON. 172 (1990).

disclosure. Next, in Part II, we set forth the study design relating to abandoned published patent applications. Part III provides our empirical results, both comparing how the USPTO treats abandoned applications and issued patents and analyzing highly cited abandoned applications in more detail. Finally, we discuss implications in Part IV.

## **I. Background Literature**

In this section, we first explain the USPTO process of publishing, examining, and issuing patents. We explain how and why published patent applications constitute prior art. We also provide an overview of theories of patent disclosure.

### **A. Patent Applications in the United States**

After an inventor has conceived of an invention, he or she prepares a patent application, or has it prepared by a patent attorney or agent. A patent application contains an abstract, a detailed description of the invention (typically including figures which appear on sheets that proceed the textual description), and a series of patent claims. The patent claims are detailed, one-sentence descriptions of the invention(s) that the applicant claims to have invented, including independent claims and then claims that depend on, and in turn narrow, the independent claims (called “dependent” claims). The applicant files the patent application with the USPTO.

The USPTO employs more than 9,000 patent examiners, most of whom have a scientific, engineering or other technical background. A patent examiner is responsible for evaluating whether a patent application meets the legal requirements for a patent. He or she uses a detailed set of procedures and rules contained in the USPTO’s Manual of Patent Examining Procedure (“MPEP”). The MPEP’s individual provisions are based on the patent laws contained in title 35 of the United States Code and the patent regulations contained in title 37 of the Code of Federal Regulations (“CFR”). The process of obtaining a U.S. patent is known as “patent prosecution.” Patent prosecution includes a series of interactions between the applicant (or the applicant’s attorney) and the patent examiner.

After a patent application has been filed, the USPTO conducts an initial review to determine whether formal requirements have been satisfied, such as whether an oath of invention has been filed, and then assigns the application to a patent examiner in a Group Art Unit. The patent examiner searches for prior art, examines the claims in the application, and prepares an Office Action that contains his or her analysis regarding patentability. It is in this Office Action that the patent examiner will use prior art such as prior issued patents or published applications in novelty (§ 102) and obviousness (§ 103) rejections asserting that one or more claims have either been already disclosed in the prior art (not novel) or describe a minor improvement over the prior art (obvious). In response to an Office Action, an applicant can file an Amendment and/or Remarks. The patent examiner then examines the claims again. The process continues until the claims are allowed, finally rejected, or abandoned. If the claims are

allowed, a patent will issue. If the claims are rejected, the applicant can appeal to the USPTO's Patent Trial and Appeals Board ("PTAB") or continue prosecuting the application by filing a Request for Continued Examination ("RCE"), permitting further amendment of the claims and continuation of the prosecution process.<sup>6</sup>

Patent rights are provided only after a substantive examination with the USPTO and the payment of an issuance fee. Starting in 2000, nearly all United States patent applications were published eighteen months after filing with the USPTO.<sup>7</sup> The change brought the United States in step with the patent laws of other nations.<sup>8</sup> The USPTO automatically publishes applications unless it receives a proper request for non-publication.<sup>9</sup> Prior studies estimate that only about 5 to 7.5 percent of patent applications contain a non-publication request.<sup>10</sup> Consequently, since 2000 almost all patent applications in the United States have been published.<sup>11</sup> The publications of patent applications are made available to the public.<sup>12</sup>

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<sup>6</sup> Prosecution typically includes two office actions, a non-final and final action, before an RCE needs to be filed to continue prosecution further without abandoning the application.

<sup>7</sup> 35 U.S.C. § 122(b)(1) ("each application for a patent shall be published, in accordance with procedures determined by the Director, promptly after the expiration of a period of 18 months from the earliest filing date for which a benefit is sought under this title.") Before that time, patent applications were maintained as confidential by the USPTO. See Daniel K. Johnson & David Popp, *Forced Out of the Closet: The Impact of the America Inventors Protection Act on the Timing of Patent Disclosure*, 34 RAND J. OF ECON. 96 (2003). ("Historically information on a U.S. patent application has not been published until the patent is granted.")

<sup>8</sup> Johnson & Popp, *supra* note 7 (one reason advanced by proponents of the new law was "it moves toward international harmonization of patent law.")

<sup>9</sup> Applicants may request non-publication if the application will not be filed in any foreign countries and other certain circumstances. 35 U.S.C. § 122(b)(2)(B) ("if an applicant makes a request upon filing, certifying that the invention disclosed in the application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication of applications 18 months after filing, the application shall not be published.") At the time, some argued that the practitioners may have problems with the non-publication requirements. See Jay Z. Zhang, *Patent Application Publication under 122(b): A New Adventure with Unforeseen Consequences*, 85 J. PAT. & TRADEMARK OFF. SOC'Y 715 (2003) (arguing that there are several pitfalls in the non-publication requirements and that practitioners should be careful).

<sup>10</sup> Chad Gilles, *Nonpublication Requests and Their Pitfalls (including Making Zombies)*, available at <https://bigpatentdata.com/2019/03/nonpublication-requests-and-their-pitfalls-including-making-zombies/> ("It seems about 5% of applications are filed with nonpublication requests."); Stuart Graham & Deepak Hegde, *Do Inventors Value Secrecy in Patenting? Evidence From the American Inventor's Protection Act of 1999*, available at <http://ssrn.com/abstract=2170555> (2014) (estimating 7.5% percent of issued patents had a non-publication request); see also Stuart Graham & Deepak Hegde, *Disclosing Patents' Secrets*, 347 SCIENCE 236 (2015).

<sup>11</sup> Others have argued that the publication requirement did not have a significant effect on applicant behavior. See Reiko Watase, *The American Inventors Protection Act of 1999: An Analysis of the New Eighteen-Month Publication Provision*, 20 CARDOZO ARTS & ENT. L.J. 649 (2002) (arguing that the new publication provision of the AIPA fails to have any major impact on the U.S. patent system because of the broad exemption for applicants that do not file abroad.).

<sup>12</sup> Some believed that the publication requirement would result in more knowledge diffusion. Johnson & Popp, *supra* note 8 (using U.S. patent data from 1976 to 1996 to assert that the addition of a publication requirement in the United States will result in faster knowledge diffusion.) Others have argued that publication increased licensing activity. See Deepak Hegde & Hong Luo, *Patent Publication and the Market for Ideas*, 64 MGMT. SCI. 652 (2018) (finding data to support the view that published patent applications are significantly more likely to be licensed before patent grant and shortly after 18-month publication.)

Even after publication, patent examiners continue to evaluate and examine these applications. Some of the applications eventually issue as patents and some do not. When a patent issues, its owner obtains the right to exclude others from making, using, selling, offering to sell and importing into the United States devices, systems or methods that fall within the scope of an issued claim.<sup>13</sup> Unless a patent issues, the owner has no rights to exclude others whatsoever.<sup>14</sup> Publication provides no affirmative rights to the applicant, unless the patent later issues. Instead of issuing, the patent application may go abandoned. Abandonment occurs when either the applicant expressly notifies the USPTO of its intent to abandon,<sup>15</sup> the applicant fails to respond to an office action or other USPTO action within the required statutory period,<sup>16</sup> or the applicant decides to not pay the issuance fee within a defined period. Once a published patent application is abandoned, the applicant cannot reapply for a patent on the same invention.<sup>17</sup>

The patent prosecution process typically takes several years to complete.<sup>18</sup> In nearly all instances, patent prosecution will include one or more Office Actions containing rejections of claims by the patent examiner. Common rejections include that the claim is not novel (identified as “102” based on the statute, 35 U.S.C. 102) and that the claim is obvious (identified as “103” based on the statute, 35 U.S.C. 103). An applicant or counsel for an applicant typically will respond to the rejections. Common responses are that the rejections were issued in error, that additional information, such as additional testing data, moots the rejection, or that the claims are being amended to avoid the problems identified by the patent examiner.

As provided by Title 35 and applicable regulations, the USPTO permits patent applicants to file applications that are related to a pending original application. Related applications are denominated divisionals, continuations or continuations-in-part. All are examined in the same manner as an originally filed application, but are treated as if they were filed on the same date as the originally filed application. Patent applicants frequently file related applications in the course of patent prosecution. Patent applicants may also claim priority to foreign filed patent applications (filed in other jurisdictions) or from Patent Cooperation Treaty (PCT) filings.

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<sup>13</sup> 35 U.S.C. § 271.

<sup>14</sup> 35 U.S.C. § 154(d) provides provisional rights to a patent owner. That right permits recovery of a reasonable royalty for an infringer for periods before the patent issued in certain circumstances. However, these provisional remedies are only available if a patent eventually issues. If the application is abandoned, then no provisional right accrue. See also Charles R. Macedo, *Effect of the Publication of Applications under the American Inventors Protection Act of 1999*, 13 FED. CIR. B.J. 627 (2004).

<sup>15</sup> 37 C.F.R. 1.138(a) (“An application may be expressly abandoned by filing a written declaration of abandonment identifying the application in the United States Patent and Trademark Office.”)

<sup>16</sup> See, e.g., 37 C.F.R. 1.137(a) (“If an applicant of a patent application fails to reply within the time period provided [], the application will become abandoned unless an Office action indicates otherwise.”)

<sup>17</sup> This is because the published application will count as disqualifying prior art to the subsequent patent application. Of course, if the applicant filed a continuation application before abandonment, the applicant can rely upon the original filing date.

<sup>18</sup> Across all art units, the average pendency from filing to issuance in fiscal year 2016 at the USPTO was 25.3 months. United States Patent & Trademark Office, *Performance and Accountability Report 2016* (2016) (available at <https://www.uspto.gov/sites/default/files/documents/USPTOFY16PAR.pdf>).

## B. Published Patent Applications as Prior Art

Published patent applications undoubtedly count as prior art, even if the application was abandoned. Below we first describe the law on printed publications. Then we explain why the law comports with sound policy.

While it is not important to this Article's methodology or findings, it is useful to keep in mind that the America Invents Act ("AIA"), signed into law in 2011, altered the novelty requirement in patent law. The AIA changed the United States from a system where the first inventor was entitled to the patent (subject to some limitations), to a system where the first filer of a patent application was entitled to a patent (subject to some limitations).<sup>19</sup> Under both the pre- and post-AIA change, published patent applications clearly were prior art to subsequent inventions.

The Patent Act has long classified "patents and printed publications" as key categories of prior art.<sup>20</sup> Printed publications include any document that is accessible to the public so people in the field can locate it.<sup>21</sup> A leading opinion from the United States Court of Appeals for the Federal Circuit ruled that a "single catalogued thesis in one university library" was sufficiently accessible to constitute prior art that precluded a subsequent inventor.<sup>22</sup> Because a published patent application is accessible to the public, it clearly constitutes prior art. Thus, published patent applications qualify as prior art.

Moreover, published patent applications are prior art for another reason. There is a special section of the Patent Act relating to novelty geared only to issued patents and published patent applications.<sup>23</sup> The pre-AIA section 102(e) and post-AIA section 102(d) permit the use of published applications as of their filing dates rather than the date publicly available. The same sections permit the use of issued patents as of their filing dates too.

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<sup>19</sup> David S. Abrams & R. Polk Wagner, *Poisoning the Next Apple? How the America Invents Act Harms Inventors*, 65 STANFORD L. REV. 517 (2013).

<sup>20</sup> For patent applications with an effective filing date before March 2013, prior art for purposes of novelty was defined by 35 U.S.C. § 102(a) and 35 U.S.C. § 102(b). Both of these provisions preclude patentability of the invention if it was previously "patented or disclosed in a printed publication." 35 U.S.C. §§ 102(a), 102(b) (1952). The America Invents Act ("AIA") revised the statute, 35 U.S.C. § 102, for applications with an effective filing date after March 2013, but maintained the same operative language. 35 U.S.C. § 102(a) (2019) ("patent, described in a printed publication.")

<sup>21</sup> Manual of Patent Examining Procedure, § 2128 (9<sup>th</sup> ed., Rev. 08, 2018) ("A reference is proven to be a 'printed publication' 'upon a satisfactory showing that such document has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it.').

<sup>22</sup> *In re Hall*, 781 F.2d 897 (Fed. Cir. 1986).

<sup>23</sup> The pre-AIA included 35 U.S.C. § 102(e). That section included as prior art disclosures in "an application for patent, published under [35 U.S.C.] section 122(b)...." The post-AIA Patent Law includes an analogous provision: 35 U.S.C. § 102(d).

Published patent applications constitute prior art for purposes of obviousness too. Obviousness, which generally involves the combination of multiple pieces of prior art to invalidate a claimed invention, involves the same prior art as considered for novelty.<sup>24</sup> The Patent Act defines obviousness with a note that the “claimed invention is not identically disclosed as set forth in section 102 [novelty]....”<sup>25</sup> Many years of judicial decisions has tied the prior art as defined for novelty to the prior art for obviousness purposes.<sup>26</sup> For these reasons, the USPTO treats published applications, including abandoned published applications, as prior art for purposes of novelty and obviousness to subsequent applications.

Why does the patent system count published applications that are later abandoned to qualify as prior art? Under longstanding patent theory and practice, patents are only awarded for ‘new’ inventions.<sup>27</sup> If an invention is not new, then the patent has not provided new information to society.<sup>28</sup> Patents are supposed to be a bargain: rights to exclude others from making, using, selling, offering to sell, and importing, in exchange for a full and valuable disclosure.<sup>29</sup> If the invention is not new, the cost to society of the exclusive rights of a patent would be unwarranted.<sup>30</sup> The other half of the bargain would not be met because the disclosure would not be valuable; instead it would be old information.<sup>31</sup>

Abandoned published applications are abandoned, by definition, meaning that the original inventor did not obtain a patent. However, the publication of the disclosure of the invention is available to society. If someone else invents the same thing later in time, the second inventor did not provide a new disclosure to society, and has not invented anything new. Thus, using abandoned published applications as prior art makes theoretical sense in the patent system.

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<sup>24</sup> To be sure, there are doctrines such as the analogous arts doctrine that preclude some pieces of prior art from applicability to the obviousness determination. Jacob S. Sherkow, *Negating Invention*, 2011 BYU L. REV. 1091 (2011).

<sup>25</sup> 35 U.S.C. § 103(a).

<sup>26</sup> Donald S. Chisum, *Sources of Prior Art in Patent Law*, 52 WASH. L. REV. 1 (1976); Controversially, the courts treat “secret prior art” as prior art for obviousness. See Dennis Crouch, *Does Secret Prior Art Apply to the Obviousness Analysis?* (Dec. 13, 2017) (available at <https://patentlyo.com/patent/2017/12/secret-obviousness-analysis.html>).

<sup>27</sup> 35 U.S.C. 102; Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1022 (1989).

<sup>28</sup> Jones Anderson, *Nontechnical disclosure*, 69 VAND. L. REV. 1573, 1585-86 (“Disclosure theorists put the primary emphasis on disclosing new inventions and the further innovation that comes from that disclosure.”). Anderson, *supra* note 27, at 1585 (“Therefore, according to disclosure theorists, the patent system can be justified by how much information it brings to the public that otherwise would be private.”).

<sup>29</sup> *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 151 (1989) (“In consideration of [the invention’s] disclosure and the consequent benefit to the community, the patent is granted.”); *Universal Oil Prods. Co. v. Globe Oil & Ref. Co.*, 322 U.S. 471, 484 (1944); Sean B. Seymore, *Making Patents Useful*, 98 MINN. L. REV. 1046, 1073-74 (2014).

<sup>30</sup> Anderson, *supra* note 28, at 1585 (“Therefore, according to disclosure theorists, the patent system can be justified by how much information it brings to the public that otherwise would be private.”).

<sup>31</sup> *Integra Lifesciences I, Ltd. v. Merck KGaA*, 331 F.3d 860, 873 (Fed. Cir. 2003) (Newman, J., dissenting) (“The purpose of a patent system ... serves to add to the body of published scientific/technologic knowledge.”).



### C. Disclosure Theory of Patents

As authorized under the U.S. Constitution, Congress established the U.S. patent system in 1790 to promote the progress of science and the useful arts. The patent system encourages inventors to create new inventions and disclose them to the public by providing the inventors with finite exclusive rights. The exclusive rights provided by a patent are in exchange for a disclosure of the invention. This trade, exclusive rights for disclosure and potential abandonment of trade secret protection, is known as the patent bargain. Basically, the patent laws encourage the disclosure with the enticement of the exclusive rights.

Publication of patent applications complicates this bargain. The disclosure in a published application is available to the public before patent rights are awarded to the owner. For this period of time, the public can use them, subject to certain limitations. Once a patent issues, then others cannot make, use, sell, offer to sell, or import anything claimed by the patent. The information becomes part of the public domain when the issued patent expires.

However, as previously noted, not all patent applications issue as patents. If a patent does not issue, then the publication is never removed from the public domain. The public can use the information disclosed in the patent application without fear of liability to the applicant.

Scholars have debated the quality and importance of patent disclosure. The law requires that patent applicants disclose the invention sufficient for a person of skill in the field to make and use it without undue experimentation.<sup>32</sup> The disclosure must be contained within the originally filed patent application, including the figures and the detailed description of the invention.<sup>33</sup>

Many scholars have doubted whether the patent disclosure provides any technical teaching component at all. Jeanne Fromer argues that patent disclosure is ineffective because it is written in a confusing amalgamation of technical and legal jargon.<sup>34</sup> Fromer asserts that patent disclosures convey useful information since they often contain verbiage that is difficult for engineers to understand.<sup>35</sup> Sean Seymore makes a similar argument, arguing that patents are shrouded with jargon and formalism of “patentese,” which obscure the invention from those seeking to learn from the disclosure.<sup>36</sup> Numerous other scholars, including Michael Abramowicz, Dan Burk, Colleen Chien, Tim Holbrook, Doug Lichtman, Jason Rantanen, Benjamin Roin,

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<sup>32</sup> 35 U.S.C. § 112(a).

<sup>33</sup> To be sure, the USPTO prevents applicants from adding new material to their previously filed patent applications. 35 U.S.C. § 132 (“No amendment shall introduce new matter into the disclosure of the invention.”) If any new matter is added to an application, a new application is required and the applicant is not entitled to rely upon the original filing date for purposes of patent examination.

<sup>34</sup> Jeanne C. Fromer, *Patent Disclosure*, 94 IOWA L. REV. 539, 564 (2009).

<sup>35</sup> *Id.* at 2023-24.

<sup>36</sup> Sean B. Seymore, *The Teaching Function of Patents*, 85 NOTRE DAME L. REV. 621 (2010) (patents are shrouded with the jargon and formalism of “patentese” which obscures the invention from those seeking to learn); see also Sean B. Seymore, *Uninformative Patents*, 55 HOUS. L. REV. 377, 398-99 (2017) (disclosure fails to stimulate ideas and promote technological progress because the law requires only minimal disclosure from the inventor).

Katherine Strandburg, and Peter Yu have questioned the value of patent disclosure.<sup>37</sup> Other scholars have argued for different ways to conceptualize the patent disclosure functions.<sup>38</sup> Several scholars have recently studied the diffusion of knowledge among scientists by patents and failed to find significant benefits to disclosure.<sup>39</sup>

Scholars have claimed that many scientific researchers ignore patents, rendering the disclosure portion of the patent bargain illusory. Mark Lemley argued that researchers, especially in the semiconductor, telecommunications, and software fields, make conscious decisions to avoid reading the patents of others.<sup>40</sup> Lemley asserted several reasons for this, including that

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<sup>37</sup> See, e.g., Douglas Lichtman, *How the Law Responds to Self-Help*, 1 J.L. ECON. & POL'Y 215, 255 (2005) (noting that disclosure is "rarely revealing"); Peter K. Yu, *The International Enclosure Movement*, 82 IND. L.J. 827, 847 (2007) (suggesting that patent disclosures are frequently too cryptic); Jason Rantanen, *Patent Law's Disclosure Requirement*, 45 LOY. U. CHI. L.J. 369, 370-71 (2013); Michael Abramowicz, *The Uneasy Case for Patent Races over Auctions*, 60 STAN. L. REV. 803, 839 n. 140 (2007) (finding the extent to which patent documents successfully teach the inner workings of cutting-edge technologies is quite limited); Dan L. Burk, *Patent Silences*, 69 VAND. L. REV. 1603, 1606 (2016) ("far from focusing on enhanced disclosure, we should recognize that much of the critical work of the patent system can and should occur in the open rhetorical spaces where patents are silent"); Jeanne C. Fromer, *Dynamic Patent Disclosure*, 69 VAND. L. REV. 1715, 1715-16 (2016) (state of patent disclosure is "impoverished" because disclosure occurs too early in the process of innovation, namely at filing, which is often before refinement, prototyping, market research, etc.); Benjamin N. Roin, *The Disclosure Function of the Patent System (or Lack Thereof)*, 118 Harv. L. Rev. 2007 (2005) (arguing that "patent disclosure fails to convey useful information."); See, e.g., Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81, 105, 111, 119 (advocating that disclosure is irrelevant for self-disclosing inventions and arguing further that these inventions came about because of the patent incentive); Timothy R. Holbrook, *Possession in Patent Law*, 59 SMU L. REV. 123, 133-35 (2006) (advocating that the set of non-self-disclosing inventions is small compared to those that self-disclose and thus the focus of the patent system should be on incentive to innovate, not disclosure); Kristen Osenga, *Cooperative Patent Prosecution: Viewing Patents through a Pragmatic Lens*, 85 ST. JOHNS L. REV. 115, 175 (2011) (advocating ways to make patent disclosure more robust); Janet Freilich, *Against Prophetic Patents* (draft available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3202493](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3202493)) (arguing that disclosures of roadmaps for future research in patents often mislead scientists).

<sup>38</sup> See, e.g., Colleen V. Chien, *Contextualizing Patent Disclosure*, 69 VAND. L. REV. 1849 (2016) (arguing that patent disclosure should be viewed beyond disclosures in the patent document itself, such as licensing and commercialization); Alan J. Devlin, *The Misunderstood Function of Disclosure in Patent Law*, 23 Harv. J.L. & Tech., 401 (2010) (arguing that disclosure is not a primary purpose of the patent system, and should be viewed as a mere "byproduct").

<sup>39</sup> See, e.g., Bhaven Sampat & Heidi Williams, *How Do Patents Affect Follow-on Innovation? Evidence from the Human Genome*, 109 AM. ECON. REV. 203 (2019) (finding that gene patents have no quantitatively significant effect on innovation); Stefano Buruffaldi & Markus Simeth, *Patents and Knowledge Diffusion: the Effect of Early Disclosure*, 2017 ACADEMY OF MANAGEMENT PROCEEDINGS 1 (2017) (questioning whether information disclosed in patents is used as an input in new inventive activities); *but see* Jeffrey L. Furman, Markus Nagler, & Martin Watzinger, *Disclosure and Subsequent Innovation: Evidence from the Patent Depository Library Program* (available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3189955](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3189955)) (arguing that the opening of new patent libraries in the United States boosted local patenting activity, and that the data "suggest that the disclosure of technical information in the patent documents is the mechanism underlying this boost in patenting").

<sup>40</sup> Mark A. Lemley, *Ignoring Patents*, MICH. ST. L. REV. 19, 21 (2008) (popularizing the idea that no one reads patents and third-parties are deliberately ignorant of prior art).

reading patents could give rise to a later finding of willful infringement and triple damages.<sup>41</sup> Lemley asserted that ignoring patents by researchers may be beneficial in that reading patents would delay development of new products.<sup>42</sup> Consistent with the view that researchers ignore patents of others, Cotropia, Lemley, and Sampat found empirical evidence that patent examiners rarely use applicant-submitted art in their rejections to narrow patents, implying that applicant-submitted art was unimportant.<sup>43</sup>

Other scholars debate the view that researchers ignore patents, and counter that some researchers find patent disclosure useful. Lisa Ouellette surveyed researchers in the chemistry and biotechnology fields to investigate whether they read patents.<sup>44</sup> Ouellette found evidence that about three quarters of researchers in these fields read patents, and but even these researchers offered complaints regarding the readability of patents.<sup>45</sup> Some researchers found the patents “vague,” “barely readable,” and “deliberately written in a manner that makes it very hard work to find what you’re looking for.”<sup>46</sup>

In sum, most academic scholars question the effectiveness of the current patent disclosure system. They doubt researchers read patents, and believe that the prior art submitted to the patent office by applicants is of little value.

## II. Study Design

We used the rejection and citation information from the USPTO Office Action Dataset from 2008 to 2017.<sup>47</sup> This dataset identifies rejections in office actions issued for patent applications filed over this time period,<sup>48</sup> as well as all citations in those applications.<sup>49</sup> For each office action, the dataset provides the following: every patent number used in the rejection, who cited it—the applicant or the examiner, and whether it was used in a 102 or 103 rejection.<sup>50</sup>

Starting with this dataset, we obtained citation information on all patents that issued, and applications that published, from January 1, 2000 to July 1, 2017. We choose the start date to narrow the universe of patents to coincide with the beginning of application publication in the United States. We chose the end date to coincide with the last office action in the dataset. We

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<sup>41</sup> *Id.* at 21 (“Companies and lawyers tell engineers not to read patents in starting their research, lest their knowledge of the patent disadvantage the company by making it a willful infringer....”)

<sup>42</sup> *Id.* at 21 (asserting that if researchers read patents, then “both research and the manufacture of products would be regularly delayed for years and perhaps decades as potential defendants identified and cleared rights.”)

<sup>43</sup> Christopher A. Cotropia, Mark A. Lemley, and Bhaven Sampat, *Do Applicant Patent Citations Matter*, 42 RESEARCH POLICY 844 (2013).

<sup>44</sup> Lisa Ouellette, *Who Reads Patents?*, 35 NATURE BIOTECHNOLOGY 421 (2017).

<sup>45</sup> *Id.*

<sup>46</sup> *Id.* at 423.

<sup>47</sup> Qiang Lu, Amanda Myers, & Scott Beliveau, *USPTO Patent Prosecution Research Data: Unlocking Office Action Traits*, working paper available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3024621](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3024621).

<sup>48</sup> *Id.* at 2-3.

<sup>49</sup> *Id.* at 9.

<sup>50</sup> *Id.* at 13.

added to this dataset both patents and published applications that were not cited at all in this dataset. We excluded design and plant patents from the dataset which meant our data included 3,662,741 utility patents<sup>51</sup> and 4,913,874 published utility patent applications.

Once the universe of patents and published applications was defined, we sought to determine which published applications were “truly” abandoned. That is, a particular application that is published may become abandoned, but an application related (claims priority) to that abandoned application may eventually issue. That is, the published application may have a parent or child application that includes a similar disclosure issue as a patent or is still pending at the time of this study.<sup>52</sup> Thus, to define “truly” abandoned applications, the status of both the published application and its parents and children were determined using the Patent Examination Research Dataset<sup>53</sup> and the USPTO PatentsView data.<sup>54</sup> Accordingly, a published application was identified as “truly abandoned” if that application, and its parents and children, were abandoned as of December 1, 2018. Of the 4,913,874 published applications, 558,201 identified as “truly” abandoned. From here forward, this article will refer to these “truly” abandoned as simply abandoned.

Additional information was collected about the patents and published abandoned applications in our data from the Patent Examination Research Dataset, USPTO PatentsView, and published abandoned applications themselves.<sup>55</sup> This additional information included:

- the U.S. Patent Classification
- the small entity status of the patent or application
- the title
- the original assignee
- the number of figure/drawing pages
- the number of independent claims
- the total number of claims, and
- whether the patent or application claimed priority to a foreign patent application.

The Patent Examination Research Dataset did not have independent claim data or number of figure sheet data for all of the patents in our data.<sup>56</sup>

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<sup>51</sup> This included reissued utility patents from 2000 forward.

<sup>52</sup> A continuation is proper as long as it is filed during the pendency of the prior application, even if the prior application is later abandoned. 35 U.S.C. § 120 (requiring a continuation be “filed before the patenting or abandonment of or termination of proceedings on the first application.”)

<sup>53</sup> Graham, Stuart J.H. and Marco, Alan C. and Miller, Richard, *The USPTO Patent Examination Research Dataset: A Window on the Process of Patent Examination* (November 30, 2015) (available at <https://ssrn.com/abstract=2702637>).

<sup>54</sup> USPTO PatentsView, <http://www.patentsview.org/download/>.

<sup>55</sup> The information from the face of the published, but abandoned application was collected from [patents.google.com](https://patents.google.com) because the USPTO’s research datasets did not provide such information.

<sup>56</sup> Specifically, the Dataset is missing the number of independent claims for 754,386 patents and the number of figures sheets for 168,768 patents.

The Patent Examination Research Dataset was also used to collect information about the patent prosecution of the patents and published abandoned applications in our data. The number of office actions—including non-final, final, and advisory actions—was identified as well as the number of times the applicant appealed to the Board or filed a request for continued examination (“RCE”) when prosecuting the patent. The total number of transactions with the USPTO was identified. The number of parents and child non-provisional applications was also determined.<sup>57</sup>

### III. Results

Now we present our empirical findings. We first report summary statistics on abandoned published applications, including a comparison to issued patents during the same time period. We have isolated the published patent applications that were abandoned without any patent rights provided to the applicant. That means that there were no parents, continuations, continuations-in-part, or divisionals granted or pending as of December 1, 2018. To reiterate, we found 558,201 truly abandoned published applications out of the 4,913,874 applications that were published after 2000.<sup>58</sup> Thus, a little over ten percent, 11.35% to be more precise of published applications have gone abandoned during the time period of our study.<sup>59</sup>

#### A. Characteristics of Patents and Abandoned Published Applications

In Table I below, we report the summary statistics on family characteristics and small entity status.<sup>60</sup> We report the means, which are all statistically significant to  $p < 0.001$ .<sup>61</sup> A more detailed reporting of these descriptives, and others set forth below, is in Appendix A.

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<sup>57</sup> If an application claimed priority to a provisional application, we did not count it as a child. We only included priority claims to non-provisional applications.

<sup>58</sup> We truncated our analysis of abandoned and non-abandoned applications as of June 2017, when the USPTO dataset ends.

<sup>59</sup> If a published application and its child both went abandoned, then each would be in our list of published abandoned applications. Similarly, if a published application and its child both issued as patents, then both would be in our list of issued patents.

<sup>60</sup> A small entity is (i) a nonprofit organization; or (ii) a company that does not, together with all affiliates, have 500 or more employees, and that has not assigned, licensed or otherwise conveyed an interest in the invention to a non-small entity. See 37 C.F.R. 1.27 (defining small entity status and noting that small entities are permitted to pay reduced fees to the USPTO).

<sup>61</sup> The result from a t-test.

**Table I: Summary Statistics on Patent Families**

	<b>Abandoned applications</b>	<b>Issued patents</b>
<b># Observations</b>	558201	3662741
<b># Parents</b>	0.083	0.830
<b># Children</b>	0.049	0.544
<b>Small entity</b>	0.321	0.196
<b>Foreign priority</b>	0.493	0.397
<b># Figure sheets</b>	7.793	9.452
<b># Claims</b>	16.854	17.119
<b># Indep. Claims</b>	2.694	2.801
<b># Office actions</b>	2.619	2.098
<b># Rces</b>	0.292	0.316
<b># Prosecution transactions</b>	40.153	60.822
<b># Board appeals</b>	0.089	0.079

Not surprisingly, issued patents have significantly more parent applications and child applications. In fact, there are about ten times more parents and eleven times more children.<sup>62</sup> Applicants may be more willing to invest in continuations when the USPTO has granted some patent rights. In contrast, more abandoned applications claim priority to foreign patent applications (49.3% v. 39.7%). The existence of potential foreign patent rights, and the fact that a foreign application was filed first, may account for the increased willingness to abandon a U.S. application and the lower value of U.S. protection compared to protection in the foreign jurisdiction. For small entity status, abandoned published applications were more likely to be held by small entities (32.1% v. 19.6%). This is consistent with smaller companies having fewer resources to devote to patent prosecution. Fewer resources result in more applications going abandoned.<sup>63</sup>

Table 1 also reports on the number of figure sheets and claims in patents and abandoned published applications. Abandoned applications contained slightly fewer figure sheets<sup>64</sup> at the mean, about eight for abandoned applications to almost ten for issued patents. Fewer figures means a less robust disclosure. The differences in total number of claims and the total number of independent claims are much closer. Issued patents have a slightly higher number of claims, both in total and independent, and the results are statistically significant at the mean. However, the size of the difference is quite small. Thus, in terms of gross claim drafting strategy, the differences between abandoned applications and issued patents is not that profound. To be sure, the number of claims in an issued patent may be different than the prior published application. For instance, the patentee may cancel claims during prosecution once the USPTO signals that other claims are allowable. Or the patentee may add new claims during prosecution. The difference means that the comparison of claims—patents versus published applications—is less insightful.

Table I further reports on summary statistics on various attributes of patent prosecution. Specifically, we tabulate the number of office actions, the number of appeals to the Board, the number of RCEs, and the number of prosecution transactions. This last metric provides the number of documents in the file wrapper of the application.

Abandoned applications had, on average, more office actions than issued patents. In contrast, there are fewer RCEs and prosecution transactions for abandoned applications than for issued patents. In fact, abandoned applications had about 50% fewer prosecution transactions than issued patents. The increased number of prosecution transactions for issued patents can be partially explained by additional papers reflecting payment of the issue fee and issuance of the patent. However, these issuance-related documents do not explain the full difference in prosecution transactions between abandoned applications and issued patents.

## B. Citation and Rejection Uses of Patents and Abandoned Published Applications

Below in Table II, we report basic information about citations and uses in rejections. We report how often each patent and abandoned published application in our data was cited during the prosecution of another application. As previously noted, citations can arise from the applicant, (typically via a Form 1440) citing the patent or published application, or the patent examiner. We report both separately and then a measure of all citations.<sup>65</sup> The means are reported below and all are statistically significant to  $p < 0.001$ . Additional descriptives on citations are reported in Appendix B.

**Table II: Summary Statistics on Basic Citation Characteristics**

	<b>Abandoned applications</b>	<b>Issued patents</b>
<b>All citations</b>	4.209	4.716
<b>Applicant citations</b>	2.682	3.618
<b>Examiner citations</b>	1.597	1.171
<b>102 uses</b>	0.097	0.070
<b>103 uses</b>	0.630	0.309

<sup>62</sup> We wonder why abandoned applications have any children applications. Perhaps they are divisionals. Otherwise, a rational applicant should file an RCE instead of a continuation. Continuations move the applications back to the beginning of the queue for examination.

<sup>63</sup> The average cost of patent prosecution vary by technology and complexity. On average, the fees are between \$7,500 and \$30,000, including USPTO filing fees and attorney time for drafting and prosecution. See Jonathan S. Masur, *Costly Screens and Patent Examination*, 2 J. LEGAL ANALYSIS 687, 699 (2010) (providing estimates of attorney fees for patent prosecution).

<sup>64</sup> A single figure sheet typically includes 1 to 2 figures.

<sup>65</sup> Some patents and published applications are cited by both the applicant and the examiner. Consequently, one cannot merely add the applicant and examiner citation numbers to reach the All Citation numbers.

The citation data provides some interesting information. Issued patents are cited more than abandoned applications, overall. This is due, apparently, in large part because applicants cited to patents much more than abandoned applications. On average, issued patents are cited to 3.6 times, compared to 2.6 times, for applications.

However, the trend switches for examiner citations. Examiners cite to abandoned applications more than issued patents. This is surprising given the conventional wisdom that abandoned applications are not valuable. It raises the question of why examiners are citing to them during the prosecution of other patent applications.

Table II also shows that abandoned applications are used more than issued patents in both anticipation and obviousness rejections by the USPTO. The numbers for obviousness rejections are especially interesting: the USPTO cites to an abandoned application at over twice the rate, on average, that it cites to an issued patent.

To analyze citations in more detail, we performed a series of OLS regressions. Table III below provides the results of our most detailed model for four citation/use metrics—(1) applicant citations, (2) examiner citations, (3) 102 rejection uses, and (4) 103 rejection uses.

**Table III: OLS Regression on Citations and Rejection Uses<sup>66</sup>**

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<sup>66</sup> We use the following notation: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . These models do not include all of the patents in our dataset because of the lack of independent claim data for some patents.



	(1)	(2)	(3)	(4)
	Applicant Citations	Examiner Citations	102 Rejection Uses	103 Rejection Uses
<b>Abandoned</b>	-0.734*** (0.0249)	0.143*** (0.00436)	0.0161*** (0.000653)	0.236*** (0.00190)
<b>Small entity</b>	-0.833*** (0.0206)	0.0298*** (0.00361)	-0.00382*** (0.000540)	-0.00387* (0.00157)
<b>Parent applications</b>	0.212*** (0.00566)	-0.0331*** (0.000992)	-0.00458*** (0.000149)	-0.0199*** (0.000432)
<b>Children applications</b>	0.978*** (0.00426)	0.0932*** (0.000748)	0.00715*** (0.000112)	0.0235*** (0.000326)
<b>Foreign priority</b>	-1.611*** (0.0170)	-0.283*** (0.00298)	-0.0126*** (0.000446)	-0.0987*** (0.00130)
<b># of Office Actions</b>	-0.0800*** (0.00633)	0.00745*** (0.00111)	0.000878*** (0.000166)	0.0120*** (0.000484)
<b># of Appeals</b>	-0.577*** (0.0224)	-0.112*** (0.00393)	-0.00959*** (0.000588)	-0.0262*** (0.00171)
<b># of RCEs</b>	-0.370*** (0.0178)	-0.0574*** (0.00313)	-0.00436*** (0.000468)	-0.0210*** (0.00136)
<b># of Prosecution Transactions</b>	0.0285*** (0.000621)	0.00668*** (0.000109)	0.000300*** (0.0000163)	0.00151*** (0.0000474)
<b># of Claims</b>	0.0925*** (0.000701)	0.0196*** (0.000123)	0.00140*** (0.0000184)	0.00724*** (0.0000535)
<b># of Indep Claims</b>	-0.00154 (0.00403)	0.00856*** (0.000708)	0.000782*** (0.000106)	0.00334*** (0.000308)
<b># of Figure Sheets</b>	0.0387*** (0.000582)	0.0119*** (0.000102)	0.000687*** (0.0000153)	0.00241*** (0.0000445)

<b>Year</b>	$\chi^{***}$	$\chi^{***}$	$\chi^{***}$	$\chi^{***}$
<b>USPC</b>	$\chi^{***}$	$\chi^{***}$	$\chi^{***}$	$\chi^{***}$
<b>_Cons</b>	56.16*** (9.709)	4.296* (1.704)	0.455 (0.255)	3.285*** (0.742)
<b>N</b>	3305012	3305012	3305012	3305012
<b>R-sq</b>	0.121	0.125	0.024	0.080

Our regression results are consistent with the summary statistics. After controlling for the year of the patent, the number of claims, figures, RCEs, small entity status, related applications, and other variables, including technology class (USPC), abandoned applications are negatively correlated with application citations, while positively correlated with examiner citations, and 102 and 103 rejection uses. This result is puzzling if abandoned applications were worthless. Why are examiners citing to them frequently, and why are examiners using them in 102 and 103 rejections more than examiners use issued patents?

To be sure, examiners use published applications as prior art differently than they examine the application itself. When examining the application, the USPTO focuses on the claims, determining whether they meet all of the requirements for patentability. In contrast, when a patent examiner is searching for prior art, she focuses on the disclosure in the specification. The figures and detailed description are important there, not the claims.

### **C. Top 100 Rejection Used Abandoned Published Applications**

In order to get a better understanding as to why an abandoned published application would be used so heavily by examiners, we further examined the top 100 abandoned published applications used by examiners in office action (in 102 and/or 103 rejections). The full list, including the title and original assignee of these top 100, is reproduced in Appendix B. That list includes many older published patent applications, reflecting the fact that older publications may have been used more merely due to their age.

Appendix C lists the top 100 abandoned published applications by relative total citations by year (RCY). RCY is calculated by initially computing the mean of total citations received by all patents and abandoned published applications issued/published in a given calendar year. Then, the total citations received for a specific abandoned published application is divided by the mean generated for the same publication year. This generates the RCY—with an RCY greater than 1 meaning the abandoned published application performed better than the average citations received by other patents and abandoned applications issued/published the same year. And an RCY less than 1 means the abandoned published application performed worse than the mean for the same year. The RCY essentially contextualizing the citations received by a specific abandoned published application within a cohort of patents and abandoned published applications that became available for citation within the same year. Such relative citation metrics are commonly used to normalize citations to allow for more proper comparisons across cited articles.<sup>67</sup>

The discussion below focuses on the top 100 list in Appendix B. The means of application and prosecution characteristics are reproduced below, in Table IV.

**Table IV: Summary Statistics on Patent Families**

	<b>Top 100 Abandoned Applications</b>
<b># Parents</b>	0.19
<b># Children</b>	0.06
<b>Small entity</b>	0.37
<b>Foreign priority</b>	0.29
<b># Figure sheets</b>	14.72
<b># Claims</b>	42.57
<b># Indep claims</b>	5.33
<b># Office actions</b>	3.91
<b># RCEs</b>	0.73
<b># Prosecution transactions</b>	58.96
<b># Board appeals</b>	0.22

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<sup>67</sup> See Purkayastha, A., Palmaro, E., Falk-Krzesinski, H.J. and Baas, J., 2019. *Comparison of two article-level, field-independent citation metrics: Field-Weighted Citation Impact (FWCI) and Relative Citation Ratio (RCR)*. J. OF INFORMETRICS, 13(2), pp.635-642.

All of the means for the top 100 are all higher compared to other abandoned published applications, except foreign priority which is lower. There is more prosecution activity as well as document characteristics (figures sheets, independent claims, and claims). The top 100 also exhibit larger patent families, but lower foreign priority. All of this seems consistent with more rejection uses and thus higher disclosure relevance and value.

Of particular interest are the original assignees that appear multiple times in the top 100. A frequency chart for those original assignees that appear more than once is shown below in Table V. Notably, all of these companies are in the information technology and computer space.

**Table V: Original Assignees in Top 100 Abandoned Published Applications**

	<b># of Abandoned In Top 100</b>	<b>Total 102 Rejection Uses</b>	<b>Total 103 Rejection Uses</b>
<b>Microsoft Corp</b>	9	41	214
<b>Nokia Oyj</b>	5	17	126
<b>Samsung Electronics Co Ltd</b>	4	11	129
<b>Apple Inc</b>	3	13	104
<b>International Business Machines Corp</b>	3	16	66
<b>Kyocera Corp</b>	2	7	41

#### **IV. Implications and Discussion**

Our findings raise significant questions about the conventional wisdom surrounding abandoned applications. If abandoned applications are worthless, then why are they relied upon so heavily by the USPTO in examining other applications? Below we first discuss the implications of our findings about abandoned patent applications for patent law theory. More precisely, our results unveil a new theory of patent disclosure. Next, we critically analyze several potential mechanisms for our findings. We seek to understand why applicants are abandoning seemingly valuable patent applications.

We first turn to policy debates about patent disclosure. As noted in Section I.B, *supra*, legal scholars have questioned the value of the disclosure provided by patents. Scholars have claimed that scientific researchers ignore patents. We find that patent examiners cited to abandoned applications as a significant source of prior art. Importantly, patent examiners utilize abandoned patent applications for rejections on the basis of anticipation and obviousness. The USPTO patrols the boundary between private patent rights and the public domain. When the USPTO grants an applicant broad claims to an invention, others without permission cannot practice the claimed invention. Rejections on the basis of anticipation and obviousness often require narrowing amendments by applicants in order to place the claims in condition for allowance by the USPTO. By requiring that the applicant narrow the claims, the exclusive rights provided are narrower.

This aspect of patent examination – requiring narrowing amendments due to prior art – is very important to the system, and abandoned applications play a critical role. Abandoned applications disclose to patent examiners the most relevant prior art for use in the examination of other applications. The disclosure in abandoned applications is important to the system. Scholars have overlooked this function of patents in general, and of published applications in particular. Abandoned published applications is an extreme example of the value of the disclosure.

[More details to come]

APPENDIX A – Additional Descriptives

	# OFFICE ACTIONS		# RCE		# PROSECUTION TRANSACTIONS	
	<i>Patents</i>	<i>Abandoned</i>	<i>Patents</i>	<i>Abandoned</i>	<i>Patents</i>	<i>Abandoned</i>
<b>MEAN<sup>68</sup></b>	2.098107	2.619132	0.316085	0.291823	60.82153	40.15267
<b>SD</b>	1.9987	2.158267	0.674938	0.642961	27.28485	22.32061
<b>P10</b>	0	1	0	0	33	19
<b>P50</b>	2	2	0	0	56	34
<b>P90</b>	5	6	1	1	95	70
<b>MIN</b>	0	0	0	0	1	5
<b>MAX</b>	37	38	24	14	948	363
<b>N</b>	3662741	558201	3662741	558201	3662741	558201

	# FIGURE SHEETS		# OF CLAIMS		# OF INDEP. CLAIMS	
	<i>Patents</i>	<i>Abandoned</i>	<i>Patents</i>	<i>Abandoned</i>	<i>Patents</i>	<i>Abandoned</i>
<b>MEAN<sup>69</sup></b>	9.45186	2.098107	17.11854	16.85398	2.801017	2.694288
<b>SD</b>	14.7241	1.9987	12.28684	11.37097	2.191957	2.32625
<b>P10</b>	2	0	5	6	1	1
<b>P50</b>	7	2	16	16	2	2
<b>P90</b>	19	5	29	27	5	4
<b>MIN</b>	0	0	1	1	1	1
<b>MAX</b>	8039	37	803	565	248	435
<b>N</b>	3493973	3662741	3662502	558201	2908355	558201

	# PARENTS		# CHILDREN		SMALL ENTITIES	
	<i>Patents</i>	<i>Abandoned</i>	<i>Patents</i>	<i>Abandoned</i>	<i>Patents</i>	<i>Abandoned</i>
<b>MEAN<sup>70</sup></b>	0.830291	0.082967	0.544186	0.049384	2.098107	2.619132
<b>SD</b>	1.597577	0.389939	1.842687	0.34442	1.9987	2.158267
<b>P10</b>	0	0	0	0	0	1
<b>P50</b>	1	0	0	0	2	2
<b>P90</b>	2	0	2	0	5	6
<b>MIN</b>	0	0	0	0	0	0
<b>MAX</b>	400	34	390	43	37	38
<b>N</b>	3662741	558201	3662741	558201	3662741	558201

<sup>69</sup> The differences between means are significant to p<0.001.

<sup>70</sup> The differences between means are significant to p<0.001.

	<b>ALL CITATIONS</b>		<b>APPLICANT CITATIONS</b>		<b>EXAMINER CITATIONS</b>	
	<i>Patents</i>	<i>Abandoned</i>	<i>Patents</i>	<i>Abandoned</i>	<i>Patents</i>	<i>Abandoned</i>
<b>MEAN</b> <sup>71</sup>	4.715795	4.209136	3.617521	2.682408	1.170701	1.59657
<b>SD</b>	14.50487	11.20128	13.57362	9.958701	2.293358	2.771918
<b>P10</b>	0	0	0	0	0	0
<b>P50</b>	1	1	0	0	0	1
<b>P90</b>	11	10	8	6	3	4
<b>MIN</b>	0	0	0	0	0	0
<b>MAX</b>	1559	1457	1545	1448	228	262
<b>N</b>	3662741	558201	3662741	558201	3662741	558201

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<sup>71</sup> The differences between means are significant to  $p < 0.001$ .

APPENDIX B – Top 100 Abandoned Published Applications

<b>Total Citation in Office Actions</b>	<b>Original Assignee</b>	<b>Invention Title</b>	<b>Filing Date</b>	<b># Office Actions During Prosec.</b>	<b>Reason for Abandon</b>
<b>87</b>	Nosa Omoigui	SYSTEM AND METHOD FOR KNOWLEDGE RETRIEVAL, MANAGEMENT, DELIVERY AND PRESENTATION	7-Dec-00	1	Failure Resp. OA
<b>53</b>	Flipt Inc	Mobile dating system incorporating user location information	14-Dec-00	1	Failure Resp. OA
<b>51</b>	General Electric Co	High efficiency inorganic nanorod-enhanced photovoltaic devices	7-Feb-01	5	Aband. After Board Appeal
<b>50</b>	Sharp Corp	Solar cell and method of manufacturing the same	9-Mar-01	1	Failure Resp. OA
<b>49</b>	ActiveSky Inc	OBJECT ORIENTED VIDEO SYSTEM	11-May-01	1	Failure Resp. OA
<b>47</b>	Apple Inc	Touch-sensitive display	29-May-01	6	Aband. After Board Appeal
<b>45</b>	Yann Emmanuel Motte	Methods and apparatus for selection of information and web page generation	21-Nov-01	9	Failure Resp. OA
<b>45</b>	Cone Julian M	Adaptive search engine	19-Feb-02	3	Failure Resp. OA
<b>45</b>	Keiwa Inc	Back sheet for photovoltaic modules and photovoltaic module using the same	28-Jun-02	1	Failure Resp. OA
<b>43</b>	Video Networks IP Holdings Ltd	System and method for identification and insertion of advertising in broadcast programs	23-Jul-02	5	Aband. After Board Appeal
<b>42</b>	Samsung Electronics Co Ltd	ZnO thin film transistor and method of forming the same	7-Aug-02	2	Failure Resp. OA
<b>41</b>	Nokia Oyj	Augmented reality assisted shopping	19-Dec-02	9	Failure Resp. OA
<b>40</b>	Brother Industries Ltd	Tape cassette	29-May-03	8	Failure Resp. OA
<b>40</b>	Jayant Shukla	Application Sandbox to Detect, Remove, and Prevent Malware	13-Aug-03	1	Failure Resp. OA
<b>40</b>	Samsung Electronics Co Ltd	Biochip	3-Sep-03	4	Failure Resp. OA
<b>39</b>	Apple Inc	INTUITIVE, GESTURE-BASED COMMUNICATIONS WITH PHYSICS METAPHORS	10-Sep-03	6	Failure Resp. OA
<b>38</b>	Je-Hsiung Lan	Biometric sensor	24-Oct-03	1	Failure Resp. OA



38	INFOSAFE CORP	Method and apparatus for recognition and real time protection from view of sensitive terms in documents	30-Oct-03	1	Failure Resp. OA
38	National Institute of Agrobiological Sciences	Full-length plant cDNA and uses thereof	5-Nov-03	1	Failure Resp. OA
37	Midwest Research Institute	Bifacial structure for tandem solar cells	7-Nov-03	1	Failure Resp. OA
37	Sense Pad Tech Co Ltd	Capacitive-type touch panel	10-Dec-03	3	Failure Resp. OA
37	National University of Singapore	Marketing platform	8-Dec-03	5	Failure Resp. OA
36	Watanachote Susornpol J.	Methods of interacting with a computer using a finger(s) touch sensing input device with visual feedback	30-Dec-03	7	Failure Resp. OA
36	Microsoft Corp	Methods and systems for planning advertising campaigns	31-Dec-03	1	Failure Resp. OA
35	Silverbrook Research Pty Ltd	Head mounted display with wave front modulator	27-Jan-04	5	Failure Resp. OA
35	YEGHIKTAN DAVIT	Solar cell	13-Feb-04	7	Failure Resp. OA
34	SERGEANT LABORATORIES Inc	Methods and systems for monitoring user, application or device activity	18-Feb-04	3	Failure Resp. OA
34	ASM Japan KK	SEMICONDUCTOR-PROCESSING APPARATUS WITH ROTATING SUSCEPTOR	4-Mar-04	2	Failure Resp. OA
34	International Business Machines Corp	Device, System, and Method of Generating Location-Based Social Networks	16-Mar-04	15	Failure Resp. OA
34	Southern California Edison Co	METHOD OF COMMUNICATING BETWEEN A UTILITY AND ITS CUSTOMER LOCATIONS	13-Apr-04	2	Failure Resp. OA
33	BIODERM Research	Topical Delivery System for Cosmetic and Pharmaceutical Agents	28-May-04	4	Failure Resp. OA
33	Microsoft Corp	Methods and instructions for patch management	31-May-04	6	Failure Resp. OA
32	Emerson Process Management Power and Water Solutions Inc	Wireless power transmission systems and methods	29-Jun-04	1	Failure Resp. OA
32	Monroe David A.	Method and apparatus for collecting, sending, archiving and	22-Nov-04	5	Failure Resp. OA

		retrieving motion video and still images and notification of detected events			
32	Toptrend Global Tech Inc	Dual display apparatus and methodology for broadcast, cable television and IPTV	22-Nov-04	10	Failure Resp. OA
32	Samsung Electronics Co Ltd	OBJECT MANAGEMENT METHOD AND APPARATUS USING TOUCHSCREEN	12-Oct-04	2	Failure Resp. OA
32	Microsoft Corp	GESTURE INPUT	25-Oct-04	7	Failure Resp. OA
31	Apple Inc	Mechanical overlay for touch sensitive devices.	12-Nov-04	3	Failure Resp. OA
31	AU Optronics Corp	Touch Panel Structure	11-Feb-05	4	Failure Resp. OA
31	Tung Wan Cheng	Flexible Multi-touch Screen	10-Mar-05	10	Failure Resp. OA
31	Olympus Corp	Endoscope insertion aiding device	16-Mar-05	2	Failure Resp. OA
30	Ethicon Inc	WOUND DRESSINGS FOR VACUUM THERAPY	12-May-05	2	Failure Resp. OA
30	Pezaris Design Inc	Method and system for controlling access to user information in a social networking environment	30-Jun-05	1	Failure Resp. OA
30	Hansen Scott R	RFID applications	22-Jul-05	5	Failure Resp. OA
29	ATEX Co Ltd	LED lighting system	1-Aug-05	5	Failure Resp. OA
29	Michael Joseph Quinn	System and method for searching, advertising, producing and displaying geographic territory-specific content in inter-operable co-located user-interface components	1-Aug-05	4	Failure Resp. OA
29	Smith Micro Software Inc	Software update for a plurality of mobile devices	8-Sep-05	3	Failure Resp. OA
29	Microsoft Corp	Hyperlink preview utility and method	13-Sep-05	8	Appeal Withdrawn
29	Nokia Oyj	USER INTERFACE, DEVICE AND METHOD FOR A PHYSICALLY FLEXIBLE DEVICE	27-Sep-05	6	Failure Resp. OA
28	HGST Netherlands BV	FLASH DEVICES WITH RAID	11-Oct-05	2	Failure Resp. OA
28	HP Inc	Personal medical database device	28-Nov-05	2	Failure Resp. OA
28	International Design and	COMPUTER BASED SYSTEM AND METHOD FOR PROVIDING	8-Dec-05	2	Failure Resp. OA

	Construction Online Inc	SITUATIONAL AWARENESS FOR BUILT ENVIRONMENTS USING A THREE - DIMENSIONAL VIRTUAL REALM FOR SENSOR DATA FEEDS			
28	Chi-Hsiang Yeh	Method of interference management for interference/collision prevention/avoidance and spatial reuse enhancement	26-Jan-06	3	Failure Resp. OA
28	Selim Shlomo Rakib	Home network for ordering and delivery of video on demand, telephone and other digital services	8-Feb-06	4	Failure Resp. OA
28	Scenera Technologies LLC	Controlling functions of a multifunction device by Orientation	27-Mar-06	3	Failure Resp. OA
28	Microsoft Corp	UNIVERSAL HEALTH DATA COLLECTOR AND ADVISOR FOR PEOPLE	28-Jun-06	12	Failure Resp. OA
28	PBM PRODUCTS LLC	Nutritional supplements	29-Jun-06	5	Failure Resp. OA
28	Roosevelt Fernandes	Power line universal monitor	1-Jun-06	4	Failure Resp. OA
27	Balaji Ramachandran	Method and apparatus for updating firmware and software	7-Aug-06	2	Failure Resp. OA
27	Nokia of America Corp	METHOD AND APPARATUS FOR RECOMMENDING APPLICATIONS TO MOBILE USERS	7-Sep-06	1	Failure Resp. OA
27	Acrosense Tech Co Ltd	Capacitive Touch Panel	29-Jun-06	6	Failure Resp. OA
27	Yoav Shdema	Audio system	13-Sep-06	1	Failure Resp. OA
27	Nokia Oyj	Method and system for controlling access to content	18-Sep-06	2	Failure Resp. OA
27	BlackBerry Ltd	User Interface for Touchscreen Device	19-Sep-06	1	Failure Resp. OA
27	SECRETARY OF STATE ACTING THROUGH ORDINANCE SURVEY	Image streaming	25-Sep-06	5	Aband. After Board Appeal
27	Microsoft Corp	Augmented Reality Cloud Computing	28-Nov-06	4	Failure Resp. OA
26	BP Corporation North America Inc	PROCESS FOR PRODUCING PHOTOVOLTAIC DEVICES	16-Oct-06	4	Failure Resp. OA

26	PROFILUM Inc	System and method for the delivery of targeted data over wireless networks	22-Nov-06	7	Failure Resp. OA
26	Avago Technologies ECBU IP Singapore Pte Ltd	Single Layer Mutual Capacitance Sensing Systems, Device, Components and Methods	13-Dec-06	3	Failure Resp. OA
26	Gabi Harkham	Methods and systems of providing real time on-line casino games	24-Jan-07	2	Aband. After Board Appeal
26	Samsung Electronics Co Ltd	METHOD AND APPARATUS FOR CONFIGURING CONTROL CHANNEL IN OFDM SYSTEM	31-Jan-07	6	Failure Resp. OA
25	Harman International Industries Inc	Adaptive navigation system with artificial intelligence	15-Feb-07	3	Expressly Abandon During Prosec.
25	Robert Knauerhase	Dynamic virtual machine service provider allocation	26-Mar-07	10	Failure Resp. OA
25	Halliburton Energy Services Inc	Method and Apparatus for Exposing a Servicing Apparatus to Multiple Formation Zones	5-Feb-07	2	Failure Resp. OA
25	ATI Technologies ULC	Activity controlled multimedia conferencing	27-Jun-07	5	Failure Resp. OA
25	Mikhael Vitenson	System and method for advertising to telephony end-users	29-Jun-07	3	Failure Resp. OA
25	International Business Machines Corp	System, method, and program for ranking search results using user category weighting	13-Jun-07	4	Failure Resp. OA
25	Cheung Osbert H	Enhanced photovoltaic module	28-Aug-07	3	Failure Resp. OA
25	Mitsubishi Electric Research Laboratories Inc	Hand gesture interaction with touch surface	30-Oct-07	2	Failure Resp. OA
25	Toyota Industries Corp	Organic electroluminescent device with multiple stacked light-emitting layers	12-Nov-07	1	Failure Resp. OA
24	Swisscom Mobile AG	Communication device, system and method	31-Dec-07	6	Failure Resp. OA
24	LG Chem Ltd	SMALL BATTERY PACK EMPLOYING PCM ON SIDE SEALING PART	2-Jan-08	4	Aband. After Board Appeal
24	Kyocera Corp	Solar Cell Module and Manufacturing Process Thereof	14-Jan-08	6	Failure Resp. OA
24	Microsoft Corp	LOCATION BASED NOTIFICATION SERVICES	31-Jan-08	7	Failure Resp. OA
24	Dell Products LP	Configurable Keyboard	27-Feb-08	1	Failure Resp. OA

24	Walker Digital LLC	METHOD AND APPARATUS FOR PROVIDING A COUPON OFFER HAVING A VARIABLE VALUE	16-Jun-08	6	Aband. After Board Appeal
24	Kyocera Corp	Solar cell element and solar cell module	27-Jun-08	9	Failure Resp. OA
24	Motorola Solutions Inc	Microfluidic devices for high gradient magnetic separation	16-May-08	3	Failure Resp. OA
23	Nokia Oyj	Pointing device detection	10-Jul-08	6	164
23	Nokia Oyj	Linking security association to entries in a contact directory of a wireless device	2-Jul-08	2	Failure Resp. OA
23	Microsoft Corp	DYNAMIC MOOD SENSING	6-Jan-09	1	Failure Resp. OA
23	International Business Machines Corp	DETECT AND QUALIFY RELATIONSHIPS BETWEEN PEOPLE AND FIND THE BEST PATH THROUGH THE RESULTING SOCIAL NETWORK	22-Jan-09	2	Failure Resp. OA
23	Sanyo Electric Co Ltd	Manufacturing method of organic electroluminescent display device	1-Apr-09	4	Failure Resp. OA
23	Microsoft Corp	USER COMMUNICATION RESTRICTIONS	18-May-09	1	Failure Resp. OA
23	Boye Dag E	Secure biometric authentication system	7-Oct-09	2	Failure Resp. OA
23	QOS LOGIX Inc	Method of and system for physically distributed, logically shared, and data slice-synchronized shared memory switching	5-Jan-10	2	Failure Resp. OA
23	Vinay Sabharwal	System for automatic, secure and large scale software license management over any computer network	18-Feb-10	1	Failure Resp. OA
23	HORIZON SEMICONDUCTOR S Ltd	Home gateway for multiple units	9-Jun-10	6	Failure Resp. OA
23	Motorola Mobility LLC	Wearable Band with Ease of Adjustment	24-Aug-10	2	Failure Resp. OA
23	Taiwan Semiconductor Manufacturing Co (TSMC) Ltd	Method and system for immersion lithography	7-Jun-12	1	Failure Resp. OA

APPENDIX C – Top 100 Abandoned Published Applications Controlling for Year

Relative Total Citations by Year	Total Citations	Original Assignee	Invention Title	Filing Date	# Office Actions During Prosec.	Reason for Abandon
<b>383.7214</b>	240	Gabriel Jakobson	Method and system for processing and displaying email thread information	1-Jul-13	1	Failure Resp. OA
<b>351.7447</b>	220	Gabriel Jakobson	Method and systems for online advertising to users using fictitious user identities	27-Sep-13	1	Failure Resp. OA
<b>342.1516</b>	214	Empire IP LLC	Advertising content in regions within digital maps	1-Jul-13	2	Failure Resp. OA
<b>262.0856</b>	1339	Sony Corp	THIN FILM TRANSISTOR WITH PROTECTIVE FILM HAVING OXYGEN TRANSMISSION AND DISTURBANCE FILMS AND METHOD OF MANUFACTURING SAME	10-Sep-09	10	Failure Resp. OA
<b>255.8143</b>	160	Gabriel Jakobson	Incorporating advertising content into a digital video	18-Dec-13	1	Failure Resp. OA
<b>235.0294</b>	147	Gabriel Jakobson	Commercial transactions via a wearable computer with a display	18-Nov-13	2	Failure Resp. OA
<b>233.3522</b>	1406	Samsung SDI Co Ltd	Thin film transistor and organic light-emitting display device having the thin film transistor	14-Mar-08	4	Failure Resp. OA

<b>232.1904</b>	1399	Samsung Electronics Co Ltd	THIN FILM TRANSISTOR SUBSTRATE AND METHOD OF MANUFACTURING THE SAME	10-Apr-08	7	Failure Resp. OA
<b>220.6669</b>	37	Applied Materials Inc	FEOL LOW-K SPACERS	3-Jul-14	4	Failure Resp. OA
<b>214.2557</b>	1433	Samsung Electronics Co Ltd	ZnO thin film transistor and method of forming the same	5-Feb-07	2	Failure Resp. OA
<b>212.9101</b>	1424	Canon Inc	Oxide semiconductor thin film transistor and method of manufacturing the same	29-Aug-06	1	Failure Resp. OA
<b>210.0693</b>	1405	Samsung Electronics Co Ltd	METHOD OF FABRICATING ZnO FILM AND THIN FILM TRANSISTOR ADOPTING THE ZnO FILM	19-Jan-07	3	Failure Resp. OA
<b>207.079</b>	1385	Toppan Printing Co Ltd	Structure, transmission type liquid crystal display, reflection type display and manufacturing method thereof	11-Apr-07	11	Failure Resp. OA
<b>172.3849</b>	1457	Panasonic Corp	Thin film transistor array, method of producing the same, and display panel using the same	15-Nov-01	2	Failure Resp. OA
<b>151.5423</b>	1395	Industrial Technology Research Institute	LIQUID CRYSTAL DISPLAY HAVING STRIPE-SHAPED COMMON ELECTRODES FORMED ABOVE	20-Nov-99	3	Failure Resp. OA

			PLATE-SHAPED PIXEL ELECTRODES			
<b>102.1723</b>	522	Nosa Omoigui	SYSTEM AND METHOD FOR KNOWLEDGE RETRIEVAL, MANAGEMENT, DELIVERY AND PRESENTATION	22-Jan- 09	1	Failure Resp. OA
<b>93.78226</b>	744	RightNow Technologie s Inc	Method for providing search- specific web pages in a network computing environment	12-Jul-02	11	Failure Resp. OA
<b>78.34312</b>	49	Energous Corp	PORTABLE TRANSMITTER FOR WIRELESS POWER TRANSMISSION	8-Nov-13	1	Failure Resp. OA
<b>77.53163</b>	13	Gersse LLC	System, apparatus, and method for template-based adaptive review	26-Aug- 14	1	Failure Resp. OA
<b>73.2178</b>	100	Honeywell Internationa l Inc	MULTIMEDIA NEAR TO EYE DISPLAY SYSTEM	3-Dec-12	6	Failure Resp. OA
<b>71.56766</b>	12	Applied Materials Inc	INTEGRATED OXIDE AND SI ETCH FOR 3D CELL CHANNEL MOBILITY IMPROVEMENTS	5-Aug-14	4	Failure Resp. OA
<b>71.02127</b>	97	Nokia Oyj	Provision of an Image Element on a Display Worn by a User	6-Dec-12	6	Failure Resp. OA
<b>68.75009</b>	43	Hand Held Products Inc	SYSTEM AND METHOD FOR INDICIA READING AND VERIFICATION	22-Nov- 13	8	Failure Resp. OA
<b>68.75009</b>	43	Hand Held Products Inc	HIGH DYNAMIC- RANGE INDICIA READING SYSTEM	10-Dec- 13	4	Failure Resp. OA



<b>67.15125</b>	42	Hand Held Products Inc	METHOD FOR MANUFACTURING LASER SCANNERS	7-Aug-13	3	Failure Resp. OA
<b>67.15125</b>	42	eBay Inc	SYSTEMS AND METHODS FOR INCREASING USER ENGAGEMENT BY DETERMINING THE MODE OF TRANSPORT OF THE USERS	2-Aug-13	2	Failure Resp. OA
<b>65.55241</b>	41	GM Global Technology Operations LLC	ELASTICALLY AVERAGED ALIGNMENT SYSTEMS AND METHODS	11-Jul-13	3	Failure Resp. OA
<b>65.55241</b>	41	GN Store Nord AS	AUDIO RENDERING SYSTEM CATEGORISING GEOSPATIAL OBJECTS	15-Aug-14	1	Failure Resp. OA
<b>65.16385</b>	89	Hand Held Products Inc	MOBILE COMPUTER CONFIGURED TO SELECT WIRELESS COMMUNICATION NETWORK	11-Sep-12	2	Failure Resp. OA
<b>64.43167</b>	88	Intermec IP Corp	VOICE-ENABLED DOCUMENTS FOR FACILITATING OPERATIONAL PROCEDURES	11-Oct-12	2	Failure Resp. OA
<b>64.43167</b>	88	Honeywell International Inc	INPUT/OUTPUT CONNECTOR CONTACT CLEANING	2-Aug-12	1	Failure Resp. OA
<b>64.43167</b>	88	Honeywell International Inc	INDICIA READING TERMINAL WITH NON-UNIFORM MAGNIFICATION	29-Jun-12	1	Failure Resp. OA
<b>63.95358</b>	40	Applied Materials Inc	METHOD FOR MATERIAL REMOVAL IN DRY ETCH REACTOR	27-Jan-14	6	Failure Resp. OA

<b>61.48603</b>	196	Nosa Omoigui	SYSTEM AND METHOD FOR KNOWLEDGE RETRIEVAL, MANAGEMENT, DELIVERY AND PRESENTATION	24-Jun-11	1	Failure Resp. OA
<b>60.75589</b>	38	Google LLC	INPUT DETECTION FOR A HEAD MOUNTED DEVICE	22-Nov-11	2	Failure Resp. OA
<b>57.26023</b>	318	DexCom Inc	SYSTEM FOR PROCESSING SIGNALS FROM TWO IN VIVO ANALYTE SENSORS	25-Mar-08	5	Failure Resp. OA
<b>55.64553</b>	76	Adobe Inc	METHODS AND SYSTEMS FOR MANAGING THE PRESENTATION OF WINDOWS ON A DISPLAY DEVICE	9-Sep-11	2	Failure Resp. OA
<b>55.46263</b>	440	International Business Machines Corp	Distributed storage system for data-sharing among client computers running different operating system types	18-Dec-02	2	Failure Resp. OA
<b>54.36054</b>	34	GM Global Technology Operations LLC	ELASTICALLY AVERAGED ALIGNMENT SYSTEMS AND METHODS	19-Sep-13	2	Failure Resp. OA
<b>53.82396</b>	427	International Business Machines Corp	Recovery from failures within data processing systems	11-Sep-03	1	Failure Resp. OA
<b>53.67575</b>	9	Google Technology Holdings LLC	ANTENNA TUNING APPARATUS AND METHOD FOR MAXIMIZING POWER TRANSFER WHILE	29-Jul-14	3	Failure Resp. OA

			CONSTRAINING RETURN LOSS			
<b>51.16286</b>	32	GM Global Technology Operations LLC	ELASTICALLY AVERAGED ALIGNMENT SYSTEMS AND METHODS THEREOF	14-Aug- 13	5	Failure Resp. OA
<b>51.16286</b>	32	Sony Corp	SILENT MODE FOR SUBMERGED DEVICES	27-Jun- 14	2	Failure Resp. OA
<b>51.15489</b>	367	DexCom Inc	Systems and methods for manufacture of an analyte-measuring device including a membrane system	6-Jul-04	4	Failure Resp. OA
<b>50.08769</b>	335	ActiveSky Inc	OBJECT ORIENTED VIDEO SYSTEM	7-Sep-06	1	Failure Resp. OA
<b>49.54756</b>	362	SERGEANT LABORATOR IES Inc	Methods and systems for monitoring user, application or device activity	13-Feb- 04	2	Failure Resp. OA
<b>49.29274</b>	297	Ethicon Endo- Surgery Inc	Surgical stapler end effector with tapered distal end	11-Jan- 07	4	Failure Resp. OA
<b>49.25156</b>	157	Rawllin Internationa l Inc	GENERATING PRODUCT RECOMMENDATION S BASED ON DYNAMIC PRODUCT CONTEXT DATA AND/OR SOCIAL ACTIVITY DATA RELATED TO A PRODUCT	28-Apr- 11	2	Failure Resp. OA
<b>48.31393</b>	410	HP Inc	Method of billing for utilization of a data storage array, and an array controller therefor	28-Jun- 02	0	Expressly Abandone d

<b>48.29693</b>	291	Ethicon Endo-Surgery Inc	Buttress material for use with a surgical stapler	11-Jan-07	5	Failure Resp. OA
<b>48.29693</b>	291	Southern California Edison Co	METHOD OF COMMUNICATING BETWEEN A UTILITY AND ITS CUSTOMER LOCATIONS	24-Jan-07	2	Failure Resp. OA
<b>48.07698</b>	267	Ethicon Endo-Surgery Inc	BUTTRESS MATERIAL WITH ALIGNMENT AND RETENTION FEATURES FOR USE WITH SURGICAL END EFFECTORS	15-Feb-08	5	Failure Resp. OA
<b>47.71177</b>	8	CDTI	Sulfur Resistance of Zero-PGM for Diesel Oxidation Application	29-Oct-14	2	Failure Resp. OA
<b>47.36934</b>	151	Lookout Inc a California Corp	MOBILE WEB PROTECTION	14-Jun-11	5	Failure Resp. OA
<b>46.64545</b>	192	Ethicon Endo-Surgery Inc	SURGICAL STAPLE HAVING AN EXPANDABLE PORTION	20-Apr-11	2	Failure Resp. OA
<b>46.36634</b>	29	GE Medical Systems Global Technology Co LLC	ULTRASONIC DIAGNOSTIC DEVICE AND CONTROL PROGRAM FOR THE SAME	20-Jun-14	2	Failure Resp. OA
<b>46.36634</b>	29	Google LLC	Enhancing Readability on Head-Mounted Display	23-Mar-12	5	Failure Resp. OA
<b>46.09628</b>	256	Ethicon Endo-Surgery Inc	BUTTRESS MATERIAL FOR A SURGICAL STAPLING INSTRUMENT	15-Feb-08	4	Failure Resp. OA
<b>45.4099</b>	232	Ethicon Endo-Surgery Inc	SURGICAL INSTRUMENT WITH APPARATUS FOR MEASURING	18-Sep-08	4	Failure Resp. OA

			ELAPSED TIME BETWEEN ACTIONS			
<b>45.19596</b>	251	Ethicon Endo-Surgery Inc	BUTTRESS MATERIAL HAVING AN ACTIVATABLE ADHESIVE	15-Feb-08	3	Failure Resp. OA
<b>45.0159</b>	250	Ethicon Endo-Surgery Inc	PACKAGING FOR ATTACHING BUTTRESS MATERIAL TO A SURGICAL STAPLING INSTRUMENT	15-Feb-08	4	Failure Resp. OA
<b>44.7675</b>	28	GM Global Technology Operations LLC	ELASTIC AVERAGING SNAP MEMBER ALIGNING AND FASTENING SYSTEM	23-Aug-13	6	Failure Resp. OA
<b>44.55562</b>	298	Ethicon Endo-Surgery Inc	Disposable staple cartridge having an anvil with tissue locator for use with a surgical cutting and fastening instrument and modular end effector system therefor	31-Jan-06	7	Failure Resp. OA
<b>44.29565</b>	246	Ethicon Endo-Surgery Inc	BUTTRESS MATERIAL FOR A SURGICAL INSTRUMENT	15-Feb-08	1	Failure Resp. OA
<b>43.48383</b>	262	Ethicon Endo-Surgery Inc	Pneumatically powered surgical cutting and fastening instrument with actuator at distal end	2-Aug-06	4	Failure Resp. OA
<b>43.39533</b>	241	DexCom Inc	IMPLANTABLE ANALYTE SENSOR	4-Nov-08	3	Failure Resp. OA
<b>43.24422</b>	178	Silverbrook Research Pty Ltd	AUGMENTED REALITY DEVICE FOR PRESENTING VIRTUAL IMAGERY	4-Oct-10	2	Failure Resp. OA

			REGISTERED TO A VIEWED SURFACE			
<b>43.19851</b>	59	Intermec IP Corp	TECHNIQUES FOR STANDARDIZING ANTENNA ARCHITECTURE	9-Jan-13	1	Failure Resp. OA
<b>43.16866</b>	27	GM Global Technology Operations LLC	ELASTIC AVERAGING ALIGNMENT SYSTEM AND METHOD	22-Aug-13	4	Failure Resp. OA
<b>41.7478</b>	7	Clean Diesel Technologies Inc	Cobalt Containing Bimetallic Zero PGM Catalyst for TWC Applications	17-Nov-14	1	Failure Resp. OA
<b>41.7478</b>	7	Clean Diesel Technologies Inc	Sulfur-Resistant Synergized PGM Catalysts for Diesel Oxidation Application	19-Nov-14	1	Failure Resp. OA
<b>41.7478</b>	7	Hand Held Products Inc	AIMER FOR BARCODE SCANNING	31-Mar-15	1	Failure Resp. OA
<b>41.7478</b>	7	Clean Diesel Technologies Inc	Thermally Stable Zero PGM Catalysts System for TWC Application	30-Oct-14	3	Failure Resp. OA
<b>41.7478</b>	7	Clean Diesel Technologies Inc	Synergized PGM Catalyst with Low PGM Loading and High Sulfur Resistance for Diesel Oxidation Application	17-Nov-14	2	Failure Resp. OA
<b>41.72245</b>	93	Echoworx Corp	METHOD AND SYSTEM FOR CREDENTIAL MANAGEMENT AND DATA ENCRYPTION FOR iOS BASED DEVICES	9-Sep-11	2	Failure Resp. OA
<b>41.65817</b>	251	Microsoft Corp	EMPLOYMENT OF OFFLINE BEHAVIOR	29-Jun-06	4	Expressly Abandoned

			TO DISPLAY ONLINE CONTENT			
<b>41.65817</b>	251	Ethicon Endo-Surgery Inc	Cable attachment arrangement for attaching a cable to a surgical instrument	18-Jun-07	4	Failure Resp. OA
<b>41.56982</b>	26	Samsung Electronics Co Ltd	PHOTOGRAPHING APPARATUS AND METHOD OF CONTROLLING THE SAME	11-Feb-14	7	Failure Resp. OA
<b>41.56982</b>	26	Toshiba Lighting and Technology Corp	Luminaire	14-Mar-14	0	Expressly Abandoned
<b>41.56531</b>	278	Ethicon Endo-Surgery Inc	Surgical cutting and fastening instrument with closure trigger locking mechanism	31-Jan-06	7	Failure Resp. OA
<b>41.00197</b>	56	Aslam Ansari	COMPOSITION AND METHODS FOR SITE-SPECIFIC DRUG DELIVERY TO TREAT MALARIA AND OTHER LIVER DISEASES	4-Oct-12	1	Failure Resp. OA
<b>40.82519</b>	91	Metrologic Instruments Inc	CODE SYMBOL READING SYSTEM EMPLOYING DYNAMICALLY-ELONGATED LASER SCANNING BEAMS FOR IMPROVED LEVELS OF PERFORMANCE	15-Aug-11	1	Failure Resp. OA
<b>40.66236</b>	245	DexCom Inc	SILICONE COMPOSITION FOR BIOCOMPATIBLE MEMBRANE	14-Jun-07	3	Failure Resp. OA
<b>40.5187</b>	271	Flipt Inc	Mobile dating system	1-Jun-06	1	Failure Resp. OA

			incorporating user location information			
<b>40.37656</b>	90	Metrologic Instruments Inc	HYBRID-TYPE BIOPTICAL LASER SCANNING AND DIGITAL IMAGING SYSTEM EMPLOYING DIGITAL IMAGER WITH FIELD OF VIEW OVERLAPPING FIELD OF FIELD OF LASER SCANNING SUBSYSTEM	10-Jan-12	3	Failure Resp. OA
<b>39.97099</b>	25	SURVISION	AUTOMATIC CLASSIFICATION SYSTEM FOR MOTOR VEHICLES	24-Mar-15	2	Failure Resp. OA
<b>39.97099</b>	25	Applied Materials Inc	HIGH SELECTIVITY GAS PHASE SILICON NITRIDE REMOVAL	19-Jun-14	2	Failure Resp. OA
<b>39.92793</b>	89	Samsung Electronics Co Ltd	CHIP PACKAGE STRUCTURE AND METHOD OF MANUFACTURING THE SAME	3-Apr-12	4	Failure Resp. OA
<b>39.84044</b>	127	PICTURE HEALING Inc	SYSTEMS AND METHODS FOR ALLOCATING A COMMON RESOURCE BASED ON INDIVIDUAL USER PREFERENCES	18-Feb-11	2	Failure Resp. OA
<b>39.4793</b>	88	BlackBerry Ltd	ELECTRONIC DEVICE AND METHOD FOR CLASSIFICATION OF COMMUNICATION DATA OBJECTS	1-May-12	3	Failure Resp. OA
<b>39.43393</b>	219	Gurvinder Singh	Distribution Of Context Aware Content And Interactable Advertisements	8-Apr-08	2	Failure Resp. OA



<b>39.16225</b>	331	International Business Machines Corp	Coupon delivery via mobile phone based on location	29-Nov-00	3	Expressly Abandoned
<b>39.16225</b>	331	Maxell Holdings Ltd	Electronic coupon system	1-Aug-01	1	Failure Resp. OA
<b>39.02354</b>	261	Ethicon Endo-Surgery Inc	Gearing selector for a powered surgical cutting and fastening instrument	31-Jan-06	4	Failure Resp. OA
<b>38.80544</b>	53	Ford Global Technologies LLC	TRAILER LENGTH ESTIMATION	21-Feb-13	2	Failure Resp. OA
<b>38.58562</b>	123	Microsoft Corp	INTEGRATED VIRTUAL ENVIRONMENT	12-Apr-11	4	Failure Resp. OA
<b>38.58205</b>	86	Pantech Co Ltd	METHOD AND PORTABLE DEVICE FOR CONTROLLING PERMISSION SETTINGS FOR APPLICATION	7-Jun-12	2	Failure Resp. OA
<b>38.57068</b>	326	Technology Patents and Licensing Inc	Location based profiling	14-Feb-01	1	Expressly Abandoned
<b>38.37214</b>	24	GM Global Technology Operations LLC	SERVICEABLE ALIGNING AND SELF-RETAINING ELASTIC ARRANGEMENT FOR MATED COMPONENTS AND METHOD	26-Sep-13	2	Failure Resp. OA
<b>38.37214</b>	24	GM Global Technology Operations LLC	ELASTIC APERTURE ALIGNMENT SYSTEM FOR PROVIDING PRECISE FOUR-WAY ALIGNMENT OF COMPONENTS	2-Oct-13	2	Failure Resp. OA

Relative Total Citations By Year	Total Citations	Original Assignee	Invention Title	Filing Date	# Office Actions During Prosec.	Reason for Abandon
<b>383.7214</b>	240	Gabriel Jakobson	Method and system for processing and displaying email thread information	1-Jul-13	1	Failure Resp. OA
<b>351.7447</b>	220	Gabriel Jakobson	Method and systems for online advertising to users using fictitious user identities	27-Sep-13	1	Failure Resp. OA
<b>342.1516</b>	214	Empire IP LLC	Advertising content in regions within digital maps	1-Jul-13	2	Failure Resp. OA
<b>262.0856</b>	1339	Sony Corp	THIN FILM TRANSISTOR WITH PROTECTIVE FILM HAVING OXYGEN TRANSMISSION AND DISTURBANCE FILMS AND METHOD OF MANUFACTURING SAME	10-Sep-09	10	Failure Resp. OA
<b>255.8143</b>	160	Gabriel Jakobson	Incorporating advertising content into a digital video	18-Dec-13	1	Failure Resp. OA
<b>235.0294</b>	147	Gabriel Jakobson	Commercial transactions via a wearable computer with a display	18-Nov-13	2	Failure Resp. OA
<b>233.3522</b>	1406	Samsung SDI Co Ltd	Thin film transistor and organic light-emitting display device having the thin film transistor	14-Mar-08	4	Failure Resp. OA
<b>232.1904</b>	1399	Samsung Electronics Co Ltd	THIN FILM TRANSISTOR SUBSTRATE AND	10-Apr-08	7	Failure Resp. OA

			METHOD OF MANUFACTURING THE SAME			
<b>220.6669</b>	37	Applied Materials Inc	FEOL LOW-K SPACERS	3-Jul-14	4	Failure Resp. OA
<b>214.2557</b>	1433	Samsung Electronics Co Ltd	ZnO thin film transistor and method of forming the same	5-Feb-07	2	Failure Resp. OA
<b>212.9101</b>	1424	Canon Inc	Oxide semiconductor thin film transistor and method of manufacturing the same	29-Aug-06	1	Failure Resp. OA
<b>210.0693</b>	1405	Samsung Electronics Co Ltd	METHOD OF FABRICATING ZnO FILM AND THIN FILM TRANSISTOR ADOPTING THE ZnO FILM	19-Jan-07	3	Failure Resp. OA
<b>207.079</b>	1385	Toppan Printing Co Ltd	Structure, transmission type liquid crystal display, reflection type display and manufacturing method thereof	11-Apr-07	11	Failure Resp. OA
<b>172.3849</b>	1457	Panasonic Corp	Thin film transistor array, method of producing the same, and display panel using the same	15-Nov-01	2	Failure Resp. OA
<b>151.5423</b>	1395	Industrial Technology Research Institute	LIQUID CRYSTAL DISPLAY HAVING STRIPE-SHAPED COMMON ELECTRODES FORMED ABOVE PLATE-SHAPED PIXEL ELECTRODES	20-Nov-99	3	Failure Resp. OA

<b>102.1723</b>	522	Nosa Omoigui	SYSTEM AND METHOD FOR KNOWLEDGE RETRIEVAL, MANAGEMENT, DELIVERY AND PRESENTATION	22-Jan-09	1	Failure Resp. OA
<b>93.78226</b>	744	RightNow Technologies Inc	Method for providing search-specific web pages in a network computing environment	12-Jul-02	11	Failure Resp. OA
<b>78.34312</b>	49	Energous Corp	PORTABLE TRANSMITTER FOR WIRELESS POWER TRANSMISSION	8-Nov-13	1	Failure Resp. OA
<b>77.53163</b>	13	Gersse LLC	System, apparatus, and method for template-based adaptive review	26-Aug-14	1	Failure Resp. OA
<b>73.2178</b>	100	Honeywell International Inc	MULTIMEDIA NEAR TO EYE DISPLAY SYSTEM	3-Dec-12	6	Failure Resp. OA
<b>71.56766</b>	12	Applied Materials Inc	INTEGRATED OXIDE AND SI ETCH FOR 3D CELL CHANNEL MOBILITY IMPROVEMENTS	5-Aug-14	4	Failure Resp. OA
<b>71.02127</b>	97	Nokia Oyj	Provision of an Image Element on a Display Worn by a User	6-Dec-12	6	Failure Resp. OA
<b>68.75009</b>	43	Hand Held Products Inc	SYSTEM AND METHOD FOR INDICIA READING AND VERIFICATION	22-Nov-13	8	Failure Resp. OA
<b>68.75009</b>	43	Hand Held Products Inc	HIGH DYNAMIC-RANGE INDICIA READING SYSTEM	10-Dec-13	4	Failure Resp. OA
<b>67.15125</b>	42	Hand Held Products Inc	METHOD FOR MANUFACTURING LASER SCANNERS	7-Aug-13	3	Failure Resp. OA

<b>67.15125</b>	42	eBay Inc	SYSTEMS AND METHODS FOR INCREASING USER ENGAGEMENT BY DETERMINING THE MODE OF TRANSPORT OF THE USERS	2-Aug-13	2	Failure Resp. OA
<b>65.55241</b>	41	GM Global Technology Operations LLC	ELASTICALLY AVERAGED ALIGNMENT SYSTEMS AND METHODS	11-Jul-13	3	Failure Resp. OA
<b>65.55241</b>	41	GN Store Nord AS	AUDIO RENDERING SYSTEM CATEGORISING GEOSPATIAL OBJECTS	15-Aug-14	1	Failure Resp. OA
<b>65.16385</b>	89	Hand Held Products Inc	MOBILE COMPUTER CONFIGURED TO SELECT WIRELESS COMMUNICATION NETWORK	11-Sep-12	2	Failure Resp. OA
<b>64.43167</b>	88	Intermec IP Corp	VOICE-ENABLED DOCUMENTS FOR FACILITATING OPERATIONAL PROCEDURES	11-Oct-12	2	Failure Resp. OA
<b>64.43167</b>	88	Honeywell International Inc	INPUT/OUTPUT CONNECTOR CONTACT CLEANING	2-Aug-12	1	Failure Resp. OA
<b>64.43167</b>	88	Honeywell International Inc	INDICIA READING TERMINAL WITH NON-UNIFORM MAGNIFICATION	29-Jun-12	1	Failure Resp. OA
<b>63.95358</b>	40	Applied Materials Inc	METHOD FOR MATERIAL REMOVAL IN DRY ETCH REACTOR	27-Jan-14	6	Failure Resp. OA
<b>61.48603</b>	196	Nosa Omoigui	SYSTEM AND METHOD FOR KNOWLEDGE RETRIEVAL,	24-Jun-11	1	Failure Resp. OA

			MANAGEMENT, DELIVERY AND PRESENTATION			
<b>60.75589</b>	38	Google LLC	INPUT DETECTION FOR A HEAD MOUNTED DEVICE	22-Nov- 11	2	Failure Resp. OA
<b>57.26023</b>	318	DexCom Inc	SYSTEM FOR PROCESSING SIGNALS FROM TWO IN VIVO ANALYTE SENSORS	25-Mar- 08	5	Failure Resp. OA
<b>55.64553</b>	76	Adobe Inc	METHODS AND SYSTEMS FOR MANAGING THE PRESENTATION OF WINDOWS ON A DISPLAY DEVICE	9-Sep-11	2	Failure Resp. OA
<b>55.46263</b>	440	Internationa l Business Machines Corp	Distributed storage system for data- sharing among client computers running different operating system types	18-Dec- 02	2	Failure Resp. OA
<b>54.36054</b>	34	GM Global Technology Operations LLC	ELASTICALLY AVERAGED ALIGNMENT SYSTEMS AND METHODS	19-Sep- 13	2	Failure Resp. OA
<b>53.82396</b>	427	Internationa l Business Machines Corp	Recovery from failures within data processing systems	11-Sep- 03	1	Failure Resp. OA
<b>53.67575</b>	9	Google Technology Holdings LLC	ANTENNA TUNING APPARATUS AND METHOD FOR MAXIMIZING POWER TRANSFER WHILE CONSTRAINING RETURN LOSS	29-Jul-14	3	Failure Resp. OA
<b>51.16286</b>	32	GM Global Technology	ELASTICALLY AVERAGED ALIGNMENT	14-Aug- 13	5	Failure Resp. OA

		Operations LLC	SYSTEMS AND METHODS THEREOF			
<b>51.16286</b>	32	Sony Corp	SILENT MODE FOR SUBMERGED DEVICES	27-Jun-14	2	Failure Resp. OA
<b>51.15489</b>	367	DexCom Inc	Systems and methods for manufacture of an analyte-measuring device including a membrane system	6-Jul-04	4	Failure Resp. OA
<b>50.08769</b>	335	ActiveSky Inc	OBJECT ORIENTED VIDEO SYSTEM	7-Sep-06	1	Failure Resp. OA
<b>49.54756</b>	362	SERGEANT LABORATOR IES Inc	Methods and systems for monitoring user, application or device activity	13-Feb-04	2	Failure Resp. OA
<b>49.29274</b>	297	Ethicon Endo-Surgery Inc	Surgical stapler end effector with tapered distal end	11-Jan-07	4	Failure Resp. OA
<b>49.25156</b>	157	Rawlin International Inc	GENERATING PRODUCT RECOMMENDATIONS BASED ON DYNAMIC PRODUCT CONTEXT DATA AND/OR SOCIAL ACTIVITY DATA RELATED TO A PRODUCT	28-Apr-11	2	Failure Resp. OA
<b>48.31393</b>	410	HP Inc	Method of billing for utilization of a data storage array, and an array controller therefor	28-Jun-02	0	Expressly Abandoned
<b>48.29693</b>	291	Ethicon Endo-Surgery Inc	Buttress material for use with a surgical stapler	11-Jan-07	5	Failure Resp. OA
<b>48.29693</b>	291	Southern California Edison Co	METHOD OF COMMUNICATING BETWEEN A UTILITY	24-Jan-07	2	Failure Resp. OA

			AND ITS CUSTOMER LOCATIONS			
<b>48.07698</b>	267	Ethicon Endo-Surgery Inc	BUTTRESS MATERIAL WITH ALIGNMENT AND RETENTION FEATURES FOR USE WITH SURGICAL END EFFECTORS	15-Feb-08	5	Failure Resp. OA
<b>47.71177</b>	8	CDTI	Sulfur Resistance of Zero-PGM for Diesel Oxidation Application	29-Oct-14	2	Failure Resp. OA
<b>47.36934</b>	151	Lookout Inc a California Corp	MOBILE WEB PROTECTION	14-Jun-11	5	Failure Resp. OA
<b>46.64545</b>	192	Ethicon Endo-Surgery Inc	SURGICAL STAPLE HAVING AN EXPANDABLE PORTION	20-Apr-11	2	Failure Resp. OA
<b>46.36634</b>	29	GE Medical Systems Global Technology Co LLC	ULTRASONIC DIAGNOSTIC DEVICE AND CONTROL PROGRAM FOR THE SAME	20-Jun-14	2	Failure Resp. OA
<b>46.36634</b>	29	Google LLC	Enhancing Readability on Head-Mounted Display	23-Mar-12	5	Failure Resp. OA
<b>46.09628</b>	256	Ethicon Endo-Surgery Inc	BUTTRESS MATERIAL FOR A SURGICAL STAPLING INSTRUMENT	15-Feb-08	4	Failure Resp. OA
<b>45.4099</b>	232	Ethicon Endo-Surgery Inc	SURGICAL INSTRUMENT WITH APPARATUS FOR MEASURING ELAPSED TIME BETWEEN ACTIONS	18-Sep-08	4	Failure Resp. OA
<b>45.19596</b>	251	Ethicon Endo-Surgery Inc	BUTTRESS MATERIAL HAVING AN ACTIVATABLE ADHESIVE	15-Feb-08	3	Failure Resp. OA



<b>45.0159</b>	250	Ethicon Endo-Surgery Inc	PACKAGING FOR ATTACHING BUTTRESS MATERIAL TO A SURGICAL STAPLING INSTRUMENT	15-Feb-08	4	Failure Resp. OA
<b>44.7675</b>	28	GM Global Technology Operations LLC	ELASTIC AVERAGING SNAP MEMBER ALIGNING AND FASTENING SYSTEM	23-Aug-13	6	Failure Resp. OA
<b>44.55562</b>	298	Ethicon Endo-Surgery Inc	Disposable staple cartridge having an anvil with tissue locator for use with a surgical cutting and fastening instrument and modular end effector system therefor	31-Jan-06	7	Failure Resp. OA
<b>44.29565</b>	246	Ethicon Endo-Surgery Inc	BUTTRESS MATERIAL FOR A SURGICAL INSTRUMENT	15-Feb-08	1	Failure Resp. OA
<b>43.48383</b>	262	Ethicon Endo-Surgery Inc	Pneumatically powered surgical cutting and fastening instrument with actuator at distal end	2-Aug-06	4	Failure Resp. OA
<b>43.39533</b>	241	DexCom Inc	IMPLANTABLE ANALYTE SENSOR	4-Nov-08	3	Failure Resp. OA
<b>43.24422</b>	178	Silverbrook Research Pty Ltd	AUGMENTED REALITY DEVICE FOR PRESENTING VIRTUAL IMAGERY REGISTERED TO A VIEWED SURFACE	4-Oct-10	2	Failure Resp. OA
<b>43.19851</b>	59	Intermec IP Corp	TECHNIQUES FOR STANDARDIZING ANTENNA ARCHITECTURE	9-Jan-13	1	Failure Resp. OA

<b>43.16866</b>	27	GM Global Technology Operations LLC	ELASTIC AVERAGING ALIGNMENT SYSTEM AND METHOD	22-Aug-13	4	Failure Resp. OA
<b>41.7478</b>	7	Clean Diesel Technologies Inc	Cobalt Containing Bimetallic Zero PGM Catalyst for TWC Applications	17-Nov-14	1	Failure Resp. OA
<b>41.7478</b>	7	Clean Diesel Technologies Inc	Sulfur-Resistant Synergized PGM Catalysts for Diesel Oxidation Application	19-Nov-14	1	Failure Resp. OA
<b>41.7478</b>	7	Hand Held Products Inc	AIMER FOR BARCODE SCANNING	31-Mar-15	1	Failure Resp. OA
<b>41.7478</b>	7	Clean Diesel Technologies Inc	Thermally Stable Zero PGM Catalysts System for TWC Application	30-Oct-14	3	Failure Resp. OA
<b>41.7478</b>	7	Clean Diesel Technologies Inc	Synergized PGM Catalyst with Low PGM Loading and High Sulfur Resistance for Diesel Oxidation Application	17-Nov-14	2	Failure Resp. OA
<b>41.72245</b>	93	Echoworx Corp	METHOD AND SYSTEM FOR CREDENTIAL MANAGEMENT AND DATA ENCRYPTION FOR iOS BASED DEVICES	9-Sep-11	2	Failure Resp. OA
<b>41.65817</b>	251	Microsoft Corp	EMPLOYMENT OF OFFLINE BEHAVIOR TO DISPLAY ONLINE CONTENT	29-Jun-06	4	Expressly Abandoned
<b>41.65817</b>	251	Ethicon Endo-Surgery Inc	Cable attachment arrangement for attaching a cable to a surgical instrument	18-Jun-07	4	Failure Resp. OA

<b>41.56982</b>	26	Samsung Electronics Co Ltd	PHOTOGRAPHING APPARATUS AND METHOD OF CONTROLLING THE SAME	11-Feb-14	7	Failure Resp. OA
<b>41.56982</b>	26	Toshiba Lighting and Technology Corp	Luminaire	14-Mar-14	0	Expressly Abandoned
<b>41.56531</b>	278	Ethicon Endo-Surgery Inc	Surgical cutting and fastening instrument with closure trigger locking mechanism	31-Jan-06	7	Failure Resp. OA
<b>41.00197</b>	56	Aslam Ansari	COMPOSITION AND METHODS FOR SITE-SPECIFIC DRUG DELIVERY TO TREAT MALARIA AND OTHER LIVER DISEASES	4-Oct-12	1	Failure Resp. OA
<b>40.82519</b>	91	Metrologic Instruments Inc	CODE SYMBOL READING SYSTEM EMPLOYING DYNAMICALLY-ELONGATED LASER SCANNING BEAMS FOR IMPROVED LEVELS OF PERFORMANCE	15-Aug-11	1	Failure Resp. OA
<b>40.66236</b>	245	DexCom Inc	SILICONE COMPOSITION FOR BIOCOMPATIBLE MEMBRANE	14-Jun-07	3	Failure Resp. OA
<b>40.5187</b>	271	Flipt Inc	Mobile dating system incorporating user location information	1-Jun-06	1	Failure Resp. OA
<b>40.37656</b>	90	Metrologic Instruments Inc	HYBRID-TYPE BIOOPTICAL LASER SCANNING AND DIGITAL IMAGING SYSTEM EMPLOYING	10-Jan-12	3	Failure Resp. OA

			DIGITAL IMAGER WITH FIELD OF VIEW OVERLAPPING FIELD OF FIELD OF LASER SCANNING SUBSYSTEM			
<b>39.97099</b>	25	SURVISION	AUTOMATIC CLASSIFICATION SYSTEM FOR MOTOR VEHICLES	24-Mar-15	2	Failure Resp. OA
<b>39.97099</b>	25	Applied Materials Inc	HIGH SELECTIVITY GAS PHASE SILICON NITRIDE REMOVAL	19-Jun-14	2	Failure Resp. OA
<b>39.92793</b>	89	Samsung Electronics Co Ltd	CHIP PACKAGE STRUCTURE AND METHOD OF MANUFACTURING THE SAME	3-Apr-12	4	Failure Resp. OA
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<b>39.16225</b>	331	Maxell Holdings Ltd	Electronic coupon system	1-Aug-01	1	Failure Resp. OA

<b>39.02354</b>	261	Ethicon Endo-Surgery Inc	Gearing selector for a powered surgical cutting and fastening instrument	31-Jan-06	4	Failure Resp. OA
<b>38.80544</b>	53	Ford Global Technologies LLC	TRAILER LENGTH ESTIMATION	21-Feb-13	2	Failure Resp. OA
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<b>38.37214</b>	24	GM Global Technology Operations LLC	SERVICEABLE ALIGNING AND SELF-RETAINING ELASTIC ARRANGEMENT FOR MATED COMPONENTS AND METHOD	26-Sep-13	2	Failure Resp. OA
<b>38.37214</b>	24	GM Global Technology Operations LLC	ELASTIC APERTURE ALIGNMENT SYSTEM FOR PROVIDING PRECISE FOUR-WAY ALIGNMENT OF COMPONENTS	2-Oct-13	2	Failure Resp. OA