

The Social, Textual Lives of Patents

The Phillips Screw and Driver

Grant Leyton Simpson

Introduction

THERE IS A GOOD CHANCE, GIVEN THAT *TEXTUAL CULTURES* transitioned away from print in 2013 (O'SULLIVAN 2013), that you are reading this on a device that is held together by one or more screws. It is less likely that those fasteners were active objects of your cognitive faculties, at least until prompted by this article's title. Even when directly engaging with a screw and driver, we tend to do so in a manner in which they are, to use Heideggerian terminology, ready-to-hand (*zuhanden*) rather than present-at-hand (*vorhanden*). They are just there, waiting with potential utility. Most of us do not dwell on the fact that they have not always been there nor that they directly affect the affordances of particular devices.

Devices with commonly available fasteners afford opening, i.e. the potential for opening exists, even if it is never exploited.¹ Screws, though small and seemingly inconsequential, are gatekeepers to the concrete internals of our technology. They inhabit our furniture, toys, electronics, and sometimes our bodies (see figure 1). As such, they contribute to how we relate to objects in the modern world, whether those objects are high tech or low tech, human or inanimate. They are commonplace inventions. Yet commonplace inventions have historical and social footprints that, due to the market protections afforded by patent grants, intersect in complex ways with networks of patents, inventors, users, and numer-

1. If you chose to read this article on paper by, say, printing it out, you chose the particular experiences that paper affords; just as glass affords looking through and breaking (NORMAN 2013), paper affords annotation, curling, shuffling, and dog-earring, among other things.

Figure 1. An ankle held together by several screws. Detail of a photograph by Flickr user ceonyc. Used according to a Creative Commons CC-BY-SA license.



ous associated others. Patent texts stipulate how objects like these, i.e. objects in the world should be instantiated—that is, they establish an ideal type to which the tokens that proliferate should conform. They are also instruments of power, as a patent for a mass-producible item is both a pattern for proliferation and a monopoly on production. When such power is mobilized, the results are never merely technical but are always also social and frequently textual.²

After all, small objects such as these often have an outsized effect on our lives. When Apple Inc., recently the world’s largest company by market capitalization, changed to an obscure pentalobe screw in its devices, the devices ceased affording opening (WIENS 2011). The intent was clear: *consumers are not meant to open these devices*. Puns using the verb “to screw” abounded. The approach was predicated upon scarcity, as Apple “chose this fastener specifically because it was new, guaranteeing repair tools would be both rare and expensive” (WIENS 2011). The pentalobe screw stands in the way of our relating to a particular piece of technology in a particular way; one must subvert it in order to exploit the affordance of opening. Until

2. The model for power used herein, in which power is exercised by means of a series of associations between human and non-human agents, comes from Latour (1986).

then, the pentalobe screw not only fastens, it seals. The Phillips screw, on the other hand, is ubiquitous. Drivers are easily obtained, even for very small heads. The screws can be installed, removed, or replaced. But this fact is historically contingent, much like the scarcity of pentalobe drivers in 2011. Though Apple did not patent the pentalobe screw and driver, Henry Phillips filed for numerous patents for his particular cruciform fastener and its corresponding driver. Until the patents expired, anyone legally manufacturing Phillips screws or drivers would have had to license the technology.

The present work attempts two things. First, it explores the nature of patent textuality. In doing so, it construes patents as collaboratively created social actors whose legal and cultural authority are effected by performative speech acts. As a social actor, a patent—and the invention that corresponds to it—is the subject of interpretation by lawyers, inventors, implementers, and users. The second goal of this article engages such interpretation in the context of the Phillips screw and driver patents. In exploring said patents and the tools' reception in the popular culture by users and handypersons, I take up two challenges put forth by D.F. McKenzie: to account for the textuality of new forms and to account for the social aspects of texts.

Patent Basics

Patents in the United States fall broadly into three categories: utility, design, and plant. A design patent covers “the design embodied in or applied to an article of manufacture (or portion thereof)”, while a utility patent covers the function of the article (UNITED STATES PATENT AND TRADEMARK OFFICE 2014, §1502). A plant patent covers the rights to exploit the creation of an asexually reproducing plant. The present work focuses solely on utility patents.

“Patent” can signify different things, depending upon context. It may refer to the grant to exploit an invention, the certificate on which that grant is written, or the text of that document. It may also refer to the invention itself. For example, bibliometric study of patents uses patents “as a proxy for inventions” (BENSON AND MAGEE 2015, 1971). The grant is treated as intellectual property (IP) similar to trademarks and copyrights.³ In addition to the obvious possibility of commercializing an invention, there are also markets for trading in patent grants (i.e., the IP) and, to a lesser extent,

3. See Lemley (2012, 80 n. 22) for a thorough bibliography of patents as property.

the certificates.⁴ Thus one may own the IP, the certificate granting it, or an instance of the invention. In the U.S., with few exceptions, one may not own the copyright to the contents of the patent, as “the text and drawings of a patent are typically not subject to copyright” (United States Patent and Trademark Office n.d.).⁵ This is due to the need for the content of the patent to be complicit in the patent bargain (discussed below), i.e. the inventor receives a time-limited, exclusive right to reap the economic benefits and prestige conveyed by the patent in exchange for committing a permanent textual and visual record of the invention.

If an invention fulfills certain conditions, the invention is considered patentable.⁶ That is, patentability conditions are individually necessary and collectively sufficient for determining whether a patent should be granted. Current patentability conditions are defined in 35 U.S.C. §§100–112. An invention must be “a new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof” (§101), novel (§102), nonobvious (§103), and enableable (§112). The requirement of enablement, as Seymore notes,

compels a patent applicant to enable a person having ordinary skill in the art (PHOSITA) to make and use the full scope of the claimed invention without undue experimentation. Enablement, therefore, places an outer limit on the scope of the claims. (SEYMORE 2008, 130)

In addition to its limiting role, enablement makes sure that the patent specification remains useful to the public once the patent falls into the public domain. However, as Ganguli and Blackman note, “It should be appreciated that a patent document is not necessarily (most often not) equivalent to ‘technology know-how’” (1995, 249).⁷

4. Collecting patent certificates is a pursuit similar to scripophily, the collection of stock and bond certificates *as certificates*. In both cases, the owner owns the physical document and usually not the property to which the document refers.
5. “Typically” refers to the fact that patents may include portions of text or drawings that are already copyrighted. In this case, the patent may include a copyright notice but this does not preclude reproduction of the patent grant (UNITED STATES PATENT AND TRADEMARK OFFICE 2014, §1.71).
6. For a discussion of how patents in the Anglo-American tradition became rights, see Bracha (2004).
7. The requirement that an invention not be “obvious at the time the invention was made” to a PHOSITA is a relatively new condition, having been added when the patent laws were extensively revised in 1952 (35 USC §103 1952, p.

The Patent Bargain

The modern utility patent grant is a monopoly on the exploitation of an invention. This monopoly is subject to temporal and geopolitical boundaries. Even within just the Anglo-American patent tradition, the rights, obligations, and privileges granted by the monopoly, the process for acquiring one, and the conditions for granting it have varied over time. Nevertheless, some features have remained fairly consistent, namely that an inventor or his or her agent supplies a petition that a sovereign government—often consisting of numerous state actors and sometimes, as is the case in the United Kingdom, an actual sovereign or his or her representatives—acts upon in producing an official state document that grants the monopoly. This monopoly is a right from the patent holder’s point of view but “a form of regulation” to those who would otherwise “practic[e] the invention” (BURSTEIN 2015, 510).

In the United States, the authority to legislate on matters pertaining to patents, trademarks, and copyright derives from the Constitution, wherein Congress is given the power to “promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries” (1 CONST. §8). The promotion of “Progress” is twofold: The inventor receives the limited monopoly in exchange for exposing information about the invention in a manner that enables study of it, improvement upon it, and, once the patent expires, exploitation of it without licensing it from the inventor. This is commonly known as the patent bargain. Pottage (2006) characterizes the bargain in terms of private knowledge becoming public:

“knowledge” exists in two registers: the register of “public” science, which is conserved by restricting patents to applications of science—to inventions rather than discoveries—and the register of specific “private” inflections of science. Patents make that difference in a somewhat complicated way. As knowledge, even these private inflections become public because the knowledge that goes into the making of a patented

5232). The concept of obviousness, however, was already playing a factor in the patent process. In the reviser’s comment to 35 USC §103, he or she remarks that “the refusal of patents by the Patent Office, and the holding of patents invalid by the courts, on the ground of lack of invention or lack of patentable novelty has been followed since at least 1850”. Nevertheless, it would have not been a legally mandated requirement when the Phillips patents were under consideration.

artefact is disclosed in the patent text. So although according to the classic formulation of the “bargain” no one could use that recipe to manufacture the artefact, they could use it in basic scientific research. The application is protected, but (at least in theory) the knowledge remains available for basic research or even for the development of new proprietary inventions (88).

Another way of putting this is that, “Disclosure . . . is not conceptualized as a cost of doing business but as the information necessary to ensure protection” (BIAGIOLI 2006, 1131). The requirement that a PHOSITA be able to understand and act upon the information presented in the patent enables the transfer of information between social actors. The USPTO’s *Manual of Patent Examination Procedure* (MPEP) explains the role of the disclosure in the patent bargain succinctly: “The requirement for an adequate disclosure ensures that the public receives something in return for the exclusionary rights that are granted to the inventor by a patent” (§608).

The availability of patent information is sometimes construed as a moral obligation to society. Austin (1936, 943), for example, holds that, “The patent law condemns secret uses such as the Chamberlen family resorted to in keeping the knowledge of forceps from the public for many generations, thereby depriving humanity of the general use of an instrument valuable in saving the lives of women and children at childbirth”.⁸ Moral imperative or not, the sharing of information often benefits the public more than it does the inventor or his or her firm (TEECE 1986) and thus patents provide “public welfare effects” (KITCH 1977, 275).

Through the legal mechanism of the bargain, invention information is automatically available as a medium by means of which technoscientific networks can be connected or connections discovered; participants in this network who have no direct connection to one another may be indirectly connected through one participant’s use of another’s patent specification in

8. William Chamberlen had two sons named Peter, the elder of which is thought to be the inventor of the forceps (RUSSELL 2014). As Moore (2007, 698) argues, “Paradoxically, the successive Chamberlens thereby saved countless lives of mothers and babies when called by female midwives to problematic births, yet condemned many more to excruciating deaths by refusing to share their invention”. In an ironic turn, Peter Chamberlen, a physician and son of the younger Peter (hence William’s grandson), petitioned Parliament to build public baths as a defense against the plague, arguing “that the longer they are deferr’d, the more lives must perish; the sooner they are made, the more lives may be saved” (CHAMBERLEN 1649).

the course of basic or applied research. As Rockett (2010, 354) notes, “both the enabling disclosure in the patent and the act of patenting per se carry information”.

Ganguli and Blackman argue that “patents form the single most comprehensive technical resource in the world” (GANGULI AND BLACKMAN 1995, 247). Researchers from the academic, legal, and business spheres engage with this resource in different ways and for different purposes. Executives, inventors, and lawyers use patent claims as indications of prior art and as a means to mitigating legal risk. Searches of patent databases can also help in “generat[ing] ideas for RD”, “find[ing] products”, and finding “solutions to problems” (GANGULI AND BLACKMAN 1995, 247). Patents also provide textual evidence for legal scholarship. Examples of this include investigations into the geographical extent of patents (WINSTON 2015), patent litigation reform (GUGLIUZZA 2015), citing prior art (RICHARDSON 2015), patent quality (CASS 2015), experimenting with patent policy (OUELLETTE 2015), and the relationship between patents and antitrust (HOVENKAMP 2015).⁹

Patent Grant Textuality and the Patent as Performance

Ganguli and Blackman note that “documentation in a patent is necessarily well structured”, a structure that consists of a title page, text, and claims (GANGULI AND BLACKMAN 1995, 247). This facilitates what Geof Bowker has called the “internalist and Whig accounts of the development of the process or apparatus that they describe” (1992, 53). The contents of the U.S. patent are stipulated by 35 U.S.C. §154(a)(1) which requires that:

9. Due to their status as records of technoscientific activity and information, scholars of science and technology have frequently studied patents. Historians of science and technology have investigated the role of patents in various historical, geopolitical, and disciplinary contexts; examples include Baldini et al. (2014), Gabriel (2014), MacLeod (2012), de Chadarevian (2011), Miller (2011), and Yi (2011). Recent scientometric work on patents includes discerning patent value (Yang et al. 2015), identifying gender disparity (Sugimoto et al. 2015), mapping geographical sources of invention (Leydesdorff et al. 2015), predicting “potential evolutionary pathways” (Zhou et al. 2014, 705) or “potential opportunities” (Ma and Porter 2015) for a given technology, analyzing the relationship between patent classification diversity and technology life-cycles (Leydesdorff 2015), producing methods to assist in setting priorities for venture capital firms (Motta et al. 2015), and analyzing patent families (Nakamura et al. 2015).

Every patent shall contain a short title of the invention and a grant to the patentee, his heirs or assigns, of the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States or importing the invention into the United States, and, if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States, or importing into the United States, products made by that process, referring to the specification for the particulars thereof.

Furthermore, 35 U.S.C. §154(a)(4) stipulates that, “A copy of the specification and drawing shall be annexed to the patent and be a part of such patent”.

The specification is “a written description of the invention and of the manner and process of making and using the same”. MPEP (§608.01) states that “The specification must include a written description of the invention or discovery and of the manner and process of making and using the same” and it “must set forth the precise invention for which a patent is solicited, in such manner as to distinguish it from other inventions and from what is old”. Furthermore:

It must describe completely a specific embodiment of the process, machine, manufacture, composition of matter or improvement invented, and must explain the mode of operation or principle whenever applicable. The best mode contemplated by the inventor of carrying out his invention must be set forth . . . In the case of an improvement, the specification must particularly point out the part or parts of the process, machine, manufacture, or composition of matter to which the improvement relates, and the description should be confined to the specific improvement and to such parts as necessarily cooperate with it or as may be necessary to a complete understanding or description of it.

What we now call a patent is one form of the letter patent. Letters patent are records of the exercise of sovereign authority. Blackstone explains the etymology thus:

The *king's grants* are also matter of public record. . . . These grants, whether of lands, honours, liberties, franchises, or aught besides, are contained in charters, or letters-*patent*, that is, open letters, *literæ patentēs*: so called because they are not sealed up, but exposed to open view, with the great seal pendant at the bottom; and are usually directed or

addressed by the king to all his subjects at large. And therein they differ from certain other letters of the king, sealed also with his great seal, but directed to particular persons, and for particular purposes: which therefore, not being proper for public inspection, are closed up and sealed on the outside, and are thereupon called writs *close*, *literæ clausæ*, and are recorded in the *close-rolls*, in the same manner as the others are in the *patent-rolls*. (BLACKSTONE 1753, 1:346)

As Bracha notes, “A patent was a creature of royal prerogative. It was based on case-specific policy decisions of the monarch to confer particular privileges on a certain individual in order to promote some economic, social, or political goal” (2004, 185). The terms of each patent for an invention, including the privileges conferred, the obligations on the patent holder, and the term for which the patent applied varied accordingly (BRACHA 2004).¹⁰

Letters patent are still issued for more than just inventions. Figure 2 shows the letter patent that commissioned Sonia Sotomayor as Associate Justice of the Supreme Court. Note specifically the formula, “In testimony whereof, I have caused these letters to be made patent and the Seal of the Department of Justice to be hereunto affixed” (WAGNER 2014).¹¹ In diplomatic terms, this closing formula is a clause of corroboration, that is,

10. The Act on Monopolies, enacted in 1624, established conditions for legitimate letters patent. In contrast to modern patents, which we noted before are considered a right to be granted when conditions are met, monopolies granted by the sovereign were still a matter of prerogative; this prerogative, however, was now subject to Common Law:

And be it further enacted by the authoritie aforesaid, That all Monopolies and all such Commissions Graunts Licences Charters lettres patents Proclamacions Inhibicions Restraints Warrants of Assistance and all other Matters and Things tendinge as aforesaid, and the force and validitie of them and every of them ought to be, and shalbe for ever hereafter examyned heard tryed and determined by and accordinge to the Common Lawes of this Realme and not otherwise. (STATUTES OF THE REALM 1819, 1212)

(I have maintained the spelling, capitalization, and punctuation of the act as it appears in *The Statutes of the Realm* though I have expanded its copious abbreviations, as they are neither important for our purposes nor practical to reproduce.)

11. As is to be expected, Queen Elizabeth II frequently issues letters of patent, an example of which is the one that declared that the Duke and Duchess of Cambridge’s children would be princes or princesses. The notice of this in *The London Gazette* reads as follows:

Figure 2. Letter Patent Appointing Sonia Sotomayor to the Supreme Court (Wagner, 2014)

BARACK OBAMA,
PRESIDENT OF THE UNITED STATES OF AMERICA,
To all who shall see these Presents, Greeting:
KNOW YE; That reposing special trust and confidence in the Wisdom, Uprightness, and Learning of Sonia Sotomayor, of New York, I have nominated, and, by and with the advice and consent of the Senate, do appoint her an Associate Justice of the Supreme Court of the United States, and do authorize and empower her to execute and fulfill the duties of that Office according to the Constitution and Laws of the said United States, and to Have and to Hold the said Office, with all the powers, privileges and emoluments to the same of right appertaining, unto her, the said Sonia Sotomayor, during her good behavior.
In testimony whereof, I have caused these Letters to be made patent and the seal of the Department of Justice to be hereunto affixed.
Done at the City of Washington, this sixth day of August, in the year of our Lord two thousand nine, and of the Independence of the United States of America the two hundred and thirty-fourth.
[SEAL] BARACK OBAMA
By the President:
ERIC H. HOLDER,
Attorney General

it “enunciat[es] the means used to validate the document and guarantee its authenticity” (DURANTI 1998, 148).¹² Duranti notes that, “The wording changes according to the time and place, but these clauses are usually formulaic and fixed. Examples are, ‘I have hereunto set my Hand and Seal of Office’, ‘Signed and Sealed’, ‘Witness our Trustworthy and Beloved . . .’, etc.” (1998, 148). This particular letter patent has a rather clearly defined protocol, text, and eschatocol. In this case, the protocol contains a brief entitling (“Barack Obama, President of the United States of America”) and a general inscription (“To all who shall see these Presents, Greeting”). The text contains a notification (“Know Ye”) and the disposition. The eschato-

The Queen has been pleased by Letters Patent under the Great Seal of the Realm dated 31 December 2012 to declare that all the children of the eldest son of The Prince of Wales should have and enjoy the style, title and attribute of Royal Highness with the titular dignity of Prince or Princess prefixed to their Christian names or with such other titles of honour.

12. Diplomatics is the study of historical documents. As such, it has a robust terminology for the description of said documents. For more on diplomatics, see Duranti (1998, 133–158) or Giry (1894).

col, or closing section, contains the clause of corroboration, the date, and the attestations of Obama and Eric Holder.

As we see from the clause of corroboration, the letter patent shares features with the performative speech act.¹³ The letter patent does not merely describe that a grant has occurred (though I will argue later that it also does this) but also is the act that brings about the grant. A speech act consists of three parts: the locutionary act and what Austin called the illocutionary and perlocutionary acts (also called perlocutionary effect). Kempson (1977) explains the distinction thus:

a speaker utters sentences with a particular meaning (locutionary act), and with a particular force (illocutionary act), in order to achieve a certain effect on the hearer (perlocutionary act). (p. 51)

That is, the perlocutionary effect is brought about by the illocutionary act, which is expressed in terms of a particular locutionary act. In terms of the letter patent, the locutionary act is found in the wording of the letter patent, the illocutionary act is that which creates the grant, and the perlocutionary effect is that the recipient has whatever privileges or writes the grant confers. In the case of the letter patent in figure 2, the perlocutionary effect is that Sonia Sotomayor is now an associate justice on the U.S. Supreme Court, with all that entails.

We might also speak of the letter's direction of fit (SEARLE 1975), where direction of fit indicates whether the words used affect the world (world-to-words) or the world affects the words used (words-to-world).¹⁴ In one sense, the letter patent has a world-to-word direction of fit, i.e., by virtue of the state of affairs that the illocutionary act brings about, the world has changed to admit a particular perlocutionary result, that of Sotomayor's being on the Supreme Court. This contrasts with, say, a news report on her

13. Austin (1975) identified performatives (as opposed to constatives) as having the following two qualities:

A. they do not 'describe' or 'report' or constate anything at all, are not 'true or false'; and B. the uttering of the sentence is, or is part of, the doing of an action, which again would not normally be described as, or as 'just', saying something. (5)

The performative/constative distinction is highly useful, though it must be recognized that Austin argues that the distinction ultimately collapses upon further investigation.

14. The terms "world-to-words" and "words-to-world" may seem a bit confusing. They are perhaps better phrased as "world-fits-words" and "words-fit-world", respectively.

appointment, which would have a word-to-world direction of fit, i.e. the words in report fit the situation in the world.

But in another sense, the letter patent is a report. The letter patent is predicated upon an imagined readership, an imagined public to which its perlocutionary act applies (readers are either Sotomayor herself and thus enjoy certain privileges and responsibilities or are or kept from exploiting those privileges by means of the letter). Yet, for all the public may care, the text has a words-to-world direction of fit because it can be read as a description of the state of the world, i.e. that the conditions granted by the letter exist, i.e. Sotomayor is an associate justice of the Supreme Court. Or, in the case of an invention, that a monopoly for a particular invention, which has a particular specification, exists.¹⁵

Figure 3 shows an example patent certificate from the early twentieth century.¹⁶ As one can see, the form of the certificate had by this point become routinized such that spaces were made available for writing or typing in the details of a particular patent. It is nonetheless a letter patent. Duranti (1998, 154, 156–158), in her book on diplomacy, performs a diplomatic reading of the structure of this form of patent certificate. It contains three main parts: the protocol, text, and eschatocol. The protocol contains the inscription “to all to whom these presents shall come”. The text con-

15. This duality of directions of fit is in fact part and parcel of this type of speech act. In Searle’s (1975) taxonomy of speech acts, the act performed by the letter patent constitutes a declarative speech act. As Searle says:

It is the defining characteristic of this class that the successful performance of one of its members brings about the correspondence between the propositional content and reality, successful performance guarantees that the propositional content corresponds to the world: if I successfully perform the act of appointing you chairman, then you are chairman; if I successfully perform the act of nominating you as candidate, then you are a candidate. (16–17)

According to Searle, declarations are “very special category of speech acts” (18) because they have a bi-directional direction of fit. A declaration is both a performance that makes the world fit its words as well as a statement whose words fit the world now brought about by the performance.

16. It would have been ideal to base our discussion of the form of the patent certificate on one of the Phillips patents. However, USPTO does not seem to keep copies of the certificates themselves—only the specifications. Phillips would have received his certificate upon issuance of the grant. I have been in contact with the records department of Phillips Screw Company which has not, as of the date of this writing, been able to locate any of the original 1930s certificates. However, as one will see from the following discussion, the form of the letter patent was by that point formulaic. It is the formula in which we are interested.



Figure 3. Patent Certificate for US 1,417,941. From the Water Resources Archive, Archives and Special Collections, Colorado State University.

tains an exposition and a disposition. The exposition, i.e. “the narration of the concrete and immediate circumstances generating the act and/or the document” (146), consists of both clauses that begin with the conjunction “whereas”. The disposition, “that is, the expression of the will or judgement of the author” (147), consists of part that starts with “now therefore” and ends with “territories thereof”. The eschatocol begins with the formula “in testimony whereof”.

A key portion of the exposition is the phrase “a description of which invention is contained in the specification of which a copy is hereunto annexed and made a part hereof”. This is the mechanism by which the letter patent incorporates the invention’s specification; the details of the invention or improvement are thus “made a part” of the letter patent itself by the illocutionary force of the phrase. In terms of the patent bargain, the specification is of prime importance, as it provides the PHOSITA with the information necessary to practice the invention when the patent expires (or at the point at which it is licensed from the patent holder). It is the portion of the patent in which the grant’s words-to-world direction of fit is most easily recognized, as the specification seems to say that there exists in the world such an invention that conforms to the what is specified therein. The grant’s world-to-words direction of fit, on the other hand, is most evident on the letter proper.

Patents as Social Actors

In addition, since the specification is not written by USPTO, the agency responsible for the letter patent, but by some combination of the inventor and his or her attorneys, it is clear evidence that the speech act of the patent grant is a collaborative one. After all, a patent passes through many hands. Its illocutionary act may be determined by convention and its illocutionary force the purview of the sovereign government, but many labor in the production and review of the patent text. Indeed, just as particular social conditions need to be in place in order to perform the speech act involved in getting married, conditions, called felicity conditions, need to be respected in order to bring about the desired result. In many cases this means several individuals need to be involved in the in producing—and verifying the truth of—the patent text.

Let us look at a (fictionalized) extreme case. In Charles Dickens’s “A Poor Man’s Tale of a Patent”, which appeared in *Household Words* in

1850,¹⁷ Old John, the titular poor man, goes through thirty-five steps to patent his invention. After laboring for twenty years fabricating it, he presents it to his learned friend, William Butcher, who asks, “What will you do with it, John?” This leading question serves as a pretense to educate John on the ills of the Victorian patent process:

I said, “Patent it.” William said, “How Patent it, John?” I said, “By taking out a Patent.” William then delivered that the law of Patent was a cruel wrong. William said, “John, if you make your invention public, before you get a Patent, anyone may rob you of the fruits of your hard work. You are put in a cleft stick, John. Either you must drive a bargain very much against yourself, by getting a party to come forward beforehand with the great expenses of the Patent; or you must be put about, from post to pillar, among so many parties, trying to make a better bargain for yourself, and showing your invention, that your invention will be took from you over your head.” I said, “William Butcher, are you cranky? You are sometimes cranky” (DICKENS 1850, 74).

Butcher’s potential crankiness—he swears he is not—is understandable: there is a fair distance between patenting an invention by “taking out a patent” and patenting one by being “put about, from post to pillar, among so many parties”. Butcher discloses the unruly innerworkings of the patent system, which John treats, in his naiveté, as a singular entity. Old John soon learns, after spending £96.7s.8d. and more than a month going through “thirty-five stages” of being “hustled backwards and forwards among all those offices” (DICKENS 1850, 75), what George Dodd¹⁸ later declared, namely that, “The subject of Patents is rather incomprehensible

17. Contributions to *Household Words* were typically anonymous. Lohrli, using the journal’s records, identifies Dickens as the author of this piece (1973, 68). Dickens revisits the absurdities that inventors faced in *Little Dorrit*, by way of Daniel Doyce’s dealings with the Circumlocution Office, a venerable bureaucracy that cultivates what we would today call “best practices” in the area of “HOW NOT TO DO IT” (DICKENS [1857] 2002, 107). Doyce’s invention, after he suffers “interminable attendance and correspondence, after infinite impertinences, ignorances, and insults” (123), and after numerous public trials, effectively disappears into the machinery of the Circumlocution Office.
18. Identified by Lohrli (1973, 164).

to those not concerned in them, and often disappointing to those who are” (DODD 1857, 190).¹⁹

In this example, the black box of patenting, when opened up, consists of many documents (an initial petition, a “report-of-course” based on the petition, a warrant based on the report, a “Queen’s bill” based on the warrant, and a “signet bill” based on the Queen’s bill) that pass through the hands of numerous individuals and offices (Home Secretary, Attorney-General, the Home Office, the Queen, the Patent Office, Clerk of the Signet, Clerk of the Lord Keeper of the Privy Seal, and Clerk of the Patents, not to mention numerous others who require payment). Though fictionalized, this account hews closely to Dickens’s story is based on a treatise for patent reform by Sir Henry Cole who “enumerated, probably for the first time on a single page” the thirty-five necessary steps for obtaining a patent (COLE 1884, 275).²⁰ The Cole-Dickens critique is that all this labor is not necessary or even germane to the realm of invention. Old John is a “working-man that never labors less . . . than twelve or fourteen hour a day” (DICKENS 1850, 73) and whose twenty years’ labor on an invention seems only to be the preamble to the real task of procuring a patent. Superfluous or not, the patent process of the time required the patentee to circulate his or her invention to numerous individuals who participated in the patenting effort.²¹

19. The situation, for Old John, is alienating in addition to being expensive and inconvenient. He asks, “Is it reasonable to make a man feel as if, in inventing an ingenious improvement meant to do good, he had done something wrong?” (DICKENS 1850, 75). Daniel Doyce complains of much the same thing, i.e. being “made to feel . . . as if [he] had committed an offence” (DICKENS [1857] 2002, 123).

20. Dickens sent a letter to Cole on September 25th, 1850 (just about three weeks before the story appeared on October 19th), saying “Your proof has greatly interested me. I shall be happy to ‘join the Union’, and I am now at work on a paper for ‘Household Words’ which I hope may help the question in a taking manner” (COLE 1884, 274). Cole is probably best known as organizer, along with Prince Albert, of the 1851 Great Exhibition.)

21. Whether a patent process could exist without particular acts of labor—no matter how inconsequential they may be—is beside the point. Within that particular process at that point in time they were necessary conditions for the granting of the patent. Without these, the patent could not be granted because the conditions for felicity would not have been met. The process could, as Cole was trying to do, be re-formed into one in which such acts of labor were not necessary conditions.

The creation of a patent is collaborative in that numerous actors co-labor to bring it about. It participates in relationships among and between inventors, research and manufacturing firms, universities, government agencies, and those who implement and use the invention. These relationships, especially those described by what Etzkowitz and Leydesdorff have called “the Triple Helix of university-industry-government relations” (2000, 109), facilitate the patent’s creation and negotiate its socioeconomic value.²² But it would be a mistake to consider the patent as a mere object passed about from subject to subject. Rather, the patent is a quasi-object that conveys onto these actors the subjective experience of the network in which they are all enmeshed. Michel Serres theorizes the quasi-object in his work on the parasite; the metaphor he uses is a children’s game in which an item called a “furet” (“ferret” in English) is passed between players. As Serres says,

The quasi-object is not an object, but it is one nevertheless, since it is not a subject, since it is in the world; it is also a quasi-subject, since it marks or designates a subject who, without it, would not be a subject. He who is not discovered with the furet in his hand is anonymous, part of a monotonous chain where he remains undistinguished. He is not an individual; he is not recognized, discovered, cut; he is of the chain and in the chain. (2007, 225)

As Ekbia notes, Serres’s quasi-object is an attempt to “theorize community . . . from a materialist perspective” (2009, 2557). A patent is a material object that provides linkages between members of a community that would otherwise not be linked in quite this manner. For the purposes of a given invention as it works its way through the patent system, the inventor, lawyer, or examiner is not anonymous only insofar as he or she engages with said patent.²³

Some of the collaborative aspects of the modern patent process show traces of themselves on the patent grant, namely the coauthorship efforts of lawyers and examiners. Figure 4 shows the byline of U.S. patent number 2,046,837, “Means For Uniting a Screw with a Driver” (Phillips 1936a).

22. Morillo and Efrain-Garcia (2015) have also studied the role of non-profit technology centers in technology production.
23. This is not to say that those people do not have subjectivity in the sense of experiencing the phenomenal world but rather that they are made subjects within the patent “game” by association with the patent.

Figure 4. Byline of U.S. Patent 2,046,837, “Means For Uniting a Screw with a Driver”.

INVENTOR.
HENRY F PHILLIPS
BY *James D. Givnan.*
ATTORNEYS.

(56)

References Cited

U.S. PATENT DOCUMENTS

5,393,071 A * 2/1995 Best 463/35

FOREIGN PATENT DOCUMENTS

JP	11076621 A	3/1999
JP	200070550 A	3/2000
JP	2000245968 A	9/2000

OTHER PUBLICATIONS

“Vagrant Story”; Instruction Manual, Square Electronic Arts LLC, 1999, p. 8.

* cited by examiner

Primary Examiner—Mark Sager

Assistant Examiner—Steven Ashburn

(74) *Attorney, Agent, or Firm*—Nixon & Vanderhye P.C.

Figure 5. References Cited in U.S. Patent 6,935,954 B2, “Sanity System for Video Game”.

Awarded in 1936, it lists two people, inventor Henry F. Phillips and his attorney James D. Givnan. The words “inventor” and “attorneys” are fixed parts of the form, implying an inventor-attorney patent collaboration, for which “by” indicates co-authorship.²⁴ Similarly, the work of examiners shows itself in the references cited in the patent. Figure 5 shows those in U.S. patent number 6,935,954 B2, “Sanity System for Video Game” (STERCHI ET AL. 2005), which cites U.S. 5,393,071 A. The asterisk next to the

24. Note that “attorneys” is plural even though there is only one attorney. This is an indication that the text printed on this part of the page is standard.

reference indicates that the examiner, not the inventors or patent attorney cited it.

Collaboration need not imply a harmonious relationship. Though Givnan appears as attorney on five other utility patents with Phillips, and one design patent, all awarded during the 1930s (PHILLIPS 1936b,c; PHILLIPS AND FITZPATRICK 1936a,b; PHILLIPS 1937a,b), by 1944 Phillips and his Phillips Screw Company were working with a different patent attorney, E.G. Buckhorn (PHILLIPS 1946). That year Givnan stopped working with the Phillips Screw Company and filed his own patent application, also for a screw (GIVNAN 1946). Within the next few years he had formed the Givnan Recessed Screw Company to exploit this patent (PHILLIPS SCREW CO. v. GIVNAN 1954). Phillips Screw Company sued Givnan and the case was ultimately decided by the Supreme Court of Oregon, which stated that:

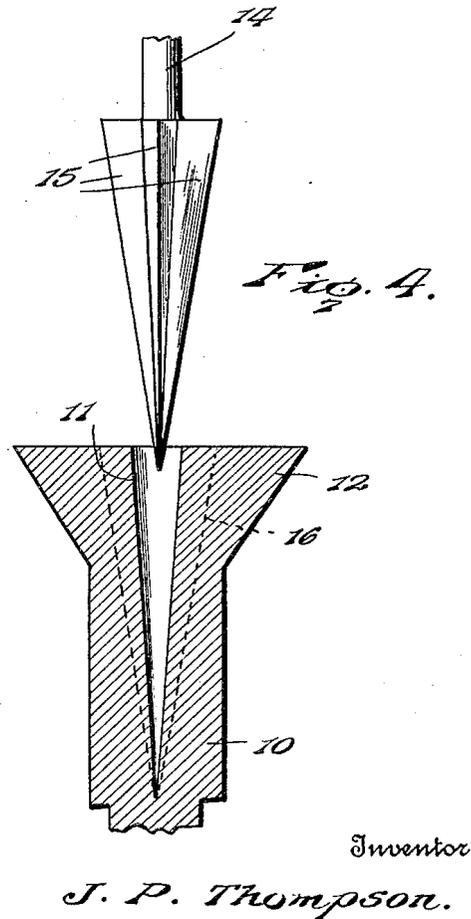
There is no question that defendant Givnan was guilty of breach of trust in obtaining the patent for his own account since he occupied a confidential relation with the company as its patent attorney, and the invention leading up to his patent unquestionably took shape in his mind during the ten years he was acting for the company. (PHILLIPS SCREW CO. v. GIVNAN 1954)

This ruling emphasizes the collaborative aspect of the patent process. Givnan's involvement with the Phillips Screw Company was such that what "took shape in his mind" could not be disentangled from the set of relationships forged by the engineering and patenting process.

The Phillips Patents

The Phillips screw and driver are two complex yet commonplace inventions. The dual technologies of screw and driver are often noticed only when performing poorly—such as when the driver strips a screw or slips out of the cruciform. The relationship between the two (and in some cases, the failure of said relationship) is mediated and mandated by a series of patent documents issued to Henry Phillips in the 1930s. In addition to patenting the screw and its driver, Phillips also patented the "means for uniting" the two. The precision with which this unification is specified, accompanied by a specific misreading of the patent, have given rise to a common belief that the Phillips system was designed such that the driver was supposed to come out under certain circumstances. This belief interprets a design flaw

Figure 6. Detail of US
Patent 1,908,080



as a feature and maintains the aura of the author-inventor as a masterful engineer whose intent governs not only wording of the document but also the objects which are patterned from it. The notion of the solitary inventor who is solely responsible for the content of a patent's specification is, because of the text's social nature, problematic. Indeed, much of what Foucault (1998) says of authors is also true of author-inventors. Yet we will see in the Phillips patents an attempt to closely control the relationships both among patent specifications and between the screw and driver.

There is no one patent that defines the Phillips screw, just as there is no one patent which defines its corresponding driver. We will concentrate on a nexus of seven different utility patents that contribute to our understanding—and misunderstanding—of the intent of the inventors. On May 9, 1933, Phillips was issued two patents: 1,908,080 and '81, assigned to him by

the inventor John P. Thompson (THOMPSON 1933a; THOMPSON 1933b). 1,908,080, filed in May 1932, describes a type of cruciform screw, while ‘81, filed in June 1932, describes a corresponding driver. These patents define the immediate ancestor to what we think of as the Phillips screw and driver. Figure 6 shows a drawing of the driver engaging the screw.

Thompson had two goals for improving upon existing cruciform screw designs. His screw was designed such that the same driver could drive screws of different sizes. Furthermore, it was meant to be produced cheaply and efficiently in an automated fashion. Thompson argues that:

Hitherto the manufacture of screws with a cruciform or other shape of aperture has been impractical, several types requiring casting, which is so expensive as to make manufacturing costs prohibitive. Other types require broaching. This operation pushes the metal ahead of the tool and so disturbs the distribution of metal as to render the screw head extremely fragile. (THOMPSON 1933, 1)

Regular screws, in contrast, were produced cheaply by means of automation. Thompson accomplishes his two goals by devising a cruciform screw with an opening whose “side walls . . . converge downwardly to a point on the axis of the screw and converge radially outward to a knife edge” (THOMPSON 1933, 1). This screw can be punched by means of automated equipment and provide the benefits that come with cruciform screws, all while remaining durable and inexpensive. Since the driver comes to a fine point—what Thompson calls a “knife’s edge”, it can be used with screws of different sizes. While this is a useful feature, it by no means also for an ideal coupling of screw and driver since one cannot specify the length of the driver the screw will receive.

On July 7, 1936, Phillips received five screw-related patents: 2,046,343, ‘837, ‘838, ‘839, and ‘840 (PHILLIPS 1936a; PHILLIPS 1936b; PHILLIPS 1936c; PHILLIPS AND FITZPATRICK 1936a; PHILLIPS AND FITZPATRICK 1936b). He is listed as the sole inventor on three of them; 2,046,839 and ‘840 were co-invented by Thomas M. Fitzpatrick. The relationships among these patents and between these patents and ones that come before are a bit obscure, so we will proceed through them slowly. ‘343, ‘837, and ‘838 were filed on July 3, 1934, just over two years before they were granted. ‘839 and ‘840 were filed early the next year, on January 15, 1935, along with another patent, 2,066,484, which was eventually granted on January 5, 1937 (PHILLIPS 1937).

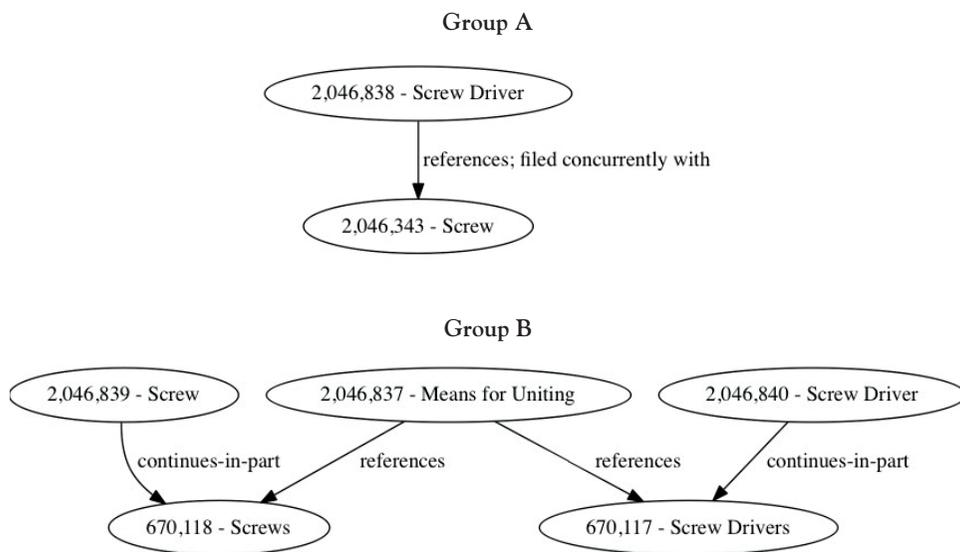


Figure 7. Relationships between Phillips' July 1936 Patents

Figure 7 graphs relationships between the July 1936 patents. Several of the patents refer to other patents. '838, a patent for a screw driver, mentions it is "adapted for operative engagement with the type of screw shown and described in [his] co-pending application filed concurrently herewith and entitled Screws, Serial Number 733,623" (PHILLIPS 1936c, 1), which was granted as '343. Furthermore, two applications are continuations-in-part of prior applications and thus have a special referential relationship with those applications. According to the MPEP, "A continuation-in-part is an application filed during the lifetime of an earlier nonprovisional application, repeating some substantial portion or all of the earlier nonprovisional application and adding matter not disclosed in the said earlier nonprovisional application" (§201.08). A continuation-in-part carries the filing date of the earlier application. '839, a patent for a screw, continues an application with serial number 670,118, which Phillips filed on May 9, 1933 (PHILLIPS AND FITZPATRICK 1936a, 1). '840, a patent for a screw driver, continues an application with serial number 670,117, which Phillips also filed on May 9, 1933 (PHILLIPS AND FITZPATRICK 1936b, 1).

Every indication points to the fact that patents for those two prior applications were never granted in the United States, though the inventions were patentable. '837, a patent specifying the "means for uniting a screw

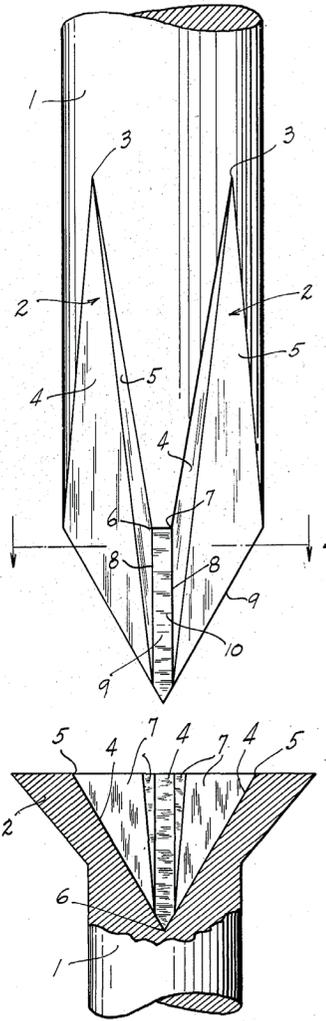


Figure 8. Composite Image of Screw and Driver from A Group

The A and B patents were all issued in July 1936.

Since the B patents, being continuations-in-part, supersede the Ur-B applications, the Ur-B applications were not published. Thus precisely what was common between them and what was new material is unknown. It is possible that the Ur-B applications reference the Thompson screw and driver, though, because of their respective shapes, it is less likely that they

with a driver”, cites both of these prior applications and mentions the dates on which they were “allowed” (PHILLIPS 1936b, 1). An allowed patent is one that the patent examiner has deemed should be granted but that hasn’t yet been granted. After fees are paid, allowed patents get issued. From figure 7, it is clear that there are two distinct groups of patents, A and B. Thus Phillips was issued patents in the same year for two different sets of screws and drivers, as well as a “means for uniting” screw and driver that references an earlier version of one of the sets. The earlier versions, i.e. 670,117 and 670,118, we will refer to as Ur-B.

Phillips filed the Ur-B applications for a screw and driver on May 9, 1933, the same day the Thompson screw and driver patents were issued. Both of the Ur-B applications were allowed, but not issued, in April 1934. In the summer of 1934, he filed the A applications, for a different screw and driver, as well as one of the B applications that makes explicit reference to the Ur-B applications. This “means for uniting a screw and driver” was a conceptual advance as far as stipulating the precise relationship between the parts involved. Meanwhile, the Ur-B applications were reworked and their continuations-in-part, the B applications, were submitted in January 1935.

would cite the Thompson inventions than the A patents would. At any rate, it is significant that Phillips chose not to have the Ur-B patents issued even though they were allowed and thus eligible to be issued. That is, the examiner considered them patentable but Phillips chose not to patent them even though he had gone through the process.

The A patents show a common heritage with the Thompson patents. The recess in the A screw, and thus end of the A driver, come to a fine point. However, the angle created by the meeting of the sides of each of these is much greater in the A patents than in the Thompson patents. This results in the A driver looking less menacing than the Thompson driver, less knife-like (see figure 8). This angle would also have meant losing some degree of the one-size-fits-all aspect of the Thompson driver.

The B screw and driver patents are quite different.²⁵ Notice, in figure 9, that the B recesses and corresponding drivers are much less dramatic than the ones in the A patents or the Thompson patents. The “knife’s edge” is almost entirely gone. In this sense, the B patents are more in line with contemporary Phillips screws and drivers.

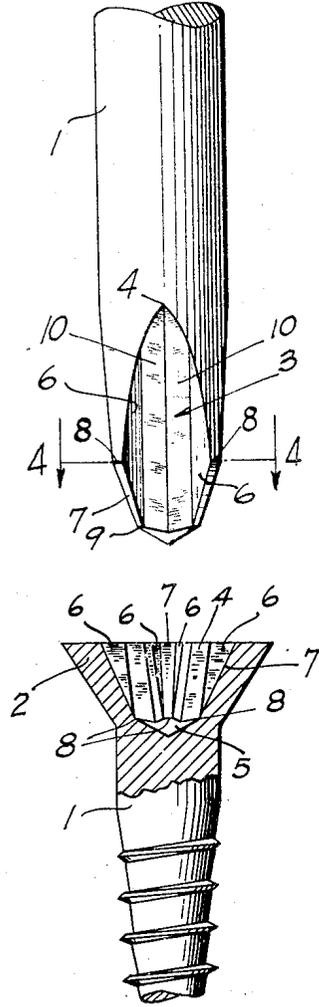


Figure 9. Composite Image of Screw and Driver from B Group

25. '839 and '840 define two screws and drivers, respectively, one set being the primary set and the second one being an alternate. The alternate versions differ only slightly in that they smooth out small portions of the recess. The alternate versions were potentially patented in order to keep competitors from making the same sort of changes and circumventing at least one of the patent claims. For our purposes, the slight differences between the primary and alternate sets are of no consequence.

There are key similarities between the A and B patents that demonstrate an advancement on the kind of screw and driver envisioned in the Thompson patents. That is, they are both designed such that the driver fulfills most if not all of the screw's recess. Patent '838 is for "a type of driver particularly adapted for operative engagement with the type of screw shown and described in my co-pending application" (PHILLIPS 1936cc). That is, "The principal object of the invention is the provision of a tool of this character particularly adapted for precise and firm engagement within a recess of corresponding shape". Furthermore, the corresponding screw is "particularly adapted to be actuated" by the driver and "provide[s] means for self-centering said driver with respect to the screw, this same means also acting as a positive lock and stabilizer" (PHILLIPS AND FITZPATRICK 1936a). Similarly, "the principal object of ['840] is to provide a screw driver formed at one of its ends with a bit of special configuration to fit precisely within a recess of corresponding shape formed in the head of all sizes of screws for driving the same" (PHILLIPS AND FITZPATRICK 1936b).

One key difference between the A and B patents is the degree to which the driver fills the entire recess. Figure 10 shows the patent drawings adapted to show the drivers' engagement with the screw recesses. This image was created without modifying the proportions of any of the drivers with respect to their screws. In the case of the A patents, the driver fits perfectly within the A screws recess. When manufactured to these specifications, such a driver would have no play. On the other hand, there is a bit of play between the driver and the screw recess in the B patents. This is shown on the right where the red indicating the recess is viewable on the sides. This extra space presumably accounts for the fact that the B driver is meant to be used with screws of differing size.

'837 is a peculiar patent, titled "Means for Uniting a Screw and Driver". What '837 claims is not any particular screw or driver, but rather features of any screw or driver that help the two form a single unit. That is, it "is directed to a composite structure of a screw and a tool or driver therefor, and more particularly to the provision of co-operative means in each of said elements in the ordinary manner of presenting a driver to a screw, will cause the two to become securely united" (PHILLIPS 1936b). The effect is that "screw and driver are joined together in operative relation, instead of the driver merely occupying the space defined by the recess as is the case in the aforesaid separate screw and driver inventions". '837 is not a patent meant to merge the '839 and '840 patents. Rather, '837 defines a *union* of a screw and a driver that may indeed be those described by the other B patents:

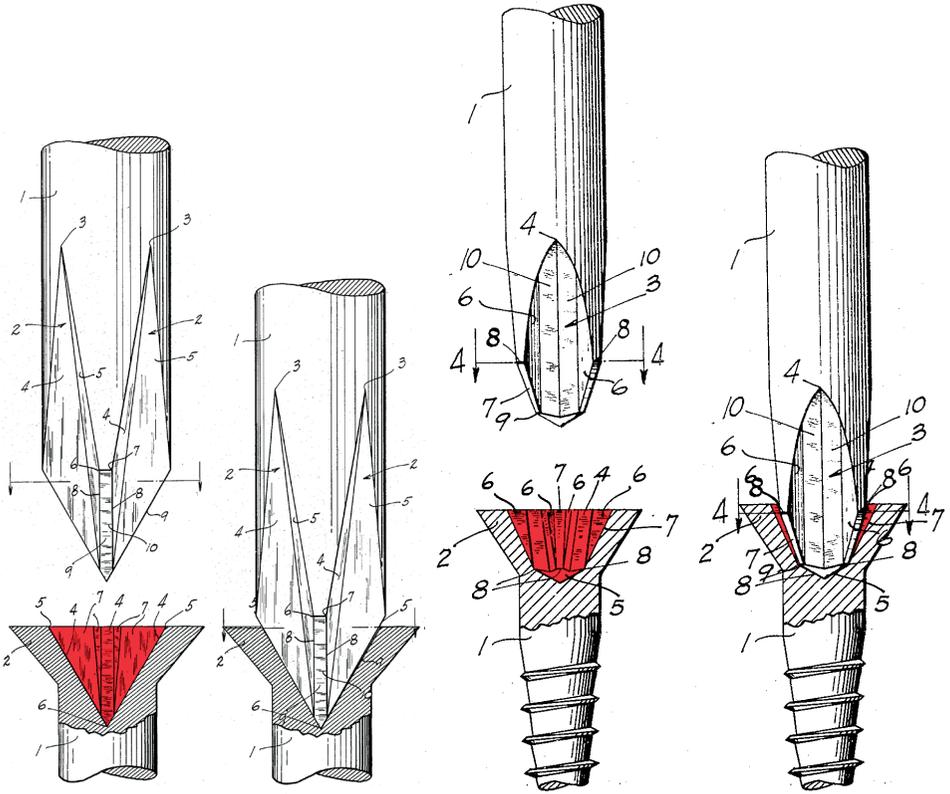


Figure 10. Images from A and B patents adapted to show the drivers' engagement with the screw recesses Left: A patents. Right: B patents.

The screw and driver shown and described in the aforesaid allowed patent applications, comprise a tool-receiving recess formed in the screw head and a tool formed at its working end with a bit made to fit precisely the recess in the screw. In other words, the precision limits of manufacture of the recess are identical with those of the correspondingly shaped end of the driver, so that a perfect fit between the two without binding or wedging is accomplished.

In contrast to these structural characteristics, of identical form, the elements constituting my present form of composite invention are constructed along complementary angular lines to effect a positive wedging engagement when the screw and driver are joined together in operative relation, instead of the driver merely occupying the space defined by the

recess as is the case in the aforesaid separate screw and driver inventions. (1)

The wedging action that allows a Phillips screw to “stick” to a Phillips screwdriver such that the two stay together before and during the application of force is a consequence of this invention. This wedging action allows for a tight coupling of screw and driver.

We see in Phillips’s work a tendency both toward more tightly specified relationships between invented objects and toward more inter-textual relationships between patents. As Phillips’s work progresses, the patents become more tightly coupled just as the coupling between screw and driver becomes tighter. By the time ‘837 was filed, the two are elements of a well-regulated, highly-specified whole.

What, then, when that whole fails to stay whole? A 1988 piece in the *Wall Street Journal* (BAILEY 1988) called the Phillips screw “one of the world’s least loved inventions. The reason: the screwdriver’s maddening tendency to slip out of the screw head instead of turning it”. The article continues:

This is known as “cam-out” in the tool trade, and it often leads to stripped screw heads, ruined screwdrivers, skinned knuckles, lost tempers and untold domestic discord. This doesn’t result from some innocent design flaw, incidentally. . . . The idea was that the automated screwdrivers would turn the screw with increasing force until the top of the driver popped out. Which brings us to the real scandal behind the invention of the fiendish screw: it was designed to cam out as it was driven in by automated screwdrivers, so the screw head wouldn’t be ruined.

Bailey interprets the failure of the Phillips driver to properly do its job as a design feature rather than a flaw. He provides no evidence for this assertion.

There is a short Wikipedia article on cam out that points to the Phillips screw and driver as an example of the phenomenon. As of February 2017, it states that:

The Phillips design is auto-centering, that is, the screw does not slip off the screwdriver, unlike normal slotted-head screws, but it cams out once the screw has been driven home. These properties were used to speed up automobile production in the US in the early years of the industry.

As of this writing, that final statement is followed by the dreaded “citation needed” tag and rightfully so. Like Bailey, the Wikipedia authors cite no source for this. To be sure, the phrasing here does not explicitly claim that cam out was an intended feature of the Phillips screw but merely that it was used, intent aside, in the automobile industry. This claim was part of the article’s first version, created on February 25, 2007 by user West London Dweller, who commented on his work that it was an “initial stub, as I’d never heard of ‘cam out’.

It seems odd that someone who had never heard of the phenomenon would write an article on it and not provide any sources.²⁶ In West London Dweller’s initial version of the article, the text cited above is preceded by the following:

Frequently, camming out damages the screw, and possibly also the screwdriver, and is usually attempted to be avoided. However, the Phillips head screw and screwdriver combination was designed specifically to cam-out, as at the time of its invention torque sensing automatic screwdrivers did not exist.

This claim persists for some time. On May 24, 2010, an unnamed user edited the article simply to add the word “not” before “designed specifically to cam-out”. This edit was quickly reverted by user Wizar191 who “identified [it] as vandalism”. On October 31, 2011, user Theon144 added the citation needed tag right after claim, writing “citation needed about the claim that philips [sic] head screw designed specifically to cam out”. This tag persisted until June 16, 2015 when an anonymous user changed the article to read in part that “The Phillips head screw and screwdriver combination was *not* purposely designed to cam out when the screw stalled”, an assertion he or she backs up by citing Adler (1998).²⁷ After a review of the Phillips patents, Adler concluded that Bailey’s claim that “Phillips designed the bit

26. By June 1, 2007, user Ravedave tagged the article with a template message saying that the “article does not cite any sources”, a message that persisted until it was removed, without reason, by an unnamed user on September 9. User Robofish reapplied the template on December 30. It persisted until November 10, 2009, when it was removed, after an attempt to provide sources, by user Rumping. It has not appeared since.

27. This edit was made after a version of this paper was presented at the Society for Textual Scholarship conference Loyola University Chicago in 2013. That version had also cited Adler’s work, specifically his assertion that cam out was not intentional. It is unlikely, though, that my presentation caused someone to make this edit.

. . . to “cam-out” . . . does not appear to be the case” (2.2). Instead, “Phillips’s claim of a camming or wedging action to dislodge foreign particles found in the screw recess has created confusion”. That is, Adler implies, a misreading of ‘837 has caused the view that cam out was part of the design all along.

There is little reason to argue that elements of an invention that are not explicitly stated in a patent specification are, for the purposes of the patent grant, intentional. Letters patent for inventions can only effect a grant for claims that are explicitly made in the specification. The formula for this, which appears several times in any given patent specification, is clear: “I claim X”. The illocutionary force of the letter patent can only act on behalf of what has been claimed. To put it another way, in order for the world to fit the words, the words have to exist.

Indeed, there is further evidence in the Phillips patents against the claim that cam out was intentional. In ‘839, one of the B patents, Phillips says that:

One of the principal objects of the invention is the provision of a recess in the head of a screw which is particularly adapted for firm engagement with a correspondingly shaped driving tool or screw driver, and in such a way that there will be no tendency of the driver to cam out of the recess when united in operative engagement with each other. (PHILLIPS and FITZPATRICK 1936a)

As we see here, Phillips was actively trying to prevent cam out, not make it a feature of his invention.

The change to the Wikipedia article lasted less than three minutes. Later on June 16, 2015, user Anaxial, likely not knowing that the change had been made as a means of countering an earlier statement that the Phillips system had been designed to cam out, came across the statement that it had not been in the context of an article specifically on cam out. He or she thus removed the sentence entirely, commenting “Then why mention it?” Thus the argument that Phillips meant for cam out to happen disappears from the article. It has not appeared since.

Conclusion: Bug or Feature?

If you reached the end of this article on an electronic device—and that device is intact—then its fasteners are doing the job for which they were

designed. They hold surfaces together, keeping electronic components inside. Perhaps, in the case of specialty fasteners, such as Apple's pentalobe screws, they keep you on the outside. How do we know they were designed for this? Indeed, in the face of indeterminacy, how can we say what any historical inventions were meant to do? As we see from the discussion of cam out above, accidental features of inventions can easily come to be part of the interpretation of intent.

The sociotechnical context of the invention provides us with a starting point. We can infer with confidence that pentalobe screws were meant to make it difficult to open devices because such screws were introduced well before widespread availability of their corresponding drivers and such screws seem not to afford anything different than a typical fastener. In its early days, the Phillips screw would have also been an oddity; yet we know the Phillips screw was intended to have benefits over and above other screws. We know this because of key actors in the Phillips screw and driver's sociotechnical context: the Phillips patents.

The present work has explored the textuality of patents. It asserted that the patent grant is a social creature, having been made through the collaboration of inventors, drafters, attorneys, officials, and others, as well as in the sense that it cannot be felicitously effected without fitting particular social requirements. The speech act that creates a patent grant has, as all declarative speech acts do, a dual direction of fit. It is both the instrument that brings about the patent grant, i.e. it makes the world fit its words, as well as a means of providing a report on the invention and the grant of monopoly, i.e. its words fit the new state of the world. As with all social creatures, the patent cannot control its own interpretation. While the words fit the world, those words are only one participant in a network of actors. The Phillips patents, though they show evidence of increasing precision in the design of the invention, cannot force individuals not to misread them.

That misreading, i.e. the assertion that cam out was a design feature rather than a flaw is, in a way, a means of recuperating the inventor. It is what Sedgwick (1997) might call a "reparative reading" of the patent because it generously ascribes a meaning to the patent that allows the inventor to stay nominally in control of the effects of his or her invention. There is something oddly comforting about this move to say that an aspect of a thing's operation is not an aberration, that instead it is acting as it is meant to—that, to use the language of software development, it is not a bug but a feature. As Ekbja (2009) has shown, bugs and features are not Platonic concepts existing *a priori* to development. Instead, this difference is socially mediated among developers, quality assurance analysts, users,

and other interested parties. In the case of the Phillips screws' cam out, interpreting it as a feature serves to reinforce the mythological figure of the genius inventor. It seems to say that someone, however far removed from our current context, accounted for the features of the fasteners with which we interact every day. It works to reassure us that some *person* is behind even the most mundane aspects of our technology.

References

1789. *The Constitution of the United States of America*.
1819. *The Statutes of the Realm*, Volume 4 Part 2. London: G. Eyre and A. Strahan.
1954. Phillips Screw Co. v. Givnan. https://scholar.google.com/scholar_case?q=Phillips+Screw+Co.+v.+Givnan&hl=en&as_sdt=800006&as_vis=1&case=17327778740750319613&scilh=0
- AUSTIN, J. 1975. *How to Do Things with Words* (2nd ed.). Cambridge, Massachusetts: Harvard University Press.
- AUSTIN, J. H. 1936. "The Patentable Invention". *University of Pennsylvania Law Review* 84: 943–965.
- BALDINI, N., R. FINI, R. GRIMALDI, and M. SOBRERO. 2014. "Organisational Change and the Institutionalisation of University Patenting Activity in Italy". *Minerva* 52.1: 27–53.
- BENSON, C. L. and C. L. MAGEE. 2015. "Technology structural implications from the extension of a patent search method". *Scientometrics* 102.3: 1965–1985.
- BIAGIOLI, M. 2006. "Patent Republic". *Social Research* 73.4: 1129–1172.
- BLACKSTONE, W. 1803. *Blackstone's Commentaries: With Notes of Reference, to the Constitution and Laws, of the Federal Government of the United States; and of the Commonwealth of Virginia*. Philadelphia: William Young Birch and Abraham Small.
- BOWKER, G. 1992. "What's In a Patent?" In *Shaping Technology/Building Society: Studies in Sociotechnical Change*, edited by W.E. BIJKER and J. LAW. Cambridge, MA: The MIT Press.
- BRACHA, O. 2004. "The Commodification of Patents 1600–1836: How Patents Became Rights and Why We Should Care". *Loyola of Los Angeles Law Review* 38: 177–244.
- BURSTEIN, M. J. 2015. "Rethinking Standing in Patent Challenges". *George Washington Law Review* 83.2: 498–553.
- CASS, R. A. 2015. "Lessons from the Smartphone Wars: Patent Litigants, Patent Quality, and Software". *Minnesota Journal of Law, Science and Technology* 16.1: 1–61.
- CHAMBERLEN, P. 1649. "To the honourable House of Commons assembled in Parliament, the humble petition of Peter Chamberlen, doctor in physick". <http://quod.lib.umich.edu/cgi/t/text/text-idx?c=ebo2;idno=B18893.0001.001>
- COLE, H. 1884. *Fifty Years of Public Work of Sir Henry Cole, K.C.B. Accounted For in His Deeds, Speeches, and Writings*. London: George Bell and Sons.

- DE CHADAREVIAN, S. 2011. "The Making of an Entrepreneurial Science: Biotechnology in Britain, 1975–1995". *Isis* 102.4: 601–633.
- DICKENS, C. 1850. "A Poor Man's Tale of a Patent". *Household Words* 2.30: 73–75.
- . 2002. *Little Dorrit*. New York: Modern Library Classics.
- DODD, G. 1857. "A Room Near Chancery Lane". *Household Words* 15.361:190–192.
- DURANTI, L. 1998. *Diplomatics: New Uses for an Old Science*. Lanham, Maryland: Society of American Archivists and Association of Canadian Archivists in association with The Scarecrow Press, Inc.
- EKBIA, H. R. 2009. "Digital artifacts as quasiobjects: Qualification, mediation, and materiality". *Journal of the American Society for Information Science and Technology* 60.12: 2554–2566.
- ETZKOWITZ, H. and L. LEYDESDORFF 2000. "The Dynamics of Innovation: From National Systems and 'Mode 2' to a Triple Helix of University-Industry-Government Relations". *Research Policy* 29.2: 109–123.
- FOUCAULT, M. 1998. "What is an author?" In *Aesthetics, Method, and Epistemology*, edited by J.D. FAUBION. New York: The New Press.
- GABRIEL, J. M. 2014. *Medical Monopoly: Intellectual Property Rights and the Origins of the Modern Pharmaceutical Industry*. Chicago: University of Chicago Press.
- GANGULI, P. and M. BLACKMAN. 1995. "Patent Documents: A Multi-Edge Tool". *World Patent Information* 17.4: 245–256.
- GIRY, A. 1894. *Manuel de Diplomatie*. Paris: Hachette.
- GIVNAN, J. D. 1946. "Screw". U.S. Patent 2,395,476, filed March 25, 1944 and issued February 26, 1946.
- GUGLIUZZA, P. R. "2015". "Patent Litigation Reform: The Courts, Congress, and the Federal Rules of Civil Procedure". *Boston University Law Review* 95.1: 279–301.
- HOVENKAMP, H. 2015. "Antitrust and the Patent System: A Reexamination". *Ohio State Law Journal* 76.3: 467–564.
- KEMPSON, R. M. 1977. *Semantic Theory*. Cambridge textbooks in linguistics. Cambridge: Cambridge University Press.
- KITCH, E. W. 1977. "The Nature and Function of the Patent System". *Journal of Law and Economics* 20.2: 265–290.
- LATOUR, B. 1986. "The Powers of Association". In *Power, Action, and Belief: A New Sociology of Knowledge?*, edited by J. LAW, 264–280. London: Routledge & Kegan Paul.
- LEMLEY, M. A. 2012. "Ignoring Patents". In *The Future of the Patent System*, edited R. Shimanami, 79–94. Cheltenham, U.K.: Edward Elgar.
- LEYDESDORFF, L. 2015, July. "Can technology life-cycles be indicated by diversity in patent classifications? The crucial role of variety". *Scientometrics* 105.3: 1441–1451.
- LEYDESDORFF, L., F. ALKEMADE, G. HEIMERIKS, and R. HOEKSTRA. 2015. "Patents as instruments for exploring innovation dynamics: geographic and technological perspectives on photovoltaic cells". *Scientometrics* 102.1: 629–651.
- LOHRLI, A. 1973. *Household Words*. Toronto: University of Toronto Press.

- MA, J. and A. L. PORTER. 2015. "Analyzing patent topical information to identify technology pathways and potential opportunities". *Scientometrics* 102.1: 811–827.
- MACLEOD, C. 2012. "Reluctant Entrepreneurs: Patents and State Patronage in New Technosciences, circa 1870–1930". *Isis* 103.2: 328–339.
- MILLER, D. 2011. "The Paradoxes of Patenting at General Electric: Isador Ladoff's Journey from Siberian Exile to the Heart of Corporate Capitalism". *Isis* 102.4: 634–658.
- MOORE, W. 2007. "Keeping Mum". *British Medical Journal* 334: 698.
- MORILLO, F. and P. EFRAIN-GARCIA. 2015. "A bibliometric analysis of Technology Centres". *Scientometrics* 104.3: 685–713.
- MOTTA, G. d. S., P. A. d. A. GARCIA, and R. H. QUINTELLA. 2015. "A patentoscience approach to venture capital investment prioritization". *Journal of the Association for Information Science and Technology* 66.4: 765–777.
- NAKAMURA, H., S. SUZUKI, Y. KAJIKAWA, and M. OSAWA. 2015. "The effect of patent family information in patent citation network analysis: a comparative case study in the drivetrain domain". *Scientometrics* 104.2: 437–452.
- NORMAN, D. 2013. *The Design of Everyday Things* (Revised and expanded ed.). New York: Basic Books.
- O'SULLIVAN, D. E. 2013. "Stepping Back and Leaping Forward". *Textual Cultures* 8.1: 1–5.
- OUELLETTE, L. L. 2015. "Patent Experimentalism". *Virginia Law Review* 101.1: 65–128.
- PHILLIPS, H.F. 1936a. "Screw". U.S. Patent 2046343, filed July 3, 1934 and issued July 7, 1936.
- . 1936b. "Means For Uniting a Screw With a Driver". U.S. Patent 2046837, filed July 3, 1934 and issued July 7, 1936.
- . 1936c. "Screw Driver". U.S. Patent 2046838, filed July 3, 1934 and issued July 7, 1936.
- . 1937. "Screw". U.S. Patent 2066484, filed January 15, 1935 and issued January 5, 1937.
- . 1946. "Screw". U.S. Patent 2402342, filed January 19, 1943 and issued June 18, 1946.
- PHILLIPS, H. F. and T. M. FITZPATRICK. 1936a. "Screw". U.S. Patent 2046839, filed January 15, 1935 and issued July 7, 1936.
- PHILLIPS, H. F. and T. M. FITZPATRICK. 1936b. "Screw Driver". U.S. Patent 2046840, filed January 15, 1935 and issued July 7 1936.
- POTTAGE, A. 2006. "Materialities in Life and Law: Informatic Technologies and Industrial Property". *Paragrana* 15.1: 82–101.
- RICHARDSON, J. H. 2015. "Are Prior Art Citations Determinative of Patent Approval?: An Empirical Analysis of the Strategy Behind Citing Prior Art". *Hastings Science and Technology Law Journal* 7.1: 25–42.
- ROCKETT, K. 2010. "Property Rights and Invention". In *Handbook of the Economics of Innovation*, edited by B. H. HALL and N. ROSENBERG, Volume 1, 315–380. Amsterdam: North-Holland.

- RUSSELL, L. 2014. "An Asclepiad family—The Chamberlens and DeLaunes, 1569–1792: Five generations of surgeons, physicians, accoucheurs and apothecaries". *Journal of Medical Biography* 24: 477–491.
- SEARLE, J. R. 1975. *Expression and Meaning: Studies in the Theory of Speech Acts*. Cambridge: Cambridge University Press.
- SEDGWICK, E. K. 1997. "Paranoid Reading and Reparative Reading, or, You're So Paranoid, You Probably Think This Introduction Is About You". In *Novel Gazing: Queer Readings in Fiction*, edited by E. K. SEDGWICK, 1–37. Durham: Duke University Press.
- SERRES, M. 2007. *The Parasite*. University of Minnesota Press.
- SEYMORE, S. B. 2008. "Heightened Enablement in the Unpredictable Arts". *UCLA Law Review* 56, 127–168.
- SIMMONS, E. S. 2009. "Black sheep in the patent family". *World Patent Information* 31.1: 11–18.
- STERCHI, H. C., E. A. RIDGWAY, and D. P. DYACK 2005. "Sanity System for Video Game". U.S. Patent 6935954B2, filed December 14, 2000 and issued August 30, 2005.
- SUGIMOTO, C. R., C. NI, J. D. WEST, and V. LARIVIÈRE 2015. "The Academic Advantage: Gender Disparities in Patenting". *PLOS ONE* 10(5), e0128000.
- TEECE, D. J. 1986. "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing, and Public Policy". *Research Policy* 15: 285–305.
- THOMPSON, J. 1933. "Screw". U.S. Patent 1908080A, filed May 20, 1932 and issued May 9, 1933.
- UNITED STATES PATENT AND TRADEMARK OFFICE. (n.d.) Terms of Use for USPTO Websites. <https://www.uspto.gov/terms-use-uspto-websites>.
- UNITED STATES PATENT AND TRADEMARK OFFICE. 2014. *Manual of Patent Examining Procedure* (9th ed.).
- WAGNER, F. D. ed. 2014. "Cases Adjudged in the Supreme Court at October Term, 2008". Number 557 in United States Reports. Washington: U.S. Government Printing Office.
- WIENS, K. 2011. "Apple's Diabolical Plan to Screw Your iPhone". <http://www.ifixit.com/blog/2011/01/20/apples-diabolical-plan-to-screw-your-iphone/>
- WINSTON, E. I. 2015. "Patent Boundaries". *Temple Law Review* 87.3: 501–546.
- YANG, G.-C., G. LI, C.-Y. LI, Y.-H. ZHAO, J. ZHANG, T. LIU, D.-Z. CHEN, and M.-H. HUANG 2015. "Using the comprehensive patent citation network (CPC) to evaluate patent value". *Scientometrics* 105.3: 1319–1346.
- YI, D. 2011. "Who Owns What? Private Ownership and the Public Interest in Recombinant DNA Technology in the 1970s". *Isis* 102.3: 446–474.
- ZHOU, X., Y. ZHANG, A. L. PORTER, Y. GUO, and D. ZHU. 2014. "A patent analysis method to trace technology evolutionary pathways". *Scientometrics* 100.3: 705–721.