How patents became documents, or dreaming of technoscientific order, 1895-1937

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Abstract

Purpose – The purpose of this paper is to show how the documentation movement associated with the utopian thinkers Paul Otlet and Henri La Fontaine relied on patent offices as well as the documents most closely associated with this institutional setting – the patents themselves – as central to the formation of the document category. The main argument is that patents not only were subjected to and helped construct, but also in fact engineered the development of technoscientific order during 1895–1937.

Design/methodology/approach – The paper draws on an interdisciplinary approach to intellectual property, document theory and insights from media archeology. Focused on the historical period 1895–1937, this study allows for an analysis that encapsulates and accounts for change in a number of comparative areas, moving from bibliography to documentation and from scientific to technoscientific order. Primary sources include Paul Otlet's own writings, relevant contemporary sources from the French documentation movement and the *Congrès Mondial de la documentation universelle* in 1937.

Findings – By understanding patent offices and patents as main drivers behind those processes of sorting and classification that constitute technoscientific order, this explorative paper provides a new analytical framework for the study of intellectual property in relation to the history of information and documentation. It argues that the idea of the document may serve to rethink the role of the patent in technoscience, offering suggestions for new and underexplored venues of research in the nexus of several overlapping research fields, from law to information studies.

Originality/value – Debates over the legitimacy and rationale of intellectual property have raged for many years without signs of abating. Universities, research centers, policy makers, editors and scholars, research funders, governments, libraries and archives all have things to say on the legitimacy of the patent system, its relation to innovation and the appropriate role of intellectual property in research and science, milieus that are of central importance in the knowledge-based economy. The value of this paper lies in proposing a new way to approach patents that could show a way out of the current analytical gridlock of either/or that for many years has earmarked the "openness-enclosure" dichotomy. The combination of intellectual property scholarship and documentation theory provides important new insight into the historical networks and processes by which patents and documents have consolidated and converged during the twentieth century.

Keywords Classification, Patents, Patent offices, Technoscience, Paul Otlet

Paper type Research paper

Introduction

Toward the end of 1937, Paul Otlet (1868-1944), a man who since 1895 had a finger in almost all European initiatives regarding information and documentation, commissioned the image featured below, document 8694 or "Laboratorium Mundaneum," from the illustrator

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Constantin Platounoff. As opposed to the relative anonymity that continues to surround his longstanding collaborator Henri La Fontaine (1854-1943), Otlet has catapulted into fame as a forefather of the internet, the posterchild of a lesser-known European proto-internet history (Levie, 2008; Wright, 2014).

In large part, Otlet finds himself in this position less because of what he wrote and more because of what he drew. His images of planetary interconnectedness by way of machines, knowledge and information feel eerily clairvoyant. Yet, it was not unusual for Otlet to ask a professional to execute his vision and give his sketchy and almost childlike doodling a more polished form. Document 8694 is no exception. But what exactly do we see? (Figure 1). First, perhaps an enormous black monolith, similar to, if not an exact replica of, a Bessemer converter[1]. Henry Bessemer's innovation made steel out of iron and the process (covered by an impressive number of patents) proved of watershed importance in the history of industrialization. But the buckets attached to the ropeway conveyors in document 8694 carry

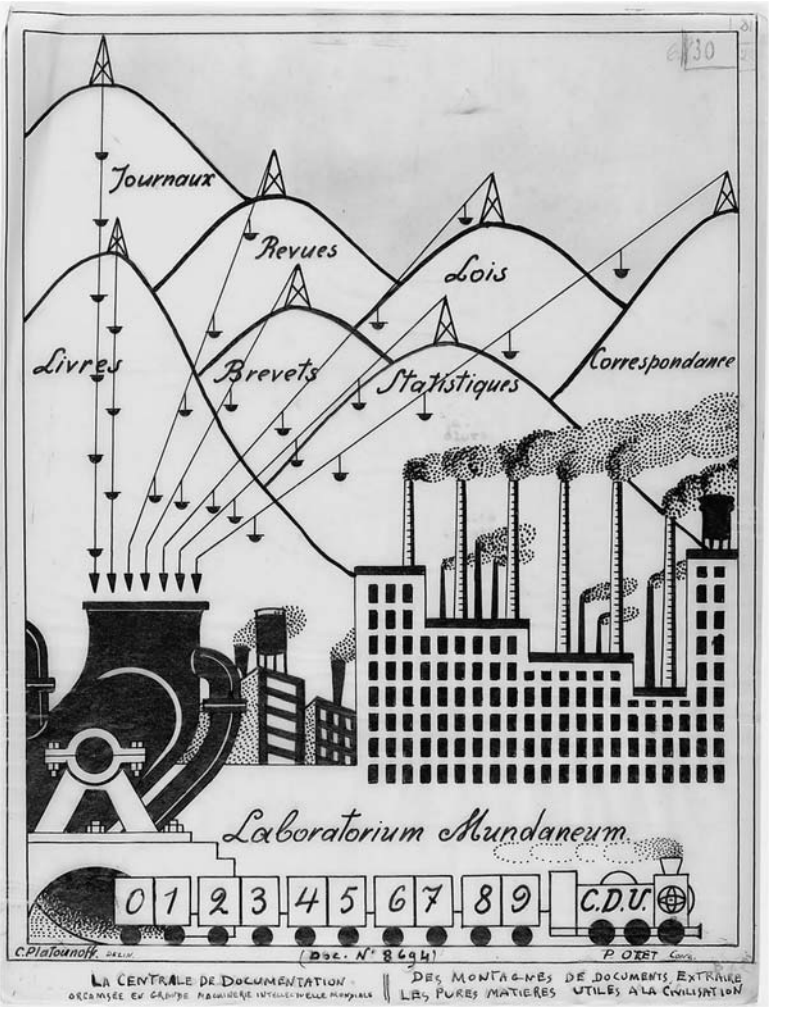

Figure 1.
Laboratorium Mundaneum: powerhouse of documentation. [December 28, 1937] (Mons, Mundaneum EUM 8694©)

something very different from ore or iron. They carry documents. Towering above the factories, the chimneys and the smoke is a mountain range of seven different types of informational inclines: books, correspondence, journals, statistics, magazines, laws and patents. Regardless of height or numerical importance, all seven document types bow to the cable's relentless gravitational pull: down, down, down and into the mouth of the melting-pot. And then, once they have made it through, the documents become something else. From within the belly of the beast, a small train exits carrying "pure matter useful to civilization," moving purposely forward fueled by one of Otlet and La Fontaine's major contributions to the history of information, the *Classification décimale universelle* (CDU). A mountain range, a black melting-pot, chimney smoke and a small train running on classification. Simple, straightforward things. Or so it would seem.

Because of the extensive body of research that now exists on Otlet and La Fontaine's various utopian and international initiatives, chief among them the rise and fall of the multi-institution *Mundaneum* (Day, 2008, 2014; Rayward, 1975, 1983, 1997, 2008; Wright, 2014), there is no need to reiterate once again the fairly well-known story of the two Belgian visionaries' central role in the formation of the modern information age. While indebted to that longer history, this paper has a more limited focus and extends primarily to the explanatory potential of document 8694 in relation to one of the peaks in Otlet's mountain range of documents: patents (*brevets*).

Why patents? Despite the centrality of this particular category to the twentieth-century desires of never-ending technological progress and their key function in the transition from industrial to informational economy, patents still remain narrowly conceptualized. We meet them as statistical indicators of inventive activity (Galvez-Behar, 2008; Khan, 2005; MacLeod, 2002), understand them in relation to law-making, innovation and the nation-state (Sherman and Bently, 1999), but more seldom approach them in their role as information or documents. When Cornelia Visman argues that "the erratic side of the law – the administrative operations, the transmission medium itself – remains a blind spot of legal history"(Visman, 2008, p. 75), she offers perhaps a partial explanation as to why studies of patents have largely left unexplored the document as both material and analytical category. However, while the strengths of documents may be their situatedness (Gitelman, 2014, p. 4), document studies have largely remained silent on the patent regime (Bowker and Star, 1999; Briet, 1951; Buckland, 1997; Day, 2014; Fayet-Scribe, 2000; Riles, 2006). Equally, media archeology (Gitelman, 2014; Heide, 2009; Krajewski, 2011; Visman, 2008) has paid cursory, if any, attention to the specific form and function of patents. My ambition is to bridge these different lacunas and contribute to an expansion of the range of interpretative possibilities *vis-à-vis* patents, aligning myself with important interdisciplinary contributions situating patents as texts, documents and classification devices (Bazerman, 1997, 1999; Bellido and Kang, 2016; Biagioli, 2006; Bowker, 1992, 1994; Kang, 2012; Myers, 1995).

The overarching purpose of this article is to prove just how crucial the patent regime – national and international – was to the formation of the central tenets of the documentation movement, and perhaps vice versa. The "documentation movement" refers to the networks and alliances that resulted from the establishment of Otlet and La Fontaine's *Institut International de Bibliographie* (IIB) in 1895 and that reached its pinnacle at the 1937 *Congrès Mondial de la documentation Universelle* (CDMU). Aided by the "Laboratorium Mundaneum" image, this paper argues that patents and patent offices – designated as documents and documentation centers in Otlet's thinking – not only were subjected to and helped construct, but also in fact engineered the consolidation of technoscientific order as a powerful conduit for the patent system as a whole. The eponymous label "technoscience" (Latour, 1987), for the nexus of science/technology in a post-1914 world (Bonneuil and Pestre, 2015), would probably have made little sense to Otlet. And yet, the "great global machinery" of document 8694 – the processes of listing, indexing, abstracting, classifying and retrieving that represent the *sine qua non* of Otlet's document universe – is the materialization of "technoscientific order."

The question before us, then, is what sort of history of patents, technoscience and documents will we have if we follow patents, not down a rabbit hole, but down into a black melting-pot?

The patent office as a documentation center

Both members of the fin-de-siècle Brussels bourgeoisie, Paul Otlet and Henri La Fontaine, were not so much brought together by a shared social standing as a shared interest in bibliography. The two lawyers and future collaborators met through another lawyer, Edmond Picard, the man behind the monumental, 151-volume legal bibliography *Pandectes Belges, encyclopédie de législation, de doctrine, de jurisprudence belges* (1878–1933). Otlet, who passed the bar in 1890, worked as an intern with Picard on the *Sommaire periodique des revues du droit*, a monthly bibliography of articles published in international law journals. The idea was simple: listing topics in alphabetical order and from administrative, civil, fiscal and maritime law to *droit d'auteur* and comparative law; the *sommaire* covered all aspects of legal thinking. In the spring of 1892, the restless Otlet, whose mind already had wandered beyond compiling sources for Picard, wrote a letter to La Fontaine suggesting that they take things a step further. Was it not possible, he asked, "that our *sommaire* could become part of a bigger *œuvre,*" and then he outlined how it might, together with a journal on political and social economy and a bibliography, serve as the basis for a Bibliographic Institute, one that in time could branch out into other areas (Otlet, 1892). And in 1895, with the support of the Belgian government, the IIB was established. The IIB had three goals: to perfect and unify bibliographic methods. To organize the international scientific collaboration in bibliographic work. To prepare a universal *Répertoire Bibliographique Universel* (RBU) and from it deliver extracts and duplicates.

Somehow, this ambitious program had to be disseminated into the wider world, where the IIB could enlist support from likeminded individuals and institutions. Enter the *Bulletin de l'IIB*, which began appearing in 1895 but was known under an array of different names, in turn, mirrored the constant organizational turmoil of the IIB[2]. An important node in the network that sustained the expanding documentation movement, the *Bulletin* was riddled with problems, appeared irregularly (if at all) and was known to its detractors by an unfortunate propensity for factual errors (Rayward, 1975, p. 133). With the benefit of hindsight, we know that the modest "branching out" Otlet suggested in 1892 not quite captured the frenzied proliferation of initiatives that actually ensued, but the IIB always remained the jewel in Otlet and La Fontaine's crown. In large part this was so because what drove them to launch the institution in 1895 – and what drove many others to launch similar initiatives at the same time – was a challenge that did not, indeed could not, be met. If a solution existed, the IIB would serve no purpose.

In the historiography of Otlet, La Fontaine and the *Mundaneum,* it is the publication, in 1903, of "Les Sciences Bibliographiques et la Documentation" (Otlet, 1903) which tends toward status as "ur-text" in terms of the documentation movement (Rayward, 1997; Woledge, 1983). However, as the title of the paper intimates, Otlet could not introduce the term documentation and simultaneously demote bibliography into a mere branch of this new modality without leaning on the science of bibliography. While systems of listing, classification and calculation had been second nature to both scientific work and information for centuries, it was not until around 1900 that bibliography became a "science" in its own right, producing a particular cognitive awareness among professionals dedicated to the work of classification and order, work that the IIB claimed was "auxiliary to all sciences" (Otlet, 1900, p. 107).

According to Alex Cszisar, the search for order around the 1890s was substantially driven by the ascent of the scientific periodical as the primary vehicle for "authoritative scientific knowledge" (Cszisar, 2010, p. 400). However, it is the patent, the patent office and a general interest in the administrative sciences, rather than the scientific journal, library or academy that pave the way for the documentation movement and the dream of

technoscientific order. In a departure from the traditional genesis outlined previously, I therefore propose an alternate reading route through the *Bulletin* and related IIB publications, making a case that the documentation movement emerges in close symmetry with the modern patent system.

In 1902, the *Bulletin* published an anonymous piece entitled "Notice sur l'organisation de la publicité des brevets d'invention" (*Bulletin de l'IBB*, 1902)." Actually, all the texts I am concerned with in the following are unsigned, anonymous, neither translated (Otlet (1892/1990)) nor included in recent bibliographies (Rayward, 2017) constituting the Otlet canon. Boyd Rayward noted that while many of the texts in the early editions of *Bulletin* were unsigned, they were probably written by Otlet himself, possibly with the help of La Fontaine (Rayward, 1967, p. 262). Even so, my argument is that it is precisely because they are unsigned that they make a stronger link in the chain of evidence. Authored by the movement rather than one of the leaders of it, the timing of the first IIB publications on patents to 1902 and 1903 (*Bulletin*, 1903) is no coincidence.

As much as they managed to be Belgian nationalists and ardent internationalists at the same time, Otlet and La Fontaine were also French speaking and French cultured. Given their legal background, they would have known that the French Parliament for many years had debated a change in patent law. When *l'Office national de la propriété industrielle* (ONPI) was formed in 1901, a designated patent office was a novelty in France, but old news in the US (1836), the UK (1852), Germany (1877) and Sweden (1885).

Otlet had used the patent office as a model for his bibliographic ambitions already in one of his earliest texts, "Un peu de bibliographie." Concerned with how to enable the productive registration of "sociological facts and data," he wrote: "Each country has a patent office which registers every invention and publishes a journal, which, day by day, keeps the industrial world abreast of progress" (Otlet, 1892/1990, p. 13). In many ways, this is a description of what we could call a "pre-document" patent office, or a registration bureau. When Alexandre Millerand, *Ministre du Commerce, de l'Industrie et des Postes et Télégraphes* set out the ideas behind the new patent legislation and the establishment of ONPI, he noted that many other countries already had such autonomous institutions which had fully proved their utility for industry. The French separation between expired patents being archived at the *Conservatoire national des arts et métiers* (CNAM) and patents in force being consultable at the *Ministère du commerce* was counterintuitive and inefficient. Millerand emphasized that the innovator could use the inspiration from old and new patents both, and the "centralization to the same local of all documents concerning industrial property" (*Journal Officielle*, 1901, p. 5858) was the obvious solution. As a signatory to the 1883 Paris Convention for the Protection of Industrial Property, France had promised to abide by Article 12, which stipulated that contracting parties should "establish a special service for industrial property and a central depot for the communication to the public of patents, drawings or industrial models, as well as trademarks[3]."

It is not too far-fetched to suspect that Otlet and La Fontaine, who always had their ear to the ground and were keen to promote their various schemes, wanted to position themselves as the obvious supplier of the expertise and tools needed by this new patent office. The founders of the IIB understood that the result of the new publication policy would be an exponential growth of information, one they stood ready to organize and structure into meaning. With their training in law and experience as compilers of legal bibliography, combined with their unwavering belief in the science of bibliography, the two men were ready to shoulder the needs of this new institution. The *Bulletin* noted that "unfortunately, there existed no common plan for the publication of patent specifications by different countries. As a consequence, there is a great diversity of approaches, something which results in considerable loss of time" (*Bulletin de l'IBB,* 1902, p. 171). Avoiding "loss of precious time" was almost verbatim the same as argument Otlet and La Fontaine had given as

the underlying rationale for their services at the launch of the IIB in 1895 (La Fontaine and Otlet, 1895, p. 8).

Given the projected changes brought on by the establishment of ONPI, it is perhaps logical that the anonymous *Bulletin* piece not so much concerned itself with patents as with patent offices, arguing that "the more progressive among them have exerted themselves in order to give their collections an organization that make their inestimable treasures easy to access" (*Bulletin de l'IBB*, 1902, p. 170). But what did it mean for a patent office to be "progressive"? It was clearly imperative to provide access to the "inestimable treasures" contained within them. But in order to function as an optimal documentation central, something else was needed.

In contrast to many other industrial nations at the time, France and Belgium did not implement the pre-examination of patent applications in order to verify the all important novelty requirement. It is not inconceivable that the absence of such a gatekeeping function could have motivated the IIB to offer their services. The German *patentamt* (1877) was seen as a model in terms of weeding out invalid patents against standards of novelty before they could be issued, and the same principle was applied in the US, the UK and the Scandinavian countries. Belgium did not subscribe to such an approach, and nor did France, where patents famously came with the stamp *Sans garantie du gouvernement* (S. G. D. G), which meant that they did not enjoy any protection by the state and could only be challenged in court, a principle that would remain in place in France until as late as 1968. The value of pre-examination had been a longstanding and contentious topic of debate in France. Proponents against the implementation of an examination scheme had prevailed, arguing that the process was not only cumbersome and costly, but philosophically incompatible with a system where patents were viewed a natural right.

In the eyes of the *Bulletin*, an exemplary patent office was one which carried out pre-examination, a practice which more or less pushed the patent office to become a center of documentation. If you had the power to reject applications and ensure some sort of quality threshold, such decisions could not be taken without qualified in-house expertise of patent examiners or clerks (Swanson, 2009), a professional cadre that needed to have at its disposal all the documents by which the examiners could award the patent (or not). In extension, it was the preliminary examination of the "progressive" patent offices which would set the institution on the path to become a full-blown "centre of remarkable documentation on technical subjects" (Santhagens, 1935, p. 1). And this means taking on another identity, less storage facility and more "veritable scientific Institute," à la the *patentamt* (*Bulletin de l'IBB*, 1907, p. 220). As always with Otlet and La Fontaine, their ambition was global and all-encompassing:

> From a bibliographical and research viewpoint, a patent office is not only a library where you preserve volumes; it is a center of documentation whose function now appears clear: collect all the documents printed in various countries on patents; reduce these documents into a certain number of elementary units or descriptions of patents; classify each patent according to uniform headlines; and to form, thereby, by means of the numerous materials published in the great collections, a homogenous and constantly updated collection (*Bulletin de l'IBB*, 1902, p. 170).

The patent as document

The title of the present paper suggests that there is a certain point in time when patents became documents. Logically, this implies that there was a period when they were something else. One of Otlet's most famous disciples in the documentation movement, Suzanne Briet, once defined a document as "any source of information, in material form, capable of being used for reference or study or as an authority" (Briet, 1951, p. 7). Such a broad definition would make early modern Venetian patents documents too, but incompletely captures the process of how the modern patent document emerges.

Complementary to the material object itself is an institutional upgrade, leaving behind an old identity as "industrial archive, a […] permanent registry of innovations and discoveries" (Otlet, 1903, p. 146) and replacing it with something else. For the IIB in 1902, this "something else" is systematically related to the way in which the patent office epitomizes a modern, efficient and professional knowledge unit but the transformation into document also depended on another important change in the French law.

French engineers and innovators had for a long time lobbied for the publication *intégrale* of patents. The demand for quicker, more accurate and less costly publication of patents was a main impetus behind the change in law (Dumas, 2003; Galvez-Behar, 2008). Publishing the whole patent document, rather than just having it listed in abbreviated form indicated that by now the logic of more information begets more innovation was firmly set in place. Influential legal minds such as Eugène Pouillet, author of the many times reprinted *Traité théorique et pratique des brevets d'invention et de la contrefacon* and vice-president of *L'Association Internationale pour la protection de la propriété industrielle* (AIPPI), took the opportunity of his fourth *Traité* edition to ask the government outright when they intended to follow the example of full publication set by most signatories of the Paris Convention (Pouillet, 1899, p. 170).

In 1902, when the *Bulletin* designated patents documents and patent offices documentation centers that perform duties beyond those traditionally associated with libraries, the Paris Convention and Union had been in existence for twenty years and established minimum standards for the protection of industrial property. Patents were awarded for innovations or processes that were "non-obvious," that in some jurisdictions were judged "useful," and that above all, had to be "new." I will return to the significance of the novelty requirement further below, but what towers above all of these obligations is the pivotal aspect of disclosure. The disclosure function of patents is sometimes described as "the patent bargain," expressed by Judge Newman as: "the study of patented information is essential to the creation of new knowledge, thereby achieving further scientific and technological progress" (cited in Rimmer, 2008, p. 176). Disclosure is not as straightforward as it might seem in this continuum. Despite being a constituent feature of patents, what and how much that is in fact disclosed is another matter. Information is elusive. There is both an internal aspect and external aspect of the information that a patent contains, simply because there is always "considerable information *outside* [my emphasis] what is revealed in the patent" (Feldman, 2012, p. 54). The trade-off for the protection is that you show as well as tell. But just how much that is shown and told is a balancing act.

There is little doubt that the importance of the patent in the Otlean universe is based on the fact that for the IIB, patents constituted an important source of technical information. In his *Traité de documentation*, Otlet assigned patents fifth place in his hierarchy of document collections, trailing the expected books, journals and newspapers but preceding manuscripts, maps and photographs (Otlet, 1934, p. 400). Since the mid-nineteenth century, the touchstone right of the patent to exclude others from commercial exploitation for a limited period is secured by divulging enabling information. The underlying rationale is that patents, alongside all the other document types Otlet identified in "Laboratorium Mundaneum," constitute a primary source of information, beneficial to society in its ability to generate new innovation/knowledge. Thus, the first stipulation of patents as documents is that they have value as a source of information.

Next comes the requirement that documents take material form. Such material form has shifted over the centuries. For Otlet, whose mindset was always book oriented, the patent is paper-based information, but up until around the mid-nineteenth century, models were required to accompany the patent application (Biagioli, 2006; Pottage, 2001; Pottage and Sherman, 2010) partly to demonstrate the workability of the invention. Around 1900, however, the requirement of models had begun to be abandoned in favor of the written

application and the all important category of the "new." Interestingly enough, as the documentation movement was consolidated before the first world war and developed in the 1930s, it takes the opposite direction, moving away from privileging the written record and opening the door to other technologies and records.

The most famous example of this process is Suzanne Briet's antelope (Briet, 1951), which becomes a document when transposed into a very specific institutional setting. Antelope in the wild? Not a document. Antelope in a zoo? Document. Paraphrasing Briet, one could perhaps say something similar about patents: registered, listed, abbreviated, archived? Not documents. Pre-examined, published in full and made available in a "progressive" patent office? Documents. To summarize, the patent becomes a document when placed in an organized, meaningful relationship with other evidence (Buckland, 1997, p. 806), including the particular institutional setting the IIB refers to as "progressive."

Finally, there are various uses of the patent document such as it is "capable of being used as reference, study or as authority." The very understanding of patents as having a public role, as being called upon by the state, by enterprises, by research institutions and individuals in order to expand and to claim knowledge and innovation has varied historically. So, different usages must be understood in relation to different publics or readers, who consult and are allowed to consult the patent. As already indicated, one of the most important requirements of an innovation is that it is new. Such a claim, however, cannot prevail without having done a diligent search of what is called "prior art."

The patent document not only points to an object or a process – the referent itself – but is also a link in a chain of references. More than any other aspect by which we can study patents as documents, prior art shows us patents as "social texts" that are "produced and reproduced under specific social and institutional conditions" (McGann, 1991, p. 21). McGann never included patents in his definition of social texts, but that is what they are and circulate as. The *quid pro quo* of the patent bargain means that as patents disclose they become part of an ever-expanding pool of prior art. Prior art is not only what has been patented before, but it also includes technical literature and scientific articles. Because you have to prove novelty by mastering knowledge of what has been done before, the exponential increase in prior art is directly related to the expansion of the pool of information.

As study: the second use of patents as a learning tool, fundamentally related to the assumption that they can be used as such, that they in fact can be read at all. And finally, and most importantly: as authority or proof. All of these functions engender different strategies in terms of the writing, searching and reading undertaken during patenting (Kang, 2012, p. 557). The patent has powers other documents do not have. By conferring a 20-year exclusive right to exclude others from making, using or selling an invention, the law does make a documentary difference. How that difference is played out is the result of the interaction between particular institutional settings such as patent offices and those particular processes that the document itself insists on. The becoming of the patent as document is therefore not only a mutually reinforcing process between internal mechanisms, as the prior art requirement, but also how external, institutional forces, in this case illustrated by the patent office to do more than just collect.

As patents take on their modern documentary shape, they require the support of an administrative and expert corps, a bureaucracy. They circulate within that bureaucracy as proof and as documents. But they need something more. They need machines to run at optimal speed.

The great global machinery (of classification)

So, what sort of impact, if any, did the 1902 notice have in the larger networks of documents and patents that were beginning to form at the time? Initially, it was quickly picked up and reprinted in its entirety by the most important international source for industrial property,

La Propriété Industrielle, the official mouthpiece of the Paris Union. Just as the *Bulletin* sought to become a critical node in the development of a documentation network, *Propriété Industrielle* took on a similar role in patents and related rights. The importance of the Paris Convention (and its counterpart in copyright, the Berne Convention for the Protection of Literary and Artistic Works from 1886) and their namesake Unions cannot be overestimated. Not only because they set in place supra-national frameworks dedicated to the standardization of the law, a process which matched the concurrent standardization of knowledge under discussion here, but also in their capacity of being clearing-houses of information to which contracting nations were willing to make an "institutional investment" (Bellido, 2014, p. 391). The return on such investment came, for instance, in the shape of *La Propriété Industrielle*.

Classification was the most complicated and pressing question identified by the *Bulletin*, and the IIB stated that the "ideal would of course be to obtain a universal classification of patents, as there already exists for certain questions a standard legislation of patents – legislation universally adopted" (*Bulletin de l'IBB*, 1902, p. 172). Considering that patents were subjected to national laws and issued by national patent offices, there seems to be some confusion about what the "universally adopted legislation" referred to. Otlet and La Fontaine, who considered the world their playground, seem here to reference the successful Paris Convention itself as proof in favor of the viability of their ideas. The tension between the international and the national, the dynamics of well-established national traditions running counter to the way in which the patent was increasingly becoming an international matter of concern, would be a persistent dilemma in the years to come.

In their extensive commentary to the proposals put forward by the IIB, *La Propriété Industrielle* was positive but perhaps more realistic than the authors about the possibility of implementing the many ideas articulated. Expressing the official standpoint of the Paris Union, *La Propriété Industrielle* noted that there was a variety of various classification schemes already set in place. Exemplifying with the classification system of the US patent office, *La Propriété Industrielle* underlined the importance of unification and suggested that trademarks might be an easier area to begin with. "The international unification of the classification of patents, will no doubt take place one time or another, this is our conviction, but it must first overcome very great obstacles" (*La Propriété Industrielle*, 1903, p. 160). "Very great obstacles" was an understatement. A more extensive treatment of the modern history of patent classification lies beyond the scope of the current article, but it is worth noting that while its origins might be located to the launch of the Paris Convention, it would take close to a century for the International Patent Classification (IPC) to become a reality through the 1971 Strasbourg Agreement.

Until 1906, there are few traces of classification of patents gaining any real traction in the *Bulletin*. But that year, Otlet and La Fontaine launched a new "service technique" as part of the IIB, which they advertised being in response to critical questions raised at the *Congrès International d'Expansion Mondiale* in Mons the previous year regarding the challenges of an increasingly global market (Otlet, 1906, p. 2). Clearly intended to meet the interests of industry, the most important result from this new IIB service was the *Répertoire des Brevets d'Invention délivrés en Belgique* (1907-1909). Based on the previous publications of Belgian patents in the official *Moniteur belge*, the *Répertoire* was published two times each month, at a subscription cost of 4 Belgian *francs* annually, and gave Otlet and La Fontaine the opportunity they had been waiting for since that first intervention on patents five years previously: a concrete way to show the "encyclopedic, systematic, documentary, universal" (*Répertoire*, 1907) supremacy of the CDU, their version of the Dewey decimal classification system. Here was proof that the classification of patents offered by the *Répertoire* allowed "for all transformations and developments that become necessary, without causing chaos in anterior classifications," assuring a classification "always at the forefront of scientific

progress (*Bulletin de l'IBB*, 1902, pp. 173-174). The *Bulletin* did its best to show support for the ambitions of the new service by publishing a follow-up piece to the 1902 text, "La documentation en matière de brevets d'invention" (*Bulletin de l'IBB*, 1907), and reprinting texts further underlining the importance of the IIB initiative; for instance, a call for an International Patent Office with pre-examination originally published in the *Journal des Brevets* (*Bulletin de l'IBB*, 1907, pp. 220-223), backed by the repeated arguments of efficiency and further standardization in an increasingly international market.

The launch of the *Répertoire* mobilizes a number of contributions in the *Bulletin* dedicated to the general usefulness of decimal classification. The concentration to 1907–1909 is partly explained by the fact that Otlet and La Fontaine would host another bibliographic conference in Brussels in 1908. Hippolyte Sébert, the founder of the Paris branch of the IIB, the *Bureau Bibliographique de France*, gave every possible support to Otlet and La Fontaine, the *service technique* of the IIB, and to the "elasticity of the system" in a contribution to the 1908 conference (Sébert, 1908), which once again repeated the *Bulletin* argument used six years previously: the CDU did not interfere with previous classifications, and the *Répertoire* had proven the point emphatically.

And then, silence. There is no trace of the *Répertoire* having been published beyond 1907-1909. The experiment with the *Répertoire* may have proved to be more complicated and time consuming than anticipated. Otlet and La Fontaine's attention also turned elsewhere, primarily to the *l'Union des Associations Internationales* (UAI), founded in 1907 as another outcome of the 1905 Mons *Congrès* and an important venue for their internationalist ambitions, until these were cut short by the first world war. Following armistice, the 1920s would see success and failure. They not only realized the *Mundaneum*, but also become increasingly marginalized in the international community, evidenced by their contentious relationship with the *Commission Internationale de Coopération Intellectuelle*, launched by the League of Nations in 1922.

But then, in 1926, there is something akin to an official recognition of the value of IIB's work in respect to the classification of patents. *La Propriété Industrielle* reported that during a recent meeting in Berne of the *Réunion technique* they had expressed themselves favorably on the implementation of the IIB's decimal classification system. After flattering references to the IIB, this "important Institute of abundant documentation," the journal goes out of its way to acknowledge Otlets' importance, admitting that they even had "borrowed long passages from this or that document" of his. Ending with a complete reprint of Hippolyte Sébert's 1908 contribution, *La Propriété Industrielle* concluded that the time had come for this "ingenious system" to be implemented as soon as it was practically feasible (*La Propriété Industrielle*, 1927, pp. 30-33). But was not to happen. An international classification system was still many years in the future.

It would be a mistake to assume that because patents have an irregular appearance in the *Bulletin*, they also disappear from the concerns of the documentation movement. On the contrary, the most tangible proof we have of the proximity between the documentation movement and the patent regime comes directly from within the organization itself.

By 1931, the IIB had undergone substantial changes. Otlet and La Fontaine were no longer in charge. The IIB had moved to Holland and became the *Institut International de Documentation* (IID) under the leadership of the much younger Dutchman Donker Duyvis, who had met Otlet in 1920 (Lancaster-Jones, 1961, p. 195). Since then, the IID became headquartered in the Hague. This shift introduced a new era in the life of the documentation movement, where the linkages to the patent system were strengthened, not weakened. Donker Duyvis and Alingh Prins, men who would take a central role in the development of the IID during the 1930s, were both employed by the Dutch Patent Office. Furthermore, besides sharing people between them, the IID and the Dutch Patent Office also shared office space. There were a number of various institutions and initiatives, such as the Netherland

Institute for Information, Documentation, and Filing (NIDER) which would overlap with the IID and the Dutch Patent Office, creating interesting personal and institutional alliances between administration, documentation, and patenting (Van den Heuvel 2012, 2013, 2014).

Working toward his magnus opus *Traité de la Documentation*, Otlet may have been disconnected from and sometimes extremely irritated with (Rayward, 1975, p. 326) the more immediate running of the IID, but he continued to write and think about the various "sciences" that had been part of his many years in the documentation movement. Administration was one of them. Speaking at the *IV Congrès International des Sciences Administratives* in Madrid in 1930, Otlet not only touched on the omnipresence of machines, but of a possible connection *between* machines:

> […] after the Great War, the machine has been triumphant. There are machines, instruments, apparatuses, furniture for most operations: writing, drawing, registration, classifying and conserving, calculation, extracting, selecting, making statistics and accounting, copying, multiplying and printing, transmitting and communicating remotely […] The machines are mechanical servants. They bring speed, economy, precision. What will take place now is their synchronization and their connection. Of all the machines we'll build a great machinery, composed of many separate machines, or parts of machines, which are of different operations and all these operations will probably be connected in a cycle without end, in the manner of the famous assembly lines which are now being installed in factories. (Otlet, 1930, p. 12)

Is this the machine of machines that toward the end of 1937 materializes as the black monolith in document 8694? Perhaps. That summer, that summer, Otlet and La Fontaine both participated in the CDMU, organized in Paris as part of the *Exposition Universelle*. With 460 participants from more than 45 countries representing 31 governments and 48 international organizations, the *Congrès* seemed to confirm the relevance of the document movement. Its two founding fathers were old now, still revered and with some clout, but on their way out, replaced by a new leadership.

Otlet spoke on the first day, and in his trademark style; visionary, somewhat rambling. Perhaps optimistic, perhaps slightly desperate, he ended his speech with an unmistakable call to arms. "Ralliement! En avant!" (Otlet 1937, p. 262). When he returned to Brussels, did he think about everything that had transpired during the *Congrès*? Maybe H. G. Wells notion of a "global brain" planted the seed for what later that year became the "great global machinery." The machine of machines that subjects *all* documents, including patents, to something bigger than themselves. Curiously, this involves a process of diminution, reducing documents into numbers or the essence of what they were before. For that process to succeed, for technoscientific order to become a reality and not only a dream, forward motion was the only option, pretty much like that of a small train running on classification.

Conclusion

This paper has shown how the documentation movement relied on patent offices as well as the patent document itself as essential building blocks in its own self-formation, represented primarily by Paul Otlet's influential writing and visualizations. Important changes in French law regarding both institutional reorganization as well as in the publishing policy of patents provided vital influence for this conceptualization to develop. By a reading of unsigned *Bulletin* texts from 1902 and 1907, patents were seen to manifest themselves as a crucial document category, just as the patent office was singled out as a proper powerhouse of documentation. Classification was a constant challenge associated with the demands for efficient access to patents. Otlet drew inspiration from the patent office as a crucial node in knowledge production, its rapport with the various roles and objectives of the patent as document and used both as a combined "testing ground" on which he could articulate the validity and potential of the document category and promote the IIB, obviously.

The introduction made a case for why we should study patents as documents. Further clarification is perhaps in order. Patents have always caused emotions to run high. Some have been convinced that they act as incentives for increased innovation and serve the public good, others have taken just the opposite view. Although such debates have occasionally resulted in abolition (Machlup and Penrose, 1950), patents have become ever more contentious in contemporary research-intensive environments and in the hybrid context of technoscience, the type of milieu that Otlet and La Fontaine founded the IIB to support. The controversial Bayh–Dole Act from 1980 – which opened the door for federally funded US universities to patent their research – is often cited as the reason why we today have rent-collecting demons known as patent "trolls" and layers of counter-productive patent "thickets" that, some claim, hinder rather than encourage innovation (Lemley and Melamed, 2013). Perhaps more so than any other intellectual property, patents have come to epitomize an intellectual property regime gone berserk. Given controversies surrounding the relative success or failure of the current intellectual property regime, for many patents now symbolize the dark underbelly of an ongoing and dangerous commodification of knowledge in research and science (Greenberg, 2007; McSherry, 2001; Mirowski, 2011; Rader, 2010; Rooksby, 2016).

While patents tend to be associated with the "enclosed" rather than the "open" of information, its Latin root *patere* means "to lay open." Patents transgress the border between making knowledge and owning things (Myers, 1995). On the one hand, an illustration of everything that has gone haywire in the intellectual property system, a dense, impenetrable licensing-layer causing serious anti-commons tragedies (Heller, 1998). On the other hand, a carrier of information, a document category that is there to be read, consulted, disclosed. Of course, it is part of the current critique against patents that nobody reads them in the way Otlet may have believed. Legal scholars have argued that the patent's ability as information carrier has been severely compromised, and since patents cannot be deciphered or read in any productive way (Roin, 2005), their underlying rationale of containing technical information is moot. If patents are crafted in an opaque language difficult to read much less understand (Chien, 2016, p. 1852), they ultimately forfeit any underlying "teaching function" (Seymore, 2010) altogether. Some legal scholars have recently tried to reclaim the understanding of disclosure (Fromer, 2016; Murray, 2014), partly as a response to the failure of the patent system.

Because they both enclose and open information, patents can tell us something new about the value and power of information across seminal distinctions between pure and applied, between open and enclosed, between secrecy and disclosure. Bogged down in the enclosure/openness dichotomy, there is a great need to restock the analytical response to the understanding of "publicness" in general, and the study of patents as documents may help us do so and arrive at a more nuanced understanding of what concepts such as "public," and "open," means in today's knowledge infrastructures. Patents are indistinguishable from the structures of the information age; indeed, they have helped build these structures in the first place, producing their own administrative and expertise communities, straddling the national and the international, becoming dependent on systems of classification, sorting and ordering, as indeed, acting every bit as the social texts that they are.

Simply put, more research is warranted on the embeddedness – historical as well as contemporary – of patents in informational systems. Such embeddedness has been constitutive of the patent system for more than a century but still remains under-researched. For the sake of limitation and logic, this paper focuses on what can be called the first period in the documentation movement, but it is hardly overconfident to suggest that as we follow all the networks of the IIB/IID into our own time, we will come to understand this embeddedness in new ways, through new technologies and alliances. The broader juncture of patents and documents opens up a number of underexplored avenues

of research which provide new perspectives both in regard to the situatedness of the patent system as a whole, but also *vis-à-vis* the informational systems that enable patents to be found and used. Future explorations deeper into this territory are absolutely necessary, but not necessarily absolute.

Notes

1. Sometimes referred to as a grinder (Van den Heuvel and Rayward, 2008, p. 132; 2011, p. 2317), I have instead opted for the melting-pot metaphor. On the importance of visualizations more generally in Otlet's *oeuvre,* see Van Acker (2011) and his "Mapping Knowledge," exhibition, available at https://artsandculture.google.com/exhibit/QQ_clnh7 (accessed December 19, 2018).
2. The organization was called *The Institut International de Bibliographie* (IIB) between 1895 and 1931. That year, it moved from Brussels to Holland and became *Institut International de Documentation* (IID). At the 1937 *Congrès* in Paris, IID was renamed *Federation Internationale de Documentation (*FID) an acronym that remained until 2002, despite that it had changed names one final time in 1986, becoming *Fédération Internationale d'Information et de Documentation*. The history of the organization's main publication, initially called the *Bulletin de l'Institut International de Bibliographie* is equally confusing. *Bulletin de l'IBB* (1895–1930), *Documentatio Universalis* (1931-1933), *IID Communicationes* (1934–1938), *FID Communicationes* (1939–1946), *Revue [Internationale] de Documentation* (1947–1965), *Informations FID* (1951–1960) and finally *FID News Bulletin*, 1960+.
3. World Intellectual Property Organization (WIPO), Paris Convention for the Protection of Industrial Property. Available at: www.wipo.int/treaties/en/text.jsp?file_id=288514#P227_38153 (accessed November 22, 2018).

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