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WHAT IS A PATENT?

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I

THE PATENT AND PUBLIC PURPOSE

A patent, or a letter patent, is an open letter addressed to all whom it may concern. The term was used at first for all grants made by the Crown and was as broad as the king's pleasure. In time, and with the rise of constitutional government, it has been narrowed in meaning. The emphasis has shifted from the first to the second word; the noun "letter" has been retired; the adjective "patent" has come to be a noun. The term now stands for a privilege granted by the Federal Government to an individual. Although the word has not entirely outgrown its original meaning—witness the land patent—it most commonly refers to invention. A patent is, then, the grant by the United States to the inventor of a right in his own invention from which all other persons, so long as the grant runs, are excluded. By statute this right is defined as the right to make, use, and vend.

The authority for the grant is a clause in the Constitution. To the Congress is granted the power "to promote the progress of science and useful arts." And the means is specified: "by securing for limited times to inventors the exclusive right to their inventions." The word "patent," be it noted, is not used. The exclusive right is a right, however it may be defined by the Congress, from which all persons save the inventor are excluded. The right is in no sense natural or inalienable.¹

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¹ Thomas Jefferson, the administrator of the first United States patent law, made this point at some length. "It has been pretended by some, (and in England especially,) that inventors have a natural and exclusive right to their inventions, and not merely for their own lives, but inheritable to their heirs. But while it is a moot question whether the origin of any kind of property is derived from nature at all, it would be singular to admit a natural and even an hereditary right to inventors. It is agreed by those who have seriously considered the subject, that no individual has, of natural right, a separate property in an acre of land, for instance. . . . Stable ownership is the gift of social law, and is given

As a gift of the national legislature it is a privilege; it is by the Constitution made an instrument of public purpose. As an incentive its frame of reference is to promote the progress of science and useful arts. This is the condition under which Congress has power to make the grant; this is the end which, if it is to be justified, the grant must serve.

Under our form of government, intolerant as it is of special privilege, such a grant must be set down as a departure; it is, within the framework of a republic, to be justified only by the importance of the end for which it is invoked. The Fathers who met at Philadelphia were intent upon preventing the political abuses which had been rife in the mother country. They were well acquainted, both from history and by experience, with the excesses which had attended the royal "patent of monopoly." They knew the part the fight against the royal prerogative, finding legislative expression in the Statute of Monopolies, had played in the struggle by which "English liberties" were won and American independence established. Intent upon preventing the recurrence of a "plague of monopolies," they conferred upon the new republic—a government of delegated and limited powers—no general warrant to issue exclusive writs of any kind.² The mandate in respect to the exclusive right to the inventor is thus to be read as an exception to the general rule.³

late in the progress of society. It would be curious then, if an idea, the fugitive fermentation of an individual brain, could, of natural right, be claimed in exclusive and stable property. If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of every one, and the receiver cannot dispossess himself of it. Its peculiar character, too, is that no one possesses the less, because every other possesses the whole of it. He who receives an idea from me, receives instructions himself without lessening mine; as he who lights his taper at mine, receives light without darkening me. That ideas should freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature, when she made them, like fire, expansible over all space, without lessening their density in any point, and like the air in which we breathe, move and have our physical being, incapable of confinement or exclusive appropriation. Inventions then cannot, in nature, be a subject of property. Society may give an exclusive right to the profits arising from them, as an encouragement to man to pursue ideas which may produce utility, but this may or may not be done, according to the will and convenience of the society, without claim or complaint from any body. Accordingly, it is a fact, as far as I am informed, that England was, until we copied her, the only country on earth, which ever, by a general law, gave a legal right to the exclusive use of an idea. In some other countries it is sometimes done, in a great case, and by a special and personal act, but, generally speaking, other nations have thought that these monopolies produce more embarrassment than advantage to society; and it may be observed that the nations which refuse monopolies of invention, are as fruitful as England in new and useful devices." 6 WRITINGS OF THOMAS JEFFERSON 180-181 (H. A. Washington ed. 1854).

² The failure specifically to make this reservation was resented by several of the states. In its proposals for revision of the Constitution at the time of ratification, Massachusetts wanted included a statement that "Congress erect no Company of Merchants with exclusive advantages of commerce"; New York suggested the inclusion that "Congress do not grant Monopolies or erect any Company with exclusive advantages of Commerce." Other states had similar proposals. See DOCUMENTS ON FORMATION OF THE UNION (Library of Congress, 1927).

³ Even James Madison, generally credited with being the author of the patent clause in the Constitution, occasionally had doubts about the provision. In replying to Jefferson, who wanted a specific anti-monopoly clause in the Bill of Rights, he said: "With regard to Monopolies, they are justly classed among the greatest nuisances in Government. But is it clear that as encouragements to literary works and ingenious discoveries, they are not too valuable to be wholly renounced? Would it not suffice to reserve in all cases a right to the public to abolish the privilege at a price to be specified in the grant of it?" 5 WRITINGS OF JAMES MADISON 1787-1790 274-275 (1904).

And, as an exception, its justification is to be found in the larger public end—over and beyond any gain to the individual—it was meant to serve.

To use an exclusive right, however worthy the purpose, is dangerous business. The instrument is at odds with the economy within which it is set. A letter patent is, within its limits, a monopoly, and the common law—eventually caught up into the antitrust acts—has decreed that our industrial system shall operate as free enterprise. A monopoly removes from the domain of competition all that it encompasses. If the monopoly can be enlarged and perpetuated, it threatens to remove areas of industry from market control and to make of them closed corporate estates. Of this threat the framers of the Constitution were quite aware. Hence they decreed that the “exclusive right” was to run only for a “limited time.”⁴

Nor did they specify the letter patent as the only form the inventor’s incentive might take. The old Continental Congress had recommended to the states the grant of premiums to encourage the development of new inventions,⁵ and had actually considered recompensing James Rumsay for an invention with a gift of thirty thousand acres of land west of the Ohio.⁶ James Madison’s own proposal at the Constitutional Convention for the reward of invention did not mention the word patents. He proposed the use of “premiums and other provisions” for encouraging the “advancement of useful knowledge and discoveries.”⁷ The notion that a bonus should be paid the inventor and the invention be then presented to the public had wide popularity, and agitation for such a system continued well after the passage of the first patent act.⁸ The device of the patent prevailed for the practi-

⁴How little Madison guessed that the innocuous patent clause in the Constitution would produce such industrial empires as United Shoe Machinery Company, RCA, and General Electric is indicated in his attitude to such corporations: “Incorporated companies, with proper limitations and guards, may, in particular cases, be useful; but they are at best a necessary evil only. Monopolies and perpetuities are objects of just abhorrence. The former are unjust to the existing, the latter, usurpations on the right of future generations.” 3 *id.* at 567.

⁵24 JOUR. CONT. CONG. 515, 516 (1922).

⁶A committee of the Continental Congress recommended “that 30,000 Acres of Land in the new Purchase to the West of Ohio be given to James Rumsay provided he shall before the first day of May next produce good and sufficient Evidence that by means of certain Mechanism of his Invention wrought or aided by three men only, a Boat carrying ten Tons has been moved for six days in succession against the Stream of the R. Ohio at the rate of 50 miles per day. Which Land he shall receive by a draught to be made out of the first Surveys that shall be transmitted to the Treasury after the necessary Proof shall have been made.” 28 JOUR. CONT. CONG. 350 (1933).

⁷DOCUMENTS ON THE FORMATION OF THE UNION, *supra* note 2 at 564.

⁸A minority of early American inventors of eminence refused to take out any patents. Benjamin Franklin said of one of his inventions in 1742, “Gov’r Thomas was so pleas’d with the construction of this stove, as described in it [a pamphlet], that he offered to give me a patent for the sole vending of them for a term of years; but I declin’d it from a principle which has ever weighed with me on such occasions, viz., *That, as we enjoy great advantages from the inventions of others, we should be glad of an opportunity to serve others by any invention of ours; and this we should do freely and generously.*” 1 WRITINGS OF BENJAMIN FRANKLIN (370 Albert H. Smith, ed. 1907).

When Thomas Jefferson invented a hemp-break, he wrote to a friend, “Something of this kind has been so long wanted by the cultivators of hemp, that as soon as I can speak of its effect with certainty, I shall probably describe it anonymously in the public papers, in order to forestall the prevention of its use by some interloping patentee.” 6 WRITINGS OF THOMAS JEFFERSON 506 (H. A. Washington ed. 1854).

cal reason that it was impossible to tell in advance how important an invention would prove to be. It was, accordingly, necessary to see to it that the "limited monopoly" was held to the public office it was intended to serve. To that end two legal restrictions were essential.

The first was to make sure that the area of the grant is properly limited. The patent has been defined as a "private claim on the public domain." And the law demands that the grant, like any other privilege, be narrowly construed. The exclusive right must be severely restricted to the invention; it must not be allowed to cover what lies in the prior art, what belongs to another, or what is a part of the public domain. The boundaries of the grant and of the owner's exclusive right are fixed by the invention; and those rights, no more and no less, the letter conveys. All the ways and means of securing his "reward" are left to the inventor; all the risks which attend "putting it to work" are for him to avoid. The government, in issuing the grant, guarantees to him no compensation; it assures him no right to do whatever is necessary to make his patent a commercial success. His remuneration—if much or less or any at all—must come directly from the exclusive right with which he is endowed in the practice of the invention. It does not, according to the Constitution and the statutes, come from privileges in relation to matters outside the invention.⁹

The second was to make sure that the privilege—confined to its legitimate area—is kept subordinate to the purpose which sanctioned its issue. The Constitution does no more than assure to the inventor the exclusive right in his invention. The statutes, judicial opinion, and practice have conspired to decree that the owner's right is "to make, use, and vend"; and that he may work the patent himself or engage

⁹ A number of provisions in the statutes make this clear. A grant of rights in the invention is invalidated if the claim made in the application or set forth in the letter goes beyond the invention. The grant is invalidated in toto if the invention and the method of its practice are not fully disclosed. The only escape which the law allows to the person who claims more than his invention is a timely correction before the Patent Office. There, to save his writ, he must show that the excess of exaggeration, devoid of any attempt to deceive, was due to mistake, accident, or inadvertence. The very condition of the issue is that the applicant shall "particularly point out and distinctly claim the part, improvement or combination which he claims as his invention or discovery." To permit an excessive claim—or to sanction a limited monopoly where the invention is not fully made public—would be to confer privilege when no grant should issue. Thus the letter, in the precision of its boundaries, marks off an area against trespass, reserves against appropriation the prior art, specifies the eventual contribution to the pool of common knowledge. To allow the patent owner to assert rights beyond those conveyed would be to blur the frontiers of the grant, to make standards of possession uncertain, to confuse the office which it is the very purpose of accurate description to serve.

In a number of recent cases the United States Supreme Court has employed this rationale to proclaim the limited scope of the patent grant. *United States v. Masonite Corp.*, 316 U. S. 265 (1942); *Ethyl Gasoline Corp. v. United States*, 309 U. S. 436 (1940); *United Carbon Co. v. Binney & Smith Co.*, 317 U. S. 228 (1942); *United States v. Univis Lens Co.*, 316 U. S. 241 (1942); *Morton Salt Co. v. G. S. Suppiger Co.*, 314 U. S. 488 (1942); *Marconi Wireless Telegraph Co. v. United States*, 320 U. S. 1 (1943); *Sola Electric Co. v. Jefferson Electric Co.*, 317 U. S. 173 (1942); *Mercoird Corp. v. Mid-Continent Investment Co.*, 320 U. S. 661 (1944); *Precision Instrument Mfg. Co. v. Automotive Maintenance Machinery Co.*, 324 U. S. 806 (1945); *Halliburton Oil Well Cementing Co. v. Walker*, 67 Sup. Ct. 6 (1946); *Edward Katzinger Co. v. Chicago Metallic Mfg. Co.*, 67 Sup. Ct. 416 (1947); *MacGregor v. Westinghouse Electric Mfg. Co.*, 67 Sup. Ct. 421 (1947).

others to work it. If he operates through others, an agreement is made and both the contract and the stream of human behavior which results must be measured by—and fall within the tolerance of—the law. If the device of license is employed to put the invention to work, the owner may attach conditions and through them exercise control over his licensee—provided that the conditions imposed are not contrary to the law of the land. Since a limited monopoly is recognized within a competitive economy, great care must be taken to make sure that the exclusive right is not exercised in such a way as to create hazards to free enterprise. A privilege sanctioned for a public purpose is not to be allowed to undo the policy through which the Congress shapes the pattern of industry.¹⁰

II

THE PATENT AND THE INVENTION

A patent is given for an invention. It follows that an accurate definition of the invention is essential to the issue of the patent. The invention needs to be sharply separated from all that is the previous art, all that as yet has not been found out, all that is not the invention. The task is like that of defining a real property, yet of far greater difficulty. Any area can be divided into personal demesnes by the drawing of precise lines. A private holding in a technological field is not so easily marked off. The land was there all the time ready to be divided; the claim is supposed to encompass something which was not there before. The land to which title is taken requires nothing more than to be marked off; the invention needs to be disentangled from the useful art out of which it is sprung. At times land law presents its perplexities; to expect to stake out an exact claim in the public domain of technology would not in advance seem to be a very promising venture.

It is, in fact, an invitation to headache for the law to undertake to separate by precise lines the novelty from everything else which makes up the useful art of which it has just come to be a part. The new comes out of the old; the innovation emerges out of what has been established. An idea may, as the "next step," be inevitable or within the reach of only the extraordinary man.¹¹ An idea, familiar to

¹⁰ This paper cannot attempt to enumerate the terms and conditions which lawfully may be lodged in the patent license. It is here enough to insist that the grant, always to be justified by the public purpose it serves, is not to be read as an immunity to the law of the land. No magic to make innocent that which is unlawful lurks in the words "exclusive right." It has become the habit of owners of large portfolios of patents to argue that an exclusive right is a plenary right which the government is without authority to alter or redeem. "The patent owner," so runs the current legend, "is an absolute czar in his realm; he can do as he pleases and is obliged to give reasons to no one." For such an interpretation of "exclusive right" there is no warrant at law or in the history of the statute. The privilege, like all of its kind, is under the law; its legal reference, as specified by the Congress, is always to the purpose of its issue.

¹¹ "But the question, who commenced the Revolution? is as difficult as that of the first inventors of a thousand good things. For example, who first discovered the principle of gravity? Not Newton; for Galileo, who died the year that Newton was born, had measured its force in the descent of gravid bodies. Who invented the Lavoisierian chemistry? The English say Dr. Black, by the preparatory discovery of latent heat. Who invented the steamboat? Was it Gerbert, the Marquis of Worcester, Newcomen, Savary, Papin, Fitch, Fulton? The fact is, that one new idea leads to another, that to a third,

one art, may be brought as a stranger to another one. A physician in a surgical operation employs a knot he learned as a canal-boy on the Erie. Gunpowder, useful to the Chinese in making a big noise to celebrate ancestors, is used in Western Europe to propel bullets; the vacuum tube, developed in the radio, is carried over to the phonograph. An ironic story tells of Edison spending the better part of two days "playing" with the vacuum tube, then, in a heroic moment, stoutly returning to his "serious business"—which was to tinker a step ahead with the old acoustical phonograph. In the plaything—physically in his hand but a universe away from his mind—he held and missed the superior answer to his immediate problem. Is it invention to make explicit what is implicit? Is it invention to borrow from one useful art to enrich another? What if familiar elements are thrown into an unfamiliar combination? What if there is a severe limit to the number of permutations and the inventor tries them all until he has hit upon the right one? What if familiar processes are adapted to unknown uses?¹²

There is in technology now and then a leap, a break with what has gone before which is sharp and great.¹³ But for the most part the useful arts move along by steps, often so gradually that not a single step stands sharply out.¹⁴ An art moves

and so on through a course of time until some one, with whom no one of these ideas was original, combines all together, and produces what is justly called a new invention." 15 WRITINGS OF THOMAS JEFFERSON 163 (Memorial ed. 1904).

¹² These problems were met with at the very inception of our patent laws. Out of his experience as member of the first Patent Board under the 1790 patent statute, Jefferson wrote to Oliver Evans: "You agree in the latter, that the chain of buckets and Archimedes screw are old inventions; that every one had, and still has, a right to use them and the hopper-boy, if that also existed previously, in the forms and constructions known before your patent. . . . Recurring now to the words of your definition, do they mean that, while all are free to use the old string of buckets, and Archimedes' screw for the purposes to which they had been formerly applied, you alone have the exclusive right to apply them to the manufacture of flour? that no one has a right to apply his old machines to all the purposes of which they are susceptible? that every one, for instance, who can apply the hoe, the spade, or the axe to any purpose to which they have not been before applied, may have a patent for the exclusive right to that application? and may exclude all others, under penalties, from so using their hoe, spade, or axe? If this be the meaning, my opinion that the legislature never meant by the patent law to sweep away so extensively the rights of their constituents, to environ everything they touch with snares, is expressed in the letter of August 13, from which I have nothing to retract, nor ought to add but the observation that if a new application of our old machines be a ground of monopoly, the patent law will take from us much more good than it will give. Perhaps it may mean another thing, that while every one has a right to the distinct and separate use of the buckets, the screw, the hopper-boy, in their old forms, the patent gives you the exclusive right to combine their uses on the same object. But if we have a right to use three things separately, I see nothing in reason, or in the patent law, which forbids our using them all together. A man has a right to use a saw, an axe, a plane separately; may he not combine their uses on the same piece of wood? He has a right to use his knife to cut his meat, a fork to hold it; may a patentee take from him the right to combine their use on the same subject? Such a law, instead of enlarging our conveniences, as was intended, would most fearfully abridge them, and crowd us by monopolies out of the use of the things we have." 6 WRITINGS OF THOMAS JEFFERSON 297, 298, 299 (H. A. Washington ed. 1854).

¹³ A striking example of this in recent times has been invention by Major E. H. Armstrong of frequency modulation, which threatens to revolutionize the radio industry.

¹⁴ All congressional hearings with respect to patents and invention are replete with testimony to this effect. A witness testifying in 1878 said, "All inventions run in lines. There is a certain progress and a steady improvement in all the arts, and, as I shall show in the course of my remarks, not by virtue of the patent law exclusively. These lines of invention are what is called 'the art.' Mr. A starts on one of these lines of invention to remedy an existing evil. He studies over the matter and gets one element. It

with the accumulated force of all that lies behind it; in our age it moves with accelerated speed. Its progress, if left unchecked, almost takes care of itself.¹⁵ Even today a patent is taken out by "the sole and true inventor." The theory is that the invention is the brain-child of a single person, or at most of two or three persons working together. An assumption which was of doubtful truth when the Constitution was drawn up in 1787 is still preserved.¹⁶ Yet now most scientific work is carried on by organized groups, permanent bodies, with research workers who come and go.¹⁷ In a continuous process of discovery, constantly refreshed by ideas from many quarters, the usual invention is of multiple authorship. Shall we, therefore, award the patent to the man who takes the last useful step in a continuous process of finding out? Or shall we attempt to reward all of those whose contributions were essential to the result? Or shall we set the invention down to a community of scientists, whose work cannot be individually isolated? And how, when the climate

makes no difference whether it is a machine or a process that is to be patented. His patent is inapplicable; it is not used at all; but he started in the right direction, and the claim of his patent covers one element of the final solution of the difficulty.

"Mr. B builds upon that, perhaps independently of A, so far as personal knowledge is concerned, and adds a second element. He has to use the first element, and consequently he gets a combination claim in his patent. He does not solve the difficulty. Mr. C adds still a third element to the other two, traveling in the same line, not necessarily knowing what the others have done. He builds upon their work, but traveling in the same line his machine or process necessarily involves the two elements invented by these other men, and Mr. C gets a combination claim for his three elements. Now, you cannot use Mr. C's patent without paying Mr. C for it, but neither can you use Mr. C's patent without paying also Mr. A and Mr. B. C's patent is perfectly valid. He has a good claim for those three elements, but his patent is subject to the other two patents, the first of which covers one element and the second covering two elements." Testimony of J. H. Raymond in *Arguments before the Committee on Patents of the Senate and House of Representatives*, 45th Cong., 2d Sess. 110 (1878).

¹⁵ Examples of patents declared invalid where the changes were found to be such that a person skilled in the particular art could make them whenever occasion should arise include the following: Thomson-Houston Electric Co. v. Lorain Steel Co., 117 Fed. 249 (C. C. A. 2d 1902) (Pat. No. 390,921); Bromley Bros. Carpet Co. v. Stewart, 51 Fed. 912 (E. D. Pa. 1892) (Pat. No. 418,349 for a carpet loom); Elliott & Co. v. Youngstown Car Mfg. Co., 181 Fed 345 (C. C. A. 3d 1910) (Patent No. 771,774 for a blue-print machine); American Chain Co., Inc. v. Cox Brass Mfg. Co., 292 Fed. 624 (E. D. Ohio 1922) (Patent No. 1,374,893 for an automobile bumper). The courts in such cases have found it difficult to discover just what changes a person skilled in the particular art would make as a matter of course, but have been helped to their conclusions by the fact that the patented changes had been made simultaneously and independently by different inventors.

¹⁶ Even in the early days of the republic, departures from beaten paths could not always be specified as the work of a particular person. At a certain time the idea of the steamboat was in the air; a number of persons could with some show of reason claim it as their own; and even today we cannot identify the true inventor beyond a reasonable doubt. William Henry, of Lancaster, Pennsylvania, completed a paddle-wheel steamboat in 1763 which sank in the Conestoga River on its first trip. James Rumsay experimented with a steamboat on the Potomac at Shepherdstown, West Virginia, in 1774 and 1786. John Fitch demonstrated a boat to the members of the Constitutional Convention in 1787 and placed a boat in commercial service in 1790. Other pioneers include Samuel Morey, Nathan Read, Oliver Evans, Elijah Ormsbee. Robert Fulton with his first boat, the "Clermont," is credited with being the first successful builder of a commercial steamboat. He at least possessed the "know-how," though it would be difficult to prove that he was the inventor.

¹⁷ Just before the war, Patent No. 2,281,613, in respect to butadiene, a synthetic rubber, was granted by our Patent Office to Heinz Wollthan and Wilhelm Becker, both of Germany, and assigned—even before it was granted—to Jasco, a Louisiana corporation owned jointly by I. G. Farben and Standard Oil. One could not say that Herr Wollthan and Herr Becker had no hand in the matter. But a most superficial knowledge of the synthetic rubber process is enough to disclose that their work could have been but a single factor in the invention.

of opinion plays a dominant role and there is a constant interchange of fact and idea, is the contribution of the individual to be isolated?

Since the law postulates an inventor, the patent is taken out in the name of a particular person. Yet the sole and true inventor—like the economic man and the reasonable man of the law—is a hypothetical being in whose name a system operates. The Patent Office takes the inventor on faith; it does not—unless two persons are laying claim to the same invention—go back of the statement made in the application.¹⁸ This leaves the matter, not to the inventor, but to the party really responsible for the application. A corporation which maintains a research staff chooses the person who is to stand as inventor for purposes of the patent.¹⁹ For this role, anyone who has had a hand—even a minor one—in bringing the novelty into being is eligible for the office of the inventor. Quite frequently the head of the laboratory signs the papers, even when his connection has been wholly administrative and in no sense scientific or technical.²⁰

Most discoveries patented today can be anticipated. They can also be assured in advance—given the time, the technicians, and the funds. Of these the funds are the mightiest. The discovery will be made by the person or the group who gets the money for the experimental work. And for the most part, technicians are not self-starters.²¹ The bulk of them, in fact, are captive; the ones in corporate employ are told by business executives what problems to work on. The garret-dweller, whatever his innate abilities, has little chance to invent if the use of a laboratory and a complement of expensive mechanisms are essential to the result. The solo inventor's real opportunity is to seize or blunder upon a pioneer idea; as a technology foliates from its base, his self-reliance is hardly a match for a bevy of experts who can be kept on the job. Above all, access to the art in action is essential to its advancement. The man who stands on the sidelines and speculates can hardly prove as effective as the technician who has at hand a going shop in which to try out every idea. There is, therefore, not even an approach to equality of opportunity for the inventor. The chance to invent is not only a matter of consequence; it is as well a pecuniary asset of great value. A captive technology offers no chance to invent except to those already in control, or to others on such terms as those in control dictate.

¹⁸ Even in the case of a conflict—technically known as an interference—it does not always have to probe into the validity of the applicant's claim. The concern of its primary inquiry is priority—to discover which applicant can establish the earlier date. Thus, save in the exceptional case, the Patent Office does not go back of the returns.

¹⁹ As Mr. Kettering of the General Motors research staff stated at the TNEC hearings, "No, there is not a lack of specific technicians. You can get somebody to do anything you want done." *Hearings before the Temporary National Economic Committee*, Pt. 30, 76th Cong., 3d Sess. 16310 (1940).

²⁰ The hearings of the Senate Patents Committee in 1942 show, in respect to the patents for butyl rubber taken out by Standard Oil, that the patents were taken out in the name of a certain Frolich who was not even in the United States when the experimental work was done.

²¹ Kettering has described invention as "team play" and has stated, "We want to keep these fellows from becoming individuals. If we gave the bonus for a new invention to the specific man under whose care it was done, then these fellows would just begin to make little cliques. . . ." *Hearings before the Temporary National Economic Committee*, Pt. 30, 76th Cong., 3d Sess. 16310 (1940).

A task of consequence is to disentangle the invention from the developing art in which it is set. The heart of the question is the novel—and workable—idea. Is “the inventor” responsible for the big idea? Or did he, following timidly where others had boldly blazed the way, merely take an all-but-obvious step or contrive a variation on a well-known device? A simple illustration will make the point. Was the safety razor a single invention, or are there as many inventions as there are distinct types on the market? It would seem that the basic notion was to attach a blade—which once used could be thrown away—at a perpendicular angle to the handle and to protect the face from the blade by a guard. Given the original safety razor, size, angle, relation of parts can be changed; the man of little imagination may ring an infinite number of permutations on the old Gillette. Is there, then, one invention to be patented, or are there thirty or three hundred? And is it the novel way to shave that is the invention, or does invention lurk in arrangement and quantitative differences among like parts?²²

It would seem that unless, in relation to the impinging art, the invention can be given a clear-cut identity, no patent should issue. Unfortunately, the salutary rule that the patent is limited to the actual invention enjoys greater repute in the courts than in the Patent Office.²³ If the examiners acted solely upon the injunction to advance “the progress of science and useful arts,” they would isolate the advance before blessing it with a patent. But, where the Patent Office assumes that an invention claimed is an invention made—unless disproved by a hurried and routine procedure—the machinery of examination is set for multiple grants.²⁴ And the patrons of the Patent Office—if they may be so defined—have been resourceful in capitalizing

²² In 1935 Waldemar Kaempffert, science editor of the New York Times, pointed out that 90,000 patents were being taken out annually, and over 2,000,000 patents had been issued by the Patent Office. He said, “It would be astounding if there were 2,000,000 first class inventions.” *Hearings before the House Committee on Patents on H. R. 4523*, Pt. 1, 74th Cong., 1st Sess. 874 (1935). The same situation had been pointed out before. In 1928 Fred S. Armstrong, an inventor, told a congressional committee, “I just saw by the report of the Commissioner of Patents that last year the Patent Office ran behind because there was such a run of patents. There were 89,000 patents, and I want to tell you that there were not 89,000 inventions in the last year. If there were really 1,000 inventions there were a lot of them.” *Hearings before the Senate Committee on Patents on S. 2783*, 70th Cong., 1st Sess. 68 (1928).

²³ Judge Learned Hand cautions us “. . . not to mistake for invention the . . . inevitable progress of an industry through trial and error,” and not to “confer a monopoly merely upon the exercise of persistent and intelligent research for improvement,” in which he finds no invention at all. *Picard v. United Aircraft Corp.*, 128 F. 2d 632, 636 (C. C. A. 2d 1942). A failure to follow this caution is a failure to define the invention. It sometimes happens that the invention lies implicit in a great scientific discovery which is not eligible for a patent; and that the invention, upon which the patent is granted, is no more than an application which any one of a host of technicians could have worked out.

²⁴ This situation has been decried in congressional hearings for decades. As early as 1878 one witness pointed out: “They have gone on now at the Patent Office so that they have educated a body of examiners there who can discriminate where there is no difference; and that is how the land comes to be flooded with these conflicting patents. The ingenuity of man runs in a particular channel; and when a thing becomes popular men work to get a share in the profits; and the Patent Office is flooded with patents so that a plain and ordinary man cannot, for the life of him, see the difference between one thing which has been patented and another which has been patented; and therefore the task of deciding is transferred to the courts.” Testimony of S. A. Hurlbut, in *Hearings before the Committee on Patents of the Senate and House of Representatives*, 45th Cong., 2d Sess. 442 (1878).

such frailties in the process of issue. It is the very purpose of the patent lawyer to flood the office with an endless stream of applications. In the field in which his client operates he wants to lay legal claim to all that is, or may become, a part of the technical process. The arsenal serves the double purpose of an armament to ward off competitors and an array of choice weapons with which to attack them.

A single case will outline the general strategy. The Ethyl Gasoline Corporation took out a single patent on the Midgley process for combining gasoline with tetraethyl lead. Then, to entrench this patent in a strategic position in a field of industrial use, a host of applications were filed. One patent applied for was for gasoline and a volatile compound of lead other than tetraethyl. Another was for gasoline burned in the presence of a gaseous ethyl compound of a metal. A third was for a compound of tetraethyl lead used as a pellet rather than a fluid. One group of five patents covered gasoline, tetraethyl lead, and at least one other agent. Four patents covered tetraethyl lead combined with other lead compounds. A group of eight—all granted on the same day—covered a volatile compound of metals other than lead. Specifically, one patent made use of selenium; another, tellurium; and others, arsenic, cadmium, bismuth, titanium, tin, nickel carbonyl, antimony. One patent was for a phosphorus compound, three for aniline; three for substances other than organic metal compounds—ammonia, benzol, iodine. And six were for patent processes for atomizing the antiknock substance. One patent was for adding tetraethyl lead at the time the fuel is dispensed to the consumer, and thirty-one were made to cover processes for the manufacture of tetraethyl lead or other compounds. Similar patents have been added from year to year. The end was to exclude all invention—if such mechanical combinations could be called invention—in a field of use dominated by a single simple idea: the mere addition of an antiknock substance to gasoline.²⁵

Note that, save for the initial idea, there is hardly a trace of novelty here. Not even experimental work was necessary as a preliminary to the applications filed in the Patent Office. It cannot be positively asserted that they were worked out without benefit of a laboratory. But the whole lot could easily have been mapped out by a man familiar with the chemical field without any indulgence in practical trial and error.²⁶ His requisites need have been no more than a model application form, a few hours of time, and a typewriter. Under such a process of issue, it is a matter of course that grants overlap, get tangled, usurp the same technical domain.

²⁵ After the company had firmly entrenched itself in its heavily buttressed patent monopoly, the outlawing of its pricing practices by the United States Supreme Court (*Ethyl Gasoline Corp. v. United States*, 309 U. S. 436 (1940)) had not the slightest effect upon the traditional two-cent retail differential between ethyl and standard grades of gasoline.

²⁶ While the Ethyl Corporation was developing a volatile compound of lead, I. G. Farbenindustrie was engaged upon similar experimental work with iron. I. G. took out a number of patents upon this alternative process, the validity of which was not questioned by Ethyl. In fact, a contract between the parties made Ethyl the agent of I. G. in the sale of this particular volatile compound in the United States. In function, in action, in process, the lead compound and the iron compound are identical. The only essential difference—a difference which it would not take a scientist to think up—is the shift from lead to iron as the antiknock agent.

III

THE BLURRED EDGES OF THE GRANT

A direct mind would assume: one invention, one claim. The mind habituated to patent usage realizes that in the claim he has a mighty asset. He wishes to blanket with his patent as large a technical area as possible; to that end an elaboration of claims is a handy instrument. A single grant covers the whole process of frequency modulation. Separate grants might have been taken out for transmission and reception. Or a number of patents might have been secured upon each of the two mechanisms in which the invention was realized. Or the basic patent might have been "fortified" by a series of patents on the parts of the equipment. The "covering" technique not used here is, however, subject to rather general employment. In securing its patents the United Shoe Machinery Company takes full advantage of multiple grants. So do other large corporations, such as RCA, General Electric, and du Pont, to whom a large "portfolio" of patents is an essential stock in trade.²⁷ The process of fragmentation presents distinct assets. Grants may be made to overlap; gaps may be left between the separate patents; the sum of the patents may be more or less than the process it professes to cover; the disclosure may fall short of a revelation of the technique.²⁸

The reason for the practice is no mystery. The Patent Office—rather than the statute—tolerates a multiplication of claims. The patent applicant uses a device which is tolerated to make his protection as broad and secure as possible. A large number of claims are made to stand for a single discovery, "each spreading the patent in a different direction like the ribs of an umbrella."²⁹ The notion is that if one, two, several of these fail to stand up, there are others in reserve to fall back on. And, even if it is easy to explode a single claim, it is not an easy matter to break through the cordon and have all declared invalid. The process of elaboration, by resort to the art of drafting, does not add one scintilla to the discovery; in however

²⁷ For an illustrative list of patents held by large corporations, see Appendix to *House Hearings on Act Authorizing the Federal Trade Commission to Accept and Administer Government Patents* 3408 ff. (1939). General Electric controls between 8,000 and 9,000 patents; American Telephone and Telegraph, 15,000; International Harvester, 1,000. Most of the companies reporting stated that only a very small proportion of patents taken out were in actual use.

²⁸ Consider the possibilities. An invention may be of primitive simplicity; yet it can be viewed from a number of different angles. It can be described in sheer mechanical terms; on this level there can be as many claims as there are plausible permutations of wheels, bolts, rivets, parts. It can then be described in terms of a process which, if verbal ingenuity holds out, can be elaborated into a series of processes, each of which attains legal dignity as a claim. Then it can be described in terms of the function it is held out to perform; and a function, at the hands of an expert craftsman, can be made to beget other functions, any one of which is good for a claim. And, finally, that the several descriptions shall not stand out in isolation, a kind of over-all halo may be set down "in different degrees of polysyllabic complexity in order to give an appearance of profundity." Although now the job is done, for good measure—and in the hope that more of them may get by—a number of claims may be copied bodily from other publications. *E pluribus unum* is set into reverse.

²⁹ *Monsanto Chemical Co. v. Coe*, 145 F. 2d 18, 19 (App. D. C. 1944). Another judge has recently referred to a "proliferation of patents." *United States v. National Lead Co.*, 63 F. Supp. 513, 532 (S. D. N. Y. 1945).

many forms it is encased in words, a single invention remains a single invention. It does, however, blur the edges of the patent and it does drive a line between the patent and the invention.

As the edges of the patent are blurred, it is not easy to determine what has been granted and what has been withheld. The Patent Office cannot be quite certain what it has sworn away. So it is to be expected that in instances—in fact, quite habitually—grants will overlap, and that two or more persons may secure patents for what is in essence a single invention. In the usual case the patents are not exactly alike; logomachy has too many possibilities for that. And even in material terms there may be technical differences. In the fields of chemicals and metallurgy particularly there is abundant opportunity for variation without essential difference. The materials may be slightly altered; the steps which make up the process may be set down in a somewhat different order. The invention may be rather differently resolved into its parts, for each of which a separate patent is asked. Since the division can be done in different ways, the several patents in the two or more series will fail to correspond—although the sum of the patents of one inventor is the equivalent of the sum of patents held by the other. The use of technical language and the over-elaboration of description may be so skillfully effected as to make the two sets of applications appear very different in the sight of the Patent Office. Such differences may be small or great; they are likely to be in particulars, not in principle. The norms of the scientist would reveal far fewer and less sharp distinctions than the official examiners manage to discover. As thus a single novelty comes to support a multiplex of grants, the norm for a true invention threatens to be lost.

Nowhere in the economy is there need for sharper definition than with the letter patent; yet the Patent Office fails to fit out with sharp edges the writs it issues. If it is desirable that the inventor secure an exclusive right in his invention, it is equally essential that his privilege shall not trespass upon what is not his. He has no claim to the prior art, to any antecedent scientific discovery, to any bit of technology which lies to right or left. That which is his contribution needs, as a condition of the grant, to be sharply separated from all to which it is related. Unless that is done, the patent owner may assert a private claim to some part of the fund of common knowledge; he may assert a monopoly over techniques which all members of the industry are legally free to use. The United States Supreme Court has denied access to equity to owners who use their patents beyond the limits of the grant.⁸⁰ The sharpest sort of definition is necessary to protect the public domain against technological trespass.

At present the Patent Office accords no such protection to the right of the public in technology. The applicant employs the broadest sort of language; he claims all that he has any chance to get. Even if he knows how limited his contribution is,

⁸⁰ *Morton Salt Co. v. G. S. Suppiger Co.*, 314 U. S. 488 (1942); *Mercoid Corp. v. Mid-Continent Investment Co.*, 320 U. S. 661 (1944); *Hartford-Empire Co. v. United States*, 323 U. S. 386 (1945); *United States v. National Lead Co.*, 67 Sup. Ct. 1634 (1947).

he has no incentive to erect modest barriers upon his own preserves. If he can secure title to more than he has created, so much the greater is his strategic hold upon the whole of a useful art. Such a hazard is likely to be minimized by the beneficiaries of the system. The usual apologist professes to see no danger of the patent owner's claiming what is not his.³¹ This bit of folklore is rather more comfortable than akin to the facts of life. A huge number of outstanding patents have been drawn with little regard to trespass on the public domain. Today, in view of the general dissemination of scientific and technical knowledge, not one but many persons—given access to the present state of the art—have the capacity to make the invention. And each year a flood of patents are granted which close to the craft of scientists opportunities to invent. Almost all invention, under the conditions of today, is carried on within—not without—the public domain. This circumstance demands utmost precision in marking out the boundaries of grants.

In the light of this situation, the letter which now issues from the Patent Office does not—and cannot—have finality. The degree of presumption set down in its favor must reflect the character and thoroughness of the inquiry which precedes its issue. The bevy of claims attending multiple patents for a single invention presents a docket of issues quite beyond the capacity of the Patent Office expeditiously to resolve. The examiner, in making his decision, must depend upon a hurried search through scanty materials. He has at hand no such voluminous and searching a body of materials as opposing lawyers present when an infringement suit is fought out by adverse parties in open court. As the patent issues, its boundaries are only vaguely defined, and whether or not there should be a grant at all is a question which has received only a tentative answer.

The patent carries—and as matters now go can be made to carry—no warranty. The Patent Office does not stand—it could not stand—back of its grants. The writs it issues are worth whatever they are found to be worth later in a bout at law. The letter gives to its owner the right to go into court and there bring suit against any person who without his consent makes use of the invention. In the trial a number of defenses are open to the alleged infringer. He can produce a patent of his own; he can insist that he has not trespassed upon forbidden territory; he may deny novelty in the invention. Then the question of the boundary between grants, of the frontier between the well known and the novel, must be threshed out anew. The patent is little more than a ticket of admission to the courts. The Patent Office guarantees nothing but a chance at litigation.

³¹ "Patents represent an addition to, and not a subtraction from the public wealth; the giving of something to the public, not taking anything away from it." GEORGE E. FOLK, PATENTS AND INDUSTRIAL PROGRESS 387 (1942). Folk has been patent advisor to the National Association of Manufacturers, and for twenty years was general patent attorney for American Telephone & Telegraph Company.

IV

THE PROBLEM OF POLICY

The patent system has gone astray. About a nucleus in the law, a great body of usages for which the law furnishes no sanction has been developed. Large segments of the industrial domain have been engulfed in a flood of patents and caught up in the control of one or a few dominant corporations;³² whole industries have had their policies lock-stepped through the pooling of patents, under which a handful of industrial giants act as one.³³ And as the activities of these corporations have spread out and beyond national frontiers, there have sprung up—under the sanction of the patent—international trade accords among the industrial elect. The negotiations of the gentlemen of Standard Oil and I. G. Farben, of du Pont and Imperial Chemical Industries, despite the intricacy and detail of the problems, met with far greater success than the accords achieved by their governments; an amity and understanding developed rapidly which made a resort to—even a threat of—violence unthinkable.³⁴ In each instance the patent has been the instrument for setting limits on production, establishing restricted market areas for members, curbing the unruly advance of technology, setting prices, and fixing other terms for the control of the industry.

Today we have no established policy with respect to the place of the useful arts in the national economy. There is no policy in respect to the encouragement of invention, its introduction into the industrial system, the control of its own devastating consequences. Instead we have allowed technology to become captive to the corporate estate, where its advance or stagnation has had to wait upon the irrelevant prompting of the profit motive. Despite the reiterated beat of the problem—the same points made over and over again at congressional hearings—Congress has continued to turn a deaf ear to patents, to the extra-legal uses to which the grants have been put, to the neglect and even stifling of fundamental inquiry. The ad-

³² See, for example, the *Hartford* and *National Lead* cases, which are ably discussed in Marcus, *Patents, Antitrust Law and Antitrust Judgments Through Hartford-Empire*, 34 GEO. L. J. 1 (1945), and Zlinkoff and Barnard, *The Supreme Court and a Competitive Economy: 1946 Term*, 47 COL. L. REV. 914 (1947).

³³ Samuel E. Darby, prominent patent attorney, in presenting a picture of the RCA patent monopoly, has stated: "Due to the fact that these large corporations maintain a large staff of patent solicitors who are devoting their energies to grinding out patents, it is inevitable that patents of one company of the pool overlie or so closely ally with patents of other companies of the pool that, as a result of the patent pooling, and the close cooperation of the patent solicitors made possible thereunder, it becomes difficult, if not impossible, as a practical matter, to manufacture any commodity in this industry, even under license from one of the companies, without infringing, in terms at least, upon one or more patents of another member of the pool. To offset this, therefore, a cautious manufacturer is required to go from door to door begging a license from each, and agreeing to pay any royalty each requires, to a point where, logically, the royalties, in total sum, may equal or exceed the cost of manufacture of the device itself." *Hearings before the House Committee on Patents on H. R. 4523*, Pt. 1, 74th Cong., 1st Sess. 999 (1935).

³⁴ For a discussion of these agreements and the documents, see *Hearings before the Senate Committee on Patents*, *supra* note 22.

vances which have been made, now painfully slow, now turbulent, have come in spite of public neglect.

It is hard to realize how antique, how very antique, our patent policy is. Our present patent act, with a few amendments largely procedural, goes back to the 1830's; in its essence it is little changed from the initial acts of the 1790's. Think what a labor policy, an investment policy, a taxation policy would be today, if it represented the legislative will of 1793 even with such change as has come to it in extra-legal ways. The present patent system represents, not a conscious commitment of public policy, but the acts of persons who have attempted to turn the system to their own advantage. The lack of a policy in respect to technology is a great—perhaps the greatest—source of national weakness at the present time.

The useful arts stand at the very center of the economy. It is the useful arts which determine the forms into which labor and capital are cast. It is the advance of the industrial arts which creates or denies opportunities for enterprise and for employment. It was the emergence of a new technology which ushered in the industrial revolution; it is the constant shift in technology which makes the industrial revolution a continuous process. It was once said that the standard of life was pent in by our limited resources. We now know that technology is the more fundamental factor; that our natural resources are largely what the current state of our industrial arts makes them. By invention and discovery we find potential wealth in what otherwise would be inert matter. A new technique creates new wealth; an advance in technology secures more out of familiar resources. The rate of technical advance is an index to the progress of the nation. The patent must be restored to its constitutional office; it must again become an instrument to the progress of science and useful arts.