

THE JOHN MARSHALL REVIEW OF INTELLECTUAL PROPERTY LAW



KSR AND STANDARDS OF INVENTIVE STEP: A EUROPEAN VIEW

PAUL COLE

ABSTRACT

The United States Supreme Court decision in *KSR International Co. v. Teleflex Inc.* raises many questions, most importantly, how the test for obviousness applied in the United States (“U.S.”) now compares with that applied in the United Kingdom (“U.K.”) and by the European Patent Office (“EPO”). In seeking to answer those questions, this article explores the history of obviousness and the tests for inventive step in the United States, the U.K. and the European Patent Office. A comparison of the United States Patent and Trademark Office and EPO examination guidelines, suggests that it would have been a good idea to inform the U.S. patent examiners that if an applicant can demonstrate a new and unexpected result, this is strong prima facie evidence of inventive step, a fact supported by several opinions of the U.S. Supreme Court. Experience in the EPO is that where an applicant can demonstrate a credible technical problem that he has solved, he will almost always be granted a patent. This article asserts that instructions to examiners are of general importance because they are the main tool used during examination and the important event for most applicants is grant or refusal by the patent office. Thus, quality patent examination is not just a matter of ensuring that applications lacking merit are reliably refused, but also of ensuring that meritorious applications are reliably granted.

Copyright © 2008 The John Marshall Law School



Cite as Paul Cole, *KSR and Standards of Inventive Step: A European View*, 8 J. MARSHALL REV. INTELL. PROP. L. 14 (2008).

KSR AND STANDARDS OF INVENTIVE STEP: A EUROPEAN VIEW

PAUL COLE*

INTRODUCTION

When it first reached the United States Supreme Court (“Supreme Court”), the *KSR International Co. v. Teleflex Inc.*¹ case was said to be all about the collocation/combination test.² In its opinion, the Supreme Court expressed qualified approval of that test, but omitted to apply it to the facts about which it had to decide and instead reached its decision on other grounds,³ which could be regarded as a curious incident⁴ and perhaps a clue to an implicit intention of the court. It is submitted that it was not an accidental omission, but instead was a deliberate policy decision that amounted to a tacit but significant change of position, as will be explained below.

Under the common law, only the *ratio decidendi* of a decision is binding in subsequent cases—i.e. that abstract principle of law which determined the judgment.⁵ Nothing else is binding; although, it may be a highly persuasive *obiter dictum*.⁶ It is plain on the face of the *KSR* opinion that the same outcome could have been reached without any mention whatsoever of the collocation/combination test and of the controversial decision in *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*⁷ Therefore, questions arise: what weight (if any) should now be given to the collocation/combination test, how it fits into the framework for applying the statutory language of 35 USC §103 set out in *Graham v. John Deere Co.*,⁸ and how the test for obviousness applied in the United States (“U.S.”) now compares with that applied in the United Kingdom (“U.K.”) and by the European Patent Office (“EPO”).

* European Patent Attorney, CIPA authorized IP litigator, Visiting Professor of IP Law, Bournemouth University.

¹ 127 S. Ct. 1727 (2007).

² *Id.* at 1739.

³ *Id.* at 1741–42.

⁴ See SIR ARTHUR CONAN DOYLE, *Silver Blaze*, THE MEMOIRS OF SHERLOCK HOLMES, available at http://etext.library.adelaide.edu.au/d/doyle/arthur_conan/d75me/silver.blaze.html. “Is there any point to which you would wish to draw my attention?” “To the curious incident of the dog in the night-time.” “The dog did nothing in the night-time.” “That was the curious incident,” remarked Sherlock Holmes.” *Id.*

⁵ BLACK’S LAW DICTIONARY 1290 (8th ed. 2004).

⁶ *Id.* at 1102.

⁷ See *Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 152 (1950) (reversing the lower courts and finding the patent invalid based because the lower courts used a standard of invention which was “less exacting than that required where a combination is made up entirely of old components”); see also Paul Cole, *Supermarket Check-outs Revisited*, PATENT WORLD, Mar. 1988, at 12–17 (stating that amongst other difficulties with that decision, the art of providing equipment for playing pool was considered analogous to the art of designing equipment for supermarkets, and a closed three-sided frame for assembling the balls used in pool was equated with a three-sided open frame for collecting, moving and discharging goods on a supermarket counter).

⁸ See *Graham v. John Deere Co.*, 383 U.S. 1, 14–15 (1966); see also 35 U.S.C. § 103 (2006).

I. TESTS FOR INVENTIVE STEP UNDER THE COMMON LAW

A late development, obviousness is a concept derived from judicial opinions and inclusion of a statutory requirement that claimed subject matter should not be obvious.⁹ It is to be found neither in the U.K. Statute of Monopolies 1623, nor in the U.S. Constitution. Obviousness was not included in any U.K. statute up to 1932, nor in any U.S. statute up to 1952.

In *Graham*, the Supreme Court referred to Thomas Jefferson's active interest in and influence on the development of the patent system, and held that his conclusions on patentability "are worthy of note."¹⁰ Jefferson's views were summarized in the following terms:

Only inventions and discoveries which furthered human knowledge, and were new and useful, justified the special inducement of a limited private monopoly. Jefferson did not believe in granting patents for small details, obvious improvements, or frivolous devices. His writings evidence his insistence upon a high level of patentability.¹¹

Therefore, it is appropriate to consider briefly the role of Jefferson in the development of the U.S. patent system and the views that he expressed in the letters quoted by the Supreme Court in *Graham*.

The first U.S. Patent Act of 1790 provided that any person or persons could petition the Secretary of State, the Secretary for the department for War, or the Attorney General that they "hath or have invented¹² or discovered¹³ any useful art,

⁹ See also *Am. Braided Wire Co. v. Thomson*, (1889) 44 Ch.D. 274, 6 R.P.C. 518, 528 (C.A. 1890) (introducing considerations of obviousness); Patents and Designs Act, 1932, 22 & 23 Geo. 5, c. 32, § 3 (Eng.) (stating a patent may be invalidated when "the invention is obvious and does not involve any inventive step having regard to what was known or used prior to the date of the patent"); 35 U.S.C. § 103 (2006) (setting forth the conditions for patentability, specifically non-obvious subject matter); *Graham*, 383 U.S. at 14 (stating "patentability is to depend, in addition to novelty and utility, upon the 'non-obvious' nature of the 'subject matter sought to be patented'").

¹⁰ *Graham*, 383 U.S. at 7.

¹¹ *Id.* at 9.

¹² Patent Act of 1790, ch. 7, sec. 1, 1 Stat. 109, 109–110 (repealed 1793) (current version at 35 U.S.C. § 112 (2006)). The word "invention" was used early on to mean something created or devised. See SIR THOMAS ELYOT, *THE BOKE NAMED THE GOVERNOUR LONDON*, Vol. 1, at 273–74 (Henry Herbert Stephen Croft ed., Kegan, Paul, Trench, & Co., London, 1883) (1531). Elyot, a courtier of Henry VIII and a friend of Sir Thomas More, wrote: "undoubtedly they that write of the firste inuentions of thinges, haue good cause to suppose Lucifer, prince of deuilles, to be the first inuentour of dise playinge, and helle the place where it was founden." (sic) *Id.*

¹³ Patent Act of 1790, ch. 7, sec. 1, 1 Stat. at 110. The term "discover" originally meant expose in the sense of betray; discoverer originally meant "informer." The modern meaning, to obtain knowledge or sight of that which was not known, dates from 1535. See, e.g., MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY 357 (11th ed. 2005). About the time when the U.S. Constitution was being drafted, a range of meanings of the word discover was in existence. See generally WILLIAM HANDS, *THE LAW AND PRACTICE OF PATENTS FOR INVENTIONS* (W. Clarke & Sons 1808). The following passages are relevant to the meaning of the term "discover": "the discoverer of the expansive force of steam"; "the publisher of the discovery"; "as the patentee's reward for the discovery"; "most of the cases which have arisen upon patents, have been decided against the patentees, upon the grounds of their *not* having made full and fair discoveries of their inventions." *Id.* at 5, 7–8, 12. The U.S.

manufacture, engine, machine, or device, or any improvement therein not before known or used” and that a patent might be granted if the invention or discovery was “sufficiently useful and important.”¹⁴ It also provided for pre-grant examination whether the letters patent was “conformable to this Act,” and it is believed that this was the first provision for pre-grant examination of patent applications on their merits anywhere in the world.¹⁵ As noted in *Graham*, Jefferson served as Secretary of State and while a member of the “patent board” was well aware of the “difficulty of ‘drawing a line between the things which are worth to the public the embarrassment of an exclusive patent, and those which are not.’”¹⁶ Jefferson also explained some of the rules that the board evolved to exclude patents for certain types of subject matter:

- (a) a mere change of use of an existing machine, e.g. the use of “a screw for crushing plaster might be employed for crushing corn cobs” or the use of “a chain pump for raising water might be used for raising wheat”;
- (b) a mere change of form, e.g. “a high-quartered shoe instead of a low one; a round hat instead of a three-square; or a square bucket instead of a round one”;
- (c) a mere change of material, e.g. “a ploughshare of cast rather than of wrought iron; a comb of iron instead of horn or of ivory, or the connecting buckets by a band of leather rather than of hemp or iron.”¹⁷

At least some of these rules were incorporated into the U.S. Patent Act, 1793, Ch. 11, Section 2 which pointed towards a future test for inventive step insofar as it provided *inter alia* that “*simply* changing the form or the proportions of any machine, or composition of matter, in any degree, shall not be deemed a discovery.”¹⁸ The inclusion of the word “simply” deprives the statute of its bright-line character, and it is apparent that its exclusion would not necessarily cover a change of form or proportions giving rise to a new effect.

Section 3 of the 1793 statute pointed towards a requirement for patent claims insofar as it required the inventor to “fully explain the principle, and the several modes in which he has contemplated the application of that principle or character, by which it may be distinguished from other inventions.”¹⁹

The examination provided for by the 1790 statute took more time than the members of the patent board could spare from their other duties, and in 1793 the

Patent Act of 1790 uses the expression “invention or discovery,” which points to a finding itself rather than to a disclosure of that finding. *See* Patent Act of 1790, ch. 7, sec. 1, 1 Stat. at 110. However, it may be that both senses are implied.

¹⁴ Patent Act of 1790, ch. 7, sec. 1, 1 Stat. at 110.

¹⁵ *Id.*

¹⁶ Letter from Thomas Jefferson to Isaac M’Pherson (Aug. 13, 1813), *in* VI THE WRITINGS OF THOMAS JEFFERSON: BEING HIS AUTOBIOGRAPHY, CORRESPONDENCE, REPORTS, MESSAGES, ADDRESSES AND OTHER WRITINGS, OFFICIAL AND PRIVATE, 1790–1826, at 181 (H. A. Washington ed., 1859) [hereinafter Letter, Isaac M’Pherson]. *See also* *Graham v. John Deere Co.*, 383 U.S. 1, 9 (1965) (noting that Thomas Jefferson served as Secretary of State).

¹⁷ Letter, Isaac M’Pherson, *supra* note 16, at 181–82.

¹⁸ Patent Act of 1793, ch. 11, sec. 2, 1 Stat. 318, 321 (repealed 1836) (current version at 35 U.S.C. § 112 (2006)) (emphasis added).

¹⁹ *Id.* at 321–22.

U.S. patent system reverted to mere registration, with the validity of granted patents being determined by the courts.²⁰ Jefferson did not approve of this development, believing that examination of patents required technical rather than legal skills:

Instead of refusing a patent in the first instance, as the board was authorized to do, the patent now issues of course, subject to be[ing] declared void on such principles as should be established by the courts of law. This business, however, is but a little analogous to their course of reading, since we might in vain turn over all the lubberly volumes of the law to find a single ray which would lighten the path of the mechanic or the mathematician. It is more within the information of a board of academical professors, and a previous refusal of patent would better guard our citizens against harassment by law-suits. But England had given it to her judges, and the usual predominancy of her examples carried it to ours.²¹

The correspondence of Thomas Jefferson, quoted by the Supreme Court in *Graham*, concerns the flour milling inventions of Oliver Evans, who was one of the distinguished inventors of the Founding Father generation and who deserves to be numbered with John Fitch and Robert Fulton.²² In addition to his flour milling inventions, Oliver Evans experimented with steam engines and a “steam-driven land carriage.”²³ Evans made three inventions concerning improved mills which were evaluated by Jefferson,²⁴ and which are discussed briefly below because they demonstrate how he applied the requirements of novelty and sufficient “importance”:

(a) A device called the Hopper Boy for cooling and drying flour immediately after it had been ground and before it was packed. This took the form of a pan for receiving the flour and a rake for turning over the flour which was connected to and moved with the mill machinery. Of this, Jefferson said, “[t]he Hopper-Boy is a useful machine and, so far as I know original.”²⁵ It turned out, however, that others had made and used similar devices before

²⁰ Compare Patent Act of 1790, ch. 7, sec. 1, 1 Stat. 109, 110 (repealed 1793) (current version at 35 U.S.C. § 112 (2006)) (providing for the granting of patents if deemed “sufficiently useful and important”), with Patent Act of 1793, Patent Act of 1793, ch. 11, sec. 2, 1 Stat. at 320 (removing the phrase “sufficiently useful and important”).

²¹ Letter, Isaac M’Pherson, *supra* note 16, at 182.

²² *Id.*; see also Thomas P. Jones, *Preface* to OLIVER EVANS, THE YOUNG MILL-WRIGHT AND MILLER’S GUIDE, vi (Blanchard and Lea 1860) (likening the contributions of Oliver Evans to that of Whitney and Fulton).

²³ See Albert Shaw, ed., *Eighteenth-Century Automobiles*, 60 AM. REV. OF REV., Oct. 1919, at 443 (citing Oliver Evans application for patent for a vehicle driven by steam).

²⁴ See Letter, Isaac M’Pherson, *supra* note 16, at 175 (describing subject of letter as Mr. Oliver Evans’ exclusive right to the use of what he calls his elevators, conveyors, and hopper-boys); see also Letter from Thomas Jefferson to Oliver Evans (Jan. 16, 1814), in THE WRITINGS OF THOMAS JEFFERSON: BEING HIS AUTOBIOGRAPHY, CORRESPONDENCE, REPORTS, MESSAGES, ADDRESSES AND OTHER WRITINGS, OFFICIAL AND PRIVATE, 1790–1826, at 297 (H. A. Washington ed., 1859) [hereinafter Letter, Oliver Evans] (describing evaluation of elevators, conveyors and hopper-boys).

²⁵ Letter, Isaac M’Pherson, *supra* note 16, at 180.

Evans, and the relevant patent was eventually held to be invalid by the Supreme Court²⁶;

(b) A screw conveyor for flour and grain. Jefferson gave this qualified approval: “The screw of Archimedes is as ancient, at least, as the age of that mathematician, who died more than 2,000 years ago . . . [t]he cutting of its spiral worm into sections for conveying flour or grain, seems to have been an invention of Mr. Evans, and to be a fair subject of a patent right. But it cannot take away from others the use of Archimedes' screw with its perpetual spiral, for any purposes of which it is susceptible.”²⁷

(c) A conveyor based on a chain of buckets mounted on an endless leather strap. Jefferson was firmly of the view that the conveyor was not an invention because the leather strap which was added by Evans was not a patentable difference²⁸:

The question then whether such a string of buckets was invented first by Oliver Evans, is a *mere question of fact* in mathematical history. Now, turning to such books only as I happen to possess, I find abundant proof that this simple machinery has been in use from time immemorial. Doctor Shaw, who visited Egypt and the Barbary coast in the years 1727-8-9, in the margin of his map of Egypt, gives us the figure of what he calls a Persian wheel . . . his figure, and the verbal description of the Universal History, prove that the string of buckets is meant under that name. His figure differs from Evans' construction in the circumstances of the buckets being round, and strung through their bottom on a chain. But it is the *principle*, to wit, a string of buckets, which constitutes the invention, not the *form* of the buckets, round, square, or hexagon; nor the manner of attaching them, nor the material of the connecting band, whether chain, rope, or leather. . . .

. . . .
 . . . These verbal descriptions, applying so exactly to Mr. Evans' elevators, and the drawings exhibited to the eye, flash conviction both on reason and the senses that there is nothing new in these elevators but their being strung together on a strap of leather. If this strap of leather be an invention, entitling the inventor to a patent right, it can only extend to the strap, and the use of the string of buckets must remain free to be connected by chains, ropes, a strap of hempen girthing, or any other substance except leather. But, indeed, Mr. Martin had before used the strap of leather.²⁹

One of the main achievements of Oliver Evans was to combine items of equipment so that a mill could be operated in a largely automatic manner with

²⁶ See *Evans v. Eaton*, 20 U.S. (7 Wheat.) 356, 435 (1822).

²⁷ Letter, Isaac M'Pherson, *supra* note 16, at 179.

²⁸ *Id.* at 177, 179.

²⁹ *Id.* (emphasis added).

considerable saving in the manpower needed.³⁰ However, Jefferson was not persuaded that combining known items of equipment to achieve this somewhat generalized result was inventive.³¹ In a subsequent letter to Oliver Evans, he said:

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? [T]hat no one has a right to apply his old machines to all the purposes of which they are susceptible? [T]hat 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? [A]nd 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.³²

It is apparent from the above quotation that the “high level of patentability” referred to by the Supreme Court in *Graham* deserves explanation in the light of the detailed content of these documents. Clearly Jefferson’s view that patents for small details, obvious improvements, and frivolous devices is supported by his writings. It is also clear that Jefferson did not approve of patents for mere collocations.³³ But there is little support for the proposition that he advocated any qualitative test. It seems that Jefferson’s view was that patentable novelty was an issue of fact to be decided objectively having regard to the relevant state of the art as evidenced, e.g. by the books that in his library, that the question had a simple yes or no answer, and

³⁰ Thomas P. Jones, *Preface to OLIVER EVANS, THE YOUNG MILL-WRIGHT AND MILLER’S GUIDE*, vi (Blanchard and Lea 1860) (stating that even forty years after Evans first made improvements to the flour mill, American mills were superior to mills in Great Britain).

³¹ Letter, Oliver Evans, *supra* note 24, at 298–99

³² *Id.*

³³ *Id.*

that Jefferson applied that standard to the facts of the hopper-boy dispute in a manner that is fully in accordance with modern practice.³⁴

In 1836, a new patent act was passed setting up the U.S. Patent Office.³⁵ However, the provisions relating to form and proportions were not re-enacted, which implies acceptance of the proposition that patentability is to be decided according to the evidence and that bright-line rules cannot be devised.³⁶

Although a requirement for inventive step was implicit in earlier U.K. and U.S. decisions, the U.S. Supreme Court in *Graham v. John Deere Co.*³⁷ attributed its origin in U.S. law to the opinion in *Hotchkiss v. Greenwood*³⁸ insofar as that opinion called for a comparison between the subject matter of the patent or application and the background skill of the calling and for determination of patentability on the basis of that comparison.³⁹ But the words of the U.S. Constitution and of the patent statutes at that time referred to “inventor” and “discovery”. It was natural that the courts repeatedly returned to the language of the statutes which were then in force, although this led to what was euphemistically referred to in *Graham* as “a large variety of expressions in decisions and writings.”⁴⁰ The opinion of Justice Douglas in *Cuno Engineering Corp. v Automatic Devices Corp.*⁴¹ was particularly singled out. It not only equated a requirement for “more ingenuity . . . than the work of a mechanic skilled in the art” with a requirement for “a flash of creative genius,” but also used the word “merely” to denigrate the production of a “more efficient, useful, and convenient article,” which has elements of self-contradiction.⁴² For these reasons, in 1952, Congress codified the inventiveness requirement in § 103 and defined the operative requirement to be “non-obviousness” which was believed to be more definite than “invention.”⁴³ However, the attempt to sweep away existing judicial precedents

³⁴ See Letter, Isaac M’Pherson, *supra* note 16, at 177–79.

³⁵ Patent Act of 1836, ch. 357, sec. 1, 5 Stat. 117, 117–118 (repealed 1870) (current version at 35 U.S.C. § 112 (2006)).

³⁶ Compare Patent Act of 1793, ch. 11, sec. 2, 1 Stat. 318, 321 (repealed 1836) (current version at 35 U.S.C. § 112 (2006)) (providing that “simply changing the form or the proportions of any machine, or composition of matter, in any degree, shall not be deemed a discovery.”), with Patent Act of 1836, ch. 357, sec.1, 5 Stat. at 118. (failing to include language concerning form or proposition and stating that a patentee must “particularly specify and point out the part, improvement, or combination, which he claims as his own invention or discovery”).

³⁷ 383 U.S. 1 (1966)

³⁸ 52 U.S. (1 How.) 248 (1851).

³⁹ *Id.* at 267. The Supreme Court held that a patentable invention must demonstrate more ingenuity and skill than an ordinary mechanic acquainted with the business would possess. *Id.*

⁴⁰ *Graham*, 383 U.S. at 14. The Supreme Court noted that the “invention” language of *Hotchkiss* was ambiguous when compared to Congress’ “nonobviousness” test found within the Patent Act of 1952. *Id.*

⁴¹ 314 U.S. 84 (1941).

⁴² *Id.* at 90–91.

⁴³ Patent Act of 1952, ch. 950, § 103, 66 Stat. 792, 798 (current version at 35 U.S.C. § 103 (2006)). The section addressing non-obvious subject matter states:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

and lower the threshold for patentability (if there ever was such a threshold) was unsuccessful since the *Graham* court held that the revision was not intended to change the general level of patentability but merely to codify existing precedents.⁴⁴

As is familiar, *Graham* sets out an algorithmic approach requiring three factual enquiries to be made before the issue is determined, the steps of the algorithm being to:

- (a) determine the scope and content of the prior art;
- (b) ascertain the differences between the prior art and the claims at issue;
- (c) resolve the level of ordinary skill in the pertinent art; and then
- (d) against this background determine the obviousness or non-obviousness of the claimed subject matter.⁴⁵

Courts decide cases according to the evidence, and it is strongly arguable that to do otherwise denies the parties due process. It is therefore not surprising that after specifying matters that should be covered in evidence, the approach leaves the court with the same freedom of decision that it had before. Clearly the evidence that might be submitted is not limited to the required factual enquiries and could, for example on behalf of a patentee, cover the achievement of a new result, the unexpected nature of that result, and whether the prior art relied on teaches towards or away from the invention.⁴⁶ In addition to this technical evidence, the Court held that circumstantial evidence or “secondary considerations,” might be relevant, including commercial success, the length of time that the problem solved by the invention had existed and the efforts of others to solve the problem.⁴⁷

Interestingly, the outcome in *Graham* was the result of simple factual enquiries directed to the technical merit of the invention and without circumstantial evidence playing any part whatsoever, although as noted above it is clearly admissible.⁴⁸ The invention was a third generation improvement patent relating to a chisel plow, and the allegedly patentable difference was reversal in position of the shanks and their fixing brackets, which was said to have the advantage of increasing the length over which the shanks could flex.⁴⁹ The patentees said that this difference in flexing, though small, effectively absorbed the tremendous forces of the shock of obstructions whereas prior art arrangements failed.⁵⁰ However, the Court held that the

Id.

⁴⁴ *Graham*, 383 U.S. at 3–4.

⁴⁵ *Id.* at 17.

⁴⁶ See *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1322 (Fed. Cir. 2004) (“Where there is a range disclosed in the prior art, and the claimed invention falls within that range, there is a presumption of obviousness. But the presumption will be rebutted if it can be shown: (1) that the prior art taught away from the claimed invention, or (2) that there are new and unexpected results relative to the prior art.”).

⁴⁷ *Graham*, 383 U.S. at 17–18.

⁴⁸ See generally *id.* at 19–26 (applying the conditions of patentability to the patent in issue in *Graham v. John Deere*, including discussion of the invention factually, the background of the patent, the prior art and the obviousness of the differences). The patent at issue was “No. 2,627,798 . . . relat[ing] to a spring clamp which permit[ed] plow shanks to be pushed upward when they hit obstructions in the soil.” *Id.* at 19–20.

⁴⁹ *Id.* at 22–23.

⁵⁰ *Id.* at 23.

differences were minor and within the skill of those in the art, and that the alleged advantages associated with the difference were not credible because no such function was hinted at in the specification, nothing had been said about it during prosecution before the Patent Office, and cross-examination of the expert witness for the patentee showed that the alleged advantage was insignificant.⁵¹ The relevant passage of cross-examination is set out below:

Q. Do you regard the small degree of flex in the forward end of the shank that lies between the pivot point and the point of spring attachment to be of any significance or any importance to the functioning of a device such as 798?

A. Unless you are approaching the elastic limit, I think this flexing will reduce the maximum stress at the point of pivot there, where the maximum stress does occur. I think it will reduce that. I don't know how much.

Q. Do you think it is a substantial factor, a factor of importance in the functioning of the structure?

A. Not a great factor, no.⁵²

In hindsight, it is surprising with this devastating testimony on the record that *Graham* went anywhere near the Supreme Court; a settlement prior to first instance judgment would have been a wiser strategy for the patentees.

What extra does the *KSR* opinion contribute? Its contribution is the finding that the “court can take account of the inferences and creative steps that a person of ordinary skill in the art would naturally employ.”⁵³ The observation that evidence of a known problem for which there was an obvious solution points towards obviousness.⁵⁴ An acknowledgement, however, that “inventions in most, if not all, instances rely upon building blocks long since uncovered, and that claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.”⁵⁵ Admonitions to avoid rigid preventative rules that “deny fact finders recourse to ordinary common sense” and to realize that “a person of ordinary skill is a person of ordinary creativity, not an automaton.”⁵⁶ Increased willingness to consider arguments of the “obvious to try” type.⁵⁷ As Justice Kennedy might concede, the *KSR* opinion is of a conservative character within the general ambit of the *Graham* decision, and calls for changes in approach which the Federal Circuit had very largely already adopted before it was handed down.⁵⁸

In the U.K., the concept of obviousness was introduced in the speeches of Lord Herschell in *American Braided Wire Co. v. Thompson*⁵⁹ and in *Vickers v. Siddell*,⁶⁰

⁵¹ *Id.* at 25.

⁵² *Id.* at 25 n.13.

⁵³ *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007).

⁵⁴ *Id.* at 1742.

⁵⁵ *Id.* at 1741.

⁵⁶ *Id.* at 1742.

⁵⁷ *Id.*

⁵⁸ See generally *id.* at 1745–46.

⁵⁹ (1889) 44 Ch.D. 274, 6 R.P.C. 518 (A.C. 1890).

but obviousness only became a statutory ground of objection in 1932.⁶¹ The current test is set out in *Windsurfing International v. Tabur Marine*,⁶² as modified by *Pozzoli SPA v. BDMO SA*,⁶³ and also involves an algorithmic sequence of questions followed by a decision-making step as indicated below:

- [-] identify the art or field of endeavour in which the invention arises];⁶⁴
- (i) identify the notional "person skilled in the art";
 - (ii) identify the relevant common general knowledge of that person;
 - (iii) identify the inventive concept of the claim in question or if that cannot readily be done, construe it;
 - (iv) identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed; and
 - (v) viewed without any knowledge of the alleged invention as claimed, decide whether those differences constitute steps which would have been obvious to the person skilled in the art or whether they required any degree of invention.⁶⁵

The similarity to the *Graham* test is self-evident.⁶⁶ Like its U.S. counterpart, once the preliminary enquiries have been made an unfettered decision has to be made according to the evidence.⁶⁷ A. W. White and J.C. Warden argued in favour of

⁶⁰ *Vickers v. Siddell*, (1890) 15 App. Cas. 496 (H.L.) (U.K.) ("But experience has shown that not a few inventions . . . have been of so simple a character that when once they were made known it was difficult . . . not to believe that they must have been obvious to everyone.").

⁶¹ Patents and Designs Act, 1932, 22 & 23 Geo. 5, c. 32, § 3 (Eng.) (stating a patent may be invalidated when "the invention is obvious and does not involve any inventive step having regard to what was known or used prior to the date of the patent").

⁶² *Windsurfing Int'l Inc. v. Tabur Marine (Great Britain) Ltd.*, [1985] R.P.C. 59, 71 (U.K.) (stating that obviousness is tested "by hypothesizing what would have been obvious at the priority date to a person skilled in the art to which the patent in suit relates").

⁶³ [2007] EWCA 588, [14]–[15] (A.C. (Civ. Div.)) (U.K.).

⁶⁴ *See generally id.* at [23] (While this step is not expressly enumerated in *Pozzoli*, it is implicitly required; otherwise there would be no basis for identifying a skilled person and the associated knowledge expected of that person.).

⁶⁵ *Id.*

⁶⁶ *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). *Graham* requires determination of the scope and content of the prior art and *Windsurfing* steps (-) and (iv) correspond insofar as (iv) refers to the matter cited as forming part of the "state of the art." *Compare id.*, with *Windsurfing Int'l Inc. v. Tabur Marine (Great Britain) Ltd.*, [1985] R.P.C. 59, 73–74 (U.K.). It then requires ascertainment of the differences between the prior art and the claims at issue, and *Windsurfing* step (iv) makes the same requirement. *Compare Graham*, 383 U.S. at 17, with *Windsurfing Int'l Inc. v. Tabur Marine (Great Britain) Ltd.*, [1985] R.P.C. 59, 73–74 (U.K.). It goes on to require resolution of the level of ordinary skill in the pertinent art as also required in *Windsurfing* steps (i) and (ii), the person skilled in the art not being a real person but being a legal creation reflecting the policy underlying the law of obviousness. *Compare Graham*, 383 U.S. at 17, with *Windsurfing Int'l Inc. v. Tabur Marine (Great Britain) Ltd.*, [1985] R.P.C. 59, 73–74 (U.K.). It then leaves open what further evidence may be adduced, as does *Windsurfing*. *Compare Graham*, 383 U.S. at 17, with *Windsurfing Int'l Inc. v. Tabur Marine (Great Britain) Ltd.*, [1985] R.P.C. 59, 73–74 (U.K.).

⁶⁷ *See Pozzoli*, [2007] EWCA 588, [64]–[66] (A.C. (Civ. Div.)) (U.K.) (providing an example of the step-by-step reassigning by the U.K. courts and holding that the claimed subject matter was lacking an inventive step, allegations of commercial success were unpersuasive for lack of nexus and eventual success was the result of good design rather than invention).

preserving flexibility are advanced and warned that: “[F]or administrative convenience, inventiveness may come to be judged by some philosophical metre—stick and not by a pragmatic approach based on a full consideration of all the facts. This can only lead to the patent system becoming more divorced from reality.”⁶⁸

In the outcome these concerns proved unfounded. There has in fact been no discontinuity between the approach adopted under the previous statutes and that adopted under the Patents Act 1977; and the previous flexible common law approach continues to be applied.⁶⁹ Section 14 of the U.K. Patents Act, 1977 makes no reference to technical problem and nor do the U.K. Patent Rules.⁷⁰ Therefore, there has been no legislative push towards application by the U.K. Intellectual Property Office and courts of a technical, problem-based approach of the European Patent Office (“EPO”) and up to now they have declined to do so.⁷¹ However, today, the courts sometimes their reasoning by reference to EPO Appeal Board decisions to see whether the same result would be arrived at, such decisions being of persuasive authority in the U.K.⁷²

⁶⁸ Alan W. White & J.C. Warden, *The British Approach to ‘Obviousness,’* 1977 ANN. OF INDUS. PROP. LAW 447, 463 (1978) (Eng.).

⁶⁹ See e.g., *Research In Motion, Ltd. v. Visto Corp.*, [2008] EWHC (Pat) 335, [2008] All E.R. 250 (Eng.) (reaching the decision on obviousness on the basis of the *Windsurfing* and *Pozzoli* tests and not on the basis of the problem/solution analysis used by the EPO); *Actavis, Ltd. v. Janssen Pharm. N.V.*, [2008] EWHC (Pat) 1422, [103], [108]–[125], [2008] All E.R. 429 (Eng.) (same); *Alan Nuttall, Ltd. v. Fri-Jado Ltd. & Anor*, [2008] EWHC (Pat) 1311, [71]–[80], [2008] All E.R. 153 (Eng.) (same); *Generics, Ltd. v. Daiichi Pharm. Co., Ltd. & Anor*, [2008] EWHC (Pat) 2413 [128], [158], [2008] All E.R. 124 (Eng.) (same); *Armour Group v. Leisuretech Elecs. Ltd.*, [2008] EWHC (Pat) 2797, [63]–[95], [2008] All E.R. 155 (Eng.) (same).

⁷⁰ See generally Patents Act, 1977, c. 37, pt. I, § 14 (U.K.) (last amended Dec. 17, 2007) available at <http://www.ipo.gov.uk/patentsact1977.pdf> (setting forth the requirements for the “making of application” and making no reference to “technical problem”); The Patents Rules, 2007, S.I. 3291, pt. II, sec. 15, (U.K.) (setting forth the requirements for the specification and Rule 15 setting forth the requirements for the abstract of a patent, which includes “a technical explanation of the invention” but neither of which makes any mention of “technical problem”).

⁷¹ *Symbian, Ltd. v. Comptroller Gen. of Patents*, [2008] EWCA (Civ) 1066, [16], [2008] All E.R. 75 (Eng.). The U.K. court illustrated its skeptical attitude to the EPO problem/solution analysis by stating:

Tribunals not infrequently suggest a specific staged approach to resolve issues in patent cases; obvious examples include the problem/solution approach recommended in the Guidelines for Examination in the European Patent Office (“the EPO Guidelines”), and the approaches proposed in *Windsurfing v. Tabur Marine* [1985] RPC 59 as updated in *Pozzoli v. BDMO* [2007] EWHC Civ. 588, [2007] F.S.R. 37 and *Improver v Remington* [1990] F.S.R. 81. While such staged approaches are often very valuable, they should not necessarily be followed blindly in every case. Thus, as Mr. Prescott said, the problem/solution approach is scarcely appropriate where at least part of the originality involves appreciating the existence of a problem or the opportunity for an unexpected improvement. In such a case, one can risk creating an artificial problem before going on to consider the solution.

Id.

⁷² See e.g., *H. Lundbeck A/S v. Generics, Ltd. & Ors*, [2008] EWCA (Civ) 311, [37]–[40] (Eng.) (discussing the EPO Appeal Board decisions); see also *Conor Medsystems, Inc. v. Angiotech Pharms., Inc. & Ors.*, [2008] UKHL 49, [31]–[36], [53], [2008] 4 All E.R. 621 (U.K.).

In *Haberman v Jackel International*,⁷³ the U.K. High Court produced a checklist of factors which was created in order to facilitate a decision whether or not commercial success was relevant insofar as it might throw light on the thought processes which pervaded the relevant industry, but which is self-evidently of wider applicability and provides a useful check list of evidence which it may be helpful to adduce:

- (a) What was the problem which the patented development addressed? (Although sometimes a development may be the obvious solution to another problem, that is not frequently the case);
- (b) How long had that problem existed?;
- (c) How significant was the problem seen to be?; A problem which was viewed in the trade as trivial might not have generated much in the way of efforts to find a solution. So an extended period during which no solution was proposed (or proposed as a commercial proposition) would throw little light on whether, technically, it was obvious. Such an extended period of inactivity may demonstrate no more than that those in the trade did not believe that finding a solution was commercially worth the effort. The fact, if it be one, that they had miscalculated the commercial benefits to be achieved by the solution says little about its technical obviousness and it is only the latter which counts. On the other hand evidence which suggests that those in the art were aware of the problem and had been trying to find a solution will assist the patentee.
- (d) How widely known was the problem and how many were likely to be seeking a solution? Where the problem was widely known to many in the relevant art, the greater the prospect of it being solved quickly.
- (e) What prior art would have been likely to be known to all or most of those who would have been expected to be involved in finding a solution? A development may be obvious over a piece of esoteric prior art of which most in the trade would have been ignorant. If that is so, commercial success over other, less relevant, prior art will have much reduced significance.
- (f) What other solutions were put forward in the period leading up to the publication of the patentee's development? This overlaps with other factors. For example, it illustrates that others in the art were aware of the problem and were seeking a solution. But it also is of relevance in that it may indicate that the patentee's development was not what would have occurred to the relevant workers. This factor must be treated with care. As has been said on more than one occasion, there may be more than one obvious route round a technical problem. The existence of alternatives does not prevent each of them from being obvious. On the other hand, where the patentee's development would have been expected to be at the forefront of solutions to be found yet it was not and other, more expensive or complex or less satisfactory, solutions were employed instead, then this may suggest that the *ex post facto* assessment that the solution was at the forefront of possibilities is wrong.

⁷³ [1999] F.S.R. 683 (Ch. (Pat. Ct.)) (U.K.).

(g) To what extent were there factors which would have held back the exploitation of the solution even if it was technically obvious? For example, it may be that the materials or equipment necessary to exploit the solution were only available belatedly or their cost was so high as to act as a commercial deterrent. On the other hand if the necessary materials and apparatus were readily available at reasonable cost, a lengthy period during which the solution was not proposed is a factor which is consistent with lack of obviousness.

(h) How well has the patentee's development been received? Once the product or process was put into commercial operation, to what extent was it a commercial success? In looking at this, it is legitimate to have regard not only to the success indicated by exploitation by the patentee and his licensees but also to the commercial success achieved by infringers. Furthermore the number of infringers may reflect on some of the other factors set out above. For example, if there are a large number of infringers it may be some indication of the number of members of the trade who were likely to be looking for alternative or improved products (see (iv) above).

(i) To what extent can it be shown that the whole or much of the commercial success is due to the technical merits of the development, i.e. because it solves the problem? Success which is largely attributable to other factors, such as the commercial power of the patentee or his licensee, extensive advertising focusing on features which have nothing to do with the development, branding or other technical features of the product or process, says nothing about the value of the invention.⁷⁴

II. U.K. AND U.S. – THE PERSUASIVE POWER OF NEW RESULT EVIDENCE

The collocation/combination test has both positive and negative aspects, the former providing affirmative and persuasive evidence of inventive step. Decisions of courts in the U.S., the U.K., and of EPO Appeal Boards agree on this point.⁷⁵ It is a matter of experience that the ability to identify a new function or result flowing from a claimed combination of features is a strong indicator that the claim should be allowed during official examination and is also a good predictor of validity in court proceedings where the inventive character of a granted patent is in dispute.⁷⁶

It is convenient to consider U.S. and U.K. decisions together because they have the same legal origin and because in the early 19th century U.K. decisions were widely cited and followed in the U.S.⁷⁷

The positive aspect of the test can be traced back to early days of patent law. The first (1883) edition of Terrell on Patents quotes Lord Ellenborough in *Huddard v.*

⁷⁴ *Id.* at 699–701.

⁷⁵ See *Bendix/Braking Apparatus*, [1988] E.P.O.R. 285, 289; *United States v. Adams*, 383 U.S. 39, 51 (1966).

⁷⁶ See, e.g., *Adams*, 383 U.S. at 51 (stating an invention is non-obvious where a combination of elements yields unexpected results).

⁷⁷ See R.H. Helmholz, *Magna Carta and the Ius Commune*, 66 U. CHI. L. REV 297, 299–300 (1999).

Grimshaw,⁷⁸ “I suppose it will not now be disputed that a new combination of old materials, so as to produce a new effect, may be the subject of a patent.”⁷⁹

The fact that new effect was key to patentability of combination inventions was therefore known when Thomas Jefferson was U.S. President, William Pitt was Prime Minister of Britain, and Nelson was scouring the Mediterranean and the Atlantic for the French fleet that he encountered with fatal consequences at Trafalgar.

The same proposition was advanced in the U.S. in a speech on behalf of Oliver Evans before the Supreme Court in relation to the same Hopper Boy patent that had been the subject of his earlier correspondence with Thomas Jefferson⁸⁰ in *Evans v. Eaton*⁸¹ in the following language:

That a new modus operandi, by a new combination of old instruments or machines, so as to produce either a new effect, or an old effect in a new way, is the proper subject matter of a patent, appears from numerous authorities, and may be considered as a settled principle of the patent law. It was on this principle that Watt's patent for his improvements on the steam engine, which made so much noise in Westminster Hall, and produced such important effects, was finally supported and established.

The English law of patents, though different from ours in its origin, was probably the same in its principles. Indeed, our act of Congress was a mere enactment of the principles and system, which the English Courts had established.⁸²

The U.K. decision in *Crane v. Price*⁸³ has been cited with approval in subsequent decisions both in the U.K. and in the U.S. and indeed has been referred to by a 19th century U.S. textbook writer as a “very important case.”⁸⁴ The claimed invention in *Crane* was to the use in the smelting of iron from ironstone of anthracite in combination with a hot air blast, both individually known.⁸⁵ The evidence was that the new process improved the yield of iron, improved the quality of the iron, and reduced cost compared to an older method in which bituminous coal was used.⁸⁶ The Court of Common Pleas affirmed that the claimed invention was valid and said:

We are of the opinion, that if the result produced by such a combination is either a new article, or a better article, or a cheaper article

⁷⁸ (1803) 1 Web. P.C. 85 (K.B.).

⁷⁹ THOMAS TERRELL, *THE LAW AND PRACTICE RELATING TO LETTERS PATENT FOR INVENTIONS* 32 (London Henry Sweet) (1884). Terrell continues to be a leading U.K. textbook on U.K. patent law and the current (16th) edition is published by Sweet & Maxwell, the successors of Henry Sweet. The first edition is in the public domain and can be downloaded as two pdf files from the Franklin Pierce Law Centre IP Mall (www.ipmall.info).

⁸⁰ See Letter, Isaac M'Pherson, *supra* note 16, at 180.

⁸¹ 20 U.S. (7 Wheat.) 356 (1822).

⁸² *Id.* at 399.

⁸³ (1842) 1 Web. P.C. 393 (K.B.) (appeal from Court of Common Pleas) (Eng.).

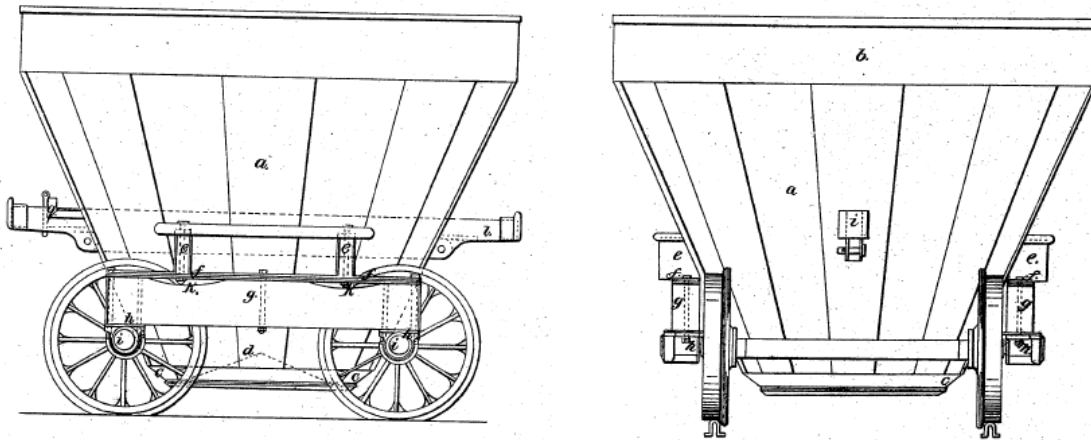
⁸⁴ GEORGE T. CURTIS, *A TREATISE ON THE LAW OF PATENTS FOR USEFUL INVENTIONS AS ENACTED AND ADMINISTERED IN THE UNITED STATES OF AMERICA* 15 (4th ed., Little, Brown, & Co. 1873).

⁸⁵ *Crane*, 1 Web. P.C. at 399.

⁸⁶ *Id.*

to the public, than that produced before by the old method, that such combination is an invention or manufacture intended by the statute, and may well become the subject of a patent.⁸⁷

An example where the Supreme Court made an affirmative finding that the invention as claimed provided a new result is provided by *Winans v Denmead*,⁸⁸ which concerned a railroad car for transporting coal or other bulk goods as shown below.⁸⁹



The patented car had a frustoconical body whose lower portion extended within the frame of the truck and between the axles and terminated in a bottom discharge outlet.⁹⁰ Advantages for the claimed form of the body were that the pressure of the load was equalized in every direction so that the load was largely self-supporting and tensile strength of the iron of which the body was made was used more efficiently.⁹¹ Railroad cars in the prior art could not carry a load greater than their own weight, whereas those constructed in accordance with the patent could carry twice their own weight.⁹² A majority of the Supreme Court justices in *Winans* were convinced that an invention had indeed been made and their opinion is notable because it was handed down in the same time frame as *Hotchkiss v Greenwood*.⁹³ The *Winans* court observed that:

⁸⁷ *Id.* at 375, 409.

⁸⁸ 56 U.S. 330 (1854).

⁸⁹ *Id.* at 338; U.S. Patent No. 5,175 figs.2–3 (filed June 26, 1847).

⁹⁰ *Winans*, 56 U.S. at 339.

⁹¹ *Id.*

⁹² *Id.* at 340.

⁹³ 52 U.S. 248, 267 (1850) (holding that if no more ingenuity and skill was necessary to construct a new knob than “were possessed by an ordinary mechanic acquainted with the business,” the patent was invalid); *Winans*, 56 U.S. at 341 (stating that the substance of the railroad car “is a new mode of operation, by mean of which a new result is obtained”).

To change the form of an existing machine, and by means of such a change to introduce and employ other mechanical principles or natural powers, or, as it is termed a new mode of operation, and thus attain a new and useful result, is the subject of a patent.

Its substance is a new mode of operation, by means of which a new result is obtained. It is this new mode of operation which gives it the character of an invention, and entitles the inventor to a patent; and this new mode of operation is, in view of patent law, the thing entitled to protection.

....

Patentable improvements in machinery are almost always made by changing some one or more forms of one or more parts, and thereby introducing some mechanical principle or mode of action not previously existing in the machine, and so securing a new or improved result.⁹⁴

The legal significance of evidence establishing that a new result has been achieved was identified by Mr. Justice Bradley in *Loom Co. v. Higgins*⁹⁵ and his explanation was cited with approval in subsequent cases, including *Washburn & Moen Manufacturing, Co. v. Beat'Em All Barbed-Wire Co.*⁹⁶ and *Carnegie Steel Co. v. Cambria Iron Co.*⁹⁷ The invention in *Loom* concerned a loom for weaving Brussels carpet that could make 50 yards per day whereas the looms of the prior art could not make more than 40 yards per day.⁹⁸ The court, affirming the validity of the patent, warned about the dangers of hindsight analysis and stated, “[i]t may be laid down as a general rule, though perhaps not an invariable one, that if a new combination and arrangement of known elements produce a new and beneficial result, never attained before, it is *evidence* of invention.”⁹⁹

Perhaps the best simple example of new result is found in the *Washburn* case, which concerned a patent covering the first successful form of barbed wire, one of its drawings appearing below.¹⁰⁰

⁹⁴ *Winans*, 56 U.S. at 341–42.

⁹⁵ 105 U.S. 580, 591 (1881).

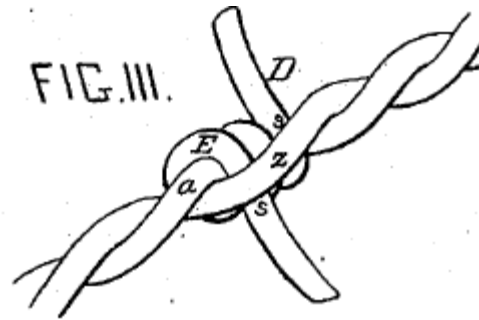
⁹⁶ 143 U.S. 275, 283 (1892) (noting that in the *Loom* case, “a monopoly [was] sustained in favour of the last series of inventors, all of whom were groping to attain a certain result, which only the last one of the number seemed able to grasp”).

⁹⁷ 185 U.S. 403, 437–38 (1902) (discussing Justice Bradley’s observations in the *Loom* case, specifically, whether the sufficiency of the description of the invention as the basis for sustaining patents).

⁹⁸ *Loom Co.*, 105 U.S. at 583–84.

⁹⁹ *Id.* at 591 (emphasis added). See also *KSR Int’l. Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1739 (2007) (stating that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results,” which is consistent with the Court’s language in *Loom*). In *KSR*, the Court disagreeing with the Court of Appeals narrow and rigid approach, not only reaffirmed the rule that a new result provides evidence of nonobviousness, but also asserted that as to “the question of obviousness, [the Court’s engagement with] cases have set forth an expansive and flexible approach.” *Id.*

¹⁰⁰ *Washburn*, 143 U.S. at 281–83 (noting twisted wire and sharp thorns or barbs to be unpatentable known elements, however, ruling their combination to be an invention, as evidenced by their new and beneficial result); see U.S. Patent No. 157,124 fig.3 (filed Oct. 27, 1873).



The features which were held to support patentability were (a) “the introduction of the coiled barb,” and (b) its combination with the twisted wire, so that the barb was held rigidly in place and held against either turning relative to the wire of moving along the wire.¹⁰¹ These features were held to provide “a most valuable contribution to the art of wire fencing.”¹⁰²

A further well-known example of new result supporting patentability is found in the *United States v. Adams*,¹⁰³ where the Supreme Court found that the Adams invention provided:

[T]he first practical, water-activated, constant potential battery which could be fabricated and stored indefinitely without any fluid in its cells. It could be activated within 30 minutes merely by adding water. Once activated, the battery continued to deliver electricity at a voltage which remained essentially constant regardless of the rate at which current was withdrawn. Furthermore, its capacity for generating current was exceptionally large in comparison to its size and weight.¹⁰⁴

The patent specification stated that “an object of the invention was to provide a battery rendered serviceable by the mere addition of water,” and the Supreme Court held that “reliance upon this feature was not the afterthought of an astute trial lawyer.”¹⁰⁵ If the electrodes in the Adams battery had been merely equivalents to those in prior art devices, then the Adams battery would have had equivalent operating characteristics, whereas it had been found “wholly unexpectedly” that it had “certain valuable operating advantages over other batteries.”¹⁰⁶ In *KSR*, the Supreme Court quoted *Adams* with approval and commented that “[t]he fact that the elements worked together in an unexpected and fruitful manner supported the conclusion that Adams's design was not obvious to those skilled in the art.”¹⁰⁷

¹⁰¹ *Id.* at 281.

¹⁰² *Id.*

¹⁰³ 383 U.S. 39 (1966).

¹⁰⁴ *Id.* at 43. When the cuprous chloride and magnesium were used as electrodes in an electrolyte of either plain water or salt water, an improved battery resulted. *Id.*

¹⁰⁵ *Id.* at 48–49.

¹⁰⁶ *Id.* at 51.

¹⁰⁷ *KSR Int'l. Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740 (2007).

In the U.K., judicial approval of the positive form of the collocation/combination test was given by the House of Lords in *British Celanese Ltd. v. Courtaulds Ltd.*¹⁰⁸ in an often overlooked second part of the observations of Lord Tomlin stated, “where the old integers when placed together have some working inter-relation producing a new or improved result then there is patentable subject-matter in the idea of a working inter-relation brought about by the collocation of the integers.”¹⁰⁹

Examples of new function or result which have supported patentability in the United Kingdom in recent cases follow.

In *Beecham Group Ltd.’s (Amoxycillin) Application*,¹¹⁰ the combination of properties exhibited by amoxycillin was significant: it exhibited high activity combined with high achieved blood level and these properties were neither disclosed nor suggested by the prior art.¹¹¹

In *Fichera v. Flogates*,¹¹² the invention concerned a ladle for molten steel having a bottom discharge outlet closed by a sliding gate valve, and the improvement involved the provision of a ring of refractory material in the bottom of the ladle, a bush with a vertical hole for tapping metal mounted in the ring, and a stationary refractory plate having an upper surface on which the bush rested and a lower surface along which the valve slid.¹¹³ The bush was well known in a different form of bottom discharge outlet, and the defendants objected that the provision of this well-known bush in a known form of outlet was within the range of variants which a skilled person would make without invention.¹¹⁴ However, the effect of the change was to move the seat of erosion by the molten steel from the sliding parts of the valve to the top of the bush, where it is less damaging, and to enable the outlet to be used to pour many charges of molten steel instead of only a single charge as in the prior art.¹¹⁵ Both the Patents Court and the Court of Appeal held on the basis of the evidence adduced that the patent was valid and warned against treating dismissively apparently small changes to seemingly simple structures.¹¹⁶

In *Molnlycke AB v. Proctor & Gamble Ltd.*,¹¹⁷ the invention concerned a disposable diaper which could be opened and re-fastened.¹¹⁸ Its novel feature was that a single plastics strip was provided extending across the diaper at one end for fastening of tape tabs from the other end, the surface texture of the plastics strip being such as to control adhesion and permit tab removal and re-fastening.¹¹⁹ The effect of this feature was to provide a landing surface with different characteristics from the back-sheet so that each could be independently optimised.¹²⁰ Both the

¹⁰⁸ (1935) 52 R.P.C. 171 (H.L.) (U.K.).

¹⁰⁹ *Id.* at 193.

¹¹⁰ [1980] R.P.C. 261 (A.C. (Civ. Div.)) (U.K.).

¹¹¹ *See id.* at 293. Lord Justice Buckley held that “[t]he evidence does not suggest that a higher blood level was an objective which Beecham had particularly in mind or that there was any reason to expect it.” *Id.*

¹¹² *Fichera v. Flogates*, [1984] R.P.C. 257 (A.C. 1983) (appeal taken from Patents Court) (U.K.).

¹¹³ *Id.* at 274–75.

¹¹⁴ *See id.* at 276

¹¹⁵ *See id.* at 276.

¹¹⁶ *Id.* at 274 (holding the invention as not obvious).

¹¹⁷ [1994] R.P.C. 49 (A.C. 1993) (appeal taken from Patents Court) (U.K.).

¹¹⁸ *Id.* at 120.

¹¹⁹ *Id.* at 120–21.

¹²⁰ *Id.*

Patents Court and the Court of Appeal held that the added feature provided a novel solution to the problem of providing tapes that could be securely re-fastened without tearing the back-sheet and that the patent was valid.¹²¹ The Court of Appeal observed that:

[T]he inventive step may not have been large and it is not surprising to us that more than one inventor may have broadly the same idea at around the same time. Where the subject-matter of a patent is an idea, the inventive step involves having an insight which, although simple, genuinely requires an act of insight rather than a mere development and application of existing ideas.¹²²

In *Haberman*,¹²³ the use in an infants' trainer cup of a self-closing slit valve solved the long-standing problem that such cups were prone to leak when upset.¹²⁴

In *Dyson Appliances Ltd. v. Hoover Ltd.*,¹²⁵ the use of an upstream low-efficiency cyclone in a vacuum cleaner enabled it to separate carpet fluff, thread, paper shreds, dog hairs and the like and avoid so-called "hang-up" i.e. material within the cyclone which kept spinning about without being deposited.¹²⁶

In *Conor Medsystems v. Angiotech*¹²⁷ the incorporation of taxol into a drug-eluting coating on a stent to prevent unwanted cell proliferation leading to restenosis, the patent specification not containing proof that taxol would have the desired effect but nevertheless containing sufficient information to make that effect plausible.¹²⁸

It is clear, however, that although a new result is evidence of inventive step, it is not conclusive. For example, in *Hotchkiss v. Greenwood*¹²⁹ the claimed invention was the substitution of clay or porcelain for metal in knobs for furniture or doors.¹³⁰ The inventors explained that their invention was chiefly predicated on one principle, which was that of having the cavity in which the screw or shank is inserted largest at its inner end in the form of a dovetail and forming the screw or shank by pouring in molten metal.¹³¹ The evidence was that this construction had been used in Middletown, Connecticut before the invention for making metallic knobs.¹³² It could be argued that the invention was more than a mere substitution of materials because

¹²¹ *Id.* at 93, 132.

¹²² *Id.* at 132.

¹²³ *Haberman v. Jackel Int'l.*, [1999] F.S.R. 683 (Ch. (Pat. Ct.)) (U.K.).

¹²⁴ *Id.* at 701–04. The court observed that Mrs. Haberman had "taken a very small and simple step" to incorporate a slit valve into an infant's trainer cup, but it was a step others "could have taken at any time over at least the preceding ten years or more." *Id.* at 706. The resulting commercial success, that was "almost entirely due to . . . the simple slit valve," led the court to conclude that the invention was not obvious. *Id.* at 704, 706.

¹²⁵ [2001] EWCA 1440, [2002] R.P.C. 22 (U.K.).

¹²⁶ *Id.* at [4] and [10].

¹²⁷ [2008] UKHL 49, [2008] R.P.C. 28 (appeal taken from Eng.).

¹²⁸ *Id.* at [36].

¹²⁹ 52 U.S. 248 (1850).

¹³⁰ *Id.* at 248–49.

¹³¹ *Id.* at 250.

¹³² *Id.* at 252.

metal is tough whereas clay or porcelain is brittle and prone to crack.¹³³ The patentees argued that it required skill and thought and invention to unite these dissimilar materials and make a firm and substantial product, and it was accepted that the choice of a dovetail construction avoided cracking or breakage of the clay or porcelain whereas the other possible method of fastening using a hole or screw did not.¹³⁴ There was also evidence of commercial success and that the patented knobs were “almost everywhere taking the place of the metal knob.”¹³⁵ Justice Woodbury (dissenting) was of the opinion that if there was a new effect then even though the change was slight there was scope for a patent, and in addition to the dovetail construction he also pointed to the durability, cheapness and beauty of the patented knobs.¹³⁶ However, the majority view was that any difference had to be “the result of some new contrivance or arrangement in the manufacture,” that (arguably incorrectly from a technical standpoint) the anti-cracking effect was the same as that in a knob of wood, bone, metal or any other material, and that the substitution was the work of a skilled mechanic, not an inventor¹³⁷.

III. U.K. AND U.S. CONSEQUENCES WHEN NEW RESULT EVIDENCE CANNOT BE ADDUCED

What should be the consequences if either (a) the claimed combination of features provides no new result or (b) there is such a result but it is not disclosed in the written description? It is self-evident that the weight of evidence for inventive character of the claimed subject matter is significantly or fatally weakened even if circumstantial evidence such as failure of others and commercial success is available.¹³⁸ But should there be any legal consequence beyond what is inevitable on the basis of straightforward analysis of the evidence?

¹³³ *Id.* at 266–67.

¹³⁴ *Id.* at 252.

¹³⁵ *Id.* at 256.

¹³⁶ *Id.* at 268 (“[W]hereas in my view the true test of it being patentable was, if the invention was new, and better and cheaper than what preceded it.”) (Woodbury, J., dissenting).

¹³⁷ *Id.* at 266. The fact pattern raises could/would issues: a skilled person undoubtedly could have made porcelain knobs with the dovetail metal insert, but would he have known or would it have been obvious to him prior to the date of the invention that this structure would solve the problem of uniting a metal screw or shank to a clay or porcelain knob? *Id.* at 266–67 (“It seemed to be supposed, on the argument, that this mode of fastening the shank to the clay knob produced a new and peculiar effect upon the article . . . that for this reason the clay or porcelain knob was not so liable to crack or be broken.”). However, the patentees were in a weak position to rely on any such argument because the problem of cracking and its solution by the dovetail insert were nowhere mentioned in their specification, and in any event it is unlikely that arguments of this type would have been persuasive in the less developed state of patent law as it was in 1850. *Id.* at 267 (stating that the first issue on the record was “whether the patent covered merely the knob, the bulbous handle, or included also the shank or spindle, and the mode of fastening it to the handle”).

¹³⁸ *Cf.* EPO Guidelines, *supra* note 71, at pt. C, ch. IV, 2.1–2.2 (setting forth what is meant by not obvious and consequently inventive combination of features).

An approach which has been suggested by the U.K. House of Lords in *Sabaf SpA v. MFI Furniture Centres Ltd.*,¹³⁹ is to treat it as a matter of claim construction and of identifying what is alleged to have been invented.¹⁴⁰ Lord Hoffmann observed:

I quite agree that there is no law of collocation in the sense of a qualification of, or gloss upon, or exception to, the test for obviousness stated in section 3 of the Act. But before you can apply section 3 and ask whether the invention involves an inventive step, you first have to decide what the invention is. In particular, you have to decide whether you are dealing with one invention or two or more inventions. Two inventions do not become one invention because they are included in the same hardware. A compact motor car may contain many inventions, each operating independently of each other but all designed to contribute to the overall goal of having a compact car. That does not make the car a single invention.¹⁴¹

Section 14(5)(d) of the Act provides (following article 82 of the European Patent Convention (“EPC”)) that a claim shall ‘relate to one invention or to a group of inventions which are so linked as to form a single inventive concept.’¹⁴² Although this is a procedural requirement with which an application must comply, it does suggest that the references in the Act to an ‘invention’ (as in section 3) are to the expression of a single inventive concept and not to a collocation of separate inventions.¹⁴³

The EPO guidelines say that “the invention claimed must normally be considered as a whole.”¹⁴⁴ But equally, one must not try to consider as a whole what are in fact two separate inventions. What the Guidelines do is to state the principle upon which you decide whether you are dealing with a single invention or not.¹⁴⁵ If the two integers interact upon each other, if there is synergy between them, they constitute a single invention having a combined effect and one applies section 3 to the idea of combining them.¹⁴⁶ If each integer “performs its own proper function independently of any of the others,” then each is for the purposes of section 3 a separate invention and it has to be applied to each one separately.¹⁴⁷

Advantages of this approach are that it is objective and free of the prejudice and emotional baggage that characterises many earlier decisions on this topic. An inventor in the mechanical engineering field does not need or deserve the put-down of being told how unusual it is to find invention in his field of endeavour¹⁴⁸ or how long

¹³⁹ *Sabaf SpA v. MFI Furniture Centres Ltd.*, [2004] UKHL 45, [2005] R.P.C. 10 (appeal taken from Eng.).

¹⁴⁰ *Id.* at [24].

¹⁴¹ *Id.*

¹⁴² *Id.* at [25].

¹⁴³ *Id.*

¹⁴⁴ *Id.* at [26].

¹⁴⁵ *Id.*

¹⁴⁶ *Id.*

¹⁴⁷ *Id.*

¹⁴⁸ *See also* *Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 152 (1951) (Justice Jackson stating “[e]lements may, of course, especially in chemistry or electronics, take on

the path that the inventor of a better mousetrap has to tread before reaching the Patent Office.¹⁴⁹ Instead, he simply needs a straightforward decision on the facts of his case firstly whether or not there is indeed a new function that enables the features that he has claimed to be identified as a true combination and provides evidence in support of patentability and secondly whether patentability can be established on the basis of that evidence or whether there is some reason why that evidence should not be decisive e.g., “obvious to try,” “one way street” or mere “bonus effect.”¹⁵⁰

The views of Thomas Jefferson have been set out above. Decisions of the U.S. Supreme Court under the pre-1952 statutes lay down a “bright line” rule that absence of new result is fatal to validity. The opinion of Justice Jackson in the *Great Atlantic & Pacific Tea* case is representative of many judicial observations on this topic:

Courts should scrutinize combination patent claims with a care proportioned to the difficulty and improbability of finding invention in an assembly of old elements. The function of a patent is to add to the sum of useful knowledge. Patents cannot be sustained when, on the contrary, their effect is to subtract from former resources freely available to skilled artisans. A patent for a combination which only unites old elements with no change in their respective functions, such as is presented here, obviously withdraws what already is known into the field of its monopoly and diminishes the resources available to skillful men.¹⁵¹

Restatements of the same bright-line rule are found in post-1952 decisions in *Anderson’s–Black Rock, Inc. v. Pavement Savage Co.*¹⁵² and in *Sakraida v. AG Pro, Inc.*¹⁵³ It could, however, be argued that since there is no bright-line rule *for* a finding of non-obviousness if evidence of new result can be adduced, then a balanced approach must preclude a bright-line rule *for* a finding of obviousness if no such evidence is available.¹⁵⁴ A problem with bright-line rules is that they can be applied

some new quality or function from being brought into concert, but this is not a usual result of uniting elements old in mechanics.”)

¹⁴⁹ *Graham v. John Deere Co.*, 383 U.S. 1, 19 (1966).

¹⁵⁰ EPO Guidelines, *supra* note 71, at pt. C, ch. IV, 11.9.

¹⁵¹ *Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 152–53 (1951). The basis for the alleged “difficulty and improbability” is not apparent: if (as seems probable) it was earlier opinions of the courts then it is anecdotal, and may reflect the prejudice of a non-technical court more than scientific or engineering reality. Mechanical engineering inventions that are litigated may not be representative of the generality of such inventions since it may be that in the U.S. only the weaker patents come before the courts so that the courts see a statistically biased sample. No rigorously conducted and peer-reviewed academic study of mechanical engineering inventions appears to have been considered, if indeed, such studies were available at the time. Similarly, the author was recently told by members of a leading firm of patent attorneys in China that foreign patent owners are successful in 75% of cases brought before the Chinese courts, but in this case it may be only the very strong patents that are considered suitable candidates for enforcement proceedings.

¹⁵² U.S. 57, 61 (1969).

¹⁵³ 425 U.S. 273, 282 (1976).

¹⁵⁴ *Cf. Rockwell Int’l Corp. v. U.S.*, 147 F.3d 1358, 1366 (Fed. Cir. 1998). “Evidence of secondary considerations is but a part of the ‘totality of the evidence’ that is used to reach the

inappropriately, and there was much discussion of a requirement for “synergy” during the 1960’s and 1970’s which predates the establishment of the Federal Circuit in 1982 and is now, fortunately, of historical interest only.¹⁵⁵ At the time, Judge Markey who was the chief judge of the U.S. Court of Appeals for the Federal Circuit, was driven to say, “[o]nly God works from nothing. Man must work with old elements.”¹⁵⁶ In *Stratoflex Inc. v. Aeroquip Corp.*,¹⁵⁷ Judge Markey also stated that:

A requirement for "synergism" or a "synergistic effect" is nowhere found in the statute, 35 U.S.C. When present, for example in a chemical case, synergism may point toward nonobviousness, but its absence has no place in evaluating the evidence on obviousness. The more objective findings suggested in *Graham* . . . are drawn from the language of the statute and are fully adequate guides for evaluating the evidence relating to compliance with 35 U.S.C. § 103. . . . The reference to a "combination patent" is equally without support in the statute. . . . Reference to "combination" patents is, moreover, meaningless. Virtually *all* patents are "combination patents," if by that label one intends to describe patents having claims to inventions formed of a combination of elements. It is difficult to visualize, at least in the mechanical-structural arts, a "non-combination" invention, i.e., an invention consisting of a *single* element. Such inventions, if they exist, are rare indeed.¹⁵⁸

It should be noted that the Federal Circuit did not overrule the judgment of the Circuit Court, which it held to be supported on the conventional basis set out in *Graham*.¹⁵⁹ However, the Circuit Court’s findings on “synergism” that the claim “lack[ed] the unique essence of authentic contribution to the [relevant] art which is at the heart of invention” were held to be flawed for the reasons set out above.¹⁶⁰ Furthermore, the Federal Circuit’s ruling on exclusion of evidence is wholly inconsistent with the existence of any bright-line rule:

It is jurisprudentially inappropriate to disregard any relevant evidence on any issue in any case, patent cases included. . . . Indeed, evidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not. It is to be considered as part of all the evidence, not just when the decisionmaker remains in doubt after reviewing the art.

ultimate conclusion of obviousness.” *Id.* “In some cases, this evidence is the most probative of obviousness, but its existence or non-existence does not control the obviousness determination.” *Id.*

¹⁵⁵ See, e.g., *Sakraida*, 425 U.S. at 281–82. (“We cannot agree that the combination of these old elements . . . can be properly characterized as synergistic, that is ‘resulting in an effect greater than the sum of the several effects taken separately.’”) (quoting *Anderson’s–Black Rock*, 396 U.S. at 61).

¹⁵⁶ Howard T. Markey, *Why Not the Statute?*, 65 J. PAT. & TRADEMARK OFF. SOC’Y 331, 334 (1983).

¹⁵⁷ 713 F.2d 1530 (Fed. Cir. 1983).

¹⁵⁸ *Id.* at 1540.

¹⁵⁹ *Id.*

¹⁶⁰ *Id.*

...
 ... En route to a conclusion on obviousness, a court must not stop until *all* pieces of evidence on that issue have been fully considered and each has been given its appropriate weight. Along the way, some pieces will weigh more heavily than others, but decision should be held in abeyance, and doubt maintained, until all the evidence has had its say.¹⁶¹

Since 1982, the Federal Circuit has used the teaching-suggestion-motivation (TSM) test which was in issue in *KSR* and has applied that test without objection from the Supreme Court for two decades, with arguments based on the negative aspect of collocation/combination or on a bright-line requirement for “synergy” having lost all significance.¹⁶² The test is now whether a person of ordinary skill in the art would have been motivated to combine the prior art to achieve the claimed invention and whether there would have been a reasonable expectation of success in doing so.¹⁶³

In *KSR*, essentially the same objection arose as in *Crane v. Price* and indeed as preoccupies prosecution attorneys on a daily basis: A is known, B is known and there was [allegedly] no inventive step in combining them.¹⁶⁴

It was open to the Supreme Court to reassert the bright-line test that it unequivocally set out in *Sakraida v Ag Pro Inc.*¹⁶⁵ Significantly, however, in *KSR*,

¹⁶¹ *Id.* at 1538–39. The concept of evidential weights to be placed in the judicial scales to see where the preponderance of evidence lies flows naturally from the *Graham* test, the *Windsurfing* test and the observations in *Loom* that a new result is *evidence* of invention. See *Graham v. John Deere Co.*, 383 U.S. 1 (1966); *Windsurfing Int'l Inc. v. Tabur Marine (Great Britain), Ltd.*, [1985] R.P.C. 59 (U.K.); *Loom Co. v. Higgins*, 105 U.S. 580 (1881).

¹⁶² *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741–42 (stating that “in the years since the Court of Customs and Patent Appeals set forth the essence of the TSM test, the Court of Appeals no doubt has applied the test . . . in many cases” and has transformed “the general principle into a rigid rule that limits the obviousness inquiry”). The Court in *KSR* stated that the question of obviousness called for a “flexible and expansive approach.” *Id.* at 1739. See also *Loom Co. v. Higgins*, 105 U.S. 580, 583–84 (1881) (stating the general rule that if “new combination and arrangement of known elements produce a new and beneficial result, never attained before, it is *evidence* of invention”) (emphasis added).

¹⁶³ See, e.g., *Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 229 F.3d 1120, 1124 (Fed. Cir. 2000); *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1366 (2006).

¹⁶⁴ *KSR Int'l*, 127 S. Ct. at 1746 (2007) (finding that KSR provided evidence which demonstrated “that mounting a modular sensor on a fixed pivot point of the Asano pedal was a design step well within the grasp of a person of ordinary skill in the relevant art” and holding the patent invalidated because it was obvious); *Crane v. Price*, (1842) 1 Web. P.C. 393, 409 (K.B.) (appeal from Court of Common Pleas) (U.K.) (stating “that if the result produced by such a combination is either a new article, or a better article, . . . than that produced before the old method, that such combination is an invention . . . and may well become . . . a patent.”).

¹⁶⁵ *Sakraida v. AG Pro, Inc.*, 425 U.S. 273, 282 (1976). The language that the Court could have, but fortunately refrained from reasserting, reads: “We cannot agree that the combination of these old elements . . . can properly be characterized as synergistic, that is, ‘result[ing] in an effect greater than the sum of the several effects taken separately.’” *Id.* (quoting *Anderson's-Black Rock v. Pavement Co.*, 396 U.S. 57, 61 (1969)). The Court went on to say, “[r]ather, this patent simply arranges old elements with each performing the same function it had been known to perform, although perhaps producing a more striking result than in previous combinations. Such combinations are not patentable under standards appropriate for a combination patent. *Id.* (citation omitted).

the Court refrained from the use of bright-line language and instead used language reflecting caution and a need to evaluate the evidence as a whole. The Court stated, “[t]he combination of familiar elements according to known methods *is likely* to be obvious when it does no more than yield predictable results”¹⁶⁶ but, as previously noted, it went on to say that “a court *must ask* whether the improvement is more than the predictable use of prior art elements according to their established functions.”¹⁶⁷ The “curious incident”¹⁶⁸ is that although the *KSR* Court concluded that the claimed invention was obvious and admonished that the TSM test should not be transformed from a general principle into a rigid rule, it nevertheless followed the route suggested by Judge Markey in *Stratoflex* and decided the question on the conventional grounds set out in *Graham* and without reference to collocation/combination or “synergy” issues.¹⁶⁹ The decision to adopt this approach is consistent with a positive decision not to re-initiate the previous “synergy” debate, and it is submitted that if the “curious incident” is to be treated as a clue, then the solution that should be deduced from that clue is a significant (though tacit) guideline for the handling of future cases, i.e. that “synergy” considerations are not to be invoked widely or indiscriminately. Indeed, putting forward any bright-line rule would have been inconsistent with the court’s admonition that the approach should be “expansive and flexible.”¹⁷⁰

Nevertheless, a litigator acting for a patentee who is not in a position to adduce evidence of new result and is conducting a good fact/bad fact analysis should place that deficiency firmly in the “bad facts” column. If the new result exists, but the written description of the patent fails to mention it, then following observations in *Adams*, a litigator representing a patentee should also place that deficiency firmly in the “bad facts” column.¹⁷¹ Although a bright-line rule has not been reasserted, enforcement of a patent where no new result can be identified or is disclosed in the patent must be considered to be very difficult.¹⁷²

¹⁶⁶ *KSR Int’l*, 127 S. Ct. at 1739.

¹⁶⁷ *Id.* at 1731 (emphasis added); *see also* *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.3d 1530, 1535–36 (1983) (discussing the scope and content of the prior art and the differences between the claimed invention and the prior art).

¹⁶⁸ DOYLE, *supra* note 4.

¹⁶⁹ *Id.* at 1739, 1745.

¹⁷⁰ *Id.* at 1739.

¹⁷¹ *See generally* *United States v. Adams*, 383 U.S. 39, 52 (1966) (finding that the *Adams* patent was valid because the “obvious implication from the absence of any mention of an electrolyte, a necessary element in any battery, in the other eight claims” reinforced the conclusion that the batter was water activated). “While the claims of a patent limit the invention, and specifications cannot be utilized to expand the patent monopoly . . . it is fundamental that claims are to be construed in light of the specifications and both are to be read with a view to ascertaining the invention. *Id.*”

¹⁷² *See generally* *Cuno Eng’g. Corp. v. Automatic Devices Corp.*, 314 U.S. 84, 91 (1941) (“A new application of an old device may not be patented if the ‘result claimed as new is the same in character as the original result’ . . . even though the new result had not before been contemplated.”) (citations omitted).

IV. EPC – NEW RESULT EVIDENCE IS MANDATORY

The EPC resulted from negotiations that took place in the 1960's and 1970's and a requirement for non-obviousness was written into the Convention from the outset.¹⁷³ The EPO applies a test that is overtly result-based, and goes further than the U.S. or the U.K. as it makes the existence of a new result flowing from claimed features in combination a mandatory condition for patentability.¹⁷⁴ Surprisingly, this difference arises from the Regulations under the Patent Cooperation Treaty ("PCT") and the EPC, which as previously noted, differ from the rules made in the U.K. under the Patents Act, 1977.¹⁷⁵

Rule 5(a)(iii) PCT provides that the description of a patent specification shall disclose the invention, as claimed, in such terms that the technical problem (even if not expressly stated as such) and its solution can be understood" Rule 42(1)(c) EPC, formerly Rule 27(1)(c) EPC, is identically worded.¹⁷⁶ The EPO appeal boards regard the reference to technical problem contained in this rule as providing the fundamental basis for their technical problem based approach. As explained in *Containers/ICI T 0026/81*:

The provisions of Rule 27(1)(d) require that the description shall disclose how the invention can be understood as the solution to a technical problem. Indeed, the inventive step may be considered as a step from the technical problem to its solution. If, therefore, the requirements of the above rule are neither satisfied by the original description, nor, after request, by an amendment, it will emerge that an invention within the meaning of Article 52 does not exist. On the other hand, if the subject-matter of an independent claim, for which there is sufficient disclosure, is judged as being inventive in character, it must always be possible to derive a technical problem from the application.¹⁷⁷

It should not be assumed that the words "technical problem" have the same meaning when they are used by the EPO as they do in the U.K. or the U.S. Much of the controversy in relation to the technical problem test arises through misunderstanding of the meaning given by the EPO to these words. In the U.K. and U.S. they are generally understood to refer to a real-world problem whose existence

¹⁷³ Convention on the Grant of European Patents art. 56, Oct. 5, 1973, available at <http://www.epo.org/patents/law/legal-texts/html/epc/1973/e/contents.html> [hereinafter "EPC"] (providing "an invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art").

¹⁷⁴ EPO Guidelines, pt. C, ch. IV, 11.5 (stating "a set of technical features is regarded as a combination of features if the functional interaction between the features achieves a combined technical effect which is different from, e.g. greater than, the sum of technical effects of the individual features").

¹⁷⁵ See Patents Act, 1977, c. 37, pt. I, § 14 (U.K.) (last amended Dec. 17, 2007) available at <http://www.ipo.gov.uk/patentsact1977.pdf> (setting forth the requirements for the "making of application" and making no reference to "technical problem").

¹⁷⁶ European Patent Office, European Patent Convention, Oct. 5, 1973, R. 42 Content of the Description.

¹⁷⁷ *ICI/Containers*, [1979–85] E.P.O.R. B362, 365 (EPO (Technical Bd. App.)).

is apparent from the cited literature or from the testimony of expert witnesses.¹⁷⁸ In the EPO Guidelines they are understood more usually to relate to an artificially constructed problem derived on the basis of the particular technical success achieved by the inventor(s) vis-à-vis the closest prior art which has first to be identified.¹⁷⁹ That fact is apparent from the EPO Guidelines, Part C, IV-25 which read:

In the second stage, one establishes in an objective way the technical problem to be solved. To do this one studies the application (or the patent), the closest prior art and the difference . . . in terms of technical features (either structural or functional) between the invention and the closest prior art and then formulates the technical problem.

. . . .
In this context . . . the technical problem means the aim and task of modifying or adapting the closest prior art to provide the technical effects that the invention provides over the closest prior art.¹⁸⁰

The EPO Appeal Board decision in *AgrEvo/Triazole*¹⁸¹ is a leading authority on this point. It concerned a class of herbicides.¹⁸² The EPO held that for patentability herbicidal activity had to be expected for all members of the class.¹⁸³ It based its opinion on the principle that the extent of the patent monopoly should correspond to and be justified by the technical contribution to the art that was contained in the specification.¹⁸⁴ Although the analysis was expressed in terms of a technical problem and its solution, that problem could be a reconstruction from what the invention achieved in relation to the prior art.¹⁸⁵ The decision explains that:

“...the Board of Appeal consistently decide the issue of obviousness on the basis of an objective assessment of the technical results achieved by the claimed subject matter, compared with the results obtained according to the state of the art. It is then assumed that the inventor did in fact seek to achieve these results and therefore these results are taken to be the basis for defining the technical problem . . .”¹⁸⁶

It went on to explain that mere structural ingenuity was not sufficient.¹⁸⁷ If the result that the skilled person was seeking to achieve was simply “obtaining further chemical compounds, then all known chemical compounds [were] equally suitable as the starting point” and all known methods of transformation might be used, so that

¹⁷⁸ See generally Greg Aharonian, *Why All Business Methods Achieve a Technical Effect?*, J. INFO. L. & TECH. (July 4, 2003), available at http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/2003_1/software/aharonian/#a2.

¹⁷⁹ EPO Guidelines, *supra* note 71, pt. C, ch. 4, 11.7–11.7.1.

¹⁸⁰ *Id.* at 11.7.2.

¹⁸¹ [1996] E.P.O.R. 171 (EPO (Technical Bd. App.)).

¹⁸² *Id.* at 175.

¹⁸³ *Id.* at 185–86.

¹⁸⁴ *Id.* at 180.

¹⁸⁵ *Id.*

¹⁸⁶ *Id.* at 180–81.

¹⁸⁷ See *id.* at 182.

the selection of particular compounds to be made was a mere arbitrary choice.¹⁸⁸ For that reason, “the selection of such compounds, in order to be patentable, must not be arbitrary but must be justified by a hitherto unknown technical effect which is caused by those structural features which distinguish the claimed compounds from the numerous other such compounds.”¹⁸⁹

Identification of an undisclosed problem is consistent with the above effect-based approach, as exemplified by the EPO Appeal Board decision in *Rider/Simethicone Tablet*.¹⁹⁰ The problem of inactivation of simethicone by antacid material was known and was believed to have been overcome in commercial tablets.¹⁹¹ However, the applicants had discovered that the simethicone still lost its activity when such tablets were stored and had recognized that the reason was that the simethicone, which was an oil, was migrating through the solid material of the tablet.¹⁹² The solution was to incorporate a barrier layer to stop the oil migrating into the antacid.¹⁹³ The Appeal Board held that in the previous state of knowledge a barrier layer would have been perceived as “superfluous, wasteful and devoid of any technical effect,” whereas it had now been recognized that a barrier layer produced a substantial effect not predictable from the prior art.¹⁹⁴ Accordingly a patent was granted.¹⁹⁵

Circumstantial evidence is admissible before the EPO, but is generally considered of limited value.¹⁹⁶ The classic decision on this point is *Metal BASF/Metal Roofing* where the Appeal Board contrasted the “subjective problem” (i.e. the problem that the inventor believed he was facing when he carried out the work that led to the invention) with the “objective problem” (i.e. the problem that must be defined from the actual state of the art) and explained that:

When assessing inventive step . . . it is not a question of the subjective achievement of the inventor . . . [i]t is rather the objective achievement which has to be assessed. As in the case of novelty, inventive step is an objective concept. Objectivity in the assessment of inventive step is achieved by starting out from the objectively prevailing state of the art, in the light of which the problem is determined which the invention addresses and solves from an objective point of view . . . and considerations is given to the question of the obviousness of the disclosed solution to this problem as seen by the man skilled in the art and having those capabilities which can be objectively expected of him.

. . . .

The appellant sees the fact that the steel industry has passed by the method as applied for, despite the significant economic contribution it makes to solving the environmental problems in this field, as an indication

¹⁸⁸ *Id.*

¹⁸⁹ *Id.* at 182.

¹⁹⁰ [1979–85] E.P.O.R. 715 (EPO (Technical Bd. App.)).

¹⁹¹ *Id.* at 716.

¹⁹² *Id.* at 717.

¹⁹³ *Id.*

¹⁹⁴ *Id.* at 719.

¹⁹⁵ *Id.* at 720.

¹⁹⁶ *See generally* *BASF/Metal Roofing*, [1979–85] E.P.O.R. B354 (EPO (Technical Bd. App.)).

of the presence of inventive step. The Board takes the view that, as against the assessment of inventive step from the objective point of view . . . a mere investigation for indications of the presence of inventive step is no substitute for the technically skilled assessment of the invention vis-a-vis the state of the art, pursuant to Article 56 EPC.¹⁹⁷

It is relevant to ask why a bright-line requirement for new result has led to a test before the EPO that commands widespread acceptance, or at least the absence of widely expressed disapproval, whereas in the U.S. it has created great difficulty and has been largely abandoned, as also is the case in the U.K. One possible reason is the approach, a sequence of questions, which the EPO Appeal Boards almost invariably follow in the decisions that they hand down, and which is set out below:

- (i) What is the technical field, or the purpose and effect, of the invention?
- (ii) What was the most promising starting point prior art (“closest prior art”) prior art?
- (iii) What is the technical problem that is solved by the difference(s) vis à vis the closest prior art?
- (iv) Does the claimed subject matter indeed provide a solution for the technical problem?
- (v) Was the technical problem known or obvious? If not;
- (vi) Does the claimed subject matter provide no more than an obvious solution?
- (vii) Especially in the chemical, biochemical and biotechnology arts, was the claimed solution obvious to try? If so, was there a reasonable expectation of success?
- (viii) Does the claimed subject matter fall within exception for selection inventions or for new uses?¹⁹⁸

In this sequence of questions, an attempt is made to identify a new function or result and to reconstruct an objective technical problem from it, i.e. to identify any positive merits of the invention, *before* considering whether the differences might be objected to as obvious.¹⁹⁹ Starting from technical problem tends to make the invention look big and predisposes to foresight analysis, whereas starting from the differences as suggested by the wording of 35 U.S.C. § 103 tends to make the invention look small and predisposes to hindsight analysis.²⁰⁰ $E = mc^2$ is a simple

¹⁹⁷ *Id.* at 357, 360.

¹⁹⁸ See AgrEvo/Triazole, [1996] E.P.O.R. 171 (EPO (Technical Bd. App.)); BASF/Metal Refining, [1979–85] E.P.O.R. B354 (EPO (Technical Bd. App.)); ICI/Containers, [1979–85] E.P.O.R. B362 (EPO (Technical Bd. App.)); Rider/Simethicone Tablet, [1979–85] E.P.O.R. 715 (EPO (Technical Bd. App.)). See generally EPO Guidelines, *supra* note 71, at pt. C, ch. 4 (discussing patentability, including novelty, inventive step, technical problems, biotechnological inventions, etc.).

¹⁹⁹ See AgrEvo/Triazole, [1996] E.P.O.R. 171 (EPO (Technical Bd. App.)); BASF/Metal Refining, [1979–85] E.P.O.R. B354 (EPO (Technical Bd. App.)); ICI/Containers, [1979–85] E.P.O.R. B362 (EPO (Technical Bd. App.)); Rider/Simethicone Tablet, [1979–85] E.P.O.R. 715 (EPO (Technical Bd. App.)). See generally EPO Guidelines, *supra* note 71, at pt. C, ch. 4 (discussing patentability, including novelty, inventive step, technical problems, biotechnological inventions, etc.).

²⁰⁰ Compare EPO Guidelines, *supra* note 71, pt. C, ch. IV, with 13 U.S.C. § 103 (2006).

quadratic equation, isn't it? It did not need a genius to work out something that simple, did it? It would be wrong to imply that decision makers whether under the common law or under the EPC do less than their best to decide the cases before them in a fair and objective manner. But this difference in starting point may in practice have created and maintained significant differences in outlook.

CONCLUDING REMARKS

It is submitted that there is nothing under U.S. law, U.K. law or the EPC, which mandates a high threshold of patentability, a low threshold of patentability, or even a constitutional standard of patentability. The old German concepts of *Erfindungshöhe* and technical advance have not been carried forward into the EPC.²⁰¹ Enquiries along these lines and comparison of differing national standards inject heat, but not light, into the debate. All that is, and ever was, needed is an objective evaluation of the claimed subject matter with the prior art according to the evidence, as indeed Jefferson carried out in relation to the Oliver Evans inventions.²⁰²

The consequences of the *Markman v. Westview Instruments, Inc.*²⁰³ decision and the resulting flood of preliminary issue or summary judgment motions have been to produce a creeping tide of blandness in patent specifications, especially those in the electrical and mechanical arts. Those who draft patents feel inhibited against identifying specific items of prior art in the BACKGROUND section of the specification.²⁰⁴ It would be inappropriate for a European practitioner to disregard the compelling considerations that have led to this development. However, compliance with prudent steps to avoid unintended limitation of claim scope should not go so far as to exclude from the specification necessary statements of result (including results associated with important dependant claims), statements of advantage and (where appropriate) experimental and other supporting information.²⁰⁵ European practitioners have never advocated U.S.-style object

²⁰¹ See Laura R. Ford, *Alchemy and Patentability: Technology, Useful Arts, and the Chimerical Mind-Machine*, 42 CAL. W.L. REV. 49, 103 (2005) (discussing the merge of inventive step and technical effect under the EPC and noting that “technical advance . . . [was] not mentioned and the English inventive step was explicitly incorporated,” however “the language of technical effect and technical advance [have not faded] from the European patent law scene”).

²⁰² See generally Letter, Isaac M'Pherson, *supra* note 16.

²⁰³ 517 U.S. 370, 391 (1996) (reasoning that “treating interpretive issues as purely legal will promote (though it will not guarantee) intrajurisdictional certainty through the application of *stare decisis* on those questions not yet subject to interjurisdictional uniformity under the authority of the single appeals court” and holding “hold that the interpretation of the word “inventory” in this case is an issue for the judge, not the jury”).

²⁰⁴ The chemical, pharmaceutical and biotech people often still write the introduction to their Ph.D. theses into the Background section of their specifications, so that you can expect to get to page 20 or page 30 before you find what the invention is. See also *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1260 (Fed. Cir. 1999) (cautioning trial courts to carefully distinguish statements directed to a particular prior art device from statements directed to a general method employed by that device, in a patent's background section or prosecution history).

²⁰⁵ See generally EPO Guidelines, *supra* note 71, pt. C, ch. 3, 3-4 (setting forth guidelines regarding scope as it pertains to independent and dependent claims, alternative in claim, and clarity and interpretation of claims).

clauses, especially where such clauses inappropriately find their way into the BACKGROUND section, and even more so when they then discuss in the BACKGROUND section and implicitly admit as prior art matters that were unknown prior to the invention and represent part of the inventor's contribution. What they are more likely to recommend is objective statements of result and advantage to be included in the DETAILED DESCRIPTION section, with no or minimal use of the controversial word "preferably."

At risk of slight repetition, Rule 5 of the PCT Implementing Regulations requires *inter alia* that the description shall:

- (i) specify the *technical field* to which the invention relates;
- (ii) *indicate the background art* which, as far as known to the applicant, can be regarded as useful for the understanding, searching and examination of the invention, and, preferably, *cite the documents reflecting such art*; [and]
- (iii) disclose the invention, as claimed, *in such terms that the technical problem (even if not expressly stated as such) and its solution can be understood*, and *state the advantageous effects*, if any, of the invention with reference to the background art.²⁰⁶

The cases cited here show that this not merely a set of requirements for an International application, but also advice which we disregard at our peril. It should not be forgotten that *KSR* started with a motion for summary judgment; if our specifications fail to disclose results and advantages which support inventive character, *KSR* may have multiple summary judgment progeny and parallel applications in the EPO will be unnecessarily difficult to prosecute.²⁰⁷

The USPTO has been accused of having become significantly less applicant-friendly following the *KSR* decision.²⁰⁸ This may reflect concerns about "patent quality" and is reflected in the Guidelines given to examiners.²⁰⁹ A big difference is noticeable between the EPO Examination Guidelines and those of the USPTO.²¹⁰

²⁰⁶ Patent Cooperation Treaty, with Regulations R. 5.1(a)(i)–(iii), June 19, 1970, 28 U.S.T. 7645, available at http://www.wipo.int/pct/en/texts/pdf/pct_regs.pdf.

²⁰⁷ Compare World Intellectual Property Organization [WIPO], *World Patent Report—A Statistical Review*, at C.2.2 (2008), available at http://www.wipo.int/export/sites/www/ipstats/en/statistics/patents/pdf/wipo_pub_931.pdf (stating that in 2006, the U.S. and Japan received the largest shares of total non-resident patent grants), *with id.* at C.2.1 (showing that the EPO granted approximately 60,000 non-resident patents in 2006).

²⁰⁸ See Joshua D. Sarnoff, Bilcare, *KSR*, *Presumptions of Validity, Preliminary Relief, and Obviousness in Patent Law*, 25 CARDOZO ARTS & ENT. L.J. 995, 1040 (2007) ("Perhaps the greatest effect of *KSR* will be to shift the burdens of production and persuasion to the patent holder (and possibly limit the relevant evidence for rebuttal) once a prima facie case is made by the party challenging validity that the invention is merely a combination of prior art elements performing their expected (even if significantly improved) functions."). There is perhaps a tension between a function being expected and it being significantly improved.

²⁰⁹ See Examination Guidelines for Determining Obviousness under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, 72 Fed. Reg. 57, 526 (Oct. 10, 2007) [hereinafter USPTO Examination Guidelines].

²¹⁰ Compare *id.*, with EPO Guidelines, *supra* note 71, pt. C, ch. IV, 11.

The EPO Examination Guidelines at Part C Chapter IV give examples relating to the requirement of inventive step.²¹¹ Considerable care has been taken to balance these examples. Examples illustrating the application of known measures in an obvious way and in which inventive step can be ruled out are balanced by further examples showing the application of known measures in a non-obvious way and in which an inventive step is therefore to be recognized.²¹² An example of an obvious and consequently non-inventive combination of features is balanced by an example of a non-obvious and consequently inventive combination of features.²¹³ Examples of obvious and consequently non-inventive selection are balanced by examples of non-obvious and consequently inventive selection.²¹⁴ The single example relating to overcoming a technical prejudice shows a situation where the application should be allowed, not refused.²¹⁵ A reader of these Guidelines is made aware that although many applications are open to objection, there are many others that cover meritorious inventions and should be allowed.²¹⁶

When the USPTO issued its post-*KSR* Guidelines, from the standpoint of a prosecution attorney they made depressing reading. For example, the first heading which refers to combining prior art elements according to known methods to yield predictable results gives two examples, one of which is *Andersons-Black Rock, Inc. v. Pavement Salvage Co.*²¹⁷ and the other of which is *Ruiz v SAB Chance Co.*²¹⁸ in both of which obviousness was established.²¹⁹ There is no balancing example in which inventive character was established.²²⁰ There follow five other headings illustrated by examples, each and every one of which shows the claimed subject matter to be obvious.²²¹ The final heading concerns the TSM test which is not illustrated by any example.²²² Under the heading “Consideration of Applicants Rebuttal Evidence” there are cursory indications that an applicant might have something relevant to say in reply, and that, for example, they might argue that the claimed elements in combination do not merely perform the function that each element performs separately.²²³ Might it not have been a good idea to inform the Examining Corps that if an applicant can demonstrate a new and unexpected result, this is strong prima facie evidence of inventive step, that this fact is supported by several opinions of the U.S. Supreme Court and that where such evidence is available an applicant should unless there are compelling reasons to the contrary expect a grant decision to follow? Experience in the EPO is that where an applicant can demonstrate a credible technical problem that he has solved, he will almost always be granted a patent and that although other objections, e.g. “one-way-street” or “bonus effect” are available,

²¹¹ EPO Guidelines, *supra* note 71, pt. C, ch. IV, 11.

²¹² *Id.* at 11.4.

²¹³ *Id.* at 11.13.

²¹⁴ *Id.*

²¹⁵ *Id.* at 11.13.4.

²¹⁶ *Id.* at 11.12.

²¹⁷ 396 U.S. 57 (1969).

²¹⁸ 357 F.3d 1270 (Fed. Cir. 2004).

²¹⁹ *Andersons-Black Rock*, 396 U.S. at 62–63; *Ruiz*, 357 F.3d at 1277; Examination Guidelines, 72 Fed. Reg. at 57,529

²²⁰ See USPTO Examination Guidelines, 72 Fed. Reg. at 57,529–30.

²²¹ *Id.* at 57, 530–33.

²²² *Id.* at 57, 534.

²²³ *Id.*

circumstances where such objections succeed are rare, as acknowledged by the U.K. High Court in *Haberman*.²²⁴

Instructions to examiners are of general importance to the public because they are the main tool used during examination and the important event for most applicants is grant or refusal by the patent office, litigation of patents (even in the U.S.) being uncommon.²²⁵ Instructions are even more important for examiners who are trainees and those who have only recently acquired signatory authority because they are likely to rely chiefly on those instructions and to take some time to achieve a deep understanding of case law. It is important to teach examiners when to make objections and the appropriate grounds for doing so, but is it not equally important to teach them when applications should be allowed and to show them examples of patents whose validity has been upheld, as the EPO does? Quality patent examination is not just a matter of ensuring that applications lacking merit are reliably refused, but also of ensuring that meritorious applications are reliably granted.

²²⁴ Compare EPO Guidelines, *supra* note 71, pt. C, ch. IV, 11.9 (discussing the effects of “bonus effect” and “one-way-street” on a finding of inventive step), *with* *Haberman v. Jackel Int’l, Ltd.*, [1999] F.S.R. 683, 697–98 (Ch. (Pat. Ct.)) (U.K.) (acknowledging the difficulty in reaching a decision on the patent’s validity because the patent seemed so obvious, but finding the patent to be valid because if it the simple step taken by the patentee had been that obvious, someone in the art would have found it much earlier).

²²⁵ See 35 U.S.C. § 101 (2006).