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In This Issue—

- Product-By-Process Claims: A Practical Perspective

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<i>—Eric P. Mirabel</i>	

PRODUCT-BY-PROCESS CLAIMS: A PRACTICAL PERSPECTIVE

INTRODUCTION

In a product-by-process claim, perhaps as its terms imply, a product is defined by setting forth the process by which it is made. It is important to bear in mind that "the invention so defined is a product and not a process."¹ Thus, a more descriptive expression than "product-by-process claim" defines the product as "claimed in product-by-process terms."

Use of product-by-process claims raises a number of problems and issues, the answers to which are by no means settled. The major issues discussed herein involve defining these claims, deciding when they can properly be made and determining their relationship with the provisions of Title 35 of the United States Code. The scope of the problems which can be encountered suggests what is perhaps the most descriptive definition for these claims—a trap for the unwary.

Throughout this article a view is kept towards the practical consequences of employing this claim format. While it will be seen as disadvantageous in many respects, it is nonetheless necessary where a product cannot be adequately defined in other terms. These disadvantages only arise, however, if product-by-process principles are applicable to the claim in question. Therefore the fundamental inquiry is always: into what category does a particular claim fit?

I. CLASSIFICATION AND DEFINITION

Claims drawn in product-by-process terms must be contrasted with those which include a "functional limitation," which is defined in 35 U.S.C. 112, final paragraph:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the

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1 In *re* Bridgeford, 357 F.2d 679, 682, 149 U.S.P.Q. 55, 58 (CCPA 1966); The decision in *In re* Taylor, 360 F.2d 232, 149 U.S.P.Q. 615 (CCPA 1966) emphasizes that a process claim and a product-by-process claim describe different subject matter. It was held that a separate patent on the subject matter of each was appropriate inasmuch as the former defined a process, the latter a product.

recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material or acts described in the specification and equivalents thereof.

Thus, a functional limitation defines the function of an element of the claimed invention. In contrast, a process limitation defines the manner in which the claimed product is made. Perforce, every product-by-process claim contains process limitations. Yet the presence of a process limitation does not necessarily permit the conclusion that the claim is of the product-by-process type, for as a separate category there exists what have been called "product claims with a process limitation." While the courts have apparently had no trouble distinguishing product-by-process claims from this latter category, the difference, if there is one at all, is extremely subtle.²

To add further confusion, there have been a number of instances where what appears a process limitation has been construed as structural.³ In fairness to the courts, however, certain terms and expressions can describe either structure or method of production.^{3.1} Words of this sort are typically

2 Distinguishing these separate categories of claims may be of critical importance, for example, in an infringement action. The courts have often indicated (though as discussed *infra* in Section V, perhaps incorrectly) that a product-by-process claim is only infringed when the accused product is made by the identical process to that recited in the claim. Thus, in addition to the other disadvantages discussed in the following sections, product-by-process claims often will afford a narrower scope of protection than "conventional" product claims. Whether infringement of a "product claims with a process limitation" would also only be made out where the accused product is made by the recited process, and whether they suffer the other disadvantages of product-by-process claims, is an open question. (See Section V, *infra*, for further discussion).

3 See *In re Moore*, *infra* at n.5, ("prepared by" was a structural limitation); *In re Steppan*, *infra* at n.8, (the court indicating that "condensed" was not a process limitation); *In re Garner*, *infra* at n.17, ("interbonded").

In *National Battery Co. v. Richardson Co.*, 63 F.2d 289, 17 U.S.P.Q. 60 (6th Cir. 1933) the term "intermixed" in the following claim was found not to be a process limitation:

A composition of matter . . . comprising bitumen intermixed with acid resistant mineral matter in finely divided form. . .

3.1 Of interest is *In re Bush*, 269 F.2d 491, 131 U.S.P.Q. 263 (CCPA 1961) where the emphasized language in the following claim was said to be "a sort of product-by-process limitation":

29. As an article of manufacture, a planar sheet mechanically strong in two directions at right angles to each other in the plane of the sheet comprising a

verbs whose inflection is the past tense.⁴ The following decisions illustrate the factors used in deciding into which category a claim reciting ambiguous limitations would best fit.

In *In re Moore* the structure of the claimed compound was that of the hydrocarbon known as alkyl adamantane,

group of slightly curved, irregularly outlined, thin broken glass fragments in flake form having substantial length and width compared to their thickness, *said group being of flakes having sizes and configurations to pass through a screen and being devoid of flakes having sizes and configurations to be retained on said screen . . .* [emphasis in original]

4 See e.g., the cases *Id.* Typical of a word which can describe both structure and method of production is "welded." In *Ex parte Nelson*, 46 U.S.P.Q. 157 (Board 1939) the Board stated that its use in a claim indicated a "conventional connection" and it could be replaced with the word "connected." In contrast, in *Ex parte Murray*, 49 U.S.P.Q. 207 (Board 1940) the Examiner had found that "welded" in certain article claims referred to the process of electric welding. The Board found "no apparent reason for claiming the product by reference to the process."

In *Ex parte Rabezana*, 4 U.S.P.Q. 430, 431 (Board 1930) the expression "ground in place," describing the manner in which porcelain may be fitted into a metallic shell of a spark plug, was said to be a method step and "at the same time descriptive of the state of the porcelain and shell . . ."

Regarding the recitation of "a plurality of duplicate and symmetrical longitudinal cylindrical segments of thin flexible sheet metal of uniform thickness longitudinally press fitted into place . . .," the Board stated, "The term ['press fitted'] determines structure as well as method as urged by appellant." *Ex parte Wagner*, 58 U.S.P.Q. 500, 501 (Board 1942).

Adding yet another twist, the CCPA in *In re Fitzgerald*, 619 F.2d 67, 205 U.S.P.Q. 594 (1980) stated that although the following claim appeared to be a product claim, due to applicants' statements regarding it, product-by-process principles were applicable in determining the propriety of the 35 U.S.C. 103 rejection:

34. A self-locking metal screw-threaded fastener comprising:
a metallic fastener element having a threaded portion;
a patch of crystallizable thermoplastic polymer having a lower crystallization rate than polyethylene *directly bonded* to said threaded portion;
said polymer having a maximum crystallization shrinkage of about 3% or higher by volume, and
said polymer in said patch having a reduced degree of crystallization shrinkage of about 25% or less of its maximum crystallization shrinkage.
[emphasis added]

Nevertheless, terms which could characterize structure or method of making have often been found to do the latter. For example, in *United States Gypsum Co. v. Consolidated Expanded Metal Cos.*, 130 F.2d 888, 55 U.S.P.Q. 247 (6th Cir. 1942) the term "brushed smooth" in the following claim was found to be a process limitation:

Metallic fabric of the slit and expanded type having strands and strand interconnecting bonds forming mesh work openings having relatively sharp corners at points where strands and bonds are interconnected, said fabric having the edges and corners throughout the entire expanded metal body brushed smooth.

that structure further being highly fluorinated.⁵ In pertinent part claim 1 recited “a mixture of highly fluorinated alkyladamantanes prepared by fluorinating an alkyladamantane . . . and in which the degree of fluorination is at least 75% of that corresponding to perfluorination of said alkyladamantane.”

The court concluded that the claims were not of the product-by-process type and further held that they were not indefinite, primarily because the specific process through which fluorination was achieved was shown to be unimportant:

We simply cannot understand why it is felt that process parameters are important here. Appellants clearly disclose that it is not the *type* of fluorination process which is important but the *fact* that the products are fluorinated and fluorinated to a specific minimum degree (spelled out by all the claims). When it was questioned whether known fluorination processes would produce the same type of product, appellants submitted an affidavit by one Schneider, an expert in the field, stating the opinion that “alkyl adamantanes when fluorinated by any of such procedures to the extent of at least 75% of that corresponding to perfluorination will convert into substantially the same highly fluorinated products regardless of which fluorination procedure is used.” In the absence of anything of substance to the contrary, we find this opinion conclusive. [emphasis in original]⁶

The court then addressed the Board’s contention that the fluorination process also yielded undesired degradation products, noting that it would be pertinent to the issue of claim definiteness only if true, and further that:

[S]ince we have found that these claims are not product-by-process claims, such a contention, even if it were true would be irrelevant to the issue of what the claims define and whether they are definite since it is quite clear that appellants do not wish to claim these degradation products, if any, *but only* the highly fluorinated alkyl adamantanes which are not degraded.⁷

⁵ 439 F.2d 1232, 169 U.S.P.Q. 236 (CCPA 1971).

⁶ *Id.* at 1236, U.S.P.Q. 239. Hereinafter, all emphasis in quoted portions of text are in the original, unless otherwise indicated.

⁷ *Id.*

In summary, the evidence showed that the claims in issue contained an adequate structural definition of the claimed product even in the absence of what ostensibly was a reference to how the product was made, *i.e.*, "prepared by fluorinating an alkyl-adamantane." The phrase defining structure, "the degree of fluorination is at least 75% of that corresponding to perfluorination of said alkyladamantane," was shown by the Schneider affidavit to fully define the product. The court's conclusion that they were not product-by-process claims—where the product is defined by the process of making—thus seems sound.^{7.1}

In *In re Steppan* the following claim had been rejected for "being an improper product-by-process claim:"

25. An acid phosphate of a condensation product selected from the group consisting of a diphenylamine-4-diazonium base and the base substituted in at least one of the positions 2, 3, 2', 3', and 4', by a substituent selected from the group consisting of methyl, ethyl, methoxy, ethoxy, propoxy, isopropoxy, butoxy, isoamyl, carboxy and chloro, the acid phosphate having the general formula $\text{ArN}_2\text{H}_2\text{PO}_4 \cdot \text{H}_3\text{PO}_4$, in which ArN_2 is the diphenylamine-4-diazonium base condensed with formaldehyde.⁸

The Board had concluded that because the claim referred to a "condensation product" and to the fact that the base was

7.1 In a similar manner the court in *In re Johnson*, 304 F.2d 591, 157 U.S.P.Q. 620 (CCPA 1967) contrasted one group of article claims having process limitations with another group of product-by-process claims. The following process limitation was said to be representative of that in the former group:

said article being formed by a process involving ceramically firing to rigidity a self-supporting green ceramic structure of like configuration having firm temporary bonds of green ceramic corresponding in location to said permanent ceramic bonds in said structural article. . . .

The court reversed the Board's decision that the article claims with the process limitations did not meet the "definiteness" requirements of 35 U.S.C. 112. The court appeared to recognize that it was *because* adequate structure was recited that these claims were definite and proper "product claims with a process limitation":

It appears to us that the first portion of these claims defines an article in structural terms with adequate clarity to meet the requirements of 35 U.S.C. 112. We do not see why the addition of further limitations defining the process of producing the article should be automatically fatal to the claims any more than the addition of further structural limitations would be.

8 394 F.2d 1013, 156 U.S.P.Q. 143 (CCPA 1967).

“condensed” with formaldehyde, it was a product-by-process claim.⁹ The court noted:

Assuming *arquendo* that the practice of rejecting claims as drawn to an “improper product-by-process” is somehow implicitly permitted by the 1952 Act, without citation or reliance upon a stated statutory basis for the rejection, the dispositive inquiry, it seems to us, is whether the construction of the claim itself shows it to be of the type proscribed by that “policy.”¹⁰

Stating that the claim was not a “product-by-process claim per se,” the court reasoned:

Parsing claim 25, we find first that it is directed to an “acid phosphate.” We note that the penultimate word grouping set off by commas advises that the acid phosphate has a general formula $\text{ArN}_2\text{H}_2\text{PO}_4\text{H}_3\text{PO}_4$. The ultimate word grouping of the claim states what ArN_2 is namely, the diphenyl-4-diazonium base condensed with formaldehyde. We find nothing inherently improper, nor statutorily proscribed, by the noted word groupings which merely add clarifying language to the definition of an acid phosphate . . .¹¹

Again, as in *Moore*, the claim in *Steppan* contained a substantial definition of the claimed product even in the absence of the ostensible process limitation (“condensed”). However, unlike the limitation in *Moore*, what appeared to be a process limitation *was* necessary to fully define the product. The court nevertheless strongly implied that the claim was a “true” product claim without process limitations.

Steppan is to be contrasted with *In re Luck*, where although the process limitation was found necessary to define the product, the indication was that the claim was a product claim with a process limitation.¹² Appellants’ claims, which were directed to a coating, included the following as the primary process limitation:

9 The Board concluded that the claim was improper because the structural formula was known. It relied on the relevant section of the Manual of Patent Examining Procedure, which at that time stated that product-by-process claims are only appropriate where the invention cannot be adequately defined by other means.

10 *Supra* n.8 at 1019, U.S.P.Q. at 148.

11 *Id.*

12 476 F.2d 650, 177 U.S.P.Q. 523 (CCPA 1973).

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said coating having been affixed to said glass member by applying thereon a liquid organic solvent having dissolved therein said polymer, said organofunctional silane and said additive organic substance, and said coated glass member thereafter being baked.¹³

Indicating that the claims were not product-by-process claims the court stated, "it is well established that product claims may include process steps to wholly or partially define the claimed product,"¹⁴ and added that:

To the extent these process limitations distinguish the *product* over the prior art, they must be given the same consideration as traditional product characteristics. In the present case, we cannot agree with the Patent Office that the absence of the carrier in the final product renders the carrier immaterial. The method of application could well result in a difference in the coated article, regardless of the fate of the solvent.¹⁵

The conclusion to be drawn from the decisions in *In re Steppan* and *In re Luck* is that even where a process limitation is necessary to define the product, that does not in itself allow the conclusion that the claim is in product-by-process terms. Nevertheless, the indication in *In re Hughes* is that where the product is *primarily* defined by the described process, that claim is a "true" product-by-process claim.¹⁶ The *Hughes* court concluded that the following allowed claim was of the product-by-process type and not a "true" product claim, as had been urged by the Patent Office:

A semi-split shake comprising a tip end portion having cut top and bottom surfaces, and a weather end portion having top and bottom

13 *Id.* at 651, U.S.P.Q. at 524.

14 Citing *In re Brown*, 459 F.2d 531, 535, 173 U.S.P.Q. 685, 688 (CCPA 1972).

See also *Fromson v. Advance Offset Plate, Inc.*, 720 F.2d 1565, 219 U.S.P.Q. 1137 (Fed. Cir. 1983), wherein one of the product claims in issue (said to be representative of the product claims) included an ostensible reference to the product's method of making. Defendant urged invalidity under 35 U.S.C. 103 arguing that if product-by-process claims had originally been sought they would have been rejected because, "each claimed element would have been old." The court rejected this argument because, *inter alia*, "that a process limitation appears in a claim does not convert it to a product-by-process claim."

15 *Supra* n.12 at 653, U.S.P.Q. at 525.

16 496 F.2d 1216, 182 U.S.P.Q. 106 (CCPA 1974).

surfaces formed by natural cleavage commenced at the juncture of the tip end and the weather end portions.¹⁷

The court reasoned:

While we recognize that several structural terms derive from processes or methods and that their use in a claim will not prevent it from being considered a true product claim, [footnote omitted] we do not believe that the emphasized language in claim 8 can be considered to be anything other than a description of the shake in terms of the process by which it was made.¹⁸

In conclusion, there are hazy lines separating "true" product claims from product claims which include a process limitation from "true" product-by-process claims. The determination seems to focus on the degree of specificity with which the product is defined in the absence of the process limitations. The more precise that definition, the greater the chance that the claim will be considered a "true" product claim. As the structural definition disappears there is a shift towards "product claims with a process limitation" and ultimately to the product-by-process end of the spectrum. This suggests that the disadvantages of employing the product-by-process format can best be avoided by including as many structural features as practicable, with a view towards balancing the undesirability of having a narrow product claim

17 In contrast to this conclusion, what appeared to be a process limitation was considered a structural one in *In re Garner*, 412 F.2d 276, 162 U.S.P.Q. 221 (CCPA 1969). "Interbonded," like "formed" is a word which could perhaps fall into either category, yet the court held that the emphasized language in the following claim was a reference to structure:

A composite, porous, thermal insulation panel characterized by dimensional stability and structural strength consisting essentially of expanded perlite particles which are *interbonded* one to another by interfusion between the surfaces of the perlite particles while in a pyroplastic state to form a porous perlite panel. [emphasis added].

Nonetheless, the posture of the case sheds some light on the court's conclusion. The issue in *Garner* was whether the product defined in the claim was patentably distinguishable over the pertinent prior art products, that art disclosing expanded perlite particles interbonded by an intermediate binder composition or by reaction of the particles with hydrated lime. It was held that as none of the prior art disclosed interbonding "by interfusion *between the surfaces* [of the perlite particles]" such interbonding would not have been obvious. (emphasis added). Thus, it was probably because the structure of the product (*i.e.*, that the particles rested "one to another") patentably distinguished it more so than its process of making that the "interbonded" limitation was construed as structural.

18 *Supra* n.16 at 1219, U.S.P.Q. at 108.

against the disadvantages of having the claim construed as a product-by-process claim.

Characterization of claim format is important for a variety of reasons. As noted above, changing the characterization can change what is required to prove infringement. It can also affect the passage through the patent examination proceeding; objective evidence may be needed to establish novelty or unobviousness. If characterized as a product-by-process claim unique problems may be presented when determining whether the requirements of the first and second paragraphs of 35 U.S.C. 112 have been met. Further, that characterization can raise the issue of whether the claim is proper or whether "true" product claims should instead be used. These ramifications are dealt with in the following sections, beginning first with the last.

II. CIRCUMSTANCES WHERE PRODUCT-BY-PROCESS CLAIMS ARE APPROPRIATE

Initially the CCPA, the D.C. Circuit and the Board of Appeals all took the position that product-by-process claims were only permissible where the invention could not otherwise be adequately defined.¹⁹ Other than historical reasons, it has never been made clear why these claims should be permitted only as an "exception" and not as an accepted claim format. However, the necessity for allowing them as an exception was realized relatively early.²⁰

The justification for use of product-by-process claims

¹⁹ In re Lifton, 189 F.2d 261, 263, 89 U.S.P.Q. 641, 643 (CCPA 1951); In re Shortell, 173 F.2d 993, 996, 81 U.S.P.Q. 359, 361 (CCPA 1949); In re Butler, 37 F.2d 623, 625, 4 U.S.P.Q. 342, 344 (CCPA 1930); In re Moeller, 117 F.2d 565, 567, 48 U.S.P.Q. 542, 544 (CCPA 1941); In re Brown, 29 F.2d 873, 874 (D.C. Cir. 1928); In re Merz, 97 F.2d 599, 601, 38 U.S.P.Q. 143, 145 (CCPA 1938); Ex parte Tiffin, 167 U.S.P.Q. 359, 360 (Board 1969); In re McKee, 95 F.2d 264, 266, 37 U.S.P.Q. 209, 211 (CCPA 1938).

See also In re Wohnsiedler, 315 F.2d 934, 137 U.S.P.Q. 336 (CCPA 1963), the court there refusing to consider appellants' assertions that because certain compounds of the invention were incapable of structural definition and thus could not be otherwise covered, product-by-process claims were proper. As justification, the court noted that applicants had failed to previously raise these arguments and that their consideration would involve technical issues.

²⁰ *Ex parte Painter*, 570 O.G. 999 (C.D. 1891) (per Commissioner Simonds).

was also expressed in *re Bridgeford*, wherein the court noted that the limitations of the English language should not bar issuance of a patent and further added, "the limitations of known technology concerning the subject matter sought to be patented should not arbitrarily defeat the right to a patent on an invention."²¹ The court reasoned that the manner in which the invention is defined is not important:

Whether the invention be defined in terms of the structure of the compound, or its novel physical characteristics, or by defining it in terms of the process by which it is produced or in a proper case, by employing more than one of these methods of defining the invention, the right to a patent on the invention is the ultimate consideration, subject to conditions set forth in 35 U.S.C. 112. "In a proper case" does not mean that an applicant must prove the impossibility of defining the invention other than by using more than one of the above methods.²²

Thus, the *Bridgeford* court was not terribly concerned with whether the "exception" to the rule against product-by-process claims had been met. Instead the court shifted the inquiry away from format and towards these more basic questions: 1) is the invention patentable? 2) Have the requirements of Section 112 been met? Most of the subsequent decisions by the CCPA essentially followed the analysis set forth in *Bridgeford*, further expanding the instances where product-by-process claims are proper. For example, the court in *In re Steppan* decided that one of the claims in suit was not an "improper" product-by-process claim.²³ It was stated elsewhere that the claim was not a "product-by-process claim per se," nevertheless, the court took the time to note that compliance with the requirements of Section 112 is the relevant inquiry in determining the propriety of a claim:

Thus, the issue relating to claim 25 turns on the single question of whether the claim is an "improper" claim, presumably on the

21 357 F.2d 679, 149 U.S.P.Q. 55 (CCPA 1966).

22 *Id.* at 682-83, U.S.P.Q. at 58. In *In re Bridgeford* the product claims of the application had been rejected for double patenting over appellant's patent, in which product-by-process claims to the same subject matter claimed in the appealed claims had previously been allowed. Finding that the same invention was claimed in both the application and the patent, the court affirmed the rejection.

23 *Supra* at n.8.

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basis of some "policy" requirements here imposed by the examiner and the board. There is no question that the Patent Office will, in a "proper" case, permit an applicant to claim a product or an article of manufacture by its process of manufacture when certain "conditions" imposed by the Patent Office are met. . .

As here applied, the effect of the conditions imposed is that the right to claim 25 is being improperly denied solely because of limitations of the English language. [footnote omitted] The problem, in essence, is thus one of determining who shall decide how best to state what the invention *is*. By statute, 35 U.S.C. 112, Congress has placed no limitations on *how* an applicant claims *his invention*, as long as the specification concludes with claims which particularly point out and distinctly claim that invention.²⁴

In *In re Pilkington* another rationale for permitting product-by-process claims was put forth: that they are proper where they are the means to distinguish the product from the prior art.²⁵ Appellant's invention in *Pilkington* related to a "float-glass" process for making a sheet glass product. In addressing the Board's finding that the product could be adequately claimed by reciting the characteristics of the sheet glass and that the product-by-process claim was therefore improper, the court noted that appellant had distinctly pointed out and claimed his invention in accordance with the requirements of Section 112.²⁶ Finding an absence of anticipation or obviousness, the court concluded, "the differences between [the claimed] glass and the glass of the prior art do not appear to us to be particularly susceptible to definition by the conventional recitation of properties or structure."²⁷

For the purposes of practice before the Patent and Trademark Office (PTO), the decision in *In re Hughes* effectively laid to rest any argument that product-by-process claims are improper because the invention can be defined otherwise.²⁸ For a rejection to be sustained, the PTO must

²⁴ *Id.* at 1019, U.S.P.Q. at 148.

²⁵ 411 F.2d 1345, 162 U.S.P.Q. 145 (CCPA 1969).

²⁶ The court cited a portion of the opinion from *In re Stepan* which appears in the text *supra* preceding n.24.

²⁷ *Supra* n.25 at 1349, U.S.P.Q. at 148.

²⁸ *Supra* at n.16.

demonstrate what or where that other definition is. Moreover, even if the product can be broadly defined without process limitations, if it cannot also be defined by product claims of a different scope, product-by-process claims are permissible as a hedge against invalidity of the broader product claims.²⁹

To conclude, it appears that product-by-process claims should always be allowed where the invention cannot otherwise be adequately described, whether due to the inability of language to keep pace with inventors or the inability of existing technology to determine just what the invention is. The language of the second paragraph of 35 U.S.C. 112 imposes no restrictions on *how* one may claim an invention, by implication permitting claims in whatever form desired. Thus, the current view is that product-by-process claims can be made without showing that the invention cannot be defined other than by reference to its process of making.³⁰ However, the possibility still exists that once issued a product-by-process claim could be invalidated because there is no "necessity" for it.³¹ Where another definition is avail-

²⁹ *Id.* at 1219, U.S.P.Q. at 108.

See also *Ex parte Pantzer*, 176 U.S.P.Q. 141, 142 (Board 1972) where product-by-process claims had been rejected as "unduly multiplied." The Board stated:

The claims vary in scope and are sufficiently different in their coverage. The fact that it is necessary for an applicant to describe his product in product-by-process terms does not prevent him from presenting claims of varying scope.

³⁰ The PTO will permit claims in product-by-process terms so long as the requirements of the second paragraph of Section 112 are met. The Manual of Patent Examining Procedure (M.P.E.P.), Section 706.03(e) was amended in 1974, deleting the requirement that applicant must show that "the product cannot be described except by reference to the process of making it." Product-by-process claims are now always permitted: "An article may be claimed by a process of making provided it is definite." M.P.E.P. 706.03(e).

Accord, *Ex parte Hartmann*, 186 U.S.P.Q. 366 (Board 1974) and the following dictum from *In re Brown*, 459 F.2d 531, 535, 173 U.S.P.Q. 685, 688 (CCPA 1972), "That method of claiming is therefore a perfectly acceptable one so long as the claims particularly point out and distinctly claim the product or genus of products for which protection is sought and satisfy the other requirements of the statute."

For discussion of the requirements of the second paragraph of Section 112, *See* Section IV (B) *infra*.

³¹ The reasoning of the court in *In re Hughes* tends to diminish this possibility where a product-by-process claim is of narrower scope than a "true" product claim. The court's statement in *In re Brown*, *supra* n.30, as well as the reasoning in *In re Pilkington*, *supra* n.25, *In re Steppan*, *supra* n.23, and *In re Bridgeford*,

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able, this possibility suggests caution in using such claims. Furthermore, given their other disadvantages which are explained more fully below, one would rarely want to use this format absent "necessity."

III. ANTICIPATION, OBVIOUSNESS AND RELATED CONCERNS

When relying on a single prior art reference, the PTO can reject product-by-process claims under either 35 U.S.C. 102 or 103,³² and can force the applicant to bear the burden of comparing the claimed product with those in the prior art:

[T]he lack of physical description in a product-by-process claim makes determination of the patentability of the claim more diffi-

supra n.21, indicates that "improper" product-by-process claims no longer exist, the only requirement being that 35 U.S.C. 112 second paragraph be complied with. Also, the Second Circuit in *Trussel Manufacturing Co. v. Wilson-Jones Co.*, 50 F.2d 1027, 1029, 10 U.S.P.Q. 47, 49 (1931) held, "the claim will not be invalidated merely because it describes the article with some reference to the method of producing it." A conclusion of invalidity on the basis of no "necessity" therefore appears unlikely, especially given that "A patent shall be presumed valid . . ." 35 U.S.C. 282.

Nonetheless, the court in *Westwood Chemical, Inc. v. Dow Corning Corp.*, 189 U.S.P.Q. 649, 665 (E.D. Mich. 1975) had no trouble ignoring the countervailing authorities in holding the claims in suit invalid, stating, "Claims defining a product by the process of making it are permissible only when the product cannot be otherwise defined." *See also* *Pfizer, Inc. v. International Rectifier Corp.*, 538 F.2d 180, 188 n.15, 190 U.S.P.Q. 273, 280 n.15 (8th Cir. 1976), "A 'product-by-process claim' is a form of *product* patent for a compound that *cannot be described other than by reference to the process of making it*. P. Rosenberg, *Patent Law Fundamentals* 76 (1975)." (Second occurrence of emphasis added).

32 A rejection under 35 U.S.C. 102 is proper where there is "identity of invention." *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771, 218 U.S.P.Q. 781, 789 (Fed. Cir. 1983). "Identity of invention" is shown where "each element of the claim in issue is found, either expressly described or under principles of inherency, in a single prior art reference, or . . . the claimed invention was previously known or embodied in a single prior art device or practise." *Id.* Thus, where reliance is placed on two or more references, Section 102 is inapplicable and the rejection is only proper if made under 35 U.S.C. 103, which 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. . . .

cult, since . . . it is the patentability of the *product* claimed and *not* of the recited process steps which must be established . . .

[W]hen the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior products and make physical comparisons therewith.³³

The practical effect of this ruling is that if the claimed product and the prior art product appear *similar* following a perusal of the application and the prior art, a *prima facie* case is established and the claim will be rejected. Clearly where a prior art process is relied upon in rejecting a product-by-process claim, subjective judgment is used in deciding whether the product of that process is also similar. Rejection is therefore almost certain where that process appears similar *at all* to the one set forth in the claim.^{33.1} The burden then shifts to the applicant who must conduct testing procedures, which could be both costly and tedious, and submit evidence that the differences between his product and those of the prior art are sufficient to establish unobviousness.³⁴ Consideration of these ramifications cautions against indiscriminate use of product-by-process claims.

33 In re Brown, 459 F.2d 531, 538, 173 U.S.P.Q. 685, 688 (CCPA 1972), the court holding that the rejection under either section was proper, "Since appellants have not otherwise established that their catalysts differ unobviously from those of the references . . ."; In re Thorpe, No. 85-1913 (Fed. Cir. Nov. 21, 1985).

See also In re Marosi, 710 F.2d 799, 218 U.S.P.Q. 289 (Fed. Cir. 1983), the court upholding the rejection of the product-by-process claims because appellants had adduced no evidence commensurate with the scope of the claims of an "unobvious difference" between the claimed product and that of the prior art.

33.1 It should be noted that there are indications that similarity of the processes, in itself, can permit a conclusion of obviousness. That is, not merely a *prima facie* thereof. See In re Wertheim, *infra* n.54; In re Kern, *infra* n.57; Struthers Patent Corp. v. Nestle Co., Inc., *infra* n.59; In re Cummings, *infra* n.60.

34 The evidence would be in the form of an affidavit or declaration submitted pursuant to 37 CFR 1.132.

A. 35 U.S.C. 102

With respect to Section 102 rejections, it is clear that the focus of the inquiry is always on the product.³⁵

The form of the rebuttal evidence has been frequently in issue. The claims in issue in *In re Bloomquist*, all of which were in product-by-process terms, defined a polymer formed by "thermolyzing an addition polymerization product of a tertiary amine methacrylamide and a vinyl or vinylidene monomer copolymerizable therewith."³⁶ The sole prior art reference relied upon disclosed the copolymerization of a nitrogen containing monomer, somewhat similar in structure to tertiary amine methacrylamide, with a vinyl or vinylidene monomer. Although the structure of the resulting polymer was not disclosed, appellants conceded that it would have the same basic structure as the claimed one. The alleged distinction was that the respective polymers would have different monomer distribution profiles within the polymer chain. In an affidavit which appellants had submitted, the theoretically predicted distribution profile of the claimed product (as predicted by the "Alfrey-Price formula") was compared with that of the reference. The court concluded that there was no explanation of how the polymers in the affidavit supported any difference in monomer distribution profiles over the prior art, noting that appellants had failed to compare the closest starting materials taught in the prior art, "The particular vinyl monomer reacted with [the nitrogen containing monomer] in example 1 of Coffman is methyl

³⁵ The decision in *Tri-Wall Containers, Inc. v. United States*, 408 F.2d 748, 161 U.S.P.Q. 116 (Ct. Cl. 1969) emphasizes this point with respect to Section 102 rejections. (A similar test is applied when proceeding under 35 U.S.C. 103; *see, e.g., In re Pilkington, infra* at n.52). In *Tri-Wall* plaintiff's product-by-process claims were directed to a triple wall corrugated paper board produced by a machine process. Plaintiff did not deny having made sales of a similar manually produced product prior to the critical date, but asserted that the manually produced products were structurally different from the machine made ones. Nonetheless the court found otherwise, "As the findings of fact show, the prior art product and the claimed product are structurally identical and possess substantially identical physical properties. Section 102(b) is applicable in this case." Further, the court refused to even consider whether the *method* of making would have been obvious, noting that "a product claimed as made by a new process is not patentable unless the product itself is new." Both parties had requested that the court make findings on the obviousness of the method.

³⁶ 489 F.2d 1293, 180 U.S.P.Q. 139 (CCPA 1973).

methacrylate. However, the Culbertson affidavit employs only vinyl acetate and butyl acrylate. Thus, appellants have not shown that the [polymers] of example 1 of Coffman do not result in the same monomer distribution profiles as the claimed [polymers].³⁷

[T]he affidavit shows that use of different vinyl monomers will affect the resulting polymer product . . . different vinyl monomers result in different [polymer] structures, which hardly supports the "categorical" opinion in the Culbertson affidavit that use of a tertiary amine methacrylamide will *always* result in a different polymer from a combination of [the nitrogen containing monomer of the prior art] with *any* vinyl monomer.³⁸

In summary, the evidence was deficient because the closest prior art products had not been compared and because a critical analysis showed the affiant's conclusions to be unsupported.

Appellant's proffered evidence was similarly found insufficient in *In re Robins*.³⁹ Appellant's contribution was the catalysts, "ionizable, halogen-free monoorganic mercuric compounds," used in an otherwise old process. In rejecting the product-by-process claims the examiner had criticized the evidence which appellant had presented, noting that while the physical properties of the products produced using the stannic chloride and dibutyl chloride catalysts taught in a reference were compared with those of the product produced using one of the catalysts recited in the claims, there was no such comparison of the product produced when using dibutyl tin dilaurate. The latter compound, which was among those disclosed in the reference, was said to be closest in structure to appellant's catalysts. Although the reference taught that stannic chloride was a preferred catalyst, the court reasoned:

[W]e are not concerned with superiority of the catalysts but rather with the differences, if any, in the products produced. We agree with the examiner that to be persuasive the affidavit should have included in the comparison a product obtained using a catalyst more similar in structure to appellant's catalysts.⁴⁰

37 *Id.* at 1297 n.6, U.S.P.Q. at 141 n.6.

38 *Id.* at 1297, U.S.P.Q. at 141.

39 429 F.2d 452, 166 U.S.P.Q. 552 (CCPA 1970).

40 *Id.* at 461, U.S.P.Q. at 558.

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The *Robins* decision thus emphasizes that to overcome a Section 102 rejection, the closest products produced by the most similar prior art processes must be compared with the claimed product.

B. 35 U.S.C. 103

Product-by-process claims can also be rejected under 35 U.S.C. 103. Where the rejection is made over a similar prior art product, whether disclosed expressly or under the principles of inherency, it is incumbent upon the applicant to produce evidence establishing patentability.⁴¹ Such evidence must show that the process followed is the one in the prior art which is the closest to that set forth in the claims.⁴² Further, the proffered evidence must be presented at the proper stage during prosecution,^{42.1} and must be commensurate with the scope of the claims to which it pertains.⁴³

41 See *In re Brown*, *supra* n.33. Accord, *In re Fitzgerald*, 619 F.2d 67, 205 U.S.P.Q. 594 (CCPA 1980) wherein the court stated, "Appellants have not rebutted the [PTO's] prima facie case with proof of some unexpected property . . ." The court found that the closest fasteners in the prior art were either the same or only slightly different from those claimed, and concluded:

[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of the claimed product . . . Whether the rejection is based on inherency under 35 U.S.C. §102 on prima facie obviousness under 35 USC §103 jointly or alternatively the burden of proof is the same . . . [citing *In re Best*, 562 F.2d 1252, 1255, 195 U.S.P.Q. 430, 433-34 (CCPA 1972)]

Accord, *In re Marosi*, 710 F.2d 799, 803, 218 U.S.P.Q. 289, 292-93 (Fed. Cir. 1983).

Allowing a Section 103 rejection over a product which is inherent in the prior art is *not* tantamount to concluding that the claimed product would have been obvious. That conclusion would fly in the face of the well-settled rule that: "That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown." *In re Spormann*, 363 F.2d 444, 448, 150 U.S.P.Q. 449, 452 (CCPA 1966).

42 See *In re Chamot*, 456 F.2d 795, 173 U.S.P.Q. 231 (CCPA 1972), wherein it was noted that appellant had failed to precisely follow the process of the closest prior art. The court held that there was no "unobvious difference" between the claimed product and those of the prior art, positing that superiority of the claimed product had not been adequately established.

42.1 *In re Fessman*, 489 F.2d 742, 180 U.S.P.Q. 324 (CCPA 1974) appellants had failed to present their rebuttal evidence in a timely fashion. Accordingly, the Board's refusal to consider whether appellants' liquid smoke product, (claimed in product-by-process terms), differed from the known kinds was held proper.

43 *In re Marosi*, *supra* at n.41, wherein after noting that appellants bore the burden of distinguishing their product from that of the prior art, the court stated, "Appellants have produced no such evidence commensurate in scope with the claims."

1. Commensurate with the Scope of the Claims

The evidence presented in *In re Dill* was found insufficient for failure to meet the "commensurate with the claim scope" requirement.⁴⁴ The invention in *Dill* related to hard inserts with a specified degree of surface roughness, for use as cutting members for earth boring tools. The appealed claims were drawn in product-by-process terms. For example, claims 1-4 and 9-10 referred to the abrading process which produced the requisite surface roughness; claims 6-7 and 12-15 defined the degree of roughness by reference to the abrasive tumbling process used to produce it.

The court's reasoning why appellants' proffered evidence was deemed insufficient is reprinted in full. It provides guidelines for what constitutes a sufficient Rule 132 affidavit in like circumstances:

The critical question under §103 is whether appellants have presented sufficient rebuttal evidence. We hold that they have not.

The evidence presented to rebut a prima facie case of obviousness must be commensurate in scope with the claims to which it pertains. [citations omitted] The claimed subject matter here is considerably broader in scope than the evidence offered by way of the *Dill* affidavit, and, thus, the affidavit is not sufficient to rebut the PTO's prima facie case.

When we examine the *Dill* affidavit dated August 8, 1976, we find that prior art inserts were compared with inserts which had been "tumbled two hours in a milling jar containing slurry of finely milled boron carbide and water." No other comparisons were made. We agree with appellants that, as far as the affidavit goes, it does demonstrate markedly superior results. However, it does not go far enough because it offers no proof whatsoever pertaining to unexpected results obtained with the invention as set forth in claims 1, 2, 4, 9-10, and 12-13, which do not call for tumbling in a boron carbon medium. Thus, the evidence is not commensurate in scope with the claims and the rejections must stand.

Similarly, the affidavit offers no proof with respect to claims 3, 6, 11, and 14, which do not limit the size of the abrasive particles. The affidavit compared the prior art with inserts which had been tumbled only with "finely milled" boron carbide. These claims call for the use of abrasive particles of any size, for which there

⁴⁴ 604 F.2d 1356, 202 U.S.P.Q. 805 (CCPA 1979).

is no evidence of superior and unexpected results. Clearly, the surface roughness will be closely related to abrasive particle size. As for claims 7 and 15, which recite an abrasive size of from 100 to 325 mesh, we find the affidavit evidence too indefinite, since the term "finely milled" in reference to the boron carbide abrasive particle size is nowhere defined. We take note of the statement found in the Dill affidavit of September 6, 1977, to the effect that a finish produced by tumbling will "depend on the duration and conditions of the tumbling." The size of the abrasive particles used is one condition of the tumbling and without reference to it the affidavit is incomplete. With similar effect, we note that the tumbling *duration* is nowhere specified in any of the claims, which are thus broader in scope than the proof of unexpected results offered in the affidavit.⁴⁵

The court's reasoning emphasizes that it is the product produced by the process *as claimed* which must be compared with the prior art products. All the recited process steps and ingredients, as well as any which are omitted in the claim but are used when conducting the comparison, are relevant in determining whether the proffered evidence is commensurate with the claim scope.

2. Superior and Unexpected Results

The requirement that rebuttal evidence demonstrate both "superior *and* unexpected results" (mentioned by the *Dill* court), has sometimes been strictly construed. The invention in *In re Menzi* was a meat-flavor seasoning product which because it was produced by partial rather than total protein hydrolysis, had a flavor which was superior to the prior art product.⁴⁶ The prior art product contained a mixture of a completely and a partially hydrolyzed protein. Based on certain statements in the pertinent prior art reference, in particular, on statements that it was the partial hydrolysis step of the process which gave "a superior taste to the product," the rejection of the product-by-process claim was affirmed. The court noted that although there was some evidence submitted during prosecution that appellant's

⁴⁵ *Id.* at 1361, U.S.P.Q. at 808-09.

⁴⁶ 345 F.2d 218, 145 U.S.P.Q. 490 (CCPA 1965).

product was in fact superior, "we believe that would have been entirely expected."⁴⁷

Similar to the holding of the *Menzi* court, a high threshold has been required to show "unexpected properties" in other decisions. The invention in *In re Lyons* related to production of a kaolin product for use, *inter alia*, as a paper coating product of higher whiteness and brightness than had been previously produced when using a comparable starting material.⁴⁸ The court's analysis was unusual in that the patentability of the method claimed in certain appealed claims was apparently determined by examining the nature of the product produced.⁴⁹ The prior art mentioned that the product made by following that method would produce increased brightness and gloss when used as a paper coating. However, no mention was made of whether "whiteness" was concomitantly increased. Addressing appellant's contention that an increase in whiteness was "unexpected," the court concluded, "[a]lthough whiteness and brightness are not the same property, the increase in whiteness here does not appear to be so unrelated to an increase in brightness as to tip the scales of patentability in the face of the entirely expected properties of brightness and gloss."⁵⁰ The court then turned to the product-by-process claim and used essentially the same reasoning as used in upholding the rejection of the method claims, *i.e.*, the focus was again on the product:

Although the product has improved brightness and results in a paper having improved gloss, as expected from both Billue and the Lyons patent, only the whiteness improvement is mentioned

47 *Id.* at 221, U.S.P.Q. at 492.

48 364 F.2d 1005, 150 U.S.P.Q. 741 (CCPA 1966).

49 The court in *In re Rosenberger*, 386 F.2d 1015, 156 U.S.P.Q. 24 (CCPA 1967) used the mirror image of this analysis, determining patentability of the product based on examination of the recited process. The court accepted appellants' contentions set forth in their affidavit that their product was superior to that of one prior art reference. That reference was also found to teach that following appellants' method would yield unacceptable results. On those findings, the rejection of certain process claims was reversed. Nonetheless, the rejection of other process claims and of the product-by-process claim, none of which included the process limitation which distinguished from the process of another prior art reference, was affirmed. The product-by-process claim was treated together with the process claim from which it depended, the court simply stating that it had been properly rejected on the prior art.

50 *Supra* n.48 at 1016, U.S.P.Q. at 749.

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in the claim, and this property we have adverted to above. Of the improvement in the three properties, two are entirely expected, the other only somewhat less so. Even assuming the improvement in whiteness to be unexpected, we are not convinced the product is non-obvious upon weighing *all the properties*. [citations omitted]⁵¹

In summary, the rule is that evidence offered to overcome a rejection under either Section 102 or 103 must offer a comparison of the claimed product to the prior art product. Comparison of the steps or ingredients involved in the process of making, though probably still relevant to the extent they show production of a different product, is of lesser importance.⁵² Nevertheless, in deciding obviousness under section 103 it makes little sense to rigidly apply that rule. In the absence of "superior and unexpected results," it strains the imagination to conceive of a process which itself would have been obvious producing an unobvious product, especially in a claim where that product is defined solely by recounting that process. A more sensible approach would be to look at whether the products are similar and then determine whether the recited process steps and ingredients are also similar to what is in the prior art. An affirmative answer should permit an inference of obviousness. A negative response lends weight to an assertion that the product, though perhaps similar to what is known, is nonetheless unobvious.⁵³

⁵¹ *Id.* at 1016, U.S.P.Q. at 750.

⁵² See *In re Pilkington*, 411 F.2d 1345, 162 U.S.P.Q. 145 (CCPA 1969). The court reversed the Section 103 rejection of the product by-process claim as the characteristics of appellant's claimed glass product, "surface perfection and freedom from internal stress," as obtained by practicing the recited method, "is both new and unobvious . . ." Nevertheless, the court noted:

The addition of a method step in a product claim, which product is not patentably distinguishable from the prior art, cannot impart patentability to the old product. *In re Moeller*, 117 F.2d 565, 28 CCPA 932, 48 USPQ 542; *In re Lifton*, 189 F.2d 261, 38 CCPA 1119, 89 USPQ 641; *In re Shortell*, 173 F.2d 992, 36 CCPA 1013, 81 USPQ 359.

See also *Tri-Wall Containers, Inc. v. United States*, 408 F.2d 748, 161 USPQ 116, and cases therein. Thus our inquiry here must be directed to a comparison of appellant's sheet glass with the sheet glass of the references to determine whether any differences between them are such that the subject matter as a whole would be unobvious.

⁵³ This reasoning is in accord with that of the court in *In re Luck*, as quoted *infra* at n.66, and *In re Bush*, *infra* at n.67.

3. *Similarity of the Recited Steps or Ingredients to What is Old*

The court in *In re Wertheim* may have used comparable reasoning to that noted above; *i.e.*, it may have been the similarity of the recited steps and ingredients to those in the prior art which permitted the conclusion that the products were also similar.⁵⁴ The invention in *Wertheim* was a process for making freeze-dried instant coffee as well as the resultant product. The court examined the claimed process and observed that because appellants' starting solid content range, as well as their "foam density" range obtained following the first step of the two-step freeze drying process overlapped those taught in one reference, the respective products appeared to be indistinguishable.⁵⁵ The court said that there was no evidence that these products differed in any way, and "certainly not in any unobvious way," concluding:

That *some* of the products *covered* by appellants' claims may not be disclosed or suggested by Pfluger 1963 is not relevant to patentability, since the claims embrace other subject matter completely disclosed by Pfluger 1963, complete disclosure in the prior art being the epitome of obviousness. *In re Pearson*, 494 F.2d 1399, 181 U.S.P.Q. 641 (Cust. & Pat. App. 1974). The rejection of these product claims under §103 on Pfluger is affirmed. [footnote omitted]⁵⁶

The court in *In re Kern* apparently felt that obviousness of the underlying method would *a fortiori* render unpatentable the product claimed in a dependent claim.⁵⁷ Stating first that the article claims "are all product by process claims and are all for a fully anticipated product," the court held, "Of course, those article claims which incorporate disallowed method claims . . . are not patentable."⁵⁸ In another portion of the opinion the court affirmed the Section 103 rejection of those method claims.

54 541 F.2d 257, 191 U.S.P.Q. 90 (CCPA 1976).

55 *Id.* at 271, U.S.P.Q. at 103.

56 *Id.* at 271, U.S.P.Q. at 104.

57 289 F.2d 513, 129 U.S.P.Q. 345 (CCPA 1961).

58 *Id.* at 515, U.S.P.Q. at 347; accord, *In re Rosenberger*, *supra* n.49.

It also seems that actual identity of the recited process and the prior art process can lead to a finding of obviousness.⁵⁹ Appellants in *In re Cummings* had apparently offered no objective evidence to rebut the obviousness rejection.⁶⁰ On appeal, the court made claim interpretation the sole issue, that being the only putative dispute. The court held that because the underlying process claim essentially “read on” the prior art method, the product claim depending therefrom had been properly rejected.

4. Are Structural Limitations Needed in the Claim?

The decision in *In re Johnson* represents a departure from the way obviousness of the claimed product was generally determined in the modern period of the CCPA.⁶¹ The Board in *Johnson* had ignored the process limitations in the product-by-process claims and had found the “meager structural limitations to be obvious in view of the prior art.”

In affirming, the court noted:

This court has repeatedly held that a claim for an article capable of such definition must define the article by its structure and not by the process of making it. [citations omitted] Since the articles involved in this case are clearly capable of structural definition, which appellant has not denied, *the patentability of the claim must be determined solely on the basis of the recited structure*, exclusive of the process recitations. [citations omitted] We agree with the board that the meager structure recited in the claims is obvious in view of the references. [emphasis added]⁶²

The court’s reasoning in *Johnson* (that the claim must include sufficient structural definition to distinguish over the

⁵⁹ *In Struthers Patent Corp. v. Nestle Co., Inc.*, 558 F. Supp. 747, 211 U.S.P.Q. 1023 (D.N.J. 1981), in ruling in favor of defendant’s summary judgment motion of invalidity, the court found it unnecessary to even consider whether the product was similar to those of the prior art. Having concluded that the “combination of elements in [the method] claims . . . were obvious . . . did not involve the exercise of invention . . . were anticipated in the prior art and were obvious to a person skilled in the art at that time,” the court found that, “the product-by-process claim 5 . . . is invalid, as it is merely the product of an old and known process.” (footnote omitted, emphasis added)

⁶⁰ 418 F.2d 932, 164 U.S.P.Q. 18 (CCPA 1969).

⁶¹ 394 F.2d 591, 157 U.S.P.Q. 620 (CCPA 1968).

⁶² *Id.* at 594–95, U.S.P.Q. at 623.

prior art) seems contrary to that in decisions such as *In re Dill* and *In re Brown*.⁶³ The rationale in those decisions is that it is the product *produced* by the recited process which is to be compared with the prior art products.⁶⁴ Structure need not be set forth; thus, the lack of structure in the claims is of limited relevance in determining patentability. Moreover, the rule announced in *Johnson* would destroy product-by-process claims as a viable format where a structural definition is available. If the claims were required to recite sufficient structural features to distinguish the product over the prior art then any process limitations would merely serve to unnecessarily limit their scope.

The court in *In re Luck* appeared to completely reject the rule of *Johnson*.⁶⁵ In fact, it was indicated that the recited method of production is *always* relevant insofar as it shows the claimed product to be different from those of the prior art.⁶⁶ A similar indication was given in *In re Bush* although the court there did not accept appellant's contention that the recited method would produce the desired result, and thereby yield the desired product—a glass product of increased strength.⁶⁷ The court found that accomplishing of the desired result had not been adequately set forth in the claim. Implicit in that finding is the recognition that if it had been set forth,

63 The *Johnson* court's reasoning is however in accord with older decisions made prior to the severe limiting of the rule of "necessity" in *In re Hughes*, *supra* n.28. See, e.g., *Westinghouse Electric & Mfg. Co. v. Quackenbush*, 53 F.2d 632, 634, 11 U.S.P.Q. 44, 46-47 (6th Cir. 1931); *In re Moeller*, 177 F.2d 565, 567, 48 U.S.P.Q. 542, 444 (CCPA 1941); *United Carbon Co. v. Carbon Black Research Foundation*, 59 F. Supp 384, 396, 64 U.S.P.Q. 366, 380 (D.Md. 1945); See also *In re Grupe*, 48 F.2d 936, 938, 9 U.S.P.Q. 255, 257 (CCPA 1931):

The case cited [*In re Butler*, *supra* at n.19] goes further than the argument made, and holds that where an inventor has created a new thing which cannot be properly discriminated in a claim from the prior art otherwise than by reference to the process of producing it, such reference is proper. Even if the contention of the Solicitor were correct, omitting any portion of the claims in issue which might be held descriptive of the process, we are of opinion sufficient remains to describe a product which is new and inventive.

64 See the discussion of those decisions *supra* n.33 and *supra* section III(B)1.

65 476 F.2d 650, 653, 177 U.S.P.Q. 523, 526 (CCPA 1973).

66 ("To the extent these [recited] process limitations distinguish the product over the prior art, they must be given the same consideration as traditional product characteristics.")

67 269 F.2d 491, 131 U.S.P.Q. 263 (CCPA 1961). The desired result was that "thin, flexible and strong" fragments were passed through a screen during a separation process and "thick, inflexible and weak" fragments were not.

the rejection of one claim which contained "a sort of product-by-process limitation" may not have been affirmed.

5. The Patentability Inquiry Must Focus On The Claimed Subject Matter

In re Hirao does not strictly involve the patentability of a product claimed in product-by-process terms.⁶⁸ Nevertheless, it is of interest because it emphasizes that a process claim defines different subject matter from a product-by-process claim, even if the former appears to actually incorporate the latter.

The sole independent process claim in *Hirao* recited two process steps by which a known product was formed and a third step in which the product was used as a food and drink sweetener. The parties stipulated that:

- 1) the product, highly purified maltose, was known,
- 2) the method of its making was unobvious,
- 3) the use of the product (the third step) would have been obvious.

The Solicitor urged that the claim should be treated as a "process of using a product-by-process claim" and that "the method limitation . . . should be given little or no weight."⁶⁹ The court noted that the focus must be on the invention as a whole and not on the obviousness of the separate steps of the process, and that analogy to product-by-process claims was inapposite because it was a three-step process, and not a product or its method of use, that was being claimed.⁷⁰

Thus, to determine obviousness, it is clear that the subject matter of the claim must first be ascertained. When dealing with product-by-process claims the focus must be on the product. If, as in *Hirao*, a process claim is under consideration then the focus is on that process. Inasmuch as 35 U.S.C. 103 requires consideration of the invention *as a whole*, the similarity of the recited steps and ingredients in a product-by-process claim to what is in the prior art should always be considered.

⁶⁸ 535 F.2d 67, 190 U.S.P.Q. 15 (CCPA 1976).

⁶⁹ *Id.* at 69, U.S.P.Q. at 17.

⁷⁰ *Ibid.*

IV. THE DESCRIPTION, ENABLEMENT AND DEFINITENESS
REQUIREMENTS OF 35 U.S.C. 112

A. First Paragraph

1. Description

35 U.S.C. 112 first paragraph states that, "The specification shall contain a written description of the invention and of the manner and process of making and using it . . ." The 1967 decision in *In re Ruschig* marks the first time that the CCPA ruled that there exists a separate "written description" requirement from the mandate that the manner of "making and using" be set forth.⁷¹ Subsequent decisions emphasized that one who has enabled those skilled in the art to make and use the claimed invention has not necessarily provided an adequate description of that invention.⁷² It was said that the function of the description requirement is to ensure that the inventor "had possession of," as of the filing date of the application relied upon, the specific subject matter later claimed.⁷³ The question becomes what is meant by "had possession of." It seems that "appreciation" or "mental possession" is what is intended. Whether the inventor had physical possession is irrelevant in determining what the *specification* describes; however, what is unappreciated cannot be described. Moreover, physical possession in the form of an actual reduction to practice is not required for the issuance of a valid patent.⁷⁴

71 379 F.2d 990, 154 U.S.P.Q. 118 (CCPA 1967).

The application originally filed in *Ruschig* included claims to the genus and the subgenus, as well as claims for specific compounds. Appellants later sought to add a claim for a specific compound neither named nor identified in the specification. The court agreed with appellants that the specification disclosed to one of ordinary skill in the art how to *make* that compound, but further noted:

The issue here is in no wise a question of its compliance with Section 112, it is a question of *fact*: *Is the compound of claim 13 described therein?* Does the specification convey clearly to those skilled in the art, to whom it is addressed, in any way, the information that appellants invented the specific compound?

72 *See, e.g.*, *In re Ahlbrecht*, 435 F.2d 908, 168 U.S.P.Q. 293 (CCPA 1971); *In re DiLeone*, 436 F.2d 1404, 168 U.S.P.Q. 592 (CCPA 1971).

73 *In re Herschler*, 591 F.2d 693, 200 U.S.P.Q. 711 (CCPA 1979).

74 *Dolbear v. American Bell*, 126 U.S. 1 (1887).

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The description requirement helps ensure disclosure of the invention to the public. However, that purpose is also performed by the requirement that the “manner and process of making and using” be set forth. Inasmuch as statutory language should not be construed as mere surplusage, it seems that the requirement of a “written description” also has another purpose—that of insuring that an inventor does not claim more than was conceived. The policy behind this purpose was recognized in *Fields v. Conover* where the court stated:

If Conover is allowed to copy Fields’ claims merely because the application is sufficient to teach how to make and use the subject matter thereof and points indistinctly and ambiguously in the general direction of that subject matter, the socially valuable incentive to further research and development provided by the opportunity to obtain subservient patents will be considerably diminished.⁷⁵

The decisions in *In re Ruschig* and *Fields v. Conover* demonstrate that mere disclosure of a process for preparing a product, absent mention of that product, does not in and of itself satisfy an applicant’s burden to provide “a written description” of that product. The question arises whether the description requirement is met where the product of a disclosed reaction is not named in the specification and is claimed in product-by-process terms. The *In re Edwards* decision provides guidance.⁷⁶

In *Edwards* it was undisputed that the appellants had disclosed reactions which would produce, as the predominant product, a particular claimed chemical compound. Appellants asserted that by virtue of having provided an adequate written description of those reactions in the parent

⁷⁵ 443 F.2d 1386, 1392, 170 U.S.P.Q. 276, 280 (CCPA 1971). *Fields v. Conover* was an interference action. Conover had filed an application including a generic claim to a class of compounds. One of Field’s claims, which was copied by Conover and became one of the counts, required a specific compound which fell within the generic claim. Conover’s specification did not specifically mention that compound, nonetheless, he was initially awarded priority.

On appeal, it was held that Conover’s specification met the enablement or “how to make” requirement as it adequately taught how to complete the reaction sequences necessary to make the claimed compound. However, the description requirement was held not to be satisfied.

⁷⁶ 568 F.2d 1349, 196 U.S.P.Q. 465 (CCPA 1978).

application they had provided an adequate written description of the claimed compound.

The court stated the issue as “whether the parent application provides adequate direction which reasonably leads persons skilled in the art to the later claimed compound. See *Flynn v. Eardley*, 479 F.2d 193, 178 U.S.P.Q. 288 (CCPA 1973).”⁷⁷ It noted that the description in the parent application was not intrinsically defective merely because appellants chose to describe their claimed compound by the process of making it,⁷⁸ adding that the parent application stated that, if desired, conventional means could be used to separate the components of the first reaction and, ostensibly, those of the final product of the second reaction. Although the preferred embodiment did not disclose separating the components, the court stated that “this does not negate the express disclosure that such separation is ‘within the scope’ of the parent invention; if such express language [i.e. separating the components] does not evidence ‘possession,’ then nothing does.” The court emphasized strongly, however:

Thus, *on the facts of this case*, an adequate description of the aforementioned reactions is, concomitantly, an adequate description of the claimed compound. This should not be construed as meaning that if an application adequately describes a process which, inherently, will produce a compound, then it *necessarily* adequately describes the compound: Each case must be decided on its own facts.⁷⁹

This latter portion of the court’s reasoning emphasizes that care must be taken to ensure that the description of a product of a disclosed reaction is adequate. Nevertheless, the holding is that where the specification evidences some level of appreciation or “possession” of that product, the description requirement is satisfied irrespective of the format of the claims.

An interesting problem involving the description requirement could be presented where a disclosed reaction

⁷⁷ *Id.* at 1351–52, U.S.P.Q. at 467.

⁷⁸ Thus, describing a product *in the specification* with reference to its process of making is not *per se* violative of the description requirement. Clearly then, defining the product the same way in a product-by-process claim makes the description *in the specification* neither more nor less defective.

⁷⁹ *Supra* n.76 at 1352, U.S.P.Q. at 468.

or process produced two or more products, some of which went unappreciated and unmentioned. This situation is not at all uncommon in the biotechnology field. A product-by-process claim would then be partially supported, provided there was an adequate description of the appreciated products, and partially unsupported—the other products being unappreciated and not in anyone's "possession."⁸⁰ If the description requirement is viewed as a way to prevent claiming what was not conceived then such a claim should be rejected, especially if there is another way of defining the "appreciated" products. Yet if the limitations of language or of known technology prevent such definition, the result should be otherwise lest the inventor be unfairly denied the right to a patent.⁸¹

2. Enablement

The teaching of "the manner and process of making and using" the invention must be commensurate with the scope of a product-by-process claim. In *In re Priest* the Examiner had alleged that the lack of a certain process limitation (maintenance of low monomer to polyol ratio during the polymerization procedure) caused the claims to encompass production of a material outside the scope of the enabling disclosure.⁸² The court found, however, that the recited physical characteristics of the claimed product ("polymer particles having diameters less than one micron") permitted the absence of the above-noted process parameter in the claims:

An analysis of the claims in the manner described in *In re Moore*, 439 F.2d 1232, 58 CCPA 1042, 169 U.S.P.Q. 236 (1971), further

80 "Appreciation" should not be construed as meaning knowledge of chemical name or formula. The realization that the compound possesses a unique set of properties should suffice. As was so keenly observed by Judge Rich, "[A] compound and all of its properties are inseparable; they are one and the same thing . . . But a formula is not a compound and while it may serve in a claim to *identify* what is being patented, as the metes and bounds of a deed identify a plot of land, the *thing* that is being patented is not the formula but the compound . . ." *In re Papesch*, 315 F.2d 381, 391, 137 U.S.P.Q. 43, 51 (CCPA 1963).

81 *See, In re Bridgeford*, the portion of text *supra* preceding n.21, the court stating that where these limitations result in inability to define the product, this should not bar issuance of a patent.

82 582 F.2d 33, 199 U.S.P.Q. 11 (CCPA 1978).

leads us to the conclusion that the scope of protection sought is supported by the disclosure. The disclosure indicates that the "polymer polyols produced by the process of this invention are novel compositions of matter characterized by the relatively small size of the polymers therein which greatly facilitate their preparation, handling and utility in producing polyurethane foams having less scorch." The claims are of similar scope. Neither the examiner nor the board indicated that the disclosure fails to teach one having ordinary skill in this art how to make and use *any* of the claimed compositions. A description of the compositions is also found in the specification. Accordingly, these claims meet the requirements of the first paragraph of 35 U.S.C. 112.⁸³

Thus the recited structural limitations saved the claims in *Priest*. However, that decision should not be read as meaning that process steps or ingredients essential to produce the desired product need not be included in the claims. For where they are absent, a rejection for lack of "enablement" is normally proper.⁸⁴ In *In re Mayhew* the invention was a method for depositing a corrosion-resistant, iron-zinc coating on a steel strip.⁸⁵ The court concluded, as had the Board and the examiner, that both a "cooling bath" for the steel strip as well as a specific location thereof were essential to achieve the desired alloy coating on the steel strip. The court held that the product-by-process claims were not supported by an enabling disclosure, the one failing to recite the existence of the cooling zone and the other, although setting forth the cooling zone, failing to specify its location.

In conclusion, use of product-by-process claims can present special problems with respect to the enablement requirement of Section 112. The requirement that these claims be commensurate in scope with the teaching of how to make and use the invention is the same requirement as with any other claim format. Yet one has far less leeway in drafting broad claims, for the omission of a process step or ingredient essential for producing the desired product will lead to a

⁸³ *Id.* at 38, U.S.P.Q. at 15.

⁸⁴ A rejection for "indefiniteness" under 35 U.S.C. 112, second paragraph, would also apparently be in order. (See Section IV(B) *infra*).

⁸⁵ 527 F.2d 1229, 188 U.S.P.Q. 356 (CCPA 1976).

rejection for "lack of enablement." Again, these considerations caution against use of product-by-process claims where other formats are possible.

B. Second Paragraph

An application must include "claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."⁸⁶ Although a claim is not inherently indefinite because it defines a product in terms of its process of making,⁸⁷ product-by-process claims must meet the above requirement.⁸⁸

In *In re Ruskin* two of the appealed product-by-process claims had been rejected as "incomplete."⁸⁹ The Board affirmed, finding that they failed to recite sufficient conditions to assure that the desired compounds would be formed. The court stated:

The specification indicates that the intermediates of claims 4 and 11 may be prepared by reacting the components under anhydrous conditions at room temperature. As an example of the preferred anhydrous medium, a mixture of ethanol and dioxane is given. The utilization of an anhydrous medium is the only condition which it might be said is necessary to the claim in the light of the specification. The board has stated that it could not be assured that the desired product would be formed absent a further recital of conditions. Of course the claim requires that something be formed, that some reaction take place. There is nothing in the board's decision or in the record which indicates that something

⁸⁶ 35 U.S.C. 112, second paragraph.

⁸⁷ See, e.g., *In re Hughes*, 496 F.2d 1216, 1218, 182 U.S.P.Q. 106, 108 (CCPA 1974).

⁸⁸ See, e.g., *In re Moore*, 439 F.2d 1232, 169 U.S.P.Q. 236 (CCPA 1971); *In re Steppan*, 394 F.2d 1013, 156 U.S.P.Q. 143 (CCPA 1967); *In re Bridgeford*, 357 F.2d 679, 149 U.S.P.Q. 55 (CCPA 1966).

The meaning of the terms used in a product-by-process claim must be clear. In *In re Steele*, 305 F.2d 859, 134 U.S.P.Q. 292 (CCPA 1962), after concluding that the rejected claims defined the product partially in terms of the reactants used to produce it and thus were of product-by-process nature, the court noted that other terms in the appealed claims ("polyglycol" and "chain") referred to the product's structure. The court indicated that both the examiner and the Board had ignored the presence of another structural limitation in the claim—that a mixed chain attached to an aliphatic monohydric alcohol was "heteric"—and had misinterpreted the claim scope. "Heteric" was capable of several definitions. It was held that the claims were too indefinite to determine what was covered thereby.

⁸⁹ 274 F.2d 955, 125 U.S.P.Q. 13 (CCPA 1960).

other than the compounds to which the specification is directed will be produced by the reaction of erythromycin and B-sulfopropionic anhydride. Absent such a showing, we feel that the processes of claims 4 and 11 are sufficiently complete to assure obtaining the desired claimed products. The rejection of these claims as incomplete is reversed.⁹⁰

Thus the claims in *Ruskin* were upheld because no conditions for the reactions were set forth in the specification that were not also in the claims, and because there had been no showing that undesired products would be formed by the recited reactions. In effect, this holding was tantamount to a determination that the disclosure was commensurate with the scope of the claims.

The court in *In re Wohnseidler*⁹¹ reached an opposite result from the *Ruskin* court—finding the claims indefinite—although the *Ruskin* reasoning was impliedly followed. The specification indicated that a certain reaction was required. However, the conditions needed for performing that reaction were not recited in the claims, and thus, what product would be produced was said to be uncertain.⁹²

*In re Merat*⁹³ presents a situation similar to that in *Wohnseidler*. In *Merat*, however, the court found more than a mere lack of certainty, concluding that the desired product would not be produced by the recited process.^{93.1}

90 *Id.* at 959, U.S.P.Q. at 17.

91 315 F.2d 934, 137 U.S.P.Q. 336 (CCPA 1963).

92 In *Wohnseidler* the product-by-process claims had been rejected as indefinite for failing to recite the essential procedural steps in the process. The court noted that the claims could be broadly defined as a polymerizable "reaction product of (A) . . . with a compound (B)," and that the product would be determined by "reaction conditions, proportions of reactants, etc. none of which is recited in the claims." Noting that the claims also required that the product be "dehydrohalogenated," the court looked to certain language in appellants' specification and from that concluded that a second reaction after the initial reaction of (A) and (B) must also take place.

93 519 F.2d 1390, 186 U.S.P.Q. 471 (CCPA 1975).

93.1 The invention in *Merat* related to a method of reducing the cost of poultry breeding by the selective mating of certain poultry genotypes. It was alleged that mating dwarf hens (which consume less food) with "normal" cocks would produce chicks of normal size.

A detailed analysis of the type of offspring produced by mating the various genotypes was undertaken by the court. The court ultimately found that the word "normal" in the claim, when used in reference to the type of cocks used in the breeding process, had at least two separate definitions. Irrespective of which definition was used, however, the method could produce chickens of "normal"

In conclusion, to avoid "definiteness" problems, and also "lack of enablement" problems, it is advisable to specify in the claim all steps and reaction conditions necessary to produce the desired product, especially if those conditions or steps are described in the specification. The problem with that approach is how specific one need be, for all such recitations will likely limit the scope of the claim in a subsequent infringement action.

V. INFRINGEMENT OF A PRODUCT-BY-PROCESS CLAIM

Product-by-process claims have been considered differently depending on whether infringement or patentability was being determined. In determining the latter the focus is on the product and not on its process of making.⁹⁴ However, in *Wabash* the Supreme Court stated that the rule is essentially opposite when determining what is an infringement:

[A] patentee who does not distinguish his product from what is old except by reference, express or constructive, to the process by which he produced it, cannot secure a monopoly on the product by whatever means produced. "Every patent for a product or composition of matter must identify it so that it can be recognized aside from the description of the process of making it, or else nothing can be held to infringe the patent which is not made by that process."⁹⁵

size, of subnormal size, or of dwarf size. In effect then the court was saying that the method set forth in the product-by-process claim would not work so as to always produce the desired product, *i.e.*, a chicken of "normal" size. Accordingly, the rejection which had been made under the second paragraph of Section 112 was affirmed.

⁹⁴ See, *e.g.*, *In re Dill*, *supra* n.44, *In re Brown*, *supra* n.33.

⁹⁵ *General Electric Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 373-74, 37 U.S.P.Q. 466, 470 (1938); citing, *Cochrane v. Badische Anilin & Soda Fabrik*, 111 U.S. 293 (1884); *Hide-It Leather Co. v. Fiber Products Co.*, 226 F. 34 (1st Cir. 1915); *National Carbon Co. v. Western Shade Cloth Co.*, 93 F.2d 94, 35 U.S.P.Q. 404 (7th Cir. 1937); *cf. Maurer v. Dickerson*, 113 F. 870 (3d Cir. 1902).

It should be noted that infringement for venue purposes is not made out under this test. The issue in *General Goods Corp. v. Carnation Co.*, 411 F.2d 528, 162 U.S.P.Q. 129 (7th Cir. 1969) was whether for the purposes of venue under 28 U.S.C. 1400(b) there had been infringement of a product-by-process claim. Defendant contended that the claimed method had not been practiced in the judicial district in which the action had been brought, (which the court appeared to accept), and consequently that there had been no infringement in that district of the dependent product claim, although the product itself had been sold there. The court responded by noting:

[P]roof of infringement of the product claim will require proof that it was made in accordance with the method claim. In our view, it does not follow,

The statement above is hereinafter referred to as "the *Wabash* proposition." The CCPA has similarly stated:

[I]t may be more difficult to determine from a product-by-process claim what product is covered thereby. One cannot read the words of the claim on an article unless he is able to find out how the article was made.⁹⁶

The above statements should not be viewed as binding—they are merely dictum. As discussed below, the decisions cited for support in *General Electric Co. v. Wabash Appliance Corp.* in fact do not stand for the broadly and unequivocally stated *Wabash* proposition. In the light of the policy of the Patent Law, product-by-process claim should be construed to cover a greater range of products than are encompassed when applying the *Wabash* test.

That the *Wabash* proposition is dictum is clear.⁹⁷ The court concluded that the claim in issue did not even recite any "process of production" limitations, instead holding it invalid for using "indeterminate adjectives which describe the function of the grains to the exclusion of any structure."⁹⁸ While the holding in *Cochrane v. Badische Anilin & Soda Fabrik* is apposite, an examination of the facts shows

as Carnation argues, that because the method by which the product was produced was practiced in another jurisdiction that the jurisdiction in which it was sold is lacking in venue.

96 In re Hughes, 496 F.2d 1216, 1218, 182 U.S.P.Q. 106, 107. Accord, In re Moeller, 117 F.2d 565, 568, 48 U.S.P.Q. 542, 545 (CCPA 1941):

We think the rule is well established that where one has produced an article in which invention rests over prior art articles, and where it is not possible to define the characteristics which made it inventive except by referring to the process by which the article is made, he is permitted to so claim his article, but is limited in his protection to articles produced by his methods referred to in the claims.

97 The similar pronouncements by the CCPA in In re Hughes and In re Moeller, *Ibid.*, are also dictum. The issue in those decisions was patentability, not infringement.

98 The court also stated that functional language cannot be used "at the exact point of novelty." Modernly, 35 U.S.C. 112, final paragraph, specifically permits use of functional language in a claim. The decision in *Locklin v. Switzer Bros. Inc.*, 229 F.2d 160, 131 U.S.P.Q. 294 (9th Cir. 1961) is enlightening.

The article in *Locklin* was claimed as "the condensation reaction product" of three separate chemical compounds, and as such was ostensibly a product-by-process claim. The defendant alleged that the claim was indefinite because the amount of melamine, which was one of the reaction products, was recited as, "an amount . . . sufficient to render said condensation product substantially insoluble in aromatic hydrocarbon solvents but insufficient to render it thermosetting." The

that the statement made by the court made sense in the light of those facts, but should probably be limited accordingly.⁹⁹

In *Cochrane* the claim was to a dye-stuff known as “artificial alizarine.” It recited that this composition was “produced from anthracine [coal] or its derivatives by either of the methods herein described, or by any other method which will produce a like result.” Two different methods were described in the specification, the court designating the latter the “bromine method.”

The circuit court had found that the accused product was produced by another method—the “sulpho-acid process.” Although finding that this process was superior to the patentee’s bromine method, the circuit court had found that it “performed the same office in the same way.”¹⁰⁰ The circuit court had also found that the products produced by the respective processes were the same.

Reviewing the circuit court’s decision, the Supreme Court found that the accused product was actually produced by yet another process, the so-called “bisulpho-acid process.”¹⁰¹ This process was described in a separate patent issued to one Perkin. It was noted that the patentees had stated in a previously published paper that the bisulpho-acid process produced a different product than did their patented process.¹⁰²

On the evidence the court concluded that the products produced by the bisulpho-acid and the bromine processes were different. Further, it was noted that if the claim was intended to cover all forms of “artificial alazarine,” some varieties of which had been shown to contain ingredients other those produced by the patented process, “we then have a patent for a product or composition of matter, which gives no information as to how it is to be identified.”¹⁰³ Having said that, the court enunciated the proposition later quoted by the *Wabash* court:

court however held that this did not render the claim indefinite for using “functional language at the precise point of novelty.”

⁹⁹ Cited as supporting the *Wabash* proposition, *supra* n.95.

¹⁰⁰ 111 U.S. at 310–311.

¹⁰¹ *Id.* at 311.

¹⁰² *Id.* at 305.

¹⁰³ *Id.* at 310.

Every patent for a product or composition of matter must identify it so that it can be recognized aside from the description of the process of making it, or else nothing can be held to infringe the patent which is not made by that process.¹⁰⁴

It appears that the *Cochrane* court did not intend that every product-by-process claim should be limited to cover only products made by the recited process. When read in the light of the facts, it seems the intention was only to limit that claim. Inasmuch as the claim required production of a generic product ("artificial alizarine"), the known varieties of which could exist in several forms, it would be indefinite if not limited to the product formed by the described process.¹⁰⁵ It is also worth noting that in no way did the court imply that the lower court had erred in examining the equivalence of the accused process.¹⁰⁶ The court also apparently considered it pertinent to the determination of non-infringement that the accused and the claimed products were themselves different.¹⁰⁷

In *Hide-It Leather Co. v. Fiber Products Co.* the circuit court affirmed the trial court's holding that the product claim was not infringed.¹⁰⁸ The specification and the two process claims on appeal set forth a two-step process of making the claimed waterproof leatherboard. Claim 5, reprinted below, only recited the second step of the process:

5. A water proof leatherboard made from pulp containing disintegrated fibers of tanned leather, and having insoluble waterproofing compounds deposited by precipitation upon and thereby intimately mixed with the fibers of which it is composed, substantially as described.

In deciding infringement the court held that notwithstanding that claim 5 only recited the second step, the district court had committed no error in restricting the claim scope to include the entire process set forth in the specification or

¹⁰⁴ *Ibid.*

¹⁰⁵ Note that no process was recited in the claim itself. The claim referred to the process of the specification.

¹⁰⁶ The lower court's statement that the processes "performed the same office in the same way" was clearly an application of the doctrine of equivalents.

¹⁰⁷ The court noted that the patentees had stated as much in their published paper.

¹⁰⁸ Cited as supporting the *Wabash* proposition, *supra* n.95.

its equivalent.¹⁰⁹ Plaintiff urged that defendant's process, wherein a washing step for fibers of tanned leather was employed, was the equivalent of the first step of the patented process in which a pulp fiber mixture was ground and then an alkaline substance added. Finding that the first step of defendant's process was not equivalent, the court held there was no infringement.

To summarize, the *Hide-It* court focused on equivalence of the processes. Strict identity was not requisite to establishing infringement. Under the *Wabash* test strict identity is required. The *Wabash* proposition therefore is broader than the *Hide-It* decision relied upon for support.

In *National Carbon Co., Inc. v. Western Shade Cloth Co.* the court set forth the following dictum: "It has been said that a claim for a product produced by any process which will produce a like result covers the product only when made by equivalent processes,"¹¹⁰ citing *Pickardt v. Packard*.¹¹¹ Thus, similarly to the indication in *Cochrane* and *Hide-It*, where the courts considered it proper to apply the doctrine of equivalents in determining infringement, the *National Carbon Co.* court also felt that equivalence of the processes would establish infringement. Again it is noted that this statement does not support the *Wabash* proposition, as the test defined thereby requires that the accused product be made by an identical process.

In *Pickhardt v. Packard*¹¹² the court noted that although neither party presented any evidence that defendant's coloring matter was produced by the process of the patent, there was evidence that the coloring matter itself was identical to that produced by following that process.¹¹³ Because this coloring matter was unknown prior to the development of the patentee's process, the court held "a sufficient *prima facie* case is shown upon the question of infringement."

The *Packard* court therefore considered it relevant that the accused and patented products were identical; but it did

¹⁰⁹ 226 F. at 37.

¹¹⁰ *Supra* n.95, F.2d at 97, U.S.P.Q. at 406; (cited as supporting the *Wabash* proposition).

¹¹¹ 22 F. 530 (Cir. S.D.N.Y. 1884).

¹¹² *Ibid.* Cited for support by the *National Carbon Co.* court.

¹¹³ *Id.* at 532.

not require identity of process of making as is dictated by the *Wabash* test.

In summary, many of the courts whose decisions were cited as supporting the *Wabash* proposition considered whether the accused and claimed products were identical in determining infringement. In addition, most of those courts concluded that the accused process need only be shown to be equivalent to establish infringement—identity, as required under the *Wabash* test, was not found necessary.

Notwithstanding its fragile underpinnings, many have embraced the *Wabash* proposition as a binding rule of law. In the article "Product-By-Process Claims and their Current Status in Chemical Patent Office Practice,"¹¹⁴ it is stated, "the courts uniformly hold that only a product produced by the claim-designated process may be held to infringe [a product-by-process] claim."¹¹⁵ In addition to *Wabash* and those decisions cited as supporting the *Wabash* proposition, cited for support are *United States Gypsum Co. v. Consolidated Expanded Metal Cos.*¹¹⁶, *Plummer v. Sargent*¹¹⁷ and *Purdue Research Foundation v. Watson*.¹¹⁸ A discussion of these decisions is set forth below to demonstrate that none of them supports the *Wabash* proposition or this paraphrasing of it.

In *United States Gypsum Co.* the sole issue was patent validity, not infringement. The court wrongly thought that the *Wabash* test was somehow determinative of validity:

[W]e are, nevertheless, of the opinion that claim 16 does not describe a new product and is invalid under the rule that a patentee who does not distinguish his product from what is old except by reference, express or constructive, to the process by which he produced it, cannot secure a monopoly on the product by whatever means produced. [citing, *General Electric Co. v. Wabash Appliance Corp.*]¹¹⁹

114 Authored by J.S. Saxe & J.S. Levitt, 42 J. Pat. Off. Soc'y 528 (1960).

115 42 J. Pat. Off. Soc'y at 530.

116 130 F.2d 888, 55 U.S.P.Q. 247 (6th Cir. 1942).

117 120 U.S. 442 (1887).

118 122 U.S.P.Q. 445 (D.D.C. 1956), *aff'd*, 265 F.2d 107, 120 U.S.P.Q. 521 (D.C. Cir. 1959).

119 *Supra* n.116 at 893, U.S.P.Q. at 252.

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The holding in *Purdue Research Foundation* is also inapposite.¹²⁰ The action there was brought under 35 U.S.C. 145 in an attempt to authorize the Commissioner to issue a patent. Patentability, not infringement, was the issue.

In *Plummer v. Sargent* the court found there was no infringement ostensibly because the defendant's article, although substantially identical, was not produced by an identical process.¹²¹ Again, however, the specific facts may have led to the narrow construction of the claims. The court stated that it refused to construe the product claims so broadly as to cover the accused article, noting that because that article was produced by a process substantially identical to a prior art process:

It seems necessarily to follow from this view either that the Tucker patents are void by reason of the anticipation [by the prior art], or that the patented process and product must be restricted to exactly what is described, that is, to a simultaneous and joint oxidation of the iron and the oil after the application of the oil to a cleansed surface of cast iron. To that extent the patents may be sustained, but upon that construction they do not include the process and product of the defendants; there is consequently no infringement. [emphasis added]¹²²

The court therefore interpreted the claims narrowly, finding that they included the recited process, to avoid invalidity over the prior art. It therefore seems that the conclusion of the commentators that "[t]he courts have uniformly held that only a product produced by the claim-designated process may be held to infringe" is not supported by the decisions cited. Moreover *Wabash*, and the decisions cited as supporting the *Wabash* test, do not support that proposition.

Having established that the *Wabash* test is by no means an iron-clad rule, the question becomes what the test of infringement should be. As noted above, there is adequate support for a test which considers equivalence of the accused process and also asks whether the products are similar or identical. In addition, there may be good reasons why this

¹²⁰ *Supra* n.118.

¹²¹ *Supra* n.117.

¹²² *Id.* at 448.

should be the test. When determining patentability before the PTO the focus is on the product and there is certainly some logic to holding to that practice once before the courts. The practical difficulties the patentee encounters in determining how an accused product is made also support keeping the focus on the product. On the other hand, if infringement was determined solely by a comparison of the accused and the claimed products the public would be burdened with making product comparisons; a reading of the claim itself would not give notice which products constitute an infringement. The purpose of the second paragraph of 35 U.S.C. 112 is to ensure that the claims make clear what is covered, thereby protecting the public against liability for inadvertent infringement.¹²³ It is difficult to imagine that the drafters of that provision felt that the burden of making product comparisons should be placed on those they were seeking to protect.

It seems that a fair balance of these two seemingly conflicting considerations (consistent claim interpretation vs. fair notice to the public) could be achieved by doing essentially what many courts have done. Identity of the accused and claimed products should be a consideration. Where identity or close similarity is found, the recited process should be afforded a wide range of equivalents. Under this test, a reading of the patent claims would provide reasonable notice to the public of what products are covered; yet the claim coverage would not be limited so that identical products made by similar processes would fall outside the reach of the law. Inventors forced to claim in product-by-process terms would have some assurance that the limitations of the English language and of known technology to adequately define their products would not defeat their right to reasonable patent protection.

With that as background a remaining question is more easily answered. That is, how should infringement of a "product claim with process limitations" be determined?¹²⁴

¹²³ See, e.g., *In re Hammack*, 427 F.2d 1378, 1382, 166 U.S.P.Q. 204, 208 (CCPA 1970).

¹²⁴ See, e.g., *In re Luck*, *supra* n.12, *In re Hughes*, *supra* n.16.

Is it like a "true" product claim where the only question is whether the accused and claimed products are identical? Or is it akin to a product-by-process claim where the process limitations are of major significance in determining claim scope? The reader's attention is directed to the first section of this article. It was noted that the more structure recited in the claim, the more likely it would be considered a "true" product claim. Where there is less structure the process limitations become more significant in defining the product, and the claim is more likely of the product-by-process type. The test of infringement should vary accordingly. Where the process limitations are wholly superfluous, there being an adequate structural definition, the only consideration should be whether there is identity of accused and claimed products. Where the structural definition begins to disappear, the focus of the inquiry should begin to shift from the product to the process of its making, and whether the accused and claimed products were made by an identical or equivalent process becomes a greater concern. Irrespective of whether the claim is termed a "product-by-process claim" or "a product claim with a process limitation," the distinction between the product and its process of making is not clear-cut. Therefore all relevant evidence, *i.e.* similarity of the products, should be considered in determining infringement.

To serve both as an overall summary of the problems likely to be encountered with product-by-process claims and an illustration of how certain decisions discussed above can conflict, a practical problem is analyzed below.

FINAL OBSERVATIONS

If several products result from a disclosed process and some cannot be named or identified, *e.g.* by chemical formula, the patent draftsman faces a dilemma. Should the product(s) be claimed only in product-by-process terms, the following disadvantages may be encountered:

- 1) There could be problems of "inadequate description."¹²⁵

¹²⁵ See, *In re Edwards*, *supra* n.76.

- 2) Rejection over the prior art is virtually assured if reasonably similar products or processes are known.¹²⁶ The burden then shifts to the applicant to establish patentability. If there are several close products in the prior art, the applicant must make comparisons with each and show "superior and unexpected" results.¹²⁷
- 3) All essential steps and ingredients must be recited in the claims to ensure that they are of commensurate scope with the disclosure¹²⁸ and are "definite."¹²⁹ Further, sufficient limitations must be set forth to ensure that the desired product results from the recited process.¹³⁰ Compliance with these requirements leaves claims of narrow scope.
- 4) In determining infringement a court may well rule that only a product made by a process identical to that recited is an infringement.¹³¹ This would leave the invented products unprotected if they were produced by a different process.

126 See, In re Brown, *supra* n.33. Note that following patent issuance a court could, in determining validity, require that the claim recite enough *structural features* to distinguish it from the prior art. See, In re Johnson, *supra* n.61. However, this is not the view of the PTO. See MPEP 706.03(e).

127 In re Dill, *supra* n.44, In re Menzi, *supra* n.46, In re Lyons, *supra* n.48.

128 In re Priest, *supra* n.82, In re Mayhew, *supra* n.85.

129 In re Ruskin, *supra* n.89, In re Wohnseidler, *supra* n.91.

130 In re Merat, *supra* n.93.

131 In re Hughes, In re Moeller, *supra* n.96, General Electric Co. v. Wabash Appliance Corp., and cases cited for support therein, *supra* n.95; United States Gypsum Co. v. Consolidated Expanded Metal Cos., *supra* n.116, Plummer v. Sargent, *supra* n.117, Purdue Research Foundation v. Watson, *supra* n.118.

Given their disadvantages there is a serious question why product-by-process claims, which in any event may be restricted in scope to only cover products made by the described process, should be made. 35 U.S.C. 101 allows one to simply claim the process and thereby avoid many of these problems. The reason for claiming the *product* is that, "the sale of a product made from a process does not infringe a patent on that process." Koratron Co. v. Lion Uniform Inc., 449 F.2d 337, 338, 171 U.S.P.Q. 452, 453 (9th Cir. 1971); In re Amtorg Trading Corp., 75 F.2d 826, 832, 24 U.S.P.Q. 315, 322 (CCPA 1935). As was noted by Judge Learned Hand, "[I]t might be possible to patent a product merely as the product of a machine or process . . . While it would in that case not be infringed by anything but the product of the machine or of the process, it might be an important protection to the inventor, if the machine or the process was used in another country and the product imported." Buono v. Yankee Maid Dress Corp., 411 F.2d 1345, 1348, 26 U.S.P.Q. 57, 61 (2d Cir. 1935).

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Thus, an applicant can submit only product-by-process claims and after considerable trouble possibly receive claims of narrow scope whereby some invented products go unprotected. On the other hand, if only conventional product claims are submitted, unnamed products go unprotected. If both "conventional" claims and product-by-process claims are submitted, the applicant risks invalidity of the latter as there is no "necessity" for them,¹³² which would also leave the unnamed products unprotected. The CCPA never did overrule the "rule of necessity."¹³³

The solution to this dilemma is to simply eliminate the notion that product-by-process claims are somehow a "peculiar" or "exceptional" claim format. The concept of "necessity" is simply not relevant. Compliance with the requirements of 35 U.S.C. 112, second paragraph—that there be claims particularly pointing out and distinctly claiming the invention—should be the only issue. Inventors should be safe in the knowledge that the limitations of the English language and of known technology to adequately define their inventions do not deprive them of protection, irrespective of the format of their claims.

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¹³² In re Lifton, In re Shortell, In re Butler, In re Moeller, In re Brown, In re Merz, In re McKee, all *supra* n.19.

¹³³ Note that In re Hughes *supra* n.31, which goes furthest towards such a ruling, only holds that product-by-process claims can properly be made along with "conventional" product claims where the product cannot also be defined with "conventional" claims of narrower scope. Subsequent to that decision, at least one court has held that product-by-process claims are invalid where the product can be otherwise defined. See *Westwood Chemical, Inc. v. Dow Corning Corp.*, *supra* n.31.