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ARTICLES

IN RE DILLON: PRIMA FACIE OBVIOUSNESS OF CHEMICAL CLAIMS

BY GREGORY L. BRADLEY*

I. INTRODUCTION

Over the last forty years the courts and the Patent and Trademark Office ("PTO") have applied conflicting *prima facie* obviousness standards to chemical claims. This conflict came to a head in *In re Dillon*.¹

Dillon's claims had been rejected as obvious by the Board of Patent Appeals and Interferences. On appeal, a panel of the U.S. Court of Appeals for the Federal Circuit reversed² on the basis that the Board had used an incorrect standard for *prima facie* obviousness. The panel held that a *prima facie* case of obviousness is not made unless the claimed invention is "structurally similar"³ to the prior art reference, and there exists some suggestion in the prior art that the claimed invention will have the same or a similar utility as that discovered by the applicant.⁴

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1. 919 F.2d 688, 16 U.S.P.Q.2d 1897 (Fed. Cir. 1990).

2. *In re Dillon*, 892 F.2d 1554, 13 U.S.P.Q.2d 1337 (Fed. Cir. 1989).

3. "Structural similarity" is a term used to describe chemical compounds that have very similar molecular structures. Chemical homologs and isomers are prime examples of structurally similar compounds. See *In re Wilder*, 563 F.2d 457, 458 n. 7, 195 U.S.P.Q. 426, 428 n. 7 (C.C.P.A. 1977) ("A 'homologous series' is a series of compounds whose structures differ regularly by the successive addition of the same chemical group....Different compounds having the same molecular formula are called isomers. They contain the same numbers of the same kinds of atoms, but the atoms are attached to each other in different ways.")

4. This standard will be referred to as the *Dillon* dissent standard.

The PTO petitioned for rehearing and suggested rehearing en banc on February 12, 1990. This petition was approved and, on November 9, 1990, the U.S. Court of Appeals for the Federal Circuit issued an opinion reversing the earlier panel decision by a nine to three margin.⁵ Circuit Judge Lourie, writing for the *Dillon* majority, formulated a standard for *prima facie* obviousness different from that announced in the prior *Dillon* decision. Under this standard, a chemical compound or composition that is "structurally similar" to the prior art, where the prior art provides motivation to invent the claimed compound or composition, is *prima facie* obvious. This *prima facie* case of obviousness may be rebutted by test data showing (1) that the claimed compound or composition possesses unexpectedly improved properties over the prior art or properties not actually possessed by the prior art, (2) that the prior art provides no motivation to make the "structurally similar" compound or composition, or (3) any other relevant argument.⁶

This standard was severely criticized by the *Dillon* dissent as being both contrary to the weight of precedent and the reincarnation of a disfavored *prima facie* obviousness standard of earlier years - structurally similar chemical compounds are *prima facie* obvious.⁷ Instead, the dissent advocated using the *prima facie* obviousness standard announced in the earlier *Dillon* decision.

Despite the dissent's assertions, the *Dillon* standard for *prima facie* obviousness has a sound base in precedent and promotes the integrity of chemical compound patents. The soundness of the *Dillon* standard, however, is not as apparent with respect to chemical composition and process claims and, quite probably, will increase chemical patent prosecution expenses.

After reviewing the facts of the *Dillon* case, this paper will illustrate, by analysis of prior caselaw, that *Dillon* has not

5. Judges Archer, Markey and Michel issued a concurring opinion in which they joined the majority in its formulation of the *prima facie* obviousness standard.

6. This standard will be referred to as the *Dillon* standard.

7. This standard will be referred to as the *Hass-Henze* doctrine of structural obviousness. "Structural obviousness" is a 'presumption of obviousness' (older term for *prima facie* obviousness) based on the structural similarity of claimed and prior art subject matter, and the assumption in chemistry that structurally similar compounds have similar properties. This 'presumption' could be rebutted by evidence showing that the prior art compound did not possess the property possessed by the claimed compound. See *In re Hass*, 141 F.2d 122, 60 U.S.P.Q. 544 (C.C.P.A. 1944); *In re Henze*, 181 F.2d 196, 85 U.S.P.Q. 261 (C.C.P.A. 1950).

revived the *Hass-Henze* doctrine of structural obviousness. Rather, *Dillon* will be revealed as having molded many years of sometimes inconsistent precedent into a coherent standard for *prima facie* obviousness. Subsequently, the legitimacy of the *Dillon* standard with respect to chemical compound, composition and process claims will be considered.⁸ Finally, the effect of *Dillon* on patent prosecution costs, and other policy considerations, will be discussed.

II. PRIMA FACIE OBVIOUSNESS

At the outset, it must be emphasized that *Dillon* sets forth a standard for *prima facie* obviousness, not one for the patentability requirement of nonobviousness. The two concepts are legally distinct. As explained in *In re Piasecki*,⁹ the seminal case explaining *prima facie* obviousness, “[t]he concept of *prima facie* obviousness in ex parte patent examination is but a procedural mechanism to allocate in an orderly way the burdens of going forward and of persuasion as between the examiner and the applicant.”¹⁰ Thus, if the examiner produces factual evidence tending to prove the obviousness of the claimed invention, the *prima facie* obviousness showing has been made and the burden to rebut that showing falls upon the applicant. If adequate rebuttal evidence is produced, the holding of *prima facie* obviousness, being but a legal inference from previously uncontradicted evidence, is overcome. “Regardless of whether the *prima facie* case could have been characterized as strong or weak, the examiner must consider *all the evidence anew*.”¹¹

The final determination of obviousness, then, will rest upon consideration of all the relevant facts in evidence, including the objective factors considered in *Graham*,¹² uninfluenced by the examiner’s earlier showing of a *prima facie* case. However, the failure on the applicant’s part to

8. For the sake of clarity, compound and composition claims will be treated separately even though compound claims are technically a subgroup of composition claims.

9. 745 F.2d 1468, 223 U.S.P.Q. 785 (Fed. Cir. 1984).

10. *Id.* at 1471-72, 223 U.S.P.Q. at 787-88.

11. *Id.* at 1472, 23 U.S.P.Q. at 788 (emphasis added).

12. *Graham v. John Deere Co.*, 383 U.S. 1 (1966) (Court announced objective factors to be considered in the determination of nonobviousness, including ‘commercial success,’ ‘long-felt need,’ and ‘peer recognition.’).

produce evidence sufficient to rebut the *prima facie* case will result in a final rejection of the applicant's claimed invention.¹³

III. THE *DILLON* CASE

Dillon had applied for a patent on a composition comprising hydrocarbon fuel and tetra-orthoester¹⁴ compounds. Dillon claimed that the inclusion of the tetra-orthoester compounds in the hydrocarbon fuel composition would result in reduced particulate emissions during fuel combustion (i.e. reduced pollution).

The combination of hydrocarbon fuel and tetra-orthoester compounds was not disclosed in the prior art, and the use of tetra-orthoesters to reduce particulate emissions was not suggested in the prior art. However, the prior art did disclose the use of tri-orthoester¹⁵ compounds in hydrocarbon fuels for the purpose of dewatering the fuels. Furthermore, additional prior art indicated that tri-orthoesters and tetra-orthoesters were chemically equivalent for use as water scavengers in hydraulic fluids.

The PTO rejected Dillon's claims on the basis that the prior art references made them *prima facie* obvious. Since Dillon could not show some unexpected advantage or superiority of her claimed tetra-orthoester fuel compositions as compared with tri-orthoester fuel compositions, the PTO finally rejected Dillon's claims as being unpatentable for obviousness.

The *Dillon* court affirmed the rejection of Dillon's claims. The court believed that the prior art had established "a sufficiently close relationship between the tri-orthoesters and tetra-orthoesters . . . in the fuel oil art to create an expectation that hydrocarbon fuel compositions containing the tetra-esters would have similar properties . . . to like compositions containing the tri-esters, and to provide the *motivation* to

13. It should be emphasized that the procedural mechanism of *prima facie* obviousness is used for all patent claims, not just for chemical claims.

14. A tetra-orthoester is a carbon atom to which four -OR groups are bonded. In the chemical formula, O represents an oxygen atom and R represents a monovalent organic radical comprising 1 to 20 carbon atoms.

15. A tri-orthoester compound differs from a tetra-orthoester compound in that it has three -OR groups bonded to a central carbon atom.

make such new compositions."¹⁶ The "motivation" provided by the prior art, together with the structural similarity between the claimed and prior art compositions, resulted in a showing of *prima facie* obviousness that Dillon was unable to rebut.

IV. DILLON MAJORITY'S STANDARD IS CONSISTENT WITH PRIOR CASELAW

The *Dillon* dissent strenuously argued that the majority was reviving the *Hass-Henze* doctrine of structural obviousness. The *Dillon* majority strongly denied the dissent's assertion and declared that its *prima facie* obviousness standard was based on precedent and long-established principles of patent law. Most likely, this interpretive conflict between the *Dillon* majority and dissent is a result of the *prima facie* obviousness standard's inconsistent development in the caselaw over the last forty years.

Beginning with *Hass-Henze* and continuing into the present, the standard for *prima facie* obviousness has alternately shifted towards, and then away from, structural obviousness. Since a study of every case cited in the *Dillon* decision is exhausting,¹⁷ only a few of the most important cases will be analyzed here. This analysis shows that *Dillon* has a solid basis in precedent.

A. ORIGINS OF STRUCTURAL OBVIOUSNESS

It seems proper to begin the analysis with the cases where it all began: *Hass* and *Henze*.¹⁸ While these cases were actually decided almost six years apart, they are usually considered together when discussing the origins of structural obviousness.

In *Henze*, the applicant claimed a compound that was the adjacent homolog of a prior art compound. Due to the similar chemical structures of homologs and the "close relationship the physical and chemical properties of one member of a series bears to adjacent members,"¹⁹ the claimed compound was

16. *Dillon*, 919 F.2d at 692, 16 U.S.P.Q.2d at 1900-01 (emphasis added).

17. The *Dillon* dissent alone cited approximately forty-two cases.

18. *In re Hass*, 141 F.2d 122, 60 U.S.P.Q. 544 (C.C.P.A. 1944); *In re Henze*, 181 F.2d 196, 85 U.S.P.Q. 261 (C.C.P.A. 1950).

19. *Henze*, 181 F.2d at 201, 85 U.S.P.Q. at 205.

rejected. The *Henze* court indicated that the structural obviousness of the claimed compound could be rebutted by evidence proving that the "claimed compound possesses unobvious or unexpected beneficial properties not actually possessed by the prior art homologue."^{20,21}

Thus, under *Hass-Henze*, a compound is *prima facie* obvious if it is structurally similar to a prior art compound. According to *Hass-Henze*, this *prima facie* showing may only be rebutted in one way: evidence showing that the prior art does not actually possess the properties possessed by the claimed compound. So viewed, it is readily apparent that the *Hass-Henze* doctrine and the *Dillon* standard, while similar, are not identical. Specifically, in order for a *prima facie* case to be made under *Dillon*, more than structural similarity must be shown - the prior art must also provide motivation to the inventor to make the claimed invention.

Furthermore, *Dillon* expands the categories of evidence permitted to rebut the *prima facie* case. In addition to the rebuttal evidence permitted under *Hass-Henze*,²² *Dillon* allows for rebuttal by: 1) evidence proving that the claimed compound possesses unexpectedly improved properties over the prior art, and 2) evidence showing that the prior art gives no motivation to make what appear to be obvious changes. Thus there are some major differences between the two standards; *Dillon* does not revive the *Hass-Henze* doctrine, it merely uses the doctrine as a foundation upon which to build its own *prima facie* obviousness standard.

B. REBUTTAL EVIDENCE

*In re Papesch*²³ and *In re Chupp*²⁴ are important precedent, for each originated a specific category of rebuttal evidence embraced by the *Dillon* standard for *prima facie* obviousness.

20. *Id.*

21. *In re Hass* announced the same standard for *prima facie* obviousness as *Henze*: "[I]n order to be patentable, novel members of a homologous series of chemical compounds must possess some unobvious or unexpected beneficial properties not possessed by a homologous compound disclosed in the prior art." *Hass*, 141 F.2d at 125, 60 U.S.P.Q. at 547.

22. Evidence showing that the claimed compound possesses unobvious or unexpected properties not actually possessed by the prior art.

23. 315 F.2d 381, 137 U.S.P.Q. 42 (C.C.P.A. 1963).

24. 816 F.2d 643, 2 U.S.P.Q. 2d 1437 (Fed. Cir. 1987).

In *Papesch*, the claimed compound was a homolog of the prior art compound - the claimed and prior art subject matter were structurally similar. The examiner initially rejected the claims since they were obvious homologs of the claimed compounds. The applicant responded by filing an affidavit reporting that the claimed compound "is an active anti-inflammatory agent while the prior art compound is completely inactive in that respect."²⁵ The examiner finally rejected the claims, stating that the affidavit was not relevant as evidence to rebut the initial rejection. The only issue before the court on appeal was whether the examiner was required to entertain the evidence of nonobviousness presented in the affidavit.

The *Papesch* court was concerned with whether the affidavit contained legitimate evidence of the type sufficient to rebut a *prima facie* obviousness case. The court believed that the "failure to take into consideration the biological or pharmaceutical property of the compounds as anti-inflammatory agents . . . [was a] fundamental error of law."²⁶ The court reasoned that "[a]n assumed similarity based on a comparison of [chemical compound formulae] must give way to evidence that the assumption is erroneous."²⁷ In so holding, *Papesch* is support for the *Dillon* standard's allowance of rebuttal evidence showing that the prior art does not actually possess the property possessed by the claimed invention.

Even though *Papesch* is irrelevant to the issue of the requirements for a *prima facie* obviousness case, the *Dillon* dissent quotes a passage of the decision to the effect that, in order for a *prima facie* obviousness case to be made, the prior art must "at least to a degree . . . [disclose] the same desired property relied on for patentability in the new compound."²⁸ While this passage may be dicta, it will be addressed because the *Dillon* dissent partly relies on it for its formulation of the *prima facie* obviousness standard.

When read in context with the court's discussion preceding it, the quoted passage does not contradict the *Dillon* standard. The court's discussion was centered on the relationship between

25. *Papesch*, 315 F.2d at 383, 137 U.S.P.Q. at 45.

26. *Id.* at 391, 137 U.S.P.Q. at 51.

27. *Id.*

28. *Id.* at 392, 137 U.S.P.Q. at 52 (emphasis omitted). Note that the *Dillon* dissent standard is a rewording of this passage.

prima facie obviousness and the ultimate question of patentability. The *Papesch* court, quoting *In re Henze*, said: “[P]atentability is not resolved conclusively even where unexpected or unobvious beneficial properties are established to exist in novel members of a homologous series over prior art members, as the circumstances may require a consideration of other factors.”²⁹ That the prior art disclosed “at least to a degree . . . the same desired property relied on for patentability in the new compound” is mentioned by the *Papesch* court as being one of the ‘other factors’ bearing on the obviousness of a compound.³⁰ Since these ‘other factors’ may be considered in determining the ultimate question of nonobviousness and, hence, of patentability, they have no bearing on the determination of the *prima facie* obviousness case - *prima facie* obviousness and patentability are two distinct legal concepts. As the *Dillon* majority said in response to the dissent’s assertion, “*Papesch* indeed stated that a compound and all of its properties are inseparable and must be considered in the determination of obviousness. We heartily agree and intend not to retreat from *Papesch* one inch.”³¹

In *Chupp*,³² the applicant claimed a compound that was structurally similar (a homolog) to a prior art compound. Both the claimed and prior art compounds displayed herbicidal activity. The examiner concluded that the prior art compound rendered the claimed compound *prima facie* obvious. The applicant attempted to rebut the *prima facie* case by submitting undisputed test data showing that the claimed compound possessed at least five times the level of herbicidal activity as did the prior art compound. The examiner, and later the Board of Patent Appeals, rejected the claims on the basis that the applicant’s rebuttal evidence was insufficient to rebut the *prima facie* case.

The *Chupp* court strongly disagreed with the Board: “Evidence that a compound is unexpectedly superior in one of a spectrum of common properties, as here, can be enough to rebut a *prima facie* case of obviousness . . . based on structural similarities.”³³

29. *Papesch*, 315 F.2d at 392, 137 U.S.P.Q. at 52, quoting *In re Henze*, 181 F.2d 196, 201, 85 U.S.P.Q. 261, 264-65 (C.C.P.A. 1950).

30. *Id.*

31. *Dillon*, 919 F.2d at 697, 16 U.S.P.Q. at 1905.

32. 816 F.2d 643, 2 U.S.P.Q.2d 1437 (Fed. Cir. 1987).

33. *Chupp*, 816 F.2d at 646, 2 U.S.P.Q.2d at 1439. See also *In re Murch*, 464 F.2d 1051, 175 U.S.P.Q. 89 (C.C.P.A. 1972) (Proof that claimed compound had unexpectedly improved weld line toughness as compared to structurally similar prior art compound held sufficient evidence to rebut a *prima facie* obviousness case).

The inclusion of “unexpectedly superior properties” as allowable rebuttal evidence illustrates, again, that the *Dillon* standard is consistent with prior caselaw. The *Dillon* dissent’s assertion that the *Hass-Henze* doctrine is being revived is incorrect, especially in view of the expanded categories of rebuttal evidence permitted under the *Dillon* standard. At most, the *Dillon* majority is guilty of taking the *Hass-Henze* doctrine and improving it. Realistically, *Dillon* is a refined culmination of occasionally inconsistent caselaw and thought on “chemical obviousness.”

C. DILLON MOTIVATION REQUIREMENT

The basis for the *Dillon* standard’s motivation requirement may be found in *In re Mod*,³⁴ a case factually very similar to the *Dillon* case, and *In re Stemniski*.³⁵

In *Mod*, a homolog of a prior art compound was claimed. The claimed compound possessed antimicrobial properties, whereas the prior art compound disclosed only insecticidal properties. Due to the structural similarity of the claimed and prior art compounds and the belief that this close similarity would suggest to an inventor the making of the claimed compound, the *Mod* court determined the compounds to be *prima facie* obvious.

The *Mod* opinion sets forth the two elements required for *prima facie* obviousness under the *Dillon* standard: structural similarity between the claimed and prior art subject matter, and motivation in the prior art to make the claimed invention. The *Mod* court explained that it had “not relied on so-called structural obviousness of the claimed compounds alone in support of its conclusions. . . . Indeed, the examiner thought the compounds of the claims ‘would be expected to possess the same properties’ as [the prior art reference] discloses. . . .”³⁶ Thus, *Mod* specifically rejected the *Hass-Henze* doctrine of structural obviousness and also required, as *Dillon* now does, the element of motivation to create a *prima facie* obviousness case.

The *Dillon* dissent attempted to distinguish *Mod* on the basis that it was not relevant to the determination of a *prima*

34. 408 F.2d 1055, 161 U.S.P.Q. 281 (C.C.P.A. 1969).

35. 444 F.2d 581, 170 U.S.P.Q. 343 (C.C.P.A. 1971).

36. *Mod*, 408 F.2d at 1056, 161 U.S.P.Q. at 283.

facie case. While *Mod* did not explicitly refer to a *prima facie* obviousness issue, a fair reading of the decision shows that impliedly the *Mod* court was considering a *prima facie* obviousness case. For example, *Mod* quotes the *In re Henze* decision as indicating that the “burden is on the applicant to show that the claimed compound possesses . . . unexpected beneficial properties not actually possessed by a prior art homolog.”³⁷ Since *prima facie* obviousness is a burden-allocating device between the examiner and applicant, and the *Mod* court, as stated in the above-quoted passage, was questioning whether the applicant carried his burden, the *Mod* court could not have been discussing anything but a *prima facie* case when it made its decision. Furthermore, the last passage of the *Mod* decision shows the interplay between the burdens of proof and rebuttal in a *prima facie* case: “[T]here is no evidence here, however, to contradict the conclusion that the present compounds are obvious insecticides . . . and thus have been effectively placed in the public domain by [the prior art reference] who provides adequate motivation to those of ordinary skill to make them.”³⁸ The terms ‘conclusion’ and ‘contradict’ are direct references to the showing of a *prima facie* obviousness case and evidence required to rebut that showing, respectively.

In *Stemniski*,³⁹ an applicant claimed compounds having antioxidantal properties that were structurally similar to prior art compounds. The examiner, utilizing the *Hass-Henze* doctrine, held that a *prima facie* case of obviousness was established based on the structural similarity between the claimed and prior art compounds. The applicant neither attempted to rebut the *prima facie* obviousness case with evidence establishing that the claimed compounds possessed properties different from those actually possessed by the prior art compounds, nor did he attempt to establish that the claimed compounds in fact possessed improved properties over the prior art compounds.⁴⁰ Needless to say, the examiner finally rejected all the claims on the basis of obviousness.

On appeal, the applicant argued that the prior art references provided no motivation to invent the claimed

37. *Id.*

38. *Id.* at 1057, 161 U.S.P.Q. at 283.

39. 444 F.2d 581, 170 U.S.P.Q. 343 (C.C.P.A. 1971).

40. One should note that these categories of rebuttal evidence are identical to the ones permitted under the *Dillon* standard.

compound. Not only did the prior art not disclose antioxidant effectiveness as a utility, the prior art did not disclose any utility whatsoever for the compounds. In other words, the applicant was asking, 'how can a *prima facie* obviousness case be made when the prior art provides no logical reason to make the claimed invention?'

The *Stemniski* court was impressed with the applicant's argument:

Where the prior art reference neither discloses nor suggests a utility for certain described compounds, why should it be said that a reference makes obvious to one of ordinary skill in the art an isomer, homolog or analog of related structure, when that mythical, but intensely practical, person knows of no 'practical' reason to make the reference compounds, much less any structurally related compounds? How can there be obviousness of structure . . . when no apparent purpose or result is to be achieved, no reason or *motivation* to be satisfied, upon modifying the reference compounds' structure?⁴¹

Ultimately, the *Stemniski* court held that an applicant is entitled to a patent "where, as here, the prior art does not disclose or suggest any usefulness for the compounds it describes and the applicant does describe a usefulness conforming with statutory requirements for closely related but novel compounds he discloses."⁴²

While *Stemniski* strongly asserts that motivation is to be considered in the examiner's analysis, it does not definitely state *where* in the procedural make-up of the analysis motivation is to be considered. In other words, is motivation required in order for a *prima facie* obviousness case to be made or is motivation (or lack thereof) only to be considered as rebuttal evidence to the *prima facie* obviousness case? This confusion is documented in a number of passages in the *Stemniski* opinion. The Court itself admits that:

41. *Stemniski*, 444 F.2d at 586, 170 U.S.P.Q. at 347 (emphasis added).

42. *Id.* at 587, 170 U.S.P.Q. at 348.

[I]t is not an easy matter to determine whether we have before us a case in which the evidence adduced by the patent office to establish a *prima facie* case of obviousness is inadequate *ab initio* or whether the greater error lies in the failure to consider appellant's discovery of a new . . . usefulness for the claimed compounds as adequate rebuttal evidence of that *prima facie* case in a situation where, as here, the . . . prior art neither discloses nor renders obvious a usefulness for the compounds it describes.⁴³

The court, however, fails to state explicitly to which of the above situations the case pertains.

The *Dillon* majority appears to have been somewhat confused by the analysis in *Stemniski*. After reviewing the *Dillon* standard, one will notice that there are motivation 'elements' in both the requirements for a *prima facie* obviousness case and in the types of evidence permitted to rebut a *prima facie* obviousness case. A passage from *Dillon* will shed some light on what the majority believed to be the proper "position" for the motivation element in the *prima facie* obviousness procedural device: "*Stemniski*, rather than destroying the established practice of rejecting closely-related compounds as *prima facie* obvious, qualified it by holding that a presumption [of obviousness] is not created when the reference compound is so lacking in *any* utility that there is no motivation to make close relatives."⁴⁴ Thus, the *Dillon* majority obviously thought that the *Stemniski* motivation element was meant as an added requirement for *prima facie* obviousness.

In light of the *Dillon* majority's interpretation, one could infer that the *Dillon* standard's motivation requirement is only unfulfilled when the prior art discloses no utility. Nevertheless, *Dillon* should not be construed in this manner. The number of prior art references, especially prior art patents, that disclose no utility for its subject matter will, and should, be very limited. (A patent disclosing no utility for the invention therein should be invalid.) If this is, in fact, how the *Dillon*

43. *Id.* at 585, 170 U.S.P.Q. at 347.

44. *Dillon*, 919 F.2d at 697, 16 U.S.P.Q.2d at 1904-05 (emphasis added).

majority is construing the motivation requirement, the *Dillon* standard would be almost identical to the *Hass-Henze* doctrine of structural obviousness, the only difference between the two being the expanded categories of rebuttal evidence permitted by the *Dillon* standard.

Nevertheless, a quote from *Dillon* indicates the majority's belief that the motivation requirement's application would not be limited to those instances when the prior art disclosed no utility: "Properties . . . are relevant to the creation of a *prima facie* case in the sense of affecting the motivation of a researcher to make compounds closely related to or suggested by a prior art compound"45

D. MOTIVATION AS A CATEGORY OF REBUTTAL EVIDENCE

An additional consideration remains with respect to the motivation requirement, namely the reason for what appears to be two motivation elements within the *Dillon* standard. If, as previously stated, the *Dillon* majority interpreted the motivation element as being an added requirement for *prima facie* obviousness, why, then, does a motivation element appear as a category of rebuttal evidence in the *Dillon* standard?

While the *Dillon* majority did not discuss the reason for this apparent inconsistency, it may be explained as follows. After initial review of an applicant's patent application, the examiner has the burden of providing factual evidence in support of his *prima facie* obviousness determination. The examiner may, under the *Dillon* standard, support his *prima facie* determination by showing that prior art references, structurally similar to the claimed invention, provide motivation for the applicant to make the claimed invention. The applicant may submit to the examiner's finding of structural similarity, but he may not agree with the examiner's motivation determination. The applicant, in this case, would then argue that the prior art does not provide motivation for a likely inventor to produce the claimed invention. That argument would be permissible rebuttal evidence under the *Dillon* standard.⁴⁶ The *Dillon* majority realized that this argument would arise under its standard and they made provision for it

45. *Id.*, 16 U.S.P.Q.2d at 1905.

46. This argument would not be permissible rebuttal evidence under the *Hass-Henze* doctrine of structural obviousness.

by including a 'motivation category' in permissible rebuttal evidence.

V. ANALYSIS OF CHEMICAL CLAIMS

Before analyzing the soundness of the *Dillon* standard as applied to chemical claims, a few important points must first be introduced. First, as previously noted,⁴⁷ it is assumed in both chemistry and patent law that structurally similar chemical compounds will have similar physical and chemical properties.⁴⁸ Second, in any analysis under the patent laws, a chemical compound and its properties are indivisible. While the chemical formula "may serve in a claim to identify what is being patented. The thing that is patented is not the formula but the compound identified by it."⁴⁹ Finally, the scope of patent protection differs between compound, composition, and process patents. The scope of protection for compound and composition patents is not limited to the disclosed use of the compound or composition. Rather, the patent protects the disclosed use and all other properties/uses of the compound or composition. On the other hand, the scope of a process patent is limited to the use claimed for the compound or composition; patent protection is not granted to the underlying compound or composition. As can be seen, compound and composition patents are more desirable than process patents since they offer an extended range of protection. The above-stated "rules" are helpful in understanding the consequences of *Dillon*.

Applying the "rules" to different examples of chemical claims will help to illustrate the impact of the *Dillon* standard and to determine its legitimacy in various practical applications. This analysis will begin with an example of a compound claim and will then address examples of composition and process claims.

A. COMPOUND CLAIMS

Let us suppose that A discovers a compound X that is useful as rat poison. Prior art compound Y is a homolog of X (i.e., it is structurally similar to X) and is disclosed as being an

47. See *supra* note 8.

48. This doctrine will be referred to as the "common properties" assumption.

49. Papesch, 315 F.2d at 391, 137 U.S.P.Q. at 51.

anti-viral agent. Under the *Dillon* dissent standard,⁵⁰ X would not be *prima facie* obvious since there is no suggestion in the prior art that X would be useful as rat poison. On the other hand, the *Dillon* standard would find X to be *prima facie* obvious. Since X and Y are structurally similar, there is a presumption they will have similar properties. A, being of 'ordinary skill in the art,' would be motivated to make a compound similar to Y in the hopes that the new compound would also be harmful to organisms (albeit larger ones). A could rebut the *prima facie* case against X by showing either that Y was not a rat poison or that X was a far superior rat poison than Y.

Two scenarios immediately present themselves. In scenario one, Y is not a rat poison or, if it is, it is a relatively ineffective one. In this case, both the *Dillon* and *Dillon* dissent standards produce the same results. X is patentable. This result is good. A has advanced the useful arts by discovering the unknown rat poison, X.

In scenario two, Y is a fairly strong rat poison. Under the *Dillon* standard, X is not patentable - A cannot show that X's rat poison property is unexpectedly superior to Y's. In contrast, X would be patentable under the *Dillon* dissent standard, since there was no suggestion in the prior art that a compound structurally similar to Y would be a useful rat poison. This is bad. Y is a rat poison, even though that use was not disclosed in the patent. In patent law, though, it is the compound, and all of its inherent properties, that is patented. By granting a patent to A on X, the *Dillon* dissent would be taking "obvious" compound X out of the public domain.

In this second scenario, X and Y had similar properties. Since structurally similar compounds are assumed by those 'skilled in the art' to have similar properties, and X and Y did in fact possess such properties, what "invention" deserving a patent was there in making compound X?⁵¹ Furthermore, let us not forget that compound Y's patentee has an exclusive right to Y and its properties and uses. Do we not undermine the scope of Y's patent protection by allowing X to be patented? Looking at it another way, how many properties do X and Y have in

50. See pp. 1-2 for the *Dillon* dissent standard.

51. If you say 'the unobvious use of previously unknown, but obvious, compound X as a rat poison,' you are correct, but will have to wait until the discussion of process claims.

common? So far, we know only of one similar use - rat poison. Since structurally similar compounds are assumed to have similar properties, isn't it possible that X and Y share many common properties? Suppose A knew that X was an anti-viral agent and wanted to produce and use X as such. A would be prohibited from doing so due to the patent on structurally similar compound Y.

By placing the burden on the applicant to rebut the "common properties" assumption of structural similar compounds, the *Dillon* standard prevents the following detrimental results from occurring in chemical compound prosecution: diminution of the public domain, undermining of patent protection, and issuance of unwarranted patents. Importantly, those applicants truly deserving of a patent for their claimed compounds (i.e., those able to rebut the *prima facie* obviousness case with evidence of unexpected superior properties, etc.) are rewarded for their efforts under *Dillon*.

B. COMPOSITION CLAIMS

The analysis of composition claims follows much the same pattern as that of compound claims. In order to analyze a "real-world" situation, let us use the composition claim at issue in *Dillon* as our example. Recalling the *Dillon* facts, Dillon claimed a composition comprising a hydrocarbon fuel and a tetra-orthoester for use as a particulate emission reducer during fuel combustion. The prior art disclosed a composition comprising a hydrocarbon fuel and a tri-orthoester for use as a dewatering agent, but did not suggest a use as a particulate emission reducer. Tri- and tetra-orthoesters are structurally similar compounds and the prior art disclosed the chemical equivalence of the two compounds. Therefore, the "common properties" assumption appeared justified.

As we know, the *Dillon* court found the claimed composition *prima facie* obvious. Dillon did not rebut the *prima facie* showing and the claim was rejected for obviousness. The *Dillon* dissent, however, would not have found the claimed composition *prima facie* obvious since the prior art did not suggest the use of tetra-orthoesters as particulate emission reducers. Presumably, the claimed composition would have been patentable under the *Dillon* dissent standard.

For the same reasons as discussed in the compound claim example, the *Dillon* dissent result would be incorrect. Since tri-orthoesters were known as being dewatering agents in hydrocarbon fuel compositions, it would thus be obvious, under the common properties assumption, that tetra-orthoesters were also useful as dewatering agents. However, granting a patent to Dillon on the claimed composition would give her unwarranted protection for use of tetra-orthoesters as dewatering agents. It is irrelevant that her composition was only claimed as being useful for particulate emission reduction since a compound or composition claim may not be limited to a specific use.

While the result under the *Dillon* standard appears legitimate with respect to the specific composition claim in issue in that case, the *Dillon* standard must be carefully applied to composition claims in general.

The *Dillon* standard is primarily based on the "common properties" assumption. This assumption is useful when only one substance (i.e., a chemical compound) is being compared against prior art for a *prima facie* obviousness determination. However, when two or more substances are claimed together (i.e., a chemical composition claim) the "common properties" assumption is not as legitimate. A simple example will illustrate this idea: "When two chemical elements, such as sodium and chlorine, combine chemically to form sodium chloride, the resulting product has none of the physical or chemical characteristics of the elements from which it was formed."⁵² Thus, it is extremely difficult to predict the properties of a chemical composition from the individual properties of one of the composition's constituents.

The above-stated "exception" to the common properties assumption appears to seriously undermine the legitimacy of the *Dillon* standard as applied to chemical composition claims. Nevertheless, *Dillon*, as stated previously, will remain legitimate with respect to composition claims if applied carefully.

Referring once again to the *Dillon* facts, we will discover that the common properties assumption is still valid in that

52. A. W. Deller, 3 PATENT CLAIMS 39 (2d ed. 1971).

case. The prior art disclosed a composition of hydrocarbon fuel and tri-orthoesters and the claimed composition was comprised of hydrocarbon fuel and tetra-orthoesters. Comparing the prior art and the claim, we see that in both cases structurally similar compounds are combined with hydrocarbon fuel. Using a double common properties approach, we can reason that since tri- and tetra-orthoesters should have common properties, they should react with hydrocarbon fuel in a like manner so that the resulting compositions have similar properties.

On the other hand, had the *Dillon* prior art only disclosed a composition of hydraulic fluid and tri-orthoesters, it does not appear that the common properties assumption, and thus the *prima facie* obviousness showing, would be valid. Since the prior art did not disclose what properties or use would result from a composition of hydrocarbon fuel and tri-orthoesters, how would an examiner be able to predict with any certainty the use of a composition comprising hydrocarbon fuel and compounds (tetra-orthoesters) structurally similar to tri-orthoesters? It is reasonable to assume that the structurally similar compounds (tri- and tetra-orthoesters) would react quite differently with hydraulic fluids and hydrocarbon fuel, with different properties being the result. In this case, there would be no *prima facie* obviousness.

Strict *Dillon* adherents may suggest that the burden be placed upon the applicant to show that the common properties assumption is inapplicable. This would not be a correct interpretation of *Dillon*, for the *Dillon* standard of *prima facie* obviousness is based on the accuracy of the common properties assumption. The above suggestion would, in fact, create a new and different standard for *prima facie* obviousness - placing the entire burden on the applicant to prove the patentability of his invention. Regardless of the patent policy considerations affected by this new standard, it would appear to run afoul of §102's grant of an affirmative right to a patent.⁵³

C. PROCESS CLAIMS

The analysis of process claims follows a much different route than that of compound and composition claims. In *Dillon*,

53. 35 U.S.C. §102 (1984) ("A person shall be entitled to a patent unless-....")

Dillon had claimed a process of reducing particulate emissions from hydrocarbon fuel combustion, comprising combusting a composition of tetra-orthoesters and hydrocarbon fuel. The *Dillon* court did not consider the patentability of the process claims because, for technical reasons, they were not considered by the Board of Patent Appeals.⁵⁴ Regardless, the application of the *Dillon* standard to a process claiming a new use for a compound or composition structurally similar to a prior art compound or composition is not legitimate.

Consider again the compound claim example and the question raised therein concerning inventor A's actual invention. A's patentable invention was not compound X for use as a rat poison; compound X was "obvious" and one cannot obtain a compound or composition patent limited to a certain use. Instead, A's invention was the unobvious use of previously unknown, but obvious, compound X as a rat poison.

Likewise, Dillon's true invention was the use of the unknown, but obvious, composition of tetra-orthoester and hydrocarbon fuel as a particulate emission reducer. Assuming that the process prior art was similar in scope to the composition prior art referred to in *Dillon*, application of the *Dillon* standard would result in Dillon's process claim being found *prima facie* obvious.⁵⁵ Dillon would be required to produce evidence proving that her process was new and unobvious, even though the use was not disclosed in the prior art.

Importantly, the current patent statutes permit new and unobvious uses to be claimed, and patented, as processes. 35 U.S.C. §101 states that "[w]hoever invents or discovers any new and useful process . . . may obtain a patent therefor" Process is defined as meaning any "process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material."⁵⁶ Therein lies the solution to the problem concerning how to protect inventors discovering new and unobvious uses of obvious compounds or compositions: grant them process patents. This idea has been advocated before:

54. See *Dillon*, 919 F.2d at 694-95, 16 U.S.P.Q.2d at 1903.

55. The analysis used in the composition claim example would be identical, except for the fact that processes, instead of compositions, would be compared.

56. 35 U.S.C. §100(b) (1984).

It is basic to the grant of a patent that the scope of a patent should not exceed the scope of the invention . . . To say that a person who has discovered a new use for a structurally obvious compound, which compound would not have been entitled to any patent protection absent the new use, should receive a patent on the compound itself is to extend the patent monopoly far beyond the reason for its existence. We think that the purposes of the patent law will be adequately served if patents on compounds which are structurally obvious from the prior art are limited to method patents directed to the new and useful characteristic or property which is the essence of the discovery or invention.⁵⁷

This solution promotes two basic patent policies: it rewards inventors for the discovery of new uses for obvious or known art and, since process patents are limited in scope to the disclosed process, the inventor is not given a patent greater in scope than his invention.⁵⁸

VI. ADDITIONAL CONSIDERATIONS

Dillon requires the submission of test data as evidence to rebut a *prima facie* case. This requirement will further increase the costs of patent prosecution. Even though the extra burden *Dillon* places upon applicants will promote the integrity of chemical compound patents, and composition patents in the correct situation, is it desirable to devise a burden-allocating standard that increases costs to applicants? Will the benefit of "better" patents outweigh the "cost" to our patent system of applicants with limited resources possibly being foreclosed from patent prosecution due to cost alone? Judge Johnson, writing for the *In re Henze* court in 1950, hinted at this concern when discussing the availability to the applicant of rebuttal evidence: "...[I]n the absence of such data, the assignee of applicant's patent application, the Parke, Davis Company, might reasonably be expected to have the resources to conduct

57. *Monsanto Co. v. Rohm & Hass Co.*, 312 F. Supp. 778, 790-91, 164 U.S.P.Q. 556, 566 (E.D. Pa. 1970).

58. Or, in other words, the public domain is not unjustifiably diminished.

such tests as would be required.”⁵⁹ This quote brings two thoughts to mind. First, Judge Johnson believed, in 1950, that the requirement of rebuttal test evidence might be too costly for some individual applicants to bear alone. If Judge Johnson could accept that possibility then, should we be overly concerned now? Second, Judge Johnson thought that the applicant’s assignee would have sufficient resources to perform the required tests if needed. This statement, combined with the notion that a large proportion of patent applications are backed by companies with sufficient funds to see the prosecution through to the end, suggests that the concern for individual applicants would be easily outweighed by the benefits the *Dillon* standard offers.

VII. CONCLUSION

The *Dillon* standard has a strong basis in precedent and does not strictly revive the *Hass-Henze* doctrine of structural obviousness. Any discrepancy between *Dillon* and earlier caselaw may be explained by the inconsistent development of the caselaw on chemical obviousness over the years.

With respect to compound claims, and composition claims in particular situations, the *Dillon* standard will promote the integrity of chemical patents and prevent the unjustified erosion of the public domain. However, since the patent statutes specifically permit new and unobvious uses of old or obvious compounds or compositions to be patented, the *Dillon* standard should not be applied to process claims.

Finally, the *Dillon* standard’s requirement of test data will increase the costs of patent prosecution, possibly with the effect of foreclosing the entry of individual applicants, or small companies, with limited resources into the patent process. While this is an unfortunate “cost” to be borne, it appears that it will be outweighed by the benefits the *Dillon* standard will provide to our patent system.

59. *Henze*, 181 F.2d at 201, 85 U.S.P.Q. at 265.