Appellant's Brief

BRIEF FOR APPELLANT

IN THE

UNITED STATES COURT OF APPEALS

FOR THE FEDERAL CIRCUIT

APPEAL NO. 88-1245

IN RE: DIANE M. DILLON,

[redacted]

APPEAL FROM THE UNITED STATES
PATENT AND TRADEMARK OFFICE BOARD OF
PATENT APPEALS AND INTERFERENCES
APPEAL NO. 87-0944

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IN THE UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

In re:	:	
DIANE M. DILLON	:	Appeal 88-1245
Appellant	:	

CERTIFICATE OF INTEREST

The undersigned counsel of record for appellant furnishes the following disclosure in compliance with Rule 8:

(a) The full name of the party represented by the undersigned counsel is Diane M. Dillon.

(b) The real party in interest is Union Oil Company of California d/b/a Unocal.

(c) There are no publically held affiliates of Union Oil Company of California.

(d) The name of each law firm whose partners or associates have appeared below or who are expected to appear for the party in this court are:

BENOIT, SMITH & LAUGHLIN
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STATEMENT OF RELATED CASES

Counsel for Diane M. Dillon, Appellant in the subject proceeding hereby states that there are no related cases known to be pending or previously filed in any court.

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BRIEF FOR APPELLANT DILLON

I. INTRODUCTION

This is an appeal from the United States Patent Office Board of Patent Appeals and Interferences sustaining rejections of the appellant Dillon's claims 2 through 14, 16 through 22 and 24 through 37 as unpatentable under 35 USC 103 as being obvious in view of eight separate patents.

This is a "reason to combine" case for the central issue in this appeal is the error of the board which affirmed a rejection based upon teachings from the references which do not exist and reliance upon non-analogous art. The board employed an abundance of hindsight to find the claimed invention from references hopelessly devoid of a suggestion thereof.

Although the legal issues of this case require a resolution of whether the board erred, the real issue is whether the board, in the face of eight references which are *not* alleged to anticipate the invention and which nowhere pertain to the problem appellant faced can hold claims unpatentable, a decision which will deprive appellant of a patent for, and the public of the knowledge of, an invention of potential importance in reducing atmospheric pollution.

Secondly, but also of importance, is the question of whether the board can properly find unpatentable, within the meaning of 35 USC 103, claims for the Dillon inventive finding that orthoester (II) when blended with a hydrocarbon fuel reduces particulate emmissions where the references most relied on by the board, Sweeney and Elliott, not only *fail to show* orthoester (II) with a hydrocarbon fuel, but even worse, not used with any hydrocarbon! Appellant submits that this is the factual problem underlying the erroneous decision of the board, and because she is convinced of error in the board decision, appellant presents this appeal.

Appellant presents this appeal because the board made factual findings which are clearly erroneous In this appeal, the court is asked to review the teachings of the *eight* references relied upon by the board to support a 103 holding of obviousness. The teachings of the references are quite diverse with only the two Sweeney patents being reasonably related -- and those two not being combined with each other in either of the two rejections. The other references are non-analogous teachings pertaining to hydraulic fluids (Elliott), dissolution of propane in liquid hydrocarbons such as gasoline (White), preparation of orthoformic esters, i.e., orthoester (I) (Kesslin), preparation of orthocarbonic esters, i.e., orthoester (II) (Speh), a blended ethanol fuel with a substantial amount of water deliberately added (Neves), and the reaction of orthoesters and alkynes (Howk).

Appellant most respectfully asks the court to consider the plight of one of ordinary skill in the art of fuel combustion confronted with these references. Supposedly, the references are

to be read for what is disclosed and suggested in the absence of appellant's disclosure, and that is the most important request appellant will make of the court: that the references truly be considered as if her disclosure did not exist.

II. STATEMENT OF ISSUES

The following issues are presented for review:

1. Whether or not the Board of Patent Appeals and Interferences abused its discretion in affirming the rejection of all the claims on appeal including Claims 2 through 14, 16 through 22 and 24 through 37.

2. Whether or not the Board of Patent Appeals and Interferences committed an error of law in affirming the rejection of all the claims on appeal including Claims 2 through 14, 16 through 22 and 24 through 37.

3. Whether or not the Board of Patent Appeals and Interferences abused its discretion or committed an error of law in affirming the rejection of Claims 2 through 14, 22 and 34 through 37 under 35 USC 103 as unpatentable over 4,390,417 to Sweeney in view of the cited patents to Elliott, Howk, Kesslin, Speh, White and Neves.

4. Whether or not the Board of Patent Appeals and Interferences abused its discretion or committed an error of law in affirming the rejection of Claims 16 through 22, 24 through 33, 35, 36 and 37 under 35 USC 103 as unpatentable over 4,395,267 or 4,390,417 in view of the cited patents to Elliott, Howk, Kesslin and Speh.

5. Whether or not the Board of Patent Appeals and Interferences abused its discretion or committed an error of law in holding that the claims stand or fall together in view of appellant's arguments below.

III. STATEMENT OF FACTS

A. The Invention

The invention disclosed in the present application, Serial No. 671,570 filed on November 15, 1984 [App.14], is directed to reducing particulate emissions when hydrocarbon fuels are burned. In particular, the invention aims (as in claim 16 [App.39]) to reduce particulate emissions produced when diesel fuel or other middle distillate fuels (such as kerosene, turbine fuel and other fuels boiling entirely within the range of about 300 to 700 degrees F.) are burned. Anyone who has seen a large diesel-powered truck on the highway will recognize the importance of reducing or eliminating the black smoke often produced by such trucks, the black color being caused by the formation of carbonaceous particulate matter during combustion of the fuel. The seriousness of this problem as a contributor to air pollution is well known, and a method for reducing such particulate emissions is of environmental importance.

The invention, as claimed provides for a reduction in such particulate emissions by adding to the diesel fuel prior to combustion an orthoester additive of the following formulae:

(II) $C(OR^5)(OR^6)(OR^7)(OR^8)$

The application specification of Dillon additionally teaches the use of an orthoester of the formula:

$$(I) \quad R^1C(OR^2)(OR^3)(OR^4)$$

In both the *claimed* orthoester (II) and unclaimed orthoester (I) formulas, R^1 is hydrogen or a monovalent organic radical of 1 to 20 carbon atoms and R^2 through R^8 are monovalent organic radicals of 1 to 20 carbon atoms. For convenience of the court, the *unclaimed* formula (I) orthoester will be referred to as "orthoester (I)" while the *claimed* orthoester will be referred to as "orthoester (II)". During prosecution of the present case, appellant limited her claims to orthoester (II),[1] which contains a carbon atom fully surrounded by oxygen atoms, i.e., the carbon atom is bonded to four oxygen atoms. It is claims to this embodiment of the invention that are at issue in this appeal.

It is worthy of note that the invention provides several advantages. First, orthoester

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[1] Appellant claimed orthoester (I) in diesel fuel in her parent case, Serial No. 453,494 filed December 27, 1982, this case being abandoned after an adverse board decision. However, appellant has not accepted the board decision as meritorious, and it is her intention to pursue compositions containing such compounds for reducing particulate mater during combustion.

(II) is relatively inexpensive and commercially available in quantity. Second, orthoester (II) is itself combustible, leaving no residue or ash and forming no particulate matter. And third, as shown in Examples XIII through XVIII of the specification, particularly in Table 7 [App.31], such additives in relatively small concentrations, i.e., about 3.5 wt.%, effect between about a 10 and 17% reduction in particulate matter upon combustion of diesel fuel. Smaller, but still significant reductions are also obtainable, as shown in Examples XIX to XXIV, particularly Table 9 [App.34], upon combustion of a mixture of propane which is a relatively clean-burning fuel and orthoester (II).

B. Summary of Proceedings Below

Prosecution of the claims directed to appellant's invention before the Examiner resulted in a final rejection of all of the claims here and on appeal the Board of Patent Appeals and Interferences sustained two rejections under 35 USC 103 based upon eight separate references.

Claims 2 to 14, 22, and 34 to 37 were deemed unpatentable under 35 USC 103 over Sweeney '417 in view of Elliott, Howk, Kesslin, Speh, White, and Neves. Claims 16 to 22, 24 to 33, 35, 36, and 37 were deemed unpatentable over Sweeney '267 or '417 in view of Elliott, Howk, Kesslin, and Speh.

In response to this array of references, appellant argued below [App.91], inter alia:

(1) None of the references relates to the problem appellant confronted; none suggests any solution thereto; and in each combination of references, the references relied on are so diverse and unrelated in their teachings that, of necessity, the selection and combination of references are predicated on hindsight.

(2) Although the two primary Sweeney references[2] teach combining acetals, ketals, and orthoester (I) with certain fuels, neither teaches an orthoester (II) for such a purpose -- or, indeed, for any purpose. This fact was clearly realized by the Examiner as she sought to use a minimum of four references to overcome the deficiencies of Sweeney's teachings.

(3) The secondary Elliott reference, relied upon the most by the Examiner to modify Sweeney, relates strictly to hydraulic fluids and is non-analogous art; therefore it is unavailable for anything taught therein in this art.

(4) To whatever extent the references could be shown to set forth a prima facie case of obviousness (with it being emphasized that appellant's position is that no

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2 Throughout this brief, reference to "Sweeney" is to both Sweeney patents; reference to a particular Sweeney patent will be by specific designation, Sweeney '417 or Sweeney '267.

prima facie case in fact exists), the showing in appellant's Examples XIII through XXIV that orthoester (II) reduces particulates during fuel combustion is necessarily an unexpected result -- and this because none of the references remotely suggests such a result.

(5) The Examiner's arguments concerning the alleged "inherency" of appellant's results being achieved when an orthoester (II) is substituted for orthoester (I) of Sweeney are irrelevant in the face of numerous decisions by this court and its predecessor recognizing that "inherency is not obviousness."

(6) The Examiner relied upon appellant's showing in her disclosure that orthoesters (I) and (II) both effected reductions in particulate matter as an "admission" of equivalency. Appellant, however, never "admitted" such an equivalency; she taught such equivalency -- which cannot be used against her. *In re Ruff*, 256 F.2d 590, 598, 118 USPQ 340, 347 (CCPA 1958).

In affirming the rejections, the board relied principally on the two Sweeney references and the Elliott patent, the board stating that the teachings of Speh, Kesslin and Howk were "merely cumulative" [App.6] while those of White and Neves were relied on mainly to show the alleged obviousness of a fuel recited in the Markush groups of claims 13 and 14, respectively. [App.6]

The board held that Sweeney alone sets forth a prima facie case of obviousness because, allegedly, orthoester (II) of appellant's claims is "very close" in structure and chemical similarity to orthoester (I) in Sweeney's fuels as to suggest the substitution of the former for the latter. [App.6] In addition, the board dismissed appellant's arguments that Elliott was non-analogous art on the basis that the Elliott reference allegedly pertained to the same problem as Sweeney -- the scavenging of water in "non-aqueous liquids." [App.7] The Sweeney-Elliott combination was, like Sweeney alone, held to suggest the substitution of orthoester (II) for orthoester (I) in Sweeney's fuels, the rationale apparently being that, because Elliott allegedly teaches an orthoester (II) as a water scavenger in "non-aqueous liquids," it is obvious to substitute orthoester (II) of Elliott for orthoester (I) in Sweeney's "non-aqueous" fuel compositions, thereby recreating the invention. [App.5-7]

To appellant's numerous arguments that not one of the eight references teaches or suggests the problem to which the invention relates, and in no way suggests a solution thereto, the board held this not to be:

> ... dispositive of the issue of obviousness ... . [that] [t]he mere recitation of a newly discovered function inherently possessed by things and processes in the prior art does not cause claims drawn thereto to distinguish over that prior art. [App.8]

As to appellant's arguments regarding unexpected results, the board held that appellant's arguments were "conclusive" and that the record did not support such arguments. [App.9]

IV. SUMMARY OF ARGUMENT

Appellant submits that the board's decision is in error; it derives suggestions from the references which do not exist, it relies on non-analogous art, and it employs an abundance of hindsight to resurrect the invention from references hopelessly devoid of a suggestion thereof. In addition, the board argues in much of its decision against positions appellant never took, ignores many that were taken, misconstrues prior art teachings, and even argues that appellant never argued the claims separately when, in fact, appellant's brief to the board manifestly argued the limitations of several of the claims separately.

The board erred by affirming a rejection which improperly combined references. Among the eight references none are alleged to anticipate the invention (explicitly or inherently) and none pertain to the problem appellant faced. The board erred in affirming a rejection of the appealed claims for an orthoester (II) blended with a hydrocarbon fuel based upon obviousness within the meaning of 35 USC 103 when the references most relied on by the board (Sweeney and Elliott) *not only fail to show* an orthoester (II) admixed with a hydrocarbon fuel, but even worse, not admixed for use with *any* hydrocarbon.

These teaching are entirely unrelated to the invention concept of reducing particulate emmissions during combustion. One reference pertains to hydraulic fluids (Elliott), another to the dissolution of propane in liquid hydrocarbons such as gasoline (White), yet another to the preparation of orthoformic esters, i.e., orthoester (I) (Kesslin), yet another to the preparation of orthocarbonic esters, i.e., orthoester (II) (Speh), yet another to a blended ethanol fuel in which a substantial amount of water is deliberately added (Neves), and yet another to the reaction of orthoesters and alkynes (Howk). Finally, there are two Sweeney patents directed to the use of acetals, ketals, or orthoesters of the type (I) species in diesel fuels to scavenge water, and, in the case of Sweeney '267 specifically, for further use as a fuel-alcohol co-solvent.

The board erred in that the references are to be read for what is disclosed and suggested in the *absence* of appellant's disclosure and without benefit of her disclosure.

The board erred because appellant's invention could never be obviously uncovered from these references. **Of the eight references not one is directed to the use of fuel additives for reducing particulates during fuel combustion! Not one is directed to any method or composition for reducing particulates during fuel combustion! Indeed, not even one is directed to the combustive properties of hydrocarbon fuels!**

Appellant submits that because of the absolute failure of the teachings of the references, the board in affirming the rejections, has committed reversable error. How can it logically be argued that these references, so diverse and

unrelated in their teachings, and manifestly unrelated to the inventive concept, somehow suggest a sclution to the problem faced by appellant?

Much the same point was made in *In re Shaffer*, 229 F.2d 476, 480, 108 USPQ 326, 329 (CCPA 1956):

> . . . can it be said that these references which never recognized appellant's problem would have suggested its solution? We think not, and therefore feel that the references were improperly combined since there is no suggestion in either of the references that they can be combined to produce appellant's result.

Analogous reasoning is pertinent here. Although the problem to which appellant's invention is directed is well known in the art, it is equally true that none of the references so much as hints at it, so how can they in combination suggest its solution? Moreover, even if one skilled in the art sought to reduce particulate formation during combustion of diesel and other hydrocarbon fuels, the references relied on are utterly devoid of any guidance in solving the problem. Indeed, the references provide no teachings or suggestions of any solution to this problem, much less by means of a fuel additive, and still less by the very specific use of orthoester (II) as a fuel additive. And relative to the principal point of the above-quoted Shaffer decision, there is no suggestion in any of the references "that they can be combined to produce appellant's results."

In view of the foregoing, it can be seen why appellant's main theme in this brief will be that the board has indulged itself in hindsight. The references are so remote from appellant's invention, and the problem she faced, that it is impossible to seriously argue that one of ordinary skill in the art of fuel combustion would consult these references, then seek to combine their manifestly unrelated teachings, and somehow extract the invention therefrom. The board clearly manipulates 30 or so pages of irrelevant reference teachings using appellant's disclosure as a guide. The board erred in not reading the references from the point of view of one not cognizant of appellant's disclosure.

V. ARGUMENT

A. The Sweeney References Are Not Relevant To The Claims

The two Sweeney patents teach three types of compounds for use with diesel and other hydrocarbon fuels: ketals of formula $R_2C(OR')_2$, acetals of formula $RCH(OR')_2$, and orthoesters (I) of formula $RC(OR')_3$. Sweeney teaches such compounds as water scavengers in fuels in the presence of acid catalysts and, in the case of Sweeney '267 specifically, for further use as a co-solvent for hydrocarbon fuels and otherwise immiscible alcohols. Of critical importance is that nowhere in either Sweeney patent is orthoester (II) disclosed -- for *any* purpose -- *and certainly not for appellant's purpose.*

However, in its decision, the board lectured appellant (apparently with regard to the Sweeney patents) that it is not just what the references teach that is controlling but also what is suggested, and that a reference cannot be limited to its specific working examples. [App.5] Appellant agrees with both these points. She never sought to limit any of the references to the working examples,[3] and she has -- and had -- no quarrel with the proposition that a reference must be considered for all it suggests. But as applied by the board, this proposition merely becomes an open door to whatever hindsight recreations the board desires. In fact, the board is so overwhelmed with what can be recreated by hindsight that it even decided that Sweeney alone suggests the invention [App.6] -- and this despite the fact that the Examiner felt compelled to combine a minimum of four references with Sweeney to recreate the invention.

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[3] This is a perfect example of the board arguing against a position appellant never took. Nowhere did appellant in her brief and reply brief to the board argued that a reference must be limited to its examples. Moreover, the implication is clear; the board believes it can ignore the examples, concentrate only on the closest teachings of each reference, and *then* combine such teachings. This is error: one of extraordinary skill in the art could not know which teachings were the closest to the invention in each reference and which were not. See *In re Mercier*, *infra*, 515 F. 2d at 1166, 185 USPQ at 778.

The board readily admitted, as the Examiner had done in the final rejection, that orthoester (II) required in appellant's claims is not disclosed in either of the two Sweeney patents. [App.5]. Yet the board somehow decided that "[m]anifestly" Sweeney suggests orthoesters wherein the R in RC(OR')3 is an -OR group thus, converting Sweeney's disclosed orthoester (I) into appellant's orthoester (II). [App.5].

Appellant submits that it is highly coincidental that the board found, of all possible ways to modify Sweeney's disclosure, to include something not disclosed therein -- and with no outside help from any other pertinent reference -- that the one modification the board finds is obvious just happens to result in a fuel composition containing appellant's claimed orthoester (II). Clearly the rejection involves hindsight, which the board sought to mask by arguing that the reason for its selection of an -OR group for Sweeney's R group is:

> . . . based on the close structure and chemical similarity between the orthoesters wherein R is other than -OR and wherein R is -OR ... . [App.5].

It is curious that the board should also, in the same decision, admonish appellant that:

> Mere conclusive statements unsupported by objective evidence are entitled to little weight. [App.9]

This court's predecessor has held it necessary for the board to have a factual basis for its conclusions, and presumably that includes "conclusive" conclusions as well. *In re Warner*, 379

F.2d 1011, 1016, 154 USPQ 173, 178 (CCPA 1967); *In re Freed*, 425 F.2d 785, 165 USPQ 570 (CCPA 1970). Accordingly, appellant asks, as to the allegation that the claimed invention is obvious over Sweeney alone, where are there any facts emanating from the Sweeney references alone to support the board's contention that orthoesters (I) and (II) are close in structure and chemical similarity? No evidence is offered of the alleged chemical similarity, and as to the alleged similarity in structure, appellant submits that the similarity the board so readily sees in the two compounds is not only made easier by the board's ready access to appellant's disclosure, but is also *unsupported* by Sweeney.

If the crucial issue is, as the board found, whether Sweeney suggests a substitution of the alleged closely similar orthoester (II) for orthoester (I), appellant submits that the place to go is the Sweeney patent, not appellant's disclosure. In his teachings Sweeney at length sets forth what the R group of his $RC(OR')_3$ orthoester (I) may be,[4] and as the board admitted, none is an -OR group. *In fact, very significantly, none is an -OR group.* Sweeney is most insistent in both of his patents that the operative compounds are of three kinds, i.e., acetals: $RCH(OR')_2$, ketals: $R_2C(OR')_2$, and orthoester (I): $RC(OR')_3$[5] -- and he even teaches that the R groups for these compounds

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[4] Sweeney at column 3, lines 1 to 18. [App.77,82]

[5] Sweeney at column 2, lines 65 to 69. [App.76,81]

can bear an -OR group while carefully avoiding a teaching that the R groups can be an -OR group.[6] Moreover, Sweeney prefers alkyl groups for his R substitutes.[7] Such teachings (and lack of teachings) would have to be considered by one of ordinary skill in the art and, appellant submits, accorded great weight. Sweeney should obviously be credited with being in the best position to know what would be operative in his invention. Further, Sweeney, who obviously had an understanding of organic chemistry, was aware of -OR groups (because all three of his compounds contain such groups). Yet, his disclosure is carefully drafted to avoid compounds having a carbon atom fully surrounded by, and bonded to, four oxygen atoms, i.e., orthoester (II). In view of this, appellant submits to the court that it is not at all obvious that an orthoester (II) could be substituted for orthoester (I) and prove operative for Sweeney's purposes -- much less for appellant's purpose. Clearly, given the unpredictable nature of chemistry, a compound having a carbon atom bonded exclusively to oxygen atoms (the invention) cannot reasonably be predicted to be an equivalent for a given reaction to one having one or two of such sites occupied by hydrogen or carbon (Sweeney). Indeed, rather than suggesting the substitution of orthoester (II) for orthoester (I), Sweeney suggests just the

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6 Sweeney at column 3, lines 10 to 13. [App.77,82]

7 Sweeney at column 3, lines 13 to 18. [App.77,82]

opposite -- that orthoester (II) is not a suitable candidate for his purposes (scavenging water or dissolving alcohols in diesel fuel).

Accordingly, appellant submits that the board's argument as to the alleged closeness in similarity and chemical properties between orthoesters (I) and (II) is an argument made of convenience -- and one prompted by 20/20 hindsight. Nothing in the Sweeney patents allows one of ordinary skill in the art to reasonably predict an equivalence in chemical properties for the two orthoesters. The real driving force behind the board's decision is hindsight, impelled by the fact that appellant disclosed the two compounds in her application as equivalents for her purpose. But any reliance on appellant's teachings is improper as hindsight -- derived, and that also includes her teachings of equivalence. *In re Ruff, supra*, 590 F.2d at 598, 118 USPQ at 347 (CCPA 1958).

In addition, the board most carefully avoided mentioning the fact that both Sweeney patents teach that the function of the disclosed ketals, acetals, and orthoesters (I) is to scavenge water by a catalytic mechanism.[8] As is well known, catalysis is unpredictable. *In re Doumani*, 281 F.2d 215, 217, 126 USPQ 408, 410 (CCPA 1960); *In re Mercier*, 515 F.2d 1161, 1167-68, 185 USPQ 774, 779 (CCPA 1975). Yet here the board decision merely concludes without evidence that orthoester (II) would have similar properties to

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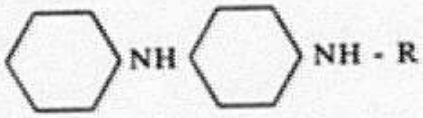
[8] Sweeney '267, col. 4, line 13, and Sweeney '417, col. 3, lines 58 to 62. [App.82,77]

orthoester (I) in the catalytic environment disclosed in Sweeney's patents.

Appellant submits that this is not correct. Chemistry in general is a an unpredictable science, and "catalytic effects are a particularly unpredictable aspect of the art of chemistry." *In re Slocombe*, 510 F. 2d 1398, 1404, 184 USPQ 740, 744 (CCPA 1975). One can have no idea from the references relied on whether Sweeney's acid media will catalyze the reaction of orthoester (II) with water, and if so, to what degree and at what rate, i.e., at the same rate as orthoester (I), or much faster, or much slower. It is simply impossible to tell -- or predict -- from Sweeney's disclosure, so that, of necessity, the claimed invention is non-obvious over the Sweeney references alone.

In view of the foregoing, appellant submits that the board's reliance on *In re Wilder*, 563 F.2d 457, 195 USPQ 426, 429 (CCPA 1977) is unavailing to the board. In that case the Wilder appellant was claiming a compound of the following formula:



where R was a specific branched chain alkyl radical. The prior art differed only in its disclosure of a different branched chain alkyl group for R, in view of which fact, the court properly found that the closeness in structure set forth a prima facie case of obviousness. But the situation is different here; appellant is not merely substituting one alkyl group for another, but an -OR group for an -R group, the result of which is

that a carbon atom is fully surrounded by, and bonded to, four oxygen atoms. Surely it requires no explanation that the functionality of an -OR group cannot be expected to be similar to an -R group, especially in a reaction requiring a catalyst. Further, as pointed out above, Sweeney's extensive disclosure as to what his -R groups could be excluded -OR groups. Accordingly, appellant submits that the nature of the difference between R groups and -OR groups, the Sweeney disclosure, and the structure of appellant's compound containing a carbon atom bonded only to oxygen atoms all defeat any argument that the Sweeney reference alone suggests the orthoester (II) additive required in the present claims.

Lastly to the Sweeney references alone, appellant would reiterate her conviction that the reason the board found her orthoester (II) similar in structure and chemical properties to Sweeney's orthoester (I) is that she used the term "orthoester" to describe the two compounds. Likewise, her formulae on page 3 of her specification [App.16], no doubt, helped the board conclude that orthoesters (I) and (II) were "very close" in structure and chemical properties. But appellant could just as easily have drafted the formulae as shown near the start of this brief and termed orthoester (II) an orthocarbonate and orthoester (I) an orthocarboxylate. But the point is that neither of these changes alters the science involved. What really counts is not how well one formula can be drawn to look like another, or different from another, or how alike or different the names are for different compounds. Instead, what is important are the scientific differences. *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963). And appellant submits that one of ordinary skill in the art could never

assume or reasonably predict that orthoester (I) and (II) would prove equivalent for any purpose without actual tests. The two compounds are substantially different in that one has only oxygen atoms bonded to a carbon atoms whereas Sweeney's disclosure *avoids exactly that teaching.*

Accordingly, appellant submits that Sweeney alone does not set forth a prima facie case of obviousness.

B. Elliott Is A Poor Reference

Although the board argued that Sweeney alone suggests the invention, it nevertheless relied on Elliott for further support, the argument being that Elliott allegedly teaches both orthoester (I) and (II) as equivalents for water scavenging, so that the substitution of an orthoester (II) for Sweeney's orthoester (I) is allegedly obvious.

Appellant strenuously argued to the board that Elliott was non-analogous art and therefore wholly unavailable as prior art for anything taught therein. Although the board did not ignore appellant's argument, the effect was just the same. Here is all the board had to say on this issue:

> While appellant argues that Elliott is non-analogous art ... , Elliott is relied on for its teaching of equivalences of various orthoesters as water scavengers in non-aqueous liquids, which is clearly analogous to their use in the Sweeney patents." [App.7]

This argument is error. Appellant provided the board with the appropriate case law setting forth both the test for whether or not a reference is non-analogous art, and the effect if it is non-analogous art. Specifically, appellant cited *In re Wood*, 599 F. 2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979) for the proposition that the reference must either be "within the field of the inventor's endeavor" or "reasonably pertinent to the particular problem with which the inventor was involved." The test set forth in *Wood* has been consistently followed and quoted with approval by this court and its predecessor: See *In re Deminski*, 796 F.2d 436, 442, 230 USPQ 313, 315 (Fed. Cir. 1986); *Strato-flex Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1535, 218 USPQ 871, 877 (Fed. Cir. 1983); *In re Pagliaro*, 657 F.2d 1219, 1224, 210 USPQ 888, 892 (CCPA 1981).

In addition appellant relied on *In re Horn*, __ F.2d, __, 203 USPQ 969, 971 (CCPA 1979), *In re Pagliaro*, *supra*, and *In re Wood*, *supra*, for the proposition that non-analogous art is wholly unavailable as prior art under 35 USC 103, the reason being found in *In re Horn*,*supra*, 203 USPQ at 971:

> ... [f]or *no matter what a reference teaches*, it could not have rendered obvious anything, "at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains," unless said hypothetical person would have considered it. [Emphasis added]

In light of the above decisions, the compelling conclusion is that the Elliott patent is non-analogous art. Elliott's teachings relating to hydraulic fluids are, beyond reasonable doubt, not within the field of endeavor for one skilled in the art of fuel combustion, and neither are they "reasonably pertinent to the particular problem with which the inventor was involved," i.e., reducing particulate matter formed during combustion of hydrocarbon fuels. Therefore, according to the *Wood* and *Deminski* decisions, the Elliott reference is non-analogous art and unavailable as prior art, "no matter what" Elliott teaches.

The board, however, decided that Elliott's teachings are analogous to Sweeney's teachings, a finding which is clearly wrong. The statute does not direct the scope of inquiry to the subject matter of any reference the board might find, or even to references analogous to available prior art. Instead, the statute directs the scope of inquiry to the subject matter to which the invention pertains. Likewise, the test set forth in the Wood decision above quoted directs the relevant inquiries to the field of the inventor's endeavor or reasonably related to the particular problem with which the inventor was involved.

From *no logical point of view* can one interpret the Elliott reference as pertaining to appellant's invention; one of ordinary skill in the art of fuel combustion would never look to the art of hydraulic fluids for an answer to the problem of reducing particulate matter during fuel combustion -- this being the subject matter to which appellant's invention pertains.

C. Sweeney-Elliott Does Not Provide A Valid Rejection

In the board decision, primary reliance for rejecting the claims was on the alleged suggestions emanating from Sweeney alone or the Sweeney-Elliott combination. In view of what appellant has argued in the preceding sections, it can be seen that appellant's main position is that Sweeney alone does not suggest the invention and that Elliott is unavailable as a reference for "no matter what it teaches." Thus, no combination of Sweeney with Elliott can properly be made.

However, in the unlikely event that the court should find the Elliott reference analogous art, appellant will now present arguments as to the impropriety of the Sweeney-Elliott combination.

Any combination of Elliott with the Sweeney patents requires hindsight. This can be most readily seen in the board decision where the board never acknowledges that the Elliott reference pertains to hydraulic fluids, and only to hydraulic fluids. Instead, the board prefers to see Elliott as pertaining to "non-aqueous liquids," the board twice referring to Elliott as such. [App.7] And the reason for this is clear: one of the Sweeney patents, but not both, refers to an apparatus broadly for dewatering "a non-aqueous liquid." This broad teaching becomes the signal for the board to ignore the reality behind the teachings of the references and force fit Elliott into Sweeney.

But appellant would ask the court to consider the reality. The thrust of everything in Sweeney relates to fuels, whereas Elliott relates to hydraulic fluids. It may seem convenient, after knowing what the invention is, to play a semantic word game by which references having nothing to do with each other -- and even less to the claimed invention -- can be made to appear related. But the fact is that prior to the invention, and to one having no cognizance of appellant's disclosure, there would be no reason to attach the kind of significance the board does to Sweeney '417 teaching "non-aqueous liquids," and then broaden Elliott's disclosure to include other non-aqueous liquids besides hydraulic fluids.

It should be recognized that the board needed to refer to the Elliott patent as relating to "non-aqueous liquids" so as to camouflage its use of hindsight. What Elliott specifically teaches is that orthoesters, orthoester (II) included, are useful in certain hydraulic fluids and that such compounds scavenge water. But it is important to note that all of Elliott's hydraulic fluids are non-hydrocarbons (being instead glycols, carbonates, orthoesters, or other oxygenated compounds). Thus, the board attempts, through semantics, to broaden Elliott's disclosure to all "non-aqueous liquids," the aim of which is to avoid confronting a very critical fact: namely, that Elliott's teachings are limited to the use of orthoesters in non-hydrocarbonaceous environments.

There is no suggestion from Elliott that all orthoesters are useful in all environments, and more specifically in hydrocarbonaceous environments, such as in the fuels of Sweeney.

Likewise, Sweeney offers no reasonable expectation that orthoester (II) will function in hydrocarbonaceous environments. In fact, as already argued in detail, he is most insistent in both of his patents that the operative compounds fall into three kinds of compounds, i.e., acetals, ketals, and orthoesters(I) -- none of which, even with any of the R groups disclosed in Sweeney's column 3 [App.77,82] -- contains a carbon atom fully surrounded by four oxygen atoms. There is no teaching or suggestion in Sweeney or Elliott that orthoester (II) would have similar properties to orthoester (I) for Sweeney's purpose of scavenging water in hydrocarbonaceous environments.

In making the above argument, appellant understands that the board is correct that obviousness does not require absolute predictability. But when it becomes necessary for the board to broaden the teachings of a reference, to find nonexistent suggestions in the references, and to make "conclusive" arguments about the closeness of structure and chemical properties, one immediately sees that the board had difficulty with the proposed combination of references -- which difficulty is easily overcome with knowledge from appellant's disclosure.

Moreover, the case law as to the propriety of a proposed combination of references requires that there be, apparent at the time of the invention and from the references themselves, an advantage or desirability to be gained from the combined teachings. *In re Sernaker*, 702 F.2d 989, 995-96, 217 USPQ 1, 6 (Fed. Cir. 1983); *In re Imperato*, 486 F.2d 585, 587, 179 USPQ 730, 732 (CCPA 1973). Here, there is nothing in the Sweeney and Elliott references to suggest an

advantage or benefit to be derived from combining them, and more specifically, no advantage or benefit to be derived from substituting an orthoester (II) from Elliott for orthoester (I) in Sweeney.

For example, the primary reason Sweeney wants an acetal, ketal, and orthoester (I) in his '267 patent is as a co-solvent for fuels and otherwise immiscible alcohols therewith. But Elliott nowhere suggests that orthoester (I) and orthoester (II) will function similarly for this purpose. Thus, there is no suggestion from the combined references that orthoester (II) can be substituted for orthoester (I) of Sweeney '267, and there also is no suggestion of an advantage or a desirability to be gained from such a substitution.

Likewise, if one considers using Elliott's orthoester (II) in place of Sweeney's orthoester (I) taught in either of his patents for use as a water scavenger, one of ordinary skill in the art is confronted -- not with any advantage or benefit to be gained by the substitution so readily seen by the board -- but rather with a significant problem. Sweeney '267 and '417, as stated before, relate to hydrocarbon fuels, and in such environments Sweeney insists that an acid catalyst is needed with orthoester (I). Thus, one of ordinary skill in the art, recognizing the unpredictable nature of catalysis, could hardly find a reason to expect that one could substitute an orthoester (II) from Elliott for Sweeney's orthoester (I) and obtain the result Sweeney needs: scavenging water from hydrocarbons in the presence of an acid catalyst. The acid catalyst may or may not catalyze the reaction between an orthoester (II) and water, no matter how similar orthoesters (I) and (II) appear on paper.

D. Speh, Kesslin and Howk Are Not Valid As References

Appellant submits that the teachings of each of the Speh, Kesslin, and Howk references are at best irrelevant and at worst non-analogous art which should not be considered. The Speh patent relates to the preparation of orthocarbonic acid esters (orthoester (II)), Kesslin to the production of purified ortho-formic esters (orthoester (I)), and Howk to the preparation of acetylenic acetals and orthoesters. These references are not only wholly unrelated to the Sweeney references but also to each other, to the inventive concept, to the field of endeavor of the appellant, and to the particular problem with which appellant was concerned. Indeed, these three references are devoid of anything relating to the echology of fuel combustion, and the Kesslin reference is further devoid of any teaching pertaining to orthoester (II). Only one reason for selecting them stands out: appellant disclosed the use of orthoester (I) and (II) for particulate reduction and with that hindsight advantage, the board simply went to any reference that could be found that taught such compounds, no matter how irrelevant their teachings.

Accordingly, appellant agrees with the board's assessment that the Speh, Howk, and Kesslin references are "merely cumulative" [App.6]: *cumulative in adding more confusion to that engendered by the Sweeney references or the Sweeney-Elliott combination.* One of ordinary skill in the art having these three references thrust at him or her after first receiving Sweeney and Elliott would undoubtedly be con-

fused; adding these three references to Sweeney and Elliott makes the invention all the more unobvious. Any reasonable combination of these references, assuming one could exist, would lead anywhere but towards the invention. Indeed, the board makes the same error in the present case as pointed to in *In re Mercier, supra*, 515 F.2d at 1166, 185 USPQ at 778:

> The board's approach amounts, in substance, to nothing more than a hindsight "reconstruction" of the claimed invention by relying on isolated teachings of the prior art without considering the overall context within which those teachings are presented. Without the benefit of appellant's disclosure, a person having ordinary skill in the art would not know what portions of the disclosure of the reference to consider and what portions to disregard as irrelevant, or misleading. See *In re Wesslau*, 53 CCPA 746, 353 F. 2d 238, 147 USPQ 391 (1965).

E. Claims 13 and 14 Are Patentable

With specific reference to claims 13 and 14 [App.39], the board argues that White and Neves, respectively, teach or make obvious a fuel recited in those claims. However, appellant never argued that she was the first to discover any of the fuels recited in these claims. The crucial issue, therefore, is not whether such fuels are known in the art but whether the respective teachings of Neves and White are properly combinable with either Sweeney patent, or further with Elliott, *and if properly combinable, is the inven-*

tion "as a whole" suggested? Appellant submits not: The selection and use of these references only compounds the hindsight involved in recreating the basic invention from Sweeney or the Sweeney-Elliott combination.

Hindsight is especially evident in the board's reliance on Neves, who teaches an ethanol-based fuel composition in which a significant amount of water -- from 15 to 30% as shown in Neves' claim 1 [App.70] -- is present and required in the fuel. This teaching is directly opposed to Sweeney's desire to scavenge trace amounts of water from fuel; the two references present conflicting teachings. And it is noteworthy that, once again, the board attempts to resolve a problem with conflicting prior art teachings by resorting to semantics, arguing that Neves teaches "a small amount of water" in the fuel and implying that such a teaching is related to Sweeney's disclosures. [App.6] Again, appellant would ask the court to see the reality behind the combination proposed by the board. Sweeney relates -- in both patents -- to removing trace amounts of water that often accompany diesel fuels; such amounts are on the order of about 5% or less, as taught by Sweeney '417 at col. 1, line 53 to col. 2, line 5. [App.76] Neves, on the other hand, not only teaches much higher amounts of water, 15 to 30%, but substituting Neves' fuel for Sweeney's makes no sense. Why would one of ordinary skill in the art go through all the trouble of adding substantial amounts of water to produce Neves' fuel, only to add an agent from Sweeney (and allegedly from Elliott) which would remove that water? The rejection has no logic behind it. Removing water from fuels in the manner of Sweeney necessarily defeats Neves' aim "to use as much water in the fuel as possible

under the operating conditions" (Neves, col. 6, lines 21 to 26). [App.68]

Earlier in this brief, appellant argued that the board's decision was based, in part, on misconstruing the references. The Neves patent is a case in point. The board blatantly ignored Neves' teachings that his fuels contained "significant amounts of water" (col. 3, line 45) [App.67] and instead converted this teaching to a "small amount" of water -- all in an attempt to make Neves' teachings appear similar to Sweeney's. Even worse, the board decided that:

> ... Neves teaches the well-known and obvious use of acetylene as a component in diesel fuel. [App.6]

Importantly, the board fails to indicate where in the Neves patent such a disclosure resides. Neves discloses both diesel engines and acetylene, but he teaches acetylene as a component of an ethanol-based fuel, not a diesel fuel. Neves' fuels contain ethanol in a large proportion (70 to 85%), water in a "significant" proportion (15 to 30%), a gaseous hydrocarbon such as acetylene in preferred proportions of 4 to 10%, benzene in a proportion sufficient to prevent phase separation, and, optionally, a lubricant such as sunflower seed oil. Nowhere is diesel fuel mentioned as a component of the fuel to which Neves adds acetylene, and indeed, Neves specifically teaches -- only some six times[9] -- that his

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[9] Neves Abstract line 1; column 1, line 8,; column 2, line 23; column 2, line 28; column 6, line 45; and column 10, line 23. [App.65-68]

fuel is intended to be a substitute for ordinary petroleum fuels. Thus, what Neves' teachings mean -- when taken in context -- is that his ethanol fuels can be used to replace gasoline in an automotive engine or diesel fuel in a diesel engine. Accordingly, there is no disclosure, as the board argues, of acetylene being taught as a component of diesel fuel.

And neither is there a reason offered in the Neves reference for adding acetylene to a hydrocarbon diesel fuel. The reason Neves adds acetylene to his fuels is to correct the stoichiometric variance between gasoline and ethanol, which causes difficulty in starting, warm-up, and smooth engine operation when ethanol is substituted for gasoline. The presence of acetylene or other gaseous hydrocarbon fuels in the ethanol corrects this stoichiometric variance. (Neves, column 4, lines 29 to 67) [App.67]

Now, considering that the board is supposed to support its position with facts, appellant asks where the Neves patent -- or any other evidence in this record -- would support the idea that acetylene should be added to diesel fuel to solve the same or similar problem as occurs with ethanol? Appellant submits that no such evidence or facts exist; the board -- and the board in particular -- is simply declaring in its inimitable "conclusive" fashion that Neves teaches or suggests the "well known" combination of acetylene and diesel fuel, and this despite the fact that there is no reason anywhere presented in the references for making such a combination. The only apparent reason that stands out is that the board is determined to introduce acetylene into

Sweeney's diesel fuel, so that the alleged prima facie case of obviousness posed by Sweeney alone will also pertain to the acetylene fuel of appellant's claims 13 and 14.

Moreover, if what the board meant by the Neves patent teaching the "well known" use of acetylene in diesel fuel is that Neves' fuel -- containing acetylene -- can be used as a substitute for diesel fuel, and in this sense is a "diesel fuel containing acetylene," appellant must respond with two points. First, Neves' fuel is not a hydrocarbon fuel, as claimed, but rather is ethanol-based. Such a fact manifestly leads away from the claimed invention. Second and of great importance is that Neves himself teaches (column 10, line 17) [App.70] that, if his fuel is used as a substitute for diesel fuel, "it is unnecessary to add a gaseous hydrocarbon component," e.g., acetylene, propane, etc., which Neves teaches as a component of his fuels used as a substitute for gasoline.

Accordingly, totally contrary to the board's position, not only is there no teaching of the "well known" use of acetylene in hydrocarbon diesel fuel but Neves himself teaches that, even for his diesel fuel substitute, there is no reason to use acetylene; it is "unnecessary."

Clearly, therefore, the board's arguments as to the acetylene fuel of claims 13 and 14 are in error. The Neves patent does not support the board's arguments and is not properly combinable with Sweeney. Likewise, the White patent does not support the board's arguments as to "propane" fuels of claim 13, and the White patent is not logically combinable with Sweeney.

Nevertheless, the board is insistent on combining White and Neves with Sweeney or the Sweeney-Elliott combination. The board argues that White teaches methanol as a "water scavenger" and Neves teaches benzene as a "binding agent" for his fuels containing substantial percentages of water. [App.6] However, the first of these arguments is outright error, the second meaningless, and both are eminently irrelevant, as will now be shown.

White does add methanol to his propane-containing fuels, but not as a "water scavenger" as alleged by the board. What White specifically teaches (White p.2 1st column) [App.45] is that methanol is an agent that can depress the freezing point of water -- much like salt can depress the water freezing point. But just as one would not consider the water as scavenged by the salt, the same is true of methanol: it does not "scavenge" water; it merely depresses the freezing point of water.

Thus, the board decidedly errs in trying to connect Sweeney's and White's teachings by making it appear that White's methanol serves the same purpose as Sweeney's orthoester (I) -- i.e., a water scavenger. Appellant submits that this is not true. Although White teaches (in line 21 of 2nd page) [App.45] that methanol has an "affinity" for water, this teaching must be read in context, *In re Mercier*, as quoted supra 515 F.2d at 1166, 185 USPQ at 778, and for its scientific meaning. Methanol is infinitely soluble in water, a fact which is well known, and thus, what White means by the "affinity" of methanol for water is that the two will readily form a solution, which solution will have a lower freezing

point than water. In addition, as is well known to anyone with a modicum of understanding of organic chemistry, alcohols are usually the end products of the reaction of water with appropriate organic compounds.[10] Alcohols themselves do not "scavenge" water in the sense of Sweeney's teachings, i.e., by reacting therewith; instead, they are often the product formed by the scavenging action of other compounds. Indeed, the Sweeney patent itself substantiates this very point, for Sweeney explicitly teaches that the compounds he adds to fuels to remove water -- acetals, orthoester (I), and ketals -- scavenge water by reacting therewith to produce alcohols (Sweeney '417, col. 4, line 5; [App.77]; Sweeney, '267, col. 4, line 60 [App.82]). In fact, the board admits this very point. [App.5]

Accordingly, appellant must protest the board's grossly unfair reading of the White patent. The board has, without doubt, attempted to convert White's teachings into something more closely resembling Sweeney's teachings -- and all in a transparent effort to create a commonality with Sweeney when in fact no such commonality exists.

For an unknown reason, the board did not change Neves' patent as it did White's patent, i.e., to extract a disclosure of a "water scaven-

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10 For example, alcohols are well known to be formed by a Grignard synthesis reaction or by the reaction of an alkene with water in acid media.

ger." But it did refer to Neves' teaching that benzene is a "binding agent" for water and the disclosed ethanol-based fuels. The board noted this fact as if it means something. It does not -- at least in revealing a suggestion of the invention defined by claims 13 and 14. A binding agent in the context of the Neves patent is simply a substance -- like Sweeney's co-solvent in the '267 patent -- that will ensure mutual solubility (and prevent phase separation) of two other components, in Neves' case, fuel components and water (Neves, col. 8, lines 63 to 65). [App.69] But such teachings are at best irrelevant to Sweeney's aim of removing water; the teachings and suggestions of the Sweeney and Neves references are "manifestly" unrelated, and as shown above, in direct conflict with each other, i.e., one reference deliberately adds water to fuel while the other's objective is to remove it. Furthermore, while Neves and Sweeney both teach binding agents or co-solvents, each seeks to combine very different substances: Sweeney, diesel fuel and alcohol, and Neves, fuel components and water. There is no logical, hindsight-free combination of Sweeney, Elliott, and Neves which renders appellant's invention of claims 13 and 14 obvious.

F. Inherency Is Not A Valid Issue

To counter appellant's reliance on *In re Shaffer, supra.* that the references can hardly suggest the invention when none of them even is related to the problem appellant confronted, the board argued that:

> The mere recitation of a newly discovered function inherently possessed by things and processes in the prior art does not cause claims drawn thereto to distinguish over that prior art. Appellant cannot remove from the public domain via a patent that which is inherently taught by the prior art... . [App.8]

The board cited several cases in support of its holding: *In re Wiseman*, 596 F.2d 1019, 201 USPQ 658, 661 (CCPA 1979); *In re Best*, 562 F.2d 1252, 195 USPQ 430, 433 (CCPA 1977); *In re Oelrich*, 666 F.2d 578, 212 USPQ 323, 324 (CCPA 1971); by analogy, *In re King*, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986).

Appellant submits that the board's reliance on these cases is misplaced, and, further, that the board ignored the controlling case law pertaining to the relationship of obviousness and inherency, the two, in fact, being "distinct concepts." *Kloster Speedsteel AB v. Crucible, Inc.*, 793 F. 2d 1565, 1576, 230 USPQ 81, 88 (Fed.Cir. 1986) *Modified on rehearing* 231 USPQ 160.

Moreover, the simple answer to the board's statement that appellant cannot remove from the public domain "that which is inherently taught by the prior art" is that appellant's invention is not "taught" by the prior art, either inherently or explicitly. There is no question (or even allegation) of anticipation by inherency in this case. And neither is appellant alleging a new and unexpected property for something in the prior art or reasonably suggested thereby, as will be more fully explained.

Two of the decisions relied upon by the board, *Oelrich* and *King*, relate to the situation of anticipation by inherency, i.e., where a single reference provides a disclosure, which if the teachings be followed, necessarily and inevitably produces that which is claimed. In such a situation, the claims are deemed anticipated and, likewise, obvious, since anticipation is well known to be the epitome of obviousness. Here, however, there is no question of anticipation by inherency; no single reference discloses adding an orthoester (II) to a fuel for any purpose.

Likewise, the *Best* case relates to the issue of anticipation by inherency, and most specifically, to a situation wherein the board has cited a reference which is so close in teaching to the claimed invention as to make it incumbent on the appellant to show that the claimed invention is not inherently achieved in the prior art patent. But again, no such situation pertains here; no one reference teaches, or for that matter, suggests, adding an orthoester (II) to a fuel, so as to yield a composition which would anticipate the present claims.

In the *Wiseman* decision, it is true that the court held that, if the suggestion of two properly combinable references in the prior art makes the solution to the problem the applicant faced obvious, then a rejection under 35 USC 103 can be validly maintained. However, a key passage in the Wiseman decision is:

> Although there may be patentable invention where the solution is obvious after the discovery of the cause of the problem... , a different situation exists where the solution is obvious

> from prior art *which contains the same solution for a similar problem...* . [596 F.2d at 1023, 201 USPQ at 661. Emphasis in the original]

One can see at once why the *Wiseman* decision does not apply to the facts here. Where does the prior art relied on -- in any combination whatever -- make obvious the same solution for a similar problem? As has been repeatedly argued hereinbefore, the prior art relied on confronts no similar problem; hence it cannot make obvious the solution appellant discovered. In other words, the *Wiseman* decision pertains to a situation where, from the references relied on, a structure, process, or composition is suggested, from which structure, process, or composition one of ordinary skill in the art could find obvious the solution to the same or similar problem appellant faced. No such situation exists here.

Accordingly, appellant submits that the case law relied on by the board is unavailing to the board; the decisions are entirely unrelated to the present factual situation, and to the extent such decisions could be so related, they support appellant's position, not the board's. In addition, appellant submits that the governing law applicable to the issue of inherency and obviousness herein is the case law the board ignored. Specifically, the decision in *In re Diamond*, 360 F.2d 214, 216, n. 3, 149 USPQ 562, 564, n. 3 (CCPA 1966) held that "inherency is not obviousness," and this for the reason succinctly stated in *In re Spormann*, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966):

> ... the inherency of an advantage and its obviousness are entirely different questions. That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown.

In fact, as pointed out in *In re Adams*, 356 F.2d 998, 1002, 148 USPQ 742, 746 (CCPA 1966), the unexpected property of an invention will always be inherent, otherwise the invention could not work.

In short, allegations of inherency are no substitute for suggestions in the prior art. And thus, the relevant inquiry is whether or not the alleged inherent result was obvious or expected *Kloster Speedsteel AB v. Crucible, Inc., supra*, 793 F.2d at 1571, 230 USPQ at 88 (Fed.Cir. 1986) or otherwise appreciated or recognized by those of ordinary skill in the art. *In re Naylor*, 369 F.2d 765, 768, 152 USPQ 106, 108 (CCPA 1966). As to this issue, appellant submits that nothing in the prior art would make it obvious or lead to the expectation that orthoester (II) would reduce particulate emissions during combustion. Nothing in the art relied on would give a person of ordinary skill in the art of fuel combustion a reasonable expectation of reducing particulates upon combustion with orthoester (II) additives.

G. <u>The Dillon Invention Provides Unexpected Results</u>

Although appellant believes the prior art relied upon by the board does not set forth a prima facie case of obviousness for the reasons

argued above, appellant submits she has achieved an unexpected result rebutting any prima facie case of obviousness as can be established. As stated hereinbefore, her data in Examples XIII to XVIII show that a mere 3.5 wt.% of orthoester (II) additive in combustive diesel fuel results in between about a 10% and 17% reduction in particulates. Since the prior art makes no suggestion whatever that any reduction can be achieved by any means, let alone by use of an additive, it should stand to reason that, as compared to what the prior art teaches and suggests, appellant has indeed achieved a result nowhere suggested therein, i.e., the result is unexpected over what the prior art teaches and suggests.

The board, however, decided otherwise, arguing that appellant's arguments on this point were "conclusive" and that, in fact, appellant's data in the specification do not show the superiority of orthoester (II) over orthoester (I). [App.9] This argument by the board shows at once how little appellant's actual arguments were considered and how dedicated the board is to the proposition that hindsight is a perfectly legitimate tool for resolving the question of obviousness. Of course appellant's data do not show that orthoester (II) is superior to orthoester (I); appellant never argued that they did. But what must be understood is that the use of orthoester (I) as an additive for reducing particulate emissions during combustion is appellant's discovery -- and one she plans to claim in a subsequent application, once the present case is resolved. Appellant submits that it is hindsight in the extreme for the board to rely on her data presented in her application as to the effectiveness of orthoester (I) as a particulate suppression additive for diesel and other soot-forming fuels. *In re Ruff, supra.*

H. The Lintner Decision Is Not Applicable

Moreover, appellant has not been unmindful in her above argument focusing on the purpose for which she added orthoester (II) to a fuel, that the the board relied on *In re Lintner*, 458 F.2d 1013, 173 USPQ 560, 562 (CCPA 1972) for the legal proposition that:

> ... differences between appellant's and the prior art's motivation for adding a component to a composition will not *alone* render the claimed composition, or process, unobvious. [Emphasis added] [App.7]

In immediate response, appellant states that she is not relying only on the difference in purpose for which she added orthoester (II) to a fuel, but also on the fact that the prior art does not provide an obvious reason to add orthoester (II) to a fuel for any purpose.

In the Lintner case, where the Lintner appellant claimed a laundry composition requiring five components, there were several facts which the present board conveniently ignored. For one, the three references relied on all related to the subject matter of the Lintner invention: laundry detergents; for another, the primary reference taught four of the five ingredients of the claimed invention; for yet another, the secondary references both taught reasons to add sugar (the fifth ingredient) to detergent compositions; and for still another, the primary reference not only pertained to the same problem as the Lintner invention but taught "the very result" the Lintner appellant asserted to be unexpected -- but, clearly without the need for the last or

fifth ingredient. In contrast, in the present case, only the primary Sweeney references pertain to fuel compositions; the secondary Elliott reference not only does not provide a legitimate suggestion of adding orthoester (II) to a hydrocarbon fuel, but is in fact non-analogous art and unavailable for anything taught therein. And, of most importance, the primary Sweeney references nowhere disclose or suggest "the very result" urged by appellant -- the reduction of particulates upon combustion of hydrocarbon fuels.

Applicant has argued her position in detail, but the point has to be noted that she is not, as the board's decision implies, relying on the difference in purpose alone. She is only relying *in part* upon that difference, which, she submits, is a factor to be weighed in determining the obviousness of the invention "as a whole," whereas the board, quite clearly, gave it no serious consideration at all.

I. Claims of Additional Patentable Distinction

The board decision nowhere more reflects its propensity to say things regardless of the facts than in its statement that:

> ... we note that insofar as appellant has not chosen to separately argue the patentability of appealed claims under 35 USC 103, they stand or fall together... . [App.7]

Appellant appreciates the fact that the board, once having its mind made up to affirm the Examiner, would naturally avoid facts in appellant's favor. But, this statement is simply wrong.

Appellant's brief in numerous locations argued limitations which exist in some of the claims and not others. Indeed, appellant's arguments relative to the Sweeney '267 patent obviously only pertained to some of the claims and not others since Sweeney '267 was only cited against some of the claims, e.g., claim 16 requiring a middle distillate fuel.

In addition, appellant does note that she separately argued the limitation of those claims limited to no more than 5.0 volume percent orthoester [App.111,121-122], those claims limited to compositions essentially free of alcohol [App.113,122-124], and the fact that the method claims inherently take advantage of the particulate reducing properties of appellant's claimed compositions [App.112].

Taking only claim 34 as an example -- which claim was specifically identified by appellant on page 23 of her brief as being argued separately [App.113], appellant asks the court to note that this claim is directed to a method for combusting a hydrocarbon fuel essentially free of alcohol (meaning less than 1 volume percent alcohol according to appellant's definition on page 5 of her specification) [App.18] and that this claim identifies claim 28 as one of the claims it depends from, which claim 28 limits the concentration of orthoester in the fuel to 0.1 to 5.0 volume percent -- itself a limitation specifically argued on pages 21, 31 and 32 of her brief below. [App.111,121-122]

Claim 34 dependent on 28, therefore, is submitted to be patentable for several reasons additional to those argued hereinbefore as to

claim 1 and 16. T: claim, it will be noted, only stood rejected by the Examiner over a combination of references using Sweeney '417 as the primary reference. Thus, it is not understood why the board included Sweeney '267 as a reference of importance in discussing this claim. [App.6-7] In any event, as to claim 34, the board argued that:

> Sweeney '267 discloses the amount of alcohol added may be as low as 5 volumes per 100 volumes of hydrocarbon... . [App.7]

Actually, what Sweeney '267 really teaches in this location is that the alcohol is added in:

> an extending amount typically 5-500 volumes, preferably 10-100 volumes, say about 31 volumes per 100 volumes of hydrocarbon. [App.81] (Col.2 lines 51-63)

Translated to percentages, the range taught by Sweeney '267 for the alcohol content is broadly from 4.8 to 83%, with specific mention being made of a value (31 vol./100 vol.) which translates into an alcohol content of 24%. Such teachings have no applicability to claim 34 -- or for that matter any claim requiring less than 1% alcohol content -- and yet the board, carried away with what can be deduced by hindsight, decided that the Sweeney '267 reference is meaningful to claim 34. Appellant submits the very opposite. Sweeney's teachings in his '267 patent lead directly away from the invention defined by claim 34, even if one were to substitute orthoester (II) for orthoester (I) in Sweeney's disclosure. The reality is that, even with that substitution,

Sweeney '267 still requires nearly 5 times as much alcohol in the fuel as claim 34 is limited to. Common sense reveals the non-obviousness of appellant's limitation.

As to the rejection of claim 34 with Sweeney '417 as the primary reference, the board is correct that Sweeney '417 does not teach "adding" orthoesters to a fuel containing alcohol. [App.7] But careful not to take any recognition of facts against its position, the board does not inform in its decision that Sweeney '417 very clearly teaches that alcohols are formed in his compositions by the reaction of orthoester (!) with water to form alcohols (Sweeney '417, col. 4, line 5) [App.77]. Thus, alcohols will inevitably form in Sweeney '417, the amount, of course, being dependent upon the water content. And, very importantly, such alcohols will form prior to the combustion of the fuel as required by claim 34 because the reaction between orthoester(I) and water occurs in the catalytic resin bed, long before the fuel is introduced into an engine.

Moreover, as to claim 34/28/24, there is a requirement for the alcohol content to not only be below 1% but also (in claim 28) for the content of orthoester (II) to be between about 0.1 and 5%. The board offered no reason whatever as to how the prior art rendered obvious the use of 0.1 to 5.0 volume percent orthoester. As appellant noted earlier, it is in this range, as shown by the data in Examples XIII to XVIII, that one can attain about a 7 to 17 percent reduction in particulates during combustion of a diesel fuel with diesel fuel and combustion in a diesel engine being specifically recited in claim 28 dependent upon claim 34.

Now, considering the results in Examples XIII to XVIII as part of the invention of claim 34/28/24 "as a whole", 35 USC 103, appellant submits that her invention is necessarily patentable over the art cited. The fact that the board had difficulty in finding a reason from the Sweeney references for using 0.1 to 5.0 volume percent orthoester is not only evident in the board's refusal to address the matter but also by the Examiner's argument as to this limitation in claim 28 in relation to the Sweeney '267 reference:

> The applicant argues that the Sweeney '267 reference requires at least 10 volume percent orthoester whereas some of applicant's claims require no more than 5.0 or 9.0 volume percent orthoester. The Examiner agrees with applicant's argument. However, the greater amount of orthoester [used by Sweeney '267] has not been shown to be detrimental to the hydrocarbon fuel when combusted. [App.130]

Appellant submits that this argument misses the point. Indeed, the Examiner's argument had the issue backwards. Assuming that the secondary references provide a legitimate suggestion to substitute orthoester (II) for Sweeney's orthoester (I) -- which assumption appellant denies to be valid for all the reasons previously advanced -- the issue then is not whether Sweeney '267 obtains good or bad results with his much higher concentrations of orthoesters but rather how do the Sweeney '267 teachings relating to the use of high orthoester concentrations suggest the deliberate use of much less orthoester, i.e.,

about 45% or more below the lowest disclosed orthoester concentration in Sweeney '267? Appellant submits that no such suggestion exists. Sweeney '267 steers the person of ordinary skill in the art to high concentrations of orthoester, thereby teaching away from the use of low orthoester concentrations and making such use non-obvious. Moreover, it is unreasonable in the extreme to believe that it is somehow obvious to modify Sweeney '267 to use a different orthoester in a lower amount *for an entirely different purpose.*

The same conclusion is reached if one reviews the combination of the Sweeney '417 patent in combination with the irrelevant secondary references. For the person of ordinary skill in the art to uncover the invention defined by claim 34/28/24, he or she must first substitute orthoester (II) from the secondary references for orthoester (I) in Sweeney '417 -- and this despite the fact that both of Sweeney's disclosures avoid such compounds and the further fact that one can hardly expect orthoester (II), with its carbon atom fully bonded to four oxygen atoms, to react like orthoester (I) in the presence of Sweeney's catalytic resin. Next, the person of ordinary skill in the art must choose a fuel for use in Sweeney's '417 dewatering process containing only an amount of water, which, if reacted with the orthoester (II), will yield less than 1% alcohol in the product while leaving between 0.1 and 5.0% unreacted orthoester in the fuel. Is this obvious from Sweeney '417 combined with the other irrelevant references? The question itself reveals its own fallacy; all too clearly it can be seen that only hindsight accounts for the board's affirmance of the rejection of claim 34/28/24.

And lastly, appellant must note that the rejection of claim 34/28/24 includes the Neves patent among the irrelevant secondary references relied upon. How the Neves patent, teaching fuels containing 70% to 85% ethanol, could possibly aid in suggesting a fuel containing less than 1% alcohol is impossible to fathom. The Neves patent leads directly away from the invention of claim 34/28/24, and its combination with the Sweeney patents is at best unintelligible. The invention defined by claim 34/28/24 is manifestly nonobvious over the art relied upon.

VI. CONCLUSION

In conclusion, appellant would leave the court with one thought. Presumably -- and in view of the board's decision it should perhaps be emphasized -- presumably, the obviousness or non-obviousness of appellant's invention is to be determined in the absence of what she has taught in her disclosure.

Presuming this, appellant must ask the court to consider the following: If appellant had been allowed to apply for a patent without first giving the board her disclosure, but informing it of the fact that her invention is directed to reducing particulate matter formed upon combustion of diesel fuel and requesting it to assemble whatever prior art it had as to this problem prior to submission of her specification and claims, does the court have any doubt whatever that no reasonable examiner would have considered even one of the references now relied upon by the board as pertinent? Appellant submits that the answer to that question should reveal how hindsight is indeed the root cause and, indeed, the only ba-

sis, for the two separate rejections under 35 USC 103 on the basis of obviousness.

The board did not follow the relevant law and the decisions of this court and in doing so it improperly sustained rejections based upon non-analogous references. There was no reason to combine the references and, indeed, the teachings of the references do not in any way make obvious the claimed invention of appellant Dillon.

Reversal of this manifestly erroneous decision of the board is most respectfully requested.

Respectfully submitted,

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