UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte LOTHAR THIELE,
HANS-PETER KOHLSTADT,
and
HANS REINHARD STRIEWSKI

_____

Appeal No. 2006-0916
Application No. 10/345,711

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ON BRIEF

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Before OWENS, DELMENDO, and JEFFREY T. SMITH, Administrative Patent Judges.

DELMENDO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 (2006) from the examiner's final rejection of claims 20 through 40 (final Office action mailed August 19, 2004), which are all of the claims pending in the above-identified application.[1]

[1] The parent application (08/983,374 filed on January 16, 1998, now abandoned) was the subject of a previous appeal (2001-0295) before this board. In that appeal, we affirmed the examiner's 35 U.S.C. § 103(a) rejection of claims 20 through 37 and 39 through 48, which were drawn to subject matter similar to that of the present appeal, over evidence inclusive of the same evidence relied upon herein. Ex parte Thiele, Appeal No. 2001-

The subject matter on appeal relates to wood chip boards or particle boards. (Specification at 1, lines 1-19.) Specifically, the invention relates to: (1) a process for making a composite of a member containing cellulose selected from the group consisting of wood particles, a cellulose-containing material other than wood particles, and mixtures thereof with a carbon dioxide-forming binder comprising a liquid polyol component, water, and a polyisocyanate component, wherein a ratio of the carbon dioxide-forming binder to the member containing cellulose is from 0.1:1 to 2:1 (claims 20-35, 39, and 40); and (2) a product made by such a process (claims 36-38). Further details of this appealed subject matter are recited in representative claims 20 through 22, 25, 28, and 36 through 39 reproduced below:

> 20. A process for making a composite of a member containing cellulose selected from the group consisting of wood particles, a cellulose containing material other than wood particles and mixtures thereof with a carbon dioxide forming binder comprising a liquid polyol component, water and a polyisocyanate component wherein a ratio of the carbon dioxide forming binder to the member containing cellulose is from 0.1:1 to 2:1, which comprises:
>
> a) forming a first mixture comprising the member containing cellulose, the liquid polyol component and water;

0295 (November 18, 2002), a copy of which is attached to the appeal brief filed on May 18, 2005.

b) mixing an equivalent excess of the polyisocyanate with the excess based on the polyol, with the first mixture, to form a second mixture; and
c) forming and reacting the second mixture under a pressure of at least 1 Kg/cm^2 to form the composite.

21. The process of claim 20 wherein the forming and reaction are carried out in a mold at a pressure of from 1 Kg/cm^2 to 100 Kg/cm^2.

22. The process of claim 21 wherein the mold is a pressure tight mold.

25. The process of claim 22 wherein the forming and reacting are carried out at a temperature of from 10°C to 30°C.

28. The process of claim 25 wherein the pressure is from 50 Kg/cm^2 to 100 Kg/cm^2.

36. A product of the process of claim 20.

37. A product of the process of claim 22.

38. A product of the process of claim 25.

39. The process of claim 20 wherein an equivalent ratio of NCO groups to OH groups in the second mixture, before reaction, is not greater than 5:1.

The examiner relies on the following prior art reference as evidence of unpatentability:

Markusch et al. 3,965,051 June 22, 1976
Markusch)

Claims 20 through 40 on appeal stand rejected under 35 U.S.C. § 103(a) as unpatentable over Markusch. (Examiner's answer mailed June 27, 2005 at 3-6.)

We affirm this rejection.[2]

Markusch describes a composite material (e.g., panels or other products useful in the building industry) produced from (a) an organic polyisocyanate containing ionic groups, (b) an inorganic and/or organic particulate and/or fibrous material; and (c) optionally other auxiliary substances and additives. (Column 1, lines 16-18; column 2, lines 33-48; column 3, lines 49-56; abstract.) According to Markusch, the organic polyisocyanate liberates carbon dioxide upon reaction with water and the "carbon dioxide evolved may have the effect of forming pores..." (Column 3, lines 38-48.) Markusch further discloses that "[a]ny suitable particulate and/or fibrous material," including cement, sand, cotton, popcorn, wood meal, wood shavings, sawdust, straw, and cork, are interchangeable and that "[t]hese materials are preferably used in combination with

[2] The appellants provide arguments for the separate patentability of the claims as follows: (i) claims 20-35 [sic]; (ii) claim 28; (iii) claims 39 and 40; (iv) claim 36; (v) claim 37; and (vi) claim 38. Appeal brief at 5-12.) We select claims 20, 28, 39, 36, 37, and 38 as representative of groups (i) through (vi), respectively, and confine our discussion of the rejection to these selected claims. 37 CFR § 41.37(c)(vii) (2005)(effective September 13, 2004).

water." (Column 9, line 19 to column 10, line 2.) With respect to the auxiliary substances or additives, Markusch discloses (as one class of suitable substances) "water and low-molecular weight organic compounds which have molecular weights of up to about 400," including polyhydroxyl compounds (polyols). (Column 10, line 25 to column 12, line 48.) The proportion by weight of the polyisocyanate to the particulate or fibrous material is said to be between 1:99 and 90:10. (Column 15, lines 41-45.)

Regarding the process of making the composite, Markusch teaches:

> The production of the composite materials may be carried out, for example, by mixing the above described components either in one stage or in several stages in an intermittently or continuously operating mixing apparatus and then leaving the resulting mixture to react, in most cases outside the mixing apparatus in molds or on suitable substrates. If only small quantities of the polyisocyanate with ionic groups are used as binder, based on the quantity of inorganic and/or organic particulate and/or fibrous material which is required to be bonded, it is often advantageous to use a procedure in which the binder components are sprayed, scattered, spread-coated or rolled on to the particulate and/or fibrous material and the component mixture is then hardened after the shaping process, optionally at an elevated temperature.
>
> The processing temperatures used may be between 0°C and 300°C but are preferably between 5°C and 150°C. According to one preferred procedure, the components are combined at room temperature and then bonded at room temperature or elevated temperature, optionally under pressure. If desired, the mixture of

> components may also be pressed, cast or injected into cold or heated molds, which may be relief molds or solid or hollow molds, and left to harden in these molds at room temperature or temperatures up to 200°C, optionally under pressure, optionally employing a centrifugal casting method. (Underscoring added; column 14, lines 37-64.)

In an example, Markusch describes a foamed composite made by a process in which 100 g of a polyisocyanate and 50 g of a polyol are stirred together for about 1 minute, and then 100 g of "finest wood chips" (water content 8% by weight) are mixed in for 1 minute. (Example 56.) According to Markusch, "[t]he foaming process set in immediately after the components had been mixed and was completed 5 minutes later at room temperature." (Column 27, lines 54-57.)

Claim 20

Markusch's process as described in Example 56 differs from the invention recited in appealed claim 20 only in that the wood particles are mixed into the reaction mixture last instead of the polyisocyanate. As noted above, however, Markusch teaches that the reaction may be facilitated "by mixing the above described components either in one stage or in several stages in an intermittently or continuously operating mixing apparatus" and places no limitation on the order of addition of the components. (Column 14, lines 37-43.) Furthermore, in

describing Example 1 where cement and building sand are used in lieu of wood particles as the "inorganic and/or organic particulates and/or fibrous material," Markusch teaches that polyisocyanate is added to a mixture of the "inorganic and/or organic particulates and/or fibrous material" and the auxiliary substance.

Because Markusch suggests that the components could be premixed without any limitation as to the order of addition, one of ordinary skill in the art would have reasonably expected that the addition of polyisocyanate to a mixture of "inorganic and/or organic particulates and/or fibrous material" and the auxiliary substance would work equally well. Hence, we agree with the examiner's conclusion that one of ordinary skill in the art would have found the requisite motivation, suggestion, or teaching in Markusch to modify the process of Example 56 so as to arrive at the subject matter of appealed claim 20. While one of ordinary skill in the art would have reasonably expected that the delayed introduction of polyisocyanate would substantially prevent the premature reaction between the isocyanate (NCO) and hydroxyl (OH) groups during mixing, we note that appealed claim 20 contains no limitations on the durations of steps b) and c).

Thus, there is no basis for asserting any unexpected results over Example 56 of Markusch.

The appellants argue that "[t]he particular sequence of steps [recited in the appealed claims] is critical and provides the unexpected properties of the composite product of the invention." (Appeal brief at 7.) As succinctly stated by the examiner (answer at 4), mere lawyer's arguments and conclusory statements, which are unsupported by factual evidence (e.g., comparative experimental data commensurate with the degree of patent protection sought), are entitled to little probative value. In re Geisler, 116 F.3d 1465, 1470, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); In re De Blauwe, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984); In re Wood, 582 F.2d 638, 642, 199 USPQ 137, 140 (CCPA 1978); In re Lindner, 457 F.2d 506, 508-09, 173 USPQ 356, 358 (CCPA 1972).

The appellants contend that Markusch's objective is to provide a polyisocyanate that is readily dispersible in water and, therefore, one of ordinary skill in the art would not consider the here claimed sequence. (Appeal brief at 8.) Thus, it appears that the appellants are contending that Markusch teaches away from the claimed invention by disclosing a water

dispersible polyisocyanate. We do not find this argument persuasive.

A reference is said to teach away when "it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant." In re Gurley, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994).

As we discussed above, Markusch teaches that the reaction may be facilitated "by mixing the above described components either in one stage or in several stages in an intermittently or continuously operating mixing apparatus" and places no limitation on the order of addition of the components. (Column 14, lines 37-43.) Markusch even discloses an example where polyisocyanate is added last. (Example 1.) The appellants have not directed us to any teaching in Markusch or other evidence that would have suggested to one of ordinary skill in the art that "the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant."

The appellants urge that "[s]ince the particulate material [in Markusch's Example 1] is non-absorbent and the amount of water added is so large compared to the amount of particulate

material, a slurry of the particulate material in free water is formed." (Appeal brief at 8.) Even were we to accept as fact the appellants' allegation that cement or building sand are "non-absorbent" and that a slurry is formed, this does not demonstrate any reversible error on the part of the examiner. Markusch suggests that particulates including wood and sand are interchangeable for purposes of practicing the disclosed molding process. Although a polyol is not used in Markusch's Example 1, Markusch teaches that polyol may be used. (Column 10, lines 7-61.) In this regard, we are in complete agreement with the examiner's determination (answer at 3) that Markusch provides the requisite motivation, suggestion, or teaching to use more than one OH-containing auxiliary substance including water and polyol because each is taught to be useful for the same or similar purpose, thus suggesting that the mixture would also be useful for the very same purpose. In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980); In re Susi, 440 F.2d 442, 445, 169 USPQ 423, 426 (CCPA 1971).

We have, as urged by the appellants (appeal brief at 10), reviewed Markusch's Example 52 and column 14, lines 48-53. However, these disclosures relate to an "advantageous" (but not exclusive) embodiment where "only small quantities" of the

polyisocyanate are sprayed, scattered, spread-coated or rolled onto the particulates.

Claim 28

Claim 28 further limits claim 20 by reciting that "the mold is a pressure tight mold" (intervening claim 22), "the forming and reacting are carried out at a temperature of from 10°C to 30°C" (intervening claim 25), and "the pressure is from 50 Kg/cm^2 to 100 Kg/cm^2" (claim 28).

As noted above, Markusch teaches that the processing temperature is preferably between 5°C and 150°C and that the materials may be molded under pressure at temperatures from room temperature up to about 200°C. (Column 14, lines 53-64.) Given these teachings, it is our judgment that one of ordinary skill in the art would have found the requisite motivation, suggestion, or teaching to arrive at optimum or workable ranges of pressures and temperatures. In re Peterson, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003)("The normal desire of scientists or artisans to improve upon what is generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."); In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980)("[D]iscovery of an optimum value of a result

effective variable in a known process is ordinarily within the skill of the art."); In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)("[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.").

Claim 39

Claim 39, which depends directly from claim 20, recites that "an equivalent ratio of NCO groups to OH groups in the second mixture, before reaction, is not greater than 5:1."

Markusch teaches that the amount of auxiliary substances (e.g., polyols) is generally 0-50% by weight based on the sum of binder and substrate. (Column 15, lines 57-60.) The reference further teaches that the polyisocyanate (100 g) used in Example 56 has an NCO content of 26.4% by weight. (Column 20, lines 1-20.) Because 50 g of a polypropylene oxide-trihydric alcohol polymer with an average molecular weight of 450 is used as the polyol component in Example 56, it reasonably appears that the NCO:OH ratio would necessarily be within the appellants' claimed range. Even if this is not the case, one of ordinary skill in the art would have found the requisite motivation, suggestion, or teaching to arrive at an optimum or workable range of NCO:OH ratio. In re Peterson, 315 F.3d at 1330, 65 USPQ2d at 1382.

Claim 36

With respect to product-by-process claim 36, it has long been held that "'[i]f the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.'" Smithkline Beecham Corp. v. Apotex Corp., No. 04-1522 slip op. at 9 (Fed. Cir. February 24, 2006)(quoting In re Thorpe, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985)).

It is also well settled that when a claimed product reasonably appears to be substantially the same as a product disclosed in the prior art, the burden of proof is on the applicants to prove that the prior art product does not inherently or necessarily possess the characteristics attributed to the claimed product. Cf. In re Spada, 911 F.2d 705, 708, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990)(holding that similarity in terms of reactants and reaction conditions amounted to a prima facie case of unpatentability and that the burden was properly shifted to applicants to show that the prior art product does not have the claimed property); see also In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977). Whether the rejection is based on inherency under 35 U.S.C. § 102 or on

obviousness under 35 U.S.C. § 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products. Best, 562 F.2d at 1255, 195 USPQ at 433-34.

In this case, Markusch describes a composite made by a process substantially identical to that recited in appealed claim 20 (the base claim for product-by-process claim 36). In particular, the materials used in Markusch's example 56 are identical to those recited in appealed claim 20, and the sequence of adding the materials differs only in one respect - polyisocyanate is not the last component introduced. Under these circumstances, the burden was properly shifted to the appellants to demonstrate that the process recited in appealed claim 20 yields a patentably distinct product. The appellants failed to meet this burden of proof. Accordingly, we uphold the examiner's rejection of product-by-process claim 36 on this additional basis.

The appellants contend that "there is no teaching nor suggestion in Markusch et al. of the product of the process of Claim 20 with its density and unexpected water resistant properties." (Appeal brief at 11.) This contention is without

merit. Appealed claim 20 contains no limitations on density or water resistant properties. Nor is there any evidence establishing that the recited process provides any unexpected result over the prior art in terms of either of these properties.

Claim 37

Claim 37 is also a product-by-process claim and depends from process claim 22, which recites that "the mold is a pressure tight mold."

As we discussed above, Markusch teaches that the molding may be carried out under pressure. The appellants have not demonstrated that the use of a pressure tight mold (as opposed to a mold under pressure) results in any unobvious difference.

Claim 38

Claim 38 is also a product-by-process claim and depends from process claim 25, which recites that "forming and reacting are carried out at a temperature of from 10°C to 30°C."

Markusch teaches that Example 56 was carried out at room temperature, which falls within the appellants' claimed temperature range.

For these reasons and those set forth in the answer, we affirm the examiner's rejection under 35 U.S.C. § 103(a) of appealed claims 20 through 40 as unpatentable over Markusch.

The decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED

Terry J. Owens Administrative Patent Judge	)
Romulo H. Delmendo Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
Jeffrey T. Smith Administrative Patent Judge	)

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