Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte MICHAEL WINDSOR SYMONS

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Appeal No. 2000-0343
Application 08/849,008

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ON BRIEF

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Before OWENS, WALTZ and DELMENDO, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal is from the final rejection of claims 1-20, 23 and 24, which are all of the claims remaining in the application.

THE INVENTION

The appellant's claimed invention is directed toward a method for treating particles of lignocellulosic material to

prepare them for the manufacture of a finished product such as particle board, and toward a process for making particle board from the treated lignocellulosic particles. Claims 1 and 23 are illustrative:

1. A method of preparing particles of a lignocellulosic material for the manufacture of a finished product includes the steps of:

(a) chemically modifying the lignocellulosic material by impregnating the lignocellulosic material with an impregnating composition comprising a dicarboxylic anhydride or a tricarboxylic anhydride dissolved in a suitable non-aqueous solvent;

(b) applying to the particles an adhesion promoter to promote the adherence of a thermoplastic resin to the surfaces of the particles of lignocellulosic material;

(c) applying to the particles a thermoplastic resin in dry powder form, so that after the application of the adhesion promoter, the thermoplastic resin adheres to the surfaces of the particles of lignocellulosic material, the thermoplastic resin having been surface modified by irradiation or by fluorination; and

(c) after step (a) or step (c), removing the solvent.

23. A process of making a particle board from particles of a lignocellulosic material treated according to the method of any one of claims 1, which process includes the steps of:

(i) impregnating a sheet or sheets of a lignocellulosic material with a composition comprising a thermosetting resin, an extending liquid for the thermosetting resin and where necessary a catalyst for the thermosetting resin;

(ii) recovering the extending liquid;

(iii) placing on one or both sides of a layer of the particles of lignocellulosic material, the impregnated sheet or sheets of lignocellulosic material to form a composite; and

(iv) compressing the composite with heating in a suitable press to allow the resin present to polymerise, and to allow any wax or convertible resin present to melt and flow, and to allow the thermosetting resin in the impregnating sheet or sheets to polymerise and to bond, and all to set to form the particle board.[1]

THE REFERENCES

Himmelheber et al. (Himmelheber)	3,477,996	Jun. 3, 1969
Gaylord (Gaylord '685)	3,900,685	Aug. 19, 1975
Gaylord (Gaylord '230)	3,956,230	May 11, 1976
Simons	5,209,886	May 11, 1993
Earl et al. (Earl)	5,385,754	Jan. 31, 1995

THE REJECTIONS

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 1-20 over Gaylord '230 in view of Earl alone, Earl in view of Simons, or Earl in view of Simons and Gaylord '685; and claims 23 and 24 over Himmelheber in view of Gaylord '230 and further in view of Earl alone, Earl in view of Simons, or Earl in view of Simons and Gaylord '685.

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[1] The examiner and the appellant should correct the language "any one of claims 1" in claims 7, 8, 10-16, 19, 20 and 23.

OPINION

We reverse the aforementioned rejections. We need to address only claims 1 and 23.

Claim 1

Gaylord '230 discloses a method for compatibilizing thermoplastic polymers with hydroxyl group-containing fillers (col. 1, lines 9-10). Gaylord '230 teaches that "[t]he material containing hydroxyl groups used in the practice of this invention may be any of the well known inorganic -OH containing filler materials or reinforcing agents such as siliceous materials (e.g., clay, sand, wollastonite, glass, quartz, diatomaceous earth, mica, silica, asbestos, talc, kaolinite and nepheline syenite); hydrated or partially hydrated metal oxides (e.g., titania, zirconia, vanadia, alumina, chromia, zinc oxide, magnesium oxide and boron oxides); carbonates (e.g., limestone and chalk); etc." (col. 2, lines 34-43). Gaylord '230 charges a thermoplastic polymer, a hydroxyl group-containing filler, an ethylenically unsaturated carboxylic acid or anhydride, and a free radical generating catalyst to a mill and blends the mixture at

exemplified temperatures above 100ºC, preferably 140-160ºC (col. 4, lines 5-7; col. 5, lines 3-8). The unsaturated carboxylic acid or anhydride "simultaneously or consecutively adducts or reacts with the thermoplastic polymer and esterifies and forms hydrogen bonds with the filler containing hydroxyl groups", thereby linking the thermoplastic polymer and filler together (col. 5, lines 49-54). The thermoplastic polymer-encapsulated filler is mixed with a thermoplastic polymer which may be the same as or different than that used to coat the filler, thereby producing a thermoplastic polymer composition having improved mechanical properties such as tensile strength, impact strength and flexural modulus (col. 1, lines 63-68; col. 5, lines 35-45).

Gaylord '230 teaches that it was known in the art that "when a cellulosic material, such as wood flour or cotton fibers, is used as a filler in polymers containing methylol groups such as phenolic, urea or melamine resins, a reaction occurs between the methylol groups and the hydroxyl groups on the cellulosic filler" (col. 1, lines 26-30). Gaylord '230, however, does not disclose that the filler in his method can be a cellulosic filler. Gaylord '230 also does not disclose

dissolving the ethylenically unsaturated carboxylic acid or anhydride in a nonaqueous solvent and impregnating the filler with this solution, and does not disclose modifying by irradiation or fluorination the surface of the thermoplastic polymer with which the coated filler is mixed.

Earl discloses a process for modifying lignocellulosic material before it is formed into a board (col. 1, lines 42-45). The process includes treating the lignocellulosic material, which may be in particulate form, sequentially or simultaneously with 1) phthalic anhydride, which may be in solution in a nonaqueous solvent, and 2) a thermosetting resin, and then heat curing the resulting product (col. 1, lines 42-53 and 62-63; col. 2, lines 8-11).

Simons discloses a method for forming particle board by impregnating natural fibrous material particles with coal tar, pitch, asphalt or bitumen dissolved in a solvent, applying novolac resin in finely divided form and a crosslinking agent to the impregnated particles so that the resin adheres to the impregnated particles, recovering the solvent, and pressing the composition to form particle board (abstract; col. 3, lines 31-32).

Gaylord ‘685 discloses a method for adhering together sheets or chips of wood by impregnating the wood with a polymerizable complex of a monomer combination such as maleic anhydride and styrene, and carrying out the polymerization through a charge transfer mechanism (abstract; col. 2, lines 20-21; col. 5, lines 8-25). Gaylord ‘685 teaches that “when the polymerizable complex contains groups which are reactive with hydroxyl groups on the cellulose substrate, such as anhydride groups, these groups in the resultant polymer react with the cellulosic hydroxyl groups to form stable, covalent ester bonds as well as hydrogen bonds” (col. 2, lines 29-34).

The examiner argues that "it would have been obvious to one so skilled to employ the sequential methodology and powder-form resin of the secondary references in the process of Gaylord ('230) in place of the corresponding, analogous methodology and resin form employed therein; mere substitution of one known set of elements for another (and in a like/similar environment) involved" (answer, page 6). In order for a *prima facie* case of obviousness to be established, however, the teachings from the prior art itself must appear to have suggested the claimed subject matter to one of ordinary skill in the art. *See In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976). The examiner's argument does not include the required explanation as to how the references themselves would have led one of ordinary skill in the art to make the substitutions referred to by the examiner.

The examiner argues that the Gaylord '230 hydroxyl group-containing particles can be cellulosic particles (answer, pages 8-9). In support of this argument the examiner points out (answer, page 9) that Gaylord '230 states that the

particles are “hydroxyl-containing particulate material such as clay” (col. 1, lines 12-13) and that “[t]he material containing hydroxyl groups used in the practice of this invention may be any of the well known inorganic -OH containing filler materials or reinforcing agents” (col. 2, lines 34-37). The examiner argues that the “such as” and “may be” language indicates that the Gaylord ‘230 particles are not limited to inorganic particles (answer, page 9). The examiner, however, provides no explanation as to why one of ordinary skill in the art, considering the reference as a whole, would have interpreted “such as” and “may be” as argued by the examiner. Except for the discussion of the prior art, the Gaylord ‘230 disclosure is directed toward inorganic fillers. Consequently, it reasonably appears that one of ordinary skill in the art would have interpreted “[t]he material containing hydroxyl groups used in the practice of this invention may be any of the well known inorganic -OH containing filler materials or reinforcing agents such as ... etc.” (col. 2, lines 34-43) as meaning that the hydroxyl group-containing material can be an inorganic material such as the ones listed. Likewise, it reasonably appears that one of

ordinary skill in the art would have interpreted “such as clay” (col. 1, line 13) as meaning similar to clay, not as meaning clay or anything else.

The examiner points out (answer, page 9) that the thermoplastic polymers disclosed by Gaylord ‘230 include chlorinated polymers (col. 2, lines 67-68), but does not explain how the applied references would have fairly suggested, to one of ordinary skill in the art, using thermoplastic polymers which have been surface modified by irradiation or fluorination.

The examiner argues that using Earl’s solvent in the Gaylord ‘230 method “as a processing aid/viscosity reducer and/or carrier” “is held/seen to be an obvious expedient to/well within the purview of one of ordinary skill in this art” (answer, page 9). The relevant issue, however, is not whether dissolving the Gaylord ‘230 ethylenically unsaturated carboxylic acid or anhydride in a nonaqueous solvent would have been within the purview of one of ordinary skill in the art but, rather, whether the applied references themselves would have fairly suggested doing so to one of ordinary skill in the art. *See Rinehart*, 531 F.2d at 1051, 189 USPQ at 147. The examiner has not explained how, particularly considering that Gaylord ‘230 is directed toward compatibilizing

thermoplastic resins with hydroxyl group-containing inorganic fillers, whereas Earl is directed toward

modifying lignocellulosic material with phthalic anhydride and a thermosetting resin, and that the Gaylord ‘230 exemplified compatibilization temperature is above 100ºC, preferably 140-160ºC (col. 4, lines 5-7), one of ordinary skill in the art would have been led by the references themselves to use Earl’s nonaqueous solvent in the Gaylord ‘230 method.

For the above reasons we conclude that the examiner has not carried the burden of establishing a *prima facie* case of obviousness of the invention recited the appellant’s claim 1. Accordingly, we reverse the rejection of this claim and claims 2-20 which depend therefrom.

Claim 23

Himmelheber discloses “[a] stratified wood panel including at least one covering layer of bonded wood fibers, oriented substantially parallel to the panel plane, secured to a core of bonded wood chips oriented substantially perpendicular to the panel plane” (col. 1, lines 14-18).

The examiner argues that “it would have been obvious to one of ordinary skill in this art to employ the particles of Gaylord (‘230) (as modified by the remaining secondary

references) in the process of Himmelheber et al, in place of the corresponding, analogous particles employed therein; mere substitution of one known hydroxyl group containing (filler) particle for another involved" (answer, page 7).

The examiner, however, has not established that the applied references would have fairly suggested, to one of ordinary skill in the art, the treated lignocellulosic material made by the method recited in the appellant's claim 1. Also, the examiner has not explained how the applied prior art would have fairly suggested, to one of ordinary skill in the art, the steps recited in the appellant's claim 23. Accordingly, we reverse the rejection of this claim and claim 24 which depends therefrom.

DECISION

The rejections under 35 U.S.C. § 103 of claims 1-20 over Gaylord in view of Earl alone, Earl in view of Simons, or Earl in view of Simons and Gaylord '685, and claims 23 and 24 over Himmelheber in view of Gaylord '230 and further in view of Earl

alone, Earl in view of Simons, or Earl in view of Simons and Gaylord ‘685, are reversed.

REVERSED

TERRY J. OWENS Administrative Patent Judge	)	
THOMAS A. WALTZ Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
ROMULO H. DELMENDO Administrative Patent Judge	)	

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