THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 14

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte CHEN-CHI M. MA

Appeal No. 95-1764
Application 07/965,864[1]

ON BRIEF

Before JOHN D. SMITH and McQUADE, Administrative Patent Judges, and CRAWFORD, Acting Administrative Patent Judge.

McQUADE, Administrative Patent Judge.

DECISION ON APPEAL

This appeal was originally taken from the final rejection of claims 1 through 18. The appellant has since canceled claims 1 through 11 and 13, and amended claims 12 and 15. Thus, the appeal now involves claims 12 and 14 through 18, the only claims presently pending in the application.

[1] Application for patent filed October 23, 1992.

The invention pertains to a process for pultruding a fiber reinforced furan resin composite. Claim 12 is illustrative and reads as follows:

12. A process for pultruding a fiber reinforced furan resin composite which comprises

drawing a plurality of continuous filaments through an impregnating batch of liquid furan resin to saturate the filaments with said resin and a squeeze orifice to remove excess resin and air, and

continuously pulling the resin-impregnated filaments through a pultrusion die to heat and cure said resin,

wherein the liquid furan resin comprises a furfuryl alcohol prepolymer which is prepared by polymerizing 100 parts by weight of furfuryl alcohol monomer with an addition of 0.05-2.5 parts by weight of an acid catalyst at a temperature of 35°-70°C until the resulting polymerization mixture has a viscosity of 300-400 cps,

and wherein the liquid furan resin is maintained at a temperature of 15-35°C and has a viscosity ranging from 500-3000 cps during the impregnating step,

and wherein the pultrusion die has three heating zones through which the resin is pultruded, the first zone having a temperature range of 150°-180°C, the second zone having a temperature range of 180°-225°C, and the third zone having a temperature range of 170°-220°C, and wherein the temperature in the second zone is higher than the temperatures in the first and third zones.

The references relied upon by the examiner as evidence of obviousness are:

Weiner et al. (Weiner)	3,367,814	Feb. 6, 1968
Fuwa	4,394,338	Jul. 19, 1983
Bogner	4,474,636	Oct. 2, 1984
Ma et al. (Ma)	4,873,128	Oct. 10, 1989
Shobert et al. (Shobert)	Re 30,770	Oct. 13, 1981

Szymanski et al., "Polyester and Furfuryl Alcohol Resins for Corrosion Control," Chemical Engineering Progress, Vol. 70, No. 1, pp. 51-54, January 1974 (Szymanski).

Downing, "Glass Fibre Reinforced Resins," The Chemical Engineer, pp. 272-274, April 1978.

The claims on appeal stand rejected under 35 USC 103 as follows:

a) claims 12 and 14 through 18 as being unpatentable over Shobert in view of Downing, Szymanski, Weiner, Ma and Bogner; and

b) claim 14 as being unpatentable over Shobert in view of Downing, Szymanski, Weiner, Ma and Bogner, and further in view of Fuwa.

Having carefully considered the scope of the claims, the teachings of the applied prior art, and the respective viewpoints advanced in the appellant's brief (Paper No. 12) and in the examiner's answer (Paper No. 13), we shall not sustain either of these rejections.

The primary reference to Shobert discloses a process for pultruding a fiber reinforced polyester resin composite. This process includes the steps of drawing a plurality of filaments through an impregnating batch of liquid resin to saturate the filaments and then through a squeeze orifice to remove excess resin and air, and continuously pulling the resin-impregnated filaments through a pultrusion die having three heating zones to heat and cure the resin. The examiner concedes that Shobert does not meet the limitations in independent claim 12 relating to the furan resin (see page 4 in the answer).

The applied references support the examiner's general conclusion that it would have been obvious to one of ordinary skill in the art to replace the polyester resin in Shobert's process with a furan resin. In this regard, Szymanski, Weiner and Downing collectively teach that furan resin is a known, and oftentimes superior, substitute for polyester resins in a variety of industrial applications. Be that as it may, the appellant's contention that the applied references would not have suggested the particular furan resin specified in claim 12 is well taken.

Claim 12 requires the liquid furan resin to comprise "a furfuryl alcohol prepolymer which is prepared by polymerizing 100 parts by weight of furfuryl alcohol monomer with an addition of

0.05-2.5 parts by weight of an acid catalyst at a temperature of 35°-70°C until the resulting polymerization mixture has a viscosity of 300-400 cps." This preparation is also required to be "maintained at a temperature of 15-35°C and [to have] a viscosity ranging from 500-3000 cps during the impregnating step." According to the appellant's specification (see, for example, pages 3 through 5), these features provide for the furan resin to have a long pot life and to undergo sufficient curing at a desired pultrusion rate.

To meet these limitations, the examiner relies on a number of disclosures in the prior art which either do not pertain to furan resins, e.g. Shobert, or are extremely broad in terms of furan resin preparation, e.g. Weiner, Bogner, Downing and Szymanski (see pages 7 and 8 in the answer). In short, these disclosures do not provide the factual basis necessary to support the examiner's conclusion that the use of a furan resin as specified in claim 12 in a process of the type claimed would have been obvious to one of ordinary skill in the art. The Fuwa reference, applied in support of the second of the two rejections on appeal, does not cure this deficiency in the basic prior art combination.

In light of the foregoing, the references advanced by the examiner do not justify a conclusion that the differences between the subject matter recited in claim 12 and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. Accordingly, we shall not sustain the standing 35 USC 103 rejection of this claim or the standing 35 USC 103 rejections of claims 14 through 18 which depend therefrom.

The decision of the examiner is reversed.

REVERSED

JOHN D. SMITH
Administrative Patent Judge)

JOHN P. McQUADE
Administrative Patent Judge) BOARD OF PATENT APPEALS AND INTERFERENCES

MURRIEL E. CRAWFORD, Acting
Administrative Patent Judge)

Appeal No. 95-1764
Application 07/965,864

BACON & THOMAS
625 Slaters Lane - 4th Floor
Alexandria, Virginia 22314