

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 31

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DEKAI LOO AND RICHARD T. MAYES

Appeal No. 1998-1411
Application No. 08/562,316

HEARD: MARCH 20, 2001

Before LIEBERMAN, TIMM, and JEFFREY T. SMITH, *Administrative Patent Judges*.
TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1-4 and 6-17, which are all of the claims pending in this application.

BACKGROUND

Appellants' invention relates to a negative photoresist composition and a process for producing a negative resist image using the composition. Claim 1 is illustrative of the composition on appeal:

1. A negative resist material comprising:
 - a) a binder comprising a polymer selected from the group consisting of acrylic polymers and methacrylic polymers;
 - b) a monomer having from two to four ethylenic double bonds;
 - c) a photoinitiator; and
 - d) a solvent comprising a compound selected from the group consisting of 2-methoxybutanol, propylene glycol butyl ether, ethylene glycol ethyl ether acetate, propylene glycol propyl ether, propylene glycol tertiary butyl ether, ethylene glycol ethyl ether, dipropylene glycol methyl ether, and propylene glycol methyl ether acetate;

wherein the photoinitiator is present in an amount of greater than 10% by weight of the material without the solvent and wherein the binder has a Tg of 110/ C or greater.

The prior art references of record relied upon by the Examiner in rejecting the appealed claims are:

Hill	4,339,527	July 13, 1982
Hofmann et al. (Hofmann)	4,935,330	June 19, 1990
Dammel et al. (Dammel)	5,234,791	Aug. 10, 1993

Claims 1-4 and 6-17 stand rejected under 35 U.S.C. § 103 as being unpatentable over Hill or Hofmann in view of Dammel¹. We reverse for the following reasons.

OPINION

The primary references, Hill and Hofmann, each describe photopolymerizable compositions containing a polymer selected from the group consisting of acrylic polymers and methacrylic polymers, an ethylenically unsaturated monomer, a photoinitiator, and a solvent. See for instance, Example 1 of Hill which includes methylene chloride (a solvent), polymethyl methacrylate (binder), 2-o-chlorophenyl-4-m-anisyl-5-phenyl imidazolyl dimer (photoinitiator) and monomer. Neither Hill nor Hofmann list the glass transition temperatures (T_g) for the acrylic and methacrylic polymers they describe. It is the Examiner's position that the exemplified polymethyl methacrylate polymers and copolymers of Hill and Hofmann inherently have T_gs within the claimed range.

We are cognizant of the fact that, “[f]rom the standpoint of patent law, a compound and all of its properties are inseparable” *In re Papesch*, 315 F.2d 381, 391, 137 USPQ 43, 51 (CCPA 1963) and thus the mere recitation of a newly discovered property, inherently possessed by a prior art

¹The Examiner no longer relies on U.S. Patent 4,692,396 issued to Uchida to reject the claims (Answer, page 3). The statement of rejection on page 4 of the Answer contains a typographical error, “in view of Hofmann” should be “or Hofmann” as stated in the final rejection as Hofmann is relied on as a primary reference. At the Oral Hearing, Appellants confirmed that their arguments are directed to Hofmann as used as a primary reference.

composition, does not cause a claim drawn to that composition to distinguish over the prior art. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). Therefore, where the prior art is silent with respect to the property, but the examiner has reason to believe that the property may, in fact, be an inherent characteristic of the prior art product, the examiner possesses the authority to require an applicant to prove that the subject matter shown to be in the prior art does not, in fact, possess the property. *Id.* However, before an applicant can be put to this burdensome task, the examiner must provide enough evidence or scientific reasoning to establish that the belief that the property is inherent is a reasonable belief. *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Int. 1990); *Ex parte Skinner*, 2 USPQ2d 1788, 1789 (Bd. Pat. App. & Int. 1986). It must be remembered that the burden of establishing a *prima facie* case of unpatentability rests upon the examiner. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). It is therefore incumbent on the examiner to provide a factual basis for the assertion of inherency which establishes its reasonableness. In the present case, the Examiner has not discharged that burden.

The Examiner finds that Hill exemplifies polymethyl methacrylate homopolymers having particular intrinsic viscosities (Examples 1, 2, 4, and 5). The Examiner also finds that Hill further exemplifies a composition comprising a binder resin copolymer of 8 wt. % methyl methacrylate and 92 wt. % methacrylic acid with an average molecular weight of 70,000 (Example 3). The Examiner infers

that the binder resin would appear to have the recited Tg of at least 110 /C because it meets the compositional limitations of the instant claims and has a relatively high molecular weight (Answer, page 4).

The Examiner has presented no documented proof of the Tg levels of the various polymers described by Hill and Hofmann. We note that the specific polymer described in Appellants' specification, i.e. a copolymer containing methacrylic acid, methyl methacrylate and ethyl acrylate in a weight ratio of 22.2/64.6/13.2, weight average molecular weight 45,000 and acid number 130-150, is different than the exemplified polymers of the references. Our own review of various handbooks² indicates that the Tgs of acrylic polymers tend to be below 110 /C and the Tg for polymethyl methacrylate appears to depend on whether the polymer is atactic (Tg 105 /C), syndiotactic (Tg 120 /C) or isotactic (Tg 45 /C)³. Therefore, for a homopolymer of polymethyl methacrylate, it cannot be

²See Zbigniew D. Jastrzebski, *The Nature and Properties of Engineering Materials*, app. Table A4 at 615 (2d ed. 1976); *Polymer Handbook* III-66-69 (J. Brandrup & E. H. Immergut eds., 2d ed. 1966); *Modern Plastics Encyclopedia* 513-14 (Rosalind Juran et al. eds. 1988).

³We note that Appellants presented evidence at the Oral Hearing concerning the Tg of polymethyl methacrylate. As this particular evidence was not in the written record and the Examiner had no opportunity to address this evidence, we cannot place any weight on it. However, we have independently cited evidence of the Tg of various acrylic and methacrylic polymers so as to illustrate why the belief that the Tgs of the prior art polymers are inherently within the claimed range is not reasonable in this case. While we have performed some limited fact finding, we wish to point out that the Board of Patent Appeals and Interferences is a board of review and not a vehicle for initial examination. See 35 U.S.C. § 6(b)(2000). It is incumbent on the Examiner and Appellants to place into the written record at the appropriate time enough evidence to meet their respective burdens of production and proof in order to advance the examination of the application.

said that the Tg is necessarily, in all cases, above 110 /C. It is *possible* that one of the particular acrylic and methacrylic polymers which were used by Hill and Hofmann had a Tg of at least 110 /C. However, the Examiner has not shown that it is reasonable to believe that any of those polymers did indeed have such a Tg. Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. The disclosure must be sufficient to show that the natural result flowing from the formulation of the resists of Hill and Hofmann is a resist containing a binder of acrylic or methacrylic polymers with a Tg of 110 /C or greater. *See In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981). The result must be a consequence of what was deliberately intended. *W.L. Gore & Assocs. V. Garlock, Inc.*, 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983). Furthermore, “it is not sufficient that a person following the disclosure sometimes obtain the result set forth in the claim, it must invariably happen.” *Glaxo, Inc. v. Novopharm Ltd.*, 830 F.Supp. 871, 874, 29 USPQ2d 1126, 1128 (E.D. N.C. 1993), *aff’d*, 34 USPQ2d 1565 (Fed. Cir.), *cert. denied*, 516 U.S. 988 (1995).

For the above reasons, we find that the Examiner has failed to present a sufficient level of evidence tending to show that it is reasonable to believe that the acrylic and methacrylic polymers of Hill and Hofmann inherently possess a Tg of 110 /C or greater. While this is a sufficient reason in and of itself to reverse the rejection, we also conclude that there is an insufficient reason, suggestion, or

motivation to combine the teachings of Dammel with those of Hill and Hofmann wherein the result would have been the claimed composition.

The subject matter of a claim is unpatentable as obvious “if the differences between the subject matter sought to be patented 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.” 35 U.S.C. § 103(a) (1994). Appellants indicate that what they have discovered is that “the combination of the disclosed binder with relatively high concentrations of photoinitiator and specific low vapor pressure solvents produce a liquid negative photoresist which is resistant to blocking and performs exceptionally as compared to prior art resists.” (Amended Brief, page 7). While we are mindful that those of ordinary skill in the art would have understood generally which solvents would be useful in the compositions of Hill and Hofmann, Dammel is directed to a different resin system and it would not appear that one of ordinary skill in the art would have had a reasonable expectation that the solvents disclosed in Dammel would have necessarily worked in the resin system of Hill and Hofmann without the performance of further investigation and experimentation. *See The Gillette Co. v. S.C. Johnson & Son Inc.*, 919 F.2d at 725, 16 USPQ2d at 1928 quoting *In re Eli Lilly & Co.*, 902 F.2d 943, 945, 14 USPQ2d 1741, 1743 (Fed. Cir. 1990) (The general disclosure must do more than lead one of ordinary skill in the art down the path of investigation, it must contain a sufficient teaching of how to obtain the desired result or must indicate that the claimed result would be obtained if certain directions

were pursued.) . Therefore, we also conclude that the Examiner has failed to establish a *prima facie* case of obviousness for this second reason.

CONCLUSION

To summarize, the decision of the Examiner to reject claims 1-4 and 6-17 under 35 U.S.C. § 103 is reversed.

REVERSED

PAUL LIEBERMAN)	
Administrative Patent Judge)	
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)	
)	BOARD OF PATENT
CATHERINE TIMM)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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JEFFREY T. SMITH)	
Administrative Patent Judge)	

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ATTN: Handbook attachments
are in the envelope-ready to be mailed.

APJ TIMM

APJ LIEBERMAN

APJ JEFFREY T. SMITH

DECISION: REVERSED

Prepared By: Jenine Gillis

DRAFT TYPED: 19 Mar 02

FINAL TYPED:

OB/HD

GAU: 1700

PALM

ACTS 2

FOIA

MONTHLY REPORT