

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(2) is not binding precedent of the Board.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. 39

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ISAO TSUKAGOSHI,
YUTAKA YAMAGUCHI, ATSUO NAKAJIMA
and YASUSHI GOTO

Appeal No. 94-3121
Application 07/853,868¹

HEARD: February 2, 1998

Before DOWNEY, WARREN and OWENS, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal and Opinion

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 1, 3, 6, 7, 12 and 13, and refusing to allow claims 14 through 16 as amended subsequent to the final rejection.²

We have carefully considered the record before us, and based thereon, find that we cannot sustain either of the grounds of rejection under 35 U.S.C. § 103 (final rejection, Paper No. 18, pages 2-4; answer, Paper No. 24, page 3). It is well settled that the examiner may satisfy his

¹ Application for patent filed March 20, 1992. According to appellants, this application is a continuation of application 07/490,915, filed March 9, 1990, now abandoned.

burden of establishing a *prima facie* case of obviousness by showing some objective teachings or suggestions in the prior art taken as a whole or that knowledge generally available to one of ordinary skill in the art would have led that person to combine the relevant teachings of the references in the proposed manner to arrive at the claimed invention without recourse to the teachings in appellant's disclosure. *See generally In re Fine*, 837 F.2d 1071, 1074-1076, 5 USPQ2d 1596, 1598-1600 (Fed. Cir. 1988); *In re Dow Chemical*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531-32 (Fed. Cir. 1988); *In re Warner*, 379 F.2d 1011, 1014-17, 154 USPQ 173, 176-78 (CCPA 1967), *cert. denied*, 389 U.S. 1057 (1968). We cannot conclude that the examiner has carried his burden in the case before us.

Representative appealed claim 1 specifies a process in which a film formed from an adhesive comprising a liquid epoxy of specified purity, a solid resin having a functional group and a microencapsulated curing agent is interposed between opposing circuits to be connected, one of which has projecting electrodes,

wherein the adhesive is removed from the contact areas of the projecting electrodes and opposing circuits due to lowering in viscosity of the adhesive and is substantially cured after the projecting electrodes have been contacted with the opposing circuits by applying heat and pressure at the time of connection with heating at 70 to 200°C for 60 seconds or less under a pressure of 1 kgf/cm² or less per one electrode.^[3]

In construing this claim, it is clear to us that one of ordinary skill in this art would clearly have determined from appellants' specification that heat within the recited range is applied for a period of "60 seconds or less" under the specified pressure after contact has been made between the opposing circuits which removes the adhesives from the contact areas and substantially cures the

² See, e.g., amendment of February 16, 1993 (Paper No. 16).

³ We have reproduced here the copy of a portion of appealed claim 1 as it appears in the appendix to appellants' main brief, which is apparently the manner in which claim 1 was intended to be amended and is consistent with the amendment to claim 14 in the amendment of February 23, 1993 (Paper No. 17) and as claim 14 appears in the appendix to appellants' main brief. It appears from the record that in the amendment of February 23, 1993, that appellants directed that the phrase "per one electrode" be inserted "after 'less'" in line 24 of claim 1. The word "less" appears twice in this line of claim 1 as "Three Times Amended" in the amendment of February 16, 1993 (Paper No. 16). The amendment to claim 1 was entered after the first appearing "less" so that line 24 of claim 1 of record reads "for 60 seconds or less per one electrode under a pressure of 1 kgf/cm² or less." While the position of the phrase in claim 1 has no bearing on our decision, appellants should correct the claim upon any prosecution of this case.

same “at the time” the electrical “connection” is formed. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). Indeed, according to appellants’ specification (e.g., page 16), the adhesive is substantially cured in the specified timeframe because of the activation of the microencapsulated curing agent.

We have compared the claimed invention with Hatada⁴ and Schmidt et al. and find that both of these references disclose a process of electrically connecting circuits which essentially differ from the claimed invention in that the adhesive resin compositions disclosed therein do not contain a second resin or an encapsulated curing agent and in the temperature and pressure conditions applied to cure the adhesive composition. In Hatada, a sheet of a resin adhesive which can be cured by light and/or heat is used in much the same process as specified in the appealed claims (e.g., col. 2, lines 16-27, and col. 3, line 62, to col. 4, line 5), except that representative cure times by heat is 5-30 minutes at 100-150° C where light is initially used to “stiffen” a modified acrylate resin (col. 4, lines 11-19). Hatada teaches that other adhesive “resins such as [sic] epoxy group” may be employed (col. 5, lines 14-16). Similarly, in the process of Schmidt et al., an epoxy resin reinforced with glass fibers⁵ is superimposed between opposing circuits to form a stack which is heated above the curing temperature of the resin that then becomes liquid and begins to jell, at which point pressure is applied to the stack to force the jelling resin from between the contact points to form an electrical connection from the contact points (e.g., col. 2, lines 24-45). Schmidt et al. further disclose that the epoxy resin “when heated to a final hardening or curing temperature begins to soften to a liquid condition and then begins to transform by jelling” (col. 3, lines 26-28) but contains no teaching as to the “hardening or curing temperature” or its duration.

⁴ Hatada and other references relied on by the examiner with respect to the grounds of rejection are listed at pages 2-3 of the answer. We refer to these references in our opinion by the name associated therewith by the examiner.

⁵ The adhesive compositions as defined in the appealed claims can contain other ingredients in addition to the three specified “essential components” through the use of the opened term “comprising.” *See, e.g., In re Baxter*, 656 F.2d 679, 686-87, 210 USPQ 795, 802-03 (CCPA 1981). Indeed, the specification recites “filler” is such an additional ingredient which would be inclusive of the “reinforcing glass fibers” used in Schmidt et al.

The examiner contends that Fujiwara et al. supplies epoxy resin containing adhesive compositions which contain a second resin and a curing agent, and that Bentov et al. teaches that the curing agent can be encapsulated. The adhesive compositions of Fujiwara et al. comprise a phenoxy resin as the principal component which requires a cross-linking agent, a low molecular epoxy resin and a cross-linking agent for the phenoxy and epoxy resins, which cross linking agents can be the same (e.g., col. 2, line 37, to col. 4, line 57, and especially col. 2, lines 53-56, col. 3, lines 18-21 and 45-53). These adhesive compositions are used by Fujiwara et al. to “laminate a metal foil on an epoxy resin impregnated fiber board” to form a printed circuit board and further “may be used as a structural adhesives” where “excellent bond strength at high temperatures is required” (col. 2, lines 16-25). In the prior use, a bonding sheet is prepared wherein a semicured sheet or “film form” of the adhesive is inserted “between a metal foil and a prepreg and heat and pressurize the overall structure to provide a laminated printed circuit board” in which the adhesive “if heated, will become a liquid, then a gel and finally fully polymerized” (col. 2, lines 25-34). Fujiwara et al. teach that the “usual conditions for laminating” is a “pressure of 40 to 60 kg./cm² and at a temperature of 160 to 180° C for one hour” (col. 4, lines 72-75). Bentov et al., in disclosing an encapsulation method, teaches the use thereof in “packaging liquid curing agents for synthetic resins to prevent reaction between the curing agent and resin carrier or the like through which they are dispersed, until such time as it is desired to initiate the curing or hardening reaction” (col. 1. lines 15-20).

It is well settled that the determination of whether one of ordinary skill in this art would have combined the teachings of applied prior art to obtain the claimed invention must be based on what the references would have reasonably suggested to that person or on knowledge within the art area. *See, e.g., Fine, supra.* Based on our consideration of the scope of the teachings of Hatada, Schmidt et al., Fujiwara et al. and Bentov et al. as combined by the examiner, we find no reasonable direction therein, either separately or combined, which would have motivated one of ordinary skill in this art to modify the processes of Hatada and Schmidt et al. by replacing the epoxy or other adhesive resins of Hatada or the epoxy resin of Schmidt et al., which are used *without* a curing agent, with the phenoxy resin based “structural” adhesive composition disclosed in Fujiwara et al. which further contains a low molecular epoxy resin and a curing agent, after the

“desired” encapsulation of the curing agent of those compositions as suggested by the general teaching of Bentov et al. Indeed, the curing of the phenoxy based “structural” resin adhesive compositions under the pressure and temperature conditions recited in Fujiwara et al. would not have suggested a “desire” to one of ordinary skill in this art to encapsulate the curing agent in order to control the curing reaction in forming a laminated circuit board. The teachings of Fujiwara would further not have reasonably suggested to one of ordinary skill in this art that such an adhesive composition would have been suitable for use in place of the simpler epoxy resin adhesive compositions of Hatada and Schmidt et al. which do not contain a further resin or a curing agent and are used under different pressure and curing conditions in a different manner for a different purpose. The examiner has not brought forward any evidence of other knowledge in this art area or set forth any scientific reasoning which would at least *prima facie* establish why one of ordinary skill in the art would have been motivated to modify the teachings of Hatada and Schmidt et al. to arrive at appellants’ invention. Indeed, mere “agreement” between disclosures in appellants’ specification and disclosures found in the prior art does not accomplish this purpose. *See, e.g., Warner, supra.* Furthermore, even if the adhesive composition of Fujiwara et al. were modified by encapsulating the curing agent thereof, the use of such compositions in the processes of Hatada and Schmidt et al. would not have resulted in the claimed processes since there is no teaching or suggestion in these references to use the adhesive compositions thereof under the conditions of temperature and pressure necessary to achieve the cure rate as specified in the appealed claims. *See, e.g. Uniroyal Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1050-53, 5 USPQ2d 1434, 1438-40 (Fed. Cir. 1988).* Accordingly, the record before us supports the inference that the examiner has relied on information gleaned from appellants’ disclosure in formulating the grounds of rejection on appeal. *Dow Chemical, supra; Warner, supra.*

The examiner’s decision is reversed.

Reversed

MARY F. DOWNEY)	
Administrative Patent Judge)	
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Administrative Patent Judge)	APPEALS AND
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