

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. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte GARY B. LARSON, DONNA KOLOGE,  
CYNTHIA RETALLICK, and AUSTIN WELLS

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Appeal No. 1999-0727  
Application No. 08/814,901

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ON BRIEF

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Before PAK, WALTZ, and PAWLIKOWSKI, Administrative Patent Judges.

PAK, Administrative Patent Judge.

DECISION ON APPEAL

Larson et al. (appellants) appeal from the examiner's final rejection of claims 1 through 10 which are all of the claims pending in the present application.

The subject matter on appeal is directed to a process for producing printed circuit boards. Claim 1, which is

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representative of the subject matter on appeal, reads as follows:

1. A process for producing printed circuit boards, which process comprises the steps of:
  - (a) forming circuitry, comprising circuits, pads, lands and tabs, on a copper clad laminate;
  - (b) applying a registered solder mask over substantially all of the circuitry and other portions of the laminate in an imagewise manner;
  - (c) applying a single imaged desensitizing mask over the solder mask; thereafter
  - (d) forming holes in an array;
  - (e) activating said holes to accept plating thereon; thereafter
  - (f) stripping the desensitizing mask thereby revealing the solder mask; and thereafter
  - (g) plating the holes.

The references of record relied upon by the examiner are:

|                                 |           |          |
|---------------------------------|-----------|----------|
| Schneble, Jr. et al. (Schneble) | 3,628,999 | Dec. 21, |
| 1971 Leech et al. (Leech)       | 4,551,488 | Nov.     |
|                                 |           | 5, 1985  |
| Bengston et al. (Bengston)      | 5,235,139 | Aug. 10, |
|                                 |           | 1993     |
| Shigemura et al. (Shigemura)    | 5,348,590 | Sep.     |
|                                 |           | 20,      |
|                                 |           | 1994     |

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Knopp 93/26145 Dec. 23, 1993  
(Published International (PCT) Application)

The appealed claims stand rejected as follows:

- (1) Claims 1 through 3 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Knopp, Schneble and Leech;
- (2) Claims 4 through 6 and 8 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Knopp, Schneble, Leech and Bengston; and
- (3) Claims 7, 9 and 10 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Knopp, Schneble, Leech and Shigemura.

Upon careful review of the claims, specification and applied prior art, including the arguments advanced by both the examiner and appellants in support of their positions, we conclude that the examiner's § 103 rejections are not well-founded. Accordingly, we reverse each of the foregoing § 103 rejections. Our reasons for this determination follow.

The examiner finds (Supplemental Answer, pages 3 and 4) and appellants acknowledge (Brief, pages 4 and 5) that Knopp discloses all the claimed printed circuit board making process steps, except for the claimed step of "applying a register

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solder mask over substantially all of the circuitry and other portions of the laminate in an imagewise manner." Specifically, appellants states at pages 4 and 5 of the Brief that:

The Knopp process comprises the following steps:  
forming conductive circuit elements on a substrate;  
a) forming conductive circuit elements on a substrate;  
b) coating the substrate and circuit elements with a desensitizing material;  
c) forming holes;  
d) activating the surfaces to accept plating;  
e) removing the desensitizing material;  
f) plating the holes.

Thus Knopp specifically contemplates applying the desensitizing material directly upon the substrate and the circuit elements. Knopp makes no realization of the advantages or desirability of applying a soldermask to the substrate and circuit elements and then applying the desensitizing material to the solder mask as is suggested by the Appellant's invention.

To remedy the deficiency of Knopp, the examiner relies on the disclosures of Schneble and Leech. See Supplemental Answer, page 4. According to the examiner, Schneble teaches using a step of applying a permanent solder mask before applying a temporary solder mask which is said to correspond to the claimed desensitizing coating material. The examiner then relies on Leech to show that the use of a register solder mask as the permanent solder mask is conventional. Based on these findings, the examiner concludes that it would have been obvious to apply

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a register solder mask prior to the desensitizing coating in the process of Knopp. *Id.*

As our reviewing court stated in *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531-32 (Fed. Cir. 1988):

[T]he full field of the invention must be considered; for the person of ordinary skill is charged with knowledge of the entire body of technological literature, including that which might lead away from the claimed invention... Evidence that supports, rather than negates, patentability must be fairly considered.

However, the examiner's analysis fails to consider the entire body of teachings in the applied prior art references as required by Section 103.

As argued by appellant, Schneble teaches various disadvantages in using a conventional registered solder mask on a printed circuit board. See column 2, lines 9-25. As a solution to this problem, Schneble applies a non-registered permanent solder mask and an adhesive coated, mechanically strippable temporary plastic mask on a printed circuit board. See column 4, lines 51-54 and column 2, lines 25-55. Similarly, Leech also teaches various disadvantages in using a conventional registered solder mask on a printed circuit board. See column

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3, line 19 to column 4, line 52. Leech avoids these disadvantages by using only a registered solder mask made of a new chemical composition. See columns 3-6.

Thus, on this record, we find no evidence that the combined teachings of Knopp, Schneble and Leech would have suggested to one of ordinary skill in the art to employ a registered permanent solder mask prior to applying a temporary desensitizing mask in the print circuit board producing process of Knopp. In the first place, to employ a registered solder mask as the non-registered permanent solder mask described in Schneble is to destroy the invention on which Schneble is based. See *Ex parte Hartmann*, 186 USPQ 366, 367 (Bd. App. 1974). In the second place, to the extent that there is some suggestion to employ the new registered solder mask described in Leech, it is taught to be used, in lieu of both the non-registered permanent solder mask and the temporary solder mask described in Schneble. Such a suggestion, of course, would destroy the invention on which Knopp is based.

Id.

Since the examiner has not relied on the remaining applied prior art references to remedy the deficiencies indicated above,

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we reverse the decision of the examiner rejecting all of the  
appealed claims under 35 U.S.C. § 103.

REVERSED

|                             |   |                 |
|-----------------------------|---|-----------------|
| CHUNG K. PAK                | ) |                 |
| Administrative Patent Judge | ) |                 |
|                             | ) |                 |
|                             | ) |                 |
|                             | ) |                 |
|                             | ) | BOARD OF PATENT |
| THOMAS A. WALTZ             | ) | APPEALS         |
| Administrative Patent Judge | ) | AND             |
|                             | ) | INTERFERENCES   |
|                             | ) |                 |
|                             | ) |                 |
|                             | ) |                 |
| BEVERLY A. PAWLIKOWSKI      | ) |                 |
| Administrative Patent Judge | ) |                 |

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# *Letty*

JUDGE PAK

APPEAL NO. 1999-0727

APPLICATION NO. 08/814,901

APJ PAK

APJ PAWLIKOSKI

APJ WALTZ

DECISION: **REVERSED**

**PREPARED:** Jul 29, 2002

**OB/HD**

**PALM**

**ACTS 2**

**DISK (FOIA)**

**REPORT**

**BOOK**