

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 10

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

PATENT OFFICE
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Ex parte BRIAN G. CHAPMAN, CHRISTIAN H. CLAUSEN
DANIEL J. MICKISH and EUSTATHIOS VASSILIOU

Appeal No. 94-1596
Application 07/884,030¹

ON BRIEF

Before JOHN D. SMITH, WARREN and OWENS, Administrative Patent Judges.

WARREN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the decision of the examiner finally rejecting claims 1 through 28. Claim 1 is illustrative of the invention encompassed by the claims on appeal:

1. In an apparatus for fabricating an integral three-dimensional object by selectively exposing successive layers of a liquid photoformable composition to actinic radiation, said apparatus including imaging means for exposing said layers, a

¹ Application for patent filed May 18, 1992. According to the appellants, the application is a continuation of Application 07/804,269, filed December 5, 1991; which is a continuation of Application 07/488,095, filed March 1, 1990, abandoned.

Appeal No. 94-1596
Application 07/884,030

vessel for containing a fixed amount of said composition so as to present a free surface at a substantially constant position relative to said imaging means, and a movable platform disposed within said vessel below said free surface, the improvement in said apparatus comprising:

a dispenser adapted to be dipped under said free surface and directly transfer part of said composition above said free surface;

means attached to said dispenser for lowering and raising said dispenser at predetermined positions alongside said platform; and

layering means for contacting the composition transferred above said free surface and moving over said platform to form a layer of said composition.

The appealed claims as represented by claim 1² are drawn to apparatus and methods for fabricating an integral three-dimensional object by selectively exposing successive layers of a liquid photoformable composition to actinic radiation. The apparatus includes a vessel in which the level of photoformable composition is maintained so as to provide a free, working surface at a substantially constant position relative to imaging means and which contains a movable platform to position the surface of the platform or previously photoformed layers thereon relative to said free, working surface. The vessel has disposed therein dispenser means adapted to be dipped under the free, working surface of the photoformable composition and transfer part of said composition over the free surface so that a layering means may produce a uniform photoformable composition layer over the platform. The apparatus and method is disclosed by

² Appellants stipulate in their brief (page 3) that the appealed claims stand or fall together. Thus, we decide the appeal based on claim 1. 37 CFR § 1.192(c)(5) (1993).

Appeal No. 94-1596
Application 07/884,030

appellants to provide a "gentle way of raising part of the photoformable composition above the surface of said composition and in front" of layering means in order to form solidified, "contiguous layers of a photoformable liquid composition, in a fast and uniform manner."³

The examiner has relied on the following references:⁴

Mellor et al. (Mellor)	2,069,322	Feb. 02, 1937
Hull (Hull `330)	4,575,330	Mar. 11, 1986
Hull (Hull `402)	4,929,402	May 29, 1990
Modrek et al. (Modrek)	5,076,974	Dec. 31, 1991
Morihara et al. (Morihara `817)	61-114817	Jun. 02, 1986
Morihara et al. (Morihara `818)	61-114818	Jun. 02, 1986

The examiner has rejected claims 1 through 28 on appeal under 35 U.S.C. § 103 as being unpatentable over Morihara `817 or `818 in view of Mellor further combined with Modrek or Hull `330 or `402. We reverse.

Rather than reiterate the respective positions advanced by the examiner and appellants, we refer to the examiner's answer and to appellants' brief for a complete exposition thereof.

Opinion

We have carefully reviewed the record and on this basis find ourselves in agreement with appellants that the examiner has failed to carry her burden of establishing a *prima facie* case of obviousness over the applied references. It is well settled that the examiner may satisfy this burden by showing some objective

³ Specification, page 6.

⁴ We have relied on the translations of Morihara `817 and `818 supplied by appellants. Any reference below as to page and figure as to these references is made with respect to the translations.

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 appellants' disclosure. See generally *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984); *In re Fine*, 837 F.2d 1071, 1074-1076, 5 USPQ2d 1596, 1598-1600 (Fed. Cir. 1988) and cases cited therein; *In re Warner*, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967), cert. denied, 389 U.S. 1057 (1968).

The prior art apparatus corresponding substantially to the description set forth in the preamble of appealed claim 1⁵ is that acknowledged in each of Morihara '817 and '818 and exemplified in Modrek.⁶ Each of Morihara '817 and '818 discusses the problems presented by the "so-called overflow system" using this prior art apparatus.⁷ Morihara '817 teaches that the problems may be solved by use of a container on a support stand

⁵ See generally *In re Fout*, 675 F.2d 297, 299-301, 213 USPQ 532, 535-36 (CCPA 1982)

⁶ See, e.g., Morihara '817, pages 3 to 5, and figures 12 to 17; Morihara '818, pages 3 to 5, and figures 12 to 17; and Modrek, figure 4. We consider Modrek to be equivalent in disclosure to Hull '330 and Hull '402 in the context of the claimed invention (cf., e.g., figure 4 of the former with figures 3 of the latter) and thus we will not discuss the Hull references. We also do not find it necessary to discuss Mellor which was not included among the "main references" by the examiner (answer, page 7).

⁷ See Morihara '817, pages 5 to 6, and '818, pages 5 to 6.

Appeal No. 94-1596
Application 07/884,030

in which the *only* photoformable composition present is deposited via⁸

means for uniformly supplying the photo-setting resin material onto said photo-setting resin surface in the predetermined direction from an elongate opening with preset width.

Morihara `818 adds⁹

a smoothing plate ... for accommodating resin from the resin supply opening on said container for accommodating resin to provide a resin layer of uniform thickness having a smooth surface.

The prior art "overflow system" as disclosed in Modrek, wherein the photoformed solid material is taken below the work surface of the photoformable composition in the container by a moveable elevator platform so that the photoformable composition can "flow" across its surface, facilitates the "flow" by the following method:¹⁰

Typically, after a layer is formed, the object ... is moved [down] beyond the level of the next layer to allow the liquid ... to flow into the momentary void at surface ... left where the solid was formed, and then it is moved back to the correct level for the next layer.

It is well settled that the test for obviousness is what the combined teachings of the applied references would have reasonably suggested to one of ordinary skill in the art. *In re Young*, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991);

⁸ Morihara `817, page 6 to 7; see also pages 8 to 13 and figures 2 to 11.

⁹ Morihara `818, page 6 to 7; see also pages 9 to 11 and figures 2 to 6.

¹⁰ Modrek, col. 8, lines 29 to 33, and col. 9, lines 46 to 50; numerals omitted.

Appeal No. 94-1596
Application 07/884,030

In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881-82 (CCPA 1981). On this record, it is clearly apparent that the Morihara references would have reasonably suggested to one of ordinary skill in this art that the identified problems with the prior art "overflow system," which employs a photoformable composition filled container having a moveable elevator platform and is exemplified by the system and apparatus disclosed in Modrek, would be solved by layering a predetermined amount of photoformable composition on the surface of a container which contains no additional photoformable composition and which surface is fixed in position. Thus, the manifestly different approach, in terms of the structural and functional relationships between apparatus components, to uniform layering that is required in stereolithography between the teachings of the Morihara references and the teachings in Modrek would have led one of ordinary skill in this art away from combining the teachings of these references to achieve the apparatus encompassed by appealed claim 1. And, indeed, even if it may be said that there was motivation to combine these references, the result obtained would not be the apparatus of appealed claim 1 as there is no suggestion in any of the references that the photoformable composition dispensers in the apparatus of either Morihara reference should be dipped under the surface of the photoformable composition in the container of Modrek. See *In re Laskowski*, 871 F.2d 115, 10 USPQ2d 1397 (Fed. Cir. 1989); *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051-53, 5 USPQ2d 1434, 1438-40 (Fed. Cir. 1988); cf. *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

We note that the examiner alleges that dipping and pouring techniques are "common practices in the coating art" (answer, page 5). However, there is no reference in the record before us

Appeal No. 94-1596
Application 07/884,030

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