

The opinion in support of the decision being entered today
is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte FUJIO YAMADA

Appeal 2007-0921
Application 10/793,878
Technology Center 1700

Decided: June 29, 2007

Before BRADLEY R. GARRIS, CHARLES F. WARREN, and
PETER F. KRATZ, *Administrative Patent Judges*.

KRATZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal from the Examiner's final rejection of claims 1, 3-10, 59, and 64-67, the only claims that remain pending in this application. We have jurisdiction pursuant to 35 U.S.C. §§ 6 and 134.

Appellants' invention is directed to molten material supply apparatus wherein a heating structure is designed to be supplied with material in the form of rods. Claim 1 is illustrative and reproduced below:

1. A molten material supply unit comprising:

a heating cylinder constructed and arranged for receiving a solid material rods, and comprising an inlet open to the atmosphere which receives the solid material rods and an outlet spaced from the inlet; and

a vacuum device communicating with the heating cylinder and constructed and arranged to generate a reduced pressure environment within the heating cylinder,

wherein the solid material rods are heated and melted in the reduced pressure environment as the rods move from the inlet to the outlet.

The Examiner relies on the following prior art references as evidence in rejecting the appealed claims:

Premkumar	US 5,775,403	Jul. 7, 1998
Cook	US 5,860,468	Jan. 19, 1999
Carden	US 6,098,700	Aug. 8, 2000

Claims 1, 3-8, 59, and 64-67 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Carden in view of Premkumar and Cook.

Claims 9 and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Carden in view of Premkumar, Cook, and Hamashima.

Concerning the Examiner's first stated rejection, all of the rejected claims require a heating cylinder constructed and arranged for receiving solid material rods, the cylinder having an inlet open to the atmosphere, a spaced outlet, and a vacuum device communicating with the heating cylinder to provide a reduced pressure environment therewithin. The Examiner

acknowledges that Carden does not teach or suggest, *inter alia*, that a die cylindrical supply unit thereof includes heating means, or that the supply unit is connected to a vacuum device (Answer 3 and 4). However, the Examiner maintains that:

Premkumar et al discloses heating means (9a) at the injection cylinder for the purpose of preventing premature solidification (col. 7, lines 4-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide heaters at the injection cylinders as taught by Premkumar et al, in Carden et al in order to prevent premature solidification.

....

Cook discloses a vacuum device in conjunction with an injection cylinder for the purpose of eliminating oxidation to the molten metal (col. 1, lines 43-64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have vacuum at the injection sleeve as taught by Cook, in Carden et al and Premkumar et al, in order to prevent oxidation at the injection cavity.

Answer 4.

Appellants, on the other hand, maintain that the Examiner erred in rejecting the appealed claims as obvious over the applied combination of references because the Examiner has not furnished a reasonable evidentiary

basis and rationale for the proposed addition of a vacuum device to the die supply unit disclosed by Carden.¹

Thus, a dispositive issue raised in this appeal with respect to both of the Examiner's obviousness rejections is: Have Appellants identified reversible error in the Examiner's rejections in that the Examiner has not discharged the burden of presenting a *prima facie* case of obvious. We answer this question in the affirmative and reverse the Examiner's rejections.

Under 35 U.S.C. § 103(a), the examiner carries the initial burden of establishing a *prima facie* case of obviousness. *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). As part of meeting this initial burden, the Examiner must determine whether the differences between the subject matter of the claims 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" (emphasis added). 35 U.S.C. § 103(a)(1999); *Graham v. John Deere Co.*, 383 U.S. 1, 14, 148 USPQ 459, 465 (1966). "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l. Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1739, 82 USPQ2d 1385, 1395 (2007). However, the Court further stated that:

¹ Because of our determination herein respecting the Examiner's proposed vacuum device addition, we need not reach the additional arguments of Appellants with respect to the "heating" aspect of the "cylinder" required by all of the appealed claims. The separate rejection of dependent claims 9 and 10 is also attended by the same vacuum addition issue. The additionally applied Hamashima is not relied on for vacuum addition by the Examiner.

Following these principles may be more difficult in other cases than it is here because the claimed subject matter may involve more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement. Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. *See In re Kahn*, 441 F.3d 977, 988 . . . (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”).

KSR, 127 S. Ct. at 1740-41, 82 USPQ2d at 1396.

Here, the Examiner has asserted that it would have been obvious to one of ordinary skill in the art to add a vacuum device to an injection sleeve (receiving chamber) of Carden to “prevent oxidation at the injection cavity” (Answer 4) and “in order to prevent any oxidation during the melting state, which can cause an explosion” (Answer 7).

Carden discloses two embodiments wherein a preheat oven 2 (Fig. 3 or Fig. 4) is open to ambient air/oxygen for preheating billets 1 (Fig. 3 or Fig. 4). The billets are made from a blend of a powdered metal alloy and ceramic particles (Carden, col. 4, ll. 45-63). Carden discloses dropping the preheated semi-solid billets into an open inlet of a receiving chamber 3 (Fig. 3) of a die casting apparatus 4 (Fig. 3) after the preheating in one embodiment, with optional further heating in a tray 26 (Fig. 4) in a second

embodiment. Each heated billet includes an oxide surface coating that maintains the billet's shape as the matrix material in the inner portion of the billet softens (Carden; col. 5, ll. 48-51). Carden discloses that the billet volume is selected to be substantially the same as the volume of the die cavity (Carden, col. 4, l. 67 - col. 5, l. 3). Moreover, it is disclosed that the billet diameter is substantially the same as that of the sleeve 5 (Fig. 4) for the second embodiment so as to displace air (Carden, col. 5, ll. 57-60). A piston 6 having a plunger tip 7 (Fig. 3 or Fig. 4) is used by Carden to rapidly force the semi-solid billet into die cavity 10 (Fig. 3 or Fig. 4).

Cook, on the other hand, is concerned with introducing molten metal into a die under vacuum (Cook, Abstract, col. 3, l. 10 - col. 4, l. 19).

Against this disclosure of the references, Appellants' arguments are persuasive in negating the Examiner's *prima facie* obviousness assertions because, unlike Cook, Carden teaches a billet supply system wherein the exposure of the billets to air during their heating is required to form an oxide coating thereon and wherein the billets are supplied individually to the die cavity in a semi-solid state, not as a molten metal (Br. 10-11, Reply Br. 2-4). This is especially the case because the Examiner has not presented a persuasive and explicit analysis as to how the vacuum device of Cook would be attached and used with the open inlet of the billet supply chamber and the sleeve of the device of Carden by one of ordinary skill in the art so as to effect the Examiner's conjectured explosion prevention while also permitting the rapid and open inlet billet supply arrangement of Carden to function. In other words, the Examiner has not provided a reasonably complete and articulated rationale founded on the record evidence showing

how and why one of ordinary skill in the art would have found or made the semi-solid billet supply system of Carden ready for a vacuum device attachment to the injection sleeve. In this regard, the Examiner has not identified any vacuum forming seals in Carden and persuasively explicated how the proposed vacuum device would have been connected and arranged to cooperate with any such seals.² Nor has the Examiner articulated how the prior art evidence establishes that any seals necessary for forming a vacuum would have been furnished as a modification to Carden by an ordinarily skilled artisan.

It is axiomatic that the legal conclusion of obviousness must be supported by facts, not speculation, and the initial burden is on the examiner to advance such facts to establish a *prima facie* case of obviousness. *In re Warner*, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967). On the record of this appeal, it is our view that the Examiner has not carried the burden of establishing a *prima facie* case of obviousness with respect to the subject matter defined by the appealed claims.

CONCLUSION

The Examiner's decision to reject claims 1, 3-8, 59, and 64-67 under 35 U.S.C. § 103(a) as being unpatentable over Carden in view of Premkumar, and Cook; and to reject claims 9 and 10 under 35 U.S.C.

² We recognize that the Examiner asserted that Carden discloses a squeezing member (7) in rejecting the claims (Answer 3). However, item (7) of Carden is disclosed as a piston plunger tip (Fig's 3 and 4), not a squeezing member constructed for solid material rods to move through and form a seal with, as specified, for example, in independent appealed claims 64 and 67.

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§ 103(a) as being unpatentable over Carden in view of Premkumar, Cook, and Hamashima is reversed.

REVERSED

clj

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