

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 DANE CHANG, YUNWA W. CHEUNG,
CHARLES F. DIEHL, and JOSEPH M. VITELIC

Appeal 2007-2154
Application 10/374,773
Technology Center 1700

Decided: July 31, 2007

Before CHARLES F. WARREN, PETER F. KRATZ, and
LINDA M. GAUDETTE, *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 1-14, 16, 17, and 39-41, the only claims that remain pending in this application. We have jurisdiction pursuant to 35 U.S.C. §§ 6 and 134.

As part of the background of the claimed invention, Appellants say that “a fugitive or disposable pattern, such as a wax, polystyrene or other commonly used fugitive pattern material, of the article to be cast is made by injection molding a fluid pattern material in a die corresponding to the configuration of the article to be cast.” This is reported to be known as the “‘lost wax’ process of investment casting” and is used for making a replica or “fugitive pattern” of the article to be cast (Specification 1). Appellants’ claimed invention is directed to a pattern material for making a fugitive pattern. The material includes a substantially random interpolymer¹ and another polymer wherein the proportionality of these two polymers is such that the pattern material is injection moldable so as to provide pattern properties for making a casting mold. Claim 1 is illustrative and is reproduced below:

1. A pattern material for making a fugitive pattern of an article to be cast of a metal or alloy, comprising;

- A) a substantially random interpolymer, and
- B) a polymer other than said interpolymer,
wherein A) and B) are present in proportion that said pattern material is injection moldable to provide pattern properties for making a casting mold.

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

Betso US 6,524,702 B1 Feb. 25, 2003

¹ Appellants define the term “interpolymer” as a polymer made from the polymerization of at least two different monomers. Interpolymers include copolymers, terpolymers, etc. (Specification 8).

Claims 1-14, 16, 17, and 39-41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Betso.

The Examiner has found that Betso discloses a material including a substantially random interpolymer in combination with another polymer corresponding to the polymer constituents of Appellants' pattern material. For instance, Betso discloses that the interpolymer can be made from polymerization of a vinyl or vinylidene monomer, such as styrene or alpha-styrene together with ethylene and/or one or more alpha-olefin monomers, such as propylene (Betso, col. 6, l. 50 – col. 12, l. 62). Moreover, Betso discloses that the interpolymer alpha-olefin proportion can be in the range of about 35-97 mole percent (Betso, paragraph bridging col. 11 and 12). Betso further discloses that a useful material can be made from a mixture of the interpolymer with another polymer, such as polystyrene (Betso, col. 12, l. 64 – col. 14, l. 10).

The Examiner has reasonably determined that the claimed subject matter herein is *prima facie* obvious to one of ordinary skill in the art over the teachings of Betso (Answer 3-6). Having considered the obviousness of the claimed subject matter in light of Appellants' arguments set forth in the Brief, we determine that the claimed subject matter would have been obvious to one of ordinary skill in the art at the time of the invention. Accordingly, we affirm the Examiner's obviousness rejection for reasons stated in the Answer and below.

Claims 1-10

Appellants do not present any separate arguments for the separate patentability of dependent claims 2-10 in the Brief (Br. 12). Accordingly, we select appealed claim 1 as the representative claim on which we decide

this appeal as to the Examiner's obviousness rejection of claims 1-10 over Betso.

There is no dispute that Betso discloses or suggests a material comprising a blend of a random interpolymer and another polymer. However, Appellants contend that Betso discloses that their interpolymer-containing material composition is useful for surrounding an electrically conductive substrate as an insulating or semi-conductive shield layer and does not teach or suggest the material is usable for making a fugitive pattern of an article to be cast of a metal or alloy (Br. 10). Moreover, Appellants contend that Betso does not suggest a pattern material including the interpolymer and other polymer component in a proportion such that the material of Betso is injection moldable with properties suitable for forming a casting mold (Br. 10-12).

Thus, the principal issues before us with respect to the Examiner's obviousness rejection, particularly the rejection of representative claim 1, is: Have Appellants identified reversible error in the Examiner's rejection by asserting that Betso does not suggest that their material can be used for making a fugitive pattern of an article to be cast, and/or by asserting that Betso does not suggest a material that is injection moldable for forming a molded pattern having properties useful for making a casting mold for a metal or alloy? We answer these questions in the negative and affirm the Examiner's rejection of claim 1 and claims 2-10 that stand or fall together therewith.

Representative claim 1 is drawn to a pattern material that comprises two constituents: (A) a substantially random interpolymer and (B) a polymer other than said interpolymer, with the further proviso that

constituents (A) and (B) are present in a proportion such that the material is injection moldable to furnish pattern properties for making a casting mold. Appealed Claim 1 is not drawn to the fugitive pattern of an article to be cast of a metal or an alloy or an injection molded product. Rather, representative claim 1 requires a material comprising the recited ingredients in a proportion such that the material is injection moldable and is capable of furnishing pattern properties for forming a casting mold.

Appellants do not argue that Betso does not disclose or suggest a material comprising a blend of a random interpolymer and another polymer. Thus, Appellants' arguments with respect to the properties of such a molded product or the fugitive pattern itself are germane only with respect to the claim 1 requirement for the proportion of the ingredients of the pattern material such that the material is injection moldable, as recited in appealed claim 1.

In this regard, the material disclosed by Betso includes both a substantially random interpolymer and another polymer corresponding to those disclosed by Appellants as useful for their pattern material. For example, Betso discloses the interpolymer can be made from vinyl or vinylidene aromatic monomers and an additional monomer (Betso, col. 6, l. 49 - col. 7, l. 62). Compare the methods of preparation of the interpolymer disclosed by Betso with the methods disclosed by Appellants (see, e.g., Betso, col. 8, ll. 26-42; Specification 13:1-20). Like Appellants, Betso discloses that the other polymer employed in their material can be polystyrene (see e.g., Betso, col. 13, ll. 32-40 and Specification 15:1-4). Furthermore, Betso discloses that the proportion of the other polymer employed in combination with the interpolymer in the material can be up to

90 percent by weight, a proportionality that embraces the proportionality of these ingredients, as disclosed by Appellants (see Betso, col. 13, ll. 46-51 and Specification 15:18-26). Given these commonalities of ingredients and proportions of the materials disclosed by Betso and Appellants, we agree with the Examiner that it would have been reasonable to expect that the materials disclosed and suggested by Betso have properties corresponding to the properties of Appellants' claimed material, including the capability for injection molding thereof as required by appealed claim 1. Where, as here, the Examiner has provided a reasonable basis to infer that the claimed and suggested prior art materials are substantially identical, the burden is properly shifted to Appellants to produce evidence which demonstrates that the prior art material does not necessarily or inherently possess the characteristics of the claimed material. *See In re Best*, 562 F.2d 1252, 1254-55, 195 USPQ 430, 433-34 (CCPA 1977). Indeed, Betso discloses that their material is capable of extrusion and the material is curable (Betso, col. 19, ll. 23-39). These characteristics are highly suggestive of the capability of the material being injection moldable. Appellants have not established otherwise.

It follows that, on this record, we shall affirm the Examiner's obviousness rejection of claims 1-10.

Claims 11-13

We select claim 11 as the representative claim for this claim grouping. Appellants' generalized contention that dependent claims 11-13 require a low molecular polymer in the recited claimed proportions to the interpolymer is not a persuasive separate argument for the patentability of this grouping of dependent claims. In particular, we note that representative

claim 11 is not limited to any particular molecular weight polymer by the use of the relative term “low” and the broadly recited proportions of the interpolymer and other polymer recited in claim 11 substantially overlap with the proportions for these ingredients as disclosed by Betso for the material disclosed therein. Thus, it would have been reasonable to expect that the material disclosed and/or suggested by Betso would have properties corresponding to the material of representative claim 11, which Appellants have not shown to be untrue. Hence, we affirm the Examiner’s obviousness rejection of claims 11-13, on this record.

Claims 14, 16, 17, 39-41

Appellants argue these claims as a group. Hence, we select claim 14 as the representative claim for this grouping of rejected claims.²

Claim 14 requires that the interpolymer is made from ethylene and styrene monomers and that the other polymer in the material is a low molecular weight polystyrene with the proviso that the interpolymer comprises 50-70 weight percent of the material and the polystyrene comprises 20-50 weight percent thereof.

Betso discloses polymerizing alpha-olefins with a preference for interpolymers formed from styrene and ethylene monomers (Betso, col. 11, ll. 60-65 and Examples). As noted above, Betso also discloses that the other polymer can be a polystyrene. Representative claim 14 does not specify a

² The recitation of the additional features of claims 16, 17, and 39-41, as generally recited in the Brief does not amount to a separate argument for the patentability of these claims. *See* 37 CFR § 41.37 (c)(1)(vii) (2006). In any event, we agree with the Examiner that Betso suggests the polymer ratio of claim 16 and materials having the properties of claims 17 and 39 for reasons stated in the Answer and above.

particular limit on the polystyrene molecular weight by the relative term “low” that patentably distinguishes the claimed material from the materials disclosed and suggested by Betso. Moreover, Betso discloses that the other polymer ingredient (polystyrene) can be present in the interpolymer/polymer material in amounts up to 90 weight percent, which is suggestive of a blend within the claimed range (Betso; col. 13, ll. 46-51). *See In re Harris*, 409 F.3d 1339, 1343-44, 74 USPQ2d 1951, 1954-55 (Fed. Cir. 2005); *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003); *In re Geisler*, 116 F.3d 1465, 1468-69, 43 USPQ2d 1362, 1364-65 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1577-78, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990); *In re Malagari*, 499 F.2d 1297, 1302-03, 182 USPQ 549, 553 (CCPA 1974). Appellants have not furnished any evidence establishing unexpected results for the claimed material. In this regard, the material of Betso would have been expected to be injection moldable and have properties corresponding to those claimed (capability of making a casting mold therefrom) given the commonalities of the material of Betso and those disclosed by Appellants.

On this record and for the reasons set forth in the Answer and herein, we shall also affirm the Examiner’s obviousness rejection of claims 14, 16, 17 and 39-41.

CONCLUSION

The decision of the Examiner to reject claims 1-14, 16, 17, and 39-41 under 35 U.S.C. § 103(a) as being unpatentable over Betso is affirmed.

Appeal 2007-2154
Application 10/374,773

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv) (2006).

AFFIRMED

clj

Eckert, Seamans, Cherin & Mellott, LLC
Alcoa Technical Center
100 Technical Center Drive
Alcoa Center, PA 15069-0001