

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 MICHAEL GREPRAGS

Appeal 2007-3191
Application 10/482,217
Technology Center 1700

Decided: October 4, 2007

Before CHUNG K. PAK, CATHERINE Q. TIMM, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-10, the only claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

The invention relates to flame retardant thermoplastic molding compositions. Claim 1 is illustrative of the invention and is reproduced below:

1. A thermoplastic molding composition, containing
 - A) from 10 to 97 wt% of
 - (a₁) at least one polyester other than polyethylene terephthalate (PET), and
 - (a₂) from 1 to 50 wt%, based on 100% by weight of A), of PET,
 - B) from 1 to 30 wt%, based on 100 wt% of B), of a flame retardant blend of,
 - b₁) from 20 to 99 wt% of a halogen-containing flameproofing agent
 - b₂) from t to 80 wt% of an antimony oxide
 - C) from 0.01 to 5 wt% of KH₂PO₄ or LiH₂PO₄ or a mixture thereof
 - D) from 0.01 to 3 wt% of an antidrip agent
 - E) from 0 to 70 wt% of one or more further additives selected from the group consisting of esters or amides of saturated or unsaturated aliphatic carboxylic acids with saturated aliphatic alcohols or amines, elastomeric polymers, fibrous fillers, particulate fillers, stabilizers, oxidation retarders, thermal decomposition stabilizers, UV stabilizers, lubricants, moldrelease agents, colorants, nucleating agents, and plasticizers, the sum of the percentages by weight of components A) to E) being 100%.

The Examiner relies on the following prior art references to show unpatentability:

Gallagher	US 5,674,931	Oct. 7, 1997
Liao	US 5,981,661	Nov. 9, 1999
Murakami	EP 0 979 845 A1	Feb. 16, 2000

The Examiner made the following rejection:

Claims 1-10 under 35 U.S.C. § 103 as unpatentable over Liao or Murakami in view of Gallagher.

ISSUE

Appellant contends that the Examiner has not established a prima facie showing of obviousness because the Examiner has not explained why one of ordinary skill in the art would have selected the components of the claimed composition from among the numerous components listed in the applied prior art. Appellant argues, in particular, that one of ordinary skill in the art would not have been motivated to select the particular phosphorus containing stabilizers of the invention from among those listed in Liao (Br. 5).

The Examiner contends that the applied prior art specifically identifies the components of Appellant's claimed composition as being suitable for use in a molding composition. The Examiner further contends that the applied prior art describes a method of selection of an appropriate stabilizer composition which would have led one of ordinary skill in the art to select the claimed potassium dihydrogen phosphate compound.

Based on the contentions of the Examiner and the Appellant, the issue before us is: Has the Examiner provided sufficient facts and reasons to establish a prima facie showing of obviousness within the meaning of 35 U.S.C. § 103? And, if so, has Appellant provided sufficient evidence to overcome the Examiner's prima facie showing of obviousness?

For the reasons discussed below, we find that the preponderance of the evidence weighs in favor of a finding of obviousness as to appealed claims 1-10.

RELEVANT FINDINGS OF FACT

- 1) Liao discloses flame retardant resin molding compositions.
- 2) Liao's compositions include a polyester resin component (Liao, col. 2, l. 8). According to Liao, the most preferred polyesters are poly(ethylene terephthalate) ("PET"), and poly(1,4-butylene terephthalate), ("PBT"), poly(ethylene naphthanoate) ("PEN"), poly(butylene naphthanoate), ("PBN") and (polypropylene terephthalate) ("PPT"), and mixtures thereof (Liao, col. 2, ll. 49-54).
- 3) According to Liao, preferred blends of polyesters include blends that incorporate PBT and PET (Liao, col. 2, ll. 54-55). "When blends of these preferred components are employed the polyester resin component can comprise from about 1 to about 99 parts by weight poly(ethylene terephthalate) and from about 99 to about 1 part by weight poly(1,4-butylene terephthalate) based on 100 parts by weight of both components combined" (Liao, col. 3, ll. 20-27).
- 4) Liao discloses the use of a flame retardant in combination with a synergist, typically inorganic antimony compounds (Liao, col. 11, l. 4). According to Liao, the flame-retardant additive should be present in an amount at least sufficient to reduce the flammability of the polyester resin. In general, the amount of additive will be from 2 to 20 percent by weight based on the weight of resin, with a preferred range from about 5 to 15 percent (Liao, col. 10, ll. 38-45). Liao states that synergists, such as antimony oxides, are typically used at about 0.5 to 15 percent, and more preferably from 1 to 6 percent by weight based on the weight percent of resin in the final composition (Liao, col. 11, ll. 0-12).

- 5) Liao states that:

In the thermoplastic compositions which contain a polyester and a polycarbonate resin, it is preferable to use a stabilizer material. Typically, such stabilizers are used at a level of 0.01-10 weight percent and preferably at a level of from 0.05-2 weight percent. The preferred stabilizers include an effective amount of an acidic phosphate salt; an acid, alkyl, aryl or mixed phosphite having at least one hydrogen or alkyl group; a Group IB or Group IIB metal phosphate salt; a phosphorus oxo acid, a metal acid pyrophosphate or a mixture thereof.

(Liao, col. 9, l. 59-col. 10, l. 1.)

- 6) Liao discloses that:

The suitability of a particular compound for use as a stabilizer and the determination of how much is to be used as a stabilizer may be readily determined by preparing a mixture of the polyester component, the polycarbonate with and without the particular compound and determining the effect on melt viscosity or color stability or the formation of interpolymer. The acidic phosphate salts include sodium dihydrogen phosphate, mono zinc phosphate, potassium hydrogen phosphate, calcium hydrogen phosphate and the like.

(Liao, col. 10, ll. 1-10.)

- 7) Liao discloses that the molding compositions of the invention may contain polytetrafluoroethylene (PTFE) type resins or copolymers used to reduce dripping in flame retardant thermoplastics. Preferably other ingredients are employed in low amounts, typically less than 5 percent by weight of the total composition, and include stabilizers, mold release, lubricants, colorants, nucleants, antioxidants and UV absorbers (Liao, col. 11, ll. 13-19).

- 8) Liao discloses the addition of other additives such as reinforcing materials (Liao, col. 8, ll. 64-67) and impact modifiers (Liao, col. 9, ll. 21-22).
- 9) Gallagher discloses flame retardant thermoplastic molding compositions which include single thermoplastic resins or a heteropolymer thermoplastic resin blend. According to Gallagher, suitable thermoplastic resins include, for example, polyesters, polyethers, polyamides, polyolefins, polycarbonates, including mixtures of these polymers provided that such mixture constitutes a heteropolymer blend. Gallagher defines the term "heteropolymer thermoplastic resin blend" as "a blend of two polymers from differing classes of polymers, such as blends of the foregoing but excluding blends of two polymers from within the same class of polymers, e.g., polyester/polyester blends, etc. A heteropolymer thermoplastic resin blend does not, however, exclude blends of two polyesters which are part of a blend of polymers from different classes, e.g., a blend of polycarbonate, polybutylene terephthalate and polyethylene terephthalate." (Gallagher, col. 2, ll. 46-54). Gallagher specifically discloses blends of polycarbonate resin with both PBT and PET (Gallagher, claim 13; Table 1).
- 10) Gallagher discloses the addition of stabilizers to the compositions at a level of 0.01-10 weight percent and preferably at a level of from 0.05-2 weight percent. The stabilizers include an effective amount of an acidic phosphate salt; an acid, alkyl, aryl, or mixed phosphite having at least one hydrogen or alkyl group; a Group IB or Group IIB metal

phosphate salt; a phosphorous oxo acid or a mixture thereof (Gallagher, col. 7, ll. 58-64).

- 11) According to Gallagher, the suitability of a particular compound for use as a stabilizer and the determination of how much is to be used as a stabilizer may be readily determined by preparing a mixture of the polyester component, the polycarbonate and the filler with and without the particular compound and determining the effect on melt viscosity or color stability or the formation of interpolymers (Gallagher, col. 7, l. 64-col. 8, l. 3).
- 12) Gallagher claim 8 is directed to a composition comprising, *inter alia*, 20-90 wt% of a heteropolymer thermoplastic resin blend and “an effective amount of a stabilizer selected from phosphites, acidic phosphate salts, phosphate salts of Group IB or Group IIB metal and phosphorous oxoacids.”
- 13) Gallagher lists the following acidic phosphate salt stabilizers: sodium dihydrogen phosphate, monozinc phosphate, potassium dihydrogen phosphate, calcium hydrogen phosphate and the like (Gallagher, col. 8, ll. 4-6).
- 14) According to Gallagher, polytetrafluoroethylene may also be added to enhance flame retardance as a drip inhibitor, generally in an amount of from 0.01-10 weight percent and more preferably from 0.01-5 weight percent (Gallagher, col. 8, ll. 21-25).

ANALYSIS AND CONCLUSIONS

Appellant contends that the Examiner’s rejection is based on improper hindsight reconstruction (Br. 5). Contrary to Appellant’s contention, we find that the Examiner has established a *prima facie* case of obviousness for the

reasons well stated in the Answer. We do not find Appellant's arguments persuasive in overcoming the Examiner's prima facie showing of obviousness for the reasons discussed below.

Appellant first argues that although Liao indicates that preferred polyesters are PET and PBT, the claimed ranges for these components are narrower than those disclosed in Liao (Br. 7). As noted by our reviewing court in *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003): "In cases involving overlapping ranges, we and our predecessor court have consistently held that even a slight overlap in range establishes a prima facie case of obviousness" (emphasis omitted). In this case (*see Findings of Fact*), because the "claimed ranges are completely encompassed by the prior art, the conclusion [that the claims are prima facie obvious] is even more compelling." *Id.*, 315 F.3d at 1330, 65 USPQ2d at 1382. *See In re Harris*, 409 F.3d 1339, 1343-44, 74 USPQ2d 1951, 1954-55 (Fed. Cir. 2005); *In re Geisler*, 116 F.3d 1465, 1468-69, 43 USPQ2d 1362, 1364 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990); *In re Malagari*, 499 F.2d 1297, 1302-03, 182 USPQ 549, 553 (CCPA 1974).

Appellant also argues that Liao's composition includes components which are not recited in the appealed claims (Br. 7). However, as correctly pointed out by the Examiner (Answer 4), Appellant's claims do not exclude the presence of additional components.

Appellant further argues that one of ordinary skill in the art would not have been motivated to select the particular phosphorus containing stabilizers of the invention from among those listed in Liao (Br. 7). In general, prima facie obviousness requires that the prior art provide some

guidance as to which of the species within the disclosed genus will provide the desired properties; the species cannot merely be “obvious to try.” *See Merck & Co. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807, 10 USPQ2d 1843, 1845 (Fed. Cir. 1989) (*citing In re O’Farrell*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988)) (“An invention is ‘obvious to try’ ‘where the prior art [gives] either no indication of which parameters [are] critical or no direction as to which of many possible choices is likely to be successful.’”)). In this case, the Examiner has provided a reasoned basis for his determination that one of ordinary skill in the art at the time of the invention would have been motivated to select KH₂PO₄ as a suitable stabilizer in Liao’s compositions (Answer 5). In particular, the Examiner points out that both Liao and Gallagher teach that suitability of a particular compound for use as a stabilizer and the determination of how much is to be used may be readily determined (Findings of Fact 6 and 11) (Answer 4-5). Liao teaches that use of a stabilizer material is preferable in thermoplastic compositions containing a polyester and a polycarbonate resin and lists acidic phosphate salts among the preferred stabilizer (Finding of Fact 5). Likewise, Gallagher specifically discloses compositions comprising, *inter alia*, 20-90 wt% of a heteropolymer thermoplastic resin blend and “an effective amount of a stabilizer selected from phosphites, acidic phosphate salts, phosphate salts of Group IB or Group IIB metal and phosphorous oxoacids” (Finding of Fact 12). The Examiner further notes that both Liao and Gallagher specifically list potassium dihydrogen phosphate as a suitable acidic phosphate salt (Findings of Fact 6 and 13) (Answer 4). Thus, contrary to Appellant’s contention, we are in agreement with the Examiner that one of ordinary skill in the art, upon consideration of Liao and Gallagher, would have been

motivated to select KH₂PO₄ as a component in Liao's thermoplastic composition.

Accordingly, we find that the Examiner has established a prima facie showing of obviousness of appealed claims 1-10 based on the combined teachings of Liao and Gallagher.

A prima facie case of obviousness may be rebutted by evidence of unexpected results or a showing that the prior art teaches away from the claimed invention in any material respect. *In re Geisler*, 116 F.3d 1465, 1469-70, 43 USPQ2d 1362, 1364 (Fed. Cir. 1997). Appellant contends that "not all phosphorus containing compounds will produce the superior results of the claimed composition." (Reply 5.) Appellant relies on the comparison testing described in the Specification as evidence of unexpected results. (Reply 5-6). Specifically, Appellant relies on test results conducted on three compositions containing .2 wt % KH₂PO₄, .1 wt% LiH₂PO₄, and .2 wt% Zn(H₂PO₄)₂, respectively, the remaining components being identical.

We do not find this evidence persuasive in overcoming the Examiner's prima facie showing of obviousness because the testing is not commensurate in scope with the claims.¹ For example, the evidence does not establish unexpected results for the entire claimed range of .01 to 5 wt% KH₂PO₄ or LiH₂PO₄. See *In re Harris*, 409 F.3d 1339, 1344, 74 USPQ2d 1951, 1955 (Fed. Cir. 2005) which states:

¹ We note that the Examiner did not comment on the test results. However, this argument appears to have been presented for the first time in Appellant's Reply Brief. See *In re Klosak*, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972) (The burden of analyzing and explaining data to support an argument of unexpected results rests on the party asserting it).

The Board also correctly reasoned that the showing of unexpected results is not commensurate in scope with the degree of protection sought by the claimed subject matter because the elemental composition of CMSX®-486 is at or near the midpoint of the claimed range. While Harris's evidence may show a slight improvement over some alloys, the record does not show that the improved performance would result if the weight-percentages were varied within the claimed ranges. Even assuming that the results were unexpected, Harris needed to show results covering the scope of the claimed range.

See also, In re Costello, 480 F.2d 894, 897, 178 USPQ 290, 292 (CCPA 1973). In addition, because Appellant's comparison testing is limited to Zn(H₂PO₄)₂, the evidence does not establish that KH₂PO₄ or LiH₂PO₄ provide unexpected results compared to the other acidic phosphate salts listed in Liao.

ORDER

The rejection of claims 1-10 under 35 U.S.C. § 103 as unpatentable over Liao or Murakami in view of Gallagher is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(i)(iv).

AFFIRMED

clj

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