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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* DONG IN HA, SEUNG SHIK SHIN, and  
KYUONG SIK CHIN

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Appeal 2020-002859  
Application 15/543,677  
Technology Center 1700

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Before LINDA M. GAUDETTE, MERRELL C. CASHION, JR., and  
SHELDON M. McGEE, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL<sup>1</sup>

The Appellant<sup>2</sup> appeals under 35 U.S.C. § 134(a), from the  
Examiner's decision finally rejecting claims 1 and 4–15.<sup>3</sup>

We AFFIRM.

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<sup>1</sup> The following documents are of record in this appeal: Specification filed July 14, 2017 (“Spec.”); Final Office Action dated Nov. 20, 2018 (“Final Act.”); Appeal Brief filed Aug. 13, 2019 (“Appeal Br.”); Examiner’s Answer dated Dec. 26, 2019 (“Ans.”); and Reply Brief filed Feb. 26, 2020 (“Reply Br.”).

<sup>2</sup> “Appellant” refers to “applicant” as defined in 37 C.F.R. § 1.42. The Appellant identifies the real party in interest as Lotte Advanced Materials Co., Ltd. Appeal Br. 3.

<sup>3</sup> We have jurisdiction under 35 U.S.C. § 6(b).

### CLAIMED SUBJECT MATTER

“The . . . invention relates to a thermoplastic resin composition exhibiting good impact resistance, flowability, external appearance, flame resistance and the like . . . .” Spec. ¶ 1. The composition may be used to manufacture electronic device housing parts. *Id.* ¶ 72. Claims 1, 13, and 14, reproduced below, are illustrative of the claimed subject matter:

1. A thermoplastic resin composition comprising:
  - about 100 parts by weight of a polycarbonate resin;
  - about 1 to about 30 parts by weight of a rubber-modified aromatic vinyl graft copolymer;
  - about 1 to about 30 parts by weight of a polyester resin;
  - about 1 to about 20 parts by weight of a glycol-modified polyester resin having about 10 mol% to about 60 mol% of a cyclohexanedimethanol (CHDM) content based on a total amount of a diol component; and
  - about 0.5 to about 15 parts by weight of a vinyl copolymer comprising an epoxy group, wherein a weight ratio of the polyester resin to the glycol-modified polyester resin ranges from about 1:0.1 to about 1:1.
13. The thermoplastic resin composition according to claim 1, wherein the thermoplastic resin composition has a melt flow index (MI) of about 12 g/10 min to about 25 g/10 min as measured at about 260°C under a load of about 2.16 kg in accordance with ASTM D1238.
14. The thermoplastic resin composition according to claim 13, wherein the thermoplastic resin composition has a notched Izod impact strength of about 45 kgf cm/cm to about 60 kgf cm/cm as measured on an about 1/8" thick specimen in accordance with ASTM D256, and a melt flow index (MI) of about 12 g/10 min to about 19 g/10 min as measured at about 260°C under a load of about 2.16 kg in accordance with ASTM D1238.

Appeal Br. 29, 31.

#### REFERENCES

The Examiner relies on the following prior art:

Name	Reference	Date
Jung I	US 2009/0012217 A1	Jan. 8, 2009
Jung II	US 2010/0152358 A1	June 17, 2010
Ito	US 2010/0253874 A1	Oct. 7, 2010

#### REJECTIONS

1. Claims 1, 4–11, and 13–15 are rejected under 35 U.S.C. § 103 over Jung I and Jung II. Final Act. 3.
2. Claim 12 is rejected under 35 U.S.C. § 103 over Jung I, Jung II, and Ito. Final Act. 6.

#### OPINION

The Appellant contends that the Examiner's fact finding and reasoning is insufficient to support a prima facie case of obviousness as to the appealed claims. More specifically, the Appellant argues that the Examiner reversibly erred in finding that (1) the ordinary artisan would have had a reason to include 3 to 20 wt% of glycol-modified polyester resin containing 5 to 80 mol% of cyclohexane dimethanol in Jung I's composition (Appeal Br. 13–15), and (2) the combined teachings of Jung I and Jung II would have resulted in the claimed composition (*id.* at 15–17). The Appellant also contends that even if the Examiner met the burden to establish a prima facie case of obviousness, the Appellant's evidence supports a finding that the claimed and prior art compositions differ and that the claimed composition exhibits unexpected results. *See* Appeal Br. 18–24. These arguments have been fully addressed by the Examiner in the Final

Office Action and the Answer, and are not persuasive of reversible error in the Examiner's obviousness conclusion for the reasons stated therein. We add the following.

The Appellant argues that "Jung I addresses problems associated with imparting sufficient flame retardancy to a rubber-modified aromatic vinyl copolymer resin without using potentially harmful compounds and/or without deteriorating impact strength." Appeal Br. 14. The Appellant argues that because Jung I solves these problems using an epoxy group-containing rubber modified aromatic vinyl copolymer resin, there would have been no reason "to further modify Jung I to address a problem stated to have been solved, much less consider . . . [Jung II, which] does not recognize or address issues associated with the use of flame retardants." This argument is not persuasive because it fails to identify error in the Examiner's finding that the ordinary artisan would have modified Jung I to include a glycol-modified polyester resin containing 5 to 80 mol% of cyclohexane dimethanol based on Jung II's disclosure of improved dimensional stability, heat resistance and weld line strength in a polycarbonate resin composition. *See* Final Act. 4–5 (citing Jung II ¶¶ 79–81); Ans. 9. The Examiner's finding that the ordinary artisan would have sought to further improve Jung I's composition by including a glycol-modified polyester resin containing 5 to 80 mol% of cyclohexane dimethanol are further supported by the following disclosures in Jung I and Jung II.

Jung I describes its composition as "an environmentally friendly flameproof thermoplastic resin composition which has excellent flame retardancy and impact resistance" and "suitable for the production of electric

or electronic housings, computer or office equipment housings, structural materials and the like.” Jung I ¶¶ 8, 89. Jung I discloses that use of a “polycarbonate resin may make it easier to impart flame retardancy to the resin composition. Accordingly, if the amount of the polycarbonate resin is less than about 30% by weight, flame retardancy and mechanical strength of the resin composition may be deteriorated.” *Id.* ¶ 63. Jung I discloses that an impact modifier can be included in the composition. *Id.* ¶ 84.

Jung II discloses that “[p]olycarbonate resins are used in a variety of engineering plastic applications because of their excellent impact resistance, self-extinguishing properties, dimensional stability and high heat resistance compared to other engineering plastics.” Jung II ¶ 3. According to Jung II, “the use of polycarbonate resins is limited in many applications because polycarbonates can have high notch sensibility and thus can exhibit reduced impact strength along parts of molded products that are subjected to stress.” *Id.* ¶ 4. In addition, “polycarbonate resins require high molding temperatures due to the low fluidity of polycarbonates, unlike other general thermoplastic resins. Therefore, physical properties of the polycarbonate resin can be reduced by thermal decomposition due to over-heating.” *Id.* Jung II discloses that

[t]he addition of an impact modifier can significantly prevent the reduction of the impact resistance of polycarbonate resin, although residual stress can remain. However, simply adding only an impact modifier does not improve the fluidity of polycarbonate resin. Further, the polycarbonate resin can exhibit discoloration and/or reduced physical properties due to changes in the impact modifier that can result from exposure to high temperatures during processing.

*Id.* ¶ 6. Jung II describes its composition as improving fluidity and weld strength of molded articles and, therefore, “suitable for use in outer parts of cellular phones, computers, door linings and the like which require impact resistance and have many weld parts.” Jung II ¶ 84. Jung II discloses that the polycarbonate resin composition may further include one or more additives, including flame retardants. *Id.* ¶ 82. Based on these disclosures, the ordinary artisan would have reasonably expected that including a glycol-modified polyester resin containing 5 to 80 mol% of cyclohexane dimethanol in Jung I’s composition would reduce or eliminate the drawbacks associated with polycarbonate resins and impact modifiers, while maintaining flame retardancy.

The Appellant argues that comparison data provided in the Specification and supplemented in an inventor declaration under 37 C.F.R. § 1.132 supports a finding that the claimed and prior art compositions differ and that the claimed composition exhibits unexpected results. Appeal Br. 18–24; *see* Declaration of Dong In Ha, executed July 31, 2018; Appeal Br. 19 (reproducing the table from Decl. ¶ 7). The Appellant argues that the data demonstrates that compositions including a polyester resin and a glycol modified polyester resin in a weight ratio outside of the upper and lower end points of the claimed ranges exhibit poor processability (melt flow index) and significantly less Izod impact strength as compared to the claimed composition. Appeal Br. 19.

We agree with the Examiner that the Appellant’s evidence is insufficient to rebut the Examiner’s strong *prima facie* showing of obviousness. Ans. 11–12; *see Sud-Chemie, Inc. v. Multisorb Techs., Inc.*,

554 F.3d 1001, 1009 (Fed. Cir. 2009). As explained by the Examiner, although the Appellant compared compositions containing the same components in varying amounts, the Appellant never varied the individual components. Ans. 11 (“[T]he examples recite specific types and amounts of polycarbonate resins (A1 and A2), while the present claim[s] recite any type of polycarbonate resins . . . [and] the examples recite specific type and amount of vinyl copolymer comprising an epoxy group (E), while the present claim[s] recite any type of vinyl copolymer comprising an epoxy group.”).

The Appellant argues that it has “demonstrated that an embodiment has an unexpected result and there is no basis to expect that other claimed embodiments will behave differently.” Reply Br. 6. That is not the proper standard for demonstrating unexpected results. Rather, the Appellant has the burden to “provide[] an adequate basis to support the conclusion that other embodiments falling within the claim will behave in the same manner” as the exemplary embodiment. *In re Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011); *see also Genetics Inst., LLC v. Novartis Vaccines & Diagnostics, Inc.*, 655 F.3d 1291, 1308–09 (Fed. Cir. 2011) (“While we have held that unexpected results must be commensurate in scope with the claims, we have not required absolute identity of scope; rather, we have rejected unexpected results where the evidence was plainly disproportionate to the scope of the claim.”); *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972) (the burden of analyzing and explaining data to support nonobviousness rests with the Appellant). The Appellant’s conclusory statements are insufficient to meet that burden. *See* Appeal Br. 22 (“The data of record clearly demonstrates a



trend, based on the weight ratio of a polyester resin to a modified polyester resin. The skilled artisan also can clearly and reasonably extrapolate or extend the probative value of the data to other compositions within the scope of the claims.”).

The Appellant argues that the Examiner’s fact finding and reasoning is insufficient to establish that the properties recited in claims 11, 13, and 14 are inherent or obvious. Appeal Br. 16, 23. The Appellant argues that the Examiner’s finding that the Appellant’s data is not commensurate in scope with the claims is the wrong legal standard for determining inherency because “inherency considers whether the alleged prior art compositions necessarily have the claimed properties.” Reply Br. 4–5. The problem with the Appellant’s argument is that the claims do not require that every composition falling within the scope of claim 1 have the recited properties. Rather, claims 11, 13, and 14 may encompass only one particular composition. *See, e.g., Spec.* ¶¶ 20, 37, 71 (referring to some embodiments or exemplary embodiments as having the recited properties).

The Appellant argues that “[w]hen properly read in context, [Jung I and Jung II] actually teach away from the composition of claim 14.” Reply Br. 6. In support of its teaching away argument, the Appellant directs us to Jung II’s example in which Jung indicates that a melt flow index of 19 g/10 min is unacceptable. *Id.* The Appellant argues that this teaches away from the claim 14 range which includes 19 g/10 min. *Id.*

The Examiner fully addresses this argument on pages 17–18 of the Answer and we agree that it is unpersuasive of reversible error for the reasons stated therein. We add that, to establish a teaching away, the

Appellant must explain why “a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). The Appellant has not sufficiently explained why this one example, limited to a teaching of the undesirability of a melt flow index value at the upper endpoint of the claimed range of “12 g/10 min to about 19 g/10 min” (claim 14), would have led the ordinary artisan in a direction divergent from the path that was taken by the Appellant.

The Appellant does not argue the separate rejection of claim 12. Accordingly, for the reasons stated in the Final Office Action, the Answer, and above, we sustain the rejections of claims 1 and 4–15.

#### DECISION SUMMARY

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 4–11, 13–15	103	Jung I, Jung II	1, 4–11, 13–15	
12	103	Jung I, Jung II, Ito	12	
<b>Overall Outcome:</b>			1, 4–15	

#### TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 41.50(f).

AFFIRMED