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PLUMSEA LAW GROUP, LLC 6710A Rockledge Drive SUITE 400 BETHESDA, MD 20817			KAUCHER, MARK S	
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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* SHINJI YAMASHITA and HIROSHI SAKAI

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Appeal 2019-004025  
Application 15/448,727  
Technology Center 1700

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Before DONNA M. PRAISS, MICHELLE N. ANKENBRAND, and  
JEFFREY R. SNAY, *Administrative Patent Judges*.

SNAY, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>1</sup> appeals from the Examiner's decision rejecting claims 1–6. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies UMG ABS, LTD. as the real party in interest. Appeal Br. 4.

## BACKGROUND

The invention relates to a thermoplastic resin composition and molded articles formed therefrom. Spec. 1. Claim 1, the only independent claim on appeal, reads as follows:

1. A thermoplastic resin composition comprising:  
25 to 50 parts by mass of a rubber-containing graft copolymer (A) obtained by copolymerizing a monomer mixture comprising an aromatic vinyl compound and a vinyl cyanide compound in presence of a diene-based rubber-like polymer, and  
50 to 75 parts by mass of a hard copolymer mixture (B) comprising a hard copolymer (B-I) and a hard copolymer (B-II), wherein  
the rubber-containing graft copolymer (A) comprises a hard copolymer component (A') in which the aromatic vinyl compound and the vinyl cyanide compound are grafted to the diene-based rubber-like polymer,  
a weight-average molecular weight of the hard copolymer component (A') is from 50,000 to 200,000,  
an amount of the hard copolymer (B-II) in the hard copolymer mixture (B) is at least 5% by mass but less than 20% by mass,  
the hard copolymer (B-I) is a polymer comprising monomer units derived from the aromatic vinyl compound and monomer units derived from the vinyl cyanide compound, and has ***a weight-average molecular weight of 50,000 to 150,000***, wherein 25 to 32% by mass of a total mass of the hard copolymer (B-I) is composed of monomer units derived from the vinyl cyanide compound, and  
the hard copolymer (B-II) is a polymer comprising monomer units derived from the aromatic vinyl compound and monomer units derived from the vinyl cyanide compound, and has ***a weight-average molecular weight of 50,000 to 150,000***, wherein 35 to 50% by mass of a total mass of the hard copolymer (B-II) is composed of monomer units derived from the vinyl cyanide compound.

Appeal Br. 38–39 (Claims Appendix) (emphasis added to highlight key disputed recitations).

## REJECTION

Claims 1–6 stand rejected under 35 U.S.C. § 103 as unpatentable over Takashi,<sup>2</sup> Dion,<sup>3</sup> and Scheirs.<sup>4</sup>

## OPINION

Appellant argues only claim 1. Appeal Br. 11–37. We focus our remarks on Appellant’s arguments concerning claim 1. Each of claims 2–6 stands or falls with claim 1.

Relevant to Appellant’s arguments on appeal, the Examiner finds Takashi discloses a thermoplastic resin composition that meets all the recitations in claim 1, except Takashi is silent regarding the weight-average molecular weight of the various polymer components. Final Act. 2–3. *See* Takashi ¶ 84 (identifying graft copolymer I-2 formed from acrylonitrile, butadiene, and styrene (“ABS”)); *id.* ¶ 90 (identifying copolymer system II-1 formed from styrene and acrylonitrile (“SAN”) with 26 wt. % average vinyl cyanide content); *id.* ¶ 94 (identifying copolymer system III-2 formed from SAN with 38 wt. % average vinyl cyanide content); *id.* at Table 1, composition 3 (formulated from components I-2, II-1, and III-2). The Examiner finds Dion teaches a weight-average molecular weight range of 50,000–130,000 as suitable for styrene-acrylonitrile copolymer components

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<sup>2</sup> JP 2013-199520 A, published October 3, 2013, as translated.

<sup>3</sup> US 5,955,540, issued September 21, 1999.

<sup>4</sup> *Modern Styrenic Polymers: Polystyrenes and Styrenic Copolymers 3–757* (John Scheirs & Duane B. Priddy eds., 2003).

in graft ABS resin compositions. Final Act. 3. The Examiner additionally finds Scheirs teaches increasing styrene/acrylonitrile copolymer molecular weight improves toughness and solvent resistance but worsens cost and processability. *Id.* at 3–4. In light of the foregoing teachings in the prior art, the Examiner determines one of ordinary skill would have had a reason to select weight-average molecular weights within the recited range of 50,000–150,000 for Takashi’s styrene/acrylonitrile components II-1 and III-2. *Id.*

Appellant argues the claimed composition suppresses the absorption effect (Appeal Br. 12), and contends the relied-upon prior art references “are silent with regard to suppressing the absorption phenomenon” (*id.* at 13). Appellant also argues “Dion does not disclose that the molecular weights of A', B-I, and B-II of the pending claim are an important feature and should be 50,000 to 130,000 for similar polymers,” and “does not teach similar compositions of ABS and SAN.” *Id.* at 16 (internal quotations and emphasis omitted). These arguments are not persuasive of reversible error. Claim 1 lacks any recitation of absorption effect. Moreover, the prior art need not supply the same reason as that of Appellant for providing Takashi’s SAN components with a molecular weight within the recited range. Contrary to Appellant’s contention, Dion expressly states that molecular weight of both grafted and ungrafted SAN components in an ABS polymer composition is important and should be from about 50,000–130,000, with a preferred range of about 80,000 to about 120,000. Dion 7:20–30. As such, a preponderance of evidence supports the Examiner’s finding that Dion would have provided a reason to select a molecular weight within the recited range for each of the SAN components in Takashi’s ABS polymer composition.

Appellant further argues that Dion’s product concerns a multi-modal polymer and, for that reason, differs from Takashi’s product such that one of ordinary skill in the art would not have looked to Dion for a molecular weight. Appeal Br. 20. Appellant’s argument is not persuasive. Both Takashi and Dion disclose grafted-rubber styrene polymer compositions for use in connection with automobiles and household appliances. *See* Takashi ¶ 2; Dion 1:22–29. Particularly, both Takashi and Dion disclose compositions formulated from grafted ABS and SAN. Takashi ¶ 13; Dion 2:50–3:31. Appellant does not explain why the fact that Dion describes multiple particle sizes for the graft ABS component would have precluded one of ordinary skill from considering Dion’s teachings regarding molecular weight of the SAN component.

Appellant also argues Takashi’s silence regarding molecular weight of SAN in the ABS/SAN composition suggests “that molecular weight is not important and the skilled practitioner would not look to Dion, or any other reference, to supply a molecular weight range.” Appeal Br. 21. To the contrary, Takashi’s silence on the point is evidence of a reason to have looked to other ABS/SAN compositions for the missing property.<sup>5</sup>

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<sup>5</sup> Appellant additionally argues Scheirs identifies a typical molecular weight range for SAN copolymers but does not teach whether molecular weight or acrylonitrile content can be used to suppress absorption phenomenon. Appeal Br. 21–22. The Examiner’s reliance on Scheirs is cumulative to the teachings of Dion. Because we are not persuaded of reversible error in the Examiner’s determination that Dion would have supplied a reason to provide Takashi’s SAN components with molecular weights within the recited range, Appellant’s arguments that Scheirs fails to supply such reason are not persuasive of error.

Appellant contends Dion's composition includes only a single nongrafted copolymer, and therefore does not provide a teaching regarding molecular weight for two components, such as B-I and B-II recited in claim 1. Appeal Br. 22–23. We disagree. Dion identifies a composition including ungrafted monovinylidene aromatic/ethylenically unsaturated copolymer having a molecular weight preferably in the range of about 80,000 to about 120,000. Dion 7:20–30. That composition is compounded with another monovinylidene aromatic monomer (*id.* 8:53–61), which preferably has a molecular weight in the range of 75,000–115,000 (*id.* 9:22–28). Thus, Dion discloses two nongrafted polymer components. Even if Dion were viewed as providing only a single nongrafted SAN copolymer, the Examiner relies on Takashi for teaching two SAN components.

Appellant points to examples and comparative examples reported in the Specification as evidence that compositions comprising B-I and B-II copolymer components with molecular weight outside the recited range, or acrylonitrile content outside the recited range, yielded unsatisfactory properties. Appeal Br. 24–29, 33–35; Reply Br. 11–16. Appellant also argues neither Takashi nor Dion recognizes an improvement in both absorption and fluidity by using the recited SAN components. Appeal Br. 27–31. Appellant's arguments, however, do not reveal error where, as here, the prior art teaches both molecular weight and acrylonitrile content values that are within the recited ranges.

For the foregoing reasons, Appellant has not persuasively demonstrated reversible error in the Examiner's obviousness determination with regard to claim 1. Appellant does not separately argue any other claim. Accordingly, we sustain the Examiner's rejection of claims 1–6.

CONCLUSION

The Examiner's decision rejecting claims 1-6 is affirmed.

DECISION SUMMARY

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1-6	103	Takashi, Dion, Scheirs	1-6	

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

AFFIRMED