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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* YUDING FENG

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Appeal 2019-001291  
Application 14/421,749  
Technology Center 1700

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Before MICHAEL P. COLAIANNI, MONTÉ T. SQUIRE., and  
MERRELL C. CASHION, JR., *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>1</sup> appeals from the Examiner's decision to reject claims 1–3 and 5–7. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART and enter a NEW GROUND OF REJECTION pursuant to 37 CFR § 41.50(b).

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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 the real party in interest as Gates Corporation. Appeal Br. 3.

Appellant's invention is directed to the use of ionomers in rubber articles in dynamic applications such as a power transmission belt (Spec. ¶ 1; Claims 1, 3).

Claims 1 and 3 are representative of the subject matter on appeal:

1. A power transmission belt comprising an elastomeric belt body, said body comprising a rubber composition comprising an ionomeric polymer additive; wherein the ionomeric polymer additive comprises butyl ionomer.
3. A power transmission belt comprising an elastomeric belt body, said body comprising a rubber composition comprising an ionomeric polymer additive; wherein said ionomeric polymer additive comprises polyethylene-methacrylic acid random copolymer wherein said polyethylene-methacrylic acid copolymer has at least a portion of its acid groups neutralized.

Appellant appeals the following rejections:

1. Claims 1 and 2 are rejected under 35 U.S.C. § 103(a) as unpatentable over Arjunan (US 5,281,651, issued Jan. 25, 1994) in view of Resendes (US 2009/0299000 A1, published Dec. 3, 2009).
2. Claims 3 and 5–7 are rejected under 35 U.S.C. § 103(a) as unpatentable over Arjunan in view of Comeau (US 2008/0058121 A1, published Mar. 6, 2008).

Appellant argues claims 1, 2, and 3 separately (App. Br. 10–16). Any claim not argued separately will stand or fall with our analysis of the rejection of claims 1 and 3.

## FINDINGS OF FACT & ANALYSIS

### Rejection (1)

The Examiner's findings and conclusions regarding the rejection of claim 1 over Arjunan and Resendes are located on pages 5 to 6 of the Final Action.

Appellant argues that Arjunan and Resendes do not teach using the butyl ionomer as an additive (App. Br. 12). Appellant contends that the Specification defines "additive" in paragraph 17 as "materials or ingredients in a rubber compound which make up less than 50% by weight of the total compound, preferably less than 100 phr" (App. Br.10). Appellant argues the claim as properly interpreted requires less than 50% (i.e., a minor amount) of a composition be the ionomer (App. Br. 10). Appellant argues that Arjunan and Resendes teach using the butyl ionomer as a base polymer, not an additive (App. Br. 10, 12; Reply Br. 5–8).

Arjunan is silent about the amount of halobutyl rubber used in the composition (col. 7, ll. 29–35). The Examiner finds, however, that Arjunan teaches using from 10 to 70% of the halobutyul rubber in the composition (Ans. 9). The Examiner reasons that Arjunan's column 9, lines 28–32 disclosure teaches that the CR (polychloroprene) and NBR (poly(butadiene-co-acrylonitrile)-nitrile rubber) is typically present in an amount from 30 to 90 parts by weight but most preferably from 70 parts by weight based on the total elastomer content (Ans. 9). The Examiner finds that the balance of the rubber composition would be the halobutyl rubber in the range from 10 to 70 parts by weight (Ans. 7). The Examiner finds that this range of halobutyl overlaps with the recited range based on the definition of what constitutes an "additive" and, thus, would meet the claim (Ans. 7).

The Examiner's finding regarding the amounts of the halobutyl and nitrile rubber in the composition are supported by Arjunan's column 8, lines 30–34 disclosure that the major component of the mixture of elastomers of the present invention is preferably polychloroprene or nitrile rubber in an amount of 30 to 90% by weight based on total elastomer content. In other words, in a binary rubber blend the balance of the elastomer content would range from 10 to 70% by weight based on total elastomer content. Arjunan focuses on binary rubber blends (col. 4, ll. 53–55). Moreover, if a ternary elastomer blend was included then amounts of the third elastomer would have been expected to be a smaller range of the 10 to 70% by weight. In other words, the halobutyl content would have been expected to be used in amount (i.e., less than 50%) that constitutes an “additive” as defined by Appellant.

We have considered Appellant's arguments in the Reply Brief regarding the amounts of the halobutyl being the major component of the polar portion of the blend (Reply Br. 5–8). However, Arjunan's disclosure that the nitrile rubber is the major portion of the blend (i.e., 30 to 90%) undermines that argument. The overlapping range of the minor portion of the component (i.e., 10 to 70%) would have rendered using the halobutyl amount as an additive obvious.

Contrary to Appellant's argument that the Examiner has not provided as reason for the modification proposed in the rejection, the Examiner proposes to substitute Resendes' butyl ionomer for Arjunan's halobutyl rubber because Resendes teaches that the presence of an ionomeric network contributes favorably to the physical properties of peroxide cured vulcanizates (Final Act. 5). The Examiner finds that Arjunan teaches using

peroxides as curing agents (Final Act. 6). Resendes states that although not preferred the compound can include polychloroprene (CR) and ethylene/propylene/diene-copolymers (EPDM) and mixtures thereof (§ 42). In other words, the Examiner provides a reasonable basis for one skilled in the art to use Resendes's butyl ionomer in place of Arjunan's halobutyl rubber and that one skilled in the art would have reasonably expected the substitution to yield a rubber product suitable for Arjunan's purposes. *In re O'Farrell*, 853 F.2d 894, 904 (Fed. Cir. 1988) ("For obviousness under § 103, all that is required is a reasonable expectation of success.").

Regarding claim 2, Appellant argues that Arjunan and Resendes do not teach using up to 50 parts per hundred rubber (phr) (App. Br. 12). Appellant contends that Resendes butyl ionomer would be considered a polar compound and would have been present in Arjunan's composition an amount of 70% because Arjunan teaches that the amount of the polar rubbers would be the major portion of the rubber blend (App. Br. 13).

Appellant does not provide any evidence to substantiate the polarity of the butyl ionomer relative to the polarity of the other rubbers in Arjunan. We are unpersuaded because attorney argument cannot take the place of evidence. *In re Schulze*, 346 F.2d 600, 602 (CCPA 1965). Further, Appellant concedes their speculation regarding the polarity of the butyl ionomer and its addition to Arjunan's blend is conjecture (App. Br. 13).

The preponderance of the evidence favors the Examiner's obviousness conclusion. We affirm the Examiner's § 103 rejection of claim 1 and 2 over Arjunan in view of Resendes.

Rejection (2)

The Examiner's findings and conclusions regarding Arjunan and Comeau are located on pages 3 to 4 of the Answer. The Examiner finds that the Arjunan's compatibilizer EACAA (ethylene/acrylate/acrylic acid) terpolymer is an additive to the rubber composition (Ans. 3). The Examiner finds that Arjunan generally teaches the subject matter of claim 3, except that it does not teach that the terpolymer has a portion of its acid groups neutralized (Ans. 4). The Examiner finds that Comeau teaches that when an acid polymer is neutralized to 70% or higher using a cation source, the resulting highly neutralized polymer (HNP) provides for compositions having improved moisture vapor transmission properties, while maintaining durability, desirable coefficient of restitution, and acceptable melt flow (Ans. 4). The Examiner concludes that it would have been obvious to neutralize the acid groups in the terpolymer of Arjunan as taught by Comeau in order to improve moisture vapor transmission properties while maintaining durability (Ans. 4).

Appellant argues that there is no reason to combine Comeau's teachings regarding a plastic material in the golf ball art with Arjunan's rubber belt composition (App. Br. 13–14). Appellant contends that the properties described in Comeau are all related to a plastic material, not a rubber (App. Br. 14). Appellant contends that Comeau does not teach the HNP as a compatibilizer for polymer blends (App. Br. 14–15). Appellant argues that Comeau's HNP materials are moisture resistant, but there is no suggestion that such properties would be imparted to a rubber composition by adding a minor amount or that Arjunan's elastomer composition needs moisture vapor resistance (App. Br. 15).

We agree with Appellant that there is reversible error in the Examiner's determination of obviousness for this claim. The Examiner fails to explain why moisture vapor resistance that is important in the golf ball art (i.e., Comeau) would have been relevant to Arjunan's rubber belt. Arjunan lists many properties that are important to the belt, but water vapor resistance is not one of them (col. 2, ll. 43–46, 55–57; col. 4, ll. 42–44, 65–68; col. 5, ll. 1–5). The Examiner concedes that Arjunan and Comeau are from different fields of endeavor (Ans. 12). However, the Examiner does not provide an analysis of whether Comeau disclosure is reasonably pertinent to Appellant's problem. See *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004).

The Examiner has not shown that one of ordinary skill in the art would have used Comeau's teachings regarding polymer acid neutralization to affect the moisture vapor resistance properties with Arjunan's disclosure regarding using a terpolymer compatibilizer for an elastomer blend used to make power transmission belts. The Examiner has not explained whether the neutralization of the acid groups on Arjunan's terpolymer compatibilizer would have affected the terpolymer's ability to function as a compatibilizer for the elastomers.

For these reasons, we reverse the Examiner's § 103 rejection of claims 3 and 5–7 over Arjunan in view of Comeau.

#### NEW GROUND OF REJECTION

We enter a new ground of rejection under 35 U.S.C. § 103(a) of claims 6–7 over Arjunan in view of Resendes. Claim 6 recites a dynamic rubber article comprising an elastomeric body wherein said body comprises

a rubber composition comprising an ionomeric polymer additive that comprises either butyl ionomer *or* polyethylene-methacrylic random copolymer with at least a portion of its acid groups neutralized and the ionomeric polymer additive is present in said rubber composition at a concentration of up to 50 phr. Because claim 6 only requires one of the ionomeric polymer additives, we find that the combined teachings of Arjunan and Resendes would have rendered obvious the use of butyl ionomer in belt or hose composition based upon the Examiner’s previous findings regarding Arjunan and Resendes on page 5 to 6 of the Final Action, and pages 4 to 5 of the Answer regarding claim 7.

Accordingly, we enter this new ground of rejection under 35 U.S.C. § 103(a) of claims 6–7 over Arjunan in view of Resendes.

### CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed	New Ground
1, 2	§ 103(a) Arjunan, Resendes	1, 2		
3, 5–7	§ 103(a) Arjunan, Comeau		3, 5–7	
6, 7	§ 103(a) Arjunan, Resendes			6, 7
<b>Overall Outcome</b>		1, 2	3, 5–7	6, 7

This decision contains new grounds of rejection pursuant to 37 C.F.R. § 41.50(b). Section 41.50(b) provides that “[a] new ground of rejection . . . shall not be considered final for judicial review.”

Section 41.50(b) also provides that Appellants, **WITHIN TWO MONTHS FROM THE DATE OF THE DECISION**, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) Reopen prosecution. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner . . . .

(2) Request rehearing. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. 37 C.F.R. § 41.50(b).

Should the Appellants elect to prosecute further before the Examiner pursuant to 37 C.F.R. § 41.50(b)(1), in order to preserve the right to seek review under 35 U.S.C. §§ 141 or 145 with respect to the affirmed rejection, the effective date of the affirmance is deferred until conclusion of the prosecution before the Examiner unless, as a mere incident to the limited prosecution, the affirmed rejection is overcome.

If the Appellants elect prosecution before the Examiner and this does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Patent Trial and Appeal Board for final action on the affirmed rejection, including any timely request for rehearing thereof.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 41.50(f).

AFFIRMED-IN-PART; 37 C.F.R. § 41.50(b)