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EXAMINER

TADAYYON ESLAMI, TABASSOM

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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* JESSE M. MARZULLO and WILLIAM J. BAJOREK

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Appeal 2019-000762  
Application 14/435,654  
Technology Center 1700

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Before JEFFREY T. SMITH, BEVERLY A. FRANKLIN, and  
KAREN M. HASTINGS, *Administrative Patent Judges*.

SMITH, *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, 11, 15, and 16. 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 the real party in interest as Audi AG. Appeal Br. 1.

The following rejections are presented for appeal<sup>2</sup>:

I. Claim 1 is rejected under 35 U.S.C. § 103 as unpatentable over Periyasamy (US 2010/0304266 A1, pub. Dec. 2, 2010), Velev (US 2010/0247908 A1, pub. Sept. 30, 2010), and Denifl (US 2009/0171042 A1, pub. July 2, 2009).

II. Claims 11, 15, and 16 are rejected under 35 U.S.C. § 103 as being unpatentable over Periyasamy, Velev, Denifl, and Kodas (US 2004/0072683 A1, pub. Apr. 15, 2004).

Appellant's invention generally relates to a method of processing a catalyst ink including ultrasonicating the catalyst ink. (Spec. ¶ 4). Claim 1 is illustrative of the subject matter on appeal and is reproduced below:

1. A method of processing a catalyst ink, comprising:
  - ultrasonicating the catalyst ink for a first period of time that is less than one hour to achieve a catalyst particle size of one micron; and
  - after completing the ultrasonicating of the catalyst ink, high shear mixing the catalyst ink for a second period of time that is less than ten minutes, the high shear mixing including:
    - placing the catalyst ink between an exterior cylinder and an interior cylinder, a central axis of the interior cylinder being aligned with a central axis of the exterior cylinder, and the interior cylinder being substantially similar to the exterior cylinder; and
    - distributing ionomer catalyst particles within the catalyst ink by rotating the interior cylinder relative to the exterior cylinder.

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<sup>2</sup> The Examiner withdrew the 35 U.S.C. § 112(a) rejection of claims 1, 11, 15, and 16. (Ans. 3).

OPINION<sup>3</sup>

We have reviewed each of Appellant's arguments for patentability. We will affirm the Examiner's rejections for essentially those reasons expressed by Examiner and below.

The dispositive issue in the present appeal is:

Did the Examiner err in determining that Periyasamy would have suggested a method of processing a catalyst ink including ultrasonicating the catalyst ink for a first period of time of less than one hour and, after completion of the ultrasonicating of the catalyst ink, high shear mixing for a second period of time of less than ten minutes as required by independent claim 1?

We answer this question in the negative.

Appellant argues Periyasamy fails to teach high shear mixing is performed only after completing the ultrasonicating of the catalyst ink, and that ultrasonicating is performed for a period of less than one hour and high-shear mixing is performed thereafter for a period of less than ten minutes, so that the entire process can be completed in under seventy minutes, as also recited in independent claim 1. (App. Br. 6).

The Examiner found Periyasamy in ¶ 71 teaches a method of processing a catalyst ink comprising ultrasonicating the catalyst and

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<sup>3</sup> Appellant has not presented arguments specific to the separate rejection of dependent claims 11, 15, and 16. Consequently, the non-argued claims will stand or fall with independent claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv). We limit our initial discussion to independent claim 1.

subsequently high shear mixing the catalyst ink as required by independent claim 1. (Non-Final Act. 3).

Periyasamy ¶ 71 states:

[T]he dispersion was allowed to warm up to room temperature and equilibrate for 24 hours. After 24 hours, a large sonic horn and a high shear mixer was introduced into the dispersion. The dispersion was chilled to 9 C.° while stirring with the high shear mixer. The chilled dispersion was sonicated a setting of 9 for three minutes with high shear mixing. The dispersion was then allowed to cool for 15 minutes while high shear mixing was continued. Five more cycles of three minutes of sonication followed by 15 minutes of cooling were carried out. The dispersion was allowed to sit overnight.

Periyasamy in ¶ 71 describes a first period of high shear mixing while chilling and mixing ingredients, then allowing the mixture to warm up and reach equilibrium for 24 hours. Thereafter, Periyasamy describes introducing both a sonic horn and a high shear mixer into the resulting dispersion and simultaneously sonicating and high shear mixing the dispersion, then high shear mixing for an additional 15 minutes, and then performing five more cycles of three minutes of sonication. While Appellant's Specification discloses the ultrasonication process is carried out before the high shear mixing, the claimed invention is not limited to this description. The claimed invention utilizes the transitional language "comprising" thus opening the claim to the recited step and any other steps such as mixing of the catalyst ink simultaneous with the ultrasonication step. *See Vehicular Techs. Corp. v. Titan Wheel Int'l, Inc.*, 212 F.3d 1377, 1383 (Fed. Cir. 2000); and *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d

1261, 1271 (Fed. Cir. 1986). Consequently, a reference that teaches sonicating and high shear mixing (i.e., Periyasamy) meets the claimed invention.

Moreover, a person of ordinary skill in the art would have reasonably expected these known processes for treating the catalyst ink could have been performed separately. “[W]hen a patent ‘simply arranges old elements with each performing the same function it had been known to perform’ and yields no more than one would expect from such an arrangement, the combination is obvious.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007) (quoting *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 282 (1976)). Appellant has not directed us to evidence that establishes the ultrasonication step occurring without simultaneous high shear mixing produces unexpected results.

In the absence of unexpected results, a person of ordinary skill in the art would have sufficient skill to select parameters so that the entire process can be completed in under seventy minutes.

Accordingly, for the reasons we stated above, we determine Appellant’s arguments are not persuasive of reversible error.

## CONCLUSION

In summary:

<b>Claims Rejected</b>	<b>Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1	§ 103 Periyasamy, Velev, and Denifl	1	

<b>Claims Rejected</b>	<b>Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
11, 15, and 16	§ 103 Periyasamy, Velev, Denifl, and Kudas	11, 15, and 16	
<b>Overall Outcome</b>		1, 11, 15, and 16	

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). *See* 37 C.F.R. § 41.50(f).

AFFIRMED