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Sigma-Aldrich Co. LLC
C/O EMD Millipore Corporation
Patents Department
400 Summit Drive
Burlington, MA 01803

EXAMINER	
FRITCHMAN, REBECCA M	

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CRAIG AURAND, CHARLES MI, PAUL ROSS, AN TRINH, HILLEL BRANDES, and MICHAEL YE

Appeal 2020-000120
Application 12/019,445
Technology Center 1700

Before JEFFREY B. ROBERTSON, BRIAN D. RANGE, and JANE E. INGLESE, *Administrative Patent Judges*.

ROBERTSON, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

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[1] This Decision includes citations to the following documents: Specification filed January 24, 2008 ("Spec."); Final Office Action mailed May 30, 2018 ("Final Act."); Appeal Brief filed April 1, 2019 ("Appeal Br."); Examiner's Answer mailed July 25, 2019 ("Ans."); and Reply Brief filed September 25, 2019 ("Reply Br.").

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[2] appeals from the Examiner's decision to reject claims 1–8 and 10–13.[3] Appeal Br. 15. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

CLAIMED SUBJECT MATTER

Appellant states the invention relates to a solid phase extraction particle and solid phase extraction techniques of sample preparation for removal of proteins and phosphate-containing compounds. Spec. ¶ 2. Claim 1, reproduced below, is illustrative of the claimed subject matter (Appeal Br., Claims Appendix 24):

> 1. A solid phase extraction (SPE) media for the selective removal of phosphate-containing compounds from a biological composition prior to bioanalytical analysis, the SPE media consisting of:
>
> a. silica substrate particles; and,
>
> b. a transition metal oxide selected from the group consisting of zirconia and titania bonded onto the substrate particles;
>
> wherein the transition metal is bonded onto the substrate through a direct bridging bond with the silica substrate particles, and wherein the SPE media bonds to the phosphate-containing compounds using a Lewis-acid interaction.

[2] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies SIGMA-ALDRICH CO. LLC as the real party in interest. Appeal Br. 3.

[3] Claims 9 and 14–71 have been cancelled. *See* Appeal Br. 7.

Independent claim 10 also stands rejected, and is similarly directed to a solid phase extraction media. *Id.* at 25.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Liu et al. hereinafter "Liu"	US 7,402,243 B2	July 22, 2008
Luca	US 2004/0026324 A1	February 12, 2004
Wilson et al. hereinafter "Wilson"	US 2009/0062234 A1	March 5, 2009
Hatton et al. hereinafter "Hatton"	US 2009/0130412 A1	May 21, 2009

REJECTIONS

1. The Examiner rejected claims 1 and 2 under 35 U.S.C. § 103(a) (pre-AIA) as unpatentable over Wilson, Hatton, and Luca. Final Act. 2–5.
2. The Examiner rejected claims 3–8 and 10–13 under 35 U.S.C. § 103(a) (pre-AIA) as unpatentable over Wilson, Hatton, Luca, and Liu. Final Act. 5–6.

OPINION

Rejection 1

We limit our discussion to claim 1, which is sufficient to dispose of this rejection.

The Examiner's Rejection

In rejecting claim 1 as unpatentable over Wilson, Hatton, and Luca, the Examiner found Wilson discloses compounds that can be used for solid phase extraction (SPE). Final Act. 2. The Examiner found Wilson discloses binding a transition metal oxide to silica support through bridging bond, which is an oxo-metal bridging system. *Id.* The Examiner found Wilson does not disclose attachment/bridging of particulate zirconia or titania. *Id.* at 3. The Examiner found Hatton discloses chemically transforming bridging organic groups in metal oxide materials containing bridging organic groups, as well as transition metals having direct bridging bonds with silica substrates forming a continuous layer of particles aggregated into a layer. *Id.* The Examiner determined it would have been obvious to use bridging bonding of particulate groups as disclosed in Hatton in the composition of Wilson to produce silica materials with controlled porosity, biological sensing, drug delivery, and nanocomposite design. *Id.*

The Examiner found Luca discloses forming a film of a transitional metal mesophase on a silica substrate by dip-coating or by grafting, which is the same method used by Appellant. *Id.* at 4. The Examiner determined it would have been obvious to graft transitional metal mesophase films onto the substrate surface as disclosed in Luca in the method of Hatton and Wilson in order to improve the processes for preparation of transition metal oxide mesophase compositions. *Id.*; Ans. 15.

Appellant's contentions

Appellant argues, *inter alia*, that the prior art does not teach or suggest solid phase extraction media consisting of silica substrate particles and a

transitional metal oxide. Appeal Br. 12. Appellant contends Wilson discloses organopolysiloxanes including organic groups. *Id.* at 12–14. Likewise, Appellant argues Hatton discloses an organic group as an integral and essential component, where Hatton discloses transforming bridging organic groups to terminal groups. *Id.* at 14–16. Appellant argues that the transitional phrase "consisting of" excludes the organic groups that are necessarily present in Wilson and Hatton. Reply Br. 2–4. Appellant argues Luca does not overcome the deficiencies of Wilson and Hatton and Luca does not disclose the conditions necessary to produce a transition metal bonded onto a silica substrate through a direct bridging bond. *Id.* at 4–5; Appeal Br. 18–20.

Discussion

We are persuaded by Appellant's arguments. The Examiner's position is that there is nothing compositionally different between the claims and the combined prior art. *See* Ans. 9–11, 14. However, claim 1 expressly recites "the SPE media *consisting of* . . . silica substrate particles; and . . . a transition metal oxide selected from the group consisting of zirconia and titania bonded onto the substrate particles" (emphasis added). Thus, although claim 1 additionally recites "the transition metal is bonded onto the substrate through a direct bridging bond with the silica substrate particles," claim 1 is closed to the presence of additional organic substituent groups. *In re Gray,* 53 F.2d 520, 521 (CCPA 1931) (holding that "consists" limits a claim to recited elements "without other elements"); MPEP § 2111.03.

Wilson expressly discloses organopolysiloxanes, which include at least one organic group. Wilson ¶¶ 1, 12–13. That is, Wilson discloses Formula I including structural unit "B", which is "always present" and includes a "Q" group bonded to a silicon atom through an ethylene group where "Q is selected from CXYR[1] and RC(Z)." *Id.* at ¶¶ 12–13. Thus, although the Examiner relies on the "known oxo metal bridging systems where the metal is zirconium" in Wilson for the zirconia recited in claim 1 (*see* Final Act. 2; Ans. 3–4;[4] Wilson ¶ 13), which Wilson discloses saturate "free valences of the silicate oxygen atoms" in the organopolysiloxanes disclosed therein (Wilson ¶¶ 12, 13), the Examiner does not sufficiently explain how or why the organopolysiloxanes in Wilson would be modified to omit the required organic group as would be necessary in order to satisfy the transitional phrase "consisting of" recited in claim 1.

In this regard, although Hatton discloses chemically transforming bridging organic groups to bridging oxide groups, the method disclosed in Hatton results in the presence of terminal organic groups. Hatton ¶¶ 75, 79. Thus, to the extent the Examiner relies on Hatton for transforming bridging organic groups (*see* Ans. 11), the Examiner does not sufficiently explain how such a method would be used in conjunction with Wilson such that the resulting material would be devoid of organic groups.

Regarding Luca, although the Examiner states that Luca is the "best reference used" (Ans. 14), the Examiner's statement is in the context of forming transitional metal oxide bonds to substrates (Ans. 14–16), and does

[4] Although the Examiner refers to paragraph 12 of Wilson, the language the Examiner refers to actually appears in paragraph 13 of Wilson.

not account for the organic groups present in Wilson, or Wilson in view of Hatton.

As a result, we reverse the Examiner's rejection of claims 1 and 2.

Rejection 2

As to Rejection 2, the Examiner relies on similar findings and rationale with respect to Wilson, Hatton, and Luca as discussed above, additionally citing Liu for particular particle sizes recited in claims 3–8 and 10–13. Final Act. 5–6.

Accordingly, we reverse the Examiner's rejection of claims 3–8 and 10–13 for similar reasons as discussed above with respect to Rejection 1.

DECISION SUMMARY

In summary:

Claims Rejected	**35 U.S.C. §**	**Reference(s)/Basis**	**Affirmed**	**Reversed**
1, 2	103(a)	Wilson, Hatton, Luca		1, 2
3–8, 10–13	103(a)	Wilson, Hatton, Luca, Liu		3–8, 10–13
Overall Outcome				1–8, 10–13

REVERSED