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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SATOSHI YANAGISAWA, SHOHEI FUJITA, TAKUYA MINAMISHIMA, and KOICHI SHIGENO

Appeal 2018-003021
Application 14/647,683
Technology Center 1600

Before DONALD E. ADAMS, RACHEL H. TOWNSEND, and MICHAEL A. VALEK, *Administrative Patent Judges*.

ADAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from Examiner's decision to reject claims 1–4, 8, 9, and 12.[2] We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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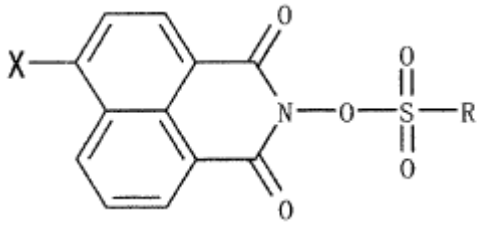
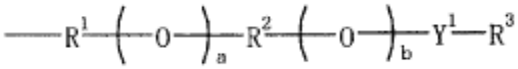
[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as "ADEKA CORPORATION" (Appellant's August 29, 2017 Appeal Brief (Appeal Br.) 1).

[2] Pending claims 5–7, 10, and 11 stand withdrawn from consideration (*see* Examiner's March 29, 2017 Final Action (Final Act.) 2).

STATEMENT OF THE CASE

Appellant's disclosure "relates to a novel sulfonic acid derivative compound. More particularly, the present invention relates to a sulfonic acid derivative compound that is useful as a photoacid generator and as a cationic polymerization initiator" (Spec.[3] 1). Appellant's independent claim 1 is representative and reproduced below:

> 1. A sulfonic acid derivative compound, which is represented by the following Formula (I):
>
> 
>
> (I)
>
> wherein, *X is a linear or branched alkyl group having 1 to 14 carbon atoms*; and *R is* selected from the group consisting of *an aliphatic hydrocarbon group having 1 to 18 carbon atoms*, an aryl group having 6 to 20 carbon atoms, an arylalkyl group having 7 to 20 carbon atoms, an aryl group having 7 to 20 carbon atoms which is substituted with an acyl group, an alicyclic hydrocarbon group having 3 to 12 carbon atoms, 10-camphoryl group and a group represented by the following Formula (II), *which aliphatic hydrocarbon group*, aryl group, arylalkyl group or alicyclic hydrocarbon group *is unsubstituted or substituted with one or more* selected from the group consisting of a halogen atom, *a halogenated alkyl group having 1 to 4 carbon atoms*, an alkoxy group having 1 to 18 carbon atoms and an alkylthio group having 1 to 18 carbon atoms
>
> 
>
> (II)
>
> wherein, Y^1 is a single bond or an alkanediyl group having 1 to 4 carbon atoms; R^1 and R^2 each is independently selected from the group consisting of an alkanediyl group

[3] Appellant's May 27, 2015 Specification.

> having 2 to 6 carbon atoms, a halogenated alkanediyl group having 2 to 6 carbon atoms, an arylene group having 6 to 20 carbon atoms and a halogenated arylene group having 6 to 20 carbon atoms; R^3 is selected from the group consisting of a linear or branched alkyl group having 1 to 18 carbon atoms, a halogenated linear or branched alkyl group having 1 to 18 carbon atoms, an alicyclic hydrocarbon group having 3 to 12 carbon atoms, an aryl group having 6 to 20 carbon atoms, a halogenated aryl group having 6 to 20 carbon atoms, an arylalkyl group having 7 to 20 carbon atoms and a halogenated arylalkyl group having 7 to 20 carbon atoms; a and b each represent 0 or 1; and at least one of a and b is 1.

(Claims App.[4] 1–2 (emphasis added).)[5]

Grounds of rejection before this Panel for review:

Claims 1–4, 8, 9, and 12 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Dautel,[6] Kim,[7] Kazuki,[8] and Murai '011.[9]

Claims 1–4, 8, 9, and 12 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the claims of Murai '268,[10] in view of Dautel, Kim, and Kazuki.

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[4] Claims Appendix of Appellant's August 29, 2017 Appeal Brief.
[5] In response to Examiner's August 12, 2016 Requirement for Restriction and Species Election, Appellant elected compounds of formula I, wherein X is an alkyl chain and R is an alkyl (*see* Appellant's October 12, 2016 Reply to Restriction Requirement, Election of Species Requirement and Preliminary Amendment 5–6).
[6] Dautel et al., US 2011/0229821 A1, published Sept. 22, 2011.
[7] Kim et al., US 8,748,894 B2, issued June 10, 2014.
[8] Kazuki et al., JP 2010053121 (A), issued Mar. 11, 2010.
[9] Murai et al., WO 2011/087011 A1, published July 21, 2011.
[10] Murai et al., US 8,680,268 B2, issued Mar. 25, 2014.

Obviousness:

ISSUE

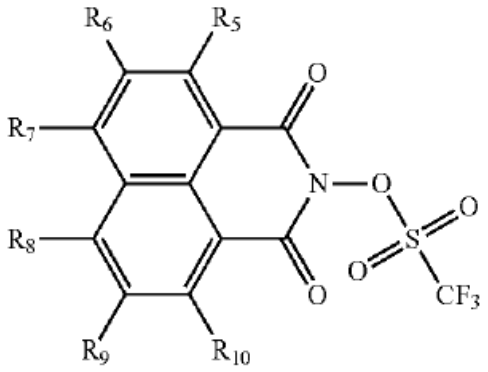
Does the preponderance of evidence relied upon by Examiner support a conclusion of obviousness?

FACTUAL FINDINGS (FF)

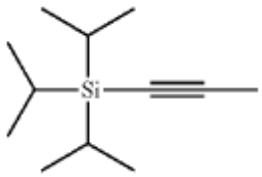
FF 1. Dautel "relates to a process for the hydrolysis-polycondensation of a sterically hindered crosslinkable chromophore, characterized in that the hydrolysis-polycondensation is catalyzed with an acid released by a photoacid generator (PAG)" (Dautel, Abstract).

FF 2. Dautel discloses that a NIOTf derivative of the following formula may be used as the PAG:

formula (A)

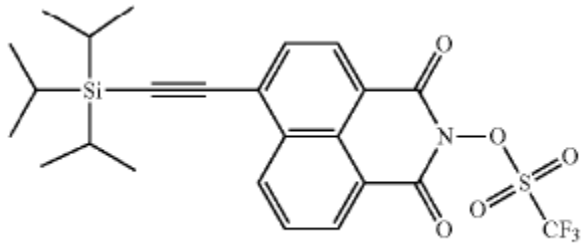


with R_5 to R_{10}, independently of each other, possibly being chosen from, *inter alia*, H, CH_3, C_5 to C_{20} alkyl, linear C_1 to C_4 alkyl, and



(*see* Dautel ¶¶ 55–59 and 63–66; *see* Ans. 4).

FF 3. Dautel discloses that a PAG within the scope of its formula (A) includes TIPSA-NIOTf, which has the following formula:



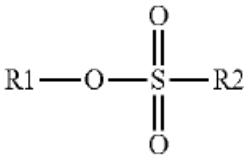
TIPSA-NIOTf

(*see* Dautel ¶ 67; *see also* ¶ 68 (Dautel discloses that TIPSA-NIOTf is a particularly preferred PAG)).

FF 4. Examiner finds that Dautel does not exemplify a composition comprising an alkyl in the R_7 position (i.e., the X position of Appellant's formula (I)) (*see* Ans. 8).

FF 5. Kim discloses a PAG having the following formula:

[Chemical Formula 1]

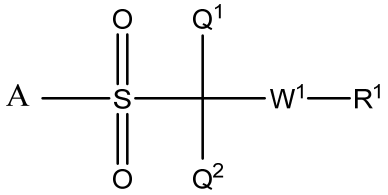


wherein

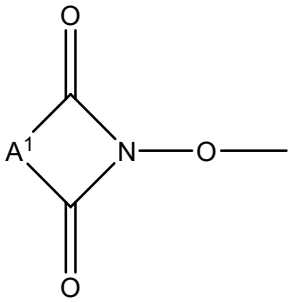
R1 is one selected from the group consisting of ester group, ether group, thioether group, amide group and carbonate group, wherein the carbon number of each group is not more than 20. Especially, R1 may be monovalent hydrocarbon with an aromatic hydrocarbon structure. R1 may be monovalent hydrocarbon with a cycloaliphatic hydrocarbon structure whose carbon number is not less than 5.

(Kim 4:50–67; *see* Ans. 5.)

FF 6. Kazuki discloses a PAG of the following formulae:



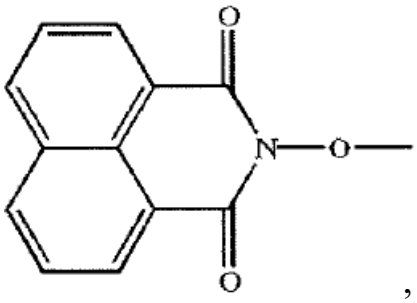
(I)



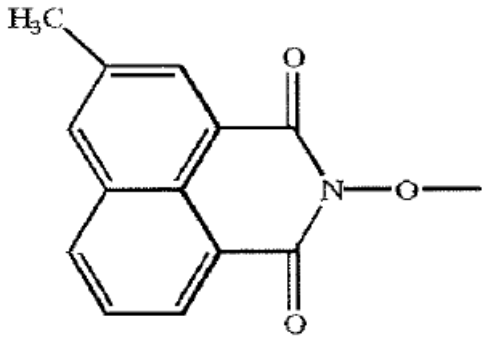
(I-1)

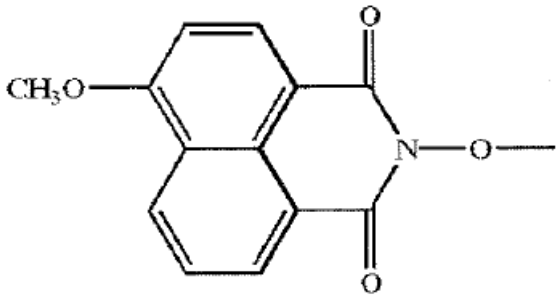
wherein, R^1 is a 1–20 C aliphatic hydrocarbon group, a 5–10 C aryl group or the like; W^1 is -CO-O-, -O-CO-, -CH_2-O, -O-CH_2- or the like; Q^1 and Q^2 are each H, F, 1–6 C alkyl or the like; A is a group of formula (I-1); and A^1 is -CH_2-CH_2-, -CH_2-CH_2-CH_2-, -CH=CH- or -CH=CH-CH_2- (Kazuki, Abstract; *see* Ans. 5–6).

FF 7. Examiner finds that Kazuki discloses that the A substituent of its formula I may also have a tricyclic core or "a group similar to [a] camphoric group," including those of the following formulae:

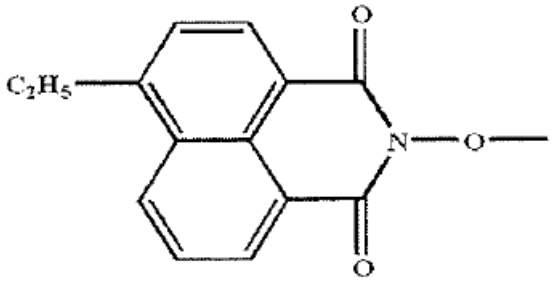


,



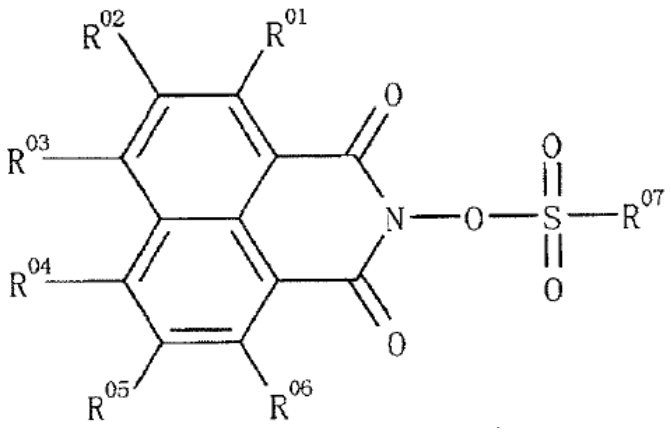


, and



(*see* Ans. 6–7 (citing Kazuki ¶¶ 32, 33, and 46).)

FF 8. Murai '011 discloses a photoacid generator having the formula:

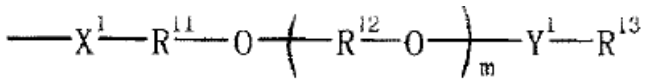


(I)

> wherein R^{01}, R^{04}, R^{05} and R^{06} represent a hydrogen atom, one of R^{02} and R^{03} represent a carbon number 4-18 alkoxy group which may be substituted with an alicyclic hydrocarbon group, a heterocyclic group or a halogen atom and which may have a branch, and R^{07} is a carbon number l-18 aliphatic hydrocarbon group which may be substituted by a halogen atom and/or an alkylthio group carbon atoms.

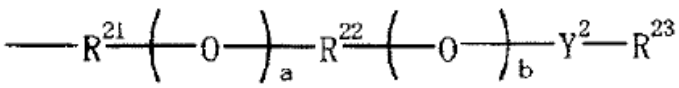
(Murai '011, Abstract.)

FF 9. Examiner finds that Murai '011 discloses that the R^{07} substituent may also have the formula:



(A)

or



(B)

(*see* Ans. 8 (citing Murai '011 4).)

ANALYSIS

Examiner finds that Dautel discloses a PAG having formula (A), wherein R_5 to R_{10} can be H or a linear or branched alkyl (Ans. 9; *see* FF 2). Examiner further finds that although Dautel does not exemplify a PAG having an alkyl at position R_7 (i.e., the X position of Appellant's formula (I)), the prior art relied upon by Examiner, including Dautel, discloses "several compounds that do [exemplify] a substituent at exactly that position" (Ans. 9; *see* FF 2–9).

Based on the combination of Dautel, Kim, Kazuki, and Murai '011, Examiner concludes that, at the time Appellant's invention was made, it

would have been prima facie obvious to prepare a compound within the scope of Dautel's formula (A), wherein R_5, R_6, and R_8–R_{10} are H and R_7 is an alkyl group (*see* Ans. 9).

We find no error in Examiner's conclusion of obviousness. On this record, Dautel discloses a PAG having the generic formula set forth in formula A and expressly directs those of ordinary skill in the art to modify formula A with a hydrogen at positions R_5, R_6, and R_8–R_{10} and alkyl at R_7 (*see* FF 2; *see also* Ans. 9). To the extent that a person of ordinary skill in this art would question whether a non-hydrogen modification could be made to the R_7 position of Dautel's formula (A), we note that Dautel expressly discloses a compound with a specific modification at the R_7 position of its formula (A) (*see* FF 3; *see also* FF 2).

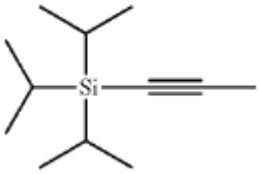
We are mindful that our reviewing court has articulated a two-part inquiry into whether a claimed chemical compound would have been obvious over particular prior art compounds. Under this "lead compound analysis," we must first "determine[] whether a chemist of ordinary skill would have selected the asserted prior art compounds as lead compounds, or starting points, for further development efforts." *Otsuka Pharm. Co. v. Sandoz, Inc.*, 678 F.3d 1280, 1291 (Fed. Cir. 2012). "The second inquiry in the analysis is whether the prior art would have supplied one of ordinary skill in the art with a reason or motivation to modify a lead compound to make the claimed compound with a reasonable expectation of success." *Id.* at 1292.

"It should be noted[, however,] that the lead compound cases do not stand for the proposition that identification of a single lead compound is necessary in every obviousness rejection of a chemical compound." *See*

MPEP § 2143; *see generally Ex Parte Cao*, Appeal No. 2010-004081, 2011 WL 4434514, at *5 (PTAB Sept. 19, 2011) ("A 'lead compound' analysis is not the exclusive test for compound obviousness.") (Non-precedential). *See also In re Deuel*, 51 F.3d 1552, 1558 (Fed. Cir. 1995) ("Normally a prima facie case of obviousness is based upon structural similarity, i.e., an established structural relationship between a prior art compound and the claimed compound. Structural relationships may provide the requisite motivation or suggestion to modify known compounds to obtain new compounds.").

Although we find that a lead compound analysis is not necessary on this record, we nonetheless find that such an analysis leads to the same conclusion—Appellant's claimed invention is obvious in view of the combination of Dautel, Kim, Kazuki, and Murai '011.

Applying the first step of the lead compound analysis, there can be no doubt that Dautel discloses a specific PAG compound, TIPSA-NIOTf, which falls within the scope of Dautel's formula (A), wherein the substituent at the R_7 position of formula (A) is



(*see* FF 3; *see also* FF 2). Thus, "a chemist of ordinary skill would have selected TIPSA-NIOTf as a lead compound, or starting point, for further development efforts." *Otsuka Pharm. Co. v. Sandoz, Inc.*, 678 F.3d at 1291. Dautel itself goes further to suggest alternative substituents for the R_7 position of formula (A) that include: H, C_5 to C_{20} alkyl, or linear C_1 to C_4 alkyl (*see* FF 2). In addition, Kazuki discloses PAG compounds having

similar alkyl modifications to the same position of a similar ring structure (*see* FF 7). Thus, a person of ordinary skill in the art would have found it prima facie obvious to modify the R_7 position of Dautel's formula (A) with any one of the substituents Dautel discloses as appropriate for this position, e.g., C_5 to C_{20} alkyl, or linear C_1 to C_4 alkyl (*see* FF 2). *See Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 335 (1945) ("Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put into the last opening in a jig-saw puzzle. It is not invention."). For these reasons, the prior art relied upon by Examiner satisfies the second step of the lead compound analysis, wherein "the prior art . . . supplied one of ordinary skill in the art with a reason or motivation to modify a lead compound to make the claimed compound with a reasonable expectation of success." *Otsuka Pharm. Co. v. Sandoz, Inc.*, 678 F.3d at 1292.

Claim 1:

Appellant's independent claim 1 is reproduced above.

For the foregoing reasons, we are not persuaded by Appellant's contention that "[i]t would not be obvious to try substituting only R7 or R8, and only with one of the substituents of X from the presently claimed invention" (Appeal Br. 7). For the same reasons, we are not persuaded by Appellant's contention that "one of ordinary skill in the art does not even have motivation to select the specific 'core' the Examiner delineated from the present invention" (Reply Br. 4).

For the reasons set forth above, we are not persuaded by Appellant's contentions regarding lead compound analysis (Reply Br. 4–6).

For the foregoing reasons, we are not persuaded by Appellant's intimation that a person of ordinary skill in this art would not have modified the R_7 position of Dautel's formula (A) with an aryl group because Dautel discloses that TIPSA-NIOTf, a compound with an R_7 position modification that does not fall within the scope of Appellant's claimed invention, is a particularly preferred PAG (*see* Appeal Br. 8; Reply Br. 3–4; *see also* FF 3). *See In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976) (A reference disclosure is not limited only to its preferred embodiments, but is available for all that it discloses and suggests to one of ordinary skill in the art.). In addition, notwithstanding Appellant's contention to the contrary, the R_7 position substituent of Dautel's TIPSA-NIOTf compound was selected from the specific substituents Dautel discloses as being useful for such a modification (*see* FF 2–3). This group of substituents also includes alkyl substituents and, thus, suggests to a person of ordinary skill in this art the modification of the R_7 position of Dautel's formula (A) with an alkyl, within the scope of Appellant's claim 1.

Examiner relied upon Kim, Kazuki, and Murai '011 to illustrate that those of ordinary skill in this art recognized that structurally similar PAGs may be extensively modified, including modifications in similar positions to Appellant's claimed invention (*see generally* FF 5–9). Nonetheless, because Dautel suggests a compound within the scope of Appellant's claimed invention, we are not persuaded by Appellant's contention that Kim, Kazuki, and Murai '011 fail to make up for Appellant's alleged deficiency in Dautel (*see* Appeal Br. 8–9; *cf.* FF 1–3).

For the foregoing reasons, we are not persuaded by Appellant's contention that Examiner's conclusion of obviousness is based on improper hindsight (*see* Appeal Br. 6 and 9; *see also* Reply Br. 5).

In addition, we note that Appellant's claimed invention does not require the compound to exhibit a particular degree of activity. Therefore, we are not persuaded by Appellant's contention that "[t]he references themselves teach that different compounds have different levels of activity" (Reply Br. 3).

Claim 2:

Appellant's claim 2 depends from and further limits the X substituent of Appellant's claim 1 to "an alkyl group having 4 carbon atoms" (Claims App. 2).

For the reasons set forth above, we are not persuaded by Appellant's contention that "[t]here is no motivation to select a lead compound of Formula (A) of Dautel" (Appeal Br. 9).

Dautel expressly suggests modifying any of positions R_5–R_7 of its formula (A) with a linear C_1 to C_4 alkyl, and more specifically suggests a modification to position R_7 of its formula (A) (i.e., position X of Appellant's claimed invention) (*see* FF 2–3). Therefore, we are not persuaded by Appellant's contention that "there is no motivation to select X as an alkyl group having 4 carbon atoms" (Appeal Br. 9).

Having found no deficiency in Dautel, we are not persuaded by Appellant's contention that Kim, Kazuki, and Murai '011 fail to make up for Appellant's alleged deficiency in Dautel (*id.* at 10).

Claim 3:

Appellant's claim 3 depends from and further limits the R substituent of Appellant's claim 1 to "a perfluoroalkyl group having 1 to 8 carbon atoms" (Claims App. 2).

For the foregoing reasons, we are not persuaded by Appellant's contention that "[t]here is no motivation to select a lead compound with fluoroalkylsulfonyloxy derivatives as in Formula (A) of Dautel" or "make the molecular modifications asserted by the Examiner to Formula (A) of Dautel" (Appeal Br. 10).

Claim 12:

Appellant's claim 12 depends from and further limits the X substituent of Appellant's claim 1 to "a linear or branched alkyl group having 3 to 8 carbon atoms" (Claims App. 2).

Dautel expressly suggests modifying any of positions R_5–R_7 of its formula (A) with a linear C_1 to C_4 alkyl, and more specifically suggests a modification to position R_7 of its formula (A) (i.e., position X of Appellant's claimed invention) (*see* FF 2–3). Therefore, we are not persuaded by Appellant's contention that "there is no motivation to select X as a linear . . . alkyl group having 3 to 8 carbon atoms" (Appeal Br. 10).

Having found no deficiency in Dautel, we are not persuaded by Appellant's contention that Kim, Kazuki, and Murai '011 fail to make up for Appellant's alleged deficiency in Dautel (*id.* at 10).

CONCLUSION

The preponderance of evidence relied upon by Examiner supports a conclusion of obviousness. The rejection of claims 1–3 and 12 under 35

U.S.C. § 103(a) as unpatentable over the combination of Dautel, Kim, Kazuki, and Murai '011 is affirmed. Claim 4 is not separately argued and fall with claim 1. Claim 8 is not separately argued and falls with claim 2. Claim 9 is not separately argued and falls with claim 3.

Non-statutory Double Patenting:

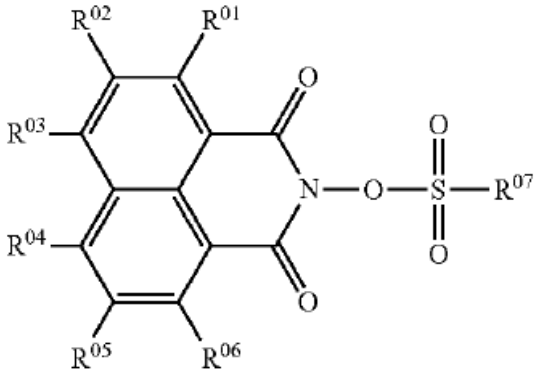
ISSUE

Does the preponderance of evidence relied upon by Examiner support a conclusion of obviousness-type double patenting?

FACTUAL FINDINGS (FF)

FF 10. FF 1–7 are incorporated herein by reference.

FF 11. Murai '268 claims a sulfonic acid derivative compound having formula:



wherein R^{01}, R^{02}, and R^{04}–R^{06} may be hydrogen, R^{03} may be an optionally substituted alkoxy group having a carbon number of 4–18, and R^{07} is a perfluoroalkyl group having a carbon number of 1 to 8 (*see* Murai '268 49:17–52 and 50:41–43).

ANALYSIS

Initially, we note that Murai '268 claims a compound having the same generic structure as is set forth in Dautel's formula (A) (*see* FF 11; *cf.* FF 2).

Although Murai '268 discloses an alkoxy group at the R^{03} position (which corresponds to Dautel's R^7 position and position X of Appellant's claimed invention), for the reasons discussed above, Dautel makes clear that this position may be C_5 to C_{20} alkyl or linear C_1 to C_4 alkyl (*see also* FF 2–3).

Therefore, we find no error in Examiner's conclusion that Appellant's claimed invention is obvious in view of the claims of Murai '268, in view of Dautel, Kim, and Kazuki (*see* Ans. 10–11).

Claim 1:

Appellant's independent claim 1 is reproduced above.

For the foregoing reasons, we are not persuaded by Appellant's contention that none of the R^{03} substituents set forth in Murai '268's claim 1 fall within Appellant's claimed invention and, therefore, Murai '268 teaches away from the X group substituents of Appellant's claim 1 (Appeal Br. 10–11). Simply stated, Appellant's contention fails to account for the contributions of Dautel, Kim, and Kazuki in the rejection over the claims of Murai '268 in combination with Dautel, Kim, and Kazuki.

As discussed above, a reference disclosure is not limited only to its preferred embodiments, but is available for all that it discloses and suggests to one of ordinary skill in the art. *See In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976). Therefore, we are not persuaded by Appellant's contention that "Dautel expresses a marked preference for alkenyl substitution" (Appeal Br. 11).

For the foregoing reasons, we are not persuaded by Appellant's contentions that "none of the reasons provided by the Examiner amount to

proper motivation for combining . . . [the claims of Murai '268] with the secondary prior art references of Dautel, Kim and [Kazuki]" or that "[t]he secondary references have been identified by hindsight and combining them with the claims . . . [of Murai '268] would not result in . . . [Appellant's claimed] sulfonic acid derivative compound" (*id.*).

Claim 2:

Appellant's claim 2 depends from and further limits the X substituent of Appellant's claim 1 to "an alkyl group having 4 carbon atoms" (Claims App. 2).

For the reasons set forth above, we are not persuaded by Appellant's contention that "[t]here is no motivation to make the molecular modifications asserted by the Examiner" (Appeal Br. 11).

As discussed above, the claims of Murai '268 expressly suggest modifying position X of Appellant's claimed structure with an alkoxy (*see* FF 11). In addition, Dautel suggests modifying position X of Appellant's claimed structure with a linear C_1 to C_4 alkyl (*see* FF 2–3). Therefore, we are not persuaded by Appellant's contention that "there is no motivation to select X as an alkyl group having 4 carbon atoms" (Appeal Br. 11).

Having found no deficiency in the combination of the claims of Murai '268 and Dautel, we are not persuaded by Appellant's contention that Kim and Kazuki fail to make up for Appellant's alleged deficiency in the combination of the claims of Murai '268 and Dautel (*id.*).

Claim 3:

Appellant's claim 3 depends from and further limits the R substituent of Appellant's claim 1 to "a perfluoroalkyl group having 1 to 8 carbon atoms" (Claims App. 2).

Murai '268 expressly claims a modification of position R^{07} of its formula with a perfluoroalkyl group having a carbon number of 1 to 8 (*see* FF 11). Therefore, we are not persuaded by Appellant's contention that "there is no motivation to select R as a perfluoroalkyl group having 1 to 8 carbon atoms" (Appeal Br. 11).

For the foregoing reasons, we are not persuaded by Appellant's contention that "[t]here is no motivation to make the molecular modifications asserted by the Examiner" (*id.*).

Claim 12:

Appellant's claim 12 depends from and further limits the X substituent of Appellant's claim 1 to "a linear or branched alkyl group having 3 to 8 carbon atoms" (Claims App. 2).

As discussed above, the claims of Murai '268 expressly suggest modifying position X of Appellant's claimed structure with an alkoxy (*see* FF 11). In addition, Dautel suggests modifying position X of Appellant's claimed structure with a linear C_1 to C_4 alkyl (*see* FF 2–3).

Therefore, we are not persuaded by Appellant's contention that "[t]here is no motivation to make the molecular modifications asserted by the Examiner" or "to select X as a linear . . . alkyl group having 3 to 8 carbon atoms" (Appeal Br. 12).

Having found no deficiency in the combination of the claims of Murai '268 with Dautel, we are not persuaded by Appellant's contention that Kim and Kazuki fail to make up for Appellant's alleged deficiency in the combination of the claims of Murai '268 with Dautel (*id.*).

CONCLUSION

The preponderance of evidence relied upon by Examiner supports a conclusion of obviousness-type double patenting. The rejection of claims 1–3 and 12 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the claims of Murai '268, in view of Dautel, Kim, and Kazuki is affirmed. Claim 4 is not separately argued and fall with claim 1. Claim 8 is not separately argued and falls with claim 2. Claim 9 is not separately argued and falls with claim 3.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–4, 8, 9, 12	103	Dautel, Kim, Kazuki, Murai '011	1–4, 8, 9, 12	
1–4, 8, 9, 12		Non-statutory Double Patenting	1–4, 8, 9, 12	
Overall Outcome			1–4, 8, 9, 12	

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. § 1.136(a).

AFFIRMED