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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte LIN ZHI

Appeal 2019-003511
Application 15/070,718
Technology Center 1600

Before FRANCISCO C. PRATS, TAWEN CHANG, and DAVID COTTA,
Administrative Patent Judges.

PRATS, *Administrative Patent Judge.*

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to finally reject claims 1–3, 6–8, 14–18, 21, and 22. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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 Ligand Pharmaceuticals, Inc. Appeal Br. 4.

STATEMENT OF THE CASE

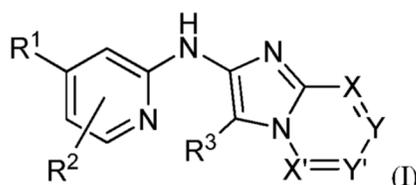
The following rejections are before us for review:

(1) Claims 1–3, 6–8, 14–18, 21, and 22, under 35 U.S.C. § 103(a) as being unpatentable over Swinnen² (Final Act. 3–5); and

(2) Claims 1–3, 6, 7, 14–18, and 22, under 35 U.S.C. § 103(a) as being unpatentable over Taniyama³ (Final Act. 11–13).

Claim 1 is illustrative and reads as follows:

1. A compound of Formula I:



or a pharmaceutically acceptable salt, ester, amide, or prodrug thereof, wherein

X is CR^{4a};

X' is CR^{4b};

Y is N;

Y' is CR^{5b};

R¹ is selected from the group consisting of hydrogen, halogen, -OR⁶, -CN, -NR⁷R⁸, -CH₂OR⁶, -CH₂NR⁷R⁸, an optionally substituted C₁₋₆ alkyl, an optionally substituted C₁₋₆ haloalkyl, an optionally substituted C₂₋₆ alkenyl, an optionally substituted C₂₋₆ alkynyl, an optionally substituted (5 to 7 membered heterocycl)alkyl, an optionally substituted 5 to 7 membered heterocycl, an optionally substituted aralkyl; an optionally substituted (5 or 6 membered heteroaryl)alkyl, an optionally substituted C₁₋₆ heteroalkyl, -C(=O)R⁶, -C(=O)OR⁶, -C(=O)NR⁷R⁸, -NHC(=O)R⁶, -SO₂R⁶, and -SO₂NR⁷R⁸;

² WO 2010/100144 A1 (published Sept. 10, 2010).

³ EP 2 277 881 A1 (published Jan. 26, 2011).

each of R², R³, R^{4a} and R^{4b} is independently selected from the group consisting of hydrogen, halogen, C₁₋₆ alkyl, OH, and C₁₋₆ alkoxy;

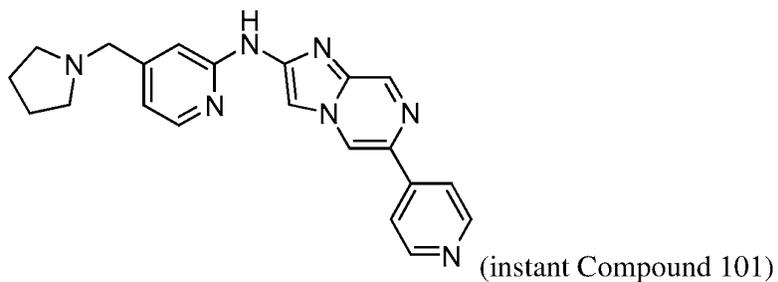
R^{5b} is selected from the group consisting of an optionally substituted aryl, an optionally substituted 5 to 10 membered heteroaryl, an optionally substituted 5-10 membered heterocyclyl, and an optionally substituted C₃₋₇ carbocyclyl;

each R⁶ is independently selected from hydrogen, an optionally substituted C₁₋₁₀ alkyl, an optionally substituted C₁₋₁₀ haloalkyl, or an optionally substituted C₁₋₆ heteroalkyl; and

each R⁷ and R⁸ is independently selected from hydrogen; an optionally substituted C₁₋₁₀ alkyl; an optionally substituted C₁₋₁₀ haloalkyl; or an optionally substituted C₁₋₆ heteroalkyl; or R⁷ and R⁸ are joined together with the nitrogen atom to which they are attached to form an optionally substituted C₃₋₇ cycloalkyl or 3 to 7 membered heterocyclyl ring.

Appeal Br. 26–27.

In response to a species election requirement, Appellant elected the following compound for prosecution on the merits:



See Appeal Br. 7; *see also* Final Act. 2 (noting that Appellant elected compound 101 and that “[c]laims 1–3, 6–8, 14–18, 21, and 22 are examined herein on the merits so far as they read on the elected species”).

Accordingly, we limit our analysis to the patentability of the elected compound, and the extent to which the appealed claims read on it. *See Ex parte Ohsaka*, 2 USPQ2d 1460, 1461 (BPAI 1987).

OBVIOUSNESS—SWINNEN

The Examiner's Prima Facie Case

The Examiner's position, essentially, is that Swinnen discloses a generic formula that encompasses Appellant's elected compound 101, when one selects the correct substituents at the appropriate positions of Swinnen's generic formula. *See* Final Act. 3–4 (finding that Swinnen's formula I-e has the same bicyclic ring structure as Appellant's compound 101 and that positions R^a and R^b of Swinnen's formula I-e include substituents corresponding to Appellant's compound 101).

The Examiner conceded that Swinnen's formula I-e differs in a number of respects from Appellant's compound 101, including in that Swinnen's formula I-e has a carbonyl moiety in place of the secondary amine of Appellant's compound 101. Final Act. 4. The Examiner concluded, nonetheless, that Appellant's compound 101 would have been obvious, because Swinnen's most generic formula I includes the substituents of Appellant's compound 101 among the functional groups useful at the corresponding positions of Swinnen's compounds. *Id.* at 5.

In particular, the Examiner reasoned:

It would have been obvious . . . to select any of the species of the genus of Formula (I) taught by the reference, including those instantly claimed, because the skilled chemist would have the reasonable expectation that any of the species of the genus would have similar properties, and thus, the same use as taught for the genus as a whole. One of ordinary skill in the art would have been motivated to select the claimed compounds from the genus of Formula (I) in the reference since such compounds would have been suggested by the reference as a whole. *A prior art disclosed genus of useful compounds is sufficient to render prima facie obvious a species falling within a genus.*

Id. at 5 (emphasis added).

Analysis

As stated in *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992):

[T]he examiner bears the initial burden . . . of presenting a *prima facie* case of unpatentability. . . .

After evidence or argument is submitted by the applicant in response, patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument.

In the present case, having carefully considered the evidence and arguments presented by Appellant and the Examiner, Appellant persuades us that the Examiner has not shown by a preponderance of the evidence that Appellant's compound 101 would have been obvious in view of Swinnen. In particular, we are not persuaded that a "prior art disclosed genus of useful compounds is sufficient to render *prima facie* obvious a species falling within a genus," as the Examiner contends. Final Act. 5.

To the contrary, the MPEP states expressly that "[t]he fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness." MPEP § 2144.08.II (citing *In re Baird*, 16 F.3d 380, 382 (Fed. Cir. 1994) ("The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious."); *In re Jones*, 958 F.2d 347, 350 (Fed. Cir. 1992) (The Federal Circuit has "decline[d] to extract from *Merck [& Co. v. Biocraft Laboratories Inc.*, 874 F.2d 804 (Fed. Cir. 1989)] the rule that . . . regardless of how broad, a disclosure of a chemical genus renders obvious any species that happens to fall within it.")).

In both *Baird* and *Jones*, our reviewing court reversed rejections similar to the present rejection, in which the rejected compounds were encompassed by large genera that included millions of compounds, but the prior art did not suggest selecting from those genera the particular species of compound recited in the claims at issue. *See In re Baird*, 16 F.3d at 382–83; *In re Jones*, 958 F.2d at 350–51; *see also* MPEP § 2144.08.II.A.4 (consistent with *Baird* and *Jones* factors to be considered when determining whether skilled artisan would have been motivated to select a particular species include (a) the size of the genus, (b) the express teachings in the reference, (c) the teachings of structural similarity including preferences and the number of variables that require modification, (d) the teachings of similar properties or uses, (e) the predictability of the technology, and (f) other teachings in the art suggesting that, based on the totality of the evidence, a skilled artisan would have selected the species under examination).

Here, like in *Baird* and *Jones*, formula I of Swinnen describes a genus of compounds that encompasses numerous distinct species. *See Swinnen* 1–8. Given the large number of distinct substituents listed for the various substitutable positions, we discern no error in Appellant’s contention, undisputed by the Examiner, that Swinnen’s formula I encompasses millions of species of compounds. *See Appeal Br.* 13.

Like the situation in *Baird* and *Jones*, moreover, we are not persuaded that the Examiner has provided a sufficient evidentiary basis that explains why, out of the large number of species encompassed by the genus described in Swinnen, a skilled artisan would have selected Appellant’s elected compound 101. *See MPEP* § 2144.08.II.A.5 (When asserting that an examined species is obvious over a prior art genus, the Examiner’s “fact-

findings should specifically articulate what teachings or suggestions in the prior art would have motivated one of ordinary skill in the art to select the claimed species or subgenus.”).

In particular, when responding to Appellant’s arguments, the Examiner identifies no specific teaching in Swinnen as to any preferred or exemplified embodiments that might suggest Appellant’s elected compound 101. Rather, the Examiner simply notes repeatedly that, among the multitude of potential combinations of substitutions described by Swinnen, one may arrive at elected compound 101 by selecting the appropriate substituents at a number of substitutable positions of Swinnen’s formula I, including positions U, V, X, and Y. *See* Ans. 4–8. As noted above, however, “[t]he fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness.” MPEP § 2144.08.II.

We acknowledge, as the Examiner contends, that in an obviousness evaluation “consideration of a reference is not limited to the preferred embodiments or working examples, but extends to the entire disclosure for what it fairly teaches, when viewed in light of the admitted knowledge in the art, to person of ordinary skill in the art.” Ans. 8 (citing MPEP § 2123). Again, however, given the large number of highly different potential combinations of functional groups encompassed by Swinnen’s genus, the mere fact that one might arrive at Appellant’s elected compound 101 by a hindsight-guided selection of appropriate substituents does not persuade us that Swinnen would have rendered compound 101 obvious to a skilled artisan. *See In re Baird*, 16 F.3d at 382–83; *In re Jones*, 958 F.2d at 350–51; MPEP § 2144.08.

We acknowledge the Examiner's finding that Swinnen's formula I-e, a subgenus of Formula I, includes the specific bicyclic structure in Appellant's elected compound 101. *See* Ans. 4–8. As Appellant points out, however, instead of the secondary amine linker in Appellant's elected compound 101 (*see* Appeal Br. 7), Swinnen's formula I-e contains a carbonyl moiety in the corresponding position (*see* Swinnen 6 (formula I-e)). Thus, to arrive at Appellant's compound 101 from Swinnen's formula I-e, a skilled artisan not only would have had to ignore the carbonyl moiety in formula I-e and instead look to Swinnen's more generic formula I as to suitable groups at that location (position X), a skilled artisan would also have had to select from the numerous potential substituents at positions R^a and R^b that may be substituted in formula I-e. *See* Swinnen 1–5.

As our reviewing court has explained, consistent with the flexible principles of obviousness enunciated in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007), to demonstrate that a claimed compound would have been obvious, “a showing that the prior art would have suggested making *the specific molecular modifications* necessary to achieve the claimed invention [i]s also required.” *Takeda Chemical Industries, Ltd. v. Alphapharm Pty., Ltd.*, 492 F.3d 1350, 1357 (Fed. Cir. 2007) (internal quotations omitted, emphasis added). We are not persuaded that the Examiner has identified sufficient evidence that suggests making the particular set of selections and modifications to Swinnen that would be required to arrive at Appellant's elected compound 101. Again, the mere fact that one might arrive at Appellant's elected compound 101 by a hindsight-guided selection of appropriate substituents from Swinnen's large genus does not persuade us that Swinnen would have rendered compound 101 obvious to a skilled

artisan. *See In re Baird*, 16 F.3d at 382–83; *In re Jones*, 958 F.2d at 350–51; MPEP § 2144.08.

In sum, for the reasons discussed, we are not persuaded that the Examiner has shown by a preponderance of the evidence that Appellant's compound 101 would have been obvious in view of Swinnen. We, therefore, reverse the Examiner's rejection of claims 1–3, 6–8, 14–18, 21, and 22 for obviousness over Swinnen.

OBVIOUSNESS—TANIYAMA

The Examiner's Prima Facie Case

The Examiner's position, essentially, is that Taniyama discloses a generic formula that encompasses Appellant's elected compound 101, when one selects the correct substituents at the appropriate positions of Taniyama's generic formula IV. *See* Final Act. 11–12 (finding that Taniyama's formula IV has the same bicyclic ring structure as Appellant's compound 101 when selecting the appropriate imidazole moiety from among those listed and that the remaining substitutable positions of Taniyama's formula IV include substituents corresponding to Appellant's compound 101).

The Examiner conceded that Taniyama differs from Appellant's elected compound 101 in that Taniyama does not expressly describe a compound having the required substituents at the locations specified in Appellant's compound 101. *See* Final Act. 12. The Examiner concluded, nonetheless, that Appellant's compound 101 would have been obvious, because Taniyama's generic formula IV includes the substituents of Appellant's compound 101 among the functional groups useful at the corresponding positions of Taniyama's compounds:

It would have been obvious . . . to select any of the species of the genus of Formula (IV) taught by the reference, including those instantly claimed, because the skilled chemist would have the reasonable expectation that any of the species of the genus would have similar properties, and thus, the same use as taught for the genus as a whole. One of ordinary skill in the art would have been motivated to select the claimed compounds from the genus of Formula (IV) in the reference since such compounds would have been suggested by the reference as a whole. *A prior art disclosed genus of useful compounds is sufficient to render prima facie obvious a species falling within a genus.*

Id. at 13 (emphasis added).

Analysis

For reasons similar to those discussed above in relation to Swinnen, Appellant persuades us that the Examiner has not shown by a preponderance of the evidence that Appellant's compound 101 would have been obvious in view of Taniyama. In particular, we are not persuaded that a "prior art disclosed genus of useful compounds is sufficient to render prima facie obvious a species falling within a genus," as the Examiner contends. Final Act. 13.

Similar to the rejection discussed above, formula IV of Taniyama cited by the Examiner describes a genus of compounds that encompasses numerous distinct species. *See* Taniyama ¶¶ 30–37. Given the large number of distinct substituents listed for the various substitutable positions, we discern no error in Appellant's contention, undisputed by the Examiner, that Taniyama's formula IV encompasses thousands if not millions of species of compounds. *See* Appeal Br. 20.

Similar to the situation discussed above, rather than identifying specific teachings as to preferred or exemplified embodiments in Taniyama

that might suggest Appellant's elected compound 101, the Examiner simply notes repeatedly that, among the multitude of potential combinations of substitutions described by Taniyama, one may arrive at elected compound 101 by selecting the correct substituents at the appropriate substitutable positions of Swinnen's formula IV. *See* Ans. 9–14. As noted above, however, “[t]he fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness.” MPEP § 2144.08.II.

We acknowledge the Examiner's repeated contention that in an obviousness evaluation “consideration of a reference is not limited to the preferred embodiments or working examples, but extends to the entire disclosure for what it fairly teaches, when viewed in light of the admitted knowledge in the art, to person of ordinary skill in the art.” Ans. 12–13 (citing MPEP § 2123). Again, however, given the large number of highly different potential combinations of functional groups encompassed by Taniyama's genus, the mere fact that one might arrive at Appellant's elected compound 101 by a hindsight-guided selection of appropriate substituents does not persuade us that Taniyama would have rendered compound 101 obvious to a skilled artisan. *See In re Baird*, 16 F.3d at 382–83; *In re Jones*, 958 F.2d at 350–51; MPEP § 2144.08.

In sum, for the reasons discussed, we are not persuaded that the Examiner has shown by a preponderance of the evidence that Appellant's compound 101 would have been obvious in view of Taniyama. We, therefore, reverse the Examiner's rejection of claims 1–3, 6, 7, 14–18, and 22 for obviousness over Taniyama.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1-3, 6-8, 14-18, 21, 22	103(a)	Swinnen		1-3, 6-8, 14-18, 21, 22
1-3, 6, 7, 14-18, 22	103(a)	Taniyama		1-3, 6, 7, 14-18, 22
Overall Outcome				1-3, 6-8, 14-18, 21, 22

REVERSED