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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TSUYOSHI ISHIKAWA, YOSHIYUKI OGAWARA, TOMOHIKO YOSHITAKE, and YUKIKO MURAKAMI

Appeal 2017-006030
Application 12/568,753
Technology Center 1700


HOUSEL, Administrative Patent Judge.

DECISION ON APPEAL¹

Appellants² appeal under 35 U.S.C. § 134(a) from the Examiner’s decision rejecting claims 1, 2, 4–10, and 17–22. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We REVERSE.


² Appellants identify Hoya Corporation as the real party in interest (Appeal Br. 3).
STATEMENT OF THE CASE

The invention relates to methods of producing fluoroapatite powder, the fluoroapatite powder product, and an adsorption apparatus that uses the fluoroapatite powder (Spec. 1:5–11).

Claim 1, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative of the subject matter on appeal. The limitations at issue are italicized. Remaining independent claim 17 recites a similar method of producing fluoroapatite powder.

1. A method of producing fluoroapatite powder from raw materials consisting of a calcium compound, a phosphate compound, a fluorine compound, and water, the method comprising:

   preparing a slurry containing fluoroapatite primary particles mainly constituted of fluoroapatite from the raw materials at a pH of 2.5 to 4.5;
   applying an ultrasonic wave to the slurry; and
   drying the slurry to which the ultrasonic wave is applied to granulate the fluoroapatite primary particles contained in the slurry to obtain the fluoroapatite powder mainly constituted of the fluoroapatite,

   wherein applying the ultrasonic wave to the slurry is carried out by using an ultrasonic washing machine having an ultrasonic tank containing water, wherein the slurry is put in a container and then the container containing the slurry is put in the ultrasonic tank, and wherein in such a state, when a total amount of the slurry and the water is 180 L, a power of the ultrasonic wave to be applied to the slurry is in the range of 500 to 2500 W, and

   wherein the fluoroapatite powder has a compressive particle strength of 5.4 MPa or more, and the compressive particle strength is measured for fluoroapatite powder particles having an average particle size is [sic, of] 40 ± 5 μm.
REJECTIONS

The Examiner maintains, and Appellants request our review of, the following grounds of rejection under 35 U.S.C. § 103(a): 

1. Claims 1, 2, 4–9, and 17–22 as unpatentable over Kobayashi\(^3\) in view of Deutsch\(^4\) and Yanagi;\(^5\) and 
2. Claim 10 as unpatentable over Kobayashi in view of Deutsch and Yanagi, and further in view of Tomlinson.\(^6\)

ANALYSIS

After review of the opposing positions Appellants and the Examiner articulate, the applied prior art, and Appellants’ claims and Specification disclosures, we determine that Appellants’ arguments are sufficient to identify reversible error in the Examiner’s obviousness rejections. \textit{In re Jung}, 637 F.3d 1356, 1365 (Fed. Cir. 2011). Accordingly, we reverse the stated obviousness rejections for substantially the reasons Appellants set forth in the Appeal and Reply Briefs. We offer the following for emphasis only.

The Examiner finds that Kobayashi discloses a method of producing fluoroapatite powder substantially as recited in claims 1 and 17, except for “whether the agitation could be produced by applying an ultrasonic wave to the slurry” (Final 3–4). To remedy this deficiency, the Examiner finds that Deutsch teaches that ultrasonic waves are an appropriate form of energy for incorporating material into hydroxyapatite \textit{id.} at 4. The Examiner

\(^4\) US 5,690,908, issued November 25, 1997 (“Deutsch”).
concludes that it would have been obvious to use ultrasonic waves in Kobayashi’s process “as part of the incorporation of fluorine into the hydroxyapatite, since ultrasonication is identified by Deutsch as a well-known mixing aid, . . . to yield the predictable result of mixing a hydroxyapatite slurry” (id.). The Examiner finds that stirring and ultrasound are known alternative forms of agitation (Ans. 3). In addition, the Examiner finds that Kobayashi teaches that the power requirement for mixing per liter of slurry is an important consideration, thereby establishing the relationship as a result-effective variable that would have motivated the ordinary artisan to operate at the claimed conditions (Final 6).

Appellants argue that the Examiner has not shown that ultrasonic power is a result-effective variable and that there is a nexus, i.e., functional relationship, between stirring and ultrasound power (Appeal Br. 14–17). In addition, Appellants contend that Deutsch applies ultrasonic power to a slurry of hydroxyapatite particles and metal ions to adsorb the metal ions onto the particle surfaces, not to improve particle strength (id. at 17).

Appellants’ arguments are persuasive of reversible error. We recognize that the substitution of one known element for another element used for the same purpose likely would have been obvious when the combination yields no more than a predictable result. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007); *In re Fout*, 675 F.2d 297, 301 (CCPA 1982). Here, however, the Examiner has neither established that stirring and ultrasound are used in the art for the same purpose, nor that the combination yields no more than a predictable result. As Appellants contend, Deutsch discloses that ultrasound and heat are alternative sources of energy for facilitating adsorption of metal ions onto the surface of
hydroxyapatite particles, not that ultrasound is an alternative for stirring or otherwise agitating a slurry, especially one composed “mainly of fluoroapatite” (Deutsch 5:32–37). Indeed, the adsorption of metal ions onto the surface of hydroxyapatite particles that Deutsch teaches does not involve the same substitution of fluorine ions for hydroxyl ions in hydroxyapatite particles as Kobayashi teaches and Appellants’ Specification provides (compare Deutsch 5:32–49 with Kobayashi Abstract and Spec. 14, <S3> Fluoroapatite Synthesis Step). Thus, the Examiner fails to establish a relationship in the record between stirring and ultrasound as known alternative forms of agitation. Nor, therefore, does the Examiner establish that ultrasound power is a result-effective variable. Obviousness cannot be established if a prior art reference, which fails to specify any range, does not recognize a variable or parameter involved is a result-effective variable. In re Antonie, 559 F.2d 618, 620 (CCPA 1977). The Examiner does not rely on either Yanagi or Tomlinson to remedy this deficiency.

Under these circumstances, we cannot conclude that the Examiner has met the minimum threshold of establishing a prima facie case of obviousness under 35 U.S.C. § 103(a). See KSR, 550 U.S. at 418 (2007) (quoting In re Kahn, 441 F.3d 977, 988 (Fed. Cir. 2006)); In re Oetiker, 977 F.2d 1443, 1445 (Fed. Cir. 1992). Accordingly, we reverse the Examiner’s prior art rejections of claims 1, 2, 4–10, and 17–22.

DECISION

Upon consideration of the record, and for the reasons given above and in the Appeal and Reply Briefs, the decision of the Examiner rejecting claims 1, 2, 4–10, and 17–22 under 35 U.S.C. § 103(a) as unpatentable over
Kobayashi in view of Deutsch and Yanagi, alone or further in view of Tomlinson, is reversed.

REVERSED