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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DIDIER BOURBON and SÉBASTIEN DEVROE

Appeal 2019-000506
Application 13/696,118¹
Technology Center 3700

Before PHILLIP J. KAUFFMAN, JEREMY M. PLENZLER, and
ALYSSA A. FINAMORE, *Administrative Patent Judges*.

KAUFFMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Examiner's decision to reject claims 1, 4, 6–9, 17, and 19–21. Final Act. 2–5. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

¹ Appellants identify Fives FCB, of Villeneuve D'Ascq, France as the real party in interest. Appeal Br. 1.

The Invention

Appellants' claimed invention relates to "producing hydraulic binders such as cement, in particular from slag from the metallurgical industry." Spec. 1:10–11. Claims 1, 20, and 21 are independent. Appeal Br. 28, 30–34. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A method for obtaining a fine fraction from a mineral material containing at least calcium and metal impurities, said method comprising the following steps:

providing said mineral material containing at least calcium and metal impurities, said mineral material being slag from the metallurgical industry or a mixture of slag from the metallurgical industry and a mineral substance,

obtaining a ground material by grinding said mineral material by material bed compression with a single grinder,

separating the ground material into a fine fraction and a coarse fraction by means of a granulometric selection device,

extracting metal impurities from the coarse fraction by subjecting the coarse fraction to magnetic sorting,

returning the coarse fraction from which metal impurities have been extracted to the single grinder for a further grinding step and a further separating step to obtain a fine fraction, and

collecting fine fractions,

wherein the extracting by magnetic sorting is implemented on the coarse fraction after separating the coarse fraction from the fine fraction using a granulometric selection device and before grinding using the grinder, the mineral materials from which metal impurities have been extracted being returned to the grinder, the extracted impurities being discharged, and

wherein at least four successive passages through the magnetic sorting enable satisfactory elimination of the metal impurities because the coarse fraction represents by weight at

least 80% of the ground material issuing from the single grinder,
and

wherein the method is implemented in plant comprising
said single grinder and said granulometric selection device.

Appeal Br. 28–29.

REJECTIONS

- I. Claims 1, 4, 6–9, 17, and 19 are rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Final Act. 2.²
- II. Claims 1, 4, 6–9, 17, and 19–21 are rejected under 35 U.S.C. § 103(a) over Sanchez, Drage '556, Drage '744, and either Cordonnier '994, Cordonnier '096, or Devroe.³ Final Act. 3–5.

ANALYSIS

Indefiniteness

Claim 1 recites, in relevant part:

A method for obtaining a fine fraction from a mineral material containing at least calcium and metal impurities, said method comprising the following steps:

providing said mineral material containing at least calcium and metal impurities, said mineral material being slag from the

² A rejection of claim 20 under 35 U.S.C. § 112, second paragraph, was withdrawn in the Answer. Final Act. 2; Ans. 3.

³ Sanchez (WO 97/14760 A1, published Apr. 24, 1997); Drage '556 (US 3,905,556, issued Sept. 16, 1975); Drage '744 (US 3,885,744, issued May 27, 1975); Cordonnier '994 (FR 2 642 994 A1; published Aug. 17, 1990); Cordonnier '096 (FR 2 658 096 A1, published Aug. 16, 1991), and Devroe (WO 2008/068432 A2, published June 12, 2008).

metallurgical industry or a mixture of slag from the metallurgical industry and a mineral substance.

Appeal Br. 28. The Examiner explains that, because the preamble recites “a mineral material containing at least calcium and metal impurities,” the mineral material recited in the body of the claim must include calcium and metal impurities. The Examiner concludes that “[i]t is unclear if the mineral material is the slag and if the slag is just calcium and metal impurities.”

Ans. 4; *see also* Final Act. 2.

A claim undergoing prosecution is indefinite if the metes and bounds of the claimed subject matter are not clear. *In re Packard*, 751 F.3d 1307, 1310 (Fed. Cir. 2014); *see also Ex parte McAward*, 2017 WL 3669566, at *5 (PTAB Aug. 25, 2017) (precedential) (relying on the standard of *Packard*). Appellants correctly point out that one of ordinary skill in the art would have understood what was meant by “slag from the metallurgical industry;” and that such slag would have contained, not only calcium and metal impurities, but other components, as well. Appeal Br. 8–9 (citing Sanchez, 7:19–22); Reply Br. 2. In view of this knowledge, claim 1 is not unclear, and requires that the mineral material (1) contains at least calcium and metal impurities, and (2) is slag.

Obviousness

As an overview, claims 1, 20, and 21 each require further grinding of a *non-magnetic* product, namely the coarse fraction from which magnetic metal impurities have been removed. In contrast, Sanchez further processes a *magnetic* product from which non-magnetic reverts are removed, and

Sanchez does not describe any further processing for the non-magnetic reverts.

The Examiner relies on Sanchez as disclosing a method as claimed except that Sanchez does not disclose: returning the coarse fraction to the grinder for a further grinding step, at least four successive passages through magnetic sorting, and the specifics of a gramulometric separator. Final Act. 3–5. The rejection is unclear if the Examiner relies on either Sanchez’s (1) non-magnetic reverts (step 111) or (2) the refined product passed to step 112, as corresponding to a coarse fraction as claimed (claim 1 - “the coarse fraction from which metal impurities have been extracted” by magnetic sorting; claim 20 - the mineral material subjected to magnetic sorting; claim 21 - “said first coarse fraction with reduced metal impurities”). *See id.* For the reasons that follow, we disagree with either possibility.

Sanchez teaches converting iron rejects from cement manufacturing processes into metal particles by means of a vibratory ball mill. Sanchez, 19:4–10, 14–16, 19:30–20:2, Fig. 6 (step 104); *see also id.* at 7:16–8:7 (explaining that, historically, iron taken from slag was wasted, but such iron has been found to be a valuable source of raw material). Sanchez discloses separating out fines by air classifying and mechanical sizing (step 106) to create two products: a fine revert product that may be recycled (step 108), and a metallic product. Sanchez, 20:2–6, Fig. 6. The metallic product is then magnetically classified (step 110) to create two products: non-magnetic reverts (step 111), and a refined product. Sanchez, 20:7–10, Fig. 6. Sanchez does not describe any further processing or use of the non-magnetic reverts.

Sanchez, Fig. 6 (Step 111). Sanchez describes that the refined product is further processed. Sanchez, 20:10–21:14, Fig. 6 (steps 112 et seq.).

Consequently, the non-magnetic reverts cannot correspond to a coarse fraction as claimed because the reverts are not subject to further processing. Sanchez, Fig. 6 (Step 111). The Examiner does not acknowledge this distinction nor propose to modify Sanchez’s method to further process the non-magnetic fraction. Nor does the refined product correspond to a coarse fraction as claimed because it is the fraction that was magnetically sorted and therefore has not had metal impurities extracted by magnetic sorting (claims 1 and 20), nor does it have reduced metal impurities (claim 21).

The Examiner does not rely on Drage ’556 or Drage ’744 to correct either alternative.

In the Answer, the Examiner cites Aihara (US 6,719,229 B2, issued Apr. 13, 2004) as evidence that “material being returned to a grinder to produce smaller particles . . . [was] well known in the art.” Ans. 7. As Appellants correctly point out, the teachings of Aihara would not have suggested modifying Sanchez’s process to subject a coarse fraction from which metal impurities had been extracted to further grinding and magnetic separation. Reply Br. 4.

Finally, the Examiner cites Cordonnier ’994, Cordonnier ’096, and Devroe as describing granulometric selection devices. Final Act. 5. The Examiner does not rely on these references to remedy the deficiencies in the combined teachings Sanchez, Drage ’556, and Drage ’744 as applied to independent claims 1, 20, and 21.

DECISION

We reverse the Examiner's decision rejecting claims 1, 4, 6–9, 17, and 19 under 35 U.S.C. § 112, second paragraph, as indefinite.

We reverse the Examiner's decision rejecting claims 1, 4, 6–9, 17, and 19–21 under 35 U.S.C. § 103(a) over Sanchez, Drage '556, Drage '744, and either Cordonnier '994, Cordonnier '096, or Devroe.

REVERSED