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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte BRUCE JOHNSON, NINA CUNNINGHAM, and MICHAEL C. MESINGER

Appeal 2014-009112
Application 13/452,678[1]
Technology Center 3700

Before EDWARD A. BROWN, BRANDON J. WARNER, and FREDERICK C. LANEY, *Administrative Patent Judges*.

LANEY, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Bruce Johnson et al. (Appellants) appeal under 35 U.S.C. § 134(a) from the Examiner's final decision rejecting claims 1–6, 8, 12–26, 28, 32, and 36–42, which are all the pending claims. We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

SUMMARY OF DECISION

We REVERSE.

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[1] According to Appellants, the real party in interest is WasteDry, LLC. Appeal Br. 2 (filed May 12, 2014).

INVENTION

Appellants' invention "relates to methods and systems for processing sewage sludge using a gasification process." Spec. ¶ 2.

Claims 1, 21, 32, and 36 are independent. Claims 1 and 32, reproduced below, are illustrative of the claimed subject matter:

> 1. A method for processing sewage sludge comprising the steps of:
>
> a. drying a first batch of sewage sludge comprising carbon-containing materials to form a first partially dried sewage sludge;
>
> b. gasifying a portion of the first partially dried sewage sludge into a gaseous fuel at a temperature of from about 1100° F. to about 1500° F. in an oxygen-starved environment containing about 0% to about 40% stoichiometric oxygen necessary for complete combustion, whereby the carbon-containing materials in the first partially dried sewage sludge chemically react to produce the gaseous fuel; and
>
> c. combusting the gaseous fuel in an oxidizer to produce a hot flue gas.

Appeal Br. 20 (Claims App.).

REJECTIONS[2]

The following rejections are before us for review:

I. The Examiner rejected claims 1–6, 8, 12, 13, 16, and 17[3] under 35 U.S.C. § 103(a) as unpatentable over McMahon (US 5,230,211, iss. July 27, 1993).

II. The Examiner rejected claims 14, 15, 21–26, and 28 under 35 U.S.C. § 103(a) as unpatentable over McMahon and Miura (US 5,171,552, iss. Dec. 15, 1992).

III. The Examiner rejected claims 18–20 under 35 U.S.C. § 103(a) as unpatentable over McMahon and Loken (US 3,954,069, iss. May 4, 1976).

IV. The Examiner rejected claims 32 and 36–42 under 35 U.S.C. § 103(a) as unpatentable over McMahon, Miura, and Loken.

ANALYSIS

Rejections I–III Obviousness of Claims 1–6, 8, 12–26, and 28

Claims 1 and 21 are directed to a method for processing a sewage sludge that requires, *inter alia*,

> gasifying a portion of the first partially dried sewage sludge into a gaseous fuel *at a temperature of from about 1100° F. to about 1500° F. in an oxygen-starved environment containing about 0% to about 40% stoichiometric oxygen necessary for complete combustion*, whereby the carbon-containing materials in the first

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[2] The Examiner's rejections of claims 32 and 40 under 35 U.S.C. § 112, first paragraph, and claims 32 and 41 under 35 U.S.C. § 112, second paragraph, have been withdrawn. Adv. Act. 2 (filed Mar. 26, 2014).

[3] The Examiner notes that the identification of claims 32 and 36 for this rejection was "a typographical error." Ans. 14.

> partially dried sewage sludge chemically react to produce the gaseous fuel

Appeal Br. 20–22 (Claims App.) (emphasis added). Claims 2–6, 8, 12–20, 22–26, and 28 depend, directly or indirectly, from either claim 1 or claim 21. *Id.*

Rejections I–III each rely on the Examiner's determination the above gasifying conditions are obvious modifications to the process McMahon discloses. Final Act. 4–9. Finding McMahon discloses gasifying sewage sludge in an oxygen-starved environment, the Examiner concludes it would have been obvious to a skilled artisan at the time of the invention to use the combination of temperature range and oxygen level recited. Final Act. 4–5, 7–8. The Examiner arrives at that conclusion by finding McMahon discloses the general operating conditions of the gasification process and, as such, discovering the optimum or workable ranges involves only routine skill in the art. *Id.*

Appellants take exception to the Examiner's findings McMahon discloses the use of a gasifying process in "an oxygen-starved environment" and the general conditions of the claimed gasification step. Appeal Br. 5–6. Appellants argue, in contrast to disclosing an oxygen-*starved* environment, McMahon teaches, "using an oxygen enriched environment in the gasifier." *Id.* at 5. Appellants point out McMahon teaches introducing a stream of free-oxygen gas into the gasifier, which gas is selected from a group consisting of substantially pure oxygen and oxygen-enriched air. *Id.* (citing McMahon, 10:31–54, 11:39–40). In addition, Appellants note "McMahon does not teach or suggest <u>any oxygen content range</u>" for the partial oxidation gasifier unit. Reply Br. 4. Regarding the operating temperature of the gasifier, Appellants point out that McMahon "teaches the gasifier

temperature should be in the range of 1800° F to 3500° F (Col. 11, lines 21–30) and preferably in the range of 2200° F to 2800° F (Col. 11, lines 28–29)." Appeal Br. 5. Accordingly, Appellants assert McMahon suggests to a skilled artisan that optimization of the gasifier operating temperatures would exist somewhere greater than 1800° F. Reply Br. 5. In the Specification, Appellants state "gasification at about 1500° F. unexpectedly results in a significantly higher level of useful products with fewer byproducts and lower costs." Spec. ¶ 85. Appellants argue McMahon does not disclose general operating conditions of the claimed gasifier, which require a range of temperatures between about 1100° F to about 1500° F in an oxygen-starved environment containing about 0% to about 40% stoichiometric oxygen necessary for complete combustion. Reply Br. 6.

Appellants' argument is persuasive. Although it is not patentably inventive to discover the optimum or workable ranges of a result-effective variable by routine experimentation, the Examiner has the initial burden of first establishing the prior art discloses the general operation conditions were known. *In re Applied Materials, Inc.*, 692 F.3d 1289, 1295 (Fed. Cir. 2012) (citing *In re Aller*, 220 F.2d 454, 456 (1955)). Furthermore,

> [w]hile it may ordinarily be the case that determination of optimum values for parameters of prior art process would be at least prima facie obvious, that conclusion depends upon what prior art discloses with respect to those parameters and, if prior art disclosure suggests the outer limits of the range of suitable values, and that the optimum resides within that range, and if there are indications elsewhere that in fact that optimum should be sought within that range, determination of optimum values outside that range may not be obvious.

In re Sebek, 465 F.2d 904, 907 (CCPA 1972). The Examiner, in this case, has not shown by a preponderance of the evidence the general operating conditions of the claimed gasifier were known in the prior art.

The Examiner fails to offer any evidence, or explanation, demonstrating a skilled artisan would have understood the partial oxidation gasifier McMahon discloses to encompass an environment that restricts the oxygen levels to something that *generally* correlates to an oxygen-starved environment with the claimed range of 0% to about 40% stoichiometric oxygen necessary for complete combustion. Moreover, the Examiner does explain why/how the teaching of McMahon to introduce a stream of free-oxygen gas into the gasifier is consistent with a finding that McMahon discloses the general operating conditions recited for Appellants' claimed gasifier.

Nor has the Examiner explained, or provided any evidence to show, why a skilled artisan would have recognized McMahon's disclosure of operating temperatures between 1800° F to 3500° F as within the scope of general operating temperatures of the claimed gasifier. No guidance, or evidence, is offered by the Examiner why a skilled artisan would understand those ranges as *generally* consistent with the significantly lower temperature range recited in claim 1 (i.e., between about 1100° F to about 1500° F).

We find *Sebek* instructive here because McMahon suggests outer limits of the range of suitable values (i.e., between 1800° F to 3500° F), and that the optimum resides within that range (i.e., between 2200° F to 2800° F). In addition, the Examiner states, "the *higher* the temperature, the more completely the volatiles are gasified" (Final Act. 5) (emphasis added), which indicates the optimum should be sought within a higher range of

temperatures and supports a determination that optimum values outside that range may not be obvious.

For the foregoing reasons, we do not sustain the Examiner's rejection of independent claims 1 and 21 because a preponderance of the evidence does not demonstrate McMahon discloses the general operating conditions of the claimed gasifier. As a result, we also do not sustain the rejections of dependent claims 2–6, 8, 12–20, 22–26, and 28 because the Examiner's rejections of those claims fail to cure the above deficiencies.

Rejection IV Obviousness of Claims 32 and 36–42

Claims 36–42

Claim 36 is independent from which claims 37–42 depend, either directly or indirectly. Appeal Br. 22–24 (Claims App.). Claim 36 is directed to a method for processing a sewage sludge that requires, *inter alia*,

> gasifying a portion of the first partially dried sewage sludge into a gaseous fuel *at a temperature of from about 1100° F. to about 1500° F. in an oxygen-starved environment containing about 0% to about 40% stoichiometric oxygen necessary for complete combustion*, whereby the carbon-containing materials in the first partially dried sewage sludge chemically react to produce the gaseous fuel

Appeal Br. 23 (Claims App.) (emphasis added). The Examiner makes the same determination discussed above (*see supra* Rejections I–III) that the operating conditions are obvious modifications to the process McMahon discloses. Final Act. 11–12. For the same reasons discussed above, *supra* Rejections I–III, addressing the same limitation found in claims 1 and 21, the Examiner's rejection of claim 36 is deficient because a preponderance of the evidence does not demonstrate McMahon discloses the general operating conditions of the claimed gasifier. The Examiner's use of the teachings of

Loken and Miura, respectively, does not cure the deficiency. Therefore, we do not sustain the Examiner's rejection of claims 36–42.

Claim 32

Claim 32 is directed to an apparatus for processing a sewage sludge that requires, *inter alia*,

> c. *an oxidizer for combusting the gaseous fuel to produce heat and to substantially reduce NOx compounds*, wherein the heat is used to directly or indirectly partially dry the sewage sludge in the dryer; [and]
>
> d. *a pathogen destruction furnace for destroying volatile organic compounds and/or residual pathogens* released from the sewage sludge.

Appeal Br. 22–23 (Claims App.) (emphasis added). The Examiner finds McMahon disclose limitations (c) and (d). Final Act. 9–10.

For limitation (c), the Examiner finds combustor 57 in McMahon is "a low NOx oxidizer . . . for combusting the gaseous fuel [converted from the sewage sludge in the gasifier (42)] to produce heat and to substantially reduce NOx compounds." Final Act. 9 (citing McMahon, 14:29–33; Fig. 1). The Examiner additionally finds McMahon teaches, "staged combustion (i.e., partial oxidation followed by complete combustion) produces a reduced amount of NOx as compared to traditional combustion due to lower combustion temperatures." *Id.* at 9–10; *see also* Ans. 16–17.

For limitation (d), the Examiner finds combustor 57 in McMahon also is "a pathogen destruction furnace . . . for destroying volatile organic compounds and/or residual pathogens released from the sewage sludge." *Id.* at 10 (citing McMahon, 7:55–58; 14:36–38). The Examiner finds the Specification "states that pathogens are destroyed at a temperature above

1100° F, so any pathogens remaining in the fuel gas would inherently be destroyed." *Id.*; *see also* Ans. 17.

Appellants argue,

> contrary to the Examiner's assertion, McMahon in Col. 14, lines 29-33, does not mention NOx or reducing NOx. Although Col. 7, lines 55-58 of McMahon disclose that drying sewage destroys cells and organisms, there is no teaching or suggestion in the sections of McMahon cited by the Examiner of a pathogen destruction furnace for destroying volatile organic compounds and/or residual pathogens released from the sewage sludge as defined by Claim 32.

Appeal Br. 12. In other words, Appellants challenge whether a preponderance of the evidence supports the Examiner's finding McMahon discloses the structures limitations (c) and (d) recite in claim 32. For the following reasons, we are persuaded the Examiner's evidence is deficient.

The Examiner's analysis erroneously relies on McMahon's combustor 57 to disclose two components distinctly claimed — i.e., (1) an oxidizer for combusting the gaseous fuel to produce heat and to substantially reduce NOx compounds and (2) a pathogen destruction furnace for destroying volatile organic compounds and/or residual pathogens released from the sewage sludge. Claim 32 identifies and describes separately the oxidizer and pathogen destruction furnace as independent structures or elements. *See* Appeal Br. 23 (Claims App.). "Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct components of the patented invention." *Becton, Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (citations omitted). Here, there is nothing in claim 32 to suggest that the oxidizer and pathogen destruction furnace are the same structure or element. To the contrary, the recitation of a distinctly separate purpose for the oxidizer (i.e.,

combusting the gaseous fuel to produce heat and to substantially reduce NOx compounds) and the pathogen destruction furnace (i.e., destroying volatile organic compounds and/or residual pathogens released from combusted gas convert from the sewage sludge) reinforces the implication that the oxidizer and pathogen destruction furnace are two distinct components. *See* Appeal Br. 23 (Claims App.). The Specification likewise describes and illustrates the low NOx oxidizer and pathogen destruction furnace as distinct components. *See, e.g.*, Spec. ¶¶ 12, 75–78, Fig. 1. McMahon's combustor 57, therefore, cannot *simultaneously* be the claimed oxidizer, where combustion of the gaseous fuel produced by the gasifier occurs, *and* the claimed pathogen destruction furnace, which receives the hot flue gas from the oxidizer to destroy the pathogens therein.

The Examiner's citation to column 14, lines 29–33, in McMahon is likewise deficient for showing combustor 57 substantially reduces NOx compounds in the hot flue gas resulting from combustion. In particular, that citation fails to establish, by a preponderance of the evidence, that combustor 57 uses "staged combustion." In fact, the Examiner identifies the gasifier as a "stage" of the combustion, but the gasifier is the structure that *produces* syngas for the combustor 57 to ignite. *See* Spec. ¶ 75. Appellants correctly note that McMahon does not say anything about combustor 57 reducing the NOx compounds in the combustion process. Nor does the Examiner offer any persuasive evidence, or explanation, a skilled artisan would understand combustor 57 *alone* inherently reduces NOx compounds, in the context of the process McMahon discloses.

The Examiner also does not rely on Loken or Miura to cure the above deficiencies with McMahon. Therefore, because a preponderance of the

evidence does not support the Examiner's finding McMahon discloses the claimed oxidizer and pathogen destruction furnace, we do not sustain the Examiner's rejection of claim 32.

DECISION

We reverse the Examiner's rejection of claims 1–6, 8, 12–26, 28, 32, and 36–42.

REVERSED