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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte BRUNO MICHEL and PATRICK RUCH

Appeal 2019-000820
Application 13/975,869
Technology Center 3700

Before JOHN C. KERINS, DANIEL S. SONG, and LEE L. STEPINA,
Administrative Patent Judges.

SONG, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

The Appellant¹ appeals under 35 U.S.C. § 134(a) from the Examiner's Final Office Action ("Final Act.") rejecting claims 1–5 and 7–14 in the present Application. We have jurisdiction under 35 U.S.C. §§ 6(b) and 134(a).

We REVERSE.

¹ The Appellant is International Business Machines Corporation, which is identified as the real party in interest. Appeal Brief ("Br.") 4.

The claimed invention is directed to a method of making integrated adsorption and heat exchanger devices for solid sorption refrigeration systems. Abstract. Representative independent claim 1, which is the only independent claim on appeal, reads as follows:

1. A method for making an integrated adsorption and heat exchanger device for a solid sorption refrigeration system, the method comprising:

forming in a first surface portion of a monolithic solid material an integrated microporous adsorption structure having average pore sizes of <2 nm, which is pervious to an adsorbate of said system, the microporous adsorption structure providing an adsorption function, and

forming in a second opposite surface portion of the same monolithic solid material an integrated heat exchanger structure, which is impervious to said adsorbate, for heat exchange with the microporous adsorption structure in operation of said system.

Br. 11 (Claims App.) (emphasis added).

REJECTIONS

The Examiner rejects various claims on appeal under 35 U.S.C. § 103(a) (pre-AIA) as follows:

1. Claims 1, 2, 4, 7, 11, 13, and 14 as unpatentable over Tonkovich (US 2009/0326279 A1, pub. Dec. 31, 2009) in view of Drost (US 6,126,723, issued Oct. 3, 2000). Final Act. 2.

2. Claim 3 as unpatentable over Tonkovich in view of Drost and Chan (US 2005/0145837 A1, pub. July 7, 2005). Final Act. 7.

3. Claims 5, 8–10, and 12 as unpatentable over Tonkovich in view of Drost and Burkay (US 2003/0015316 A1, pub. Jan. 23, 2003). Final Act.

9.

ANALYSIS

The Examiner rejects independent claim 1 as unpatentable over Tonkovich in view of Drost, finding that Tonkovich discloses a method for making a heat sink system as substantially claimed, including “forming *on a first surface portion* of a monolithic solid material (310) an integrated microporous adsorption structure (400) having average pore sizes of less than 2 nm,” and “forming in a second opposite surface portion of the same monolithic solid material (310) an integrated heat exchanger structure (330).” Final Act. 2–3 (emphasis added, citations omitted). The Examiner concedes that Tonkovich “fails to disclose forming the microporous adsorption structure *in a first surface* of the monolithic solid material.” Final Act. 3 (emphasis added). The Examiner finds that Drost discloses a method of making a microchannel thermal machine including “forming *in a first surface* of a monolithic solid material an integrated microporous adsorption structure (100) by processing a portion of the monolithic solid material to render that portion microporous.” Final Act. 3 (emphasis added) (citing Drost, col. 12, ll. 51–55, Fig. 1b). Based on these findings, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to have “improve[d] the method of making a heat sink system of Tonkovich by micromachining a solid non porous material as taught by Drost in order to provide precise control of the pore size throughout the solid material,” and that the claim merely uses a known technique to improve similar devices in the same way. Final Act. 3 (citing Drost, col. 12, ll. 55–58).

The Appellant correctly points out that “Tonkovich teaches a porous support structure 400 and a separate heat transfer wall 330 of the

microchannel 310 which is a layered or laminate structure and *not* integrated.” Br. 5 (citing Tonkovich ¶¶ 203, 271, Figs. 5, 5a–5d). The Appellant also points out that in rejecting the claim, the Examiner found that Tonkovich discloses “forming **on** a first surface portion of a monolithic solid material an integrated microporous adsorption structure” and conceded that Tonkovich fails to disclose “forming the microporous adsorption structure **in** a first surface of the monolithic solid material.” Br. 6. Indeed, the Appellant’s characterization of the Examiner’s rejection appears to be correct. *See* Final Act. 2–3; *see also* Ans. 14 (acknowledging that Tonkovich discloses “attaching, mounting or depositing a previously fabricated microporous adsorption structure to a solid metal structured wall which is different than forming an integrated microporous structure in the solid metal structured wall.”).

The Appellant also correctly points out that “Drost teaches a porous ‘contactor’ 100 which is a separate stand-alone structure . . . having pores ‘extending through the thickness’.” Br. 6 (citing Drost, col. 12, ll. 38–50, Abstract, Fig. 1A). Based thereon, the Appellant argues that Drost is “duplicative of Tonkovich in that it teaches a standalone porous structure (contactor 100) that is ‘used in combination with heat exchangers’.” Br. 6–7 (citing Drost, col. 9, ll. 46–48, col. 18, ll. 1–7, Fig. 5). The Appellant argues that even if the references are combined, there is “no teaching or suggestion of a method for making an integrated adsorption and heat exchanger device from a single integrated solid material.” Br. 7. Accordingly, the Appellant argues that the rejection

fails to adequately make a *prima facie* case of obviousness and appears to have not made provided any teaching in Tonkovich or Drost of a method that involves forming in first and opposite

surfaces of a single monolithic solid material a respective adsorption and a heat exchange structure.

Br. 9.

We are persuaded that the rejection is inadequate for the reasons argued by the Appellant, and address the Examiner's responses below.

The Examiner responds that because claim 1 uses the transitional term "comprising," Tonkovich's wall 330 and at least one porous support 400 satisfies the language of the claim. Ans. 6. However, claim 1 also explicitly recites forming a microporous adsorption structure in a first surface of the monolithic solid material, and forming an integrated heat exchanger structure in a second opposite surface of the *same* monolithic solid material. Thus, the Examiner's explanation based on the transitional term "comprising" as allowing for additional components to the heat exchange structure (i.e., wall 300) is inapposite.

The Examiner also responds that

Appellant's arguments are drawn to structural elements of an apparatus; however, Appellant's claims are drawn to a method of making the apparatus. The apparatus (integrated adsorption and heat exchanger device) is individually taught by both Tonkovich and Drost (Tonkovich, porous support (400) on structured wall (330) and Drost porous contactor (100)); and, the method of making the apparatus is rendered obvious in view of a proposed combination of Tonkovich and Drost.

Ans. 10.

However, the fact that a method claim recites structure does not mean such structure can be ignored. *In re Dillon*, 919 F.2d 688, 695 (Fed. Cir. 1990) (en banc) ("[M]aterials used in a claimed process as well as the result obtained therefrom, must be considered along with the specific nature of the process, and the fact that new or old, obvious or nonobvious, materials are

used or result from the process are only factors to be considered, rather than conclusive indicators of the obviousness or nonobviousness of a claimed process. When any applicant properly presents and argues suitable method claims, they should be examined in light of all these relevant factors.”). The rejection applied does not adequately consider and address the limitations pertaining to the two opposite surfaces of the same monolithic solid material.

The Examiner further responds in a *Summary* section of the Answer, that it would have been obvious

to improve the method of making an integrated adsorption and heat exchanger device of Tonkovich by directly micromachining the solid metal structured wall of Tonkovich as taught by Drost in order to provide precise control of the pore size throughout the solid material (Drost, Col 12, Lines 55-58) and eliminate the processing step of attaching, mounting, depositing or otherwise combining the Tonkovich previously fabricated microporous support to the solid metal structured wall and thereby improve the efficiency of the Tonkovich fabrication process.

Ans. 15 (emphasis omitted).

Notwithstanding the fact that such analysis was not provided in the Final Office Action, we find this belated analysis to be inadequate. First, the cited portion of Drost does not suggest direct micromachining of Tonkovich’s wall so that only a portion thereof is pervious to an adsorbate. Instead, Drost discloses micromachining of through pores in providing a porous contactor. Drost, col. 12, ll. 38–50, Abstract, Fig. 1A. As the Appellant argues (Br. 6–7), both of the applied prior art disclose a separate porous structure (Tonkovich: porous support structure 400; Drost: porous contactor 100/200) which are used as a layer in a laminate device.

Accordingly, the prior art suggests micromachining of a separate component to provide a porous structure that is separate from the heat exchanging structure in contrast with the language of claim 1. We agree with the Appellant that based on the two references applied, these references “provide a teaching away from the claimed processing steps applied to a same integrated solid material (a solid monolithic material) . . . by requiring a laminate structure or stack.” Br. 9 (emphasis omitted); *see In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) (“A reference may be said to teach away when a person of ordinary skill, upon reading the reference . . . would be led in a direction divergent from the path that was taken by the applicant.”). The Examiner’s response that Tonkovich discloses that “[t]he porous support may comprise a single layered microgrooved support strip,” and thus, suggests the construction claimed (Ans. 13 (quoting Tonkovich ¶ 130)) is unpersuasive because the porous support is nevertheless provided as a separate structure, separate from the wall.

As to the Examiner’s belated assertion that the suggested construction of Tonkovich in the manner suggested would eliminate the step of “attaching, mounting, depositing or otherwise combining” the microporous support to a wall, and “thereby improve the efficiency of the Tonkovich fabrication process,” we find such reasoning to be speculative and based on impermissible hindsight. It is not just the elimination of the attachment step that must be considered, but the substituted step of providing microporous surface only partially through the wall of Tonkovich that must be considered. No evidence or developed reasoning has been provided by the Examiner to establish that such substitution is attainable, and would “improve the efficiency of the Tonkovich fabrication process” as asserted.

In that regard, “factfinder should be aware . . . of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007); *In re Warner*, 379 F.2d 1011, 1017 (CCPA 1967) (Deficiencies in the factual basis cannot be supplied by resorting to speculation, assumptions and hindsight reconstruction).

Therefore, in view of the above considerations, we reverse the Examiner’s rejection of independent claim 1. The Appellant’s arguments regarding size of the pores, and the Examiner’s responses thereto (Br. 7; Ans. 10–11), are moot. We, likewise, reverse Rejections 1–3 as to claims 2–5 and 7–14 that ultimately depend from claim 1. *See In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) (“Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious.”).

CONCLUSION

The Examiner’s rejections of claims 1–5 and 7–14 are REVERSED.

REVERSED