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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHAD J. UNRAU, DAVID O. HUNT,
DAVID M. MATHEU, and SERGUEI NESTER

Appeal 2019-001995
Application 14/767,918
Technology Center 1700

Before JEFFREY T. SMITH, DONNA M. PRAISS, and
MERRELL C. CASHION, JR., *Administrative Patent Judges*.

PRAISS, *Administrative Patent Judge*.

DECISION ON APPEAL¹

Appellant² appeals under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1, 2, 4–9, 14, 22–24, 46, 50, 51, 54, and 58 under 35 U.S.C. § 103(a). We have jurisdiction over the appeal under 35 U.S.C. § 6(b). An oral hearing was held on March 17, 2020. We REVERSE.

¹ Our Decision refers to the Specification (“Spec.”) filed Aug. 14, 2015, the Examiner’s Non-Final Office Action (“Non-Final Act.”) dated June 7, 2018, Appellant’s Appeal Brief (“Appeal Br.”) filed Sept. 18, 2018, the Examiner’s Answer (“Ans.”) dated Dec. 26, 2018, and Appellant’s Reply Brief (“Reply Br.”) filed Jan. 9, 2019.

² We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant is Cabot Corporation, which is also identified as the real party in interest. Appeal Br. 3.

STATEMENT OF THE CASE

The invention relates to a method for making carbon black. Spec. ¶ 1. According to the Specification, at least one extender fluid is combined with at least one carbon black feedstock to form a fluid-feedstock mixture. *Id.* ¶ 11. The Specification discloses the extending fluid, which is preferably chemically inert to the carbon black feedstock, increases the momentum of the at least one carbon black feedstock in a direction that is substantially axial to the feedstock introduction point to the carbon black reactor. *Id.* According to the Specification, the jet penetration of the feedstock can be adjusted by the extender fluid and the overall yield of carbon black can be increased using an extender fluid. *Id.* ¶¶ 40, 41. Appellant's Figure 6 is reproduced below.

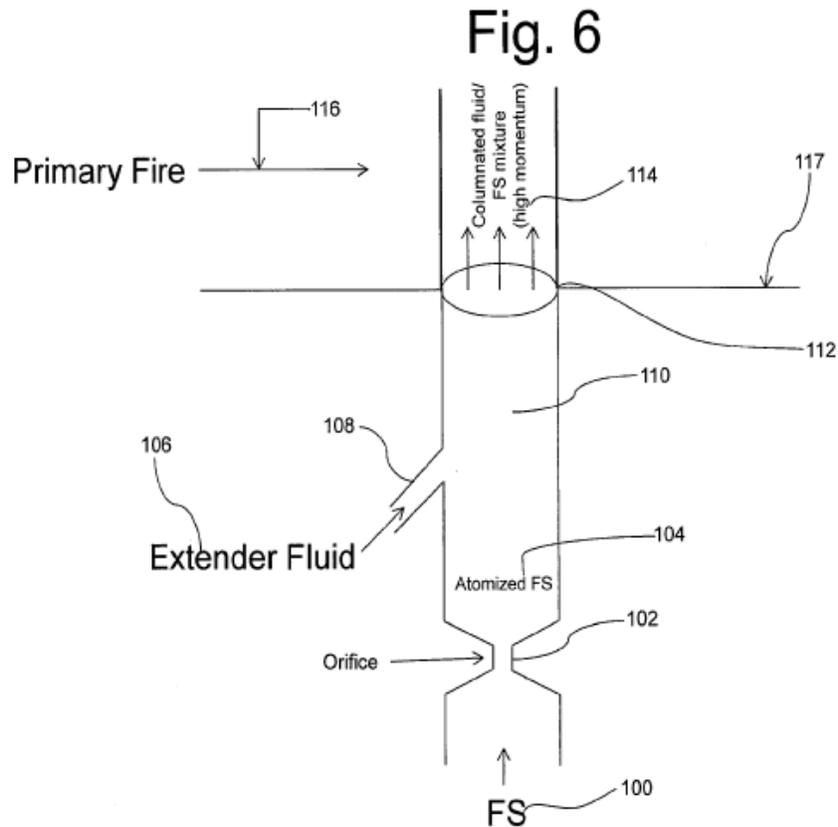


Figure 6 is a schematic that depicts injecting an extender fluid into atomized feedstock (“FS”) prior to entering a carbon black reactor and primary fire.

Id. ¶ 18.

Claim 1, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative (emphases and indentations added).

1. A method for producing carbon black comprising:
introducing a heated gas stream into a carbon black reactor to form a flow of gas;

combining at least one extender fluid with at least one carbon black feedstock to form a jet of a fluid-feedstock mixture, *wherein the at least one extender fluid is a gas or liquid that increases the momentum of the at least one carbon black feedstock in a direction that is axial or substantially axial to the direction of feedstock flow from at least one feedstock introduction point to the carbon black reactor and wherein degree of penetration of the fluid-feedstock mixture into the flow of gas is adjustable based on amount of extender fluid utilized in said fluid feedstock mixture;*

supplying said fluid-feedstock mixture to said at least one feedstock introduction point to the carbon black reactor,

combining at least said fluid-feedstock mixture through the at least one introduction point to said carbon black reactor with the flow of gas such that *the fluid-feedstock mixture penetrates into the flow of gas in a direction that is substantially perpendicular to the flow of gas* to form a reaction stream in which carbon black is formed in said carbon black reactor; and

recovering the carbon black in the reaction stream.

ANALYSIS

We review the appealed rejections for error based upon the issues Appellant identifies, in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential)

(*cited with approval in In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (“[I]t has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections.”)). After considering the argued claims in light of the case law presented in this Appeal and each of Appellant’s arguments, we are persuaded of reversible error in the Examiner’s rejections.

Rejection 1: Obviousness over Austin and Vogler

The Examiner rejects claims 1, 2, 4–9, 14, 22–24, 46, 50, 51, 54, and 58 under 35 U.S.C. § 103(a) over the combination of Austin³ and Vogler⁴ for the reasons stated on page 2 of the Non-Final Office Action.

Appellant asserts that the Examiner erred in finding that Austin discloses combining an extender fluid with carbon black feedstock to increase its momentum. Appeal Br. 19. Appellant contends Austin discloses two combustion streams to confine a carbon black feedstock (make oil) to the central inner region of a carbon black reactor. *Id.*

According to Appellant, Vogler does not cure the deficiency of Austin because Vogler uses two feedstocks, “MAKE OIL” and “SILICON OIL,” and no added fluid/air to increase the momentum of the combined feedstock. *Id.* at 21. Appellant acknowledges that Vogler discloses “ATOMIZING AIR,” however, Appellant contends that the atomizing air is introduced in a perpendicular direction rather than a coaxial direction, thus any momentum exerted would be directed towards the directly opposite inner wall of the pipe and not downstream relative to the direction of fluid flow within the

³ US 4,134,966, issued June 16, 1979.

⁴ US 6,391,274 B1, issued May 21, 2002.

pipe. *Id.* Therefore, according to Appellant, Vogler's arrangement does not suggest the atomizing air would increase the momentum of either the carbon black feedstock (make oil) to form a "jet of fluid-feedstock mixture to penetrate the flow" of combustion gas as required by claim 1. *Id.* at 23.

Appellant further contends that Vogler does not teach or suggest any degree of penetration of the fuel oil or "make oil" is adjustable based on the combination with atomizing air. *Id.* at 24.

Appellant argues that the combination of Austin and Vogler thus fails to disclose the following requirements of claim 1: (1) an extender fluid that increases the momentum of a carbon black feedstock in a substantially axial direction of feedstock flow, (2) an adjustable degree of penetration of the fluid-feedstock mixture into a flow of gas based on the amount of extender fluid utilized, and (3) penetration of the fluid-feedstock mixture into the flow of gas in a substantially perpendicular direction to the flow of gas. *Id.* at 25.

The Examiner responds that Austin's two combustion streams do not distinguish the reference from claim 1 because claim 1 does not preclude additional streams. Ans. 2. The Examiner finds that Austin discloses the presence of feedstock and indicates it may be atomized while Vogler is relied upon to teach atomization of oil. *Id.* at 2-3. According to the Examiner, it "is of no moment" that Vogler's oil is eventually part of the combustion gas stream and not the feedstock because Vogler labels "fuel oil" and "atomizing air" as inputs facing the same direction. *Id.* at 3. The Examiner finds that Vogler's atomizing air input intersects the oil input and pushes it downstream towards the reactor "simply because there is nowhere else for it to go." *Id.* The Examiner also finds Vogler's characterization of the stream as "atomizing" implies that it breaks up the liquid stream into

small droplets, which means it “highly penetrates and disrupts it.” *Id.* The Examiner determines that “the claimed effects are deemed met, even though the exact geometries . . . are different” between Appellant’s and Vogler’s figures. *Id.*

Based on the cited record in this Appeal, we are persuaded that the Examiner reversibly erred in combining the teachings of Austin and Vogler. Because claims 2, 4–9, 14, 22–24, 46, 50, 51, 54, and 58 require one or more of claim 1’s disputed limitations, our discussion focuses on claim 1.

In rejecting claims under 35 U.S.C. § 103(a), it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966) (noting that 35 U.S.C. § 103 leads to three basic factual inquiries: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art). Furthermore, the Examiner’s obviousness rejection must be based on

“some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness” [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

KSR Int’l Co. v. Teleflex, Inc., 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

If the Examiner’s burden is met, the burden then shifts to the Appellant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and

the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

Although Austin and Vogler both disclose methods for carbon black production, the Examiner does not adequately rebut Appellant's assertions (Appeal Br. 25) that the combination of Austin and Vogler fails to disclose (1) an extender fluid that increases the momentum of the feedstock in a substantially axial direction to the feedstock flow, (2) an adjustable degree of penetration of the fluid-feedstock mixture into the flow of gas based on the amount of extender fluid, and (3) such penetration is substantially perpendicular to the flow of gas as required by claim 1. As Appellant points out and the record supports, Austin's carbon black feedstock is not accompanied by an extender fluid and it is introduced parallel to the combustion gas rather than perpendicular to it. Reply Br. 2–3; Appeal Br. 9, 11, 18–19; Austin 4:10–21, Figs. 1, 2.

Although the Examiner finds that Austin's feedstock may be atomized and that Vogler's atomizing air may penetrate and go with a larger feedstock stream simply because atomizing "implies" small droplets, the Examiner does not adequately explain why penetration of the feedstock stream results in the claimed penetration of the flow of gas (hot combustion gas). Ans. 2–3; Spec. ¶ 39. The Examiner also does not adequately explain why atomized droplets teach or suggest claim 1's requirement that the extender fluid increase the momentum of the carbon back feedstock in an axial direction. The Examiner finds that a faster stream has more momentum (Ans. 3), but does not adequately explain why Vogler's atomizing air would cause a faster stream and thereby increase momentum. Therefore, based on the cited

record in this Appeal, we are persuaded by Appellant that the combination fails to teach or suggest the claimed use of an extender fluid.

For these reasons, we reverse the Examiner's rejection of claims 1, 2, 4–9, 14, 22–24, 46, 50, 51, 54, and 58 under 35 U.S.C. § 103 over Austin and Vogler.

Rejection 2: Obviousness over Austin, Vogler, Cheng, Strock, and Jordan

The Examiner rejects claims 1, 2, 4–9, 14, 22–24, 46, 50, 51, 54, and 58 under 35 U.S.C. § 103(a) over the combination of Austin and Vogler in further view of Cheng,⁵ Strock,⁶ and Jordan.⁷ Non-Final Act. 2–3. According to the Examiner, Cheng discloses gas flowing in the same direction as oil, therefore it will provide increased velocity. *Id.* (citing Cheng col 2–4, Fig. 3). The Examiner additionally relies on Strock and Jordan for increased velocity. *Id.* at 3 (citing Strock col. 2–4; Jordan col. 2–6).

Appellant relies on the same arguments presented with respect to claim 1 in asserting that Cheng, Strock, and Jordan do not cure the deficiencies of Austin and Vogler. Appeal Br. 39. Appellant specifically contends that Cheng only creates a vortex around the feedstock and around the fuel streams, therefore Cheng would not increase the momentum of the feedstock in an axial direction to the carbon black reactor. *Id.* at 39–40 (citing Cheng 3:54–66, Figs. 3, 4). Similarly, Appellant contends that Jordan does not disclose the effect of an extender fluid combined with feedstock, but, rather, other parameters that can affect performance of the feedstock

⁵ US 4,321,248, issued Mar. 23, 1982.

⁶ US 5,643,344, issued July 1, 1997.

⁷ US 3,922,335, issued Nov. 25, 1975.

injection step such as the velocity of the annular combustion product and dimensions of the enclosing apparatus. *Id.* at 44–45 (citing Jordan 7:64–8:4). Appellant points out that Strock does not relate to carbon black production, but rather, flue gas desulfurization wherein counterflowing gas flows upward along the length of scrubber reactor walls. *Id.* at 41–42 (citing Strock 5:21–43, Fig. 4).

The Examiner responds that Cheng is not relied upon for disclosing increased momentum because that is addressed by the Examiner’s discussion regarding a fast flow imparting momentum. Ans. 4. The Examiner also states that Appellant’s distinctions over Strock and Jordan are not relevant because they “are relied upon to teach the effects that are in the claims, and to provide evidence as to the effect that various physical forces have on the process-physical forces which are found in [Vogler] for the reasons advanced above.” *Id.* at 4–5.

Because the secondary references cited by the Examiner do not cure the deficiencies of the combination of Austin and Vogler discussed above in connection with claim 1, we likewise reverse the rejection of the claims over Austin and Vogler in further view of Cheng, Strock, and Jordan for the same reasons.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	References/Basis	Affirmed	Reversed
1, 2, 4–9, 14, 22–24, 46, 50, 51, 54, 58	103(a)	Austin, Vogler		1, 2, 4–9, 14, 22–24, 46, 50, 51, 54, 58

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Claims Rejected	35 U.S.C. §	References/Basis	Affirmed	Reversed
1, 2, 4-9, 14, 22-24, 46, 50, 51, 54, 58	103(a)	Austin, Vogler, Cheng, Strock, Jordan		1, 2, 4-9, 14, 22-24, 46, 50, 51, 54, 58
Overall Outcome				1, 2, 4-9, 14, 22-24, 46, 50, 51, 54, 58

REVERSED