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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JAMES P. CROCKER

Appeal 2019-006442
Application 14/796,876
Technology Center 3600

Before JILL D. HILL, LEE L. STEPINA, and
ARTHUR M. PESLAK, *Administrative Patent Judges*.

PESLAK, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1, 4–11, and 13–18. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM IN PART.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Waterblasting, LLC. Appeal Br. 1.

THE CLAIMED SUBJECT MATTER

Appellant's invention relates to a device for melting and applying thermoplastic material to a road surface. Spec. ¶2. Claims 1 and 13 are independent. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A surface marking device for applying thermoplastic marking materials to a surface comprising:

a surface marking assembly, said surface marking assembly including a melting kettle, said melting kettle having a shell, a plurality of conduit members positioned within said shell to allow hot oil to pass around in direct contact with an outer perimeter of said plurality of conduits within said shell, said plurality of conduits constructed from a heat conductive material and each conduit having an aperture at a first end thereof for accepting unmelted thermoplastic granules, a second end of each said conduit fluidly connected to a material discharge collector at the bottom end of said kettle for discharging molten thermoplastic;

a heating system for heating said oil, said oil passed through said melting kettle in direct contact with said plurality of conduits, so that said oil contacts said outer perimeter of said plurality of conduits and an inner surface of said shell, said oil having a temperature higher than a melting point of said thermoplastic granules;

said thermoplastic granules are passed from said first end of said plurality of conduits to said second end of said plurality of conduits by gravity and said outer perimeter of said plurality of conduits have a suitably sized surface area to transfer sufficient heat from said oil so that said thermoplastic granules are melted before reaching said material discharge collector.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
McIntyre	US 1,940,964	Dec. 26, 1933
Currie	US 3,554,449	Jan. 12, 1971
Varga	US 8,201,717 B2	June 19, 2012
Dirienzo	US 2004/0099212 A1	May 27, 2004

REJECTIONS

1. Claims 1, 4–7, 10, 11, and 13–17 are rejected under 35 U.S.C. § 103 as unpatentable over Dirienzo and Currie. Final Act. 2.
2. Claims 8 and 18 are rejected under 35 U.S.C. § 103 as unpatentable over Dirienzo, Currie, and McIntyre. Final Act. 7.
3. Claims 1, 4–7, 9–11, and 13–17 are rejected under 35 U.S.C. § 103 as unpatentable over Dirienzo, Currie, and Varga. Final Act. 8.
4. Claims 8 and 18 are rejected under 35 U.S.C. § 103 as unpatentable over Dirienzo, Currie, Varga, and McIntyre. Final Act. 14.

ANALYSIS

Rejection 1; Dirienzo and Currie

Claims 1, 4–7, 10, and 11

The Examiner finds that Dirienzo discloses most of the limitations of claim 1 including melting kettle 30 and conduit 40. Final Act. 2. The Examiner finds that Dirienzo does not explicitly disclose that the material of the conduit is a heat conductive material. However, the Examiner finds that because Dirienzo's conduit is heated to melt the thermoplastic material therein, one of ordinary skill in the art would have understood that the conduit is heat conductive or that it would have been obvious to make it heat conductive in order to transfer heat. *Id.* at 2–3. The Examiner finds that

Dirienzo's melting kettle uses oil for heat transfer, and although Dirienzo does not provide the details of the inner workings of the kettle, Currie does. *Id.* at 3. The Examiner considers that it would have been obvious to substitute Currie's melting kettle for Dirienzo's melting kettle as a known alternate device to melt the thermoplastic granules. *Id.* The Examiner posits that because Currie heats the thermoplastic material to a free-flowing state, and because Dirienzo teaches that the melting kettle and conduit are heated to a higher temperature than the melt temperature of the thermoplastic material, one of ordinary skill in the art would have recognized that the heat transfer fluid must have a temperature higher than the melting point of the thermoplastic material in order for the thermoplastic material to become free-flowing. *Id.* According to the Examiner, the combination of Dirienzo and Currie results in the thermoplastic granules being passed by gravity, through the vertical bends depicted in Currie, and making Currie's one conduit a plurality of conduits would have been a mere duplication of essential working parts. *Id.*

Appellant argues, *inter alia*, that because Dirienzo heats the pipe before joint 30 (kettle) and because Currie heats the hopper before the kettle, melting does not occur in a vertical conduit of a kettle using thermoplastic granules passed by gravity. Appeal Br. 15–16. For the following reasons, we do not sustain this rejection.

Dirienzo discloses that apparatus 10 comprises a hopper 20 for holding particulate thermoplastic marking material in a non-molten state, and means for conveying the thermoplastic marking material from the hopper to continuous melt processor 30, which the Examiner equates to a melting kettle. Dirienzo ¶ 14; *see also* Final Act. 2. In a preferred

Currie's sole figure illustrates, partially and schematically, a portable plastic melter 10. Currie, 2:35–37. Although conduit 34 has “vertical bends,” the majority of the conduit is horizontal and is shown in the Figure having a smaller diameter than the outlet tubing from pump 32. The Examiner does not adequately explain how the thermoplastic material would pass through conduit 34 by gravity, as required by claim 1, absent pump 32. Thus, we do not sustain the Examiner's rejection of claim 1, and claims 4–7, 10 and 11 depending from claim 1.

Claims 13–17

Although independent claim 13 does not require that the thermoplastic material pass through the conduit by gravity, claim 13 requires a plurality of conduits in a coaxial spaced apart relationship. Appeal Br. 58 (Claims App.). The Examiner finds that replacing Dirienzo's single conduit with a plurality of conduits to be a “mere duplication of essential working parts” and further finds that a coaxial spaced apart relationship “is logical.” Final Act. 6.

Appellant argues, *inter alia*, that the Examiner's reasoning is insufficient and is based on impermissible hindsight. Appeal Br. 26–27. For the following reasons, we do not sustain this rejection.

Currie discloses a coiled pipe 34 that coils from an inlet at the top of housing 38 to discharge nozzle 40 at the bottom of housing 38. Currie, 3:36–42; Fig. In light of this disclosure, we determine that the rejection is not supported by a rational underpinning because the Examiner did not adequately explain why one of ordinary skill would have found it “logical” to arrange plural pipes in a coaxial spaced apart relationship. Currie discloses flow from top to bottom, so that “the composition is transformed

from the mushy state to a relatively free flowing state in which form it exits from a discharge nozzle 40.” Currie, 3:40–42; Fig. Given the flow arrangement of Currie, the Examiner does not explain why a coaxial spaced apart relationship is “logical,” let alone why it would have been obvious to one of ordinary skill in the art to modify Currie in this manner. Therefore, we do not sustain the rejection of claim 13 and claims 14–17, which depend from claim 13, as unpatentable over Dirienzo and Currie because the rejection is not based on a rational underpinning.

Rejection 2; Dirienzo, Currie, and McIntyre

Claim 8 depends from claim 1 and claim 18 depends from claim 13. Appeal Br. 57, 60 (Claims App.). The Examiner rejects claims 8 and 18 based on the combination of Dirienzo and Currie with additional disclosure from McIntyre. Final Act. 7–8. The Examiner does not rely on the additional disclosure from McIntyre to cure the deficiencies in the combination of Dirienzo and Currie discussed above in connection with claims 1 and 13. *Id.* We, therefore, do not sustain the rejection of claims 8 and 18.

Rejection 3; Dirienzo, Currie, and Varga

Claims 1, 4–7, and 9–11

Appellant argues claims 1, 4–7, and 9–11 as a group. Appeal Br. 32–41. Pursuant to 37 C.F.R. § 41.37(c)(1)(iv), we select claim 1 as representative and claims 4–7 and 9–11 stand or fall with claim 1.

The Examiner relies on the same findings and reasoning discussed above as to Dirienzo and Currie to reject claims 1, 4–7, and 9–11 in

Rejection 3. Final Act. 8–11. Here, however, the Examiner relies on Varga in a manner that cures the deficiencies of Dirienzo and Currie discussed above.

Specifically, the Examiner finds that Varga discloses a plurality of conduits 64 and that Varga passes the granules through the conduits by gravity. Final Act. 9–10. The Examiner concludes that plural conduits would increase efficiency by melting more material, and that passing the granules through the pipes of Varga is a known alternative way to predictably move granules through conduits. *Id.*

Appellant argues that because both Dirienzo and Currie teach heating prior to the melting kettle, these reference do not suggest that melting takes place “within a vertical conduit.” Appeal Br. 38. Appellant asserts that Varga does not cure the deficiencies of Dirienzo and Currie because Varga teaches a heating manifold that is heated with electrical resistance heating elements, not a melting kettle with circulating hot oil that melts material in a vertical conduit. *Id.* at 39. For the following reasons, we are not persuaded by Appellant’s arguments.

Although we appreciate that Varga’s conduits are in a manifold, not a melting kettle, the Examiner relies on Varga for the teaching of a plurality of conduits and does not equate a manifold to a melting kettle. The Examiner relies on Currie’s disclosure of a melting kettle with conduit 34 there through. *See* Final Act. 8–9. As the Examiner correctly finds, Varga discloses that the conduits pass the material by gravity and that “[m]elting occurs within cavities 64 and transforms the solid particles into molten, hot melt adhesive, by the time the material discharges from cavities 64.” Varga, 6:49–51; *see also* Final Act. 10. Appellant does not dispute this finding.

See Appeal Br. 39. That Varga melts the material using resistance heating is of no import, because the Examiner relies on Currie to teach circulating hot oil to melt a thermoplastic material in a conduit. *See* Final Act. 9.

Specifically, Currie discloses that pipe 34 is “surrounded by a heating medium 36 . . . such as compressed steam, heated oil . . . raising [the plastic material’s] temperature from 260° F to 400–450 F . . . to a relatively free-flowing state, so that it may be sprayed by the spray nozzle 40 at the discharge end of the superheater.” Currie, 3:38, 3:71, 4:15–19. Moreover, Dirienzo discloses that electrical heating and recirculating hot oil are suitable alternatives for heating a conduit to melt thermoplastic material. Dirienzo ¶ 18. Thus, the combination of references set forth by the Examiner suggests using hot oil in a melting kettle to melt thermoplastic material in a plurality of conduits and that the material passes from one end of the conduits to the other by gravity.

Appellant also argues that the references do not “suggest a desirability for the modification,” and that the modification is based on “impermissible hindsight.” Appeal Br. 40. We are also not persuaded by this argument.

Dirienzo discloses that thermoplastic marking material can be melted by heating the elements that contain the material using “electrical band heaters 80, recirculating hot oil, and hot air.” Dirienzo ¶ 18; *see* also Final Act. 8. Because Dirienzo does not explicitly show hot oil in direct contact with the conduit, the Examiner relies on Currie, which as discussed above teaches hot oil in contact with conduit 34. Currie, 3:38, 3:71, 4:15–19. The Examiner’s reason for the combination is “a substitution of an alternate device to melt the thermoplastic granules.” Final Act. 9. Given that Dirienzo teaches that these are known alternatives, the Examiner’s reasoning

is disclosed in the cited references, rather than stemming from impermissible hindsight. The Examiner's reason for adding Varga to the combination is to "yield an increase in efficiency to allow greater surface area to melt more thermoplastic." Final Act. 9. This reasoning is based on Varga's disclosure of the advantages of using multiple short conduits instead of a single long conduit. Varga, 10:19–26. Because the Examiner's reasoning for the proposed modification is reasonable and supported by rational underpinnings found in the prior art, we do not agree that the Examiner's rejection is based on impermissible hindsight. For these reasons, we sustain the rejection of claim 1 as unpatentable over Dirienzo, Currie, and Varga. Claims 4–7 and 9–11 fall with claim 1.

Claims 13–17

The Examiner relies on the same findings and reasoning discussed above as to Dirienzo and Currie to reject claims 13–17 of Rejection 3. Final Act. 11–13. The Examiner additionally relies on Varga to disclose a plurality of conduits 64 and that Varga passes the granules through the conduits by gravity. *Id.* at 12.

Appellant argues that "[t]he combination of Dirienzo, Currie, and Varga does not teach or suggest every claim limitation of independent Claim 13." Appeal Br. 44. We agree.

Claim 13 requires that the plurality of conduit members are positioned within the shell in a coaxial spaced apart relationship. As the Examiner correctly finds, the combination of Dirienzo and Currie "includes one conduit but fails to disclose a plurality of conduits." Final Act. 12. Although the Examiner relies on Varga to disclose a plurality of conduits, the Examiner does not make any finding that Varga, or the combination of

Dirienzo, Currie and Varga suggest that the plurality of conduits are in a coaxial spaced apart relationship. *See* Final Act. 11–13. Figures 3 and 4 of Varga depict a plurality of cavities (conduits) 64. Figure 3 is a cross-sectional view that depicts the shape of one conduit 64 and Figure 4 is a cross-sectional view that depicts a plurality of conduits 64. Varga, 4:24–27, 6:28–31. The Examiner does not explain why Varga’s aligned conduits are in a coaxial spaced apart relationship as required by claim 13. We do not sustain the rejection of claim 13, and claims 14–17 depending therefrom, as obvious over Dirienzo, Currie and Varga because the Examiner does not address the requirement of claim 13 that the plurality of conduits are “in a coaxial spaced apart relationship.”

Rejection 4; Dirienzo, Currie, Varga, and McIntyre

Claim 8

Claim 8 depends from claim 1 and requires that “said plurality of conduits include at least one fin for increasing the surface area of the outer surface of said plurality of conduits thereby increasing heat transfer to said plurality of conduits from said oil.” Appeal Br. 57 (Claims App.). The Examiner finds that McIntyre teaches using fins on a conduit to enhance heat transfer. Final Act. 14. The Examiner posits that it would have been obvious to “use fins anywhere where heat transfer is desired in view of McIntyre’s teaching that the concept of using fins on a conduit for enhancing heat transfer is old and well known.”² *Id.*

² We note that McIntyre issued on December 26, 1933.

Appellant argues that the Examiner's determination is conclusory because "Currie teaches including -+the heating element within the hopper, and therefore *teaches away* from the concept of including fins" because "fins on the outside of the conduit have no practical purpose for heat transfer when the heating plate is within the thermoplastic granules being melted." Appeal Br. 53.

The Examiner responds that the rejection does not rely on using Currie's heating plates and that using fins on the conduits surrounded by hot oil, would enhance heat transfer as taught by McIntyre. Ans. 7. For the following reasons, we sustain the rejection of claim 8.

The Examiner proposes to add fins to the exterior of conduits as seen in Figure 1 of McIntyre. McIntyre discloses that using heat radiating fins provides a large heating surface, which greatly increases the heating efficiency. McIntyre, 1:11–21. Appellant does not dispute this teaching by McIntyre or the Examiner's finding that the use of fins to enhance heat transfer on conduits is old and well known. *See* Appeal Br. 53. Further, Appellant does not direct us to any evidence to support its attorney argument that Currie discourages the use of fins on conduits to enhance heat transfer and thus would support a finding that Currie teaches away from using fins. *See DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) (citation omitted) ("A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant."). Therefore, we sustain the rejection of claim 8 as unpatentable over Dirienzo, Currie, Varga, and McIntyre.

Claim 18

Claim 18 depends from claim 13. Appeal Br. 60 (Claims App.). The Examiner rejects claim 18 based on the combination of Dirienzo, Currie, and Varga with additional disclosure from McIntyre. Final Act. 14. The Examiner does not rely on the additional disclosure from McIntyre to cure the deficiencies in the combination of Dirienzo and Currie discussed above in connection with claim 13. *Id.* We, therefore, do not sustain the rejection of claim 18 as unpatentable over Dirienzo, Currie, Varga, and McIntyre.

CONCLUSION

The Examiner's rejections are affirmed in part.

More specifically,

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 4-7, 10, 11, 13-17	103	Dirienzo, Currie		1, 4-7, 10, 11, 13-17
8, 18	103	Dirienzo, Currie, McIntyre		8, 18
1, 4-7, 9-11, 13-17	103	Dirienzo, Currie, Varga	1, 4-7, 9-11	13-17
8, 18	103	Dirienzo, Currie, Varga, McIntyre	8	18
Overall Outcome:			1, 4-11	13-18

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TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED IN PART