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DICKINSON WRIGHT PLLC 2600 WEST BIG BEAVER ROAD SUITE 300 TROY, MI 48084-3312			YUEN, JACKY	
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tgood@dickinsonwright.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CELESTINE OBUNA, JACQUES GUYON, and THOMAS
HUTZLER

Appeal 2019-005352
Application 14/397,267
Technology Center 1700

Before CATHERINE Q. TIMM, JULIA HEANEY, and
JEFFREY R. SNAY, *Administrative Patent Judges*.

HEANEY, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE¹

Pursuant to 35 U.S.C. § 134(a), Appellant² appeals from the Examiner's decision to reject claims 1–2 and 7–10. *See* Final Act. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

CLAIMED SUBJECT MATTER

The claims are directed to a piston casting process and a corresponding piston casting tool. Spec. 2. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A method for producing a piston for an internal combustion engine, comprising the steps of:

filling a casting cavity having the shape of a piston with a material from a feeder at a side of the casting cavity, an axis of rotation of the piston being substantially horizontal during the filling step, and *the casting cavity having a recess extending into a side wall of the casting cavity which runs parallel to the axis of rotation of the piston*, the piston including a side wall which runs parallel to the axis of rotation of the piston and which has a top end and a bottom end, the recess being spaced from the top end and the bottom end of the side wall of the piston, and *the recess being located at a highest point of the piston during the filling step*;

¹ This Decision refers to the Specification filed Oct. 27, 2014 and as amended on the same date (“Spec.”), Final Office Action dated Oct. 16, 2018 (“Final Act.”), Appeal Brief dated Mar. 18, 2019 (“Appeal Br.”), Examiner’s Answer dated May 3, 2019 (“Ans.”), and Reply Brief dated July 3, 2019 (“Reply Br.”).

² 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 Federal-Mogul Nurnberg GmbH. Appeal Br. 1.

tilting the casting cavity after the filling step and before solidification of the material by at least 45 degrees about a horizontal axis such that the axis of rotation of the piston moves to a substantially vertical position, the feeder is located at a highest point of the piston, and *the recess is located at a side of the piston*; and removing impurities located in the recess after the tilting step.

Appeal Br. 11 (Claims Appendix) (*italics added*). Claim 8, the other independent claim on appeal, is directed to a casting tool for use in performing the method of claim 1, and includes the same limitations as those italicized above in claim 1. *Id.* at 12. The italicized limitations relate to a recess in the casting cavity, and are the main limitations discussed below.

REFERENCE

The prior art relied upon by the Examiner is:

Name	Reference	Date
Wang	CN 85105357 A	Sep. 9, 1987
Morris	US 2,195,960	Apr. 2, 1940
Menge	US 2010/0166596 A1	Jul. 1, 2010
Sulprizio	US 2,620,530	Dec. 9, 1952

REJECTIONS

1. Claims 8–10 are rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Wang and Morris. Final Act. 3.
2. Claims 1–2 and 8–10 are rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Wang, Menge, and Morris. Final Act. 5.
3. Claim 7 is rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Wang, Menge, Morris, and Sulprizio. Final Act. 7.

OPINION

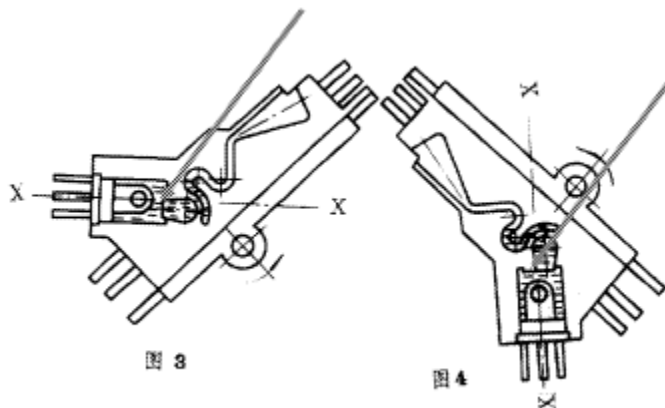
Appellant presents substantially the same arguments against the rejections of claims 1 and 8, focusing on the limitations relating to the location of the recess as italicized in claim 1 above. *See* Appeal Br. 5–9. Appellant does not separately argue any of the dependent claims. *Id.* Accordingly, we focus on the common limitations as argued by Appellant.

The Examiner finds that Wang teaches a method for producing a piston comprising the steps of claim 1, except that it does not explicitly teach (1) rotating the casting cavity to vertical before solidification, or (2) a recess extending into a sidewall of the casting cavity which runs parallel to the axis of rotation of the piston with the recess being located at a highest point of the piston during the filling step and at a side of the piston after being tilted. Final Act. 5–6. The Examiner finds that Menge teaches pivoting the mold after filling but prior to solidification (*id.* at 6 (citing Menge 2:15–35, 5:50–65)) and determines that in view of Menge, it would have been obvious to a person of ordinary skill in the art to rotate Wang’s mold prior to beginning solidification in order to prevent defects due to shrinkage. *Id.*

As to the limitations of the appealed claims relating to the recess, the Examiner finds that Morris teaches a casting apparatus that turns about a pivot in order to fill the mold, and having vent 5’ including a ball portion. *Id.* at 6 (citing Morris Figs. 1–3, p.1, 1:35–50). The Examiner finds that Morris’s vent extends into the sidewall of the cavity and is spaced from the top end and the bottom end of the side wall, and that upon turning the apparatus to fill the cavity, the vent will be located at the highest point of the cavity. *Id.* The Examiner further finds that Morris’s vent takes up impurities in the ball portion, which will be knocked off the completed

casting. *Id.* (citing Morris 1, 2:50–2, 1:2). The Examiner determines it would have been obvious to a person of ordinary skill in the art to modify Wang to include a recess/vent which would be located at a highest point of the cavity shown in Wang’s Figure 3 during filling (corresponding to the position of Morris’s vents after tilting of the apparatus, when filling occurs), and that after tilting, the recess/vent would be located at the side of the piston. *Id.* at 6–7 (citing Wang Figs. 3, 4). The Examiner determines a person of ordinary skill in the art would have modified Wang to include such a recess to take up impurities during filling which can be knocked off the casting at a later step. *Id.* at 6–7.

Appellant argues that Morris’s vent 5’ does not extend into a wall which runs parallel to an axis of rotation, and that Morris fails to suggest that the location of the vent during a filling step or after a tilting step is relevant. Appeal Br. 6. Appellant further argues that even if Morris’s vent were placed in a corresponding position in Wang’s casting tool, “the corresponding position would be the side of the mold before rotation to the left ninety degrees and the highest point of the casting **after** rotating the cavity to left ninety degrees.” Reply Br. 4. Appellant provides the following annotated illustration of Figures 3–4 of Wang:



In the annotated illustration above, Appellant has drawn arrows on Figures 3 and 4 of Wang identifying the corresponding position where Morris's vent purportedly would be placed. Reply Br. 5. Appellant explains that in this modification of Wang, the recess/vent would be located "**perpendicular** to the axis of rotation of the piston (x-x), not parallel to the axis of rotation (x-x), as recited in claims 1 and 8" and the vents 5' "would be located at the top of the piston of Wang after rotating, not at a side of the piston, like the recess recited in claims 1 and 8." *Id.*

Appellant's arguments do not persuasively identify reversible error. The Examiner's obviousness determination is based on Morris's teaching that the mold assembly of Figure 2 is rotated by ninety degrees to the left and then filled with material, followed by a return of the mold assembly to its original position. Morris Fig. 2, 1, 1:35-48, 2, 1:12-15. When the mold assembly of Figure 2 is rotated by ninety degrees to the left for filling, vent 5' is located at the highest point of the cavity. Morris Fig. 2, 1, 2:50-2, 1:1-2. In other words, Morris's Figure 2 depicts the orientation of vent 5' prior to performing a filling step. With regard to filling, which is the process step shown in Wang's Figure 3, Morris's mold is filled after the assembly is rotated to the left from the orientation shown in Morris's Figure 2.

Appellant's argument concerning the placement of the recess/vent in Wang as modified by Morris misconstrues the Examiner's finding that Morris teaches the vent is located at the highest point of the cavity at the time of filling. For that reason, Appellant's argument is not responsive to the basis for the rejection. Further, the Examiner's basis for determining that a person of ordinary skill in the art would have modified Wang to include a recess/vent is reasonable. *See* Final Act. 6-7.

CONCLUSION

The Examiner's rejections are AFFIRMED.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
8-10	103(a)	Wang, Morris	8-10	
1-2, 8-10	103(a)	Wang, Menge, Morris	1, 2, 8-10	
7	103(a)	Wang, Menge, Morris, Sulprizio	7	
Overall Outcome:			1, 2, 7-10	

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