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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte RAINER SCHARP

Appeal 2014-003773
Application 13/066,554
Technology Center 3700

Before LYNNE H. BROWNE, THOMAS F. SMEGAL, and LISA M. GUIJT, *Administrative Patent Judges*.

GUIJT, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant[1] seek our review under 35 U.S.C. § 134 of the Examiner's decision[2] rejecting claims 1–13. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART and enter NEW GROUNDS OF REJECTION pursuant to our authority under 37 C.F.R. § 41.50(b).

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[1] Appellant identifies the real party in interest as Mahle International GmbH. App. Br. 1.

[2] Appeal is taken from the Final Office Action dated May 8, 2015 ("Final Act."), as supplemented by the Advisory Action dated August 9, 2013 ("Adv. Act.").

CLAIMED SUBJECT MATTER

Claim 1, reproduced below as the sole independent claim on appeal, is illustrative of the claims on appeal.

> 1. Piston (10) for an internal combustion engine,
>
> having an outer circumferential cooling channel (19) and an inner cooling cavity (21), the cooling cavity bottom (22) of which has an opening (23) that is closed off with a separate closure element (33) that has at least one cooling oil opening (35),
>
> whereby the closure element (33) is held, in clamped manner, by means of at least two engagement elements (37) disposed on the outer edge, in at least one engagement groove (34) provided in the region of the opening (23) of the cooling cavity bottom (22),
>
> wherein the closure element (33) has at least two spring tabs (38) that support themselves on contact surface (39) provided in the piston interior, in each instance, in such a manner that a spring bias is in effect between the spring tabs (38) and the engagement elements (37), said spring bias acting in the axial direction,[3] such that the closure element (33) is held in the engagement groove (34) under axial bias.

REJECTIONS

I. Claims 1–7 and 9–13 stand rejected under 35 U.S.C. § 102(b) as anticipated by Kanda (US 4,506,632; iss. Mar. 26, 1985).

II. Claim 8 stands rejected under 35 U.S.C. § 103(a) as unpatentable over by Kanda and Kemnitz (US 5,357,920; iss. Oct. 25, 1994).

[3] Notably, there is no antecedent basis for the claim term "the axial direction."

ANALYSIS

Rejection I

Regarding independent claim 1, the Examiner finds, *inter alia*, that Kanda discloses a closure element (lubricant reservoir defining member 10) and engagement elements (legs 14) disposed in an engagement groove (groove 2a) for clamping the closure element. Final Act. 2 (citing Kanda, Figs. 1–11). The Examiner further finds that Kanda's closure element (member 10) has two spring tabs (end leg portions 13*b* of legs 13), such that a spring bias is in effect between end leg portions 13*b* and legs 14, which acts in an axial direction, such that member 10 is held in the engagement groove 2a under axial bias, as required by claim 1. *Id.* at 2–3 (citing Kanda, Figs. 5, 6). The Examiner explains that Kanda's "spring tabs 13*b* are secured partly by axial forces as shown where they are bent into place, and where tabs 14 . . . show that they are not perfectly vertical, but rather at an angle [] also hav[ing] spring force applied in an axial direction." *Id.* at 3 (citing Kanda, Figs. 5, 6) (emphasis added). The Examiner further determines that the spring bias in effect between spring tabs 13*b* and tabs 14 acts in an axial direction, such that member 10 is held in groove 2a under axial bias. *Id.* The Examiner also finds that Kanda's piston ring grooves 6 and/or oil scraper ring groove 7 correspond to the claimed outer circumferential cooling channel, and that member 10 has at least one cooling oil opening, as required by claim 1, because there are "openings about flanges 17" at reference numerals 18, 19, as depicted in Figure 3 of Kanda. Final Act. 2.

First, Appellant argues that, "[i]n *Kanda*, there is absolutely no interaction between the legs (13) and the legs (14) of the member (10)," and "[t]herefore[,] there is no spring bias effect between the leg parts (13b) and the legs (14)." App. Br. 5; *see also* Reply Br. 2. In support, Appellant submits that "legs (14) do not fix

the member (10), but simply lie flat to the grooves (2a) due to a radially acting spring force only in the inner wall of the piston skirt (2) and only serve to prevent the rotation of the member (10)." App. Br. 5. Appellant submits that "there are no axial forces at all as soon as the member (10) is fixed within the piston," because "as soon as the member (10) is fixed within the piston, there are only radial forces which have an effect on the legs (13, 14)." *Id.* at 6. Appellant further submits that "member (10) is held in position only by the legs (13)," and "[t]hus it is not [] impossible that any bias caused by the legs (14) has any influence on the form-fit fixation of the legs (13)." *Id.* at 5–6. In further support, Appellant submits that because Figures 8 to 11 of Kanda, which show another embodiment of Kanda's invention, omit legs (14), "the leg parts (13b) and the legs (14) act <u>completely independent</u> from each other." *Id.*; *see also* Reply Br. 2.

The Examiner responds that

> Figure 5 [of Kanda] shows the spring tabs 13b being bent into place in order to place the closure element 10 within the piston. . . . Once the tabs 13b are bent a force will be applied to the tabs 13b to maintain them in place, this force will have a vertical component traveling upwards due to the bending of the tabs 13b (when the two sides are squeezed a bending will occur within the other parts of the metal tab [because member 10] is one piece) this force will attempt to force the middle sections of the closure element upwards. . . . While this bending action will not be very significant, it will still occur through the body all the way down to the engagement elements 14; the engagement elements 14 are pressed against the piston sides, as they are bent into place there. . . . However, as the engagement elements 14 are pressed against the piston they cannot bend outwards thus creating a spring force bias between [engagement elements or legs 14] and the spring tabs 13b which would keep the upper part of the closure element 10 within its grooves 9b.

Ans. 7–8 (citations omitted); *see also* Adv. Act. 1 ("Because [legs 13 bend when assembled], there will be a spring force, acting as a reaction force, on the legs 13

which will act across the entire member 10 between the legs 13" and "therefore would be a spring bias force 'between' legs 13 and 14 which are composed of the same material on the same member 10.") In reply, Appellant contends that, in Kanda, "there are no axial forces at all as soon as the member (10) is fixed within the piston," but rather "only radial forces which have an effect on the legs (13, 14)." Reply Br. 2.

We determine that a preponderance of the evidence supports the Examiner's finding that when member 10 is assembled into piston body 1 of Kanda, a spring bias is in effect between the spring tabs (end leg portions 13*b*) and the engagement elements (legs 14), as required by claim 1, and that such spring bias acts in an axial direction, such that member 10 is held in engagement groove 2a under axial bias, as is also required by claim 1. As determined by the Examiner, Kanda discloses that "member **10**, shown in FIG. 4 in its free unstressed state[], is press formed as a whole of a piece of metallic plate of suitable thickness and suppleness and elasticity, such as spring steel plate." *See* Kanda 5:16–20. Kanda also discloses that "relatively large end leg portions **13***b* . . . spread outwards somewhat in the free state, as clearly shown in FIG. 5." *Id.* at 5:41–43. Kanda also discloses, with reference to Figure 5, that "member **10** is assembled into the piston body **1** . . . by utilizing its own spring action," in that "legs **13** of said member **10** are squeezed together somewhat . . . with the legs **13** bending both along the line **A** and along line **B**" (*id.* at 6:6–8, 14–21), and that "[w]hen the holes **16** in the wider legs **13** become aligned with the piston pin fitting holes **5** in the bosses **4**, then the squeezing of these legs **13** is released, so that they spring apart under their own spring force" (*id.* at 6:28–31).

Contrary to Appellant's argument, however, when legs 13 spring apart to "rest against the flat annular surfaces **9***b* defined on the inward parts of the boss

portions **4**" (*id.* at 6:31–38), legs 13 continue to apply a spring bias within member 10, because legs 13 do not spring apart into their somewhat outwardly spreading unstressed state (as discussed *supra*), but rather are vertical, as depicted in Figure 1, although less squeezed together than for insertion. *See* Kanda, Fig. 5. Appellant does not address the Examiner's determination that because a spring bias remains within member 10 due to *some* squeezing together of legs 13 in the assembled state, a spring bias would necessarily be applied to legs 14, for example, via shelf plate member 12, because (as discussed *supra*) member 10 is a one-piece spring steel plate, and thus, we are apprised of no error in the Examiner's determination. Appellant also does not address the Examiner's determination that such a spring bias, which the Examiner finds both with respect to legs 13 and legs 14 is applied against surfaces of the piston main body at an angle (as discussed *supra*), would have an axial force component, which would at least contribute to holding member 10 in groove 2a under an axial bias, and thus, we are likewise apprised of no error in the Examiner's determination. Notably, claim 1 does not exclude other forces from also being present in the piston assembly to hold member 10 in groove 2a, such as a radial spring force applied by legs 14.

The omission of tabs 14 from the embodiment depicted in Kanda's Figures 8 to 11, such that force from tabs 14 no longer contribute to holding member 10 in groove 2a under axial bias, is not evidence of error in the Examiner's determination that with respect to the embodiment depicted in Kanda's Figures 1–5, as argued by Appellant.

Second, Appellant argues that "[t]he piston according to *Kanda* does not have a circumferential outer cooling channel." App. Br. 8. In support, Appellant contends that "[t]he piston ring grooves of *Kanda* are filled with piston rings, not with cooling oil" (*id.*), concluding that "the oil scraper ring groove 7 . . . cannot be

equated with a cooling channel" (Reply Br. 4). The Examiner responds that "[w]hile it is true [that groove (or channel) 7] contain[s] oil scraping rings, these rings are for the purpose of scraping cooling oil into the channels 7 in order to transfer the cooling oil to the openings 8 for transfer of oil into the lubricant reservoir within the piston." Ans. 8–9 (citing Kanda, i.e., 4:65–5:2). The Examiner concludes that "[t]herefore, the outer circumferential channels 7 contain rings and are filled with oil being scraped into them by the rings." *Id.* at 9.

Kanda discloses, with respect to the first preferred embodiment depicted in Figures 1 and 2, that

> [c]ircumferentially around the outer surface of the crown portion **3** there are incised two piston grooves **6** and an oil scraper ring groove **7**, and, as shown in FIG. 2, the bottom of said ring groove **7** is communicated to the internal space within the piston assembly by a plurality of slit holes **8**.

Kanda 4:65 to 5:2. Thus, a preponderance of the evidence supports the Examiner's finding that "oil scraper ring groove 7" is an outer circumferential channel, which is filled with oil scraped into the channel by a ring that is transferred to an internal space within the piston assembly, and that at least one function of oil as a fluid within the piston assembly is cooling. *See* Kanda 2:11–14 ("[I]t is the primary object of the present invention to provide a piston assembly, which can be well and effectively cooled by lubricant supply to the internal space within it.").

Third, Appellant argues that "[t]he wording of claim 1 states clearly that the closure element (33) has at least one cooling oil opening (35)," and that "[c]laim 1 <u>does not</u> state that a cooling oil opening is formed between an edge of the closure element and the inner wall of the piston." App. Br. 8. We agree that the Examiner erred by relying on "opening **18** between the side wall **2** of the piston main body **1** and the edge of the shelf plate **12**" of Kanda's member 10 (Kanda 7:7–9) as

meeting the claim 1 recitation "[a] closure element . . . that has [a] cooling oil opening." (App. Br., Claims App'x). However, with reference to the fourth embodiment disclosed in Kanda, Kanda discloses that "[t]he opening **18** and **19** for passage of lubricant are defined by actual holes through the shelf plate member **12**, rather than being defined between it and the piston main body **1**; but these openings in this embodiment perform the same function." Kanda 9:4–9, Figs. 8–10. Thus, we determine that it would have been obvious to one of ordinary skill in the art to modify the openings 18, 19 of the first preferred embodiment of member 10, as depicted in Kanda's Figures 1 to 5, to include openings 18, 19 *in* member 10, as depicted in Kanda's Fig. 10, to arrive at the invention as recited in claim 1, because such a modification would have involved no "more than the predictable use of prior art elements according to their established functions." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1740 (2007). Here, Kanda itself suggests such a substitution.

Accordingly, although we cannot sustain the Examiner's rejection under 35 U.S.C § 102(b) of independent claim 1 and, therefore, claims 2–7 and 9–13 depending therefrom, because Kanda does not disclose a cooling oil opening in the closure element, as stated *supra*, we enter a new ground of rejection of independent claim 1, and claims 2–7 and 9–13 depending therefrom, under 35 U.S.C. § 103(a) as unpatentable over Kanda, because modifying the Kanda's closure element to include a cooling oil opening in the closure element would be obvious, as stated *supra*. We otherwise adopt the Examiner's findings with respect to the rejection of claims 1–7 and 9–13.

Rejection II

Appellant argues that claim 8, which depends from independent claim 1, is patentable for the reasons stated with respect to claim 1. App. Br. 8–9. However,

as discussed *supra*, Appellant's arguments regarding claim 1 are unconvincing. Accordingly, we sustain the Examiner's decision rejecting claim 8. Because of the Examiner's error with respect to the finding that Kanda discloses a closure element having a cooling oil opening, as required by claim 1, as discussed *supra*, we designate our affirmance of the Examiner's rejection of claim 8 under 35 U.S.C. § 103(a) as a new ground of rejection under 37 C.F.R. § 41.50(b) to provide Appellant a full and fair opportunity to respond to the rejection. We otherwise adopt the Examiner findings with respect to claim 8. *See* Final Act. 5–6.

DECISION

The decision of the Examiner to reject claims 1–7 and 9–13 under 35 U.S.C. § 102(b) is REVERSED. We enter a NEW GROUND OF REJECTION of claims 1–7 and 9–13 under 35 U.S.C § 103(a) as unpatentable over Kanda.

The decision of the Examiner to reject claim 8 under 35 U.S.C. § 103(a) is AFFIRMED, and we designate our affirmance as a NEW GROUND OF REJECTION.

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). 37 C.F.R. § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review." 37 C.F.R. § 41.50(b) also provides that Appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new grounds of rejection to avoid termination of the appeal as to the rejected claims:

(1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected,

> or both, and have the matter reconsidered by the Examiner, in which event the proceeding will be remanded to the Examiner. . . .
>
> (2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

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; 37 C.F.R. § 41.50(b)