UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/286,328	05/23/2014	Norbert G. Schneider	710240-7055/HD-50220	1914

59582 7590 02/27/2020

DICKINSON WRIGHT PLLC
2600 WEST BIG BEAVER ROAD
SUITE 300
TROY, MI 48084-3312

EXAMINER
MOUBRY, JAMES G

ART UNIT	PAPER NUMBER
3747	

NOTIFICATION DATE	DELIVERY MODE
02/27/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DWPatents@dickinson-wright.com
tgood@dickinsonwright.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte NORBERT G. SCHNEIDER

Appeal 2019-004792
Application 14/286,328
Technology Center 3700

Before MICHAEL L. HOELTER, LISA M. GUIJT, and
LEE L. STEPINA, *Administrative Patent Judges*.

HOELTER, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–11 and 13–20. 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 "Federal-Mogul Corporation." Appeal Br. 3.

CLAIMED SUBJECT MATTER

The disclosed subject matter "relates generally to pistons for internal combustion engines." Spec. ¶ 1. Apparatus claim 1 and method claim 13 are independent. Claim 1 is illustrative of the claims on appeal and is reproduced below.

> 1. A piston, comprising:
>
> an upper wall surrounding a center axis and presenting a combustion surface;
>
> an outer rib extending from said upper wall to a base wall and presenting an outer surface;
>
> an inner rib disposed between said outer rib and said center axis and extending from said upper wall to said base wall;
>
> said upper wall and said ribs and said base wall presenting a cooling chamber therebetween;
>
> said outer rib presenting an outer surface including a plurality of ring grooves;
>
> a single piston ring received in each of said plurality of ring grooves;
>
> said plurality of ring grooves including a first ring groove being the ring groove closest to said combustion surface and a second ring groove being the ring groove second closest to said combustion surface;
>
> said single piston ring received in said second ring groove being made as a single piece;
>
> each of said ring grooves including a pair of side flanks extending inwardly from said outer surface to a base flank;
>
> said side flanks of said first ring groove extending perpendicular to said base flank of said first ring groove; and
>
> each of said side flanks of said second ring groove being disposed at an angle greater than 90 degrees relative to said base flank of said second ring groove and said side flanks of said second ring groove diverging away from one another.

EVIDENCE

Name	Reference	Date
Hanson	US 1,426,072	Aug. 15, 1922
Stratton et al. ("Stratton")	US 4,986,167	Jan. 22, 1991
Ogino et al. ("Ogino")	US 2009/0255504 A1	Oct. 15, 2009
Schneider	US 8,065,985 B2	Nov. 29, 2011
Muscas	US 2012/0037112 A1	Feb. 16, 2012

REJECTIONS

Claims 1–8, 10, 11, and 13–18 are rejected under 35 U.S.C. § 103 as unpatentable over Stratton and Hanson.

Claims 9 and 20 are rejected under 35 U.S.C. § 103 as unpatentable over Stratton, Hanson, and Schneider.

Claim 19 is rejected under 35 U.S.C. § 103 as unpatentable over Stratton, Hanson, Ogino, and Muscas.

ANALYSIS

Although claims 1–11 and 13–20 are rejected under different combinations of references (*see* above), Appellant argues all the claims on appeal together.[2] *See* Appeal Br. 8–16. Separately, Appellant presents arguments for dependent claim 5 (*see* Appeal Br. 14–15) and dependent claim 17 (*see* Appeal Br. 16), whose arguments are similar to each other.

[2] Regarding independent method claim 13, Appellant contends that the rejection of this claim "is believed to be improper for basically the same reasons set forth above in conjunction with claim 1." Appeal Br. 15.

Rejection I: Claims 1–8, 10, 11, and 13–18

Claims 1–4, 7, 8, 10, 11, and 13–16

We select claim 1 for review, with claims 2–4, 7, 8, 10, 11, and 13–16 standing and falling with claim 1. *See* 37 C.F.R. § 41.37(c)(iv).

Claim 1 describes the structure of a piston, including a "plurality of ring grooves" and "a single piston ring received in each of said plurality of ring grooves."[3] Claim 1 specifies, "a first ring groove being the ring groove closest to said combustion surface and a second ring groove being the ring groove second closest to said combustion surface." Claim 1 further recites, "said side flanks of said first ring groove extending perpendicular to said base flank" and "each of said side flanks of said second ring groove being disposed at an angle greater than 90 degrees relative to said base flank."

The Examiner primarily relies on Stratton, and particularly Figure 3 thereof, for disclosing the recited limitations. *See* Final Act. 3–4. However, the Examiner acknowledges that "Stratton does not specifically illustrate" the recited order of the first "perpendicular" and second "at an angle" grooves, and relies on Hanson for such teaching. Final Act. 4 (referencing Figures 2 and 3 of Hanson). The Examiner finds that it would have been obvious to modify Stratton's piston "by providing the arrangement of" the grooves (and rings) described in Hanson. Final Act. 5 (emphasis added). Thereafter, the Examiner provides a reason for incorporating Hanson's arrangement. *See* Final Act. 5.

For clarity and comparison purposes, Figure 1A depicting Appellant's piston, Figure 3 depicting Stratton's piston, and Figure 2 depicting Hanson's

[3] Claim 1 requires that each ring groove has "a pair of side flanks" and also "a base flank."

piston are replicated below, *in that order*. Each figure is an enlarged cross-sectional view of the ring/groove portion of that piston, and each also depicts an upper groove ("first") and a groove immediately below that ("second").

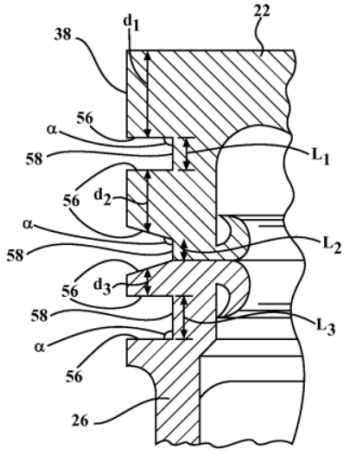
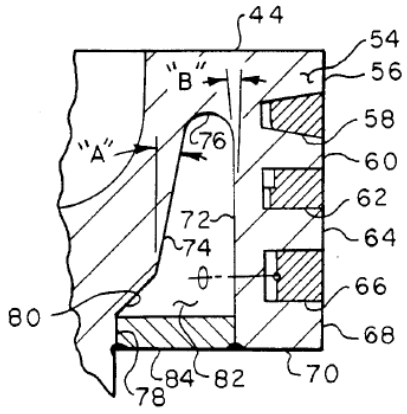


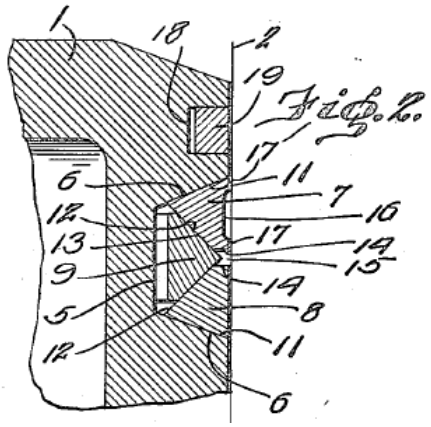
FIG. 1A

The above is a depiction of Appellant's Figure 1A.

Fig. 3.



The above is a depiction of Stratton's Figure 3.



The above is a depiction of Hanson's Figure 2.

To reiterate, the Examiner acknowledges that the primary reference to "Stratton does not specifically illustrate" the recited order of the first "perpendicular" and second "at an angle" grooves, and relies on Hanson for disclosing such an "arrangement." Final Act. 4, 5. To clarify that only the "arrangement" of Hanson is being relied upon, the Examiner explains that Hanson is "incorporated as a teaching reference into the rejection," and "that it is well-known to have a traditional-style piston ring groove [(i.e., 'perpendicular')] as the top-most ring groove to facilitate preventing leakage at the point where leakage most commonly occurs." Final Act. 15; Ans. 16 (each of their citation to Hanson omitted as containing an error). This finding by the Examiner is consistent with Hanson's teaching of "the top of the cylinder [having] an annular groove 18 . . . of conventional construction, to assist in preventing leakage at the point where leakage most commonly occurs and to promote the general efficiency of the packing." Hanson 3:63–71. In turn, Hanson's above teaching is consistent with the Examiner's reason for modifying Stratton with Hanson's "arrangement" (i.e., changing the order of Stratton's grooves), which is "to improve the sealing

characteristics of the piston rings to facilitate preventing leakage around the piston during engine operation." Final Act. 5; *see also* Ans. 15, 16.

Appellant appears to not fully understand the Examiner's reliance on Hanson's "arrangement" only. *See* Appeal Br. 8–12, 14; Reply Br. 3–5. This is because Appellant contends that a skilled person would not have incorporated "the angled surfaces of the Hanson ring groove into the Stratton piston without also bringing along the multi-piece ring taught in Hanson." Appeal Br. 8; *see also id.* at 14; Reply Br. 3, 4. In other words, Appellant appears to be under the impression that the Examiner is incorporating the angled groove (and associated ring) from Hanson into Stratton's piston, without realizing that Stratton already teaches an angled groove (and associated single piece ring). *See*, *e.g.*, Stratton Fig. 3. Appellant does not persuasively explain why there is a need to incorporate Hanson's structure into Stratton when Stratton already discloses such structure. *See*, *e.g.*, Ans. 15–16. Instead, as clearly stated, the Examiner is only incorporating "the arrangement" of Hanson's grooves/rings into Stratton, not any of Hanson's structure.[4] Final Act. 5. Thus, Appellant's contentions regarding incorporating Hanson's angled groove necessitating the further incorporation of Hanson's multi-piece angled rings, is not persuasive.[5] *See* Appeal Br. 8–12, 14.

---

[4] To clarify the lack of incorporating structure into Stratton, the Examiner states, "Stratton is not being modified in the rejection." Final Act. 15; Appeal Br. 13.

[5] We understand Appellant's focus on the inclusion of Hanson's multi-piece angled ring into Stratton is driven by the fact that in doing so, Hanson's incorporated ring would be inconsistent with the claim limitation of the second ring "being made as a single piece." *See* Reply Br. 5. However, Appellant does not dispute that Stratton's angled ring is a single-piece ring.

Appellant further contends, "the inventors have unexpectedly discovered that, pistons constructed according to the invention of claim 1 . . . operate with little ring sticking" at "a temperature of greater than 280ºC." Appeal Br. 10. On this point, however, we have been instructed that "the discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." *Atlas Powder Co. v. Ireco, Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999). We mention this in light of Hanson addressing the maintenance of the piston in a precise position in order to eliminate or reduce "pivotal play of the piston producing what is commonly known as piston slap." Hanson 2:6–10; *see also id.* at 1:12–19; Ans. 16. Stratton also addresses a need for "a high output engine piston assembly . . . which is capable of continuous and efficient operation," because, "[a]s present day engines are converted or upgraded[,] the piston assembly is subjected to even higher combustion chamber pressures and temperatures." Stratton 2:21–23, 1:19–21. Thus, our instruction above that if the product is old, a newly discovered fact about the association between its components or functions does not remove it from the domain of prior-art products. *See Atlas*, 190 F.3d at 1347.

However, to buttress Appellant's argument on this point of "new and unexpected results," Appellant presents an Affidavit by one of the inventors, Mr. Norbert G. Schneider (hereinafter "Affidavit"). Appeal Br. 10. The Examiner states, "the Affidavit filed under 37 C.F.R. § 1.132 on July 25,

---

See Final Act. 4 (referencing Stratton Fig. 3); Ans. 16; Appeal Br. 13–14 ("Appellant is not arguing that single piece angled piston rings did not exist at the time of the subject invention.").

2018 has been fully considered" (Final Act. 2), but is not dispositive (Final Act. 16). For example, the Examiner notes where the "*Affidavit* asserts that 'I arrived at this conclusion because if the Stratton inventors contemplated better sealing from locating the keystone ring in the second ring groove below the square ring, then they would have given their piston this configuration.'" Final Act. 16 (referencing Affidavit ¶ 9). The Examiner "submits that this merely amounts to a conclusory statement, as the Applicant cannot possibly know the thinking of the inventors of the Stratton patent." Final Act. 16. The Examiner states, "Applicant should present factually supported objective evidence when presenting such a response, and that mere conclusory statements are insufficient to overcome the *prima facie* case of obviousness (see MPEP § 2145)." Final Act. 16.

We note that Stratton is silent as to achieving better sealing by one particular order over another. Instead, Stratton discloses a preferred embodiment (the keystone ring topmost, *see* Stratton Figure 3) stating, "[o]ther aspects, objects and advantages of this invention can be obtained from a study of the drawings, the disclosure and the appended claims." Stratton 6:56–58. Hanson, as noted above, is directed to avoiding "play" during piston movement because "piston slap" results in "wear and tear on the cylinder wall." Hanson 1:12–19; 2:6–10; *see also* Ans. 16. Neither Appellant, nor the Affidavit, explains how Hanson' avoidance of "piston slap" fails to enhance piston sealing. Thus, Hanson's teachings buttress the Examiner's reliance on Hanson's "arrangement," and also supports the Examiner's reasoning for being combined with Stratton. *See* Final Act. 5. Consequently, statements in the Affidavit to the effect that a skilled person "would not have considered it obvious to modify the piston taught in the

Stratton reference" (Affidavit ¶ 5; *see also id.* ¶¶ 9, 10) are not persuasive of Examiner error.

Furthermore, regarding an assertion of unexpected results, we have been instructed that a party asserting unexpected results as evidence of nonobviousness has the burden of proving that the results are unexpected. *See In re Geisler*, 116 F.3d 1465, 1469–70 (Fed. Cir. 1997); *see also In re Mayne*, 104 F.3d 1339, 1344 (Fed. Cir. 1997). Further, conclusory statements cannot constitute evidence of unexpected results in the absence of factual support. *See In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995). A mere pleading unsupported by proof or showing of facts is inadequate. *See In re Borkowski*, 505 F.2d 713, 718 (CCPA 1974). In the matter before us, we are not presented with factual evidence that a piston "with little ring sticking" at "a temperature of greater than 280ºC" (Appeal Br. 10) has not already been contemplated by Stratton and/or Hanson. *See* above.

Appellant further contends that in an earlier office action "the rejection of claim 1 over Stratton in view of Hanson has been withdrawn" and that "a new ground(s) of rejection is made in view of Malina." Appeal Br. 12, 13; *see also* Reply Br. 5. Indeed, a review of the prosecution history of this application indicates that Non-Final Office Action dated April 7, 2016 rejected claim 1 in view of Stratton and Hanson. *See* Paragraph 5 of that Non-Final Office Action. Claim 1 was subsequently amended (*see* Amendment dated July 7, 2016) and, in a following Final Office Action dated October 7, 2016, the Examiner withdrew that rejection involving Hanson and stated, "upon further consideration, a new ground(s) of rejection is made in view of Malina." *See* Paragraph 49 of that Final Office action. In a later non-final office action dated January 12, 2017 (after a claim

amendment, *see* Amendment dated January 4, 2017), the rejection involving Malina was withdrawn by the Examiner and "upon further consideration, a new ground(s) of rejection is made in view of Hanson." *See* Paragraph 47 of that Non-Final Office Action; *see also* Advisory Action dated December 30, 2016. The Examiner currently maintains the rejection claim 1 in view of Stratton and Hanson, which is the basis of the appeal before us. *See* Final Act. 3. The Examiner states, "the claims as presented herein are in a much different form than those referred to by Appellant in the Responses to Office Action dated July 7, 2016" and that "[t]he most applicable art and basis for rejection is provided herein." Ans. 17.

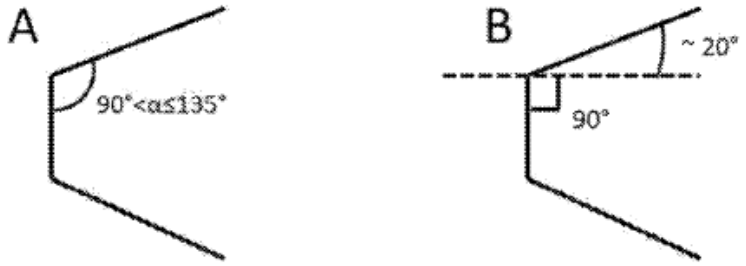
Appellant's contention above that the teachings of Hanson can no longer be re-employed because a reliance thereon had once been withdrawn, is not persuasive. This is because, as expressed by the Examiner, "[t]he most applicable art" is being applied, and also in view of subsequent amendments made by Appellant. Appellant further provides no support for this contention that might explain a basis for precluding the Examiner from re-applying the teachings of Hanson, and especially when such re-employment was applied in the furtherance of a new ground of rejection (and claim amendment). *See* Non-Final Office Action dated January 12, 2017, ¶ 47.

Accordingly, and based on the record presented, we sustain the Examiner's rejection of claim 1 and claims 2–4, 7, 8, 10, 11, 13–16 fall therewith.

Claims 5 and 17, and claims 6 and 18 depending therefrom

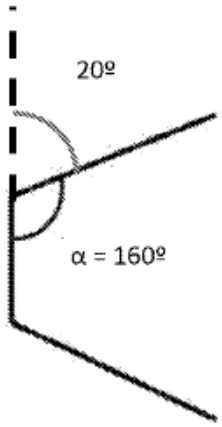
Claims 5 and 17 each recite the limitation that the flank of the tapered groove is disposed "at an angle greater than 90 degrees and not greater than

135 degrees relative to said base flank." In other words, both claims recite a limitation of a certain angle range *from the vertical* as depicted in Appellant's Figure 1A above (*see* reference α). The Examiner relies on Hanson as disclosing this limitation. *See* Final Act. 6 (referencing Hanson 1:64–70, Figs. 2, 3). For clarity, the Examiner provides the following sketches.



The Examiner describes the above as depicting "the subject matter of presently pending Claims 5 and 17 is shown at (A), while the teachings of Hanson are shown at (B)." Ans. 18.

We are not apprised of error in the Examiner's math of "20º + 90º = 110º"' as depicted in B above, nor the Examiner's finding that 110º "is within the range disclosed in Claims 5 and 17." Ans. 18. However, what is in dispute is Hanson's description of its tapering. Hanson states that wall 6 of Figure 2 (and 6*a* of Figure 3) are "inclined at a gentle angle, namely an angle of about 20º with respect to the bottom wall of the groove and longitudinal axis of the piston." Hanson 1:64–70. Appellant provides the following illustration for clarity.



Appellant describes this illustration as showing "the 20º measurement as being taken with respect to the bottom wall of the groove" as described in Hanson. Reply Br. 6–7; *see also* Hanson 1:64–70.

There is merit to Appellant's contention because both the bottom wall of the groove, and the longitudinal axis of the piston, as referenced in Hanson, are both vertical in the figures provided. *See* Hanson Figs. 2 and 3. Thus, Hanson expressly states an angle of "about 20º" to these *vertically depicted* surfaces. *See* Appellant's illustration above. As can be seen, the Examiner relies on an angle of "about 20º" with respect to a *horizontal line*, but provides no explanation as to why this horizontal line is either Hanson's "bottom wall of the groove" or Hanson's "longitudinal axis of the piston." Hanson 1:64–70. Additionally, Appellant references MPEP § 2125 which warns against scaling drawings when the drawings are not indicated as being to scale. *See* Appeal Br. 14. Because there is no indication that Hanson's figures are drawn to scale, the focus of our attention is on Hanson's written disclosure, which does not support the Examiner's findings. Even should a discrepancy exist between Hanson's figures and Hanson's description, an obviousness-type rejection cannot be based on speculation or unfounded assumptions. *See In re Warner*, 379 F.2d 1011, 1017 (CCPA 1967).

Accordingly, we do not sustain the Examiner's rejection of claims 5 and 17, and their respective dependent claims 6 and 18, as being obvious over Stratton and Hanson.

Rejections II and III

As stated *supra*, Appellant chose not to present separate arguments for the patentability of claims 9, 19, and 20, which depend from independent claims 1 and 13, apart from the arguments presented above with respect to claim 1 and Rejection I. Accordingly, for essentially the same reasons as presented *supra*, we also sustain the Examiner's rejection of claims 9, 19, and 20.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–8, 10, 11, 13–18	103	Stratton, Hanson	1–4, 7, 8, 10, 11, 13–16	5, 6, 17, 18
9, 20	103	Stratton, Hanson, Schneider	9, 20	
19	103	Stratton, Hanson, Ogino, Muscas	19	
Overall Outcome			1–4, 7–11, 13–16, 19, 20	5, 6, 17, 18

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

AFFIRMED IN PART