

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ERIC KAMMERER, MATTHIAS WEHKE and CELINE GUILLERME

Appeal No. 2006-0711
Application No. 10/407,020

ON BRIEF

Before KIMLIN, WALTZ, and KRATZ, Administrative Patent Judges.
WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the primary examiner's final rejection of claims 1 through 5, which are the only claims pending in this application.¹ We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellants, the invention is directed to a sealing ring for sealing a shaft relative to an interior space,

¹Claims 6 through 26 have been cancelled in an amendment filed with the Brief, dated Apr. 7, 2005, which was entered by the examiner (Answer, page 2, ¶(4)).

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where the sealing ring comprises a supporting ring, a sealing disc attached to the supporting ring, the sealing disc including a projection conically deformed in an axial direction of the shaft, having a first section in contact with the shaft, and the first section includes a helical groove having a base and a trapezoidal profile configured to allow return of a medium toward the interior space, wherein the width of the profile is greater than a total depth of the profile (Brief, page 2).

Representative independent claim 1 is illustrative of the invention and is reproduced below:

1. A sealing ring for sealing a shaft relative to an interior space, the sealing ring comprising:

a supporting ring; and

a sealing disc attached to the supporting ring, the sealing disc including a projection conically deformed in an axial direction of the shaft and having a first section in contact with the shaft, the first section including a helical groove having a base and a trapezoidal profile and configured to allow return of a medium toward the interior space, wherein a width of the profile at a region of the base is greater than a total depth of the profile.

The examiner has relied upon the following references as evidence of obviousness:²

²The examiner discusses Hayashida, U.S. Patent No. 4,568,092, issued Feb. 4, 1986, and Johnen, DE 100 33 446 A1, published Feb. 21, 2002, as evidence of obviousness (Answer, page 6) but fails to positively recite these references in the statement of the rejection (Answer, page

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von-Arndt et al. (von-Arndt)	5,507,505	Apr. 16, 1996
vom Schemm	5,615,894	Apr. 01, 1997

Claims 1-5 stand rejected under 35 U.S.C. § 103(a) as unpatentable over vom Schemm in view of von-Arndt (Answer, page 3). Based on the totality of the record, including due consideration of the arguments in the Brief and Reply Brief, we *affirm* the rejection on appeal essentially for the reasons stated in the Answer, as well as those reasons set forth below.

OPINION

The examiner finds that vom Schemm discloses a sealing ring for sealing a shaft relative to an interior space, including a supporting ring 6, a sealing disc 20 with a projection conically deformed in an axial direction with a helical groove 30/34 on a first section 25 in contact with shaft 22, where the helical groove has a trapezoidal profile having a base, first and second flank surfaces inclined toward one another, and is configured to allow return of a medium toward the interior space (Answer, page 3).

3). Therefore we will not consider Hayashida and Johnen as evidence of obviousness. *See In re Hoch*, 428 F.2d 1341, 1342 n.3, 166 USPQ 406, 407 n.3 (CCPA 1970)(when a reference is relied on to support a rejection, even in a minor capacity, there is no reason not to positively recite the reference in the statement of rejection); *see also Ex parte Raska*, 28 USPQ2d 1304, 1304-05 (Bd. Pat. App. & Int. 1993).

The examiner finds, and appellants do not dispute, that the only difference between the claimed sealing ring and the sealing ring disclosed by vom Schemm is that this reference does not disclose that the width of the profile at a region of the base is greater than the total depth of the profile, as required by claim 1 on appeal (Answer, page 4; Brief, page 4). Therefore the examiner applies von-Arndt for its teaching of a sealing ring where the sealing disc has helical grooves with a trapezoidal profile, further teaching a width 10 of the groove greater than the depth 17 of the groove "to reduce friction" (Answer, page 4). From these findings, the examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of appellants' invention to make the width of the grooves greater than the depth of the grooves in the sealing disc of vom Schemm, as taught by von-Arndt to reduce friction (*id.*). We agree.

Appellants argue that the combination of von-Arndt and vom Schemm does not teach or suggest a helical groove having the features as recited in claim 1 on appeal (Brief, page 4). Appellants argue that the specific helical groove geometry recited in claim 1 provides for optimal conditions for the return flow of medium through the helical groove at high rotating speeds and during long operating periods so as to reduce carbon

deposits, while vom Schemm does not address the question of optimizing flow of the medium through the grooves or the problem of carbon deposits (*id.*). Appellants further argue that the embossed recesses 32 to 35 in Figures 2 and 3 of vom Schemm "clearly show the opposite dimensional geometry" as recited in claim 1, namely deep and narrow embossed recesses so that a width is "significantly smaller" than a total depth of each groove (*id.*).

Appellants' arguments are not well taken. As correctly found by the examiner (Answer, pages 3-4), the combination of references teach every limitation as recited in claim 1 on appeal. We note that appellants have not contested the examiner's finding that vom Schemm discloses helical grooves with a trapezoidal profile and the groove is configured to allow return of a medium toward the interior space (Answer, page 3; Brief, page 4). Accordingly, appellants' argument that vom Schemm does not address the question of optimizing flow of the medium through the grooves is not well taken since this reference specifically teaches that the embossed recesses or grooves "surprisingly improves the ... oil returning effect of the shaft seal ring 20" (col. 4, ll. 34-38; see the Answer, page 3). Furthermore, it is well settled that references need not be

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directed to solving the same problem or have the same motivation as appellants in order to establish a prima facie case of obviousness. See *In re Kemps*, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996). We fail to determine any basis for appellants' argument that the trapezoidal profile shown in Figures 2 and 3 of vom Schemm "clearly show the opposite dimensional geometry," namely deep and narrow recesses (Brief, page 4). To the contrary, we note that the width and depth of the trapezoidal profile of the grooves in the reference are about equal, although there is no disclosure or teaching in vom Schemm that the drawings are to scale. Regardless of the width and depth depicted in the Figures of vom Schemm, it is well settled that the optimization of various operational parameters, i.e., the shape of the grooves, is prima facie obvious absent a showing of unexpected results. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). Additionally, we determine that vom Schemm teaches that "the geometry of the recesses [i.e., grooves] embossed through the shaft seal ring according to the invention can be *varied* in accordance with the purposes of application of the shaft seal ring" (col. 2, l. 66-col. 3, l. 1, italics added). We also determine that vom Schemm also teaches that "[t]he recesses have the shape of threaded

grooves **9, 10** of different profiles" (col. 3, l. 67-col. 4, l. 2). Accordingly, we determine that the teachings of vom Schemm alone suggest the optimization of the groove profile geometry depending on the purpose of the application of the shaft seal ring. We note that appellants have not submitted any arguments or evidence showing unexpected results.

Appellants argue that von-Arndt describes a seal for a piston or rod that moves back and forth in an axial direction of the shaft without rotating, and fails to describe a sealing ring having a "sealing disc" (Brief, page 4; Reply Brief, page 2). Appellants further argue that it is not obvious to combine the references as proposed by the examiner, since the geometry of the grooves taught by von-Arndt is for a different purpose than vom Schemm and there is no motivation to provide the teaching of the groove profile of external grooves of a reciprocating rod or piston as in von-Arndt with the internal grooves of the rotary shaft seal of vom Schemm (Brief, pages 5-6; Reply Brief, pages 3-4).

These arguments are also not persuasive. Although vom Schemm and von-Arndt are arguably not directed to the same field of endeavor, the combination of references is still proper if they are both directed to the same problem facing appellants,

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namely improving the return flow of medium through the grooves to the interior space. See *In re GPAC Inc.*, 57 F.3d 1573, 1577, 35 USPQ2d 1116, 1120 (Fed. Cir. 1995). As discussed above, vom Schemm is concerned with improving the oil returning effect of the recesses or grooves to the oil side "a" of the seal (col. 4, ll. 32-38). Similarly, von-Arndt is concerned with "a good return flow of medium being sealed toward the space being sealed" (col. 2, ll. 50-51; and col. 4, ll. 42-47). Accordingly, the combination of references as proposed by the examiner is proper (Answer, page 5). The examiner has not relied upon von-Arndt for any teaching of a "sealing disc" (Answer, page 4) as this feature has already been disclosed by vom Schemm (Answer, page 3). Contrary to appellants' characterization of the grooves of the applied prior art as "internal" or "external," we note that both the grooves of vom Schemm and von-Arndt are grooved surfaces on a sealing ring facing the surface to be sealed (see Figures 2 and 3 of vom Schemm and Figures 1-3 of von-Arndt).

For the foregoing reasons and those stated in the Answer, we determine that the examiner has established a prima facie case of obviousness in view of the reference evidence. Based on the totality of the record, including due consideration of appellants' arguments, we determine that the preponderance of

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evidence weighs most heavily in favor of obviousness within the meaning of section 103(a). Therefore we affirm the rejection on appeal.

The decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv)(2004).

AFFIRMED

EDWARD C. KIMLIN)	
Administrative Patent Judge)	
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THOMAS A. WALTZ)	APPEALS
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