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Datasheet for the decision of 1 April 2019

Case Number: T 0762/16 - 3.2.08

Application Number: 04768325.5

Publication Number: 1664562

IPC: F16C35/067, B21D28/26

Language of the proceedings: EN

Title of invention:
A BEARING ASSEMBLY

Patent Proprietor:
NSK Europe Ltd

Opponent:
SKF GMBH

Headword:

Relevant legal provisions:
EPC Art. 54, 56, 84, 123(2)
RPBA Art. 12(4)

Keyword:
Novelty - (yes)
Inventive step - (yes)
Claims - clarity (yes)
Amendments - allowable (yes)
Late-filed request - admitted (yes)

Decisions cited:
G 0003/14

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 0762/16 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 1 April 2019

Appellant 1: (Patent Proprietor)	NSK Europe Ltd Northern Road Newark Nottinghamshire NG24 2JF (GB)
Representative:	Brookes IP Windsor House 6-10 Mount Ephraim Road Tunbridge Wells, Kent TN1 1EE (GB)
Appellant 2: (Opponent)	SKF GMBH Patentabteilung Gunnar-Wester-Strasse 12 D-97421 Schweinfurt (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 21 January 2016 concerning maintenance of the European Patent No. 1664562 in amended form.**

Composition of the Board:

Chairman	C. Herberhold
Members:	M. Foulger
	Y. Podbielski

Summary of Facts and Submissions

I. With the decision posted on 21 January 2016, the opposition division decided that the patent EP-B-1 664 562 and the invention to which it related, according to the then valid auxiliary request 3, met the requirements of the EPC.

II. Both appellant 1 (patent proprietor) and appellant 2 (opponent) filed appeals against this decision.

III. Oral proceedings took place before the Board on 1 April 2019.

IV. The requests at the end of the oral proceedings were as follows:

Appellant 1 requested that the decision under appeal be set aside and the patent be maintained on the basis of the main request filed as auxiliary request 4A during the oral proceedings before the Board.

Appellant 2 requested that the decision under appeal be set aside and the patent be revoked.

V. Main request

a) Claim 1 reads as follows:

"**(M1)** A bearing assembly comprising:
a bearing (1) having an outer race for reception in a bearing housing (2) formed in a casing (3) and an inner race to be journaled onto a shaft (4), wherein **(M2)** a retaining plate (6) is mounted for relative rotation with respect to the outer race and **(M3)** provided with fastening means (7) to cooperate with

fastening means (9) provided in or on a wall of the casing (3) opposing the retaining plate (6); **(M4")** the retaining plate (6) being mounted by means of a plurality of press action loose fitting clinching lips (17) **(M5')** formed along arcs spaced around the circular inside edge of the retaining plate (6) **(M6a)** which are plastically deformed **(M6b)** to engage in a circular groove (21) formed in a circular shoulder (20) in the outer race of the bearing (1)."

b) Claim 5 reads as follows:

"**(N1)** A method of forming a bearing assembly comprising the steps of:
first mounting a retaining plate (6) on an outer race of a bearing (1) so that the retaining plate can rotate relative to the outer race whereby, **(N2)** when the bearing (1) is subsequently seated in a bearing housing (2) it is axially retained by the retaining plate (6) **(N3)** which is secured by fastening means (9) acting between a casing (3) in which the bearing housing (2) is formed and the retaining plate (6); **(N4)** including the steps of:
forming a shoulder on an outer edge of an outer race of the bearing (1),
forming a groove in the shoulder,
(N5) forming the retaining plate (6) by punching a hole in strip material,
(Nx) punching a sizing nose onto the retaining plate (6) in an arc around the hole,
(N6) forming a plurality of clinching lips along arcs spaced around the inside edge of the retaining plate (6),
(N7) locating the hole of the retaining plate (6) over the shoulder and **(N8a)** pressing the retaining plate (6) axially against the side of the outer race **(N8b)** to

upset each clinching lip (17) so that a reshaped lip (17) is formed engaging in the groove."

(Feature numbering in bold added by the Board)

VI. The following documents are referred to in this decision:

D1: DE 200 19 278 U1

VII. Appellant 2 (opponent) argued essentially as follows:

a) Admissibility of main request

The request should not be admitted because it formed part of a non-converging set of requests. Moreover, it could have been filed in proceedings before the opposition division but was not. Thus, the Board should not admit this request.

b) Added subject-matter (Article 123(2) EPC)

i) Claim 1

The originally filed claim 1 included the feature that the retaining plate was "mounted onto the outer race before assembly into the bearing housing (2)" (feature M2A). During examination this feature had been deleted despite being portrayed as being essential for the invention. The scope of protection had thus been extended in that the claimed subject-matter now included embodiments in which the plate was mounted onto the outer race during or after assembly into the bearing housing, e.g. by interaction with the bearing housing.

Feature M4" ("a plurality of lips") had been introduced. The originally filed claim had specified "a lip", i.e. singular, the embodiment of the invention shown had three lips. This teaching had been unallowably generalised to "a plurality" and thus encompassed embodiments, e.g. with ten lips, which were never foreseen in the originally filed application.

The scope of the claim also covered more embodiments than had been originally specifically described, in particular with respect to the geometry of the lips and their interaction with the circular groove (cf. description, p. 5, l. 9 - 19).

ii) Claim 5

In claim 5, the term "area" had been changed to "arc". There was no basis in the published application for this change.

Therefore, the subject-matter of both independent claims went beyond that of the application as originally filed.

c) Clarity

i) Claim 1

The term "formed along arcs spaced around the circular inside edge of the retaining plate" (feature M5') did not give any clear technical teaching. It was furthermore unclear whether the lips should be arc-formed or whether they could be some other shape and then arranged in an arc.

It was also unclear at what point the lips should be plastically deformed. Indeed the unclear wording even allowed the plastic deformation to take place at a point in time earlier than and independent of the engagement of the lips in the circular groove.

Thus, claim 1 did not meet the requirements of Article 84 EPC.

ii) Claim 5

The claim did not specify clearly whether the lips were themselves arc shaped or whether they were arranged in an arc. Moreover, it was not specified whether the lips were formed in a single or multiple operations. The claim was thus unclear.

d) Novelty

i) Claim 1

Features M1 - M5 were known from D1.

Feature M6a was known from D1 because the passage at p. 2, final paragraph disclosed that the lips were formed by stamping or deep drawing i.e. by plastic deformation. Moreover, feature M6b was known from D1 because the plastically deformed lips engaged the groove in the shoulder of the bearing outer race (Figure 2).

Thus, D1 disclosed all features of claim 1.

e) Inventive step

i) Claim 1

Starting from D1, the skilled person would experiment with different fits for the retaining plate on the shoulder. At a certain point, in order to fit the retaining plate, engagement of the circular groove would at least partly include plastic deformation of the lips in order to fit over the shoulder of the outer race.

Thus, as part of their normal design activities the skilled person would arrive at an at least partly plastic deformation falling under the subject-matter of claim 1 without the exercise of inventive activity.

ii) Claim 5

All features of claim 5 with the exception of N5 were known from D1. In particular, engaging the noses 6 into the groove of D1 was encompassed within the scope of features N7 - N8b.

For the skilled person it would however have been obvious to make the retaining plate by means of a punching operation.

VIII. Appellant 1 (patent proprietor) argued essentially as follows:

a) Admissibility of main request

The request was submitted together with the statement setting out the grounds of appeal, i.e. at the earliest

possible moment in appeal proceedings. Given that various objections under Article 123(2) EPC had been raised, it was both appropriate and necessary to file diverging requests. Moreover, the requests were reasonable in number and replied directly to the objections raised.

b) Added subject-matter (Article 123(2) EPC)

i) Claim 1

The claim related to a bearing assembly with a bearing and a retaining plate. The bearing housing was not part of the originally claimed subject-matter and thus the omission of feature M2a did not contravene Article 123(2) EPC.

The originally filed description at p. 4, l. 20 - 21 disclosed literally "a plurality of clinching lips". The following sentence stated "[i]n the present example..." before mentioning an embodiment with three lips. It was therefore unambiguous that three lips was only a specific example of the general teaching of a plurality of lips. Thus a plurality of lips was clearly and unambiguously disclosed.

The passage p. 5, l. 9 - 19 had not been generalised in an inadmissible manner. It related to a particular embodiment and the related method steps. This passage was, however, a more specific example of the general disclosure of p. 4, l. 20 - 21 discussed above.

Therefore, the subject-matter of claim 1 did not extend beyond that of the application as filed.

ii) Claim 5

Claim 5 was based on claims 13, 15 and 16 as originally filed. The wording of the claim where "area" had been changed to "arc" was disclosed on p. 4, l. 21 of the application as originally filed.

c) Clarity

i) Claim 1

Claim 1 had been amended in opposition and appeal proceedings and only these amendments could be examined under Article 84 EPC.

The lips were formed along arcs spaced around the circular inside edge of the retaining plate (feature M5'). Consequently the lips must be arc shaped and follow the circular edge of the hole.

Feature M6a which specifies that the lips were plastically deformed was clear because it described a physical state rather than a method step. This state was furthermore distinguishable in the finished product. Moreover, it was unambiguously clear that the term "plastically deformed to engage" implied that the engagement had to be the direct consequence of the plastic deformation.

ii) Claim 5

Whether the lips were made in one or several operations was not defined in the claim. This however did not introduce any ambiguity because both alternatives were covered. Moreover, as argued for claim 1, since the

lips were arranged around the circular inside edge of the retaining plate they must be arc shaped. Claim 5 was thus clear.

d) Novelty

i) Claim 1

D1 disclosed a bearing assembly with a bearing and a retaining plate. Unlike the presently claimed bearing assembly in which the lips were plastically deformed to engage the circular groove formed in the bearing race shoulder, according to D1, the lips of the retaining ring were elastically deformed to engage the bearing race. Thus, the subject-matter of claim 1 was new.

e) Inventive step

i) Claim 1

D1 was the closest prior art. The subject-matter of claim 1 differed from the bearing assembly known from D1 at least in that the clinching lips were plastically deformed to engage in a circular groove.

The technical effect of this difference was that the retaining plate could be mounted rotatably on the bearing outer race. The bearing assembly was consequently easier to mount on the gearbox housing.

The claimed solution was not suggested by the prior art. Moreover, it was not possible to modify the arrangement of D1 to allow for such a plastic deformation because there was no space to insert a tool to plastically deform the lips to engage in a circular groove formed in a circular shoulder in the outer race

of the bearing.

Therefore, the subject-matter of claim 1 involved an inventive step.

ii) Claim 5

D1 disclosed a method of forming a bearing assembly whereby the lips of the retaining plate were elastically deformed to engage the groove in the shoulder of the outer race. Claim 5 required however that the retaining plate be pressed axially against the side of the outer race to upset the clinching lip so that a reshaped lip was formed engaging in the groove. This feature was not known from D1 because even though D1 disclosed a plastic deformation to produce the lips these were not upset nor was a reshaped lip formed engaging in the groove.

As argued above for claim 1, this was not obvious from the prior art. The subject-matter of claim 5 therefore involved an inventive step.

Reasons for the Decision

1. Admissibility of main request

The main request is based on auxiliary request 4 filed with the statement setting out the grounds of appeal as part of a set of 9 auxiliary requests.

This set of requests did indeed diverge in that claim 7 of these requests had different features added and subsequently removed. In this particular case, the Board views this as appropriate because appellant 1 was

seeking to overcome objections of added subject-matter based to a large extent on an allegedly unallowable intermediate generalization. The Board also considers the requests to be a legitimate response to the decision under appeal.

Therefore, the Board saw no reason to exercise its discretion not to admit these requests into the proceedings (Article 12(4) RPBA).

In the course of the appeal proceedings, auxiliary request 4 underwent a minor editorial amendment (auxiliary request 4A) likewise considered allowable by the Board. All other pending requests were eventually withdrawn, making auxiliary request 4A the main request.

2. Added subject-matter (Article 123(2) EPC)

2.1 Claim 1

Claim 1 as originally filed includes feature M2A whereby the retaining plate is mounted onto the outer race before assembly into the bearing housing. This feature has been omitted from claim 1 of this request.

Claim 1 as originally filed relates to a bearing assembly with a bearing and a retaining plate. The bearing housing was thus not part of the originally claimed subject-matter. It is further clear from the application as originally filed, see for example p. 1, l. 2 - 5 and p. 2, l. 9 - 10, that the invention relates to solely the bearing assembly. Said bearing assembly is claimed in its assembled state (according to the claim, the retaining plate is mounted and the lips are plastically deformed to engage). It is

moreover claimed as being suitable for reception in the bearing housing. Hence, omission of feature M2A does not contravene Article 123(2) EPC.

The present claim 1 further differs from that originally filed in that the retaining plate is mounted by means of a plurality of lips (feature M4"). In the originally filed claim this was 'a lip', i.e. in the singular. Leaving aside the question of whether 'a lip' encompasses 'a plurality of lips', the Board considers that on p. 4, l. 20 "a plurality of clinching lips" was originally disclosed. It is correct that in the following sentence three lips are mentioned and also that Fig. 6 shows three lips. However, this specific example is introduced on p. 4, l. 21 - 22 by "[i]n the present example...". Thus, the general teaching of the application is that a plurality of lips is provided, three lips being the preferred embodiment. The application further states that "according to specific requirements two to five lip (17)s *(sic)* may be formed." Hence, a plurality of lips was clearly and unambiguously disclosed in the application as originally filed.

The objection that the teaching of the originally filed description p. 5, l. 9 - 19 has been generalised is also unpersuasive. This passage describes a particular embodiment and the related method steps according to which the retaining plate is mounted on the bearing. It directly and unambiguously discloses that the lips are plastically deformed to engage in the groove. The further features in this passage either relate to the method of forming the assembly rather than the bearing assembly itself or may be omitted in view of the more general disclosure on p. 4, l. 20 - 21.

Therefore, the subject-matter of claim 1 does not extend beyond that of the application as originally filed.

2.2 Claim 5

Claim 5 is based on claims 13, 15 and 16 of the application as filed. It is correct, as brought forward by appellant 2, that compared with granted claim 7 the term "area" has been changed to "arc". This amendment is however in conformity with the published application, p. 4, l. 21. Its subject-matter does not therefore extend beyond that of the application as filed.

3. Clarity

3.1 Claim 1

Claim 1 has been amended compared with the granted claim. The compliance of the amendments may be examined with regard to Article 84 EPC (G 3/14, EPO OJ 2015, A102).

The amendment in feature M5', whereby the lips are formed along arcs spaced around the circular inside edge of the retaining plate, provides a clear technical teaching. The inside edge of the retaining plate is circular formed. Consequently, the lip at this inside edge must be in the form of an arc - otherwise the inside edge would not be circular. Furthermore, the line joining the individual lips is also an arc because they are arranged around the inside edge.

It is correct, as brought forward by appellant 2 that plastically deforming is a method step. However, the

claim requires that the lips are plastically deformed. In the context of a product claim, it is clear that this wording defines the state of the product rather than the active process of its manufacture. The wording furthermore requires a causal link between the plastic deformation and the engagement of the lips in the groove (see in this respect also point 4.1 below). As the defined state is distinguishable in the product, the feature is clear.

Hence, claim 1 meets the requirements of Article 84 EPC.

3.2 Claim 5

Feature N6 of "forming a plurality of clinching lips along arcs spaced around the circular inside edge of the retaining plate (6)" provides a clear technical teaching. As stated above in paragraph 3.1 above, the inside edge of the retaining plate is circular and so the above findings apply equally to claim 5.

The claim does not specify whether the plurality of lips are formed together in a single step or whether they are formed in a plurality of steps. This does not however render the claim unclear because both interpretations would be covered by the claim and thus there is no lack of clarity as to the protection conferred by the claim.

4. Novelty

4.1 Claim 1

D1 discloses that the retaining ring is elastically deformed in order to mount it in the groove on the

shoulder of the bearing outer race. The elastically deformable lips have been made in an earlier process by plastic deformation (see p. 2, final paragraph).

The claim however requires that the lips are "plastically deformed to engage in a circular groove". The engagement of the lips in the groove is thus causally linked in the claim to their plastic deformation.

It is correct, as brought forward by appellant 2, that this feature describes a product by a manufacturing step. While the prior art protrusions (see D1, Fig. 2, item 6) have been manufactured by plastic deformation (deep drawing or embossing), it is evident to the skilled person that this plastic deformation did not result in the protrusions engaging the circular groove, i.e. they are not plastically deformed to engage the circular groove as claimed. Thus, the subject-matter of claim 1 is new compared to the bearing assembly disclosed in D1.

5. Inventive step

5.1 Claim 1

The subject-matter of claim 1 differs from the bearing assembly known from D1 in that the plurality of lips are plastically deformed to engage in the circular groove.

This feature has the technical effect that the retaining ring may be mounted for easy relative rotation which facilitates the mounting of the assembly onto the bearing housing.

The claimed solution is not obvious from D1 because firstly there is no hint in the prior art to experiment with different fits for the retaining plate, let alone to use plastic deformation for engagement of the lips in the groove. Secondly, in D1 (see Fig. 2) the lip of the groove means that there is no space to insert a tool in order to plastically deform the lugs.

The skilled person would not therefore arrive at the subject-matter of claim 1 without the exercise of inventive activity.

5.2 Claim 5

D1 discloses a method of forming a bearing assembly wherein the lips of the retaining plate are elastically deformed in order to engage the groove in the shoulder of the outer race.

In addition to feature N5 the subject-matter of claim 5 differs from the method disclosed in D1 by the fact that each clinching lip is upset so that a reshaped lip is formed engaging in the groove. Although D1 does mention that the lips are stamped, i.e. produced by plastic deformation, this is not done so that an "upset ... reshaped lip ... is formed engaging in the groove" as is required by the claim.

Hence, even if the skilled person were to form the retaining plate by punching this would still not result in the method according to claim 5 of the main request.

The subject-matter of claim 5 therefore involves an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent as amended in the following version:
   - Claims 1-12 of the main request filed as auxiliary request 4A during the oral proceedings before the Board,
   - Description: columns 1-2 as filed during the oral proceedings before the Board and columns 3-5 of the patent specification,
   - Figures 1-7B of the patent specification.

The Registrar: The Chairman:

I. Aperribay C. Herberhold

Decision electronically authenticated