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Datasheet for the decision of 22 March 2011

Case Number: T 1309/09 - 3.2.08

Application Number: 98929772.6

Publication Number: 0992696

IPC: F16C 33/44

Language of the proceedings: EN

Title of invention:
Bearing retainer of synthetic resin, method of manufacturing the same, and roller bearing

Patentee:
JTEKT Corporation

Opponent:
SKF GmbH

Headword:
-

Relevant legal provisions:
-

Relevant legal provisions (EPC 1973):
EPC Art. 100(a), 54(1)(2), 56

Keyword:
"Novelty (yes)"
"Inventive step (no - all requests)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1309/09 **-** 3.2.08

D E C I S I O N
of the Technical Board of Appeal 3.2.08
of 22 March 2011

Appellant: (Opponent)
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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 20 March 2009 concerning maintenance of the European patent No. 0992696 in amended form.**

Composition of the Board:

Chairman: T. Kriner
Members: M. Alvazzi Delfrate
U. Tronser

Summary of Facts and Submissions

I. By its interlocutory decision posted on 20 March 2009 the opposition division found that European patent No. 992 696, in the version amended according to the first auxiliary request then on file, met the requirements of the EPC.

II. The appellant (opponent) lodged an appeal against this decision on 20 May 2009, paying the appeal fee on the same day. The statement setting out the grounds for appeal was filed on 21 July 2009.

III. Oral proceedings before the board of appeal were held on 22 March 2011.

IV. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

V. The respondent (patent proprietor) requested that the appeal be dismissed or that the patent be maintained on the basis of any one of auxiliary requests 1 to 7 submitted with letter dated 8 December 2009.

VI. The patent in the version underlying the contested decision (main request) comprises independent claims 1, 4 and 5 directed respectively to a synthetic resin retainer for a bearing, a method of manufacturing such a retainer and a rolling bearing comprising such a retainer. Claim 1 reads as follows:

"A synthetic resin retainer for a bearing which is formed from a material comprising a thermoplastic resin and particles of a heat-resisting resin, characterized

in that said heat-resisting resin is polybenzimidazole (PBI), wherein said thermoplastic resin is at least one of polyether ether ketone (PEEK), polyether ketone (PEK), polyether sulfone (PES), polyether imide (PEI), polyamideimide (PAI), polyphenylene sulfide (PPS), polyallylether nitrile (PEN) and a thermoplastic polyimide resin (TPI)."

Claim 1 of the first auxiliary request differs from claim 1 of the main request by the additional feature according to which

"… the retainer has a plurality of circumferentially equally spaced apart and radially extending pockets for holding rolling elements in position".

The second auxiliary request differs from the first auxiliary request in that the independent method claim has been deleted, while claim 1 corresponds to that of the first auxiliary request.

Claim 1 of the third auxiliary request differs from claim 1 of the second (or first) auxiliary request by the additional feature according to which

"… said material further contains reinforcing fibers".

Claim 1 of the fourth auxiliary request differs from claim 1 of the third auxiliary request in that the thermoplastic resin has been restricted to polyether ether ketone (PEEK).

Claim 1 of the fifth auxiliary request differs from claim 1 of the fourth auxiliary request by the restriction of the reinforcing fibers to carbon fibers.

Claim 1 of the sixth and seventh auxiliary requests differ from claim 1 of respectively the fourth and fifth auxiliary requests by the addition of the following feature:

"… the bearing is adapted to be used in a supercharger, for supporting a gas turbine shaft, or for supporting a machine tool shaft".

VII. The following documents are relevant for the present decision:

D2: US -A- 4 371 445;
D5: US -A- 5 522 667; and
D6: US -A- 5 391 605.

VIII. The appellant's arguments can be summarised as follows.

Admissibility of document D6

It was true that D6 was only filed together with the statement setting out the grounds of appeal. However, this document disclosed already in the abstract a bearing formed from a material in accordance with claim 1 of the main request. Therefore, it was prima facie highly relevant and should be admitted into the proceedings.

Novelty

D6 referred to low friction elements such as bearings. As it was clear to the person skilled in the art that a bearing comprised a retainer, D6 implicitly also referred to a retainer. Moreover, D6 disclosed that the friction elements are formed from a material in accordance with claim 1 of the main request. Accordingly, the claimed subject-matter lacked novelty in view of D6.

Additionally, the subject-matter of claim 1 of the main request was also not novel in view of D2. This document related to a tribological system which, according to the passage in column 8, lines 10-15, could comprise a bearing retainer. The base material for the system could be, according to Table 4a, a combination of a thermoplastic and a heat-resisting resin in accordance with claim 1. Since D2 also described that part of the material could be in the form of particles, it disclosed all the features of claim 1.

Inventive step

If the subject-matter of claim 1 of the main request should be regarded as being novel over D6 and D2, D5 represented the most relevant prior art. This document disclosed a synthetic resin retainer for a bearing which was formed from a material comprising a thermoplastic resin in accordance with claim 1 of the main request.

Starting from the retainer disclosed in D5, the object to be achieved could be seen as being to improve its

heat resistance. This object was achieved by the claimed invention in that the material comprised particles of the heat-resisting resin polybenzimidazole (PBI).

Faced with said object the person skilled in the art would have consulted D6, which taught that polybenzimidazoles/polyaryletherketones blends exhibited excellent mechanical, thermal and chemical resistance properties. Therefore, it would have been obvious to achieve the object above by selecting these blends as material for the retainer according to D5, for instance the blend disclosed in example 1, which comprised PEEK together with PBI particles. Hence, the subject-matter of claim 1 of the main request did not involve an inventive step.

Claim 1 of the first and second auxiliary requests did not involve an inventive step either, since a retainer with a plurality of circumferentially equally spaced apart and radially extending pockets for holding rolling elements in position was commonly used, and also shown in D5.

Since example 1 of D6 also disclosed the addition of graphite fibers, whose reinforcing effect was well known, it was obvious to provide them in the material for the retainer shown in D5. Therefore, the subject-matter of claim 1 of auxiliary requests 3 to 5 did not involve an inventive step either.

As the bearing disclosed in D5 could be considered as being adapted to be used in a supercharger, for supporting a gas turbine shaft, or for supporting a

machine tool shaft, the subject-matter of claim 1 of auxiliary requests 6 and 7 did not involve an inventive step either.

IX. The respondent's arguments can be summarised as follows.

Admissibility of document D6

D6 had been filed late without any valid reason. Moreover, it was no more relevant than the documents already cited in the notice of opposition. Therefore, it should not be admitted into the proceedings.

Novelty

D6 did not mention a retainer, and D2 did not disclose the features of claim 1 of the main request in combination, but only within a number of different lists. Hence, neither D6 nor D2 took away the novelty of the subject-matter of claim 1.

Inventive step

Starting from the retainer disclosed in D5, which was formed from a material comprising a thermoplastic resin in accordance with claim 1 of the main request, the object underlying the claimed invention could be seen in improving heat resistance of the retainer while producing it by a cost-effective process. This object was achieved in that the material, in addition to the thermoplastic material which allowed the use of cost-effective injection moulding, comprised particles of polybenzimidazole (PBI), which was a heat-resisting resin.

To achieve said object the person skilled in the art would have limited himself to the materials proposed by D5, as the retainer described therein was already made from a heat-resistant resin. In any case he would not have consulted D6, since this document dealt with another purpose, namely the reduction of friction by the use of internal lubricants.

Moreover, even considering D6, he would have had no reason to select the particular composition of example 1, which was the sole example disclosing the use of PBI in the form of particles. Therefore, the combination of D5 and D6 did not lead in an obvious way to the claimed retainer.

Therefore, the subject-matter of claim 1 of the main request and of auxiliary requests 1 to 7 involved an inventive step.

Reasons for the Decision

1. The appeal is admissible.

2. Admissibility of document D6

D6 was filed by the appellant together with the statement setting out the grounds of appeal to reinforce the line of attack already made before the department of first instance. This has to be considered as the normal behaviour of a losing party and does not constitute an abuse of procedure (see Case Law of the Boards of Appeal of the EPO, 6th edition 2010,

page 716, VII.C.1.6, fifth paragraph). Moreover, D6 discloses already in the abstract a composition for bearings comprising a thermoplastic resin according to claim 1 of the main request together with PBI. Since the presence of PBI was the key for acknowledging inventive step in the appealed decision (see page 8, point 7) this document is prima facie highly relevant. Under these circumstances, it is admitted into the proceedings.

3. Novelty

The appellant submitted that the subject-matter of claim 1 of the main request lacked novelty in view of each of D6 and D2.

3.1 D6 relates to a composition for preparing low friction, shaped articles, such as bearings, bearing sleeves, rings, etc. (see abstract and column 1, lines 13-15). As acknowledged by the appellant itself, a bearing retainer, albeit being a common bearing component, is not mentioned in D6. Since a generic disclosure does not take away the novelty of any specific example falling within the terms of that disclosure, D6 cannot take away the novelty of the subject-matter of claim 1.

3.2 D2 relates to a tribological system with plastic/plastic pairings (see abstract). According to the passage in column 8, lines 10-15, the system is applicable to all sliding friction pairs, for example, to axel/wheel, axel/lever, lever/cam, flat sliding guides, gear pairs, roller-bearing applications, roller-bearing cages, sliding seals, etc. Table 4a lists four groups of good base materials for the main

sliding partners. The fourth group ("CN") consists of ten different materials, the last of which is a mixture of PBIA, i.e. polybenzimidazole, and PI, i.e. polyimide (see list of abbreviations in column 8). D2 further discloses the possibility to combine in one or in both main sliding partners the above-mentioned groups or different individual plastics from a single one of these groups, or a single one of these plastics together with linear plastics, wherein the intercalation may be arranged to project from the friction surface or be embedded in the form of particles, fibers, felt, fabric (see last paragraph of column 19 and tables 4c and 4d).

To arrive at a retainer according to claim 1 from the disclosure of D2 first a cage has to be selected from the list in column 8, lines 10-15. Thereafter, it is necessary to choose in table 4a a base material of the group "CN" and to select from this group the specific mixture PBIA plus PI. Subsequently, the provision of an intercalation in the form of particles must be chosen. The combination of these specific selections is not specifically disclosed in D2. Moreover, this combination would still not be sufficient to arrive at the subject-matter of claim 1, since it would further be necessary to choose PBIA as a constituent for the particles, which is nowhere disclosed by D2. Accordingly, the subject-matter of claim 1 is also novel in view of D2.

4. Inventive step: main request

4.1 The most relevant state of the art is undisputedly represented by D5, which relates to the problem of heat

resistance of a retainer (see column 3, lines 45-55) and discloses a synthetic resin retainer for a bearing which is formed from a material comprising a thermoplastic resin in accordance with present claim 1 (see abstract and column 5, lines 46-55).

4.2 Starting from the retainer disclosed in D5, the object underlying the claimed invention can be seen in providing a retainer with improved heat resistance so that it can be used at a high temperature.

This object is achieved by the claimed retainer in that its material comprises particles of PBI.

No improvement in the cost-effectiveness of the production process can be seen in respect of D5, since the retainer described in this document is already made of thermoplastic resins which can be formed by injection moulding.

4.3 Contrary to the respondent's submission the person skilled in the art trying to achieve said object would not have limited himself to the materials proposed by D5. It is true that this document discloses that the resin used for the retainer provides heat resistance (see column 5, lines 49-55). However, in order to improve this property further it would have been obvious to consider other prior art documents dealing with said object.

In doing so he would consult D6. It is correct that this document mainly aims at improving the durability and wear resistance of polybenzimidazole/ polyaryletherketone blends (see column 1, lines 33-40).

However, it also discloses that these blends, useful for forming bearings (see column 1, lines 11-15), exhibit excellent mechanical, thermal and chemical resistance properties (see column 1, lines 21-24). Therefore, it teaches that the object above is achieved by choosing a material comprising polybenzimidazoles and polyaryletherketones.

Among the examples of said material, D6 discloses in example 1 a blend comprising PEEK and PBI powder. It is true, as submitted by the respondent, that this is not the only example disclosed in D6. However, it is the first of only four examples (examples 1,4,6 and 7) according to the invention of D6, the remaining ones being comparative examples. Moreover, it is the only one wherein the probe is formed by injection moulding, which allows a cost-effective production. Therefore, the material disclosed in example 1 would have been an obvious choice when trying to achieve the object above. Since this material is in accordance with present claim 1, the claimed subject-matter lacks an inventive step.

5. Inventive step: auxiliary requests

5.1 Claim 1 of each of auxiliary requests 1 and 2 does not add any distinguishing feature in view of D5, since the retainer disclosed in this document has a standard configuration exhibiting a plurality of circumferentially equally spaced apart and radially extending pockets for holding rolling elements in position (see for instance claim 1 and Figure 1). Therefore, the subject-matter of claim 1 of each of the

auxiliary requests 1 and 2 does not involve an inventive step either.

5.2 The material according to example 1 of D6 comprises PEEK and graphite fibers, which can act as a reinforcement agent (see column 4, lines 15-17). Since, as explained above, it was obvious to choose the material of said example, the subject-matter of claim 1 of each of auxiliary requests 3 to 5 does not involve an inventive step either.

5.3 The feature that the bearing is adapted to be used in a supercharger, for supporting a gas turbine shaft, or for supporting a machine tool shaft, relates to the use of the claimed retainer, without defining any distinguishing structural feature in respect of the bearing known from D5. Since the retainer according to D5 is also intended to be used in a bearing for a turbocharger (see abstract, first sentence), the subject-matter of claim 1 of auxiliary requests 6 and 7 does not involve an inventive step either.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

V. Commare T. Kriner