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D E C I S I O N
of 2 October 1995

Case Number: T 0017/94 - 3.2.5

Application Number: 86114266.9

Publication Number: 0219115

IPC: D06F 37/26

Language of the proceedings: EN

Title of invention:
Method for making a laundering tube for a laundry washing machine and laundering tub thus made

Applicant:
INDUSTRIE ZANUSSI S.p.A.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0017/94 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 2 October 1995

Appellant: INDUSTRIE ZANUSSI S.p.A.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office dated 6 August 1993 refusing European patent application No. 86 114 266.9 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: C. V. Payraudeau
Members: M. H. M. Liscourt
A. Burkhart

Summary of Facts and Submissions

I. The Examining Division has refused the European patent application No. 86 114 266.9.

II. Claim 1 of the set of 3 claims on which this decision is based reads as follows:

"1. A plastic laundering tub for a laundering washing machine, the tub (5) being adapted to contain a rotatable drum (10), the drive shaft (11) of which projects from one end wall of said drum and is supported by bearing means comprising at least two bearings (12,13) disposed within a passage formed by injection-moulding of the tub at a respective end wall thereof and disposed in an axially spaced relationship with a spacer element therebetween; said spacer element extending over a substantial portion of the length of said passage and said tub with said passage being injection moulded around said bearing means,

characterised in that

the two bearings and said spacer element are disposed within a sleeve (25) made of a plastic material of higher mechanical resistance than that of the remaining tub and extending substantially throughout the length of said passage;

wherein said spacer element is an injection-moulded plastic element (19), said sleeve is injection-moulded around the two bearings and the spacer element and the remaining tub is injection-moulded around the sleeve with the bearings and said spacer element disposed therein."

III. The Examining Division held that the subject-matter of Claim 1 lacked an inventive step in view of the combination of the teachings of IT-U-162 401 (D1), which represented the nearest state of the art and disclosed all the features mentioned in the preamble of the claim, and of FR-A-2 316 062 (D2) which disclosed or suggested to the skilled person the various features claimed in the characterising part of the claim. The skilled person would have recognised the advantages of using the roller bearing of the document D2 to solve the problem of the invention and would therefore have combined the teachings of documents D1 and D2.

IV. The Applicant appealed from this decision and submitted in their Statement of Grounds that the document D2 did not belong to the technical field of the invention and would not therefore have been taken into consideration by the skilled person and also that this document did not suggest that the outer sleeve must extend substantially throughout the length of the passage formed in the tub and that the sleeve must be made of a plastic material of higher mechanical resistance than that of the remaining tub.

V. The Applicant requested that the decision under appeal be set aside and a patent be granted on the basis of Claims 1 to 3, filed on 14 July 1995, pages 1, 2 and 2a, filed on 14 July 1995, and pages 3 to 5, as originally filed, of the description, and the drawings as originally filed.

Claim 1, filed on 14 July 1995, differs from Claim 1, on which the decision of the Examining Division was based, in that in lines 8 and 18 the expression "sleeve-like" has been deleted.

Reasons for the Decision

1. *Novelty*

1.1 Both the Appellant and the Examining Division considered that the document D1 represents the nearest state of the art and the Board of Appeal agrees with this analysis. This document discloses all the features mentioned in the preamble of Claim 1 but none of those of the characterising part.

1.2 The subject-matter of the Claim 1 differs therefore from this prior art in that:

- the two bearings and said spacer element are disposed within a sleeve (25) made of a plastic material of higher mechanical resistance than that of the remaining tub and extending substantially throughout the length of said passage;

- said spacer element is an injection-moulded plastic element (19), and

- said sleeve is injection-moulded around the two bearings and the spacer element and the remaining tub is injection-moulded around the sleeve with the bearings and said spacer element disposed therein.

1.3 The document D2 does not concern a laundry tub but a method of manufacturing roller bearings.

1.4 Therefore, the subject-matter of the claims is novel. Novelty was also never contested by the Examining Division.

2. *Inventive step*

2.1 The basic question to be decided is thus whether the teaching of the document D2 can be combined with the teaching of the document D1 and in the affirmative whether the combination leads to the claimed invention.

2.2 The document D2 discloses a ball bearing having an outer race formed of two rings and an unitary inner race (Figures 2 and 3) or being comprised of two parallel bearings (Figure 1). The rings of the outer race of the bearing or the outer races of the two bearings are (force) fitted in corresponding bores formed in a spacing sleeve made of an injection moulded relatively rigid polyamide. The double bearing thus obtained is then put into a mould and coated by injection moulding with a polyurethane.

2.3 It seems doubtful that the person skilled in the art of washing machines, wanting to solve the obvious problem of the deformation of the tub in the washing machine disclosed in the document D1, would have contemplated applying the teaching of the document D2. The problem that the document D2 aims to solve is to align the races of a double bearing during the moulding thereon of the outer sleeve of polyurethane in order to enable mass production by simple means of such bearings. To achieve this aim, the form of the separating sleeve is very important since the rings must be fitted therein with high precision. The problem of misalignment of the two bearings during use is however not considered. This is quite logical since the two outer races are contiguous so that practically no misalignment forces are exerted thereon in use. Therefore, the outer sleeve is made of an elastomer to absorb the vibrations. For these reasons, the skilled person would not have had any

reason to refer to this prior art which is not concerned with the above mentioned problem which the invention of the patent application in suit aims to solve.

2.4 Even if the skilled person had tried to combine the two teachings, he would not have arrived at the invention. According to the invention, the inner sleeve is only a spacer which does not need to be made with very high precision. According to the document D2, the inner sleeve must be moulded with two bores which ensure the alignment of the races or rings, which means that they have to be made with high precision. Moreover the outer sleeve has to be made of an elastomeric material. This is contrary to the teaching of the patent application in suit according to which the outer sleeve ensures in fact the alignment of the bearings and of the inner sleeve. To obtain this result, the outer sleeve must be rigid in order to maintain the alignment of the bearings which are submitted to mechanical stresses during use.

2.5 In summary, to adapt the teaching of the document D2 to the teaching of the document D1, the skilled person would have had:

- to modify the inner sleeve in order to make it longer,

- to eliminate the bores formed in the inner sleeve,

- to use for making the outer sleeve a mould having two aligned bearing surfaces for receiving the races of the two bearings separated by the spacer sleeve,

- to replace the elastomeric material by a very rigid polymer.

2.6 The inner sleeve of the document D2 is in fact not a simple spacer but the means which ensure the alignment of the races or rings of the bearings during the moulding of the outer sleeve. This feature is essential in the bearing assembly of the document D2 and no suggestion is made in the document that the feature could be replaced by any other means. The idea of the present invention to use instead a rigid outer sleeve, the bearings being maintained aligned during the moulding operation by the male part of the mould, is not to be found in the document D2 although it is an essential feature of the present invention.

2.7 For the above reasons, the subject-matter of Claim 1, having regard to the cited state of the art, was not obvious to a person skilled in the art of the manufacture of washing machines.

2.8 The same applies to the devices defined in the dependent claims which represent embodiments of the laundering tub according to Claim 1 and are for this reason also not obvious.

3. No objections having been raised by the Examining Division as concerns the other requirements of the EPC, the Board of Appeal considers that the patent application meets the requirements of the EPC.

Order

For these reasons it is decided that:

1. The decision of the Examining Division is set aside;

2. The case is remitted to the first instance with the order to grant a patent on the basis of the following documents:

Description: pages 1, 2 and 2a filed on 14 July 1995 and pages 3 to 5 as originally filed;

Claims: 1 to 3 filed on 14 July 1995;

Drawings: Sheets 1/2 and 2/2 filed on 4 April 1991.

The Registrar: The Chairman:

A. Townend C. Payraudeau