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D E C I S I O N
of 4 April 1995

Case Number: T 0554/93 - 3.2.2

Application Number: 89116751.2

Publication Number: 0360115

IPC: B23P 15/06

Language of the proceedings: EN

Title of invention:
Improvements in and relating to piston rings

Applicant:
T&N TECHNOLOGY LIMITED

Opponent:

Headword:

Relevant legal provisions:
EPC Art. 54(2)

Keyword:
"Novelty (No)"

Decisions cited:
T 0578/90

Catchword:



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D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 4 April 1995

Appellant: T&N TECHNOLOGY LIMITED
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Decision under appeal: Decision of the Examining Division of the European Patent Office dated 1 February 1993 refusing European patent application No. 89 116 751.2 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: H. Seidenschwarz
Members: M. Bidet
J. van Moer

Summary of Facts and Submissions

- I. European patent application NO. 89 116 751.2 was refused by the decision of the Examining Division dated 1 February 1993. The reason given for the decision was that the subject-matter of Claim 1 filed with letter dated 29 May 1992 lacked novelty with respect to the prior art document US-A-2 111 574.
- II. An appeal against the decision of the Examining Division was filed on 20 March 1993 and the appeal fee paid on the same day. The statement setting out the grounds of appeal was received on 25 May 1993.
- III. In a communication pursuant to Article 110(2) EPC dated 26 October 1994, the Board informed the Appellant that the intermediate metal ring was defined in Claim 1 without any structural features and parameters which could fulfil the requirements set out in the decision T 578/90 relating to structural features of a claimed product which have to be clearly physically distinguishable from the state of the art.
- IV. Oral proceedings were held on 4 April 1995.
 1. The Appellant requested that the decision under appeal be set aside and that the patent be granted on the basis of:
 - Claims 1 to 3 as filed at the oral proceedings,
 - Description: pages 5 to 27 as originally filed, pages 2, 4, 4a filed with letter of 29 May 1992
pages 1, 3, 3a filed by fax of 15 December 1994,
 - Figures 1 to 11c as originally filed.

2. Claim 1 reads as follows:

"An intermediate metal ring, subsequently to be heat treated at stress-relaxation temperatures, in the manufacture of a piston ring, said intermediate ring is produced by bending a metal strip (7) first to a predetermined smaller radius of curvature than required in said intermediate ring and then bending the metal strip again to increase its radius of curvature, to form the intermediate ring, and characterised by said predetermined smaller radius of curvature being such that the intermediate ring has the required size and shape for the piston ring, and subsequently the size and shape of the unsupported intermediate ring to remain substantially unchanged when subjected to heat treatment at stress-relaxation temperatures."

3. The arguments of the Appellant submitted in writing and during the oral proceedings to support its request can be summarised as follows:

The argument of the Examining Division that piston rings obtained by the teaching of document US-A-2 111 574 could not be distinguished from a piston ring obtained from an intermediate metal ring according to Claim 1 of the application was wrong.

Piston rings produced by the two bending step process as specified in Claim 1 were clearly distinguishable from piston rings produced by a different process by a simple ageing test made on piston rings, since only those piston rings which

did not change their size and shape to an undesirable extent when subjected to heat treatment at stress-relaxation temperatures corresponded to intermediate metal rings according to Claim 1.

The method of manufacturing piston rings disclosed in document US-A-2 748 453 cited by the Appellant in its letter dated 15 December 1994 was disadvantageous because it negated any previous precision bending of the strip material and required a lot of expensive tooling.

Reasons for the Decision

1. The appeal is admissible.

2. *Admissibility of amendments*

Claim 1 differs from Claim 1 as filed essentially by the addition of a feature relating to the fact that the ring during the heat treatment is unsupported. This feature is supported by the description and Figures 11A to 11C of the application as filed concerning the heat treatment of the intermediate metal ring.

Claim 1 fulfils the requirements of Article 123(2) EPC.

3. *Novelty*

3.1 Claim 1 relates to an intermediate metal ring which is obtained by a method in such a manner that after a particular step - i.e. the radius of the intermediate metal ring during the first bending step is smaller than

the radius for the required intermediate metal ring - the intermediate metal ring does not change its size and shape when, without being supported, it is subjected to heat treatment at stress-relaxation temperatures.

Claim 1 relates to a product *per se* and as such confers absolute protection upon the physical entity independently of the process of manufacturing it. It follows that if it can be shown that such physical entity is already in the state of the art, for example produced by any manufacturing method, then a claim to the physical entity *per se* lacks novelty (see T 0578/90 unpublished and "Case law of the Boards of Appeal of the European Patent Office 1987-1992" part II. B, paragraph 6).

The physical entity of claim 1 is an intermediate metal ring which has the physical property of not changing its size and shape when heat treated at stress-relaxation temperatures.

- 3.2 Document US-A-2 748 453 discloses a method of making piston rings by bending wire stock. The piston ring, as it is discharged from the bending machine is of the ultimately desired shape. However, in the bending of the wire to make the piston ring, internal stresses are induced therein and which it is necessary to relieve in order to have a satisfactory piston ring". A most important part of the known method is therefore the heat treatment of the piston ring, during which heat treatment, the piston rings are retained as formed by bending. These piston rings are heat treated while they are placed on a mandrel and held against said mandrel thus maintaining the initial size and shape of the piston rings during the heat treatment (see column 1, lines 36 to 40; column 2, lines 27 to 35; column 3, lines 26 to 33). Since the internal stresses have been

relieved by annealing at the end of this method, the piston rings do not change their size and shape when subjected to the test for determining whether or not these piston rings have the required characteristic of not changing their size and shape during heat treatment at stress-relaxation temperatures as set out on page 7, line 27 to page 8 line 10 of the published application.

It follows from the above paragraphs that there is no identifiable difference between the piston rings produced according to the known method and the piston rings manufactured from intermediate metal rings specified in Claim 1 of the application when they are subjected to the above mentioned test.

Consequently, a piston ring which has the physical entity per se as the piston ring obtained from the intermediate metal ring according to Claim 1 is already in the state of the art.

- 3.3 Hence, the subject-matter of Claim 1 cannot be considered to be novel within the meaning of Article 54 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:



S. Fabiani

The Chairman:



H. Seidenschwarz