



Case Number : T 73/86 - 3.2.2



Decision of 7 August 1989 correcting errors in the  
decision of the Technical Board of Appeal 3.2.2  
of 7 December 1988

Appellant : Eaton Corporation  
Eaton Center, Cleveland, Ohio 44114  
U.S.A.

Representative : Peter Wright  
R.G.C. Jenkins & Co.  
12-15 Fetter Lane  
London EC4A 1PL-GB

Decision under appeal : Decision of Examining Division 100  
of the European Patent Office  
dated 8 July 1985 refusing European  
patent application No. 80 302 755.6  
pursuant to Article 97(1) EPC

Composition of the Board :

Chairman : P. Delbecque  
Members : R. Gryc  
W. Moser

In application of Rule 89 EPC the Decision given on 7 December 1988 is hereby ordered to be corrected as follows:

Point 2 of the Order reads as follows:

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

- Description pages 1, 4 to 8 filed on 4 July 1988 and description pages 2, 3, 9 to 25 (new numbering) filed on 31 March 1983 with the amendments as requested by the Applicant in his letter dated 17 October 1988.

- For Italy:

- Claims 1 and 12 to 14 filed on 4 July 1988 and amended according to Applicant's letter of 17 October 1988.

- Claims 2 to 11 filed on 22 October 1984.

- For West Germany:

Separate set of Claims 1 to 14 filed on 4 July 1988 and amended, as requested by the Applicant in his letter dated 17 October 1988.

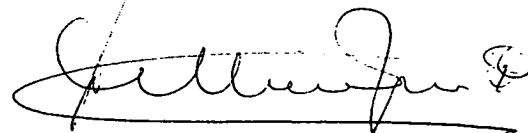
- Drawings comprising Figures 1 and 5 to 7 filed on 31 March 1983 and Figures 2 to 4 filed on 4 July 1988.

The Registrar:



S. Fabiani

The Chairman:



P.E.M. Delbecque

Veröffentlichung im Amtsblatt	Ja/Nein
Publication in the Official Journal	Yes/No
Publication au Journal Officiel	Oui/Non



Aktenzeichen / Case Number / N° du recours : T 73/86

Anmeldenummer / Filing No / N° de la demande : 80 302 755.6

Veröffentlichungs-Nr. / Publication No / N° de la publication : 0 030 781

Bezeichnung der Erfindung: Hydraulic tappet for direct acting valve gear  
Title of invention:  
Titre de l'invention :

Klassifikation / Classification / Classement : F01L 1/24

**ENTSCHEIDUNG / DECISION**  
vom / of / du 7 December 1988

Anmelder / Applicant / Demandeur : Eaton Corporation

Patentinhaber / Proprietor of the patent /  
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence : Hydraulic tappet

EPO / EPC / CBE Article 56

Schlagwort / Keyword / Mot clé : Inventive step (yes)

**Leitsatz / Headnote / Sommaire**

Europäisches  
Patentamt  
Beschwerdekammern

European Patent  
Office  
Boards of Appeal

Office européen  
des brevets  
Chambres de recours



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**D E C I S I O N**  
of the Technical Board of Appeal 3.2.2  
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**Composition of the Board :**

**Chairman :** P. Delbecque  
**Members :** R. Gryc  
W. Moser

## Summary of Facts and Submissions

- I. European patent application No. 80 302 755.6 filed on 11 August 1980 and published on 24 June 1981 (publication No. 0 030 781), claiming priority from an US application filed on 5 December 1979, was refused by the decision of the Examining Division No. 100 of 8 July 1985, communicated in writing on 7 August 1985.

The decision was based on Claims 1-15 filed on 22 October 1984.

The reason given for the refusal was that the subject-matter of Claim 1 did not involve an inventive step having regard to the general knowledge of the man skilled in the art together with the following documents:

- (1) US-A-3 509 858
- (2) DE-A-1 808 000
- (3) DE-B-1 914 693
- (4) GB-A-1 533 654

- II. The Appellant appealed against the decision on 23 September 1985, paying the appropriate fee on 25 September 1985. A statement setting out the grounds of appeal was filed on 16 December 1985.

In his statement of grounds the Appellant argued that (1) is not appropriate as a starting point, that both (2) and (3) already give a complete solution to the problem and thus need not be combined with (1), that the way of combining these three documents is inspired by foreknowledge of the invention and that the number of steps necessary to arrive at the invention shows that it is not obvious.

- III. In the meantime, third parties filed observations under Article 115(1) EPC together with new documents and alleged a lack of novelty of the invention due to prior use (Article 54(2) EPC).
- IV. With a communication filed on 4 July 1988, in response to objections raised by the Board, the Appellant submitted new Claims 1 and 12-14, together with proposals for corresponding amendments to the description.

With reference to national rights of earlier date in West Germany, the Appellant has also voluntarily submitted a separate set of claims for this designated State only and produced evidence of the existence of these rights in the form of specification DE-A-2 941 084 filed on 10 October 1979 and published on 23 April 1981.

On 17 October 1988, in reply to an invitation of the Board, further amendments to Claim 1 and the description were submitted by the Appellant to meet the requirements of Article 123(2) EPC.

- V. The effective Claim 1 reads as follows:

"A bucket tappet (10) for use in the valve gear of an internal combustion engine which is capable of operating at speeds in excess of 5000 RPM, which valve gear is of the direct acting type wherein one end of the tappet (10) is contacted by an engine cam (16) and the other end is in direct contact with a stem (22) of a combustion chamber valve (20), the tappet (10) comprising:

- a tubular outer wall (42; 102; 122; 141),

- a top (18; 107; 142), extending transversely of the outer wall at the top end of the tappet, and adapted to contact the engine cam,
- a plunger (49; 108; 132) located within and slidable axially relative to said outer wall, the plunger having at its lower end an end wall (52) for contacting the valve stem,
- an annular first portion (83) of a fluid reservoir located radially in between the tubular outer wall (42; 102; 122; 141) and said plunger (49; 108; 132) and axially between said top (18; 107; 142) and a web (44; 104; 124; 146) which forms the bottom of said annular portion of reservoir, the radial extent of said first portion being substantially the same as that of the web,
- passage means (84) for supplying fluid to said annular portion of reservoir,
- a central second portion (85) of reservoir in fluid communication with said first portion,
- a fluid pressure chamber (86) within the plunger, which chamber is located near or below the lowest level of said two portions of reservoir,
- a one-way valve (72, 74) operable to permit a flow of fluid therethrough from said central second portion (85) of reservoir into said fluid pressure chamber (86) upon movement of said plunger (49; 108; 132) in a direction tending to expand said chamber (86) and to prevent reverse flow of fluid therethrough from said fluid

pressure chamber (86) upon movement of said plunger (49; 108; 132) in a direction tending to diminish said fluid pressure chamber,

characterised in that a piston (64) unsecured to the top (18; 107; 142) is slidably received in said plunger (49; 108; 132) and cooperates with said plunger to define said fluid pressure chamber (86), biasing means (82) being arranged between said plunger and said piston for biasing said plunger and said piston in a direction away from one another,

- in that said piston (64) fits within said plunger (49; 108; 132) in a manner adapted to provide controlled leakdown from said fluid pressure chamber (86) upon the application of an axial load on said piston (64) tending to urge said piston (64) in a direction to compress fluid in said fluid pressure chamber (86),
- in that said central portion of reservoir is located within the piston (64), between the piston and said top (18; 107, 142), and
- in that the plunger is received in a generally tubular hub (46; 106; 126; 148) supported within the outer wall and extending generally parallel thereto,

said hub being maintained in fixed relation to the top (18; 107; 142), but with its upper end axially separated from said top, by means of said web which extends between the hub and the tubular outer wall and connects the hub to the tubular outer wall so as to form the sole structural support for the hub."

- VI. The separate set of claims for Germany is identical to the main set of claims, except for the insertion in the preamble of Claim 1 of the word "continuous" between the



words "in" and "fluid" in the clause beginning with "a central second portion ...".

- VII. In the notice of appeal, the Appellant appealed against the decision in its entirety. However, the requests that this decision be set aside and a European patent be granted on the basis of the presently effective documents were presented for the first time in his statement of grounds, together with a further request for refundment of the appeal fee by reason that the presentation for the first time at the oral proceedings of the obviousness argument upon which the Decision is based was a substantial procedural violation made by the Examining Division.
- VIII. For the original claims and description, reference should be made to publication No. 0 030 781.

#### Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64(a) EPC. It also complies with Rule 64(b) EPC because the content of the impugned decision consists of the refusal of the application, and the formulation "The decision is appealed against in its entirety" is therefore to be interpreted as meaning that the decision should be set aside and the grant of the European patent on the basis of the final documents of the application is requested (cf. Decision T 07/81, OJ EPO 3/1983, p. 98).

This interpretation is supported by the requests made in the statement of grounds.

The appeal is therefore admissible.

2. Except for the new background art cited in the first part of the description in order to meet the requirements of Rule 27(1)(c) EPC, all the matter related to the invention and described in the presently effective documents have a support in the application as filed. Therefore, no objection is to be made in view of Article 123(2) EPC.
3. After examination of the documents covered by the international search report and those introduced during the further proceedings, the Board is satisfied that none of them discloses a bucket type tappet having all the features as defined in Claim 1.

Since this has never been disputed, there is no need for further detailed substantiation of this matter.

As far as the third parties' observations according to Article 115(a) EPC are concerned, they fail to establish that the alleged prior use made the invention available to the public. In the Board's view, these observations do not sufficiently prove that the drawings referred to were not for internal use only, that the tests were not conducted inside their own factories and that the tappets given as samples were not given only to company employees bound to secrecy deriving from commercial relationships.

Moreover, the allegations of the third parties are contested by the Applicant.

Therefore, the subject-matter as set forth in Claim 1 is novel in the sense of Article 54 EPC.

4. Before the priority date of the present application, it was already known from the state of the art that an hydraulic lash adjuster for the valve gear of an internal combustion engine operating at high speed must be low and

light, have a reduced inertia and be of the bucket-type. It must also have oil reservoirs of sufficient volume to supply enough oil for the first filling of its high pressure chamber when starting the engine and said high pressure chamber must be located at a level below the reservoirs for direct filling with an oil supply free of air and to avoid retention of trapped air resulting in a spongy lifter.

According to the findings of the Board, such an hydraulic tappet comprising all these features is disclosed in document (2) in relation with the embodiment represented in Figure 2 of the drawings and it constitutes the most relevant prior art.

Therefore, it is justified to derive the preamble of Claim 1 from this document and to mention the known features in the precharacterising part in order to meet the requirements of Rule 29(1)(a) EPC.

5. On this known tappet suitable for high-RPM engines, the high pressure chamber is situated inside a plunger fitted over and slidably guided by a tubular extension fixed to the underside of the top of the tappet. The provision of such an extension at this position renders the manufacture of the tappet more complicated and can weaken the centre of the top of the tappet where the stresses are very high (see the description, page 5).

In the light of this prior art, the problem therefore appears to lie in the improvement of the design of the tappet of Figure 2 of document (2) in order to simplify the manufacture of the lifter, to reduce the scrap losses and to avoid weakening the stressed region of the top of the bucket.

The Board is satisfied that the aforementioned problem is solved by the provision of the technical features of the characterising portion of Claim 1.

6. On the question of whether the prior art provides any indication as to how the tappet of Figure 2 of document (2) may be modified in order to obtain a tappet according to the present Claim 1 of the application, the following should be observed:
  - 6.1 - Keeping in mind that the improved tappet must be for use in valve gears of engines capable of operating at high speed, the man skilled in the art will naturally consult first the relevant prior art for tappets of the same type as that to be improved, i.e. having the smallest possible moving masses and the largest oil storage chamber capable of supplying sufficient quantities of oil to ensure filling the pressure chamber in all circumstances, in particular on starting the engine after a long halt. Known tappets of such type are represented only in Figure 1 of document (2) and in Figures 1 and 2 of document (3).
  - 6.2 - Since document (4) is directed to a mechanism the functional purpose of which is totally different from lash-adjustment and lies in a different technical field, the person skilled in the art has no valid reason for consulting this document when searching how to improve a lash-adjusting tappet.
  - 6.3 - As far as the tappet according to document (1) is concerned, it is obviously unsuitable for use at high speed since at least two of the most essential features in this context, namely a low inertia and a large oil storage capacity are lacking. Therefore, the skilled person cannot be expected to consult this document the

teaching of which obviously leads away from the solution sought.

Since, moreover, the skilled person learns from embodiments disclosed in documents (2) and (3) that the pressure chamber of tappets for use in high RPM engines are usually delimited by and between a movable part such as a plunger and a part fixed to the inverted cup of the tappet such as the cylindrical wall of the guiding extension, said skilled person will not find any hint or suggestion to introduce another movable part such as a piston so that the oil pressure chamber be delimited by and between two movable parts, i.e. the plunger and the piston.

Furthermore, when trying to improve a tappet the inertia of which should remain as low as possible, it would scarcely appear appropriate to the skilled person to increase the number of movable parts inside the tappet, i.e. to provide both a plunger and a piston.

- 6.4 - Assuming that he would consult document (1) and decide to adopt the plunger assembly disclosed therein in order to replace the plunger and the fixed guide of the tappet according to Figure 2 of document (2), the skilled person would still have to solve the problem of guiding the assembly.

With reference to the sole documents (1) and (2) concerning tappets suitable for use in high RPM engines, he will learn that, in these tappets, the plunger is usually guided inside a cylindrical extension fixed either to the top (Figure 1 of document (2) and Figure 2 of document (3)) or to the bottom of the main annular oil reservoir, and nowhere will he find any hint

suggesting the provision of a hub supported by the web forming the bottom of the reservoir.

7. In summary, starting from the tappet of Figure 2 of document (2), and in order to imagine a tappet falling within the terms of the presently effective Claim 1, the skilled person would have to take the following steps in order to solve the aforementioned problem:
- (a) to consult document (1) which concerns tappets unsuitable for use in high RPM engines;
  - (b) to select the plunger assembly of this heavy, known tappet, although this assembly comprises two movable parts (i.e. a plunger and a piston), instead of only one as is usual in tappets for use at high speeds, and although the high pressure chamber is delimited by and between these two movable parts, instead of a movable and a fixed one, and
  - (c) without the existence of any hint based on the state of the art, to provide the inside of the bucket with a guiding hub, instead of a cylindrical extension which serves also to delimit the pressure chamber as usual.

Considering the number of deviations from the usual reasoning of the person skilled in the art and the combination of features of tappets of different types for use in different speed ranges as well, the Board is convinced that the improvement according to the terms of Claim 1 does not follow plainly or logically from the prior art, but implies an inventive step within the meaning of Article 56 EPC.

Therefore, the subject-matter of Claim 1 is patentable within the meaning of Article 52 EPC.

8. Dependent Claims 2 to 14 concern particular embodiments of the bucket tappet according to Claim 1 and are thus likewise allowable.
9. As far as the separate set of claims for West Germany is concerned, its filing is admissible on the basis of the evidence of the existence of a pertinent prior national right i.e. DE-A-2 941 084, supplied by the Appellant (cf. legal advice from the EPO Nr. 9/81, OJ EPO 3/1981).

The only difference between these claims for Germany and the claims for the other states is that the word "continuous" has been inserted in the preamble of Claim 1.

Since a support can be found in the description of the application as filed (cf. p. 9, line 27), this amendment does not contravene Art. 123(2) EPC and is therefore admissible.

The addition of this word narrows the scope of Claim 1 for Germany in comparison with that of Claim 1 for the other states. Consequently, the above statements relating to patentability of the subject-matter of the independent claim remain valid for the separate claims for Germany.

Concerning the prior national right i.e. DE-A-2 941 084, its existence is not an obstacle to patentability under the provisions of the EPC on patentability (Art. 52-57 EPC) and the examination of such prior national rights in proceedings before the EPO is ruled out by the EPC.

10. The description of the application has been adapted to the wording of the present Claim 1 and acknowledges the closest prior art from which the invention starts. These amendments are therefore not open to objection.

Moreover, some essential features, which were deleted from the description during the examining procedure, have been reinserted in the application as requested by the Appellant in his communication of 17 October 1988 and do not give rise to objections in view of Article 123(2) EPC.

11. In addition, the Board has renumbered the pages 11 to 29, 29A and 30 to 32 into pages 9 to 27, 28 and 29 to 31 and has corrected some errors in the description pages 1, 13, 14, 15, 17, 20, 22 and 23. The amendments requested by the Appellant in his letter of 28 June 1988 have also been made in the description and in Claim 7 and the amended sheet of drawings has been replaced.
12. Concerning the Appellant's request for the appeal fee to be reimbursed, the Board cannot follow the Appellant in his conclusion.

During the oral proceedings on 8 July 1985, the Applicant was offered the opportunity to present his comments on the arguments and grounds exposed by the Examining Division and he seized this opportunity to give counter-arguments as stated in the minutes of the oral proceedings.

Therefore, since the Appellant has been afforded sufficient time to comment, the procedural principle as set out in Article 113(1) EPC has been respected and the presentation for the first time at the oral proceedings of the obviousness argument by the Examining Division cannot



be taken as a substantial procedural violation in the meaning of Rule 67 EPC.

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## Order

For these reasons, it is decided that:

1. The impugned decision is set aside.
2. The case is remitted to the first instance with the order to grant a European patent on the basis of the following documents:
  - Description pages 1, 4 to 8 filed on 4 July 1988.
  - Description pages 2, 3, 9 to 25 (new numbering) filed on 31 March 1983 and amended as requested by the Applicant in his letter dated 17 October 1988.
  - For ~~France, Great Britain and~~ Italy: *sh*
    - Claims 1 and 12 to 14 filed on 4 July 1988 and amended according to Applicant's letter of 17 October 1988.
    - Claims 2 to 11 filed on 22 October 1984.
  - For West Germany:

Separate set of Claims 1 to 14 filed on 4 July 1988 and amended as requested by the Applicant in his letter dated 17 October 1988.
  - Drawings comprising Figures 1 and 5 to 7 filed on 31 March 1983 and Figures 2 to 4 filed on 4 July 1988.

3. The appeal fee is not to be reimbursed.

The Registrar:

The Chairman:

F. Klein

P.E.M. Delbecque