

A		B		C	X
---	--	---	--	---	---

File Number: T 67/91 - 3.2.4

Application No.: 89 200 322.9

Publication No.: 0 335 428

Title of invention: Valve gear for an internal-combustion engine

Classification: F01L 1/30

D E C I S I O N  
of 15 December 1992

Applicant: Muller, Jan

Headword:

EPC Art. 123(2), 111(1), 54

Keyword: "Remittal to the first instance with amended claims"



Case Number : T 67/91 - 3.2.4

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.4  
of 15 December 1992

**Appellant :** Muller, Jan  
Harm Nijholtstraat 20  
NL-8375 BV Oldemarkt (NL)

**Representative :** 't Jong, Bastiaan Jacobus  
Octrooibureau Arnold & Siedsma  
P.O. Box 18558  
NL-2502 EN 's-Gravenhage (NL)

**Decision under appeal :** Decision of the Examining Division of the  
European Patent Office dispatched on 17 August  
1990 refusing European patent application  
No. 89 200 322.9 pursuant to Article 97(1) EPC.

**Composition of the Board :**

**Chairman :** C.A.J. Andries  
**Members :** H.A. Berger  
J.P.B. Seitz

**Summary of Facts and Submissions**

- I. European patent application No. 89 200 322.9 was filed on 13 February 1989 (publication No. 0 335 428) and refused by a decision of the Examining Division 2.3.01.100 dispatched on 17 August 1990.
- II. The decision of the Examining Division was based on the published Claims 1 to 3 and Claims 4 to 6 as filed with the letter of 15 May 1990. The reason for the refusal was lack of novelty of the subject-matter of Claims 1, 2 and 3 in comparison with the state of the art disclosed in the following documents:
- DE-A-3 604 412 (D1),  
FR-A-701 697 (D2),  
FR-A-815 195 (D3) and  
WO-A-87/03 645 (D4).
- III. An appeal was lodged against this decision on 11 October 1990. The appeal fee was paid on 9 October 1990 and the Statement of Grounds of Appeal was submitted on 18 December 1990.
- IV. In response to communications of the Board, the Appellant filed with his letter of 27 October 1992 new Claims 1 to 4 and new description pages 1 and 2.

The amended Claim 1 reads as follows:

"One or more cylinder diesel or petrol combustion engines including two or more valves (13, 22, 23) per cylinder and a valve driving comprising for each valve a valve spring (4, 16) with one end engaged with a first valve spring support connected to said valve (13, 22, 23) and with its other end engaged with a second valve spring support

movably mounted to said engine and such that the valve spring (4, 16) is capable of biasing the valve (13, 22, 23) in its closing direction, and actuating means comprising a rotatable main cam member (14, 20) for driving said valve (13, 22, 23) in its opening direction against the bias of the valve spring (4, 16) from a closed rest position into an open position and a rotatable auxiliary cam member (17, 21) for driving said second valve spring support, characterized by said auxiliary cam member (17, 21) driving said second valve spring support from a maximum spring relaxing rest position in the closed period of the valve, in the spring tensioning direction up to an intermediate position during the opening period of the valve and further in the spring tensioning direction during the closing period of the valve."

With regard to the original disclosure of the features of Claim 1 the Appellant drew attention in particular to Fig. 4 of the application as originally filed.

- V. The Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the following documents:

Claims: 1 to 4, as filed with the letter of  
27 October 1992;

Description: pages 1 and 2, as filed with the letter of  
27 October 1992,  
column 1, last line to column 3, line 40 of  
the published European patent application;

Drawings: Figures 1 to 6 as published.

The Appellant further requested, in view of the costs involved for him, that the application should not be remitted to the Examining Division.

Oral proceedings were requested only if a decision to dismiss the appeal was envisaged.

### Reasons for the Decision

1. The appeal is admissible.
2. Allowability with regard to Art. 123(2) EPC

In absence of proof to the contrary, the Board assumes that the originally filed translation into English (Art. 14(2), second sentence EPC) is in conformity with the text in the original Dutch language.

- 2.1 The features of the precharacterising portion of Claim 1 are disclosed in the "Conclusions" 1 and 2 of the originally filed English translation (see page 3) and in the originally filed drawings, Figures 1, 5 and 6.

The features of the characterising portion of Claim 1 are based on Fig. 4 and on the corresponding description. Fig. 4 shows (see also page 2, lines 45 to 47 of the English translation) in its upper part the valve spring tension of the main cam (line 8) and the valve spring tension of the auxiliary cam (line 9), and in its lower part the valve lift diagram which also is shown in Fig. 3 (see page 1, lines 35 to 38 of the English translation). The main cam and the first spring support which is connected to the valve stem undoubtedly are moved in the spring tensioning direction by the main cam during the valve opening period. This is shown by the lower one of

the arrows present on the left hand side in Fig. 4, which indicates the movement of the main cam and therewith the movement of the first valve spring support in the spring tensioning direction. The upper one of the arrows is directed in the opposite direction and it is believable that it indicates not only the direction of the movement of the auxiliary cam and therewith the movement of the second valve spring support, but also the spring tensioning direction for this support. The portion of line 9 during the opening period of the valve therefore indicates a movement of the second spring support in the spring tensioning direction. During the open position of the valve the spring tension, according to Fig. 4, is not changed by the main cam and is only changed by a small amount by the auxiliary cam. Fig. 4 furthermore shows that both spring supports move approximately simultaneously in the same direction during the first part of the closing movement of the valve, i.e. the first spring support moves in the spring relaxing direction while the second spring support moves in the spring tensioning direction. According to Fig. 4 the spring is not further compressed during this movement.

On page 2, lines 41 to 44 of the English translation, it is stated with regard to the invention that the closing of the valves will improve because of the possibility to decrease the valve spring tension at the end of the valve movement, so that consequently the driving in of the valve seat will decrease considerably. Indeed, line 9 of Fig. 4 slowly decreases, with respect to the arrow shown on the right hand side of Fig. 4, at the end of the closing period of the valve, indicating that the second valve spring support starts to move in the spring relaxing direction, which initiates the relaxing of the spring tension.

An interpretation of line 9 of Fig. 4 such that the second spring support is moved in the spring relaxing direction during the opening movement of the valve and is further moved to its maximum spring relaxing position during the closing period of the valve would not be in accordance with the basic idea of the application, to obtain an optimal valve spring tension by means of the cam and cam follower profiles of the main cam 1 and the auxiliary cam 2, in connection with the maximum number of revolutions, as expressed on page 2, last paragraph of the English translation. Such a movement would diminish the spring tension considerably and would jeopardize the functioning of the device.

Although the features of the characterising portion of Claim 1 can be derived from Fig. 4 in connection with the corresponding description they cannot be derived from Figures 1, 5 and 6 of the drawings. These drawings however should not be regarded as showing details of the cams but should be considered for the overall structural features of the device, such as positioning of the cam shafts and the rockers.

With regard to the description in the English translation, page 2, lines 28 to 31 saying "This is the result of the important decrease of the initial tension of the valve spring during the opening of the valve, made possible by this system" the Board agrees with the Appellant that this passage of the description must be understood as an explanation of the advantage of the subject-matter of the application shown in Fig. 3 with regard to the state of the art shown in Fig. 2. Since the second valve spring support moves further in the spring tensioning direction during the valve closing movement, the spring tension can be kept low during the opening movement of the valve which may result in a fast opening velocity of the valve.

2.2 The features of Claim 2 are derivable from Fig. 5 and the description of the English translation, page 3, lines 5 to 8, in connection with Fig. 1 which shows the position of the valves in the engine.

The features of Claim 3 are disclosed in Conclusion 3 and in the description (page 3, lines 9 to 16) of the English translation, as well as in Fig. 6.

The features of Claim 4 are derivable from Fig. 4.

2.3 The published description column 1, last line to column 3, line 40, corresponds to the English translation, page 1, line 43 to page 3, line 16. The amended parts of the description comprise the acknowledgement of the state of the art and an adaptation to the new claims.

2.4 Hence, the claims and the description do not contravene Art. 123(2) EPC.

### 3. Novelty

3.1 Document D4 which is the most relevant document, discloses all the features defined in the precharacterising portion of Claim 1 of the application. It is true that it is moreover described in this document D4 with regard to the embodiment of Figures 6 and 7 that "if the elevation of the lift ramp exceeds the length of the negative ramp, spring 3 could be made to come under compression before the peak has been reached, thereby retaining the valve well in its critical escape velocity", see page 8, lines 6 to 9. It is therefore known from this document D4 to shape and position the main and auxiliary cams such that the spring is already compressed before the open position of the valve is reached, that means that the second spring support might already be pushed in the spring tensioning



direction before the valve is fully open. However, contrary to the subject-matter of the application, the second valve spring support of the device of document D4 is moved from a rest position in a spring relaxing direction during the opening movement of the valve. The maximum spring relaxing position of the second valve spring support, therefore, falls in the opening or in the open period of the valve and not in its closed period (see Fig. 5). The second valve spring support is moved back from the maximum spring relaxing position to the rest position.

The subject-matter of Claim 1 of the application therefore differs from this state of the art by the features of the characterising portion of Claim 1.

3.2 Also document D1 discloses a combustion engine with the features as defined in the precharacterising portion of Claim 1 of the application. The spring of this known valve device however is in its tensioned position during the closed period of the valve (Fig. 3c) and is in its relaxed position during the open period of the valve (see Claim 1 of document D1; Fig. 3a and e). Before the valve is opened the spring is moved to its relaxed position (Fig. 3d). During opening of the valve the second spring support is moved simultaneously with the valve so that the spring is not compressed or is only in a slightly compressed position (see column 4, lines 24 to 29 and column 12, lines 12 to 19 of document D1). This is the basic idea of document D1 in order to increase the efficiency of the engine and to ensure proper functioning of the valves during high engine speed (see column 4, lines 35 to 54). During the closing movement of the valve the second valve spring support is moved in the same direction as, and simultaneously with, the first valve spring support, so that again the spring remains under low tension. During

the closed position of the valve however the second valve spring support is further moved in the spring tensioning direction (Fig. 3b to c).

The subject-matter of Claim 1 of the application therefore differs from the state of the art known from document D1 by the characterising features of Claim 1.

- 3.3 Document D2 discloses a valve system wherein, during the opening movement of the valve the second spring support moves simultaneously with the first spring support so that the spring is not compressed thereby. The second spring support moves in the spring tensioning direction during the closing movement of the valve and the spring is tensioned at the end of this movement (see page 2, lines 7 to 29). No indication is given in this document that the second spring support moves in the spring tensioning direction during the opening movement of the valve and that it moves therefore opposite to the first spring support, compressing thereby the spring.
- 3.4 Document D3 discloses a valve system wherein again the second spring support is moved in the spring relaxing direction during the opening movement of the valve, so that the spring is not compressed. During closing of the valve the second spring support acts via the spring onto a first spring support and closes therewith the valve. The spring is in a slightly compressed condition during this closing movement. This document also does not lead to the subject-matter of Claim 1.
- 3.5 It follows that the subject-matter as set forth in Claim 1 is to be considered novel within the meaning of Article 54 EPC. The same applies to the subject-matter of dependent Claims 2 to 4.

4. Since the only ground given for refusal was lack of novelty, and since this has been overcome by filing the new set of claims, the decision under appeal must be set aside.

However, the patent sought cannot yet be granted because the substantive examination still has to be carried out in respect of the substantially amended claims now on file. Furthermore, due to the significant differences between the wording of the original Claim 1 and that of the present amended Claim 1, the Board is unsure that the search already made is still valid for the new Claim 1. Therefore, the Board makes use of its power under Article 111(1) EPC to remit the case to the first instance for further prosecution including consideration of whether an additional search has to be made and whether the subject-matter of Claim 1 involves an inventive step. Minor corrections of the maintained published part of the description can be effected during this further prosecution.

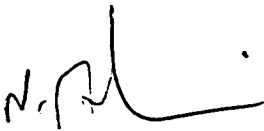
There is no need to organise oral proceedings in the present appeal because the appeal is not being dismissed.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution on the basis of the documents as defined in above section V.

The Registrar:



N. Maslin

The Chairman:



C. Andries

