Office européen des brevets

(11) **EP 0 877 154 A3** 

(12)

## **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3: 19.05.1999 Bulletin 1999/20

(51) Int. Cl.<sup>6</sup>: **F02B 75/16**, F01L 7/02

(43) Date of publication A2: 11.11.1998 Bulletin 1998/46

(21) Application number: 98108051.8

(22) Date of filing: 04.05.1998

(84) Designated Contracting States:

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

Designated Extension States:

AL LT LV MK RO SI

(30) Priority: 07.05.1997 IT MI971056

(71) Applicant: Falck, Giorgio Enrico 20122 Milano (MI) (IT)

(72) Inventor: Falck, Giorgio Enrico 20122 Milano (MI) (IT)

(74) Representative:
Trupiano, Roberto et al
BREVETTI EUROPA S.r.I.

Piazza Bernini, 6 20133 Milano (MI) (IT)

## (54) Internal combustion engine provided with rotary sleeve timing system

(57)Internal combustion four-stroke-cycle engine utilising a rotary sleeve or jacket timing system, which rotates at half speed (or multiples) with respect to the engine axle, comprising a fixed cylinder (1) with head (7), a rotary sleeve (2) top-closed by a ceiling (3) and provided with a window fit for sequentially placing itself in correspondence with a feed duct and an exhaust duct obtained in the head, and at least a rolling and radial centring element (16) so assembled as to originate a small clearance (17), in order to allow the sleeve an axial translation movement such as to push the upper ceiling (3) surface against the lower head (7) surface, until they mate and tight-fit together, ensuring in his way a perfect gas-tightness during compression and combustion.

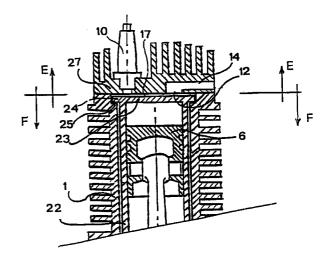


fig.4



## **EUROPEAN SEARCH REPORT**

Application Number EP 98 10 8051

| Category                   | Citation of document with income of relevant passa   |  | Relevant<br>to claim  | CLASSIFICATION OF THE APPLICATION (Int.CI.6)            |  |  |
|----------------------------|--|--|---|---|--|--|
| X                          | EP 0 016 381 A (DYLL 1 October 1980 * figures 1-5 * * abstract * * page 5, paragraph * page 6, paragraph   | A NORBERT)  3 *  | 1-4,8,<br>12,13,15  | F02B75/16<br>F01L7/02                                   |  |  |
| A                          | * figure 1 * * abstract *  | GEF SRL) 22 March 1995 - column 7, line 9 *  | 1,6,7   |   |  |  |
| X                          | DE 27 14 351 A (DYLL<br>5 October 1978<br>* figures 1-3 *<br>* abstract *<br>* page 10, paragraph<br>paragraph 2 *   |  | 1,9,10  |   |  |  |
| A                          | EP 0 285 363 A (JAGU<br>5 October 1988<br>* figure 1 *<br>* abstract *<br>* column 2, line 13  |  | 1,5   | TECHNICAL FIELDS<br>SEARCHED (Int.Cl.6)<br>F01L<br>F02B |  |  |
| Α                          | FR 2 600 718 A (PEUG<br>31 December 1987<br>* figure 1 *<br>* abstract *   | 14   |   |   |  |  |
| X                          | GB 1 260 757 A (LAMI<br>* figures 1-8 *<br>* page 2, line 76 -   | PERTI) 19 January 1972<br>page 3, line 21 *  | 1-4,9,13  | 3   |  |  |
|                            | The present search report has t  | peen drawn up for all claims   |   |   |  |  |
| <u> </u>                   | Place of search  | Date of completion of the search   | 1   | Examiner  |  |  |
|                            | THE HAGUE  | 29 March 1999  | Was   | Wassenaar, G  |  |  |
| X:pa<br>Y:pa<br>do<br>A:te | CATEGORY OF CITED DOCUMENTS<br>articularly relevant if taken alone<br>articularly relevant if combined with anot<br>current of the same category<br>chnological background<br>on-written disclosure<br>termediate document | E : earlier patent de after the filing diner D : document cited L : document cited | T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filling date D: document cited in the application L: document cited for other reasons  &: member of the same patent family, corresponding document |   |  |  |

## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 98 10 8051

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

29-03-1999

| Patent documen<br>cited in search rep | - | Publication date |                      | Patent family<br>member(s)                       | Publication date                                     |
|---------------------------------------|---|------------------|----------------------|--|--|
| EP 0016381                            | Α | 01-10-1980       | DE<br>AT             | 2910822 A<br>3663 T                              | 25-09-1980<br>15-06-1983                             |
| EP 0644319                            | Α | 22-03-1995       | IT<br>CA<br>JP<br>US | 1264947 B<br>2127418 A<br>7180558 A<br>5482011 A | 17-10-1996<br>20-01-1995<br>18-07-1995<br>09-01-1996 |
| DE 2714351                            | Α | 05-10-1978       | NONE                 |  |  |
| EP 0285363                            | Α | 05-10-1988       | AT<br>DE<br>GB<br>US | 70893 T<br>3867106 A<br>2203796 A,B<br>4838220 A | 15-01-1992<br>06-02-1992<br>26-10-1988<br>13-06-1989 |
| FR 2600718                            | Α | 31-12-1987       | NONE                 |  |  |
| GB 1260757                            | Α | 19-01-1972       | NONE                 |  |  |
|                                       |   |                  |                      |  |  |

FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82