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**Datasheet for the decision
of 31 May 2007**

Case Number: T 1227/04 - 3.2.01

Application Number: 98108112.8

Publication Number: 0905383

IPC: F15B 13/00

Language of the proceedings: EN

Title of invention:

Fixing means and fluid control apparatus incorporating same

Applicant:

FUJIKIN INCORPORATED

Opponent:

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Headword:

-

Relevant legal provisions:

EPC Art. 54, 56, 123(2)

Keyword:

"Novelty - yes (after amendment)"
"Inventive step - yes"
"Amendments - added subject-matter (no)"

Decisions cited:

T 0331/87

Catchword:

-



Case Number: T 1227/04 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 31 May 2007

Appellant:

FUJIKIN INCORPORATED
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Nishi-ku
Osaka-shi
Osaka (JP)

Representative:

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Hellersbergstraße 18
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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 13 May 2004
refusing European application No. 98108112.8
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: S. Crane
Members: J. Osborne
T. Karamanli

Summary of Facts and Submissions

I. The appeal is directed against the decision posted 13 May 2004 to refuse European application No. 98108112.8 (EP-A-0 905 383) filed on 5 May 1998 and claiming priority from 24 September 1997.

II. The following state of the art documents have been cited:

D1: US-A-5 255 647

D2: DE-U-295 11 400

D3: EP-A-0 845 623 filed on 18 November 1997, claiming priority from 20 November 1996 (JP 308869/96) and published on 3 June 1998

D4: EP-A-0 389 783

D5: DE-U-94 10 561.8

D6: GB-A-2 162 921.

The examining division found that the subject-matter of claim 1 then on file was not new with respect to the disclosure of D1.

III. The board issued a communication pursuant to Article 110(2) EPC in which it expressed its provisional opinion *inter alia* that the subject-matter of at least one claim was not new and that amendments made to the claims offended the requirement of

Article 123(2) EPC. With a reply dated 22 January 2007 the appellant filed amended claims.

IV. With a communication of 12 April 2007 the board informed the appellant that some amendments would still be necessary and indicated a version of the description and claims which it considered could form the basis for grant of a patent. With a letter of 16 April 2007 the appellant expressed its approval of the documents communicated by the board. The appellant's present request is that a patent be granted on the basis of the following documents:

- claims 1, 2 notified with the communication of 12 April 2007;
- description pages 1, 2, 2a, 3-6 and 18 notified with the communication of 12 April 2007;
- description pages 7-17 and 19-22 as originally filed;
- drawings pages 1/3 to 3/3 as originally filed.

V. Claim 1 according to the appellant's request reads:

"A fluid control apparatus comprising a fixing device for fixing lower members (31) to a support member (108) with bolts (110), the lower members (31) each having a through bore (107) and being disposed between the support member (108) and an upper member, wherein each through bore (107) comprises a large-diameter portion (107a) larger than a head (110a) of the bolt (110) in diameter, and a small diameter portion (107b) having a diameter intermediate between the diameter of the bolt

head (110a) and the diameter of the bolt shank (110b), and extending downward from the large-diameter portion (107a) with a stepped portion (107c) formed therebetween, wherein a hollow elastic member (112) is interposed between the bolt head (110a) and the stepped portion (107c) for biasing the lower member (31) toward the support member (108), wherein a hollow cylindrical spacer (111) with an inside diameter larger than the diameter of the bolt shank (110b) is fitted in the small diameter portion (107b) of the through bore (107), the spacer (111) having a lower end supported by the support member (108) and an upper end positioned in the large-diameter portion (107a), such that as the bolt (110) inserted through the through bore (107) is screwed into a screw bore (109) of the support member (108), the head (110a) of the bolt (110) is supported by the spacer (111) bearing on the support member (108), preventing further tightening of the bolt (110), and when the bolt (110) is completely tightened up the elastic member (112) can be further deformed by compression so that the lower member (31) is movable away from the support member (108), and wherein each of the lower members (31) has a fluid channel opened upward and the upper members are formed with two fluid channels opened downward and communicate with the respective fluid channels of the lower members."

Claim 2 contains features additional to those of claim 1.

Reasons for the Decision

1. The application relates to a fluid control apparatus in which fluid transfer takes place between respective series of lower and upper members. The lower members are mounted to a common support member using bolts so that each has its lower surface facing the support member. The upper members are connected to the respective upper surfaces of the lower members to enable fluid transfer between them. Differences between the height dimensions of the lower members may result in their upper surfaces being at different levels, thereby rendering it difficult to achieve a reliable seal when one upper member connects with two lower members. In accordance with the application the lower members are resiliently mounted on the support member in such a way that their upper surfaces can adopt a common level and thereby permit reliable sealing to the upper members.

Amendments - Article 123(2) EPC

2. Claim 1 is based on claim 2 as originally filed. Claim 2 corresponds to claim 3 as originally filed. The description has been amended for consistency with the claims.
 - 2.1 The subject-matter of claim 1 essentially differs from that of original claim 2 in the following ways:
 - the original term "bolt bore" which designated the bore 107 has been replaced by the term "through bore". It was clearly disclosed in the figures that the bore 107 is a through bore and, indeed, this is

an essential feature since the bolts which are inserted from the upper surface of the lower member extend through the bore into the support member;

- it is no longer specified that the hollow elastic member is "cylindrical". In the application as originally filed there was no disclosure of any form of the hollow elastic member other than cylindrical. Nevertheless, the cylindrical form was not explained as being essential, is not indispensable for the function of the invention in the light of the technical problem since a non-cylindrical form would serve equally well to provide resiliency and the absence of the cylindrical form involves no real modification of other features, cf. decision T 331/87 (OJ EPO 1991, 22);

2.2 The following wording has been added: "such that as the bolt (110) inserted through the through bore (107) is screwed into a screw bore (109) of the support member (108), the head (110a) of the bolt (110) is supported by the spacer (111) bearing on the support member (108), preventing further tightening of the bolt (110), and when the bolt (110) is completely tightened up the elastic member (112) can be further deformed by compression so that the lower member (31) is movable away from the support member (108)". This wording corresponds to that contained in the description as originally filed at page 19, line 23 to page 20, line 3 and page 20, lines 14 to 17.

2.3 The board concludes from the foregoing that the requirements of Article 123(2) EPC have not been contravened.

Novelty

3. The application both in its form as originally filed and as refused by the examining division contained claims directed to the fixing device alone. D1, D2 and D4 disclose fixing devices for use in attaching a cover to the cylinder head of an engine and none of them contains a disclosure of a fluid control device which forms the subject-matter of the present claims.
4. The priority date of the present application, which the board considers to be validly claimed, lies between the priority and filing dates of D3. The relevance of D3 as state of the art (under Article 54(3) EPC) for the present application therefore depends on the validity of its claimed priority. D3 discloses an arrangement as presently claimed but only in its figures 4 and 5 and associated description. Since none of this part of the disclosure is contained in the priority document, D3 does not form relevant state of the art for the present application.
5. D5 discloses a fluid control device comprising a single, elongated lower member mounted between a support member and a series of upper members with which the lower member is in fluid communication. There is no plurality of lower members in fluid communication with the upper member.
6. D6 discloses a fluid flow system comprising a series of components having fluid interconnections. The components are mechanically connected by means of a stud adapter which comprises a male end and a female

end. There is no hollow elastic member interposed between a bolt head and a stepped portion of a through bore.

7. The board concludes from the forgoing that the subject-matter of claim 1 is new with respect to the available state of the art (Article 54 EPC).

Inventive step

8. The closest available state of the art for consideration of inventive step is known from D5. This discloses a fluid control device comprising a single, elongated lower member mounted between a support member and a series of upper members. Fluid communication is provided between the upper and lower members. The lower members are mounted on the support member by bolts which pass through bores in the lower member and are threaded into the support member. The bolt heads are recessed in counter bores in the lower member.

- 8.1 The subject-matter of present claim 1 differs from that of D5 firstly in that there are a plurality of lower members and secondly in that these are elastically movable away from the support member. This elastic mounting results from the use of hollow cylindrical spacers which allow the respective mounting bolts to be tightened against the support member whilst an elastic element between the underside of each bolt head and the bottom of the counter bore in which it is located resiliently biases the lower member against the support member. As explained under 1 above, this eases the task of achieving a reliable seal when one upper member connects with two lower members.

8.2 The only examples in the available state of the art of a resilient mounting of the type presently claimed are in respect of covers on the cylinder head of an engine. Both D1 and D4 disclose such an arrangement in which a bolt is tightened against a hollow cylindrical spacer and the cover is decoupled from both the bolt and the cylinder head by elastic members. The arrangement according to D1 aims to isolate the cover from vibration of the cylinder head in order to minimize noise. The arrangement according to D4 aims to provide a seal against the flow of fluid through the bolt hole and also to retain the bolt in the hole before assembly. D2 discloses only the fastener assembly in isolation from the cover and aims to provide an arrangement which retains the bolt in position in the cover before fitting. None of these documents relates to the problem which is addressed by the subject-matter of the present claim. The skilled person aware of these documents therefore would receive no incentive to modify the arrangement of D5.

8.3 D3 was published after the filing date of the present application and so does not form state of the art which is to be considered in deciding whether there has been an inventive step (Article 56, second sentence, EPC). As already mentioned under 6 above D6 does not disclose an elastic member as presently claimed and so is less relevant than the other documents already considered.

9. On the basis of the foregoing the board finds that the subject-matter of present claim 1 involves an inventive step (Article 56 EPC). Since claim 2 contains all

features of claim 1 the same conclusion applies also to that claim.

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 with the order to grant a patent on the basis of the following documents:
 - claims 1 and 2 notified with the communication of 12 April 2007;
 - description pages 1, 2, 2a, 3-6 and 18 notified with the communication of 12 April 2007;
 - description pages 7-17 and 19-22 as originally filed;
 - drawings pages 1/3 to 3/3 as originally filed.

The Registrar:

The Chairman:

A. Vottner

S. Crane