



0 594 261 A1

12

EUROPEAN PATENT APPLICATION

②¹ Application number: 93202970.5

⑤¹ Int. Cl.⁵: **F24F 13/14**, F24F 13/08

②② Date of filing: **22.10.93**

③ Priority: 22.10.92 NL 9201833

④3 Date of publication of application:
27.04.94 Bulletin 94/17

⑧ Designated Contracting States:
BE DE DK ES FR GB NL SE

71 Applicant: **De Waal, Casparus Wilhelmus**
Leembaan 21
NL-5753 CW Deurne(NL)

72 Inventor: **De Waal, Casparus Wilhelmus**
Leembaan 21
NL-5753 CW Deurne(NL)

74 Representative: **Bartelds, Erik et al**
Arnold & Siedsma
Octrooigemachtigden
Sweelinckplein 1
NL-2517 GK The Hague (NL)

54 A device for mounting a plate-like body to the surface of a thin-walled support.

57) A device for mounting a plate-like body (2) to the surface of a thin-walled support (1), wherein use is made of a connecting element (3) in the form of a plug with shaft (5) and head part (4) whereof the shaft (5) is placed through the support (1) and grips the edge of the plate-like body (2), wherein the shaft (5) of the plug (3) is provided with two semi-cylindrical wall portions, the outer periphery of which is received fittingly in a bore hole of the support (1) and each of which is embodied with an axially oriented slot (6) for receiving the edge of the plate-like body (2), so that it is possible to apply the plug (3) not only as connection for plates which must have a fixed position relative to each other, such as guide plates in air ducts and the like, but also as valve bodies which can be swivelled on the axis of the plug shaft.



The invention relates to a device for mounting a plate-like body to the surface of a thin-walled support, wherein use is made of a connecting element in the form of a plug with shaft and head part whereof the shaft is placed through the support and grips the edge of the plate-like body.

In the sheet metal working industry it frequently occurs that plates have to be fixed at right angles to each other, for which purpose use is generally made of bent flanges which are secured by rivets and the like. The mounting of plugs which are placed through the one plate-like element and the shaft of which grips the other plate-like element is also known in practice.

The invention has for its object to propose an improvement to this latter fixing method with which fixedly mounted or rotatable arrangement of the plates becomes possible.

The device according to the invention is distinguished in that the shaft of the plug is provided with two semi-cylindrical wall portions, the outer periphery of which is received fittingly in a bore hole of the support and each of which is embodied with an axially oriented slot for receiving the edge of the plate-like body.

Due to the cylindrical shaft it is possible to apply the connecting element in the form of a plug not only as connection for plates which must have a fixed position relative to each other, such as guide plates in air ducts and the like, but also as valve bodies which can be swivelled on the axis of the plug shaft.

The invention further relates to a fixing element suitable for a device as described above in addition to a planar blank for obtaining a fixing element as stated above.

Above mentioned and other features will be further elucidated with reference to a number of embodiments. In the drawing:

fig. 1 shows a perspective view, partly with broken away parts, of a tubular support having arranged therein a plate-like body functioning as valve body in addition to a connecting element according to the invention,

fig. 2 shows a detail of the connecting element used in the embodiment of fig. 1,

fig. 3 shows a detail along the line III in fig. 2 of the shaft of the connecting element,

fig. 4 is a perspective view of a second use of the mounting device according to the invention,

fig. 5 shows a planar blank for obtaining a connecting element according to the invention,

fig. 6 shows in perspective an exploded view of the mounting device as depicted in fig. 2,

fig. 7 shows a detail of a second embodiment of the connecting element of fig. 1.

Designated with numeral 1 is a thin-walled support which is here formed to a tube or pipe and

which serves for through-feed of gaseous media, for instance flue gases.

The passage in the tube or pipe can be closed by a valve body 2 which according to the invention is the plate-like body. The peripheral shape of the plate-like body is here such that in the position transversely of the tube 1 the passage is closed.

The plate-like element 2 is mounted by means of two connecting elements 3 in the form of a plug, which plug is provided with a head part 4 and a shaft part 5.

The shaft part 5 has two axially oriented slots 6 which serve to receive the edge portion of the plate-like body 2, see fig. 2.

In preference the slot is embodied such that when the edge portion of plate-like body 2 is inserted it is deformed, as can be seen in fig. 3. For this purpose the slot 6 is provided on the end located close to the head part with a widening 7 whereby this edge portion is deformed at 8.

The mounting of the plate-like body 2 in the tube 1 takes place as follows. After arranging two bores diametrically opposite each other in the thin wall of tube 1, the plate-like body 2 can be arranged with the edge over the bores. The shafts 5 of the plugs 3 are then placed from outside through the bores on either side of the wall of tube 1 such that the edge of the plate-like body 2 comes to lie in the slots 6. When the plugs are driven further in, the edge will be deformed as discussed above and the fixing of the plate-like body 2 to the shafts 5 of the plug 3 is effected. The cylindrical shaft part enables rotating of the plate 2 whereby it can function as valve body.

It is additionally possible to embody the head 4 of the fixing element 3 with a, for instance square, hole 9 in which the co-acting stub 10 of a control lever 11 can be placed, see fig. 7. By fitting the lever 11 in a bracket 12, which can be embodied in random manner and which is riveted to the outer wall of tube 1 by means of pop rivets 13, the lever can be gripped from outside by means of any random actuating member, whereby the turning of the valve body 2 can be performed.

Fig. 4 shows an embodiment wherein the plate-like body 2' can be accommodated not as rotatable plate but as fixed guide blade in an air duct 15 which here has a rectangular cross-sectional form. The air duct parts, which lie mutually perpendicularly in the embodiment shown, can of course have any suitable form and the plate-like element 2' may have a curved respectively flat shape. The correct position of the blade 2' can be adjusted by again arranging the plugs diametrically opposite each other so that a swivel axis A-A is obtained in order to guide the air through the duct in suitable manner. It will be apparent that more plate-like elements 2' can be arranged in the air duct.

In fig. 5 and 6 is shown that the fixing element according to the invention can be manufactured from a planar blank 20, see fig. 5, which consists of a central part 21 with two rectangular wings 22 arranged diametrically opposite each other.

5

The rectangular wings may already be provided with slots 6 as shown in fig. 2 and 3.

The fixing element is formed by a bending operation on the wings, which are folded first through 180° against the underside of the central part 21 and then outward, wherein furthermore the outward folded portion is bent cylindrically. This takes place such that the slots come to lie diametrically opposite each other in the shaft part 5.

10

Fig. 7 shows the mounting as described above, wherein a sealing ring 23 is laid under the head part 4 formed by the central part 21 of the blank 20.

15

The invention is not limited to the above described embodiments.

20

Claims

1. Device for mounting a plate-like body to the surface of a thin-walled support, wherein use is made of a connecting element in the form of a plug with shaft and head part whereof the shaft is placed through the support and grips the edge of the plate-like body, **characterized in that** the shaft of the plug is provided with two semi-cylindrical wall portions, the outer periphery of which is received fittingly in a bore hole of the support and each of which is embodied with an axially oriented slot for receiving the edge of the plate-like body.
2. Device as claimed in claim 1, **characterized in that** at least one of the slots has a shape deviating from a straight line.
3. Device as claimed in claims 1 and 2, **characterized in that** the support has a tubular form and the plate-like body has a peripheral shape fitting into this tube, wherein in each case two connecting members are arranged lying diametrically opposed and mutually in line.
4. Device as claimed in claim 3, **characterized in that** the head of the connecting element is provided with an actuating means.
5. Fixing element suitable for a device as claimed in any of the claims, **characterized in that** the head part and the shaft part are formed integrally.

25

30

35

40

45

50

55

6. Planar blank consisting of a central part with two rectangular wings connecting thereto on either side for forming the shaft part, which wings each undergo a bending operation.

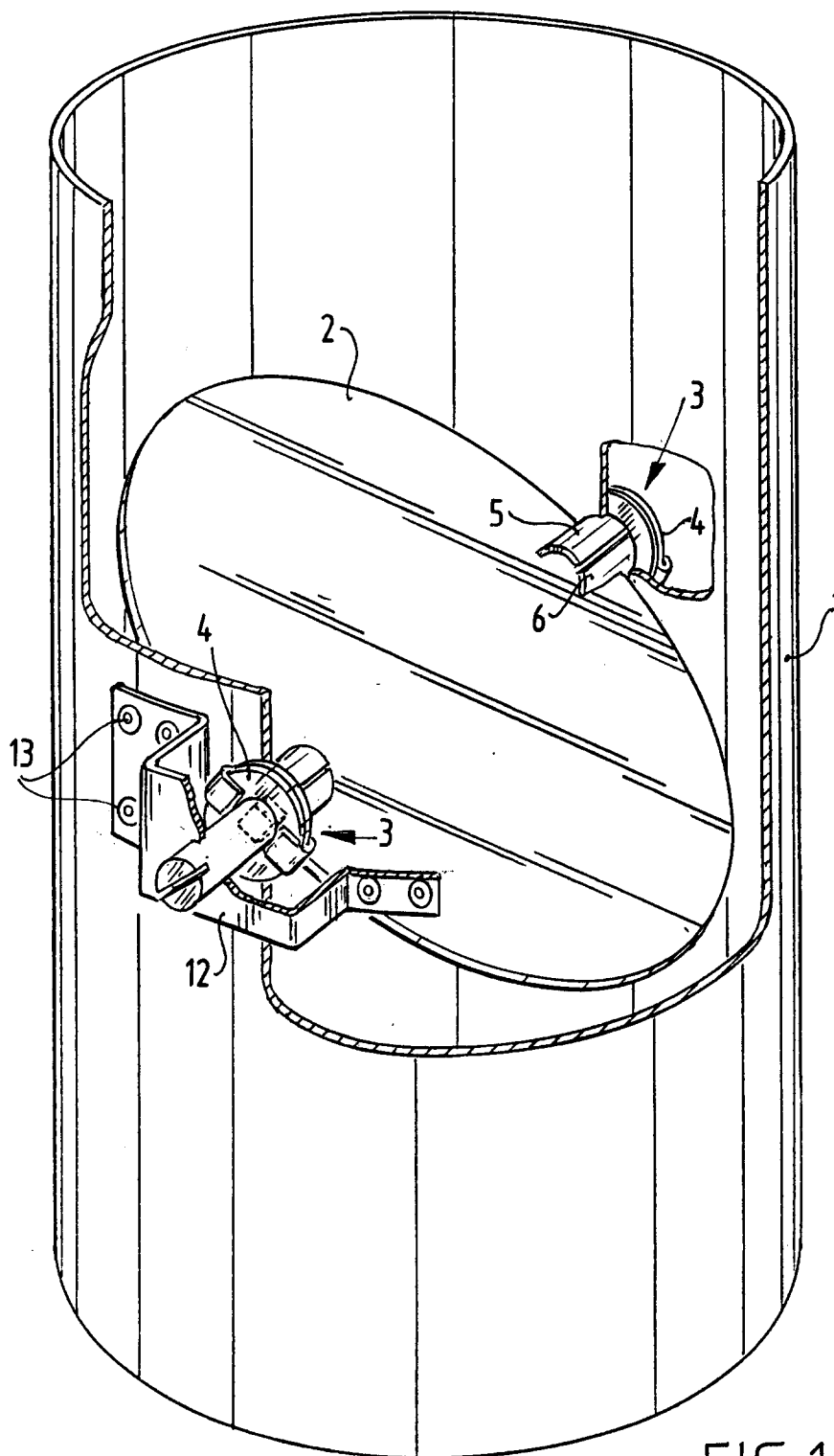


FIG.1

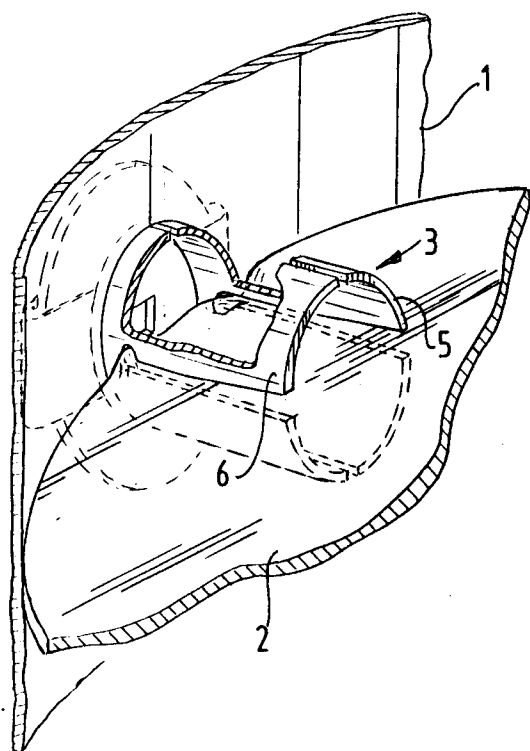


FIG. 2

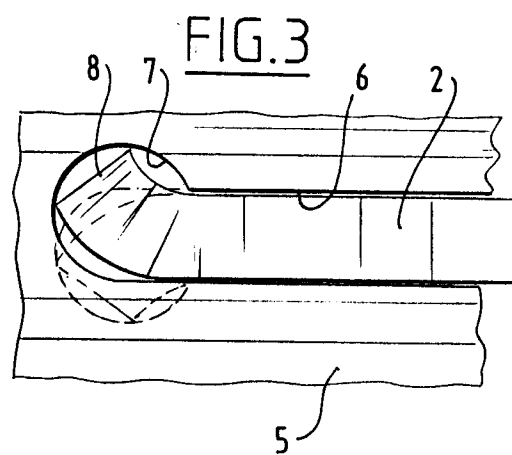


FIG. 3

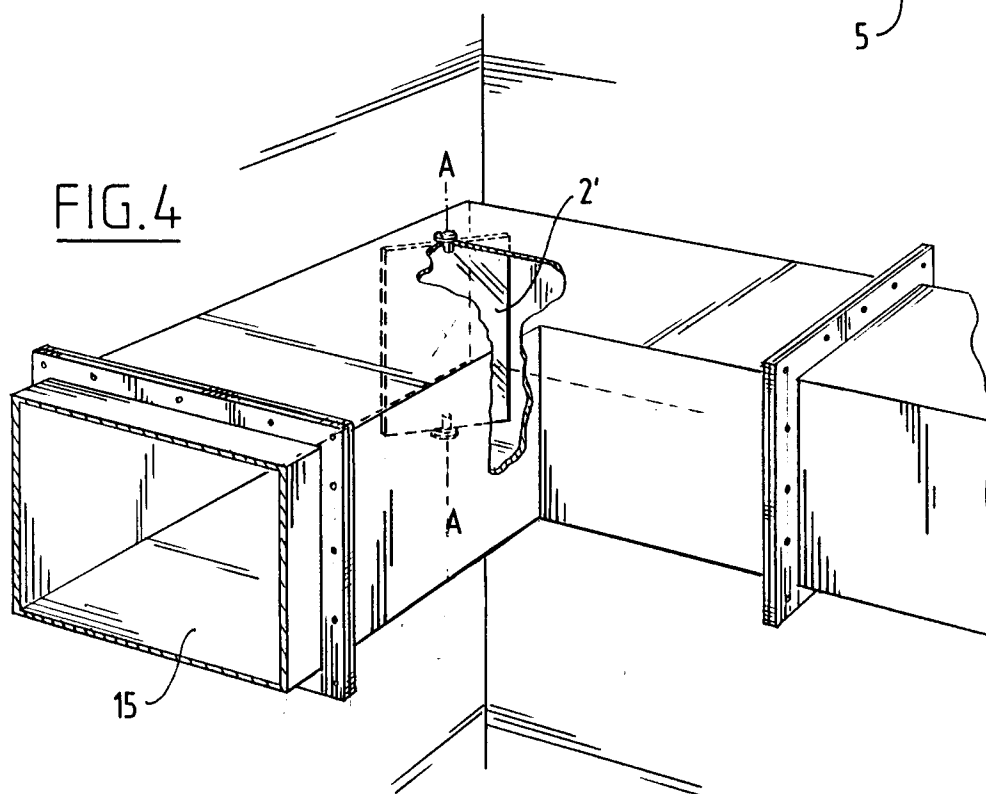
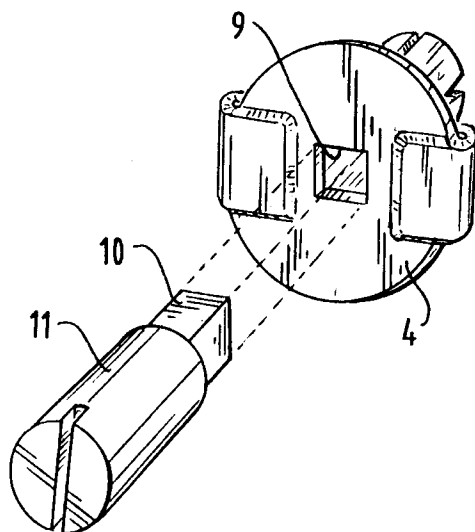
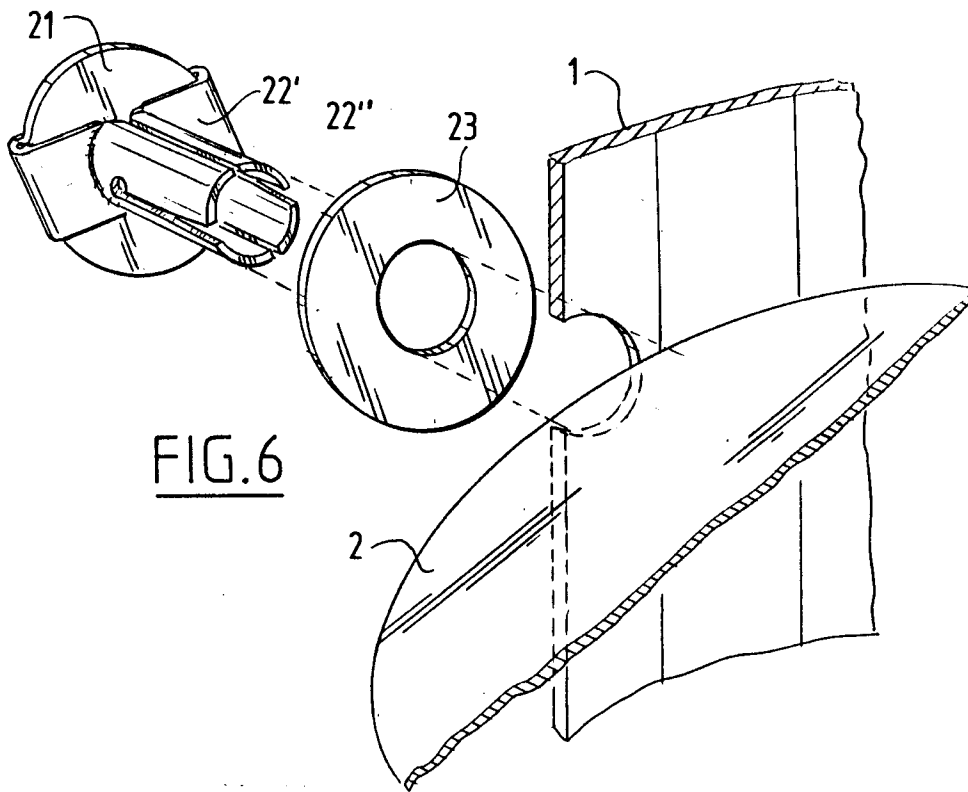
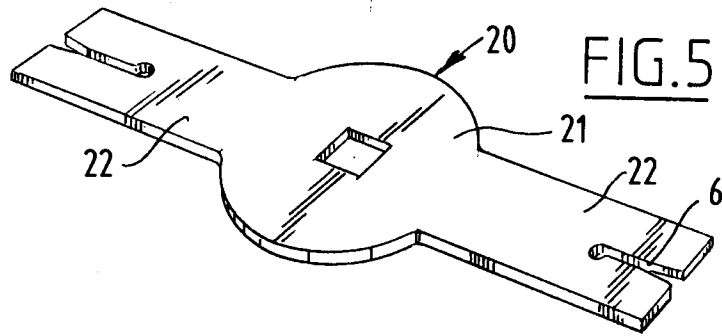


FIG. 4





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 20 2970

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	US-A-2 884 956 (PERLIN) * column 3, line 23 - line 52; figures 2,7 *	1,5	F24F13/14 F24F13/08
A	---	2,3	
A	US-A-2 134 844 (SCHARTOW) * column 2, line 10 - line 16; figures 1,4,7 *	6	
A	--- GB-A-955 502 (MANMIL PLASTICS) -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			F24F F16B F16K
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 January 1994	Examiner Peschel, G
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	