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(54) **SPACER FOR INSULATION**

(57) It is a spacer capable of spacing two surfaces between which an insulating material is placed. In particular, the spacer according to the invention allows sur-

faces to be spaced independently of the thickness of the insulating material, thus having a highly flexible and practical use.

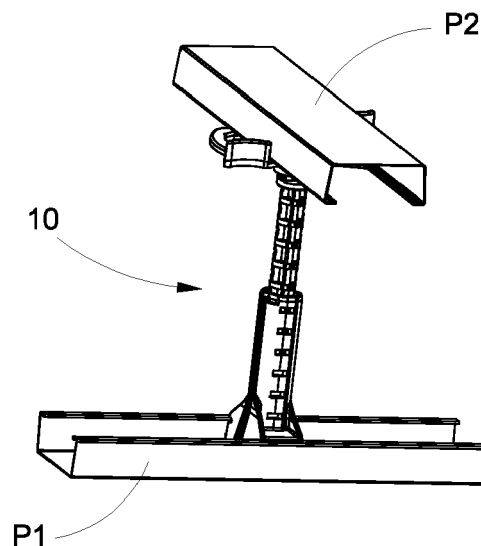


Fig. 1

Description

[0001] This invention generally refers to a spacer for insulation. In particular, it is a spacer capable of spacing two surfaces between which an insulating material can be placed.

[0002] As is well known, in the building sector there are spacers available on the market which are capable of spacing two surfaces between which a layer of insulating material can be placed.

[0003] Usually, these spacers take the form of a pin with an internally threaded hole. This pin is screwed onto a first screw, placed on the first surface, usually a base wall, on which the insulating material is placed.

[0004] Then, the second surface, usually a panel, is placed on this insulating material and a second screw is screwed through the second surface into the pin. Through this and other pins, the two surfaces are kept at a predetermined distance.

[0005] The distance between the two surfaces, in this case the base wall and the panel, is equivalent to the length of the pin.

[0006] Therefore, depending on the distance between the two surfaces, i.e. depending on the thickness of the insulation, pins of a certain size must be used.

[0007] Therefore, the pins should be selected once the thickness of the insulation material has been precisely determined.

[0008] If the choice of insulation material is changed during installation, all pins must also be replaced.

[0009] In order to overcome this problem and gain in flexibility of use, pins can be chosen which can be cut to obtain spacers of the desired length.

[0010] However, it takes time to adjust the pins to the required length in order to space the two surfaces.

[0011] An aim of this invention is to provide a spacer for insulators that solves these and other problems of known systems.

[0012] Another aim of the invention is to obtain a spacer that can be used flexibly, regardless of the variation of the distance between the walls between which the insulating material is to be mounted.

[0013] A further aim of the invention is to provide a spacer that can be quickly mounted on both the first surface, i.e. the base wall, and the second surface.

[0014] These and other aims are all achieved, according to the invention, by a spacer for insulating material to be fixed to a first C-shaped profile P1 and a second C-shaped profile P2, the first profile P1 to be fixed to a first surface, for example a base wall, and the second profile P2 to be fixed to a second surface, for example a panel, an insulating material being placed between the first surface and the second surface.

[0015] In particular, the spacer is characterized by the fact of comprising:

- a support suitable to be bound to the first profile P1;
- a stem suitable to be coupled to the support;

- a clamping flange capable of being fastened below the stem and above the second profile P2.

[0016] In addition, the spacer is characterised by the fact that the support includes first fixing means and the stem includes second fixing means, so that the first fixing means can be coupled to the second fixing means in variable positions, so that the overall height of the spacer can be varied, as well as chosen and fixed according to the thickness of the insulating material.

[0017] Advantageously, the support can include a cylindrical body in which a hole is formed at the top and at least two side seats are formed laterally and are arranged at different heights of the cylindrical body; the stem can include an elongated portion from which at least one tooth protrudes laterally which has a homologous shape to the two side seats, so that the elongated portion can be inserted into the hole and the tooth can be inserted into one of the two or more side seats.

[0018] In addition, the support may include a base in which a first lateral slot and a second lateral slot are formed on opposite portions of the base and are suitable for receiving the free ends of the first C-shaped profile P1, so as to lock the support to the first profile P1.

[0019] The support can advantageously include at least a first wing in which a through-hole is cut so that the support can be fixed to the corresponding profile P1 by means of a screw or nail.

[0020] The stem can include a tip with at least one curved face on which first knurls are formed and in the clamping flange a central hole can be formed in the inner surface of which, at an angular portion, second knurls are formed so that, when the tip is inserted in the central hole, the first knurls and second knurls interfere with each other in order to lock the clamping flange to the stem.

[0021] Advantageously, the tip of the stem can be rounded so that the clamping flange can be tilted with respect to the stem.

[0022] At least one vertical relief can protrude from the central hole and at least one tab can protrude from the tip so that, at a given rotation of the clamping flange, the relief is blocked by the tab, preventing an opposite rotation of the clamping flange.

[0023] The clamping flange may include a disc placed close to the base portion, so as to obtain an annular seat between the disc and the same base portion; the disc may be reduced on two opposite sides conforming to two lateral edges, at which the annular seat is also reduced in depth.

[0024] Through this shape, when the clamping flange is oriented in a certain way, the second profile P2 can sit on the same flange with its free ends at the annular seat portion of reduced depth.

[0025] When the clamping flange is rotated, the second profile P2 is permanently coupled to the same clamping flange.

[0026] The clamping flange may also include at least one gripping wing to make it easier for an operator to grip

the clamping flange.

[0027] Advantageously, in the basic portion of the clamping flange, at least one arrow-shaped opening can be made to indicate the direction of rotation of the clamping flange for its coupling with the stem.

[0028] Further features and details can be better understood from the following description, supplied by way of a non-exhaustive example, as well as from the attached drawing, wherein:

Fig. 1 is an axonometric view of a spacer for an insulation, made according to the invention, applied to two profiles useful for the connection with the respective surfaces between which the insulating material is to be placed;

Fig. 2 is an exploded axonometric view of the spacer and the connection profiles, illustrated in Figure 1; Figs. 3 and 4 are axonometric views only of the spacer in Figure 1, mounted and exploded, respectively, consisting of a base, a stem and a clamping flange; Fig. 5 is a top view of a clamping flange of the spacer in Figure 1;

Fig. 6 is a sectional side view of the clamping flange in Figure 5 according to the section plane B-B shown in Figure 5.

[0029] With reference to Figures 1 to 5, reference number 10 denotes a spacer suitable to be fixed to a first C-shaped profile P1 and to a second C-shaped profile P2.

[0030] The spacer 10 includes:

- a support 12 to be fixed to the first profile P1 ;
- a stem 14 to be inserted in the support 12;
- a clamping flange 16 to be fastened below the stem 14 and above the second profile P2.

[0031] The support 12 includes a base 18 and a hollow cylindrical body 20 joined in a single body to the base 18.

[0032] In the base 18, a first lateral hollow 22 and a second lateral hollow 24 are obtained on opposite portions of the base 18.

[0033] A first wing 26 and a second wing 28, opposite each other, protrude from the lower end of the base 18 and in each wing a through hole 30 is obtained.

[0034] The hollow cylindrical body 20 has a cylindrical shape and a blind hole 32 is formed at the top in it.

[0035] In the hollow cylindrical body 20 there are side seats 34 (for illustration convenience in Figure 4 a single rectangular seat is denoted by reference number 34). In particular, a first series of rectangular seats 34 is formed on a first lateral portion of the cylindrical body 20 and a second series of rectangular seats (not visible in the figures) is formed on a second lateral portion of the cylindrical body 20 opposite the first lateral portion.

[0036] Moreover, at the upper end of the hollow cylindrical body 20 there are two irregular seats 35 opposite each other, only one of which is shown in Figure 4.

[0037] The stem 14 includes an elongated portion 36

and a tip 38.

[0038] First teeth 40 and second teeth 41 protrude from the elongated portion 36 and are distributed in height along the same elongated portion 36, as shown in Figure 4 (for illustration convenience only a first tooth 40 and a second tooth 41 have been indicated).

[0039] The tip 38 of the stem 14 comprises two diametrically opposed curved faces on which first knurls 42 are formed.

[0040] The tip 38, between the two curved faces, includes tabs. In particular, two first tabs 44 protrude from one side of the tip 38 and two second tabs protrude from the opposite side of the tip 38. The first two tabs 44 and the second two tabs are arranged symmetrically with respect to the central axis of the stem 14.

[0041] The clamping flange 16 comprises a substantially rectangular base portion 46 with arched sides and in which a central hole 50 is formed at the centre.

[0042] Respective gripping lugs 48 protrude from two opposite corners of the base portion 46.

[0043] From the base portion 46, at the central hole 50, an upper cylinder 52 protrudes above and a lower cylinder 54 protrudes below.

[0044] Second knurls 56 are formed inside the lower cylinder 54.

[0045] A disc 58 protrudes from the upper cylinder 52 and is connected to the same upper cylinder 52 by means of shoulders 64, only one of which is shown in Figures 3 and 4.

[0046] The disc 58 is placed substantially close to the base portion 46 so as to form an annular seat 60 between the disc 58 and the same base portion 46.

[0047] The disc 58 is reduced on two opposite sides, conforming with two lateral edges 62, at which the annular seat 60 is also reduced.

[0048] In the base portion 46 of the clamping flange 16 there are also openings 66 in the shape of an arrow to indicate a direction of rotation of the clamping flange 16.

[0049] From the inner surface of the central hole 50 two reliefs 68 protrude opposite each other with respect to a central axis.

[0050] The procedure for fixing the spacer 10 in order to arrange an insulating material between two surfaces first requires the fixing of the first profile P1 to a surface, i.e. to the base wall.

[0051] The support 12 is fastened to the first profile P1 by pushing the base 18 inside the profile P1, so that the lateral ends of the same profile P1 are received in the first lateral hollow 22 and in the second lateral hollow 24 of the same base 18, respectively.

[0052] Alternatively, the support 12 can be fixed to the first profile P1 or directly to the wall with screws or nails through the through holes 30 formed in the wings 26, 28 of the base 18.

[0053] Then the stem 14 is fixed to the support 12. In particular, the elongated portion 36 of the stem 14 is first inserted into the blind hole 32 formed in the cylindrical body 20 of the support 12.

[0054] The attachment of the stem 14 to the support 12 takes place by means of a rotation of the stem 14 with respect to the support 12 so that the first teeth 40 fit into the rectangular seats 34 and a pair of second teeth 41 fit into the irregular seats 35, so that the shape of the teeth is matched to the respective seats.

[0055] In particular, an initial adjustment of the distance between the surfaces can already take place at this stage by inserting the stem 14 into the support 12 at the desired depth.

[0056] Once the insulating material, which is usually soft and therefore easy to drill through with the tip 38 of the stem 14, has been laid, the clamping flange 16 is coupled to the same stem 14.

[0057] In particular, the clamping flange 16 is arranged so that the second knurls 56 of the lower cylinder 54 of the clamping flange 16 do not interfere with the first knurls 42 of the tip 38 of the stem 14, as shown in Figure 1.

[0058] Then the second profile P2 is placed on the clamping flange 16. In particular, the free and opposite ends of the second profile P2 are arranged in the annular seat 60 without any opposition as they are at the two side edges 62 of the disc 58.

[0059] Finally, proceed with the rotation of the clamping flange 16 according to the direction of rotation indicated by the openings 66.

[0060] By means of this rotation, the second profile P2 is attached to the clamping flange 16 and the same clamping flange 16 is attached to the stem 14.

[0061] In fact, the second profile P2 is clamped to the clamping flange 16 because the free and opposite ends of the second profile P2 are arranged in the annular seat 60 where it is deeper.

[0062] In addition, the clamping flange 16 is connected to the stem 14 by the interference of the first knurls 42 of the tip 38 of the stem 14 with the second knurls 56 of the lower cylinder 54 of the clamping flange 16.

[0063] Once this rotation has taken place and this coupling has taken place between the second profile P2, the clamping flange 16 and the stem 14, a rotation in the opposite direction is no longer possible as the reliefs 68 protruding from the central hole 50 are blocked in their possible movement by the tabs 44 protruding from a portion of the tip 38.

[0064] The spacer 10 according to the invention is particularly flexible in its use. In fact, it can be used to space surfaces regardless of the thickness of the insulating material to be interposed, as the coupling between the stem 14 and the support 12 allows the length of the entire spacer 10 to be varied.

[0065] Furthermore, if the thickness of the insulating material is not within the range of heights obtainable from a specific model of spacer 10, it is sufficient to replace the initially chosen stem 14 with a shorter or longer stem.

[0066] A further advantage of the spacer 10 according to the invention is the fine adjustment of the coupling of the clamping flange 16 with the stem 14, in particular of the interference that can be achieved by the first knurls

42 of the tip 38 of the stem 14 with the second knurls 56 of the lower cylinder 54 of the clamping flange 16.

[0067] This coupling also allows a minimum angular adjustment of the same clamping flange 16 with the stem 14, and therefore of the second profile P2.

[0068] A technician in the sector can provide for modifications or variants which are to be considered included in the scope of protection of the present invention.

[0069] For example, a spacer according to the invention may provide for a different coupling between the stem and the support, in any case adjustable according to the thickness of the insulating material.

[0070] Similarly, the coupling between the clamping flange and the stem can also take place by means of different clamping mechanisms which allow, however, by rotation or other movement, the fastening of the profile to the clamping flange and the fastening of the same clamping flange to the stem.

Claims

1. Spacer (10) suitable for being fixed to a first C-shaped profile P1 and to a second C-shaped profile P2, the first profile P1 being adapted to be bound to a first surface and the second profile P2 being adapted to be bound to a second surface, an insulating material being arranged between the first surface and the second surface, **characterized by the fact of comprising:**

- a support (12) adapted to be bound to the first profile P1;
- a stem (14) adapted to be coupled to the support (12);
- a clamping flange (16) which comprises a base portion (46) and is adapted to be bound below the stem (14) and above the second profile P2;

and by the fact that the support (12) comprises first fixing means (20, 34, 35) and the stem (14) comprises second fixing means (36, 40, 41) so that the first fixing means (20, 34, 35) can be coupled to the second fixing means (36, 40, 41) in variable positions so as to vary the overall height of the spacer (10) as well as to choose and set the height according to the thickness of the insulating material.

2. Spacer (10) according to the preceding claim, wherein the support (12) comprises a cylindrical body (20) in which a hole (32) is formed superiorly and at least two side seats (34, 35) are formed laterally and are arranged at different heights of the cylindrical body (20), and wherein the stem (14) comprises an elongated portion (36) from which at least one tooth (40,41) protrudes laterally and has a homologous shape to the at least two side seats (34, 35), so that the elongated portion (36) can be inserted into the

hole (32) and the at least one tooth (40, 41) can be inserted into one of the at least two side seats (34, 35).

direction of rotation of the clamping flange (16) for its coupling with the stem (14).

3. Spacer (10) according to one of the preceding claims, wherein the support (12) comprises a base (18) in which a first lateral hollow (22) and a second lateral hollow (24) are formed on opposite portions of the base (18) and are adapted to receive free ends of the first C-shaped profile P1 so as to lock the support (12) to the first profile P1. 5
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4. Spacer (10) according to one of the preceding claims, wherein the support (12) comprises at least one first wing (26, 28) in which a through hole (30) is formed. 15
5. Spacer (10) according to one of the preceding claims, wherein the stem (14) comprises a tip (38) with at least one arched face on which first knurls (42) are formed and wherein a central hole (50) is formed in the clamping flange (16), second knurls (56) being formed in the inner surface of said central hole, in correspondence of an angular portion, so that when the tip (38) is inserted in the central hole (50), the first knurls (42) and the second knurls (56) interfere with each other so as to clamp the clamping flange (16) to the stem (14). 20
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6. Spacer (10) according to the preceding claim, wherein the tip (38) of the stem (14) is rounded. 30
7. Spacer (10) according to the preceding claim, wherein at least one vertical relief (68) protrudes in the central hole (50) and wherein at least one tongue (44) protrudes from the tip (38) so that at a given rotation of the clamping flange (16), the at least one relief (68) is blocked by the at least one tongue (44) preventing the clamping flange (16) from rotating in the opposite direction. 35
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8. Spacer (10) according to one of the preceding claims, wherein the locking flange (16) comprises a disc (58) placed closed to the base portion (46), so as to form an annular seat (60) between the disc (58) and the same base portion (46), and wherein the disc (58) is reduced on two opposite sides conforming with two side edges (62), in correspondence of which the annular seat (60) is also reduced in depth. 45
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9. Spacer (10) according to one of the preceding claims, wherein the clamping flange (16) comprises at least one gripping lug (48) adapted to facilitate the gripping of the clamping flange (16) by a user. 55
10. Spacer (10) according to one of the preceding claims, wherein at least one arrow-shaped opening (66) is formed in the base portion (46) to indicate the

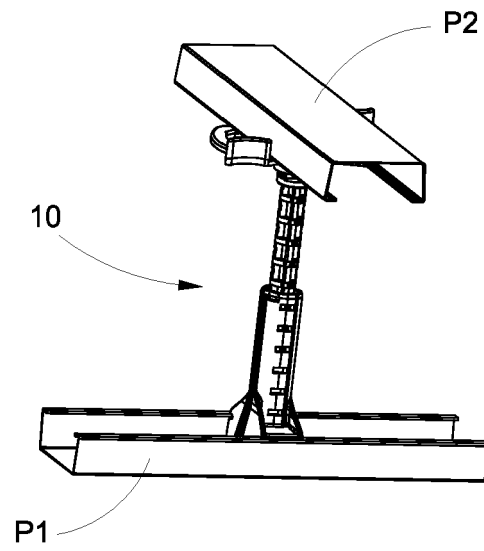


Fig. 1

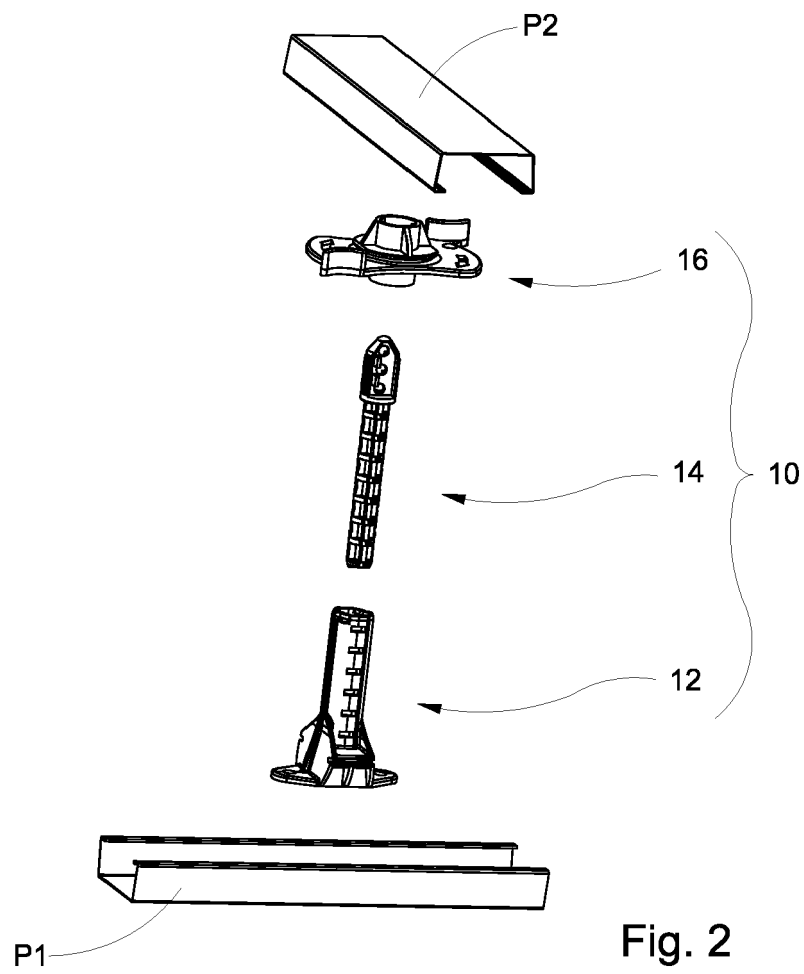


Fig. 2

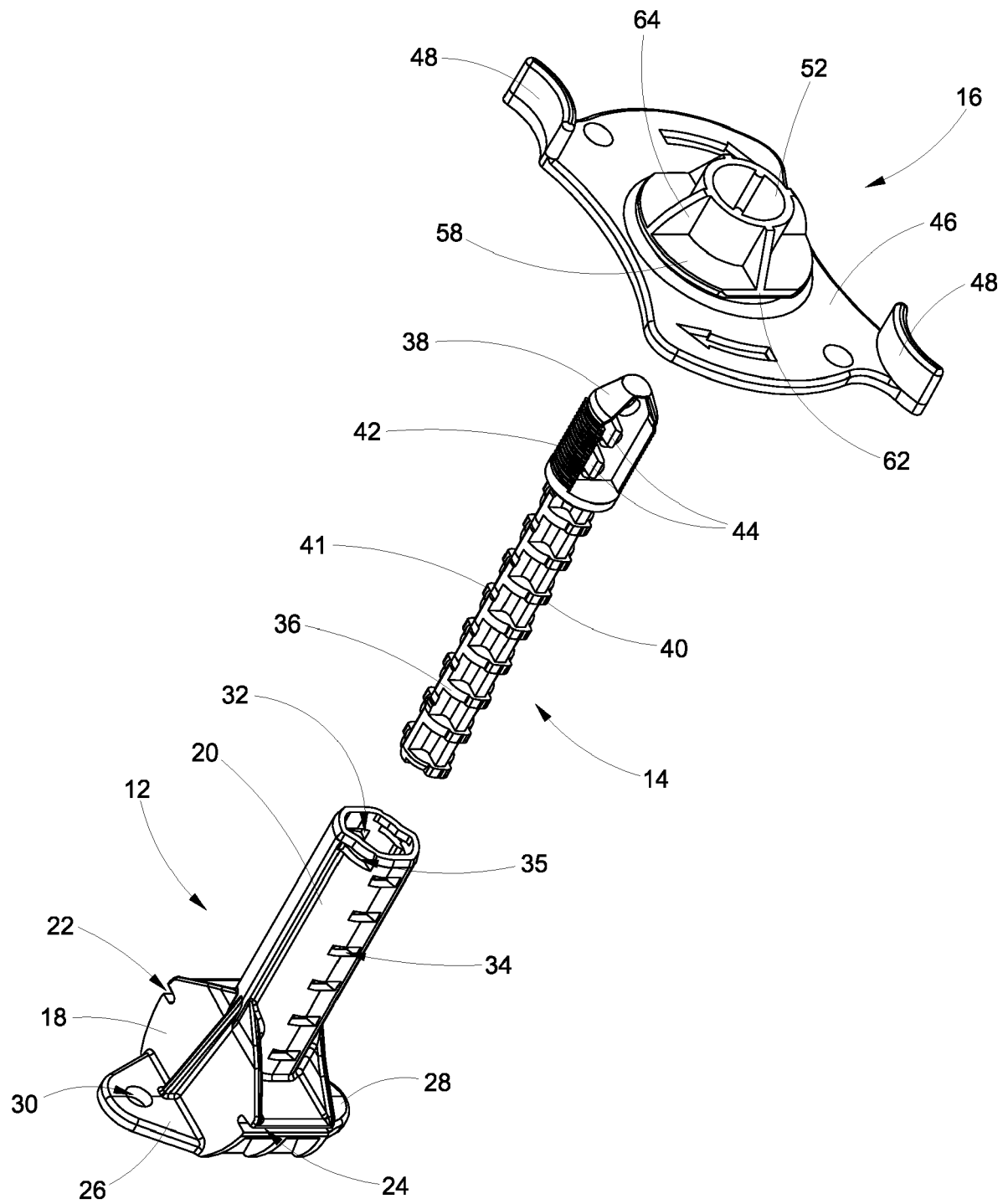


Fig. 4

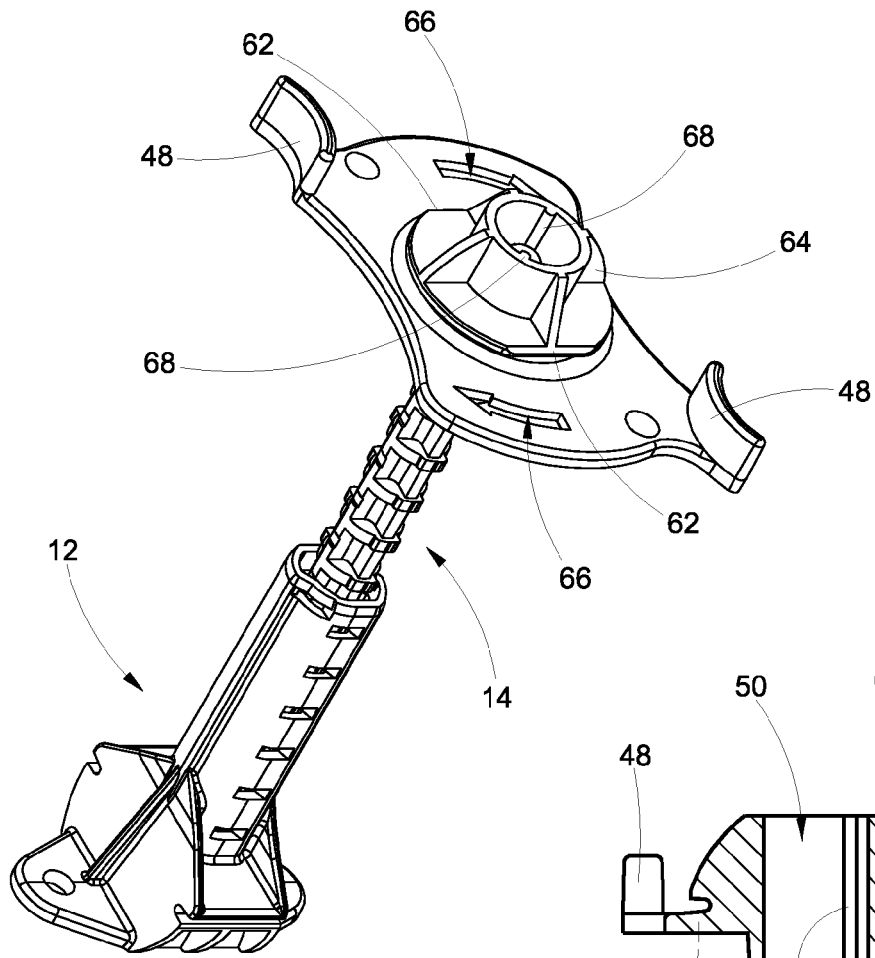


Fig. 3

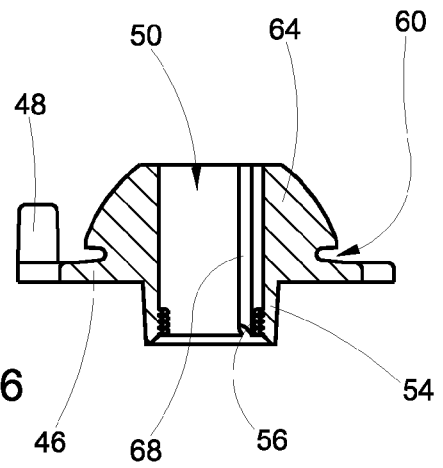


Fig. 6

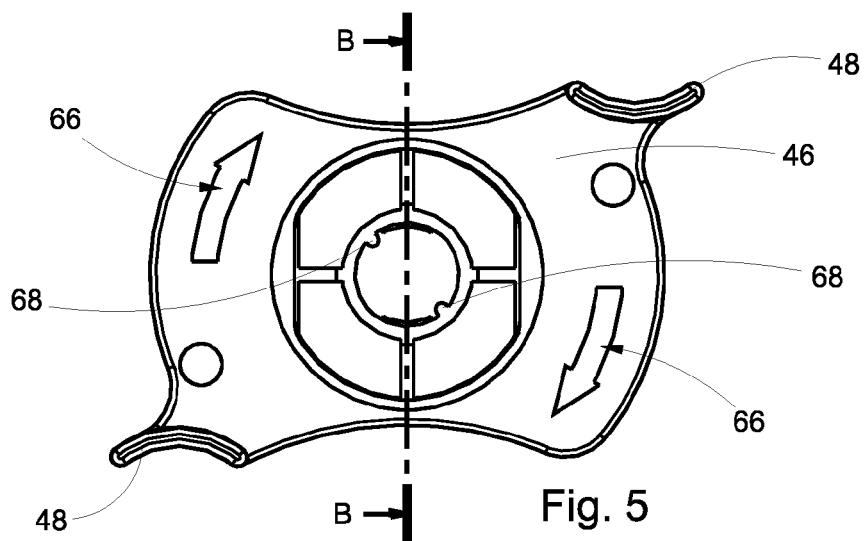


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 20 20 2526

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DOCUMENTS CONSIDERED TO BE RELEVANT			
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			TECHNICAL FIELDS SEARCHED (IPC)
			E04F E04B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 November 2020	Examiner Dieterle, Sibille
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 20 20 2526

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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