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(54) WIDTH-ADJUSTABLE GUIDE FOR SLIDING DOORS

IN DER BREITE VERSTELLBARE FÜHRUNG FÜR SCHIEBETÜREN

DISPOSITIF DE GUIDAGE A LARGEUR REGLABLE POUR PORTES COULISSANTES

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EP 2 976 483 B1

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Description

[0001] The present invention relates to a width-adjustable guide for sliding doors.

[0002] More specifically, the present invention relates to a guide to be attached to the floor, destined to prevent oscillation during the sliding of hanging doors.

[0003] It is known that the sliding doors typically used to seal off or to permit access to a room are provided at the base with a longitudinally extending milling in which a guide fixed to the floor is positioned. Such guide has the purpose of preventing the door from "waving", that is to say, oscillating in an orthogonal direction to the direction of sliding during opening or closing.

[0004] The guides of the known type are made of rigid plastic material and are formed of a flap extending vertically from the base attached to the floor the flap projects into the milling created along the rim of the base of the door and has a dimension in width such as to prevent both transversal oscillations of said door and its excessive braking in sliding. To improve the sliding of the system, sometimes an aluminium profile is inserted in the milling of the door; thereby guaranteeing a precise width of the seat in which the flap of the guide slides, and, at the same time, overcoming the drawback caused by the roughness of the walls of said milling. This solution is expensive however, given the need to provide the aluminium profile, as well as labour-intensive for the insertion and stabilisation of said profile in the milling. In any case, such solution does not permit any adjustment of the guide, which may become worn over time giving rise to clearance leading to the door oscillating in a transversal direction.

[0005] To overcome such drawback adjustable guides have been conceived of, having the purpose of adapting better to the width of the millings present at the bottom of the door. A first solution of this type provides for making a guide formed of a base, to be attached to the floor, and of two walls extending centrally upwards from said base and slightly distanced from each other. Between the two walls, presenting two tendentially convex respective outer surfaces, a dowel is placed which acts as a wedge screwing into a conical hole. By screwing the dowel more or less between the two walls the divarication between them is determined, so as to achieve the desired interference with the milling of the door. This adjustment is limited however to the area which the dowel is placed in; the two opposite walls in fact only warp in localised points, so that when the door is adjusted in height, the clearance may repeat itself.

[0006] Globally this is a solution in which width-adjustment proves complex and the friction exercised by the door on points of the guide walls may over time determine the localised wear of the walls themselves.

[0007] EP 0675252 discloses a guide for sliding doors in which two vertical moulded walls are present on the opposite outer sides, offset from each other. In this case, the initial maximum width of the two walls is greater than

that of the milling created in the door and the clearance will thus be reduced to a minimum, if not completely annulled.

[0008] On the other hand, in the presence of a too narrow a milling the door has difficulty sliding, in that the guide is forced in the milling, while if the milling is too wide the excessive clearance cannot be recuperated.

[0009] Further solutions of floor guides for sliding doors are disclosed in EP 1394347, which provide for the use of one or more opposite flexible elements having a convex surface. In one embodiment a single bodied element is provided having an ovoidal cross-section, the opposite walls of which brush along the milling during the sliding of the door.

[0010] This type of solution however does not permit adjustments to recuperate or reduce the clearances.

[0011] The purpose of the present invention is to overcome the drawbacks complained of above.

[0012] The European patent EP 2 085 551, which discloses the features of the preamble of claim 1, also relates to a guide device for sliding doors. According to this solution, a screw adjusts the radial exposition of two opposite tongues, which by sliding in a seat create friction. The tongues however abut with the vertical walls opposite the sliding seat in one point only, or in any case, along an area very limited in height.

[0013] The tongues, in other areas, may flex and the clearances or oscillations of the sliding door are therefore not excluded. In the same way, the solution disclosed in DE 198 56 618 comprises a screw which pushes an elastic element and makes it expand in the central area thereof; the friction is thus limited, in this hypothesis too, to an area very limited in height.

[0014] More specifically, the purpose of the present invention is to provide a guide for hanging sliding doors which makes it easy to achieve a precise adjustment in proportion to the width of the milling created on said door.

[0015] A further purpose of the invention is to provide a guide for sliding doors suitable to realize a width adjustment which extends along the entire height of the milling of the door.

[0016] A no less important purpose of the invention is to provide a guide for sliding doors in which the possibility of width adjustment is particularly ample so as to adapt without modifications to millings of various widths.

[0017] A further purpose of the invention is to make available to users a guide for sliding doors suitable for ensuring a high level of resistance and reliability over time, in addition such as to be easy and economical to produce.

[0018] These and other purposes are achieved by the width-adjustable guide for sliding doors of the present invention, according to the main claim.

[0019] The construction and functional characteristics of the width-adjustable guide for sliding doors of the present invention will be more clearly comprehensible from the description below in which reference is made to the appended drawings which show a preferred and non-

limiting embodiment and wherein:

figure 1 schematically shows, in a perspective view, the width-adjustable guide for sliding doors of the present invention;

figure 2 schematically shows, in a perspective view, the width-adjustment element used with said guide;

figure 3 schematically shows a partial longitudinal cross-section of the same assembled guide in its respective components;

figure 4 schematically shows, in a perspective view, the adjustable guide in an operating condition and in the position defining the least width;

figure 5 shows, in a partial cross-section view from above, the same guide as in figure 4;

figure 6 schematically shows, in a perspective view, the adjustable guide in an operating condition and in the position defining the greatest width;

figure 7 shows, in a partial cross-section view from above, the same guide as in figure 6.

[0020] With initial reference to figure 1, the width-adjustable guide for sliding doors of the present invention, globally denoted by reference numeral 10, comprises a rectangular base 12 provided with slotted holes 14 for its attachment to the floor; said holes are made along the longitudinal axis of the base 12 next to the opposite shorter sides. According to the invention, in the area comprised between said holes a through aperture 16, advantageously of a rectangular shape, is made on said base 12, the longer sides of which are directed parallel to the opposite longer sides of said base 12. The through aperture 16 is aligned along the longitudinal axis of the base 12 and is partially delimited by a moulded structure 18 extending vertically with a tendentially U-shaped cross-section turned on one side which defines a mouth 18' on a side facing one of the holes 14.

[0021] The opposite faces 19, 19' of the moulded structure 18 define a slightly convex quadrangular surface.

[0022] Between the mouth 18' of the moulded structure 18 and one of the holes 14 facing it a turret 20 extends vertically, having a quadrangular cross-section, of a height preferably equal to that of the structure 18. The base 12, the moulded structure 18 and the turret 20 are made in a single body in any suitable material such as plastic, acetal resins or equivalent. The turret 20 is provided with a threaded through hole 22, which extends parallel to the base 12 in alignment with the longitudinal axis thereof. A dowel 24 is screwed into the threaded hole 22.

[0023] Starting from the lower front of the base 12, a wedge-shaped element 26 destined to be housed inside the moulded structure 18 is placed in the through aperture 16, in which it is inserted to a greater or lesser extent depending on the thrust it receives from the dowel 24, as described in detail below.

[0024] The wedge-shaped element 26, equally made of material such as plastic, acetal resins or other suitable

material defines a rectangular-shaped base 28 from which an integral prismatic body 30 extends orthogonally and centrally; the transversal cross-section of said latter is in the shape of an isosceles trapezium and, at one end, a quadrangular shape. The upper end opposite the base 28 of the prismatic body 30 of the wedge-shaped element 26 presents, on opposite sides extending along the longer sides of the base 28 a sloping projection 32 which determines respective undercuts 34, 34'. On the vertical wall destined to face opposite the turret 20, the wedge-shaped element 26 presents a blind hole 36 formed at a height such as to align itself with the dowel 24 inserted in the hole 22 of the turret 20. The base 28 of the wedge-shaped element 26 has a smaller extension, both in width and in height, than the through aperture 16 of the base 12 of the adjustable guide 10; the moulded structure 18, at the mouth 18' is provided with opposite recesses which form, near the upper end, as many support planes 38. Said planes are made on the inner side of each of the opposite faces 19, 19', below the upper rim thereof.

[0025] During the assembly phase, the wedge-shaped element 26 is inserted from underneath, beforehand, in the through aperture 16 of the base 12 of the adjustable guide 10, with the upper part of said wedge-shaped element 26, comprising the opposite sloping projections 32, facing upwards. The prismatic body 30 of the wedge-shaped element 26 is driven to position itself in the cavity, indicated by reference numeral 21, comprised between the opposite faces 19, 19' of the moulded structure 18 until it surmounts the support planes 38 with its opposite sloping projections 32.

[0026] The cavity delimited by the opposite faces 19, 19' of the moulded structure 18 presents, in the mouth area 18', a lesser width than the maximum length of the upper part of the wedge-shaped element 26, so that said faces 19, 19' open elastically outwards to permit the sloping projections 32 to reach the support planes 38 and position themselves thereon. This way the wedge-shaped element 26 remains hanging on the moulded structure 18. At this point, the dowel placed in the threaded hole 22 of the turret 20 is screwed so that its front end abuts in the blind hole 36 of the wedge-shaped element 26. The guide 10 may, at this point, be attached to the floor with suitable retention means inserted in the slotted holes 14 of its base 12. The moulded structure 18 and the turret 20 are destined to position themselves in the milling formed along the lower rim of the sliding door. The dimension in width of the turret 20 is less than that of the milling referred to; originally, that is to say at the moment of assembly of the sliding door, the maximum width of the moulded structure 18 is also less than that of the milling created in the sliding door. The adjustment of the guide 10 is performed immediately afterwards, by simply acting on the dowel 24. Examples of adjustment are illustrated in figures 4 to 7. In particular, in figures 4 and 5 the wedge-shaped element 26 is in the maximum rearward position from the cavity comprised between the opposite faces 19, 19' of the moulded structure 18. By

screwing the dowel 24 into the threaded hole 22, a thrust is exercised, by the front end of said dowel placed in the hole 36, on the wedge-shaped element which consequently advances between said faces 19 and 19'. Due to the wedge-shaped structure of the element 26, the faces 19, 19' expand outwards, abutting in a more or less marked manner the opposite vertical walls of the milling of the sliding door.

[0027] Figures 6 and 7 show the condition in which the wedge-shaped element finds itself in the situation of maximum advancement between the faces 19, 19' of the moulded structure 18 and said faces are consequently at maximum expansion.

[0028] It is to be emphasised that the expansion or bulging of the faces 19, 19' is not limited to one or a few points, but affects a broad band for the entire height of said faces, due to the conformation of the wedge-shaped element.

[0029] The latter also works towards such expansion in the upper end part, by means of the sloping projections 32 which mimic the wedge pattern of the prismatic body 30.

[0030] This way it is possible to achieve an extremely precise regulation as regards the interference between the moulded structure 18 and milling of the sliding door preventing both forcing in the sliding, and overly reduced friction. Moreover, the adjustment is not affected by the positioning in height of the door given that the bulging of the opposite faces 19, 19' of the moulded structure 18 extends evenly for the entire height of said faces.

[0031] The possibility of expanding in a variable measure the faces 19, 19' of the moulded structure 18 makes it possible to use the guide according to the present invention on doors with millings of various widths within a range of several millimetres.

[0032] Despite the invention having been described above with particular reference to one of its embodiments, given solely by way of a non-limiting example, numerous modifications and variants will appear evident to a person skilled in the art in the light of the above description. The present invention therefore sets out to embrace all the modifications and variants which fall within the scope of the following claims.

Claims

1. An adjustable guide (10) to attach to the floor for hanging sliding doors, comprising a rectangular base (12) with holes (14) for attachment means to the floor, said base (12) presenting a through aperture (16) delimited in part by an integral moulded structure (18) extending vertically with a substantially U-shaped cross-section on its side defining opposite faces (19-19') and, on a side facing one of said holes (14), an access mouth (18') to a cavity (21) comprised between the opposite faces (19, 19') and in which a wedge-shaped element (26) is housed,

characterised in that said holes (14) are slotted holes, **in that** said wedge-shaped element (26) can be pushed into said cavity by a dowel (24) to expand said faces (19-19') progressively outwards, and **in that** said guide (10) further comprises a quadrangular cross-section turret (20), integrally made with said base (12) and positioned between said mouth (18') and one of the holes (14), said turret (20) being provided with a threaded through hole (22) extending parallel to said base, into which said dowel 24 is screwed.

2. The adjustable guide according to claim 1, **characterised in that** said wedge-shaped element (26) comprises a base (28) from which an integral prismatic body (30) extends orthogonally in a central position having a transversal cross-section in the shape of an isosceles trapezium and, at one end, with a quadrangular shape cross-section.
3. The adjustable guide according to claim 2, **characterised in that** the upper end opposite the base (28) of the prismatic body (30) has, on opposite sides extending at the longer sides of the base (28), a sloping projection (32) which forms respective undercuts (34), (34').
4. The adjustable guide according to claim 3, **characterised in that** the moulded structure (18) presents, at the mouth (18') and in a proximal position to the upper end, opposite recesses on the inner side of the faces (19, 19') which define as many support planes (38) for said sloping projections (32).
5. The adjustable guide according to claim 2, **characterised in that** the base (28) of the wedge-shaped element (26) is a rectangular shape with smaller dimensions in width and height than the through aperture (16) of the base (12).
6. The adjustable guide according to claim 1, **characterised in that** the through aperture (16) is a rectangular shape, with the longer sides parallel to the longer sides of the base (12) and is aligned along the longitudinal axis of said base.

Patentansprüche

1. Verstellbare Führung (10) zum Befestigen am Boden für hängende Schiebetüren, aufweisend eine rechteckige Basis (12) mit Löchern (14) für Befestigungsmittel am Boden, wobei die Basis (12) eine Durchgangsöffnung (16) bietet, die teilweise durch eine integral geformte Struktur (18) begrenzt ist, die sich vertikal erstreckt mit einem im Wesentlichen U-förmigen Querschnitt, der an den Seiten gegenüberliegende Flächen (19-19') definiert, und auf einer

Seite, die einem der Löcher (14) zugewandt ist, einen Zugangsmund (18') zu einer Kavität (21), die zwischen den gegenüberliegenden Flächen (19, 19') enthalten ist und in die ein keilförmiges Element (26) aufgenommen ist,

dadurch gekennzeichnet, dass die Löcher (14) Langlöcher sind, dass das keilförmige Element (26) durch einen Dübel (24) in die Kavität geschoben werden kann, um die Flächen (19-19') progressiv nach außen zu expandieren, und dadurch, dass die Führung (10) einen Turm (20) mit viereckigen Querschnitt aufweist, der integral mit der Basis (12) gebildet und zwischen dem Mund (18') und einem der Löcher (14) positioniert ist, wobei der Turm (22) mit einem sich parallel zur Basis erstreckenden Gewinde-Durchgangsloch (22) versehen ist, in das der Dübel (24) eingeschraubt ist.

2. Verstellbare Führung nach Anspruch 1, **dadurch gekennzeichnet, dass** das keilförmige Element (26) eine Basis (28) aufweist, von der sich ein integraler prismatischer Körper (30) in einer zentralen Position orthogonal erstreckt, der einen transversalen Querschnitt in Form eines gleichschenkligen Trapezes und an einem Ende einen viereckig geformten Querschnitt hat.
3. Verstellbare Führung nach Anspruch 2, **dadurch gekennzeichnet, dass** das der Basis (28) des prismatischen Körpers (30) gegenüberliegende obere Ende auf gegenüberliegenden Seiten, die sich an den längeren Seiten der Basis (28) erstrecken, einen geneigten Vorsprung (32) hat, der entsprechende Hinterschneidungen (34), (34') bildet.
4. Verstellbare Führung nach Anspruch 3, **dadurch gekennzeichnet, dass** die geformte Struktur (18) an dem Mund (18') und in einer zum oberen Ende benachbarten Position gegenüberliegende Aussparungen an der Innenseite der Flächen (19, 19') bietet, die ebenso viele Stützflächen (38) für die geneigten Vorsprünge (32) definieren.
5. Verstellbare Führung nach Anspruch 2, **dadurch gekennzeichnet, dass** die Basis (28) des keilförmigen Elements (26) eine rechteckige Form mit kleineren Dimensionen in Breite und Höhe als die Durchgangsöffnung (16) der Basis (12) ist.
6. Verstellbare Führung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Durchgangsöffnung (16) eine rechteckige Form mit den längeren Seiten parallel zu den längeren Seiten der Basis (12) und entlang der Längsachse der Basis ausgerichtet ist.

Revendications

1. Guide réglable (10) à fixer au sol pour des portes coulissantes suspendues, comprenant une base rectangulaire (12) avec des trous (14) pour des moyens de fixation au sol, ladite base (12) présentant une ouverture traversante (16) délimitée en partie par une structure moulée intégrale (18) s'étendant verticalement avec une section transversale sensiblement en forme de U sur son côté définissant des faces opposées (19-19') et, sur un côté orienté vers l'un desdits trous (14), une bouche d'accès (18') à une cavité (21) comprise entre les faces opposées (19, 19') et dans laquelle est logé un élément en forme de coin (26), **caractérisé en ce que** lesdits trous (14) sont des trous fendus, **en ce que** ledit élément en forme de coin (26) peut être poussé à l'intérieur de ladite cavité par un goujon (24) pour étendre lesdites faces (19-19') progressivement vers l'extérieur, et **en ce que** ledit guide (10) comprend en outre une tourelle de section transversale quadrangulaire (20), formée en une seule pièce avec ladite base (12) et positionnée entre ladite bouche (18') et un des trous (14), ladite tourelle (20) étant munie d'un trou traversant fileté (22) s'étendant parallèlement à ladite base, dans lequel ladite tourelle (24) est vissée.
2. Guide réglable selon la revendication 1, **caractérisé en ce que** ledit élément en forme de coin (26) comprend une base (28) à partir de laquelle un corps prismatique intégré (30) s'étend orthogonalement dans une position centrale ayant une section transversale de la forme d'un trapèze isocèle et, au niveau d'une extrémité, avec une section transversale de forme quadrangulaire.
3. Guide réglable selon la revendication 2, **caractérisé en ce que** l'extrémité supérieure opposée à la base (28) du corps prismatique (30) a, sur des côtés opposés s'étendant au niveau des côtés plus longs de la base (28), une saillie inclinée (32) qui forme des contre-dépouilles respectives (34), (34').
4. Guide réglable selon la revendication 3, **caractérisé en ce que** la structure moulée (18) présente, au niveau de la bouche (18') et dans une position proche de l'extrémité supérieure, des évidements opposés sur le côté interne des faces (19, 19') qui définissent autant de plans de support (38) pour lesdites saillies inclinées (32).
5. Guide réglable selon la revendication 2, **caractérisé en ce que** la base (28) de l'élément en forme de coin (26) est de forme rectangulaire avec des dimensions plus petites en largeur et en hauteur que l'ouverture traversante (16) de la base (12).

6. Guide réglable selon la revendication 1, **caractérisé en ce que** l'ouverture traversante (16) est de forme rectangulaire, avec les côtés plus longs parallèles aux côtés plus longs de la base (12) et elle est alignée le long de l'axe longitudinal de ladite base.

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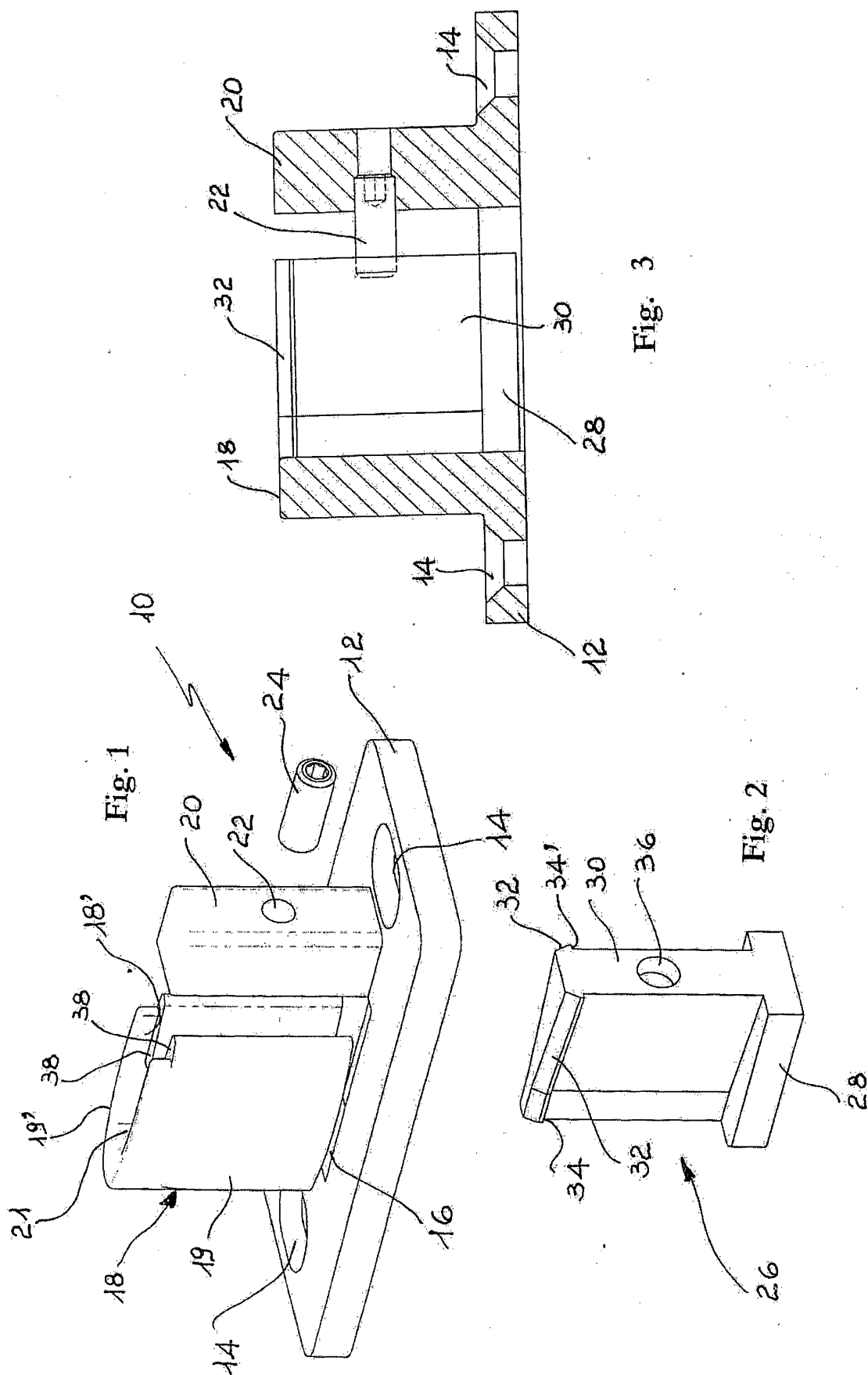
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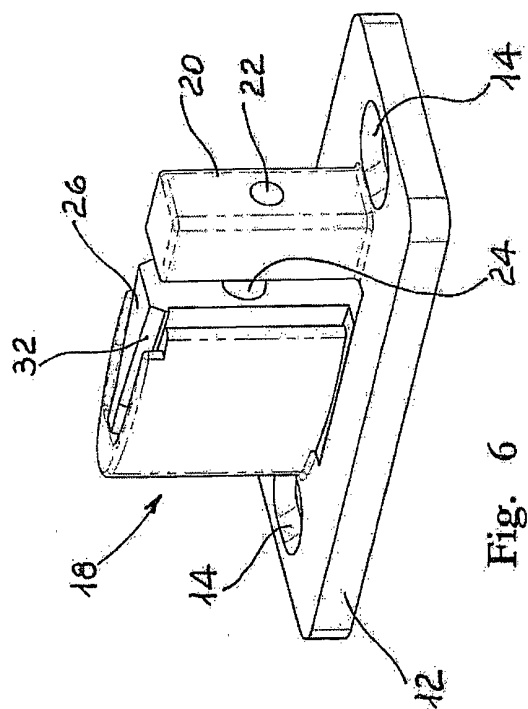


Fig. 6

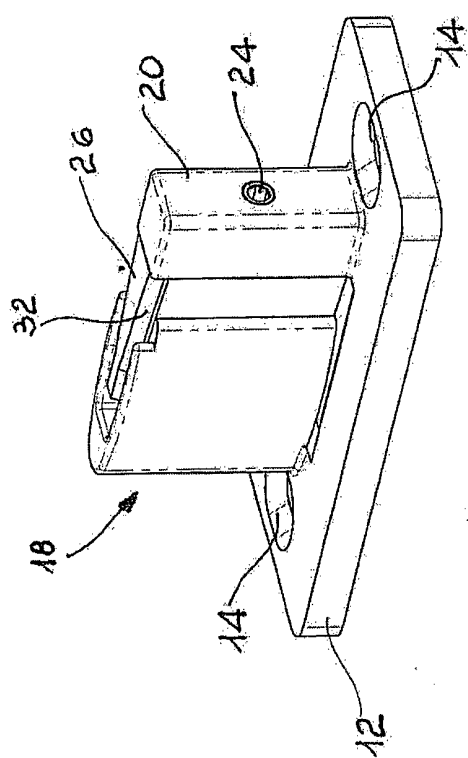


Fig. 4

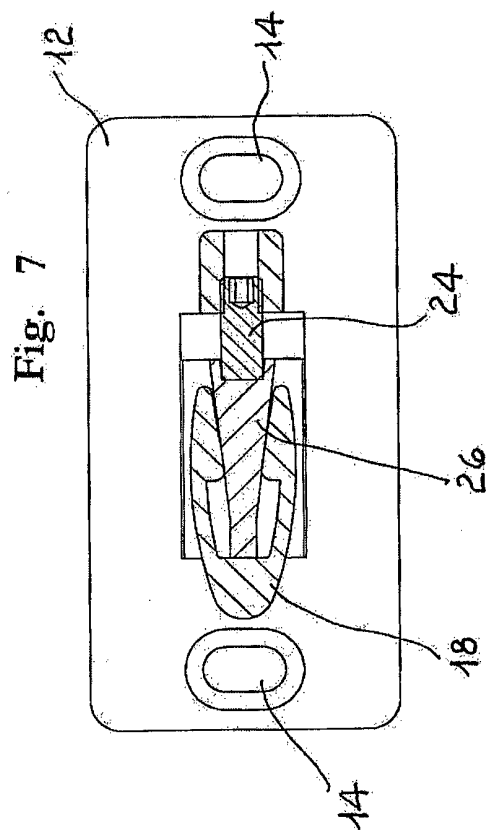


Fig. 7

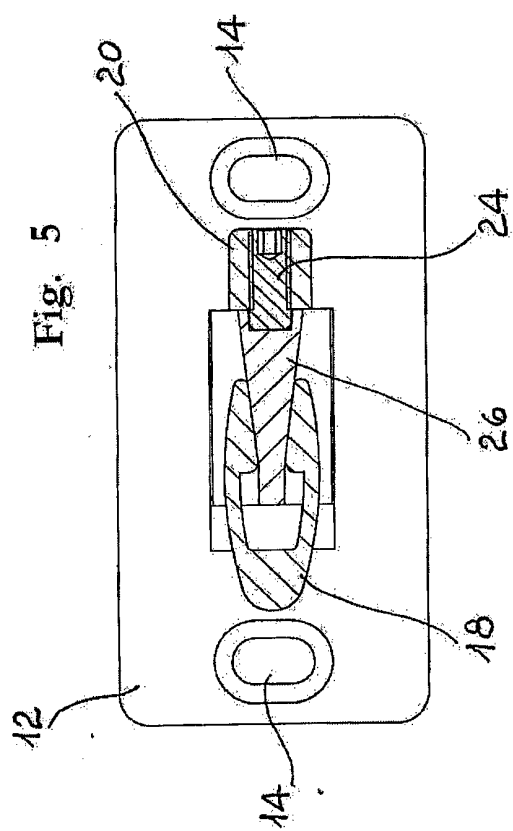


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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