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Description

Field of the Invention

[0001] The present invention relates to a hinge for a door leaf, a window and the like, which hinge has a pin comprising a holder for the door leaf, the window and the like, and a connecting part. The pin is connected to the connecting part, pivotally on its longitudinal axis.

Background Art

[0002] There are various types of known shower enclosures which prevent water from splashing outside the shower space. Examples of such installations are stationary partitions which partially enclose the shower, shower cabinets with hinge doors or sliding doors and doors mounted on the bathroom walls, which doors are in many cases foldable inwards and outwards so that space/floor space can be made available in the bathroom. Such doors frequently have a function which makes them rise somewhat from the bathroom floor when opened, see for example US 4 897 889 A.

[0003] An example of a known movable partition is a shower wall which can be rotated in two different directions (to the right or the left) from a "zero position" projecting essentially at right angles from the bathroom wall to positions where the outer end of the shower wall engages and rests against the bathroom wall. This makes space available when the shower wall is not in use in the retracted position and defines a smaller floor space.

[0004] Such a movable shower wall is often divided into a portion to be permanently mounted on the bathroom wall or a connecting shower wall, and a portion which is connected, foldably by a hinge, to the permanent portion or the connecting shower wall and which protrudes freely from the bathroom wall and connects, with its lower edge, sealingly to the bathroom floor, often by means of a sealing strip.

[0005] Where appropriate, especially in bathrooms in old houses where the walls and floor of the bathroom are frequently not perpendicular to each other and/or where the bathroom wall is uneven, the angle at which the shower wall protrudes from the bathroom wall may have to be adjusted relative to the floor and wall of the bathroom, so that a sealing connection is provided between the shower wall and the bathroom. The adjustment is often performed by the movable portion of the shower wall being rotated between fixed settings, for instance in steps of 22.5°, 45°, 90°, so that the "zero position"/use position of the shower wall is correctly set, i.e. essentially perpendicular to the bathroom wall. Then the shower wall is fixed in this use position.

[0006] The known movable shower wall can also be a door in two parts opening to the shower, i.e. two movable partitions mounted as a pair. The shower walls are in most known cases prefabricated to be hung to the left or right as the shower wall glass often has one type of sur-

face on the side facing inwards in the shower and another type of surface on the outside.

[0007] These prior-art installations for preventing splashing of water suffer from several drawbacks. The fixed shower walls and the shower cabinets require much work in mounting and constitute stationary obstacles that occupy floor space in the bathroom. Separate shower cabinets constituting a single unit standing on the bathroom floor are also difficult to mount and occupy floor space but are, above all, expensive in purchase price.

[0008] The movable inwards and outwards foldable shower walls are often difficult to mount if the bathroom wall is oblique, i.e. not perpendicular, and is more or less inclined relative to the plane of the bathroom floor and/or bulges or is uneven, which means that the shower wall is not perpendicular to the bathroom wall after mounting and therefore does not seal against the floor of the bathroom. This can imply that the correct use position of the shower wall can be between two fixed positions, thus making the subsequent adjustment of the shower wall angle to the "zero position"/use position difficult and demanding a great deal of work. The shower walls mounted as a pair are difficult to mount since they are heavy and unwieldy and are often made of glass, and their ends facing each other are often difficult to set in parallel and equidistantly and also sufficiently close to each other to prevent splashing between them, which means that mounting can only be performed by a specially trained fitter. Sometimes the respective shower walls also have an intermediate seal so that no water can leak out between them. They are also expensive in purchase price since two shower doors, one left hung and one right hung, must be provided.

Summary of the Invention

[0009] The main objects of the present invention are to provide a hinge for shower walls, which hinge and lifting function are continuously variable so that the angle of the shower walls away from the bathroom wall is easier to adjust in mounting, and also make the shower walls reversible, thus eliminating left-hung and right-hung constructions.

[0010] One object is achieved by providing a hinge according to the invention for a door leaf, a window and the like. The hinge has a pin, which comprises a holder for the door leaf, and a connecting part. The pin is connected to the connecting part, pivotally on its longitudinal axis. One end of the pin and a first carrier plate engage each other by cam surfaces, and the other end of the pin and a second carrier plate engage each other by cam surfaces. Means are arranged to lock the respective carrier plates to the connecting part and unlock the respective carrier plates from the connecting part so as to allow both a left- and a right-hung door leaf, window and the like. The inventive hinge gives the following advantages. It eliminates the need for both left-hung and right-hung shower walls since it is reversible and can be used in

both cases. The hinge facilitates mounting by means of the infinitely variable setting of its angle extending from the bathroom wall, said setting being effected with aid of the locking and unlocking means and giving a better final result.

Brief Description of the Drawings

[0011] The present invention will now be described in more detail with reference to the accompanying drawings, in which

Fig. 1 is a perspective view of a hinge according to the invention, which is not to scale in the longitudinal direction,

Fig. 2 is an exploded view in perspective of the hinge in Fig. 1 in a first embodiment,

Figs 3-7 are views and associated cross-sections A-A to E-E, illustrating the function of the hinge, and

Fig. 8 is a perspective view of the hinge with a wall attachment and a door leaf, shower pane or window.

Detailed Description of the Invention

[0012] A hinge 10 according to the invention for use with a door leaf 20, shower/partition walls, windows and the like is shown in Figs 1-8.

[0013] The hinge 10 according to the invention is shown assembled for use in Fig. 1 and in an exploded view in Fig. 2. The hinge 10 comprises a movable hinge pin 30 and a connecting part 56 which can be connected to an attachment 50 for permanent mounting on a bathroom wall (not shown). The hinge pin 30 has a first end 30a and a second end 30b and also a holder 40 for the door leaf 20 in the form of a longitudinal slot. The connecting part 56 has a first end 56a which partially encloses the pin 30 and a second end 56b to be connected to the wall attachment 50. The connecting part 56 has a third lower end 56c which encloses the first pin end 30a by means of a first guide 51 and a fourth upper end 56d which encloses the second pin end 30b by means of a second guide 54. The guides 51, 54 are designed to allow and guide a pivoting motion in the connecting part 56 for the pin on its longitudinal axis C when the door leaf 20 is rotated optionally to the right or to the left.

[0014] In the slot 40, i.e. the holder 40, the door leaf 20 is fitted (see Figs 3-8) and is held by frictional/clamping force in a squeezing grip and/or is glued, for instance by means of silicone which is introduced into the slot, after which the door leaf is inserted and held by adhesion.

[0015] The hinge 10 according to the invention is reversible, i.e. it can be used both for a door leaf 20 in a left hand version, i.e. being left-hung, which is asymmetrical, for instance with a bend to the right, and for a door leaf 20 in a right hand version, i.e. being right-hung, which is asymmetrical, for instance with a bend to the left. The hinge 10 can be turned upside-down from a first position which is shown in Fig. 1 where the lower guide 51 and

the first pin end 30a are directed downwards, to a second position where these components 51 and 30a are directed upwards, i.e. they change places with the guide 54, which is the upper guide in the first hinge position, and the upper pin end 30b. If a shower partition wall, shower cabinet or a window with a pair of door leaves/windows or partition walls 20, left hung and right hung, is to be assembled, identical hinges 10 according to the invention can be used for both door leaves/windows.

[0016] The guides 51 and 54 of the connecting part 56 are end pieces which each have a cup-like sleeve part 51a, 54a in moving engagement with the associated pin end 30a, 30b and guide the pin 30 in the vertical direction, i.e. in the longitudinal direction of the pin, and in the horizontal direction, i.e. sideways, and a part 51b, 54b which is detachably mounted on the connecting part 56 by fixing means and the shape of which largely conforms with the connecting part 56 and the inside of the mounting attachment 50. The fixing means for the guides 51, 54 in the form of screws are shown in Fig. 2.

[0017] The length of the pin 30 is adjusted so that a vertical play is achieved between the upper end guide 54 and the upper pin end 30b in Fig. 1 while at the same time the end guide 51, which is the lower end guide in Fig. 1, is in contact with the pin end 30a, which is the lower pin end in Fig. 1, and supports this pin end 30a vertically in the first position of the hinge 10. When the hinge is in its second position (not shown), instead the second guide 54 supports the second pin end 30b vertically.

[0018] The above-described play gives a clearance space in the vertical direction for the pin 30 in each position. When the hinge 10 is turned upside down, the pin 30 slides or is moved vertically so that instead the play is achieved between the pin end 30a, which previously was the lower pin end in the first hinge position, and the guide 51, which was the lower guide in the first hinge position. The clearance space serves to allow raising of the pin 30 in the vertical direction when pivoted with the door leaf 20 relative to the connecting part 56 and the wall attachment 50. This is illustrated in Figs 3-8 and the associated sections A-A to E-E which are cut along the entire length of the pin.

[0019] The connecting part 56, arranged between the pin 30 and the wall attachment 50, of the hinge 10 constitutes an angularly adjustable link between the wall attachment and the pin. The connecting part connects the pin in an adjustable manner to the mounting attachment 50, so that in the cases when a bathroom wall (not shown) is uneven and/or not perfectly vertical, i.e. is inclined towards or away from the bathroom floor, and wall and floor are not perpendicular, the hinge 10 can be set vertically at a desirable angle relative to the mounting attachment and also the wall and floor of the bathroom, essentially perpendicular to the bathroom floor, by moving, for instance, the upper or lower pin end 30a, 30b together with the upper or lower connecting part end 56a, 56b towards or away from the mounting attachment 50, before the

hinge 10 is finally locked in a detachable manner in this position by means of, for instance, self-drilling screws (not shown) in the fixed mounting attachment.

[0020] The mounting attachment 50, which is shown in Fig. 8, is largely U-shaped in cross-section, into which the connecting part 56 is inserted (shown inserted in Fig. 8) and then detachably fastened in the mounting attachment with the aid of fastening means (not shown), for instance self-drilling or self-threading screws.

[0021] Fig. 2 is an exploded view and shows most of the components included in the hinge 10 in more detail. The pin 30 furthest to the right in Fig. 2 has a substantially elongate, largely hollow cylindrical body, the lower pin end 30a comprising an end piece 31 and the upper pin end 30b comprising an end piece 32. The pin end pieces 31, 32 are identical plates and will below be referred to as pressure plates 31, 32 which are detachably fastened to the ends of the pin with the aid of fastening means, for instance self-threading screws, so that they accompany the pin 10 when pivoted on its longitudinal axis C. The door leaf 20 is distinctly shown in Figs 3-8.

[0022] Fig. 2 shows the elongate connecting part 56 and the pin 30. The connecting part end 56a is designed to match the rounding, i.e. the diameter, of the pin and partially encloses the circumference of the pin. The end 56b of the connecting part 56 is substantially square/rectangular in cross-section with a width that is smaller than the inner width of the mounting attachment 50, i.e. the inner width of the U, so that the end 56b can be inserted into the same. The distance along which the connecting part 56 is inserted into the mounting attachment 50 is determined by its projecting length perpendicular to the extent of the mounting attachment and the inclination of the bathroom wall (not shown). The connecting part end 56b must have a sufficiently inserted length left in the mounting attachment after a possible compensation for the inclination of the bathroom wall, so as to ensure steady/safe mounting of the hinge 10 on the mounting attachment 50.

[0023] The end 56b of the connecting part 56 is also formed with a longitudinal slot 57. The slot 57 has essentially the same function as the slot 40 in the pin 30, i.e. it can hold one end of a partition wall, door, window and the like (not shown), whose other end is inserted into a longitudinal slot at an end of a second connecting part (not shown) according to a second embodiment of the invention. In the first embodiment, the first connecting part 56 is connected directly to the mounting attachment 50. In a second embodiment (not shown), the pin 30 is fixed to the first connecting part end 56a while one end of a shower wall (not shown) is inserted into the slot 57 at the second connecting part end 56b and the other shower wall end (not shown) is in turn inserted into the slot at the first end of the intermediate second connecting part (not shown), whose second end resembles the end 56b and is inserted into the U section of the mounting attachment 50 similarly to the first connecting part 56 and is fastened by means of screws (not shown) in the mount-

ing attachment.

[0024] Fig. 2 shows the pressure plates 31, 32 and the carrier plates 52, 53. The plates 31, 32, 52, 53 are circular, and each pressure plate 31, 32 has one side 31a, 32a facing away from the pin 30 and having a cam surface with two recesses 33, which match and engage a cam surface facing the pin 30 and having two complementary lugs 55 on one side 52a, 53a of the respective carrier plates 52, 53. One or more than two recesses 33 and lugs 55, respectively, can be used. The other sides 52b, 53b of the carrier plates facing the respective guides 51, 54 are flat and even.

[0025] Each pressure plate 31, 32 is arranged with a flange 34 extending along the edge and intended to engage and rest against the associated pin end 30a, 30b. The flange 34 has the same outer diameter as the pin 30. The other sides 31b, 32b of the pressure plates 31, 32, facing the pin, are each formed with a guide in the form of a raised edge 35 which extends in the longitudinal direction of the pin to be fitted into the respective pin ends. When fastening the pressure plates 31, 32, each guiding edge 35 is inserted into the associated pin end until the flange 34 comes into contact with the outer edge of the associated pin end and stops/supports/engages the same, after which the screws are passed through holes in the respective pressure plates 31, 32 and screwed into integrated fixing points in the pin. Also the guides 51, 54 have raised guiding edges on their fixing parts 51b, 54b to be inserted into the associated connecting part end 56a, 56b similarly to the pressure plates.

[0026] The pin 30, the first connecting part 56, the second connecting part (not shown) and the mounting attachment 50 are in this embodiment made by continuous casting or extrusion according to prior-art technique in a suitable, preferably corrosion-resistant material and are easily formed with a cross-section that has integrated fixing points for screws, integrated slots 40, 57 and grooves for seals. In this embodiment, a brush seal (not shown), is inserted into a longitudinal groove 58 at the connecting part end 56a between this and the pin 30, so that no water can leak out between them. The connecting part 56 can be formed with more than one groove 58 and, consequently, have a plurality of juxtaposed brush seals in order to promote sealing. The pin 30 could be a solid cylinder and also be arranged with integrated cam surfaces at each pin end and a different cross-section, for instance oval or square, hexagonal or octagonal.

[0027] The guides 51, 54 are provided with one or more means 60 in the form of a threaded pin, in this embodiment a stop screw 60 for selective/optional holding of the carrier plates 52, 53. The stop screw 60 is screwed into a threaded horizontal hole 61 in the guide sleeve parts 51a, 54a.

[0028] The stop screws 60 serve to lock and unlock the carrier plates 52, 53. When mounting the hinge 10 in the first position (Figs 1, 2), the pin 30 is pivoted by means of the door leaf 20 and the pressure and carrier plates 31, 32, 52, 53 follow the pivoting motion of the pin on the

longitudinal axis C until the fitter finds a suitable angle for the door leaf relative to the connecting part 56 and, thus, the mounting attachment 50 and the bathroom (not shown). The fitter then screws the stop screws 60 into engagement with the lower carrier plate 52 in the guide 51 and locks the carrier plate 52 in this first use position.

[0029] When mounting the hinge 10 in the second use position (not shown), the fitter instead screws the stop screws 60 into engagement with the carrier plate 53 in the guide 54 and locks the carrier plate 53.

[0030] If the hinge 10 is first mounted in its first position with a left-hung door leaf 20, but then is to be moved to its second position (not shown), where it is instead right hung, the stop screws 60 are unscrewed and unlock the carrier plate 52 from the guide 51 of the connecting part, the hinge is turned upside down and moved from the left to the right and is set in the correct position in the mounting attachment 50 and fastened thereto, the door leaf is rotated to the desired projecting angle relative to the connecting part and the bathroom wall (not shown) and the stop screws are screwed in to lock the carrier plate 53.

[0031] Figs 3-7 (A-A to E-E) show in steps of 10° how the hinge 10 functions in its first position when the door leaf 20 and the pin 30 are continuously rotated to the right from their "zero position" defined as an angle of 0° (Fig. 3, A-A) up to an angle of 40° relative to the "zero position" (Fig. 7, E-E). The door leaf can also be rotated to the left when the pressure and carrier plates 31, 32, 52, 53 are symmetrically designed. The lower carrier plate 52 is locked against rotation by means of the stop screw 60 and does not accompany the pivoting motion of the pin while the upper carrier plate 53 is unlocked and, lying loose, accompanies the pivoting motion of the pin.

[0032] Figs 3-7 illustrate a straight door leaf 20, but it may also be curved/profiled in cross-section to be left- or right-hung, or it may have one type of surface facing the shower and another type of surface facing outwards.

[0033] When the door leaf 20 is rotated from the "zero position" (Fig. 3, A-A) to the position in Fig. 4 (B-B), the pin 30 begins to slide towards the cam surface 55 of the carrier plate 52 by means of the cam surface 33 of the pressure plate 31 and is moved up on the cam surface 55. At the same time the pin is raised in the vertical direction along its longitudinal axis C and moves its pressure plate 31 more and more out of engagement with the carrier plate 52 until the pressure plate 31 has been completely disengaged from the carrier plate and "stands" / rests upon the same (Fig. 7, E-E).

[0034] Cover plates 62 (Figs 1, 2) have an aesthetic and sealing function. They cover the screw heads of the guides 51, 54 and can be displaced to cover the cavity shown in Fig. 8 at the rear edge of the mounting attachment 50, thus preventing water from penetrating from above and from below into the hinge 10. The cover plates are detachably connected to the guides 51, 54 by means of profiled longitudinal edges which are inserted into grooves in the respective guides 51, 54 like tongues and

grooves, but can also be screwed or snapped on, which a person skilled in the art understands.

5 Claims

1. A hinge (10) for a door leaf (20), a window and the like, which hinge has a pin (30) comprising a holder (40) for the door leaf, the window and the like, and a connecting part (56), said pin being connected to the connecting part, pivotally on its longitudinal axis (C),
characterised in that one end (30a) of the pin (30) and a first carrier plate (52) engage each other by cam surfaces (33, 55),
the other end (30b) of the pin (30) and a second carrier plate (53) engage each other by cam surfaces (33, 55), and
means (60) are arranged to lock the respective carrier plates (52, 53) to the connecting part (56) and unlock the respective carrier plates from the connecting part so as to allow both a left- and a right-hung door leaf, window and the like.
2. A hinge (10) as claimed in claim 1, wherein each carrier plate (52, 53) is placed in a guide (51, 54) on the connecting part (56) to guide the pivoting motion of the pin (30), said guide comprising the means (60) for locking and unlocking the respective carrier plates.
3. A hinge (10) as claimed in claim 2, wherein the ends (30a, 30b) of the pin (30) each comprise a pressure plate (31, 32) which engages the associated carrier plate (52, 53) by the cam surfaces (33, 55), which pressure plates are adapted to hold the door leaf (20), the window and the like in the longitudinal direction.
4. A hinge (10) as claimed in any one of the preceding claims, wherein the holder (40) for the door leaf (20), the window and the like is a slot extending along the pin (30).
5. A hinge (10) as claimed in any one of the preceding claims, wherein the connecting part (56) is adapted to adjustably and detachably connect the pin (30) to a mounting attachment (50).
6. A hinge (10) as claimed in any one of the preceding claims, wherein the means (60) for locking and unlocking the respective carrier plates (52, 53) comprise at least one screw which extends through the respective guides (51, 54) for engaging the respective carrier plates.

Patentansprüche

1. Scharnier (10) für ein Türblatt (20), ein Fenster und dergleichen, wobei das Scharnier einen Bolzen (30) aufweist, der einen Halter (40) für das Türblatt, das Fenster und dergleichen sowie einen Verbindungsteil (56) umfasst, wobei der Bolzen mit dem Verbindungsteil schwenkbar an seiner Längsachse (C) verbunden ist,
dadurch gekennzeichnet, dass ein Ende (30a) des Bolzens (30) und eine erste Trägerplatte (52) einander über Nockenflächen (33, 55) in Eingriff nehmen, dass das andere Ende (30b) des Bolzens (30) und eine zweite Trägerplatte (53) einander über Nockenflächen (33, 55) in Eingriff nehmen, und dass Mittel (60) zum Verriegeln der jeweiligen Trägerplatten (52, 53) mit dem Verbindungsteil (56) und zum Lösen der jeweiligen Trägerplatten von dem Verbindungsteil angeordnet sind, um sowohl ein links angeschlagenes als auch ein rechts angeschlagenes Türblatt, Fenster und dergleichen zu ermöglichen.

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2. Scharnier (10) nach Anspruch 1, wobei jede Trägerplatte (52, 53) in einer Führung (51, 54) an dem Verbindungsteil (56) angeordnet ist, um die Schwenkbewegung des Bolzens (30) zu führen, wobei die Führung die Mittel (60) zum Verriegeln und Lösen der jeweiligen Trägerplatten umfasst.

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3. Scharnier (10) nach Anspruch 2, wobei die Enden (30a, 30b) des Bolzens (30) jeweils eine Druckplatte (31, 32) aufweisen, die die zugehörige Trägerplatte (52, 53) über die Nockenflächen (33, 55) in Eingriff nimmt, wobei die Druckplatten dafür ausgelegt sind, das Türblatt (20), das Fenster und dergleichen in der Längsrichtung zu halten.

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4. Scharnier (10) nach einem der vorangehenden Ansprüche, wobei der Halter (40) für das Türblatt (20), das Fenster und dergleichen ein Schlitz ist, der sich entlang des Bolzens (30) erstreckt.

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5. Scharnier (10) nach einem der vorangehenden Ansprüche, wobei das Verbindungsteil (56) dafür ausgelegt ist, den Bolzen (30) verstellbar und abnehmbar mit einer Montagehalterung (50) zu verbinden.

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6. Scharnier (10) nach einem der vorangehenden Ansprüche, wobei die Mittel (60) zum Verriegeln und Lösen der jeweiligen Trägerplatten (52, 53) mindestens eine Schraube umfassen, die sich durch die jeweiligen Führungen (51, 54) erstrecken, um die jeweiligen Trägerplatten in Eingriff zu nehmen.

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Revendications

1. Charnière (10) destinée à un battant de porte (20), une fenêtre et similaire, laquelle charnière comporte une broche (30) comprenant un support (40) destiné au battant de porte, à la fenêtre et similaire, et une pièce de raccordement (56), ladite broche étant raccordée à la pièce de raccordement, de manière pivotante sur son axe longitudinal (C),
caractérisée en ce que une extrémité (30a) de la broche (30) et une première plaque porteuse (52) viennent en prise l'une avec l'autre par des surfaces de cames (33, 55), l'autre extrémité (30b) de la broche (30) et une seconde plaque porteuse (53) viennent en prise l'une avec l'autre par des surfaces de cames (33, 55), et des moyens (60) sont agencés afin de verrouiller les plaques porteuses respectives (52, 53) à la pièce de raccordement (56) et de déverrouiller les plaques porteuses respectives de la pièce de raccordement, de manière à permettre un battant de porte, une fenêtre et similaire à la fois suspendus à gauche et suspendus à droite.

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2. Charnière (10) selon la revendication 1, dans laquelle chaque plaque porteuse (52, 53) est placée dans un guide (51, 54) sur la pièce de raccordement (56) afin de guider le mouvement de pivotement de la broche (30), ledit guide comprenant les moyens (60) pour verrouiller et déverrouiller les plaques porteuses respectives.

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3. Charnière (10) selon la revendication 2, dans laquelle les extrémités (30a, 30b) de la broche (30) comprennent chacune une plaque de pression (31, 32), laquelle vient en prise avec la plaque porteuse associée (52, 53) par les surfaces de cames (33, 55), lesquelles plaques de pression sont adaptées afin de tenir le battant de porte (20), la fenêtre et similaire dans la direction longitudinale.

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4. Charnière (10) selon une quelconque des revendications précédentes, dans laquelle le support (40) destiné au battant de porte (20), à la fenêtre et similaire est une fente s'étendant le long de la broche (30).

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5. Charnière (10) selon une quelconque des revendications précédentes, dans laquelle la pièce de raccordement (56) est adaptée afin de raccorder de manière ajustable et amovible la broche (30) à une fixation de montage (50).

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6. Charnière (10) selon une quelconque des revendications précédentes, dans laquelle les moyens (60) pour verrouiller et déverrouiller les plaques porteuses respectives (52, 53) comprennent au moins une vis qui s'étend à travers les guides respectifs (51,

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54) pour venir en prise avec les plaques porteuses respectives.

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Fig 1

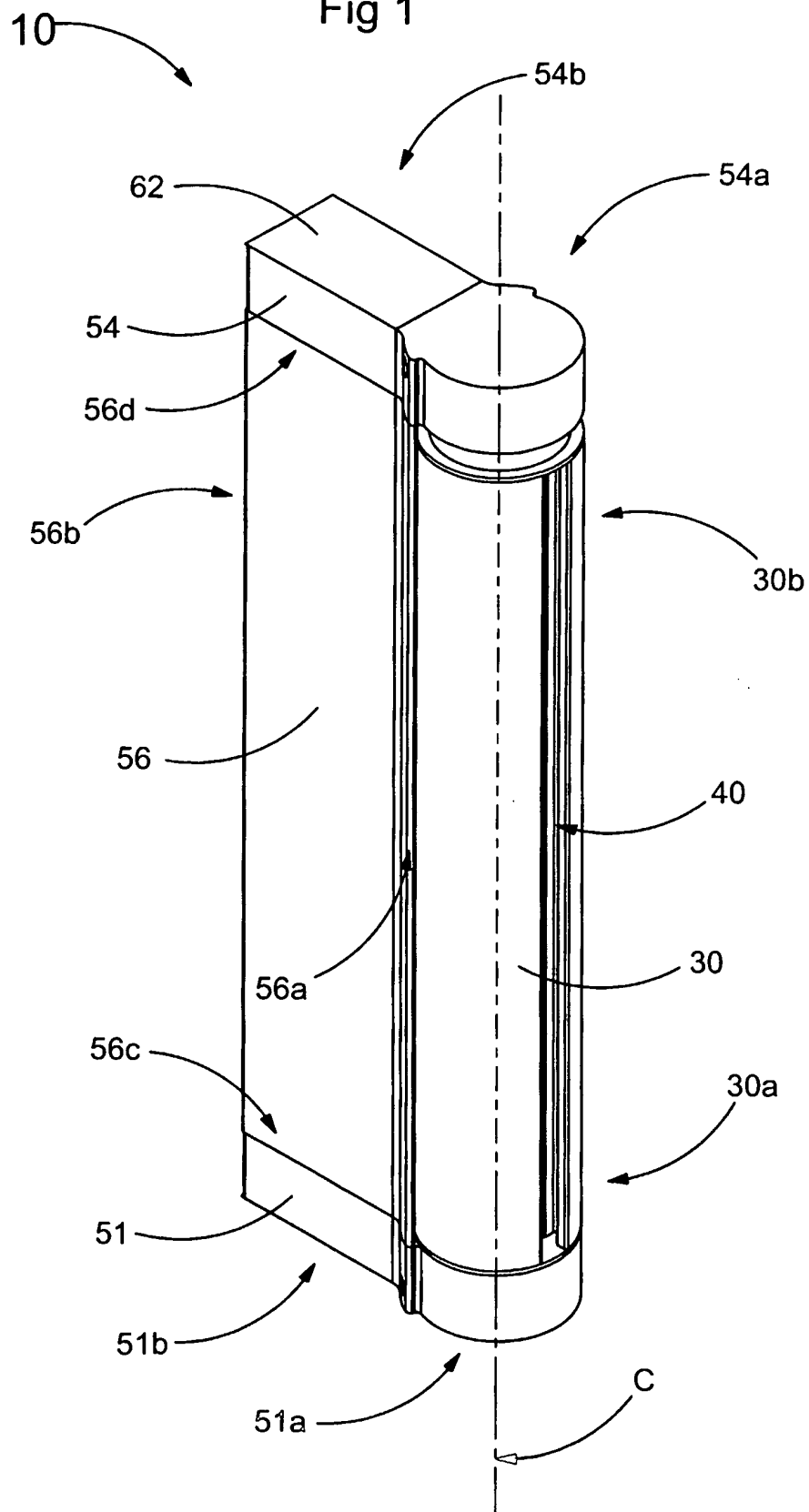
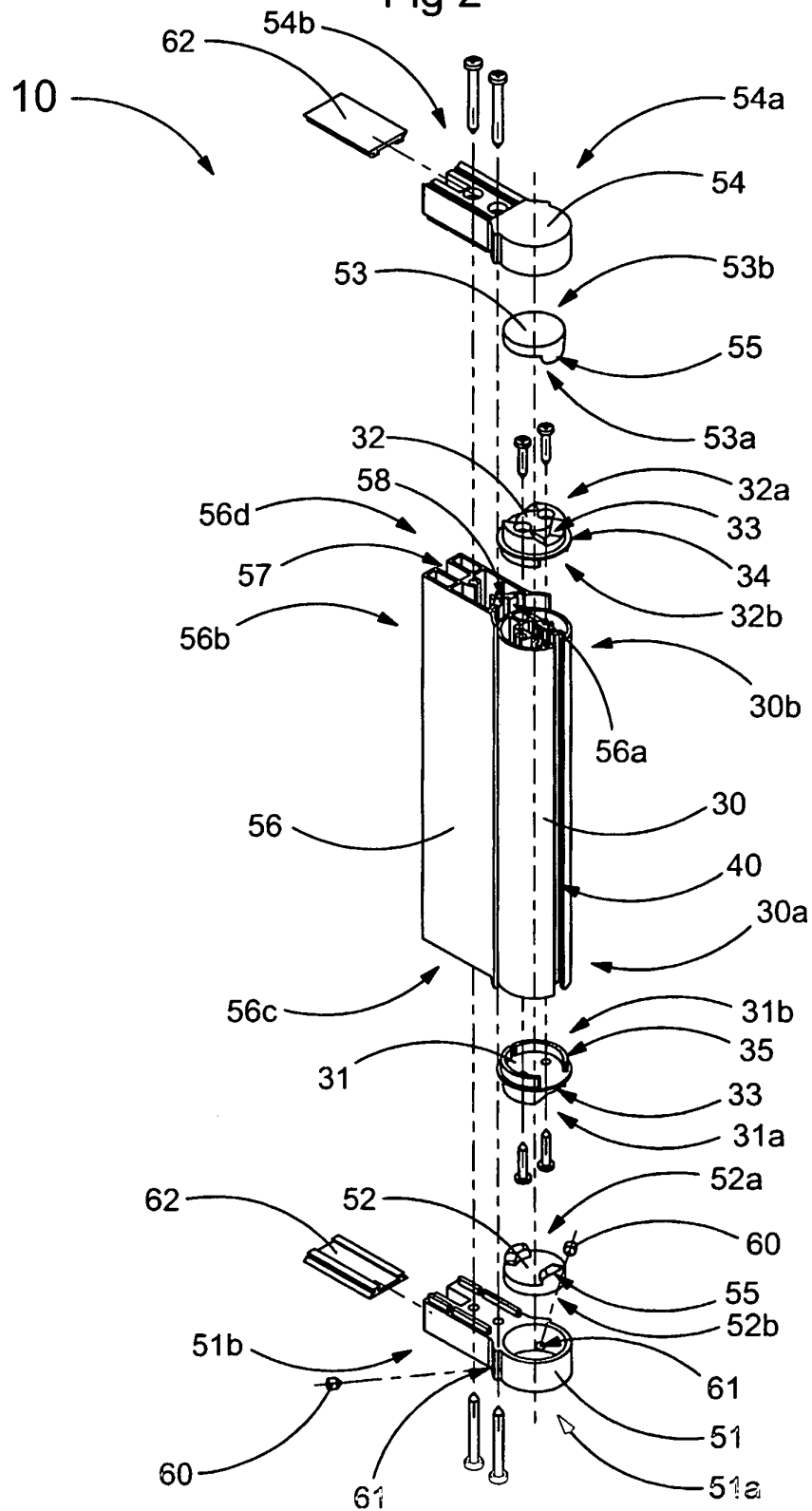


Fig 2



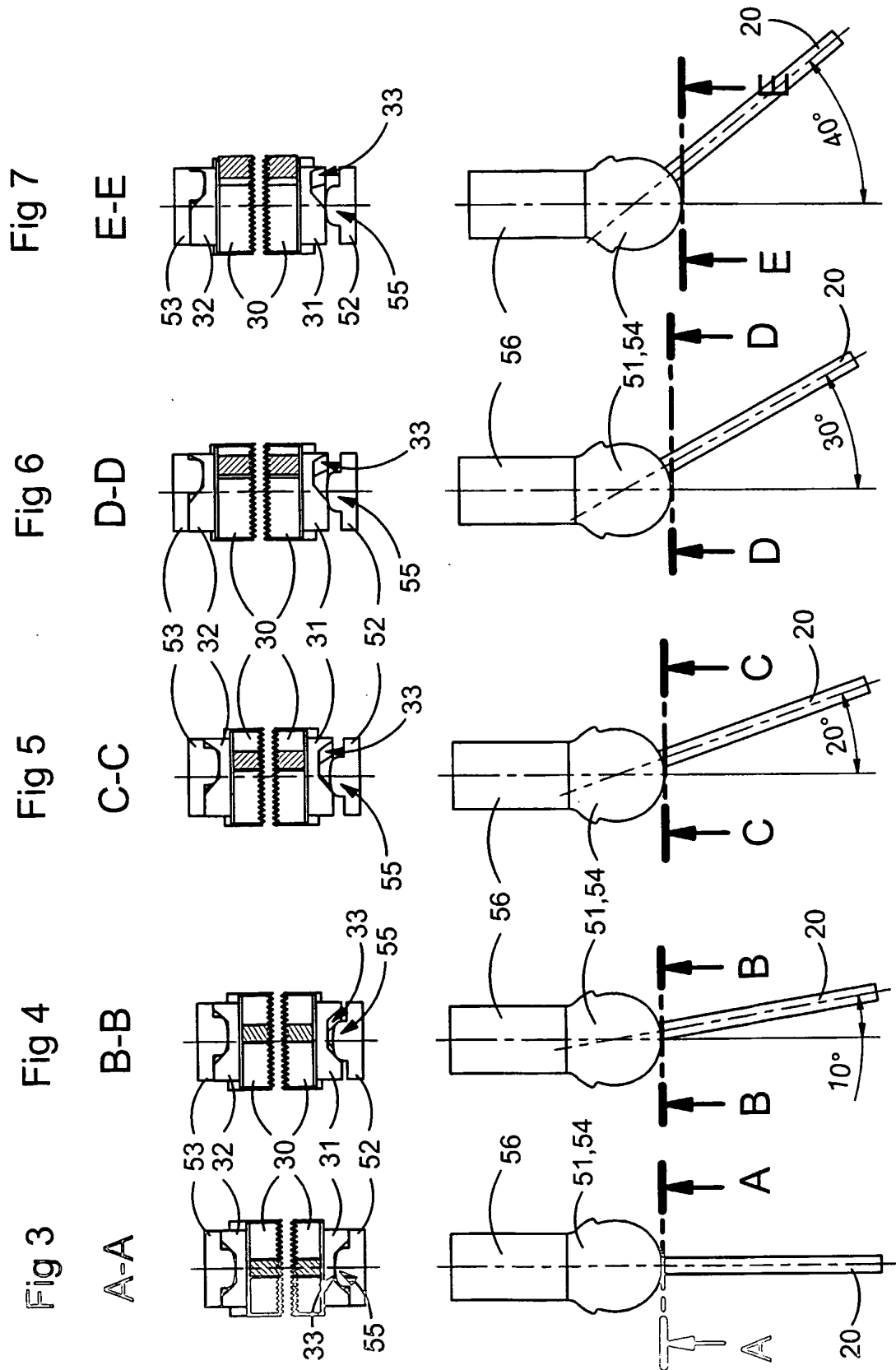
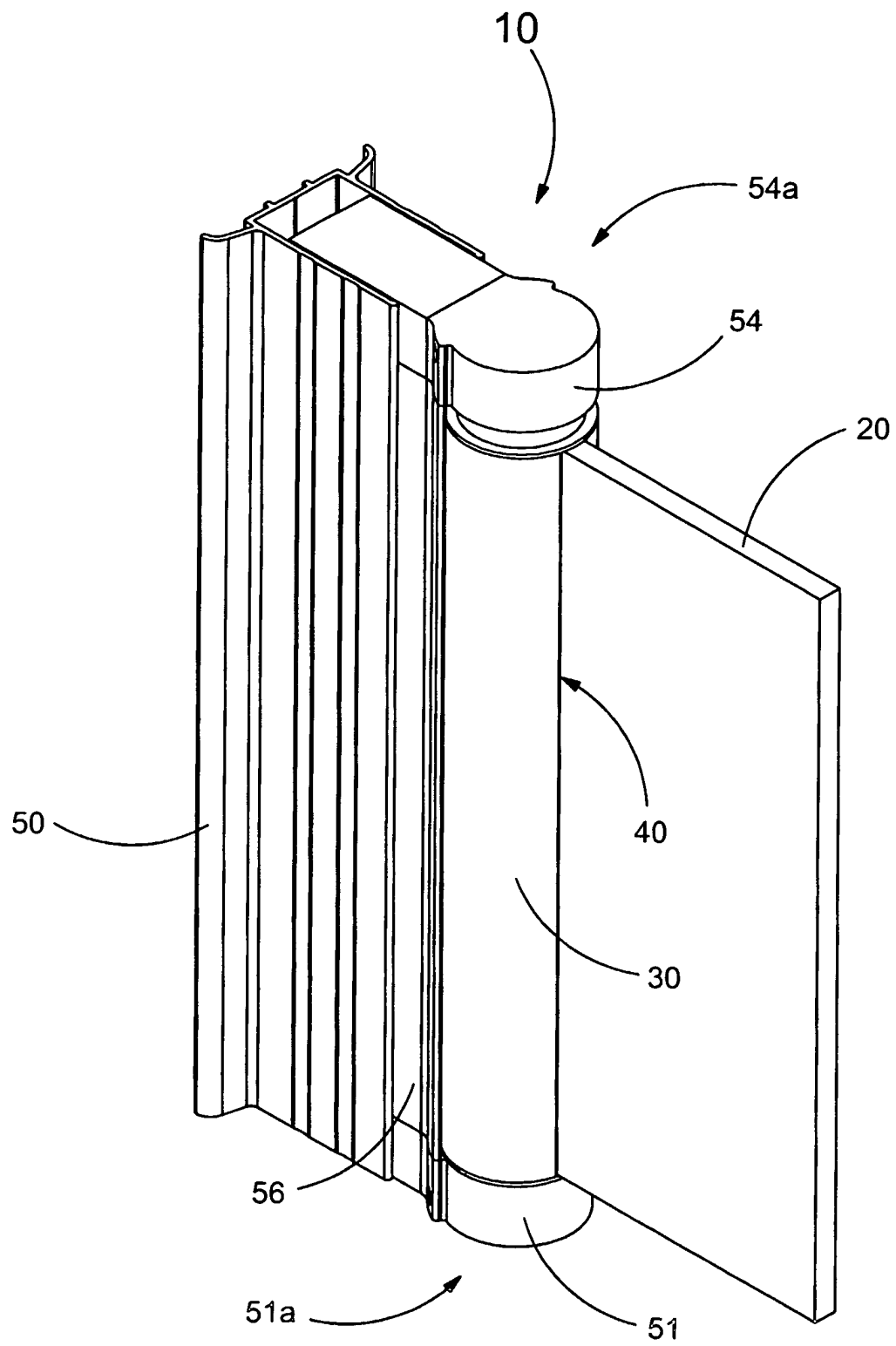


Fig 8



REFERENCES CITED IN THE DESCRIPTION

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