

(72) Inventor: **Pettersson, Robert**
218 37 Bunkeflostrand (SE)

(74) Representative: **Henriksson, Dan Ragnar Mikael**
Awapatent AB
P.O. Box 5117
200 71 Malmö (SE)

Fig 2

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.

[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.

[0009] In WO 2005/102128 a hinge and a lifting function is described. The hinge described in the above document is considered easy to adjust when mounting and make the shower walls reversible, thus eliminating left-hung and right-hung constructions. However, the hinge according to WO 2005/102128 suffers from certain disadvantages. The hinge leaves room for mounting errors by the fitter who is installing and mounting the shower doors in a bath room. Since there is no left-hung or right-hung constructions, the lifting function may be absent due to faulty installation of the constructions by the fitter. The angle of the hinge and shower door are to be adjusted and locked at the lower part of the hinge, closest to the floor. If the upper part of the hinge is adjusted with the stop screws, the hinge is not mounted correctly and the shower door will not perform properly with a lift. Also, this hinge must always be adjusted to a preferred angle from the bath room wall before use. Many times the construction might be adjusted to the wrong angle and the fitter does not correct this, leaving the construction not working properly. Most of the shower doors, about 90-95%, are to be installed at an angle of 90° from the wall. The hinge according to WO 2005/102128 could according to the above, thus be in need of improvements.

Summary of the Invention

[0010] 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. Also, the hinge according to the present invention eliminates the problems above of mounting the construction in place. Due to the construction of the hinge according to present invention the hinge and door leaf may be fixed at an angle of 90° during the production. Since about 90-95% of shower doors to be installed in bath rooms are mounted in an angle of 90° to the bathroom walls, the hinge according to the present invention makes it possible to set this angle already during the production of the hinges. Due to this, most of the hinges may be installed without any adjustments of the angles, and therefore facilitates the installation for the fitter, and also minimize or eliminate the possibility for faulty installation of the hinges for the shower walls i.e. without a lift.

[0011] 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. Each carrier plate has a plate slot, which is engageable with a projection on a respective connecting plate. The carrier plates are connected to the guides by springs. A first and a second spring are provided between the respective guide, through a hole in the respective connecting plate, and the respective carrier plate. Means are arranged to lock the respective connecting plates to the guides on the connecting part.

[0012] The carrier plates are able to engage in connecting plates. The connecting plates may engage in an associated pressure plate on a respective pin end. The upper carrier plate is rotatably arranged in a guide or in a sleeve, which is fixedly arranged in a guide.

[0013] Means are arranged to lock the respective connecting plates to the guides of the connecting part and unlock the respective connecting plates from the guides on the connecting part so as to allow a change of the angle of the door leaf from the bathroom wall for a both left- and a right-hung door leaf, window and the like. It is the lower connecting plate that is adjusted to allow a change of said angle.

[0014] 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 the fitter by means of a fixed angle after production and the infinitely variable setting of its angle extending from the bathroom wall, said setting being effected with aid of the lock-

ing and unlocking means and giving a better final result. The hinge may, due to the above, in most cases be installed without any adjustments of the angles by the fitter. The hinge, due to its construction, also minimizes or eliminates the possibility for faulty installation of the shower walls by the fitter, i.e. without a lift.

Brief Description of the Drawings

[0015] 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 from the front and from above, where some details are hidden in the front views and the views from above are illustrating the function of the hinge,

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

[0016] 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.

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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 views from the front, where some details are hidden, and also the views from above are illustrating the function of the hinge.

[0023] 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.

[0024] 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. However, the above embodiment of the mounting attachment 50 is not to be considered limiting for the shape of the mounting attachment 50.

[0025] 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. However, the above embodiment of the pin 30 is not to be considered limiting for the shape of the pin 30. 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 30 when pivoted on its longitudinal axis C. The door leaf 20 is distinctly shown in Figs 3-8.

[0026] Fig. 2 shows the elongate connecting part 56 and the pin 30. The connecting part end 56a is designed to match the shape, in this case 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 according to one embodiment 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. However, the embodiment disclosed above of the mounting attachment 50, the connecting part 56 and the pin 30 may in other embodiments of the invention have different shapes than the ones disclosed above. 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.

[0027] 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 mounting attachment.

[0028] 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. On the other sides 52b, 53b of the carrier plates facing connecting plates 62, 63, a plate slot 59 is located. The connecting plates 62, 63 have on the sides 62a, 63a, facing the carrier plate sides 52b, 53b a projection 64. The projection 64 is engageable with the plate slot 59. In the connecting plates 62, 63, there is a hole 65.

[0029] In one embodiment sleeves 66, 67 may be introduced to the corresponding guide sleeve parts 51a, 54a. The guides 51, 54 have a pin recess 70 which is used for engagement of a guide pin 68 seated on the sleeves 66, 67. The carrier plates 52, 53 and the connecting plates 62, 63, are of a slightly smaller size, i.e. diameter, than the sleeves 66, 67. The upper carrier plate 53 is rotatably arranged in the sleeve 67, which is fixedly arranged in the guide 54. In another embodiment (not shown) sleeves are excluded and the guide sleeve parts 51a, 54a are constructed as if the sleeves 66, 67 and the guide sleeve parts 51a, 54a according to Fig 2 are moulded into one. In this case the upper carrier plate 53 is rotatably arranged in the guide 54.

[0030] The use of sleeves might depend on the use of different materials for the components in the hinge.

[0031] Springs 71, 72 are provided to link the carrier plates to the guides. The springs 71, 72 are located between the carrier plates 52, 53, through the hole 65 in connecting plates 62, 63, and the guides 51, 54. There might be a recess (not shown) provided in the guides 51, 54 for holding the springs 71, 72.

[0032] 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.

[0033] 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.

[0034] The guides 51, 54 are provided with one or more means 60 in the form of e.g. a threaded pin, in this embodiment a stop screw 60 for holding of the connecting plates 62, 63. The stop screw 60 is screwed into a threaded horizontal hole 61 in the guide sleeve parts 51a, 54a.

[0035] The stop screws 60 serve to lock and unlock the connecting plates 62, 63. The connecting plates 62, 63 may be locked/engaged with the stop screws 60 during the production of the hinge, to get a pre-set angle of 90° between the door leaf 20 and a presumed wall, in order to facilitate the mounting of the hinge 10 and door leaf 20 to a wall by the fitter. When mounting the hinge 10 (Figs 1, 2) into a position other than 90° to a wall, if the hinge has been fixed at this angle, the stop screws 60 in the lower guide 51 are loosened and the pin 30 is pivoted by means of the door leaf 20 and the pressure and carrier plates 31, 32, 52, 53 and the lower connecting plate 62 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 connecting plate 62 in the guide 51 and locks the connecting plate 62.

[0036] Figs 3-7 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) up to an angle of 40° relative to the "zero position" (Fig. 7). The door leaf can also be rotated to the left when the pressure and carrier plates 31, 32, 52, 53 and the connecting plates 62, 63 are symmetrically designed. The connecting

plates 62, 63 are locked against rotation by means of the stop screws 60 and does not accompany the pivoting motion of the pin while the carrier plate 53 accompanies the pivoting motion of the pin. Not all parts of the hinge are disclosed in these views, in the front view all screws, the guides 51, 54 and the sleeves 66, 67 are hidden.

[0037] 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.

[0038] When the door leaf 20 is rotated from the "zero position" (Fig. 3) to the position in Fig. 4, 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). The lower connecting plate 62 is engaged in the respective carrier plate 52.

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, a connecting part (56) and guides (51, 54), said pin being connected to the connecting part, pivotally on its longitudinal axis (C),
in which the ends (30a) and (30b) of the pin 30 and a respective carrier plate (52, 53) engage each other by cam surfaces (33, 55),
characterised in that
each carrier plate (52, 53) has a plate slot (59) which is engageable with a projection (64) on a respective connecting plate (62, 63),
a first and a second spring (71) are provided between the respective guide (51, 54), through a hole (65) in the respective connecting plate (62, 63), and the respective carrier plate (52, 53),
means (60) are arranged to lock the respective connecting plates (62, 63) to the guides (51, 54).
2. A hinge (10) as claimed in claim 1, wherein the means (60) for locking the connecting plates (62, 63) is additionally arranged to unlock the lower connecting plate (62) from the guide (51) of the connecting part (56) so as to allow a change of the angle of the door leaf (20) from a bath room wall and relocking of the means (60).
3. A hinge (10) as claimed in claim 1 or 2, wherein the carrier plate (53) is rotatably arranged in the guide (54) or in a sleeve (67), which is fixedly arranged in the respective guide (51, 52).

4. A hinge (10) as claimed in any one of the preceding claims, wherein each carrier plate (52, 53), connecting plate (62, 63), and spring (71) is placed in a guide (51, 54) of 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 connecting plates.
5. A hinge (10) as claimed in any one of the preceding claims, wherein the ends (30a, 30b) of the pin (30) each has 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.
6. 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).
7. 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).
8. A hinge (10) as claimed in any one of the preceding claims, wherein the means (60) for locking and unlocking the respective connecting plates (62, 63) comprise at least one screw which extends through the respective guides (51, 54) for engaging the respective connecting plates.

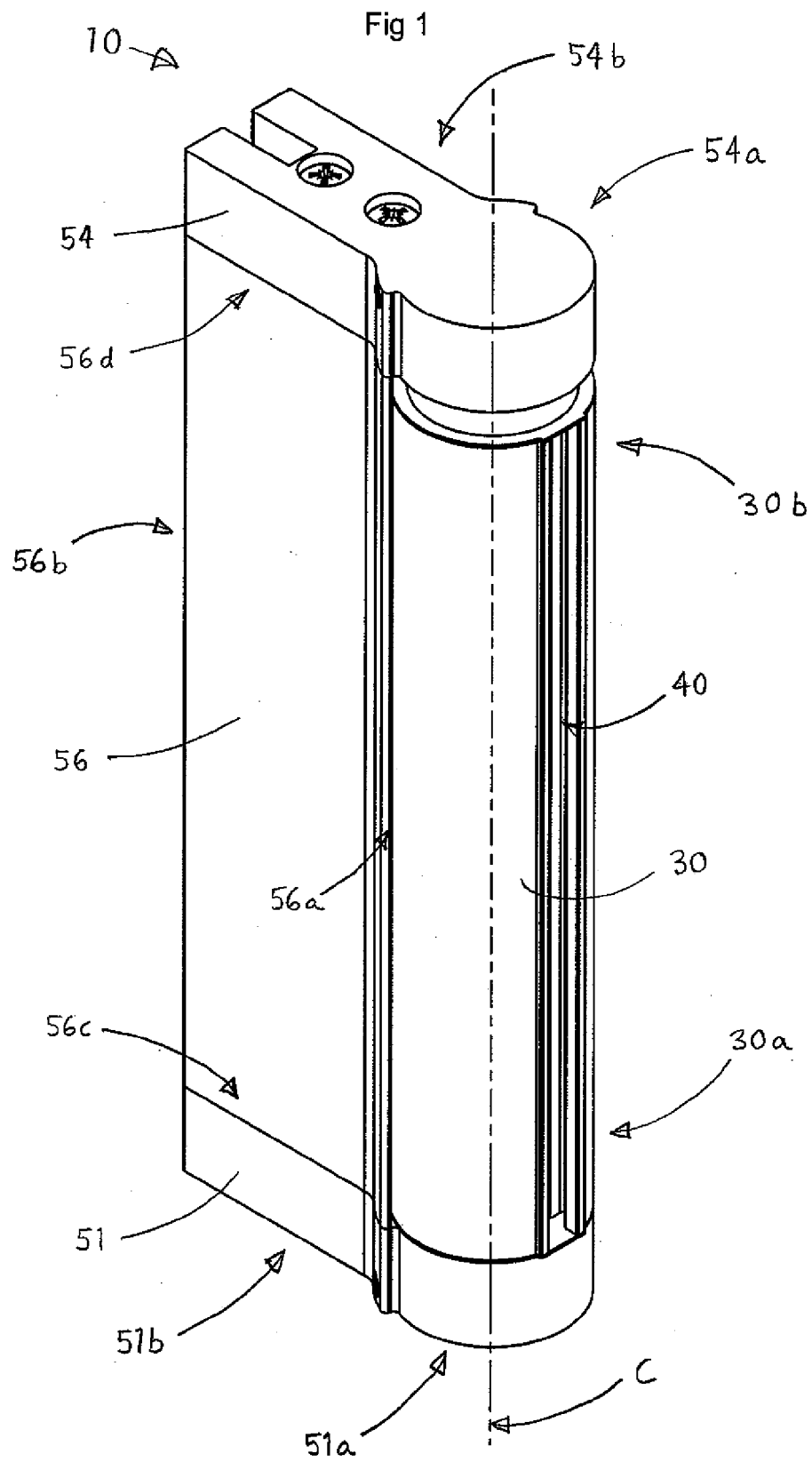
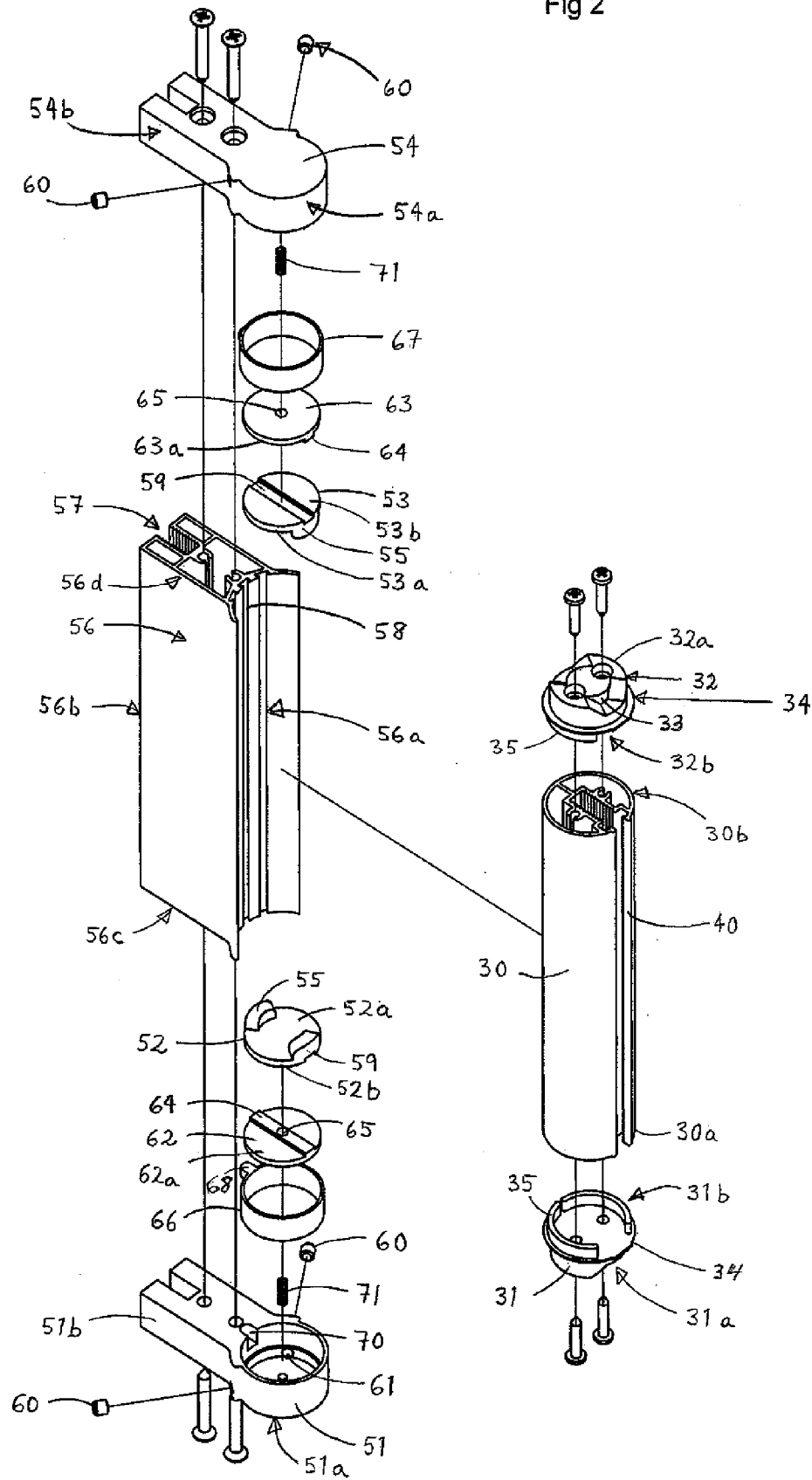


Fig 2



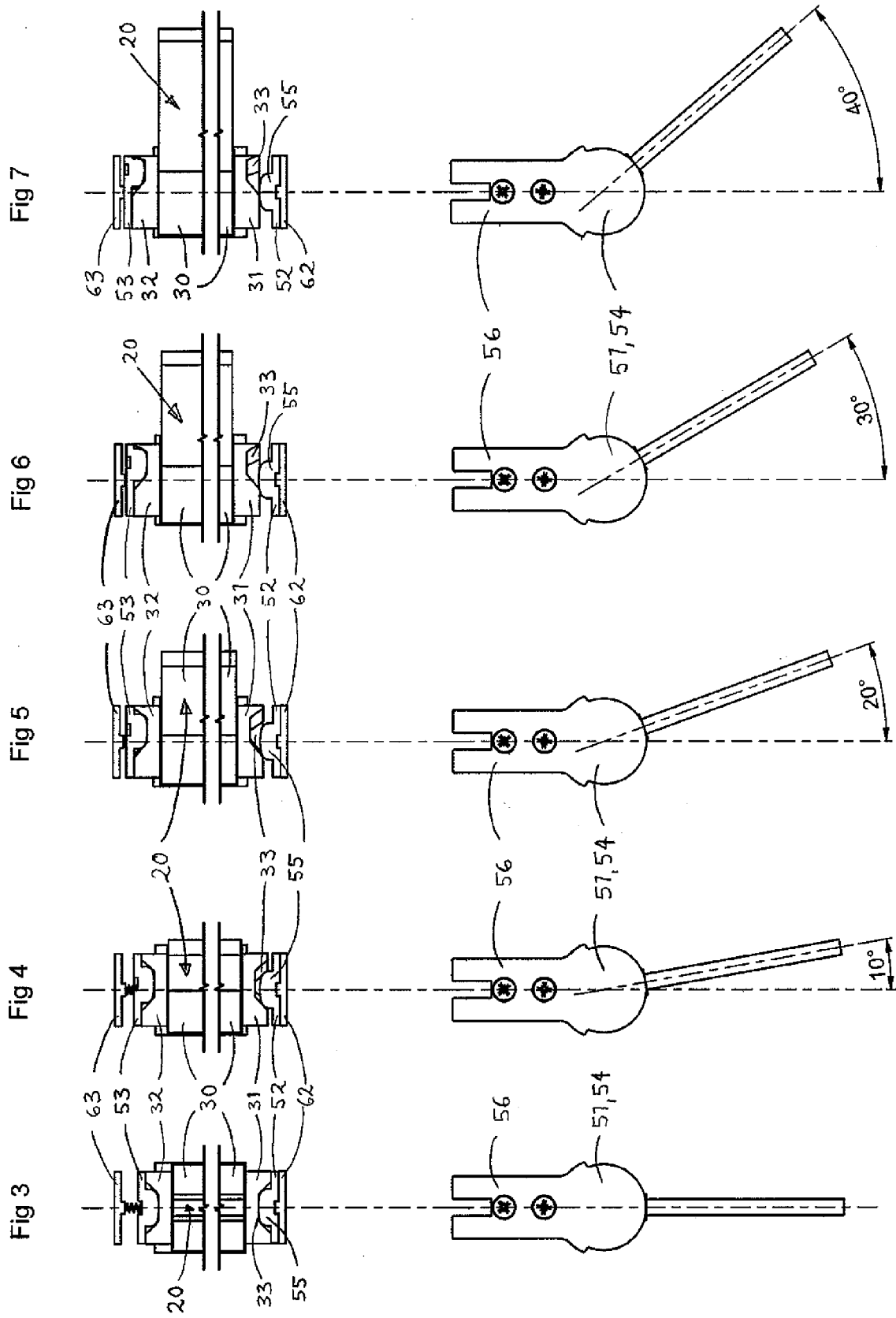
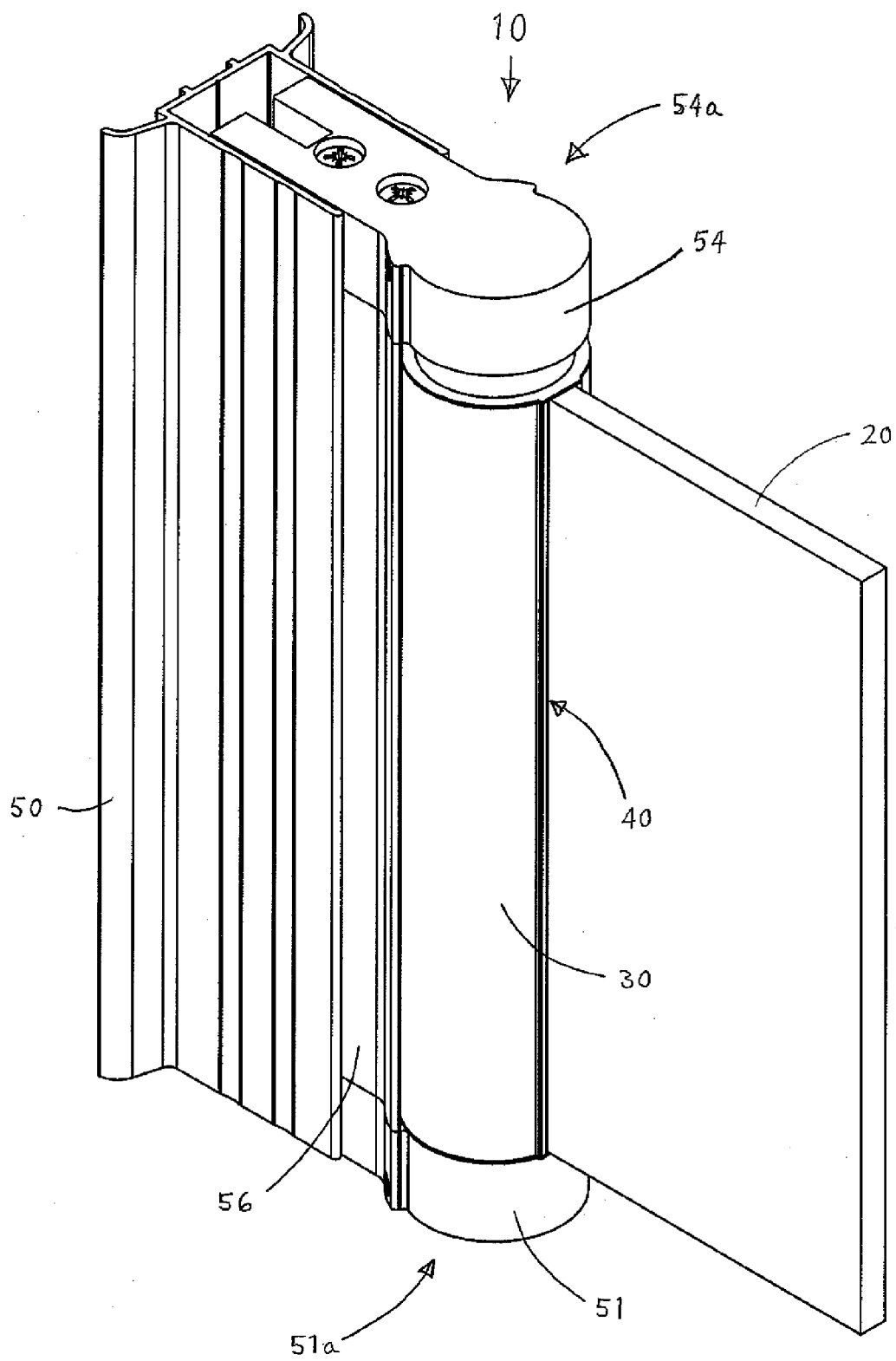


Fig 8





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 12 6268

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2005/102128 A (INREDNINGSGLAS SKANDINAVIEN AB [SE]; PETTERSSON ROBERT [SE]) 3 November 2005 (2005-11-03) * abstract; figure 2 * -----	1	INV. E05D7/02 E05F1/06 E05D11/10
			TECHNICAL FIELDS SEARCHED (IPC)
			E05D A47B E05F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 10 May 2007	Examiner WITASSE-MOREAU, C
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			

2
EPO FORM 1503 03/92 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 12 6268

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

10-05-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005102128 A	03-11-2005	EP 1746921 A1	31-01-2007

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 2005102128 A [0009] [0009] [0009]