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(54) Screen device

(57) The present invention relates to a screen device in which the torsional forces no longer have to be compensated for manually so as to be able to fit the screen roller (1) in the desired position between the end plates (2, 3) of this screen device, due to the fact that one end of the screen roller (1) comprises one or more guide pins (4) which delimit a rectangle, and due to the fact that the corresponding end plate (2) comprises a guide slot (6a, 6b) in which the one or more guide pins (4) are guided when the screen roller (1) is being fitted between the end plates (2, 3) so that a first rectangular side can extend along one side of the guide slot (6a, 6b) and a second rectangular side can extend along the width of the guide slot (6a, 6b).

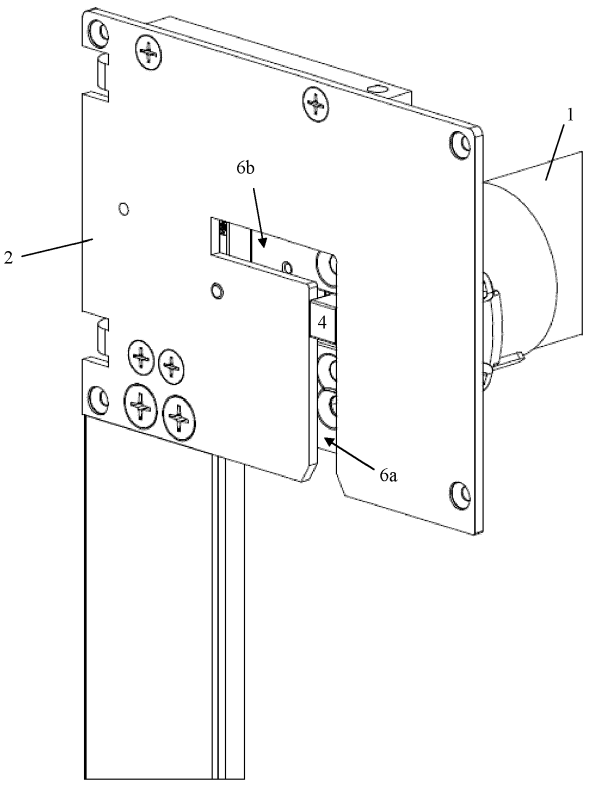

FIG. 2

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Description

[0001] The present invention relates to a screen device comprising a screen roller and two end plates between which the screen roller can be fitted and to which the ends of the screen roller can be attached.

[0002] Screen devices of this type are already generally known.

[0003] With such screen devices, it is more and more often necessary to fit the screen roller between these end plates after these end plates have already been installed at the location for installing this screen device. In many cases, a screen casing and any necessary screen and/or slat guides have already been (partly) installed.

[0004] This is the case if such a screen roller comprising a screen which is rolled onto it and to the underside of which a screen slat is attached, is relatively heavy and the weight of the combination of this screen roller with screen and screen slat, end caps, screen and/or slat guides renders installation of the screen device unnecessarily difficult. This is also the case if, when parts have to be repaired or replaced, the screen roller has to be removed from between the end plates and re-installed. Likewise, this applies in the case of newly built houses or renovation projects where the screen and/or slat guides with end plates are prefitted on the window frame and the screen roller with screen slat is only fitted after the window, together with screen and/or slat guides and end plates has been installed on site. This method is often used in order to prevent soiling and/or damage of the screen.

[0005] DE 20 2009 016 153 U1 describes a screen device in which the end plates are divided into two parts, with a first part of the end plates being fixedly attached to the ends of the screen roller and being provided with several fixing pins and with a second part of the end plates already being installed in situ and being provided with fixing openings into which the fixing pins are inserted in order to attach the two parts of the end plates to one another in order to install the screen device. The screen device described herein is certainly not suitable for use in the abovementioned situation as the second parts of the end plates cannot be fitted between the screen and/or slat guides which have already been fitted and the first parts of the end plates which have already been fitted.

[0006] In addition, fitting the screen roller in a desired position between end plates which have already been installed is in practice often rendered more difficult since, due to the weight of the screen which is at least partly rolled up onto this screen roller and due to the weight of a bottom slat which is usually provided on the underside of such a screen, a torsional force is trying to twist the screen roller. This twisting of the screen roller has to be stopped manually in order to be able to install the screen roller in a desired position between the end plates. This manual compensation of the twisting action by the screen roller makes installation of such a screen roller relatively laborious.

[0007] EP 0 026 347 A1 describes a screen device in which the ends of the screen roller comprise a guide pin with a rectangular cross section, in which each end plate comprises a corresponding guide slot, in which the corresponding guide pin can be fitted in order to guide the screen roller when fitting this screen roller between the end plates. In this case, the guide slot comprises a bend. Such a bend is said to ensure that a screen roller can be fitted between end plates which have already been installed without being impeded by screen and/or slat guides which have already been fitted. However, such a bend has to allow sufficient play in order to enable a guide pin with a rectangular cross section to take this bend. However, on account of said torsional force, it is difficult to take such a bend without a guide pin twisting in the locations where play is provided to enable the bend to be taken, thus resulting in the guide pin becoming stuck in the corresponding guide slot. It is therefore also difficult to install the screen device described herein in a simple manner without sufficient manual compensation for the occurring torsional forces.

[0008] In addition, in those screen devices where a motor is fitted in the screen roller, with the electrical coupling of this motor being produced by means of a male coupling piece and a female coupling piece, in which case one of these coupling pieces is provided on the end of the screen roller which corresponds to the motor, as is described, for example in BE-2009/0404, BE-2010/0177 and FR 2 775 729, there is a risk that this coupling piece on the end of the screen roller becomes damaged when the screen roller is being fitted between the end plates if said torsional force cannot be compensated for manually to a sufficient degree.

[0009] It is therefore an object of the present invention to also provide a screen device in which said torsional force no longer has to be compensated for manually in order to keep the screen roller in the desired position when fitting the screen roller between the end plates.

[0010] This object of the invention is achieved by means of a screen device comprising a screen roller and two end plates between which the screen roller can be fitted and to which the ends of the screen roller can be attached, in which at least one end of the screen roller comprises one or more guide pins which, in cross section, delimit a rectangle, in which the end plate corresponding to this end comprises a guide slot into which the one or more guide pins can be fitted in order to guide the screen roller when fitting this screen roller between the end plates in such a manner that a first rectangular side can extend along one side of the guide slot and that a second rectangular side can extend along the width of the guide slot and in which the guide slot comprises a first part-guide slot and a second part-guide slot which are designed substantially straight and which adjoin one another at a substantially right angle.

[0011] Due to the fact that a rectangular side can extend along one side of the guide slot and a rectangular side can extend across the width of the guide slot in any

position of the guide slot, the screen roller can be fitted between the end plates without it twisting in an undesired manner with respect to the desired position. Due to the fact that the part-guide slots are designed substantially straight and adjoin one another at a substantially right angle, hardly any play needs to be provided in order to enable the guide pin from passing from the first part-guide slot to the second part-guide slot and thus there is no longer the risk of the guide pin twisting in the guide slot on account of the torsional force and becoming stuck in the guide slot. In this manner, the desired position of the screen roller can be defined throughout the entire movement of the screen roller during installation between the end plates solely as a result of the guiding action of the one or more guide pins in the guide slot.

[0012] The one or more guide pins should not completely fill the rectangle which they delimit in cross section. It is sufficient if they delimit the latter. These guide pins may be hollow or may be provided with indentations or recesses or bevelled edges, etc. In this case, said rectangular sides may, if desired, also be provided with indentations, recesses, etc.

[0013] In this way, the risk of damaging a coupling piece which is provided at one end of the screen roller and forms part of the electrical coupling is prevented.

[0014] In a simple embodiment of such a screen device according to the present invention, the latter end of the screen roller comprises one single guide pin. The cross section of said one guide pin then preferably has the shape of said rectangle, said rectangle more preferably being a square.

[0015] Such an embodiment is simple, both in terms of production, as only one guide pin and one corresponding guide slot have to be provided at this end of the screen roller, and in terms of fitting the screen roller between the end plates, as only one guide pin has to be fitted in one guide slot at this end of the screen roller.

[0016] The latter end of the screen roller of an alternative, more specific embodiment of a screen device according to the present invention comprises four guide pins which are positioned in separate corners of the rectangle.

[0017] The object of the present invention is also achieved by means of a screen device comprising a screen roller and two end plates between which the screen roller can be fitted and to which the ends of the screen roller can be attached, in which at least one end of the screen roller comprises two guide pins which are arranged at a distance from one another, in which the end plate corresponding to said end comprises two guide slots which correspond to said guide pins and which are arranged at a distance from one another and parallel to one another, in which each guide pin can be fitted in a respective guide slot for guiding the screen roller when fitting the screen roller between the end plates and in which the two guide slots each comprise a first part-guide slot and a second part-guide slot which are substantially straight and adjoin one another at a substantially right angle.

[0018] Due to the fact that each guide pin is guided in a separate guide slot, the screen roller can be fitted between the end plates without being twisted in an undesirable manner with respect to the desired position. In this way, the desired position of the screen roller can be defined throughout the entire movement of the screen roller during installation between the end plates solely as a result of the guiding action of the various guide pins in separate guide slots.

[0019] In this way, the risk of damaging a coupling piece which is provided at one end of the screen roller and forms part of the electrical coupling is also prevented.

[0020] In this case, the two guide pins are preferably arranged in the diagonally opposite corners of a rectangle, said rectangle having a width or a height which corresponds to the width of the first part-guide slots and a height or width, respectively, which corresponds to the width of the second part-guide slots.

[0021] A screen device according to the invention in which the guide slots comprise a first and a second part-guide slot may, more specifically, furthermore comprise a screen which can be rolled up onto and unrolled from the screen roller with the first part-guide slot substantially extending along the direction of the rolling and unrolling movement of the screen.

[0022] Such an embodiment may, for example, be used effectively with screen devices in which an electrical coupling is produced when the screen roller is fitted between the end plates and in which a screen roller has to be fitted in a screen casing, with the access to this screen casing being situated at right angles to the plane in which the electrical coupling is effected.

[0023] More specifically, a screen device according to the present invention may furthermore also comprise a motor for driving the screen roller, said motor being fitted on the latter end of the screen roller in said screen roller.

[0024] More specifically, such a screen device can then furthermore comprise a power supply cable for supplying electrical power to the motor, in which said screen device comprises an electrical coupling for electrically coupling the power supply cable to the motor, comprising a male coupling piece and a female coupling piece, with the male or the female coupling piece being fitted to the end of the motor and the female or the male coupling piece, respectively, being fitted to the end plate corresponding to the latter end of the screen roller and in which the male and the female coupling piece are positioned on the motor and on this end plate in such a manner that they are coupled when the screen roller is fitted between the end plates, with the one or more guide pins being guided in the corresponding one or more guide slots.

[0025] The other end of the screen roller of a screen device according to the present invention which is situated opposite the latter end preferably also comprises a guide pin. The end plate which corresponds to said other end then preferably comprises a guide slot which corresponds to the one or more guide slots of the other end

plate and in which the guide pin can be fitted in a guiding manner in order to guide the screen roller when said screen roller is being fitted between the two end plates.

[0026] Due to the fact that a guide pin and a corresponding guide slot are also provided here, there is a greater likelihood of the guide pins securely engaging in the guide slots even if the screen roller is slightly smaller than the space between the end plates due to variations in tolerance. There is also a greater likelihood of the screen roller being fitted in a more steady manner between the two end plates.

[0027] The guide slots of a screen device according to the present invention preferably extend substantially across the thickness of the corresponding end plate.

[0028] Furthermore, after having been fitted in the corresponding guide slots, these guide pins preferably extend within the boundaries of the screen device which are defined by the end plates.

[0029] The present invention will now be explained in more detail by means of the following detailed description of a preferred screen device according to the present invention. The sole purpose of this description is to give illustrative embodiments and to indicate further advantages and features of this screen device, and can therefore by no means be interpreted as a limitation of the area of application of the invention or of the patent rights defined in the claims.

[0030] In this detailed description, reference numerals are used to refer to the attached drawings, in which:

- ***Fig. 1*** shows an end of a screen roller of an embodiment of a screen device according to the present invention in perspective, in which a motor is fitted in this end of said screen roller and a male coupling piece is provided for coupling this motor to a power supply cable and a guide pin with a square cross section is provided on this end;
- ***Figs. 2 and 3*** show, in perspective, how the end of the screen roller from Fig. 1 is attached to an end plate of the screen device by arranging the guide pin in a guide slot which is situated in this end plate and corresponds to this guide pin;
- ***Fig. 4*** shows, in perspective, the other end of the screen roller from Fig. 1 which is provided with a guide pin with a round cross section;
- ***Figs. 5 and 6*** show, in perspective, how the end of the screen roller from Fig. 4 is attached to an end plate of the screen device by fitting the guide pin in a guide slot which is situated in this end plate and corresponds to this guide pin.

[0031] In the figures, the screen roller (1) and the end plates (2, 3) of an embodiment of a screen device according to the present invention are illustrated. The screen roller (1) can be fitted between these end plates (2, 3) and can be attached to these end plates (2, 3) by its ends. These end plates (2, 3) form part of a screen casing (not shown) which largely surrounds and protects this screen roller (1) in its fitted position.

[0032] Such a screen device is usually arranged in a door or window opening, with the screen casing being installed at the top of such a door or window opening. In this case, such a screen device comprises a screen which can be rolled up onto and unrolled from the screen roller (1), by means of which this door or window opening can at least partly be screened against sunlight and/or insects and/or heat and/or cold. This screen has not been illustrated in the figures.

[0033] The illustrated screen device is a motorized screen device which comprises a motor for driving the rolling and unrolling movement of this screen. In the case of the illustrated screen roller (1), this motor is fitted in the end of said screen roller (1) which is illustrated in Figs. 1 to 3.

[0034] The screen device comprises a power supply cable (not shown) for supplying electrical power to this motor. Furthermore, the screen device also comprises an electrical coupling for electrically coupling the power supply cable to the motor, comprising a female coupling piece (not shown) which is electrically coupled to said power supply cable and a male coupled piece (8) which is electrically coupled to the motor and can be seen in Fig. 1.

[0035] The male coupling piece (8) is fitted on the end of the screen roller (1) where the motor is installed. The female coupling piece is fitted on the side of the end plate (2) (not shown) which corresponds to this end of the screen roller (1).

[0036] The illustrated screen device is a screen device in which the screen casing is arranged at the top of a door or window opening and in which the screen roller (1) can be fitted between the end plates (2, 3) via an opening in the screen casing in a direction substantially parallel to the rolling and unrolling movement of the screen. In order to couple the male coupling piece (8) to the female coupling piece, the screen roller (1) together with the male coupling piece (8) attached thereto then has to be moved in a direction perpendicular to the rolling and unrolling movement of the screen (1) to the female coupling piece on the corresponding end plate (2).

[0037] In order to guide this movement of the screen roller (1) when it is being fitted between the end plates (2, 3) without the screen roller (1) being able to twist about its axis, the end of the screen roller (1) in which the motor is fitted and on which the male coupling piece (8) is provided, is furthermore provided with a guide pin (4) having a square cross section, as can be seen in Figs. 1 to 3. In the end plate (2) which corresponds to this end of the screen roller (1), a guide slot (6a, 6b) is provided, in which the guide pin (4) with the square cross section can be fitted in order to guide the screen roller (1) when it is being fitted between the end plates (2, 3), as can be seen in Figs. 2 and 3. This guide slot (6a, 6b) has a width which substantially corresponds to the dimension of the side of the square cross section of the guide pin (4), so that twisting of this guide pin (4) in this guide slot (6a, 6b) is pre-

vented. Furthermore, this guide slot (6a, 6b) comprises a first part-guide slot (6a) which is substantially straight and extends substantially along the direction of the rolling and unrolling movement of the screen in order to guide the screen roller (1) during its fitting in the screen casing via said opening in this screen casing. In addition, this guide slot (6a, 6b) comprises a second part-guide slot (6b) which is substantially straight and adjoins the first part-guide slot (6a) at a substantially right angle in order to guide the screen roller (1) during a movement towards the female coupling piece.

[0038] The male coupling piece (8) and the female coupling piece are positioned on the end of the screen roller (1) and the end plate (2) corresponding to this end in such a manner that these are electrically coupled when the screen roller (1) is fitted between the end plates (2, 3), in which case the guide pin (4) with square cross section is guided in the guide slot (6a, 6b) in the corresponding end plate (2).

[0039] At its other end, the screen roller (1) is provided with a guide pin (5) with a round cross section, as can be seen in Figs. 4 to 6. In the end plate (3) corresponding to this end of the screen roller (1), a guide slot (7a, 7b) is provided in which the guide pin (5) with the round cross section can be fitted in order to guide the screen roller (1) when it is being fitted between the end plates (2, 3), as can be seen in Figs. 5 and 6. This guide slot (7a, 7b) has a width which substantially corresponds to the diameter of the round cross section of the guide pin (5). Furthermore, this guide slot (7a, 7b) also comprises a first part-guide slot (7a) which is substantially straight and which extends substantially along the direction of the rolling and unrolling movement of the screen in order to guide the screen roller (1) when it is being fitted in the screen casing via said opening in this screen casing. In addition, this guide slot (7a, 7b) also comprises a second part-guide slot (7b) which is substantially straight and adjoins the first part-guide slot (7a) at a substantially right angle in order to guide the screen roller (1) when it is moving towards the female coupling piece.

[0040] Thanks to this guide pin (5) with round cross section, variations in tolerance of the screen roller (1) or the end plates (2, 3) can be compensated for, as a result of which the guide pins (4, 5) on both ends of the screen roller (1) can be fitted in their corresponding guide slots (6a, 6b, 7a, 7b) with a larger degree of certainty. In practice, this guide pin (5) can be readily produced, for example by making the bearing of the shaft of the screen roller (1) slightly longer so that it protrudes with respect to a guide plate (8) on this end in which this shaft is mounted.

[0041] If this guide pin (5) is also produced in such a manner that it has a square cross section, it is moreover possible to prevent the guide plate (8) in which the shaft of the screen roller (1) is mounted from turning, so that it is certainly fitted in a screen casing or guides of the end plate (3) in the correct direction and does not have to be correctly positioned manually before this guide plate (9) is pushed into a screen casing or the guides of the end plate (3) in a guiding manner.

[0042] In the illustrated end plates (2, 3), the guide slots (6a, 6b, 7a, 7b) extend across the entire thickness of these end plates (2, 3) in order to guide the screen roller (1) in an optimum manner when it is being fitted between these end plates (2, 3), but do not extend beyond the boundaries of the screen device which are defined by the end plates (2, 3) in order not to make installation of such a screen device in a door or window opening impossible and to make it possible to provide an aesthetic finish of the screen device in case it is surface-mounted in front of a door or window opening.

[0043] The guide pin (4) with square cross section could also have a rectangular cross section, in which case the width of the first part-guide slot (6a) and the width of the second part-guide slot (6b) in which this guide pin (4) can be fitted has to be modified correspondingly, so that they substantially match the corresponding dimensions of this rectangular cross section.

[0044] Instead of the guide pin (4) with a square or rectangular cross section, several guide pins can also be provided which are arranged in such a manner that they delimit a rectangle, thus together preventing the screen roller (1) from being able to twist when the guide pins (4) are fitted in the corresponding guide slot (6a, 6b).

Claims

1. Screen device comprising a screen roller (1) and two end plates (2, 3) between which the screen roller (1) can be fitted and to which the ends of the screen roller (1) can be attached, in which at least one end of the screen roller (1) comprises one or more guide pins (4) which, in cross section, delimit a rectangle, in which the end plate (2) corresponding to this end comprises a guide slot (6a, 6b) into which the one or more guide pins (4) can be fitted in order to guide the screen roller (1) when fitting this screen roller (1) between the end plates (2, 3) in such a manner that a first rectangular side can extend along one side of the guide slot (6a, 6b) and that a second rectangular side can extend along the width of the guide slot (6a, 6b), **characterized in that** the guide slot (6a, 6b) comprises a first part-guide slot (6a) and a second part-guide slot (6b) which are designed substantially straight and which adjoin one another at a substantially right angle.

2. Screen device according to Claim 1, **characterized in that** the latter end of the screen roller (1) comprises one single guide pin (4).

3. Screen device according to Claim 2, **characterized in that** the cross section of said one guide pin (4) has the shape of said rectangle.

4. Screen device according to Claim 1, **characterized in that** the latter end of the screen roller (1) comprises four guide pins (4) which are positioned in separate corners of the rectangle.

5. Screen device comprising a screen roller (1) and two end plates (2, 3) between which the screen roller (1) can be fitted and to which the ends of the screen roller (1) can be attached, in which at least one end of the screen roller (1) comprises two guide pins (4) which are arranged at a distance from one another and in which the end plate (2) corresponding to said end comprises two guide slots (6a, 6b) which correspond to said guide pins (4) and which are arranged at a distance from one another and parallel to one another, in which each guide pin (4) can be fitted in a respective guide slot (6a, 6b) for guiding the screen roller (1) when fitting the screen roller (1) between the end plates (2, 3), **characterized in that** the two guide slots (6a, 6b) each comprise a first part-guide slot (6a) and a second part-guide slot (6b) which are substantially straight and adjoin one another at a substantially right angle.

6. Screen device according to one of the preceding claims, **characterized in that** said screen device comprises a screen which can be rolled up onto and unrolled from the screen roller (1) and **in that** the first part-guide slot (6a) extends substantially along the direction of the rolling and unrolling movement of the screen.

7. Screen device according to one of the preceding claims, **characterized in that** said screen device comprises a motor for driving the screen roller (1), said motor being fitted on the latter end of the screen roller (1) in said screen roller (1).

8. Screen device according to Claim 7, **characterized in that** said screen device comprises a power supply cable for supplying electrical power to the motor, **in that** said screen device comprises an electrical coupling for electrically coupling the power supply cable to the motor, comprising a male coupling piece (8) and a female coupling piece, with the male coupling piece (8) or the female coupling piece being fitted to the end of the motor and the female coupling piece or the male coupling piece (8), respectively, being fitted to the end plate (2) corresponding to the latter end of the screen roller (1) and **in that** the male coupling piece (8) and the female coupling piece are positioned on the motor and on this end plate (2) in such a manner that they are coupled when the screen roller (1) is fitted between the end plates (2, 3), with the one or more guide pins (4) being guided in the corresponding one or more guide slots (6a, 6b).

9. Screen device according to one of the preceding claims, **characterized in that** the other end of the screen roller (1) which is situated opposite the latter end, comprises a guide pin (5) and **in that** the end plate (3) which corresponds to said other end comprises a guide slot (7a, 7b) which corresponds to the one or more guide slots (6a, 6b) of the other end plate (2), in which the guide pin (5) on said other end can be fitted in a guiding manner in order to guide the screen roller (1) when said screen roller (1) is being fitted between the two end plates (2, 3).

10. Screen device according to one of the preceding claims, **characterized in that** the guide slots (6a, 6b, 7a, 7b) extend substantially across the thickness of the corresponding end plate (2, 3).

11. Screen device according to one of the preceding claims, **characterized in that** the guide pins (4, 5), after having been fitted in the corresponding guide slots (6a, 6b, 7a, 7b), extend within the boundaries of the screen device which are defined by the end plates (2, 3).

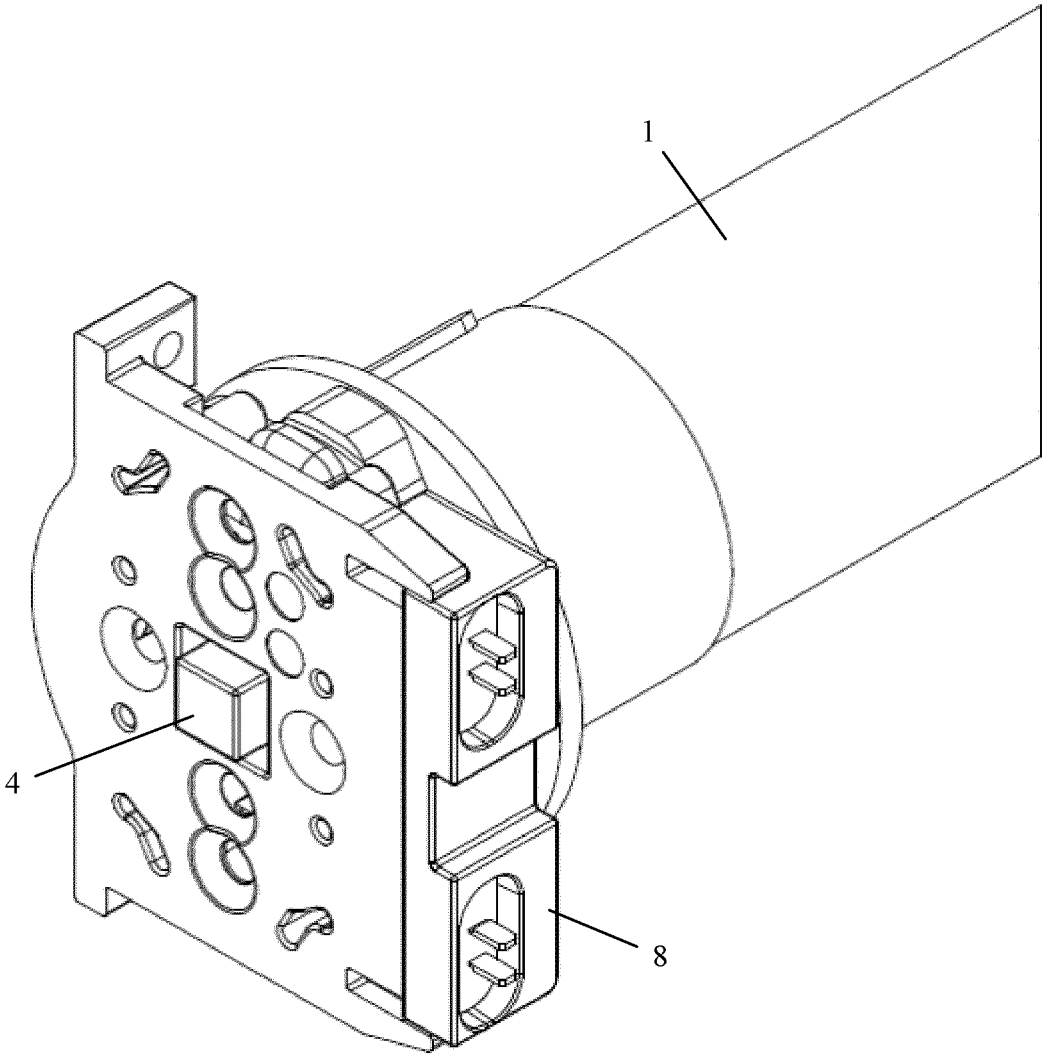

FIG. 1

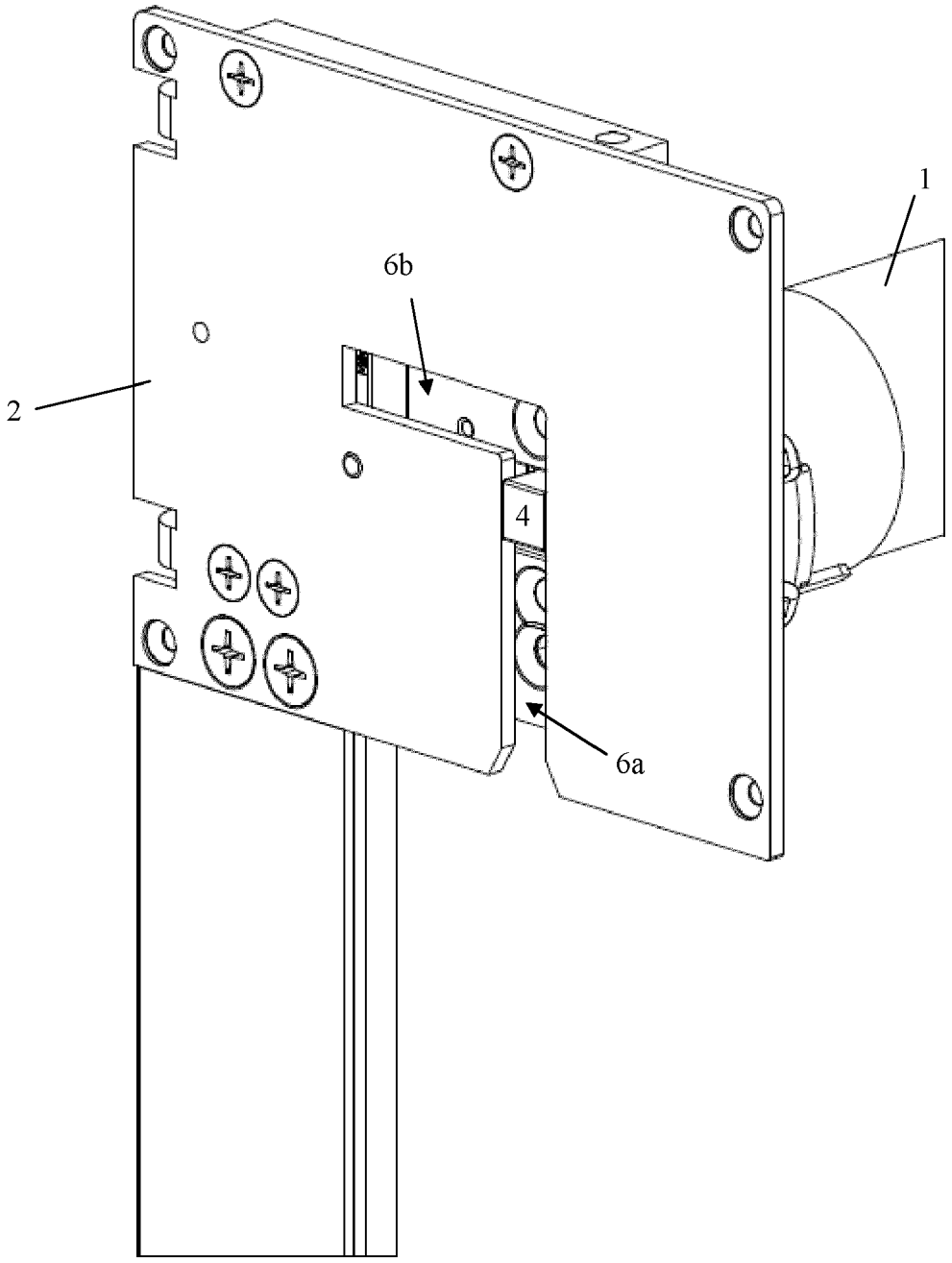

FIG. 2

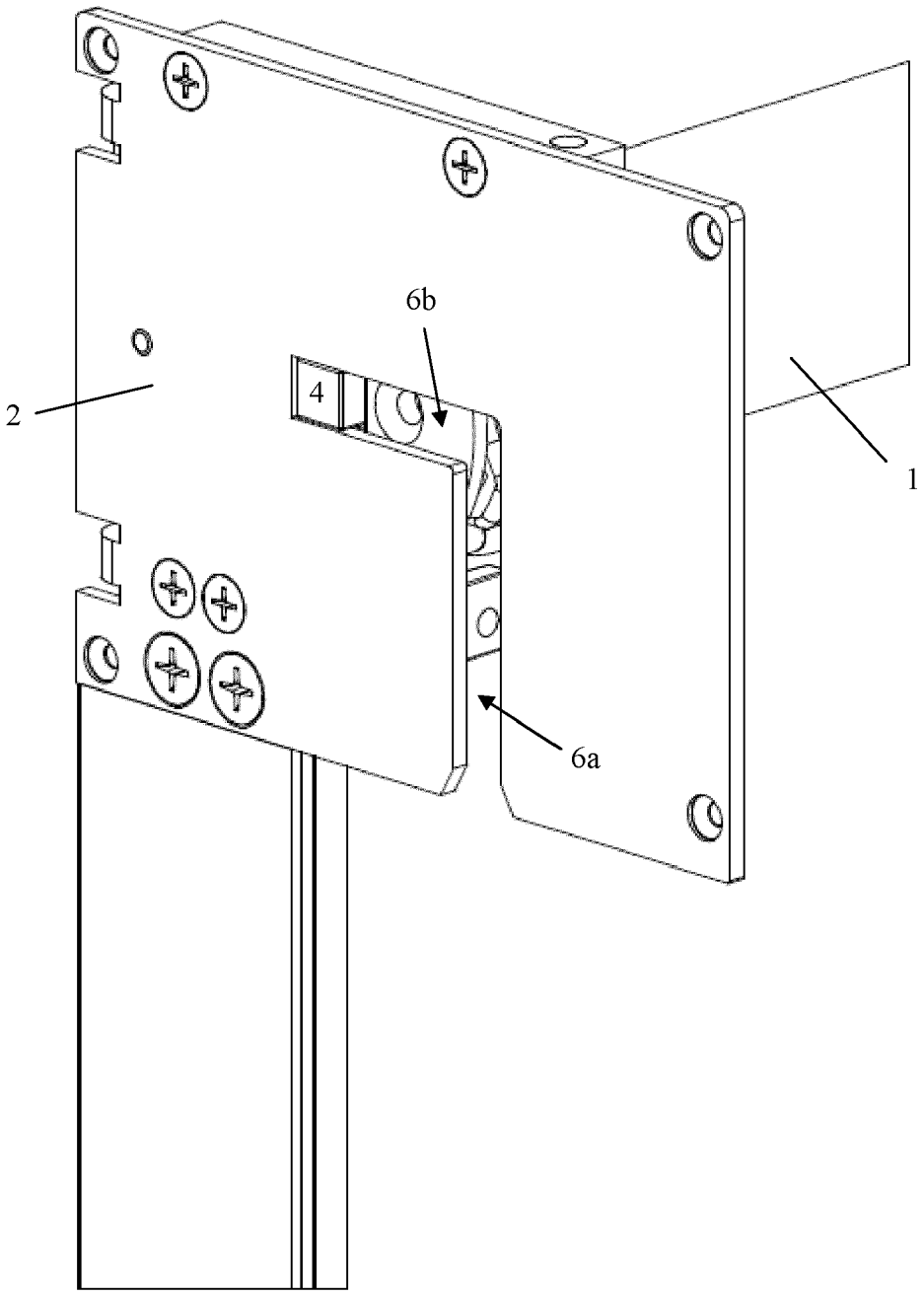

FIG. 3

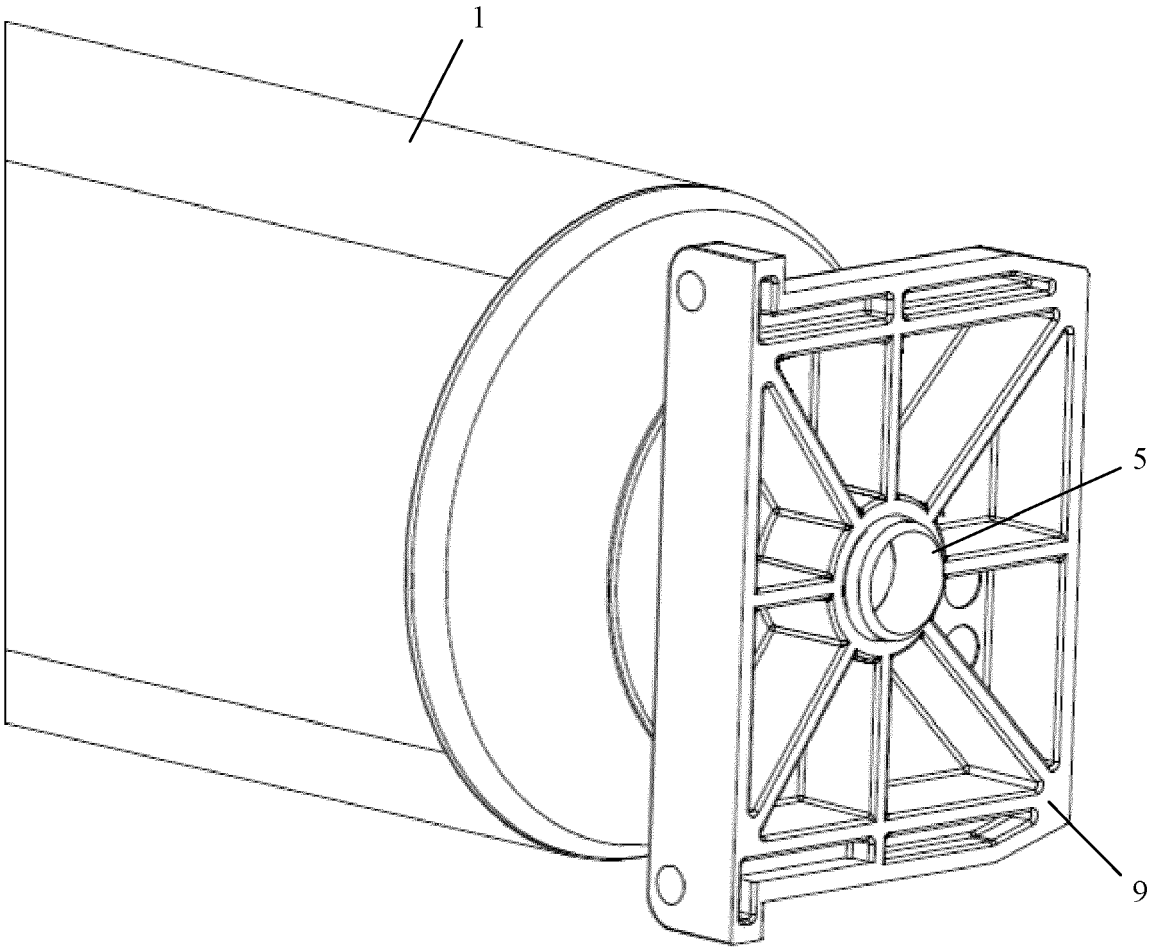

FIG. 4

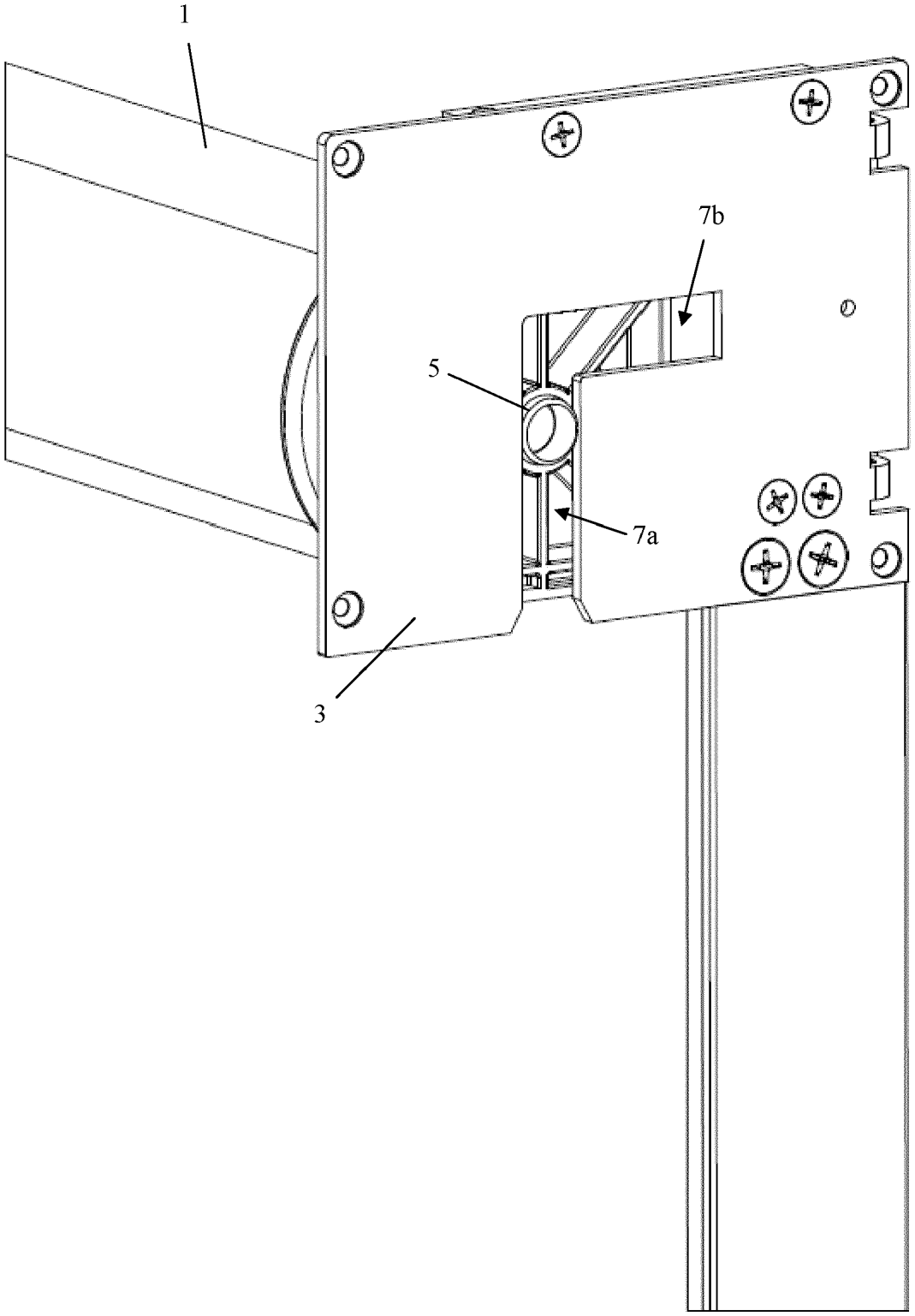

FIG. 5

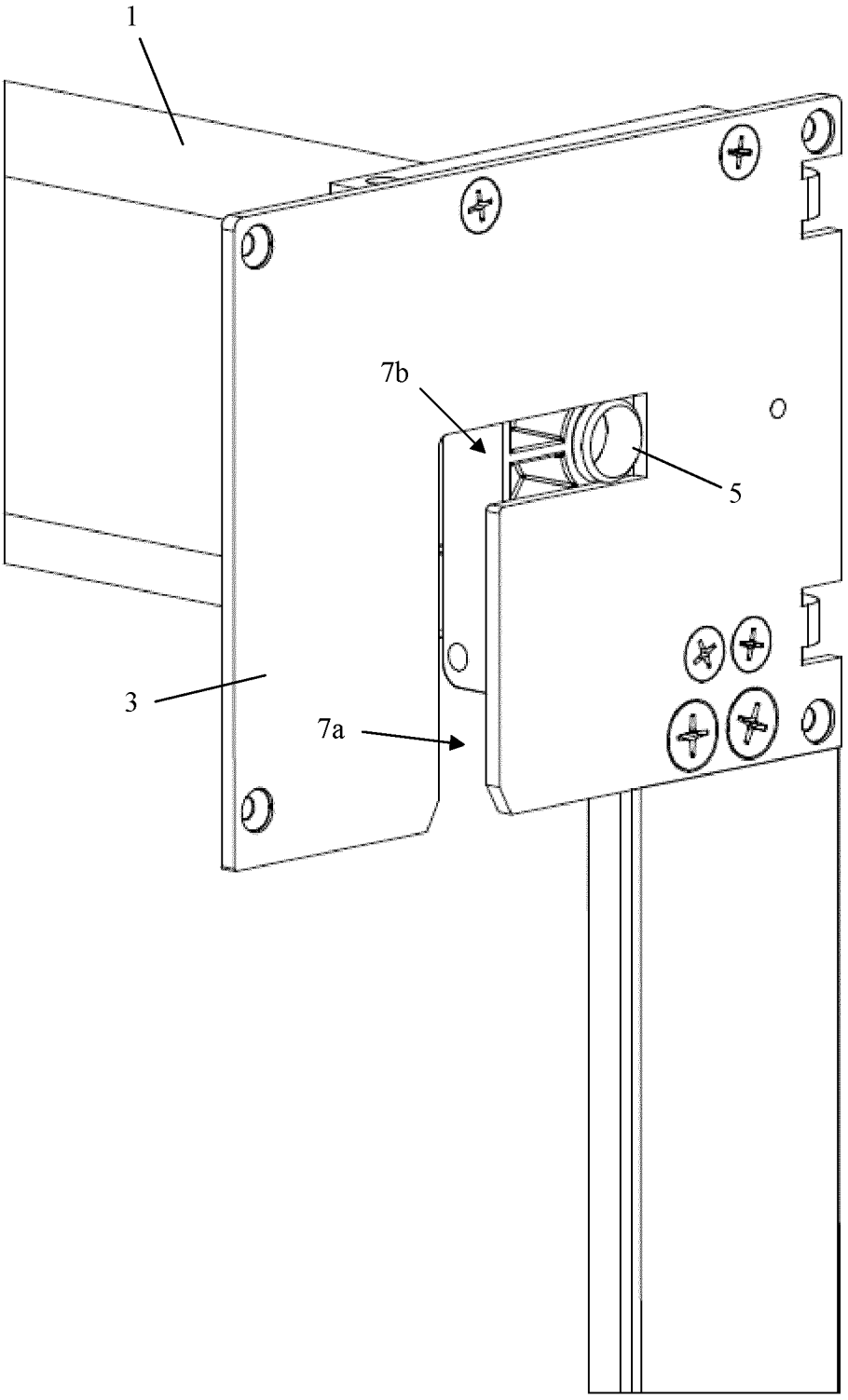

FIG. 6

REFERENCES CITED IN THE DESCRIPTION

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