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(54) **Electric plug connection between head piece and tubular motor of a winding shaft**

Elektrische Steckverbindung zwischen Kopfstück und Rohrmotor einer Wickelwelle

Connecteur électrique entre la tête et le moteur tubulaire d'un arbre d'enroulement

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Description

[0001] This invention relates to a screen device, comprising:

- an upwardly and downwardly rollable screen;
- a motor to drive the upward and downward rolling movement of the screen, comprising one or more electrical wires to incorporate an electrical power supply and/or the earthing of the motor;
- a fixing body, to which an end of the motor is fixable via a linear sliding movement, wherein the aforementioned end of the motor comprises a fixing head which is fixable to the fixing body in order to fix the motor to the fixing body;
- a power supply cable comprising one or more electrical wires, to apply an electrical power supply to and/or to earth the one or more electrical wires of the motor;
- and an electrical connection for the electrical connection of the electrical wires of the power supply cable to the electrical wires of the motor, wherein this electrical connection comprises a male connecting piece and a female connecting piece, wherein the male or the female connecting piece is fittable or fitted to the end of the motor and respectively the female or the male connecting piece is fittable or fitted to the fixing body, wherein the male and the female connecting piece are positioned on the motor and the fixing body in such a way that they are electrically connected via the sliding movement, wherein the male connecting piece comprises one or more contact pins which are electrically connected to one or more electrical wires of the motor or of the power supply cable, wherein the female connecting piece comprises one or more contact sockets which are electrically connected to one or more electrical wires of the power supply cable or respectively the motor, and wherein the contact pins are fittable into respective contact sockets in order to electrically interconnect the respective wires.

[0002] Motorised screen devices, such as, for example, those described in EP 1 443 172, EP 1 207 266, FR 2 821 885 and FR 2 775 729 comprise an electrical connection in order to simplify substantially the installation of the motor and the removal thereof in the event of maintenance or a fault. Instead of having to connect the separate wires of the power supply separately to the motor, as in the screen device from EP 1 764 474, the power supply cable can simply be connected to the motor or disconnected therefrom by fitting the male connecting piece into the female connecting piece or by removing it therefrom.

[0003] In EP 1 443 172, the motor of the screen device described is provided with the male connecting piece. The power supply cable is provided with the female connecting piece. The motor is further provided with a fixing head for the mechanical fixing of the motor to a fixing body in order to incorporate the motor into the screen device. A passage is provided in the fixing head in order to be able to connect the female connecting piece to the male connecting piece through its opening. In this way, the electrical connection is established level with the motor, wherein the latter cannot get in the way when the fixing head is fixed to the fixing body.

[0004] The motors of the screen devices in EP 1 207 266 and in FR 2 821 885 are similarly provided with a fixing head in order to fix said motors to a fixing body in order to incorporate the motor into the screen device. This fixing head of the motor is provided here with the male or the female connecting piece. The power supply cable is provided here respectively with the female or male connecting piece. In the connection thereof, the location of the electrical connection is defined so that it cannot again get in the way when the fixing head is fixed to the fixing body.

[0005] In a motorised screen device as described in EP 1 365 101, FR 2 775 729 and BE-2009/0404, the installation and removal of the motor is further simplified by implementing the electrical connection together with the mechanical connection.

[0006] In EP 1 365 101, the motor is fixed via a linear sliding movement according to the longitudinal axis of the motor to a switchbox as a fixing body. The electrical connection is similarly implemented during the mechanical fixing. The fixing head of the motor is in fact simultaneously the male connecting piece of the electrical connection, whereas the fixing body is provided with the female connecting piece of the electrical connection. In order then to connect the motor to the power supply cable, the power supply cable must still be connected to the switchbox.

[0007] In FR 2 775 729 and BE-2009/0404, a screen device is similarly described wherein the electrical connection is implemented together with the mechanical connection. In this screen device, the motor is fixable to a fixing body of the screen device with the aid of a linear sliding movement at right angles to its axis. The male and the female connecting pieces are electrically connected at the end of this sliding movement.

[0008] However, all of the electrical connections from the prior art have the disadvantage that the connection of the power supply cable to the motor requires a relatively large amount of space, which either renders the installation and removal of the motor difficult, as in the case of the screen devices from EP 1 443 172, EP 1 207 266 and FR 2 821 885, or requires the screen casing to be designed as relatively large, as in the case of the screen devices from EP 1 365 101, FR 2 775 729 and BE-2009/0404.

[0009] If a single connection is provided, wherein the mechanical connection and the electrical connection are implemented together, space must be provided next to the screen roller on which the screen is rolled up in order to be able to implement this connection. This may be

done either in the length of the screen casing, as, for example, in the screen device from EP 1 365 101, or in the width of the screen casing, as in the screen devices from FR 2 775 729 and BE-2009/0404.

[0010] In the screen device from EP 1 365 101, the screen casing, in which the screen roller is fitted together with the motor and the connection, needs to be designed as longer than in the case of the average motorised screen devices. From an aesthetic point of view, this is undesirable in most cases. In order to design the screen casing as symmetrical in relation to the screen, an equally wide projecting part of the screen casing will similarly be provided on the other lateral side of the screen.

[0011] In the screen device from BE-2009/0404, the screen casing, in which this screen roller is fitted together with the motor and the connection, must be designed as relatively much wider than the diameter of the screen and the screen roller. From an aesthetic point of view, this is often undesirable, if the screen casing in this way becomes wider than the frame above which or in front of which it is placed.

[0012] In practice, screen devices of this type will also often be provided with one or more strip guides to guide an understrip, which is fitted to the underside of the screen, during the upward and downward rolling movement of the screen. These are also increasingly provided with screen guides to guide a lateral side of the screen during the upward and downward rolling movement thereof, in order to hold the screen permanently taut. To do this, the lateral sides of the screen are provided with a thickening, which is designed, for example, as a half zip-fastener. These strip guides and/or screen guides are similarly designed here as wider, if they are then required to be positioned on the head pieces of the screen casing. In this way, not only are aesthetically less desirable wide strip guides and/or screen guides produced, but a considerable amount of additional material is also used in order both to design the screen casing as larger and to design the strip guides and/or screen guides as wider.

[0013] The object of this invention is therefore also to provide a screen device, wherein the mechanical and electrical installation and removal of the motor can be carried out simply without the screen casing and the possible screen guides having to be designed as larger.

[0014] This object of the invention is achieved by providing for a screen device according to the present claim 1, comprising:

- an upwardly and downwardly rollable screen;
- a motor to drive the upward and downward rolling movement of the screen, comprising one or more electrical wires to incorporate an electrical power supply and/or the earthing of the motor;
- a fixing body, to which an end of the motor is fixable via a linear sliding movement, wherein the aforementioned end of the motor comprises a fixing head which is fixable to the fixing body in order to fix the motor to the fixing body;
- a power supply cable comprising one or more electrical wires, to apply an electrical power supply to and/or to earth the one or more electrical wires of the motor;
- an electrical connection for the electrical connection of the electrical wires of the power supply cable to the electrical wires of the motor, wherein this electrical connection comprises a male connecting piece and a female connecting piece, wherein the male or the female connecting piece is fittable or fitted to the end of the motor and respectively the female or the male connecting piece is fittable or fitted to the fixing body, wherein the male and the female connecting pieces are positioned on the motor and the fixing body in such a way that they are electrically connected via the sliding movement, wherein the male connecting piece comprises one or more contact pins which are electrically connected to one or more electrical wires of the motor or of the power supply cable, level with a wire end of these one or more electrical wires, wherein the female connecting piece comprises one or more contact sockets which are electrically connected to one or more electrical wires of the power supply cable or respectively the motor, level with a wire end of these one or more electrical wires, wherein the contact pins are fittable into respective contact sockets in order to electrically interconnect the respective wires, wherein the contact pins of each connecting piece are connected with the aid of flag-type contacts to the corresponding wire end of the electrical wires and extend substantially at right angles to the respective wire end of the electrical wires to which said contact pins are connected, wherein the male connecting piece comprises two or more male partial connecting pieces which each comprise a part of the contact pins of the male connecting piece, wherein the female connecting piece comprises two or more corresponding female partial connecting pieces, which each comprise a corresponding part of the contact sockets of the female connecting piece, and wherein the partial connecting pieces of the male or the female connecting piece are each fittable or fitted essentially in a separate corner of the described beam shape of the fixing head.

[0015] By having the contact pins and the contact sockets extend substantially at right angles to the wire ends of the corresponding electrical wires, the electrical connection can be designed as considerably more compact than in the prior art. The most space is gained if the contact pins of the male connecting piece extend substantially at right angles to the wire ends of the electrical wires to which they are connected and if the contact sockets of the female connecting piece extend substantially at right angles to wire ends of the electrical wires to which they are connected.

[0016] The motor is preferably fixable to the fixing body

by means of a linear sliding movement at right angles to its axis.

[0017] By fixing the motor to the fixing body via a linear sliding movement at right angles to its axis, said motor can also be simply installed in and removed from a housing of a screen which is installed above a frame. Because the electrical connection is implemented via the sliding movement, it does not need to be separately connected and disconnected. This combined mechanical and electrical connection can of course also be used in screen devices for surface mounting, which are mounted in front of a frame, instead of the aforementioned screen devices for flush-mounting, which are positioned above a frame.

[0018] More specifically, the fixing head may comprise one or more guide slots and/or one or more guide ribs, wherein the fixing body then respectively comprises one or more corresponding guide ribs and/or guide slots, and wherein, when the fixing head is fixed to the fixing body, the one or more guide ribs are guided into the corresponding one or more guide slots during the linear sliding movement.

[0019] Due to these guide slots and the guide ribs, the electrical connection is securely implemented in the correct position, and is not slanting or upside down, etc.

[0020] In addition, the motor may also be attached to the fixing body with the aid of fixing means, such as, for example, screws.

[0021] A particular screen device according to this invention comprises a housing wherein the aforementioned fixing body forms part of the housing and, for example, closes this housing at one end.

[0022] In order to be able to design the screen device as particularly compact, the male or the female connecting piece extends in the installed condition of the screen device preferably essentially into an area adjacent to the fixing head which can be defined by the contact areas of the fixing head which extend at right angles to the axis of the motor.

[0023] Even more preferably, the fixing head is designed as essentially cylindrical and the male or the female connecting piece is essentially fixable or fitted within the described beam shape of the fixing body.

[0024] More specifically, the motor comprises four electrical wires, the power supply cable comprises four corresponding electrical wires, the male connecting piece comprises four contact pins which are electrically connected to the four electrical wires of the motor or to the four electrical wires of the power supply cable, the female connecting piece comprises four contact sockets which are electrically connected respectively to the four electrical wires of the power supply cable or the four electrical wires of the motor, the male connecting piece comprises two partial connecting pieces, which each comprise two of the four contact pins, and the female connecting piece comprises two partial connecting pieces, which each comprise two of the four contact sockets.

[0025] Furthermore, a screen device according to this invention preferably comprises one or more strip guides to guide an understrip which is fixed to the underside of the screen, during the upward and downward rolling movement of the screen, wherein these one or more strip guides are provided with a chamber in which the power supply cable is fittable.

[0026] Even more preferably, a screen device according to this invention comprises one or more screen guides to guide a lateral side of the screen during the upward and downward rolling movement thereof, wherein these one or more screen guides are provided with a chamber in which the power supply cable is fittable. A chamber of this type may be an enclosed chamber, but may also be the space within a recess or void.

[0027] Such a chamber of a strip guide and/or screen guide is then preferably provided in the longitudinal direction with a slot through which the power supply cable is fittable into the chamber.

[0028] This slot then preferably has a width which is smaller than the diameter of the power supply cable.

[0029] In this way, the power supply cable can be fitted through the slot into the chamber without automatically being able to come back out.

[0030] In order to design the electrical connection in a screen device according to this invention as watertight, the male connecting piece is preferably provided with a raised edge, within which one or more of the contact pins are placed, and the female connecting piece is provided with a raised part corresponding to this raised edge, in which one or more contact sockets corresponding to these contact pins are placed, wherein this raised part of the female connecting piece is fittable into the raised edge of the male connecting piece, so that, when this raised part of the female connecting piece is fitted into the raised edge of the male connecting piece, the corresponding contact pins are fitted into the corresponding contact sockets.

[0031] The raised edge of the male connecting piece is then preferably produced here from a harder material than the raised part of the female connecting piece.

[0032] This invention is now explained in detail with reference to the following detailed description of a preferred screen device according to this invention. The purpose of this description is exclusively to provide illustrative examples and to indicate further advantages and special features of this screen device, and may therefore in no way be interpreted as a limitation of the scope of application of the invention or of the patent rights asserted in the claims.

[0033] In this detailed description, reference numbers are used to refer to the drawings attached hereto, in which:

- ***Figure 1*** shows a side view of the motor and the fixing body of the preferred embodiment of a screen device according to this invention in the connected condition;
- ***Figure 2*** shows a rear view of a part of the motor and the fixing body from Figure 1 in the connected

condition;

- ***Figure 3*** shows a view of the female connecting piece of the electrical connection of the preferred screen device, with the contact sockets at the back;
- ***Figure 4*** shows a view of the female connecting piece from Figure 3 with the contact sockets on top;
- ***Figures 5*** shows a view of the male connecting piece of the electrical connection of the preferred screen device, with the contact pins at the front;
- ***Figure 6*** shows a view of the male connecting piece from Figure 5 with the contact sockets underneath;
- ***Figure 7*** shows a view of the electrical wiring from the female connecting piece from Figure 5 with the contact sockets at the front;
- ***Figure 8*** shows a view of the electrical wiring of an alternative embodiment of the female connecting piece of a screen device according to this invention, viewed with the contact sockets at the front;
- ***Figure 9*** shows a view of the electrical wiring of the male connecting piece from Figure 6 with the contact sockets at the front;
- ***Figure 10*** shows a side view of the fixing body of the preferred embodiment of a screen device according to this invention, with alternative locations for the power supply cable;
- ***Figure 11*** shows a cut-away perspective view of a part of the preferred embodiment of a screen device according to the invention, with the motor and the fixing body in the disconnected condition.

[0034] The motorised screen device according to this invention comprises an upwardly and downwardly rollable screen and a motor (1) to drive the upward and downward rolling movement of the screen. The motor (1) of this screen device is shown in Figures 1, 2 and 11. Furthermore, this screen device comprises a housing, which is constructed from a plurality of parts, also including a fixing body (9), which is provided in order to close (at least partially) an end of this screen device. The fixing body (9) is shown in Figures 1, 2, 10 and 11. An end of the motor (1) is fixable to this fixing body (9) via a linear sliding movement at right angles to its axis (A). For this purpose, the motor (1) comprises a fixing head (10) on this end, which is fixable to the fixing body (9) in order to fix the motor (1) to the fixing body (9). To do this, the fixing head (10) is mounted on a guide piece (19), wherein this guide piece (19) is fixable to the fixing body (9).

[0035] The motor (1) comprises four electrical wires (3) to incorporate an electrical power supply and to earth the motor (1). In practice, motors (1) of motorised screen devices often have two or three electrical wires (3) to incorporate an electrical power supply and/or the earthing of the motor (1).

[0036] In addition, this screen device comprises a power supply cable (5) with four electrical wires (7) to apply an electrical power supply to the corresponding electrical wires (3) of the motor (1) and to earth the motor (1) via the corresponding electrical wire (3). In the case of screen devices with motors (1) which have two or three electrical wires (3), this power supply cable (5) preferably also has only two or respectively three electrical wires (7).

[0037] In order to electrically connect the electrical wires (7) of this power supply cable (5) to the electrical wires (3) of the motor (1), this screen device further comprises an electrical connection. This electrical connection comprises a male connecting piece (2), which is shown separately in Figures 5 and 6, and a female connecting piece (6), which is shown separately in Figures 3 and 4.

[0038] The male connecting piece (2), seen here in a direction at right angles to the axis (A) of the motor (1), is detachably fixable with the aid of a snap-on connection (20) to the aforementioned guide piece (19), adjacent to the fixing head (10). In the assembled condition, this connecting piece (2) extends essentially out into an area adjacent to the fixing head (10), which is defined by the contact areas of the fixing head (10), which extend at right angles to the axis (A) of the motor (1). As shown in Figure 1, the fixing head (10) is designed as essentially cylindrical, wherein the male connecting piece (2) is fixable to the guide piece (19) essentially within the described beam shape of the fixing head (10). The female connecting piece (6) is fitted to the fixing body (9). The female connecting piece (6) could equally well be provided on the fixing head (10), wherein the male connecting piece (2) is then provided on the fixing body (9). The male connecting piece (2) and the female connecting piece (6) are positioned on the motor (1) and the fixing body (9) in such a way that they are electrically connected when the motor (1) is fixed to the fixing body (9) at the end of the sliding movement. In this way, the installation and removal of the motor (1) are extremely simple.

[0039] As shown in Figures 3 and 4, the female connecting piece (6) comprises four contact sockets (8), which are electrically connected with the aid of so-called flag-type contacts to the wire ends of the electrical wires (7) of the power supply cable (5), as shown in Figure 7. In this way, the contact sockets (8) extend substantially at right angles to the wire ends of the electrical wires (7) to which they are connected. Figure 8 shows an alternative arrangement of the electrical wires (7) of the power supply cable (5) in the female connecting piece (6), wherein the power supply cable (5) is connected on the opposite side of the female connecting piece (6) compared with the female connecting piece (6) as shown in Figures 3, 4 and 7.

[0040] The female connecting piece (6) further comprises two partial connecting pieces (6a, 6b), as shown in Figures 3 and 4, which each comprise two of the contact sockets (8).

[0041] The male connecting piece (2) comprises four contact pins (4), as shown in Figures 5 and 6, which are electrically connected with the aid of so-called flag-type contacts to the wire ends of the electrical wires (3) of the motor (1), as shown in Figure 9. In this way, the contact pins (4) extend substantially at right angles to the wire ends of electrical wires (3) to which they are connected.

[0042] The male connecting piece (2) further comprises two partial connecting pieces (2a, 2b), as shown in Figures 5 and 6, which each comprise two of the contact pins (4).

[0043] Figure 1 shows how, in the fixed condition of the male connecting piece (2) next to the fixing head (10), these partial connecting pieces (2a, 2b) are each located essentially in a separate corner of the described beam shape of the fixing head (10).

[0044] The contact pins (4) of the male connecting piece (2) are fixable in the contact sockets (8) of the female connecting piece (6) in order to electrically interconnect the respective electrical wires (3, 7). When the male connecting piece (2) is connected to the female connecting piece (6), the respective partial connecting pieces (2a, 2b, 6a, 6b) are interconnected.

[0045] In the case of motorised screen devices with a motor (1) with 2 or 3 electrical wires, the electrical connection is of course also adapted accordingly.

[0046] In order to be able to implement the electrical connection as watertight, the male connecting piece (2) is provided on each partial connecting piece (2a, 2b) with a raised edge (14), within which two of the four contact pins (4) are in each case located. The female connecting piece (6) is correspondingly provided on each partial connecting piece (6a, 6b) with a raised part (15) corresponding to this raised edge (14), in which two of the contact sockets (8) are in each case located. The raised part (15) of a partial connecting piece (6a, 6b) of the female connecting piece (6) is fittable into the corresponding raised edge (14) of the corresponding partial connecting piece (2a, 2b) of the male connecting piece (2). When this raised part (15) is fitted into the raised edge (14), the corresponding contact pins (4) are fitted into the corresponding contact sockets (8). Furthermore, the raised edges (14) of the male connecting piece (2) are produced from a harder material than the raised parts (15) of the female connecting piece (6), so that the softer material of the female connecting piece (6) can perform a sealing function during the connection. To reinforce this sealing function, the raised parts (15) are provided in this embodiment with sealing edges (16).

[0047] In order to be able to implement the fixing of the motor (1) to the fixing body (9) via a linear sliding movement at right angles to the axis (A) of the motor (1), the guide piece (19) on the fixing head (10) is provided with guide ribs on one side. The fixing body (9) is provided with corresponding guide slots on the other side. The linear sliding movement can be started by moving the motor (1) towards the fixing body (9), so that the guide ribs of the guide piece (19) engage in the guide slots of the fixing body (9). During the linear sliding movement, the guide ribs are then guided into the guide slots, until the motor (1) and the fixing body (9) are connected. The electrical connection of the male (2) and the female connecting piece (6) is also implemented in this connected position. The guide piece (19) on the fixing head (10) of the motor (1) can furthermore be attached to the fixing body (9) with one or more screws in the connected position.

[0048] In Figure 1, the motor (1) must be moved to the right in relation to the fixing body (9) in order to disconnect said motor. In Figure 2, the motor (1) must be moved backwards in relation to the fixing body (9) in order to disconnect said motor. In Figure 11, the motor (1) must be moved forwards obliquely to the left in relation to the fixing body (9) in order to connect said motor, and backwards obliquely to the right in order to disconnect said motor once more.

[0049] Figure 10 shows alternative locations (5a, 5b, 5c, 5d) of the power supply cable (5) in a screen device according to this invention. In practice, these different illustrated power supply cables (5a, 5b, 5c, 5d) will not be present simultaneously. If the power supply cable (5) assumes one of the positions (5a, 5b) on top of the screen casing, the female connecting piece (6) can then be designed with a wiring as shown in Figure 8. If the power supply cable (5) assumes one of the positions (5c, 5d) underneath the screen casing, the female connecting piece (6) can then be designed with a wiring as shown in Figure 7. The position (5d) completely underneath the screen casing is the position which the power supply cable (5) assumes in Figures 1, 2 and 11.

[0050] The preferred screen device furthermore also comprises strip guides (11) to guide the understrip, which is attached to the underside of the screen, during the upward and downward rolling movement of the screen. A strip guide (11) of this type is shown in Figure 11. This strip guide (11) is provided with a chamber (12) in which the power supply cable (5) is fittable. In the longitudinal direction of the strip guide (11), this chamber (12) is provided with a slot (13) through which the power supply cable (5) is fittable into the chamber (12). This slot (13) has a width which is narrower than the diameter of the power supply cable (5), so that the power supply cable (5) can in fact be pushed through under force, but cannot automatically come back out. Thanks to this slot (13), the power supply cable (5) can be retrieved from the chamber (12) at the location of a further connection of the power supply cable (5). In order to fit the power supply cable (5) into the chamber (12), it can also be fitted via an end of the strip guide (11) into this chamber (12). The chamber (12) is designed as sufficiently deep so that the power supply cable (5) can run alongside a screw which is fitted into the opening (18) in order to fix the housing of this screen device to the fixing body (9).

[0051] The fixing body (9) comprises a pin (17) in order to position the fixing body (9) correctly in relation to the strip guide (11) and to connect it detachably to the strip guide (11). The fixing body (9) further comprises a free space between the opening (18) and this pin (17), which is sufficiently large so that the power supply cable (5) can run via this free space to the chamber (12).

Claims

1. Screen device comprising:

- an upwardly and downwardly rollable screen;
- a motor (1) to drive the upward and downward rolling movement of the screen, comprising one or more electrical wires (3) to incorporate an electrical power supply and/or the earthing of the motor (1);
- a fixing body (9), to which an end of the motor (1) is fixable via a linear sliding movement, wherein the aforementioned end of the motor (1) comprises a fixing head (10) which is fixable to the fixing body (9) in order to fix the motor (1) to the fixing body (9);
- a power supply cable (5) comprising one or more electrical wires (7), to apply an electrical power supply to and/or to earth the one or more electrical wires (3) of the motor (1);
- an electrical connection for the electrical connection of the electrical wires (7) of the power supply cable (5) to the electrical wires (3) of the motor (1), wherein this electrical connection comprises a male connecting piece (2) and a female connecting piece (6), wherein the male (2) or the female connecting piece (6) is fittable or fitted to the end of the motor (1) and respectively the female (6) or the male connecting piece (2) is fittable or fitted to the fixing body (9), wherein the male and the female connecting pieces (2, 6) are positioned on the motor (1) and the fixing body (9) in such a way that they are electrically connected via the sliding movement, wherein the male connecting piece (2) comprises one or more contact pins (4) which are electrically connected to one or more electrical wires (3, 7) of the motor (1) or of the power supply cable (5), level with a wire end of these one or more electrical wires (3, 7), wherein the female connecting piece (6) comprises one or more contact sockets (8) which are electrically connected to one or more electrical wires (7, 3) of the power supply cable (5) or respectively the motor (1), level with a wire end of these one or more electrical wires (3, 7), and wherein the contact pins (4) are fittable into respective contact sockets (8) in order to electrically interconnect the respective wires (3, 7);

characterised in that the contact pins (4) of each connecting piece (2) are connected with the aid of flag-type contacts to the corresponding wire end of the electrical wires (3, 7) and extend substantially at right angles to the respective wire end of the electrical wires (3, 7) to which they are connected, **in that** the male connecting piece (2) comprises two or more male partial connecting pieces (2a, 2b) which each comprise a part of the contact pins (4) of the male connecting piece (2), **in that** the female connecting piece (6) comprises two or more corresponding female partial connecting pieces (6a, 6b), which each comprise a corresponding part of the contact sockets (8) of the female connecting piece (6), and **in that** the partial connecting pieces (2a, 2b) of the male (2) or the female connecting piece (6) are each fittable or fitted essentially in a separate corner of the described beam shape of the fixing head (10).

2. Screen device according to Claim 1, **characterised in that** the motor (1) is fixable to the fixing body (9) by means of a linear sliding movement at right angles to its axis (A).

3. Screen device according to claim 1 or 2, **characterised in that** the male (2) or the female connecting piece (6) extends, in the assembled condition of the screen device, essentially into an area adjacent to the fixing head (10), which is defined by the contact areas of this fixing head (10), which extend at right angles to the axis (A) of the motor (1).

4. Screen device according to Claim 3, **characterised in that** the fixing head (10) is designed as essentially cylindrical and that the male (2) or the female (6) connecting piece is fittable or fitted essentially within the described beam shape of the fixing head (10).

5. Screen device according to one of the preceding claims, **characterised in that** the motor (1) comprises four electrical wires (3), **in that** the power supply cable (5) comprises four corresponding electrical wires (7), **in that** the male connecting piece (2) comprises four contact pins (4), which are electrically connected to the four electrical wires (3) of the motor (1) or to the four electrical wires (7) of the power supply cable (5), **in that** the female connecting piece (6) comprises four contact sockets (8), which are electrically connected respectively to the four electrical wires (7) of the power supply cable (5) or the four electrical wires (3) of the motor (1), **in that** the male connecting piece (2) comprises two partial connecting pieces (2a, 2b) which each comprise two of the four contact pins (4), and **in that** the female connecting piece (6) comprises two partial connecting pieces (6a, 6b), which each comprise two of the four contact sockets (8).

6. Screen device according to one of the preceding claims, **characterised in that** the male connecting piece (2) is provided with a raised edge (14), within which one or more of the contact pins (4) are placed, and **in that** the female connecting piece (6) is provided with a raised part (15) corresponding to this raised edge (14), in which one or more contact sockets (8) corresponding to these contact pins (4) are

placed, wherein this raised part (15) of the female connecting piece (6) is fittable into the raised edge (14) of the male connecting piece (2), so that, when this raised part (15) of the female connecting piece (6) is fitted into the raised edge (14) of the male connecting piece (2), the corresponding contact pins (4) are fitted into the corresponding contact sockets (8).

7. Screen device according to claim 6, **characterised in that** the raised edge (14) of the male connecting piece (2) is produced from a harder material than the raised part (15) of the female connecting piece (6).

Patentansprüche

1. Abschirmungsvorrichtung, die Folgendes umfasst:

- eine aufwärts und abwärts rollbare Abschirmung;
- einen Motor (1) zum Antreiben der Aufwärts- und Abwärtsrollbewegung der Abschirmung, der einen oder mehrere elektrische Drähte (3) umfasst, um eine elektrische Stromversorgung und/oder die Erdung des Motors (1) zu integrieren;
- einen Befestigungskörper (9), an dem ein Ende des Motors (1) über eine lineare Gleitbewegung befestigt werden kann, wobei das vorhergehend erwähnte Ende des Motors (1) einen Befestigungskopf (10) umfasst, der an dem Befestigungskörper (9) befestigt werden kann, um den Motor (1) an dem Befestigungskörper (9) zu befestigen;
- ein Stromversorgungskabel (5), das einen oder mehrere elektrische Drähte (7) umfasst, um eine elektrische Stromversorgung an den einen oder die mehreren elektrischen Drähte (3) des Motors (1) anzulegen und/oder sie zu erden;
- eine elektrische Verbindung für die elektrische Verbindung der elektrischen Drähte (7) des Stromversorgungskabels (5) mit den elektrischen Drähten (3) des Motors (1), wobei diese elektrische Verbindung ein Steckerteil (2) und ein Buchsenteil (6) umfasst, wobei das Stecker- (2) oder das Buchsenteil (6) mit dem Ende des Motors (1) zusammengefügt werden kann oder zusammengefügt ist beziehungsweise das Buchsen- (6) oder das Steckerteil (2) mit dem Befestigungskörper (9) zusammengefügt werden kann oder zusammengefügt ist, wobei das Buchsen- und das Steckerteil (2, 6) derart auf dem Motor (1) und dem Befestigungskörper (9) positioniert sind, dass sie elektrisch über die Gleitbewegung verbunden werden, wobei das Steckerteil (2) einen oder mehrere Kontaktstifte (4) umfasst, die elektrisch mit einem oder mehreren elektrischen Drähten (3, 7) des Motors (1) oder des Stromversorgungskabels (5) eben mit einem Drahtende von diesem einen oder diesen mehreren elektrischen Drähten (3, 7) verbunden sind, wobei das Buchsenteil (6) eine oder mehrere Kontakthülsen (8) umfasst, die elektrisch mit einem oder mehreren elektrischen Drähten (7, 3) des Stromversorgungskabels (5) beziehungsweise des Motors (1) eben mit einem Drahtende von diesem einen oder diesen mehreren elektrischen Drähten (3, 7) verbunden sind, und wobei die Kontaktstifte (4) in entsprechende Kontakthülsen (8) eingepasst werden können, um die entsprechenden Drähte (3, 7) elektrisch miteinander zu verbinden;

dadurch gekennzeichnet, dass die Kontaktstifte (4) von jedem Verbindungsteil (2) mit der Hilfe von fähnchenartigen Kontakten mit dem entsprechenden Drahtende der elektrischen Drähte (3, 7) verbunden sind und sich in im Wesentlichen rechten Winkeln zum entsprechenden Drahtende der elektrischen Drähte (3, 7) erstrecken, mit denen sie verbunden sind, dadurch, dass das Steckerteil (2) zwei oder mehr Teilstecker-Verbindungsteile (2a, 2b) umfasst, die jeweils einen Teil der Kontaktstifte (4) des Steckerteils (2) umfassen, dadurch dass das Buchsenteil (6) zwei oder mehr entsprechende Teilbuchsen-Verbindungsteile (6a, 6b) umfasst, die jeweils einen entsprechenden Teil der Kontakthülsen (8) des Buchsenteils (6) umfassen, und dadurch, dass die Teilverbindungsteile (2a, 2b) des Stecker- (2) oder des Buchsenteils (6) jeweils in einer getrennten Ecke der beschriebenen Balkenform des Befestigungskopfs (10) eingepasst werden können oder eingepasst sind.

2. Abschirmungsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Motor (1) mittels einer linearen Gleitbewegung in rechten Winkeln zu seiner Achse (A) an dem Befestigungskörper (9) befestigt werden kann.

3. Abschirmungsvorrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Stecker- (2) oder das Buchsenteil (6) sich im zusammengebauten Zustand der Abschirmungsvorrichtung im Wesentlichen in einen Bereich erstreckt, der dem Befestigungskopf (10) benachbart ist, der durch die Kontaktbereiche dieses Befestigungskopfs (10) abgegrenzt ist, die sich in rechten Winkeln zur Achse (A) des Motors (1) erstrecken.

4. Abschirmungsvorrichtung nach Anspruch 3, **dadurch gekennzeichnet, dass** der Befestigungskopf (10) im Wesentlichen zylindrisch konstruiert ist, und dass das Stecker- (2) oder das Buchsenteil (6) im Wesentlichen innerhalb der beschriebenen Balkenform des Befestigungskopfs (10) eingepasst werden

können oder eingepasst sind.

5. Abschirmungsvorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Motor (1) vier elektrische Drähte (3) umfasst, dadurch, dass das Stromversorgungskabel (5) vier entsprechende elektrische Drähte (7) umfasst, dadurch, dass das Steckerteil (2) vier Kontaktstifte (4) umfasst, die elektrisch mit den vier elektrischen Drähten (3) des Motors (1) oder mit den vier elektrischen Drähten (7) des Stromversorgungskabels (5) verbunden sind, dadurch, dass das Buchsenteil (6) vier Kontakthülsen (8) umfasst, die elektrisch mit den vier elektrischen Drähten (7) des Stromversorgungskabels (5) beziehungsweise den vier elektrischen Drähten (3) des Motors (1) verbunden sind, dadurch, dass das Steckerteil (2) zwei Teilverbindungsteile (2a, 2b) umfasst, die jeweils zwei der vier Kontaktstifte (4) umfassen, und dadurch, dass die Kontaktbuchse (6) zwei Teilkontaktteile (6a, 6b) umfasst, die jeweils zwei der vier Kontakthülsen (8) umfassen.

6. Abschirmungsvorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Steckerteil (2) mit einem erhabenen Rand (14) versehen ist, in dem einer oder mehrere der Kontaktstifte (4) untergebracht sind, und dadurch, dass das Buchsenteil (6) mit einem erhabenen Teil (15) versehen ist, der diesem erhabenen Rand (14) entspricht, in dem eine oder mehrere Kontakthülsen (8) untergebracht sind, die diesen Kontaktstiften (4) entsprechen, wobei dieser erhabene Teil (15) des Buchsenteils (6) derart im erhabenen Rand (14) des Steckerteils (2) eingepasst werden kann, dass, wenn dieser erhabene Teil (15) des Buchsenteils (6) in den erhabenen Rand (14) des Verbindungsteils (2) eingepasst wird, die entsprechenden Kontaktstifte (4) in den entsprechenden Kontakthülsen (8) eingepasst werden.

7. Abschirmungsvorrichtung nach Anspruch 6, **dadurch gekennzeichnet, dass** der erhabene Rand (14) des Steckers (2) aus einem härteren Material hergestellt ist als der erhabene Teil (15) des Buchsenteils (6).

Revendications

1. Dispositif d'écran comprenant :

   - un écran enroulable vers le haut et vers le bas ;
   - un moteur (1) pour entraîner le mouvement d'enroulement vers le haut et vers le bas de l'écran, comprenant un ou plusieurs fils électriques (3) pour incorporer une alimentation électrique et/ou la terre du moteur (1) ;
   - un corps de fixation (9), auquel une extrémité du moteur (1) peut être fixée par l'intermédiaire d'un mouvement de coulissement linéaire, dans lequel ladite extrémité du moteur (1) comprend une tête de fixation (10) qui peut être fixée au corps de fixation (9) afin de fixer le moteur (1) au corps de fixation (9) ;
   - un câble d'alimentation électrique (5) comprenant un ou plusieurs fils électriques (7), pour appliquer une alimentation électrique à l'un ou plusieurs fils électriques (3) du moteur (1) et/ou pour les mettre à la terre ;
   - une connexion électrique pour la connexion électrique des fils électriques (7) du câble d'alimentation électrique (5) aux fils électriques (3) du moteur (1), dans lequel cette connexion électrique comprend une pièce de connexion mâle (2) et une pièce de connexion femelle (6), dans lequel la pièce de connexion mâle (2) ou la pièce de connexion femelle (6) peut être ajustée ou est ajustée sur l'extrémité du moteur (1) et respectivement la pièce de connexion femelle (6) ou la pièce de connexion mâle (2) peut être ajustée ou est ajustés sur le corps de fixation (9), dans lequel les pièces de connexion mâle et femelle (2, 6) sont positionnées sur le moteur (1) et le corps de fixation (9) de telle manière qu'elles soient connectées électriquement par l'intermédiaire du mouvement de coulissement, dans lequel la pièce de connexion mâle (2) comprend une ou plusieurs broches de contact (4) qui sont connectées électriquement à un ou plusieurs fils électriques (3, 7) du moteur (1) ou du câble d'alimentation électrique (5), à niveau avec une extrémité de fil desdits un ou plusieurs fils électriques (3, 7), dans lequel la pièce de connexion mâle (6) comprend une ou plusieurs prises de contact (8) qui sont connectées électriquement à un ou plusieurs fils électriques (7, 3) du câble d'alimentation électrique (5) ou respectivement au moteur (1), à niveau avec une extrémité de fil desdits un ou plusieurs fils électriques (3, 7), et dans lequel les broches de contact (4) peuvent être ajustées dans des prises de contact respectives (8) pour interconnecter électriquement les fils respectifs (3, 7) ;

caractérisé en ce que les broches de contact (4) de chaque pièce de connexion (2) sont connectées à l'aide de contacts de type à drapeau à l'extrémité de fil correspondante des fils électriques (3, 7) et s'étendent sensiblement perpendiculairement à l'extrémité de fil respective des fils électriques (3, 7) auxquels elles sont connectées, **en ce que** la pièce de connexion mâle (2) comprend deux pièces de connexion partielle mâles ou plus (2a, 2b) comprenant chacune une partie des broches de contact (4) de la pièce de connexion mâle (2), **en ce que** la pièce de connexion femelle (6) comprend deux pièces de con-

nexion partielle femelles correspondantes ou plus (6a, 6b) comprenant chacune une partie correspondante des prises de contact (8) de la pièce de connexion femelle (6), et **en ce que** chacune des pièces de connexion partielle (2a, 2b) de la pièce de connexion mâle (2) ou de la pièce de connexion femelle (6) peut être ajustée ou est ajustée sensiblement dans un coin distinct de la forme de poutre décrite de la tête de fixation (10).

2. Dispositif d'écran selon la revendication 1, **caractérisé en ce que** le moteur (1) peut être fixé au corps de fixation (9) au moyen d'un mouvement de coulissement linéaire perpendiculairement à son axe (A).

3. Dispositif d'écran selon la revendication 1 ou 2, **caractérisé en ce que** la pièce de connexion mâle (2) ou la pièce de connexion femelle (6) s'étend, dans l'état assemblé du dispositif d'écran, sensiblement dans une zone adjacente à la tête de fixation (10), qui est définie par les zones de contact de cette tête de fixation (10), qui s'étend perpendiculairement à l'axe (A) du moteur (1).

4. Dispositif d'écran selon la revendication 3, **caractérisé en ce que** la tête de fixation (10) est conçue sous forme sensiblement cylindrique et **en ce que** la pièce de connexion mâle (2) ou la pièce de connexion femelle (6) peut être ajustée ou est ajustée sensiblement à l'intérieur de la forme de poutre décrite de la tête de fixation (10).

5. Dispositif d'écran selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le moteur (1) comprend quatre fils électriques (3), **en ce que** le câble d'alimentation électrique (5) comprend quatre fils électriques correspondants (7), **en ce que** la pièce de connexion mâle (2) comprend quatre broches de contact (4), qui sont connectées électriquement aux quatre fils électriques (3) du moteur (1) ou aux quatre fils électriques (7) du câble d'alimentation électrique (5), **en ce que** la pièce de connexion femelle (6) comprend quatre prises de contact (8), qui sont électriquement connectées respectivement aux quatre fils électriques (7) du câble d'alimentation électrique (5) ou aux quatre fils électriques (3) du moteur (1), **en ce que** la pièce de connexion mâle (2) comprend deux pièces de connexion partielle (2a, 2b) comprenant chacune deux des quatre broches de contact (4), et **en ce que** la pièce de connexion femelle (6) comprend deux pièces de connexion partielle (6a, 6b) comprenant chacune deux des quatre prises de contact (8).

6. Dispositif d'écran selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la pièce de connexion mâle (2) est pourvue d'un rebord (14), à l'intérieur duquel une ou plusieurs des broches de contact (4) sont placées, et **en ce que** la pièce de connexion femelle (6) est pourvue d'une partie en relief (15) correspondant à ce rebord (14), dans laquelle une ou plusieurs prises de contact (8) correspondant à ces broches de contact (4) sont placées, dans lequel cette partie en relief (15) de la pièce de connexion femelle (6) peut être ajustée dans le rebord (14) de la pièce de connexion mâle (2), de sorte que, lorsque cette partie en relief (15) de la pièce de connexion femelle (6) est ajustée dans le rebord (14) de la pièce de connexion mâle (2), les broches de contact correspondantes (4) sont ajustées dans les prises de contact correspondantes (8).

7. Dispositif d'écran selon la revendication 6, **caractérisé en ce que** le rebord (14) de la pièce de connexion mâle (2) est produit à partir d'un matériau plus dur que la partie en relief (15) de la pièce de connexion femelle (6).

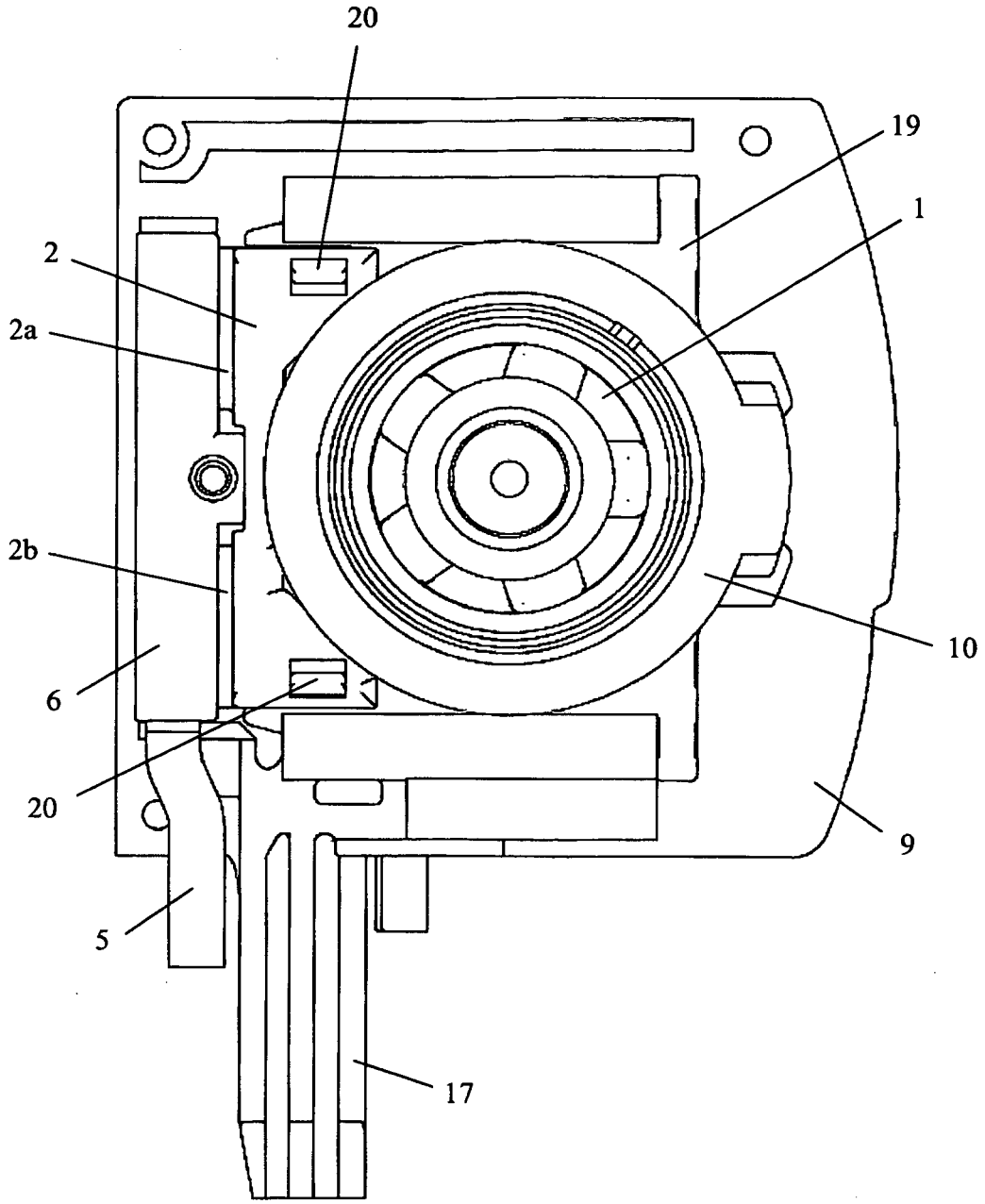


FIG. 1

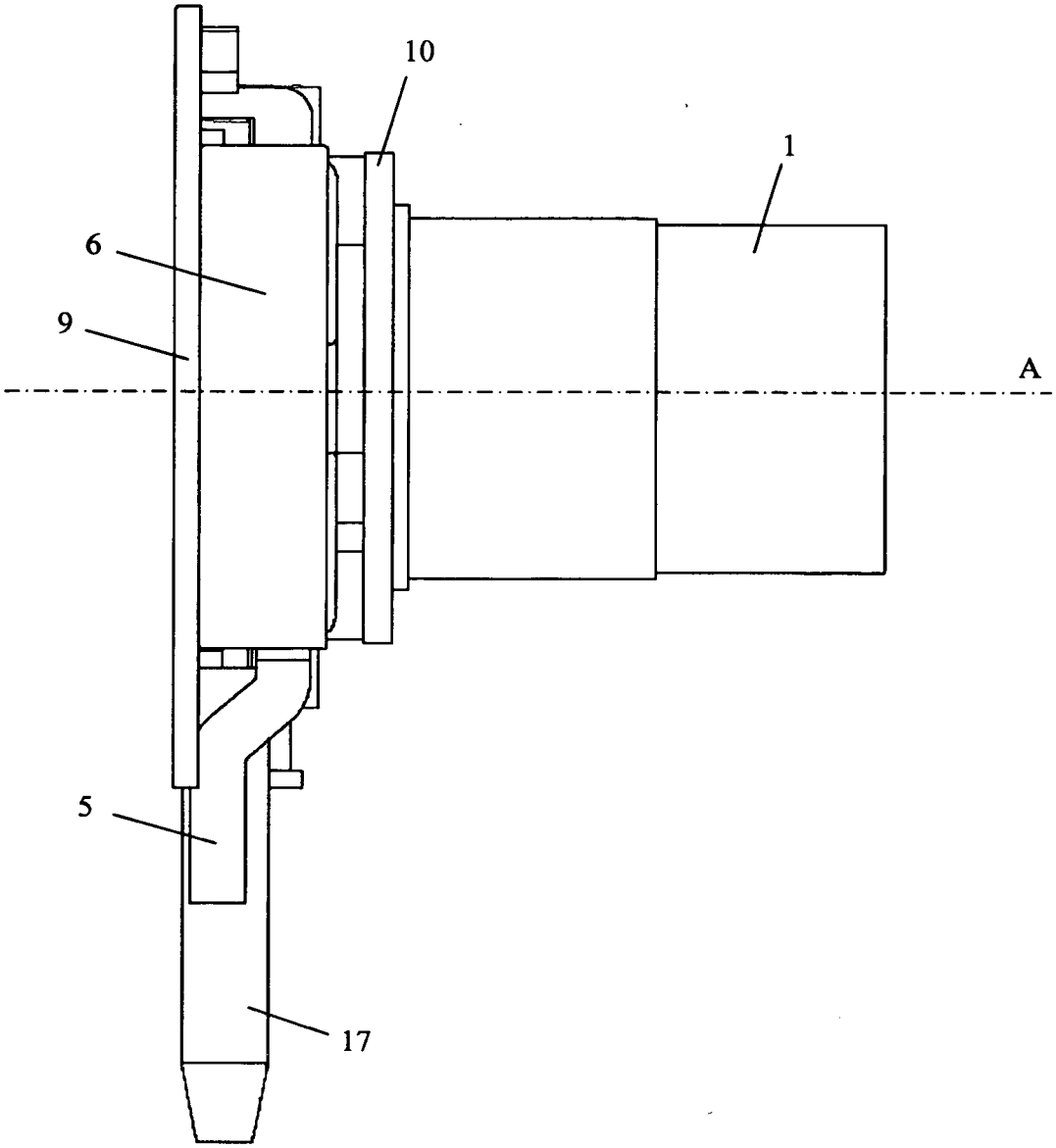


FIG. 2

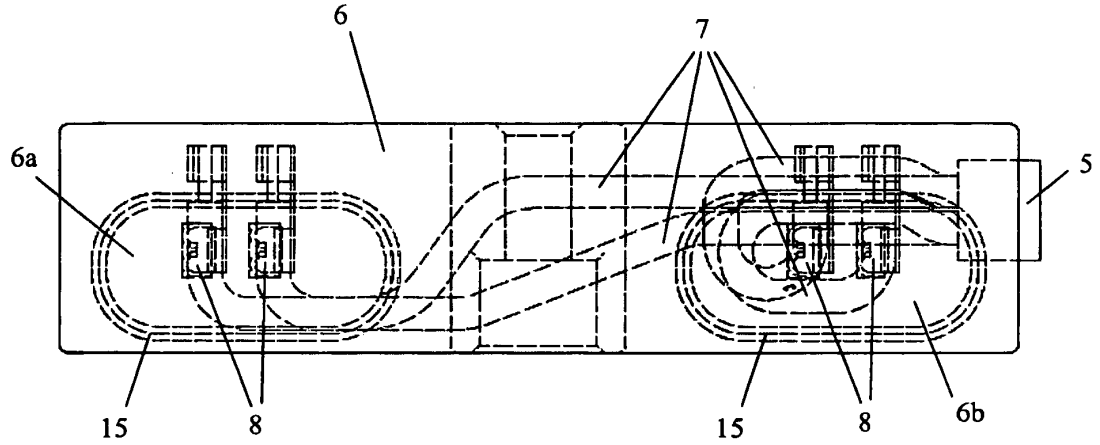


FIG. 3

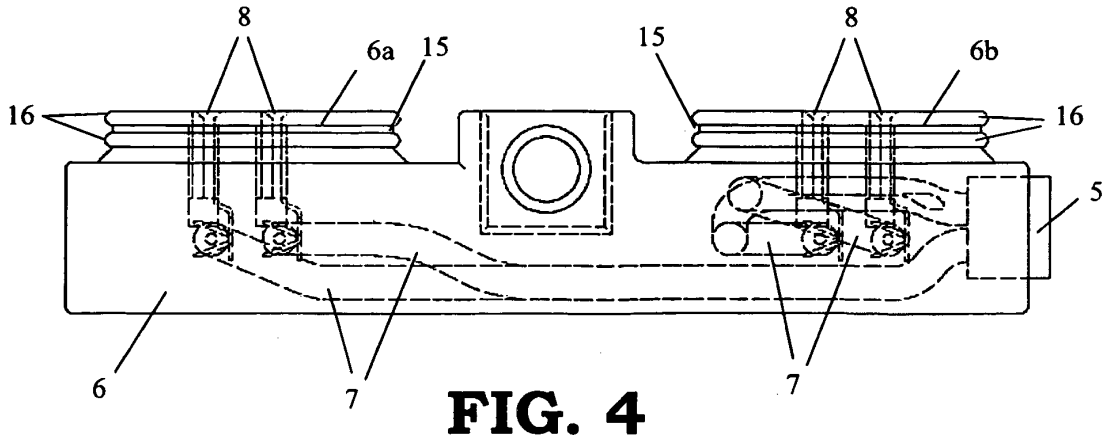


FIG. 4

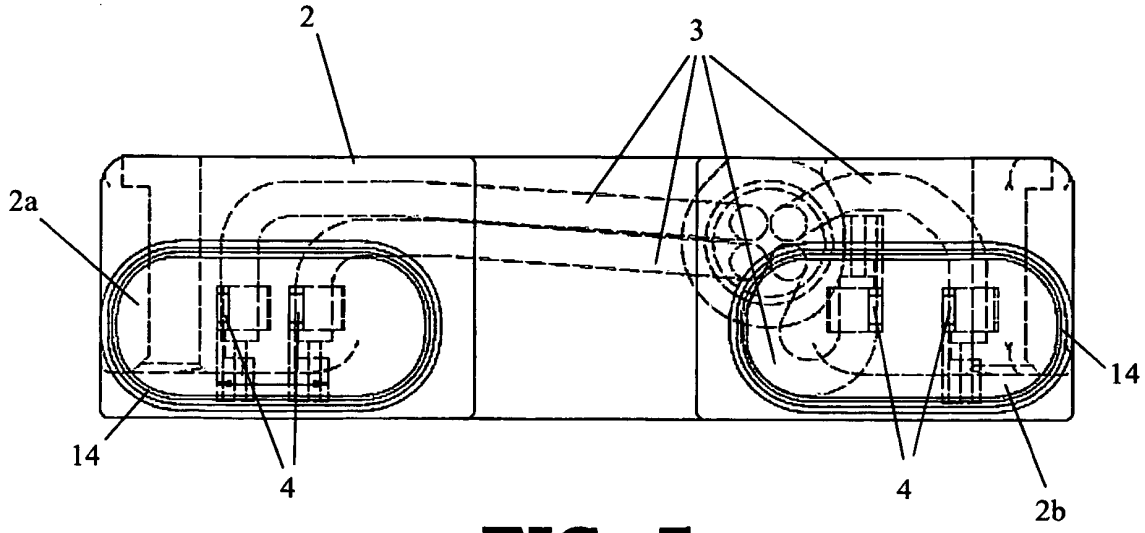


FIG. 5

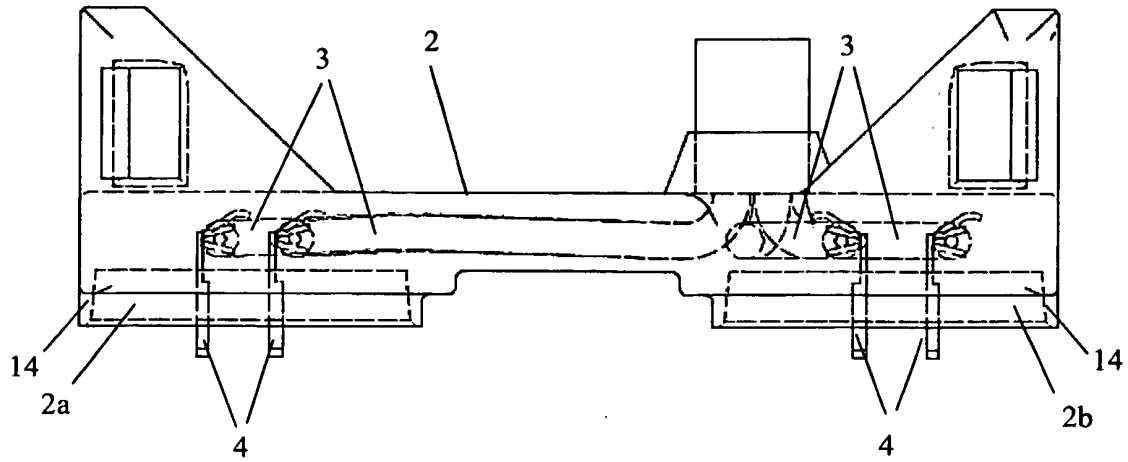


FIG. 6

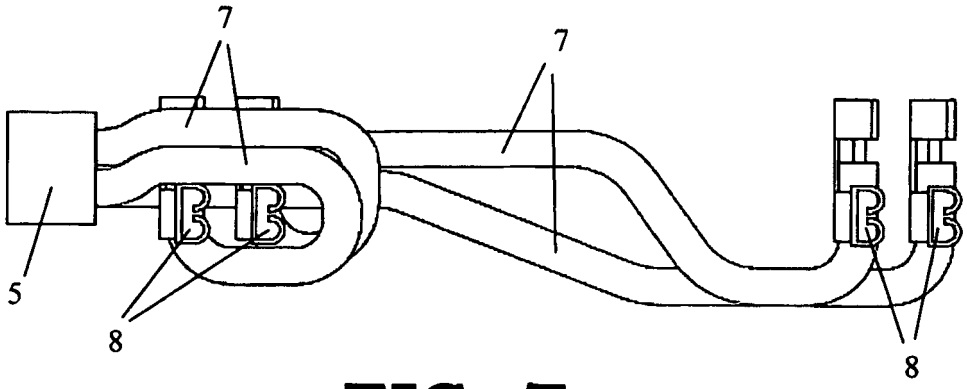


FIG. 7

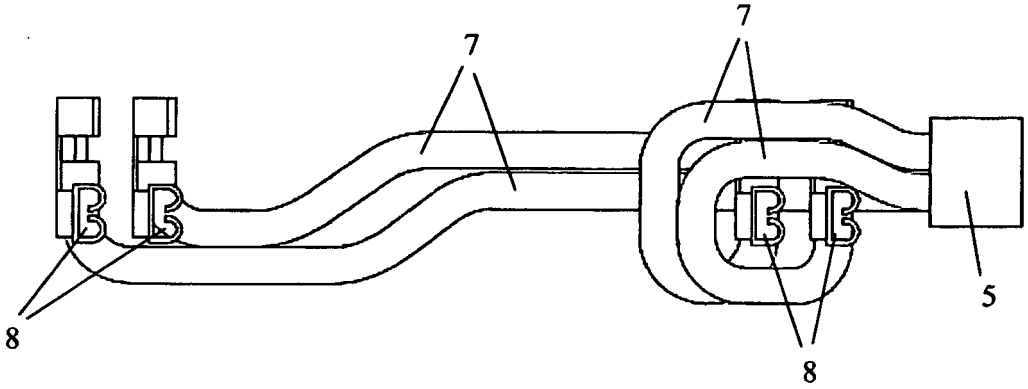


FIG. 8

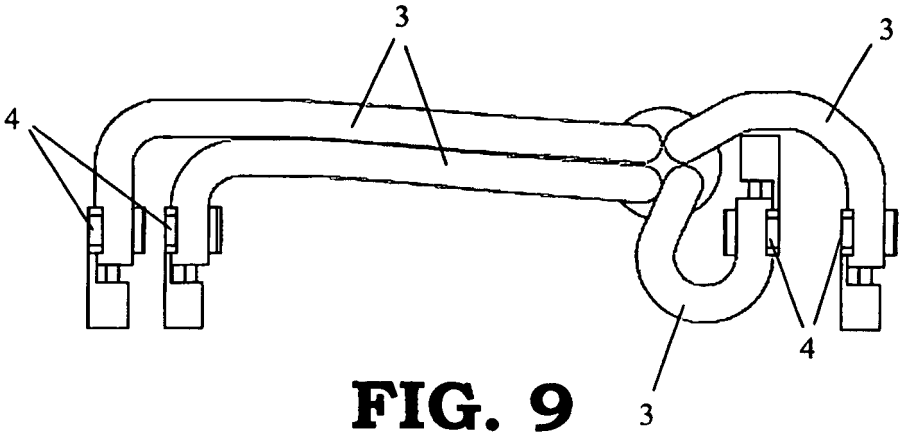


FIG. 9

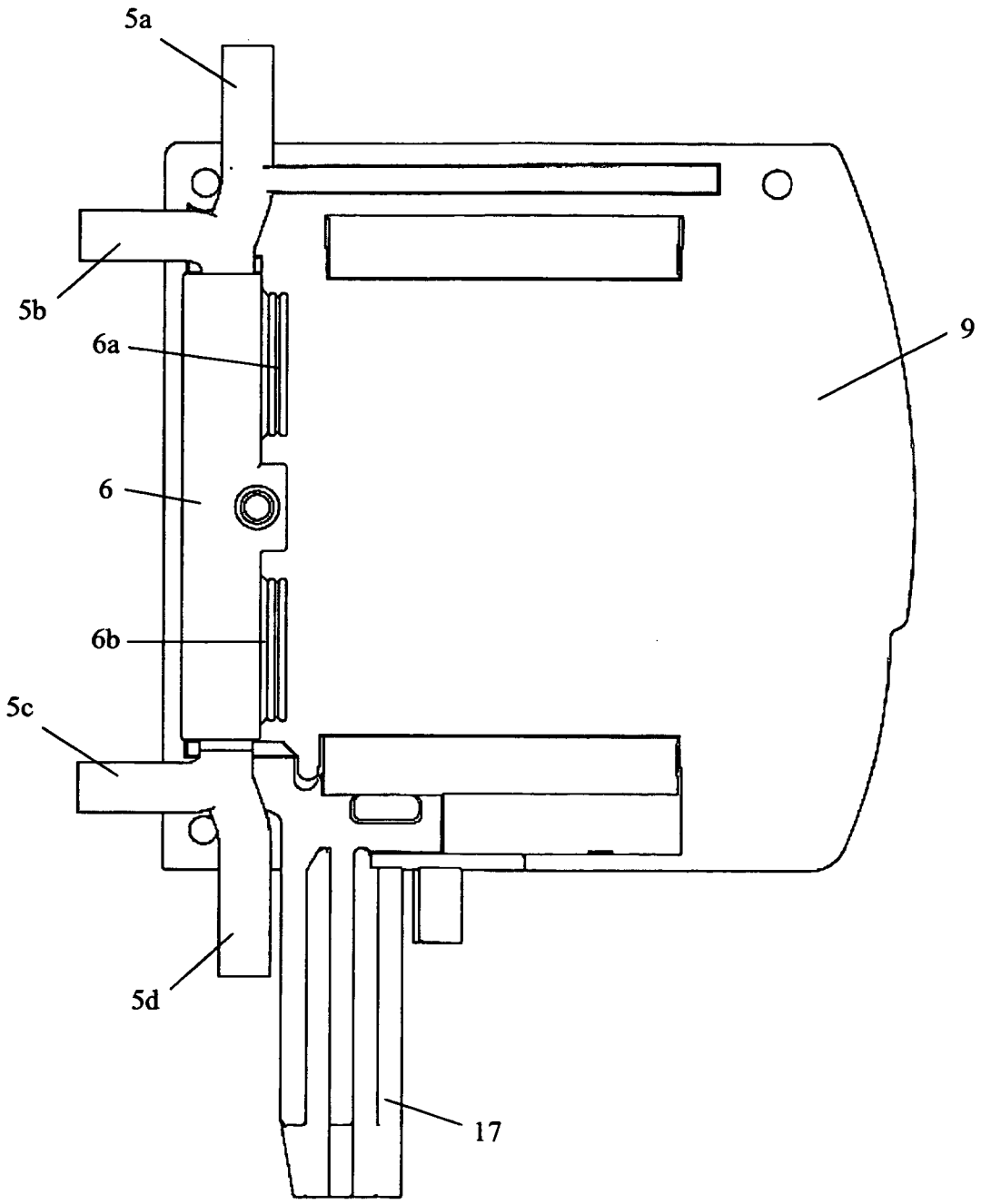


FIG. 10

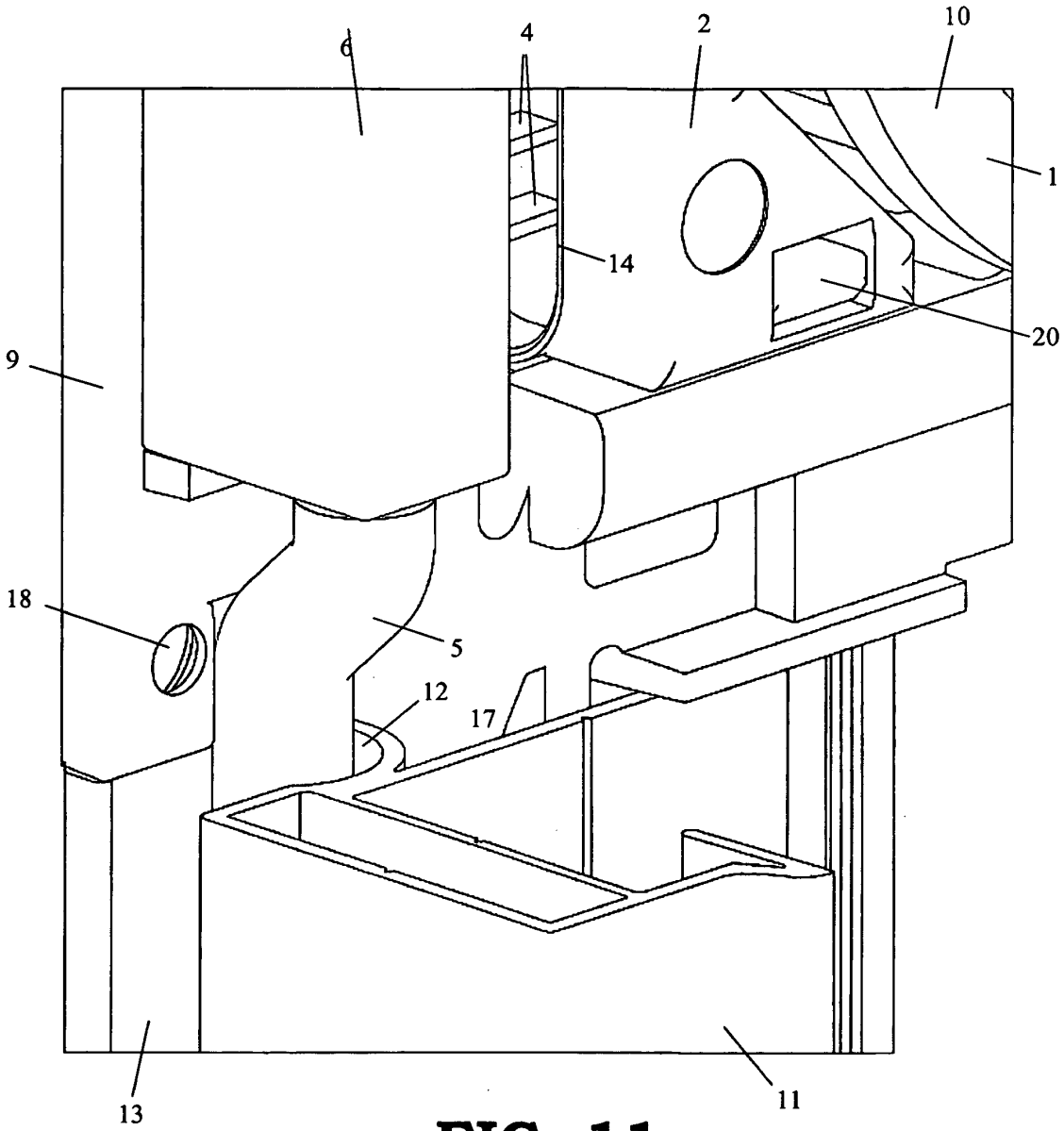


FIG. 11

REFERENCES CITED IN THE DESCRIPTION

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