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(54) **SNAP-ON HOUSING FOR A TUBULAR ROLLER SCREEN MOTOR**

(57) Disclosed is a screening device (1) for screening an architectural opening (2) such as a window. The screening device (1) comprises screening means (10) for screening at least a part of the architectural opening (2) and a reel tube (7) arranged to rotate around a longitudinal rotational axis. A first end (11) of the screening means (10) is connected to the reel tube (7) so that the screening means (10) can be rolled of or rolled up around the reel tube (7) dependent on a rotational direction of the reel tube (7). The screening device (1) further comprises a tubular drive train (3) arranged inside the reel tube (7) to drive the rotation of the reel tube (7) by means of an output shaft (20) of the drive train (3), wherein the

output shaft (20) is arranged at a first end (18) of a motor tube (26) substantially enclosing the drive train (3). The screening device (1) also comprises bracket means (5) for rotationally fixating the tubular drive train (3) in relation to the architectural opening (2), wherein the motor tube (26) is connect to the drive train (3) at the first end (18) of the motor tube (26) by means of a first snap connection (4) and wherein the motor tube (26) is connect to the bracket means (5) at a second end (19) of the motor tube (26) by means of a second snap connection (9).

A method for assembling a screening device (1) for screening an architectural opening (2) and use of a screening device (1) is also disclosed.

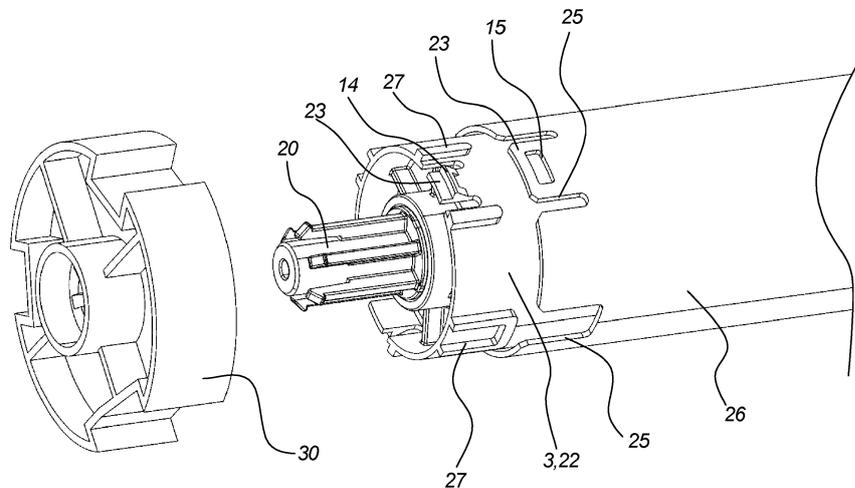


Fig. 6

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Description

Background of the invention

[0001] The invention relates to a screening device for screening an architectural opening such as a window. The screening device comprises screening means for screening at least a part of the architectural opening and a reel tube arranged to rotate around a longitudinal rotational axis.

[0002] The invention further relates to a method for assembling a screening device for screening an architectural opening and use of a screening device.

Description of the Related Art

[0003] Motorised screening devices for windows are known in the art e.g. to quickly black out a room or just to simplify the operation of curtains, blinds or the like. Typically in relation with some sort of wired or wireless remote control. And particularly in relation with roof windows and skylights the demand for motorized screening devices is pronounced because these types of window usually are mounted in a relatively remote part of a building and therefore often are difficult to reach or access.

[0004] For this purpose it is advantageous to arrange a reel around which some kind of screening device may be rolled of or rolled up around dependent on the rotational direction of the reel. To drive the rotation of the reel it is known to provide a tubular gearmotor comprising an outer tube arranged to connect the motor with a bracket arranged to rigidly connect the tube and motor in relation to the window. The outer tube will also protect the motor and transmission arranged inside the tube.

[0005] Such a system is known from WO 2006/045724 A1 where the tube is connected to the bracket by means of a transversal screw. However, this is difficult and time consuming to assemble and disassemble.

[0006] An object of the invention is therefore to provide for an advantageous technique for assembling a shading device.

The invention

[0007] The invention provides for a screening device for screening an architectural opening such as a window. The screening device comprises screening means for screening at least a part of the architectural opening and a reel tube arranged to rotate around a longitudinal rotational axis. A first end of the screening means is connected to the reel tube so that the screening means can be rolled of or rolled up around the reel tube dependent on a rotational direction of the reel tube. The screening device further comprises a tubular drive train arranged inside the reel tube to drive the rotation of the reel tube by means of an output shaft of the drive train, wherein the output shaft is arranged at a first end of a motor tube substantially enclosing the drive train. The screening de-

vice also comprises bracket means for rotationally fixating the tubular drive train in relation to the architectural opening, wherein the motor tube is connect to the drive train at the first end of the motor tube by means of a first snap connection and wherein the motor tube is connect to the bracket means at a second end of the motor tube by means of a second snap connection.

[0008] It is advantageous to connect the motor tube to the drive train and motor tube to the bracket means by means of a snap connection in that a snap connection is a simple, economical and rapid way of joining two different components. Furthermore, since it requires an axial force to connect devices to the motor tube by means of a snap connection, it is advantageous to arrange snap connections at both ends of the motor tube so that both connections can be made in a single process by applying axial force on both ends at once.

[0009] Furthermore, since snap connections can be established without the use of separate connection means - such as screws, rivets, glue or other - the assembly logistics are simpler and subsequent unlocking of the snap connection can be made without the risk of losing assembly parts.

[0010] It should be noted that by the term "snap connection" is to be understood any kind of snap joint, snap fit, snap assembly or other where a typically flexible element of a first part is arranged to engage a corresponding geometry of a second part when the two are brought together, wherein typically the flexible element will flex during assembly to return to a less flexed state when the connection has been established. A snap connection can be designed in a multitude of ways but substantially all types of snap connections have in common the principle that a protruding part of one component, e.g. a hook, stud, bead, an arm or other is deflected briefly during the joining operation and catches in a corresponding geometry such as a depression, an undercut, a hole, an indentation or other in the mating component. After the joining operation, the snap-fit features usually return to a less stressed state and often to substantially stress-free condition.

[0011] It should further be noted that the term "screening means" in this context should be interpreted as any kind of screen suited for screening a window i.e. any kind of curtain, drape, blind, shade, shutter, awning or other or any combination thereof.

[0012] It should also be noted that the term "bracket means" in this context should be interpreted as any kind of support, brace, fitting or other or any other kind of bracket suited for fixating the tubular drive train in relation to a window. And the bracket means may be multiple parts. The bracket means may also employ damping parts to reduce vibrations.

[0013] In an aspect of the invention, the first snap connection and the second snap connection are substantially identical.

[0014] Forming the snap connections substantially identical is advantageous in that it simplifies manufactur-

ing and assembly. Furthermore, this will simplify the assembly process in that the drive train and the bracket means can be connected to either ends of the motor tube. Furthermore, hereby the first snap connection and the second snap connection are interchangeable.

[0015] In an aspect of the invention, the first end of the motor tube is substantially identical with the second end of the motor tube.

[0016] Forming the ends of the motor tube substantially identical is advantageous in that it simplifies manufacturing and assembly. Furthermore, this will simplify the assembly process in that the drive train and the bracket means can be connected to either ends of the motor tube.

[0017] In an aspect of the invention, the motor tube is substantially symmetrical around a plane perpendicular to the longitudinal extend of the motor tube, wherein the plane is arranged at the middle of the longitudinal extend of the motor tube.

[0018] Forming the motor tube so that it is substantially symmetrical in its longitudinal extend is advantageous in that it simplifies manufacturing and assembly. Furthermore, this will simplify the assembly process in that the drive train and the bracket means can be connected to either ends of the motor tube.

[0019] In an aspect of the invention, the motor tube is connected to a transmission of the drive train.

[0020] The motor and the transmission are arranged in succession of each other with the output shaft extending out of the transmission. It is therefore advantageous to connect the motor tube to the transmission in that most of the drive train hereby is protected inside the motor tube.

[0021] In an aspect of the invention, the motor tube further contains an electrical energy storage arranged to power the drive train.

[0022] Since the motor is located in the reel tube it would be difficult to power the motor by means of the power grid. It is therefore advantageous to power the motor by means of e.g. a battery, accumulator or capacitor located in the motor tube to reduce wiring and cost.

[0023] In an aspect of the invention, the first snap connection comprises at least one snap protrusion arranged on the motor tube or on the drive train and at least one corresponding snap indentation arranged on the other of the motor tube or the drive train, and wherein the second snap connection comprises at least one snap protrusion arranged on the motor tube or on the bracket means and at least one corresponding snap indentation arranged on the other of the motor tube or the bracket means.

[0024] Hereby is achieved an advantageous embodiment of the invention.

[0025] In an aspect of the invention, the at least one snap protrusion are meshing with the at least one snap indentation.

[0026] Making the snap parts mesh is advantageous in that a strong and secure connection hereby is formed.

[0027] In an aspect of the invention, at least one snap protrusion is arranged on the drive train and wherein at

least one snap indentation is arranged on the motor tube.

[0028] Since the motor tube is tubular it is difficult to form a protrusion on its surface but it is advantageous to form an indentation such as a hole. However, since the casing(s) of the drive train typically is molded it is relatively easy to form a snap protrusion on its surface.

[0029] In an aspect of the invention, the snap indentation is formed as a through hole.

[0030] Forming the snap indentation as a through hole is advantageous in that it hereby can be formed in a simple punching process or by drilling.

[0031] In an aspect of the invention, the snap indentation is arranged at the end of a flexible snap arm.

[0032] Hereby is achieved an advantageous embodiment of the invention.

[0033] In an aspect of the invention, the snap protrusion is arranged at the end of a flexible snap arm.

[0034] Hereby is achieved an advantageous embodiment of the invention.

[0035] In an aspect of the invention, the tubular drive train comprises an electrical motor and at least one transmission.

[0036] Hereby is achieved an advantageous embodiment of the invention.

[0037] In an aspect of the invention, the motor tube further comprises groove means engaging stud means of the drive train and the bracket means to further lock the motor tube against rotation in relation to the drive train and the bracket means.

[0038] Providing the motor tube with separate groove means arranged to match corresponding stud means of the drive train and the bracket means is advantageous in that these groove means and stud means can act as guides to speed up and simplify the assembly process and in that they can relieve the snap connection of torsional stress.

[0039] In an aspect of the invention, the first snap connection is established on an outside surface of the motor tube and wherein the second snap connection is established on an inside surface of the motor tube.

[0040] Forming the first snap connection inside the motor tube is advantageous in that this enables that the drive train can be arranged inside the motor tube and in that the first snap connection hereby will not increase the diameter of the motor tube and thus not hinder assembly with the reel tube. And forming the second snap connection outside the motor tube is advantageous in that it hereby is ensured that the bracket means may extend outside the diameter of the motor tube and thus ensure that the bracket means may transfer much torque.

[0041] The invention further provides for method for assembling a screening device for screening an architectural opening. The method comprising the steps of:

- connecting a tubular drive train to a motor tube by means of a first snap connection, wherein the drive train is arranged substantially inside the motor tube with an output shaft of the drive train extending from

a first end of the motor tube,

- arranging the motor tube inside a reel tube to drive a rotation of the reel tube, wherein the reel tube is arranged to roll of or roll up screening means dependent on a rotational direction of the output shaft, and
- connecting a second end of the motor tube to bracket means by means of a second snap connection, wherein the bracket means comprises fixation means for connecting the bracket means to the architectural opening.

[0042] Assembling parts of the motor tube of the screening device by means of snap connections is advantageous in that the screening device hereby can be assembled fast in a simple process.

[0043] It should be noted that even though the first snap connection and the second snap connection are described in two different steps this does not exclude that the first and the second snap connections are formed substantially simultaneously or in reverse order.

[0044] In an aspect of the invention, the method is a method for assembling a screening device according to any of the previously mentioned screening devices.

[0045] The invention also provides for a screening device according to any of the previously mentioned screening devices for external screening of an architectural opening mounted in an inclined surface of a building.

[0046] External screening devices such as awnings or roller shutters are very difficult to access and it is therefore particularly to use a screening device according to the present invention in relation with external screening in that the present invention enables simpler and easier exchange of the most woundable parts of the screening device.

Figures

[0047] The invention will be described in the following with reference to the figures in which

- fig. 1 illustrates a screening device mounted on a roof window, as seen in perspective,
- fig. 2 illustrates a screening device in a rolled up state, as seen in perspective,
- fig. 3 illustrates a cross section through a screening device, as seen from the bottom,
- fig. 4 illustrates a cross section through a screening device, as seen from the front,
- fig. 5 illustrates the motor tube removed from the rest of the reel means, as seen in perspective,

fig. 6 illustrates a drive train being mounted in a motor tube, as seen in perspective, and

fig. 7 illustrates a motor tube being mounted in bracket means, as seen in perspective.

Detailed description of the invention

[0048] Fig. 1 illustrates a screening device 1 mounted on a roof window 2, as seen in perspective and fig. 2 illustrates a screening device 1 in a rolled up state, as seen in perspective.

[0049] In this embodiment the screening device 1 is mounted on an architectural opening 2 in the form of a roof window, however in another embodiment the architectural opening 2 could be a wall window, a door, a hole in a wall or roof surface, an emergency exit or other and/or the architectural opening 2 could be arranged in a wall, a floor or another part of a building.

[0050] In this embodiment the screening means 10 are roller shutters but in another embodiment the screening means 10 could be roller blinds, folding blinds, venetian blinds, awnings or other.

[0051] In this embodiment the screening device 1 is provided with a photovoltaic solar cell 17 arranged to be the sole power source regarding the operation of the screening device 1. However in another embodiment the screening device 1 could also or instead be powered by a utility grid, by means of batteries or another electrical power source.

[0052] As best seen in fig. 2; in this embodiment the screening device 1 comprises a reel unit 28 arranged at the top of the screening device 1 and two side guides 31 in the form of racks extending transversally at the longitudinal ends of the reel unit 28. In this embodiment the side guides 31 is arranged to guide the screening means 10 - as seen in fig. 1 - but in another embodiment the side guides 31 could be arranged or formed differently or the screening device 1 would be formed without side guides 31.

[0053] In fig. 2 the reel unit 28 of the screening device 1 is shown without an end cap to reveal the bracket means 5 inside the reel unit 28.

[0054] Fig. 3 illustrates a cross section through a screening device 1, as seen from the bottom and fig. 4 illustrates a cross section through a screening device 1, as seen from the front.

[0055] In this embodiment screening device 1 comprises a reel tube 7 arranged inside the reel unit 28 and arranged to be rotated around a longitudinal rotational axis in that the outer reel tube 7 is rotationally fixed to the reel unit 28 by means of some sort of bearing arrangement 32 - such as ball bearings, roller bearings, plain bearing or other similar arrangements suspending the reel tube 7 on the stationary parts of the reel unit 28 while at the same time allowing the reel tube 7 to rotate in relation to the stationary parts of the reel unit 28.

[0056] In this embodiment the outer reel tube 7 is con-

ected to a first end 11 of the screening means 10 (not shown in fig. 3 and 4) so that when the outer reel tube 7 is rotated the screening means 10 is rolled of or rolled up around the reel tube 7 dependent on the rotational direction of reel tube 7.

[0057] In this embodiment the reel tube 7 is arranged to be rotated by means of a tubular drive train 3 comprising an electrical motor 6 connected to the outer reel tube 7 through a transmission 22 and a coupling part 33. However, in another embodiment the electrical motor 6 could obviously rotate the outer reel tube 7 by other means e.g. without a transmission 22, through coupling parts 33 of a different type or other.

[0058] In this embodiment the reel tube 7 is formed so that the electrical motor 6, a power module 16 - including an electrical energy storage 24 and a printed circuit board comprising control means - and the transmission 22 is arranged stationary inside a stationary motor tube 26 - which can be seen more clearly e.g. in fig. 5.

[0059] In this embodiment the electrical energy storage 24 is also formed elongated so that it may be arranged on top of the printed circuit board inside the motor tube 26. The battery's 24 capacity is among other dependent on its size and it is therefore advantageous to efficiently utilize the cramped space inside the reel tube 7.

[0060] A further advantage of arranging the electrical energy storage 24 and printed circuit board overlapping is that this enables that these two parts can be fitted inside a common casing 21 to form a single power module 16 which enables that the two parts may be handled and exchanged as a single unit.

[0061] Fig. 5 illustrates the motor tube 26 removed from the rest of the reel tube 7, as seen in perspective.

[0062] In this embodiment the motor 6, the transmission 22 and the power module 16 are arranged to substantially extend the entire length of the motor tube 26. I.e. in this embodiment the far end of the motor tube 26 is formed to engage the far end of the transmission 22 and the closest end is arranged to engage the bracket means 5, so that the motor tube 26, the motor 6, the transmission 22, the bracket means 5 and the power module 16 are all stationary while the coupling part 33 is free to rotate.

[0063] In this embodiment a first end 18 of the motor tube 26 is arranged for being connected to the drive train 3 by means of a first snap connection 4 and a second end 19 of the motor tube 26 is arranged for being connected to the bracket means 5 by means of a second snap connection 9.

[0064] In this embodiment the first snap connection 4 and the second snap connection 9 are substantially identical so that the first end 18 of the motor tube 26 is substantially identical with the second end 19 of the motor tube 26 and so that the motor tube 26 is substantially symmetrical around a plane perpendicular to the longitudinal extend of the motor tube 26, wherein this plane is arranged at the middle of the longitudinal extend of the

motor tube 26. However, in another embodiment first snap connection 4 could be rotated in relation to the second snap connection 9 or the snap connections 4, 9 could in other ways be different in each end 18, 19.

[0065] Fig. 6 illustrates a drive train 3 being mounted in a motor tube 26, as seen in perspective.

[0066] In this embodiment the connection between the drive train 3 and the motor tube 26 is made by sliding the drive train 3 into the first end 18 of the motor tube 26 until the snap protrusions 14 of the drive train 3 meets the motor tube 26. At this point the flexible snap arms 23 of the motor tube 26 and the drive train 3 will flex in opposite directions to allow the snap protrusions 14 to pass into the motor tube 26. Once the snap protrusions 14 reaches the corresponding snap indentations 15 in the motor tube 26 the snap protrusions 14 engage the snap indentations 15 and the flexible snap arms 23 will return to a substantially un-flexed and unstressed state.

[0067] However, in another embodiment only the motor tube 26 or only the drive train 3 would be provided with flexible snap arms 23 and or some or all of the snap protrusions 14 would be arranged on the motor tube 26 and the corresponding snap indentations would then be arranged on the drive train 3.

[0068] In this embodiment the snap protrusions 14 - and the embodiment shown in fig. 7 - are formed as molded and fully integrated surface elevations comprising a chamfer to guide the parts together. However, in another embodiment the snap protrusions 14 could be formed by punching, the snap protrusions 14 could be separate parts attached to the motor tube 26, the drive train 3 and/or the bracket means 5 by means of adhesive, welding, screws or other.

[0069] In this embodiment the snap indentations 15 are formed as through holes but in another embodiment the some or all the snap indentations 15 could be formed as blind holes, grooves, recesses or other. In this embodiment the snap indentations 15 is made by punching but in another embodiment the snap indentations 15 could be made by drilling, by machining, by integrating them in the part during a molding process or other.

[0070] In this embodiment the snap connections 4, 9 are re-releasable in that the snap protrusions 14 may be pulled out of engagement with the snap indentations 15 - e.g. by hand, by means of screwdrivers, by means of a special tool or other. Thus, in this embodiment the motor tube 26 may be dismantle from the drivetrain 3 and/or the bracket means 5 which is advantageous in relation to repair, inspection or other.

[0071] In this embodiment the snap connections 4, 9 are formed as what is known as cantilever snap joints where the load is mainly flexural. However snap connections 4, 9 can be formed in numerous ways where the more common alternatives include:

- U-shaped snap joints which are a variation of the cantilever type.
- Torsion snap joints where the shear stresses carry

the load.

- Annular snap joints that are rotationally symmetrical and involve multiaxial stresses.

[0072] To guide the assembly process and to further lock the motor tube 26 and the drive train 3 against mutual rotation the motor tube 26 further comprises groove means 25 arranged to engage stud means 27 of the drive train 3. However in another embodiment some or all the groove means 25 could be arranged on the drive train 3 and some or all of the stud means 27 would then be arranged on the motor tube 26. The groove means 25 comprise an open groove 25 such that the stud means 27 may slide into the groove means 25 upon assembly. The snap indentation 15 may be flanked by the groove means 25 on each side thereof. Also the snap protrusions 14 may be flanked by the stud means 27 on each side thereof.

[0073] Fig. 7 illustrates a motor tube 26 being mounted in bracket means 5, as seen in perspective.

[0074] To prevent the motor tube 26 - containing the power module 16 and the electrical motor 6 - from rotating, one end of the motor tube 26 is in this embodiment rigidly connected to bracket means 5. In turn the bracket means 5 is rigidly connected to the reel unit 28 as best seen in fig. 2. However in another embodiment the bracket means 5 could be formed differently e.g. as some sort of fitting, mounting, support or other or the bracket means 5 could be formed integrally with another stationary part of the reel tube 7. The bracket means 5 could be from multiple elements and may further comprise vibration damping elements.

[0075] In this embodiment the bracket means 5 is further provided with fixation means 30 for fixating the bracket means 5 in relation to the architectural opening 2 to which the screening device is attached. In this embodiment the fixation means 30 are through holes through which screws, bolts, rivets or other may extend and connect the bracket means 5 directly or indirectly to the window 2 e.g. indirectly through other parts of the reel unit 28.

[0076] In this embodiment is the motor tube 26 is just about to be connected to the bracket means 5 by means of a second snap connection 9. I.e. in this embodiment the connection between the bracket means 5 and the motor tube 26 is made by sliding the second end 19 of the motor tube 26 into the bracket means 5 until the snap protrusions 14 of the bracket means 5 meets the motor tube 26. At this point the flexible snap arms 23 of the motor tube 26 and the bracket means 5 will flex in opposite directions to allow the motor tube 26 to pass into the snap protrusions 14. Once the snap protrusions 14 reaches the corresponding snap indentations 15 in the motor tube 26 the snap protrusions 14 engage the snap indentations 15 and the flexible snap arms 23 will return to a substantially un-flexed and unstressed state.

[0077] However, in another embodiment only the motor tube 26 or only the bracket means 5 would be provided with flexible snap arms 23 and or some or all of the snap

protrusions 14 would be arranged on the motor tube 26 and the corresponding snap indentations would then be arranged on the bracket means 5.

[0078] The first snap connection (4) and the second snap connection (9) may employ multiple snap indentations 15 and multiple corresponding snap protrusions 14. Preferably, each snap connection has two snap indentations 15 positioned radially opposite and two corresponding snap protrusions 14 also being positioned radially opposite.

[0079] The invention has been exemplified above with reference to specific examples of designs and embodiments of screening devices 1, screening means 10, snap connections 4, 9 etc. However, it should be understood that the invention is not limited to the particular examples described above but may be designed and altered in a multitude of varieties within the scope of the invention as specified in the claims.

20 List

[0080]

1. Screening device
2. Architectural opening
3. Drive train
4. First snap connection
5. Bracket means
6. Electrical motor
7. Reel tube
- 8.
9. Second snap connection
10. Screening means
11. First end of screening means
12. Second end of screening means
- 13.
14. Snap protrusion
15. Snap indentation
16. Power module
17. Solar cell
18. First end of motor tube
19. Second end of motor tube
20. Output shaft
21. Casing
22. Transmission
23. Flexible snap arm
24. Electrical energy storage
25. Groove means
26. Motor tube
27. Stud means
28. Reel unit
- 29.
30. Fixation means
31. Guides
32. Bearing arrangement
33. Coupling part

Claims

1. A screening device (1) for screening an architectural opening (2) such as a window, said screening device (1) comprising
 screening means (10) for screening at least a part of said architectural opening (2),
 a reel tube (7) arranged to rotate around an longitudinal rotational axis, wherein a first end (11) of said screening means (10) is connected to said reel tube (7) so that said screening means (10) can be rolled of or rolled up around said reel tube (7) dependent on a rotational direction of said reel tube (7),
 a tubular drive train (3) arranged inside said reel tube (7) to drive said rotation of said reel tube (7) by means of an output shaft (20) of said drive train (3), wherein said output shaft (20) is arranged at a first end (18) of a motor tube (26) substantially enclosing said drive train (3), and
 bracket means (5) for rotationally fixating said tubular drive train (3) in relation to said architectural opening (2),
 wherein said motor tube (26) is connect to said drive train (3) at said first end (18) of said motor tube (26) by means of a first snap connection (4) and wherein said motor tube (26) is connect to said bracket means (5) at a second end (19) of said motor tube (26) by means of a second snap connection (9).
2. A screening device (1) according to claim 1, wherein said first snap connection (4) and said second snap connection (9) are substantially identical.
3. A screening device (1) according to claim 1 or 2, wherein said first end (18) of said motor tube (26) is substantially identical with said second end (19) of said motor tube (26).
4. A screening device (1) according to any of the preceding claims, wherein said motor tube (26) is substantially symmetrical around a plane perpendicular to the longitudinal extend of said motor tube (26), wherein said plane is arranged at the middle of said longitudinal extend of said motor tube (26).
5. A screening device (1) according to any of the preceding claims, wherein said motor tube (26) is connected to a transmission (22) of said drive train (3).
6. A screening device (1) according to any of the preceding claims, wherein said motor tube (26) further contains an electrical energy storage (24) arranged to power said drive train (3).
7. A screening device (1) according to any of the preceding claims, wherein said first snap connection (4) comprises at least one snap protrusion (14) arranged on said motor tube (26) or on said drive train (3) and
 at least one corresponding snap indentation (15) arranged on the other of said motor tube (26) or said drive train (3), and wherein said second snap connection (9) comprises at least one snap protrusion (14) arranged on said motor tube (26) or on said bracket means (5) and at least one corresponding snap indentation (15) arranged on the other of said motor tube (26) or said bracket means (5).
8. A screening device (1) according to claim 7, wherein said at least one snap protrusion (14) are meshing with said at least one snap indentation (15).
9. A screening device (1) according to claim 7 or 8, wherein at least one snap protrusion (14) is arranged on said drive train (3) and wherein at least one snap indentation (15) is arranged on said motor tube (26).
10. A screening device (1) according to any of claims 7-9, wherein said snap indentation (15) is formed as a through hole.
11. A screening device (1) according to any of claims 7-10, wherein said snap indentation (15) is arranged at the end of a flexible snap arm (23).
12. A screening device (1) according to any of the preceding claims, wherein said first snap connection (4) is established on an outside surface of the motor tube (26) and wherein said second snap connection (9) is established on an inside surface of the motor tube (4).
13. A screening device (1) according to any of the preceding claims, wherein said motor tube (26) further comprises groove means (25) engaging stud means (27) of said drive train (3) and said bracket means (5) to further lock said motor tube (26) against rotation in relation to said drive train (3) and said bracket means (5).
14. A method for assembling a screening device (1) for screening an architectural opening (2), said method comprising the steps of:
 - connecting a tubular drive train (3) to a motor tube (26) by means of a first snap connection (4), wherein said drive train (3) is arranged substantially inside said motor tube (26) with an output shaft (20) of said drive train (3) extending from a first end (18) of said motor tube (26),
 - arranging said motor tube (26) inside a reel tube (7) to drive a rotation of said reel tube (7), wherein said reel tube (7) is arranged to roll of or roll up screening means (10) dependent on a rotational direction of said output shaft (20), and
 - connecting a second end (19) of said motor tube (26) to bracket means (5) by means of a

second snap connection (9), wherein said bracket means (5) comprises fixation means (30) for connecting said bracket means (5) to said architectural opening (2).

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15. Use of a screening device (1) according to any of claims 1-13 for external screening of an architectural opening (2) mounted in an inclined surface of a building.

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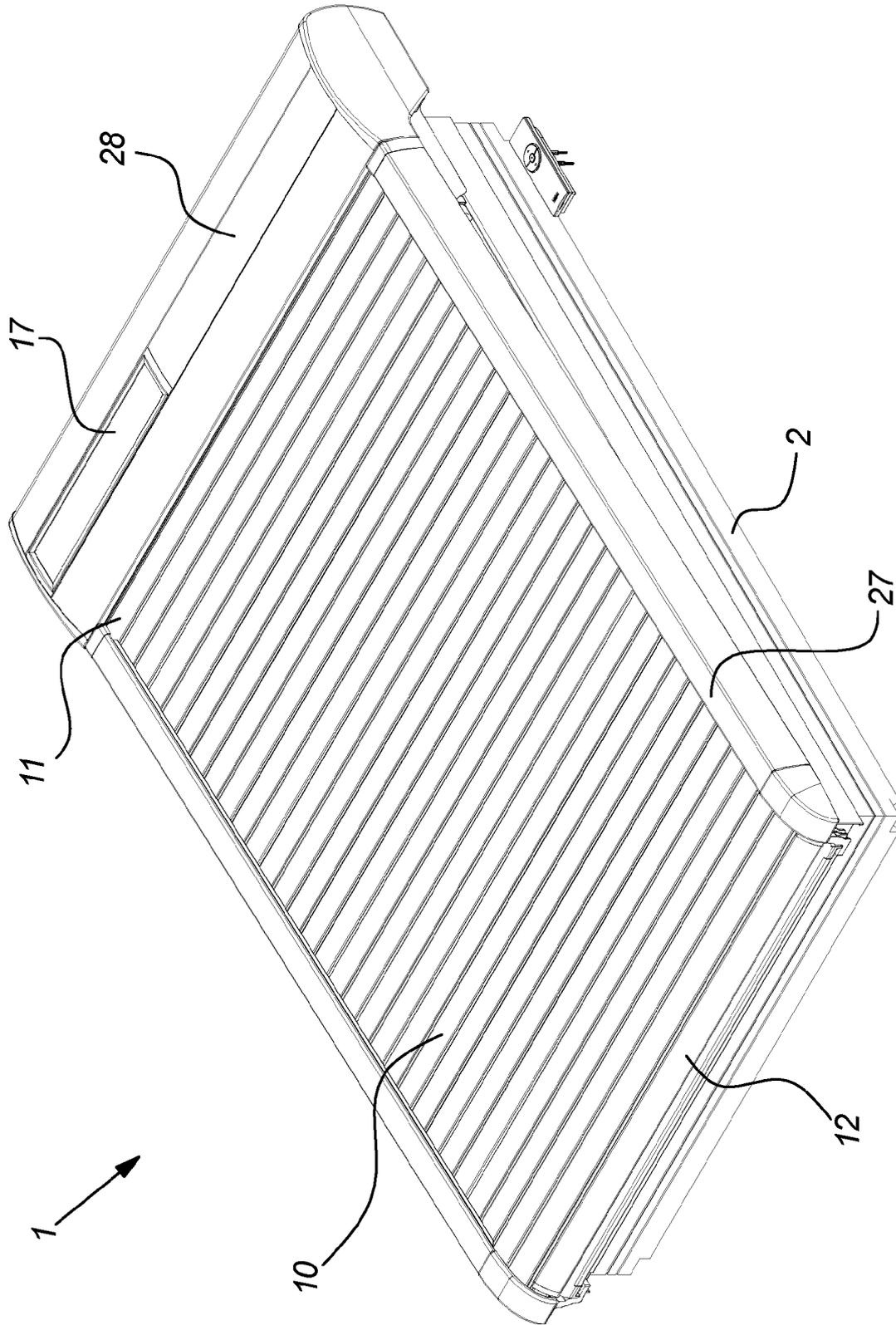


Fig. 1



Fig. 2

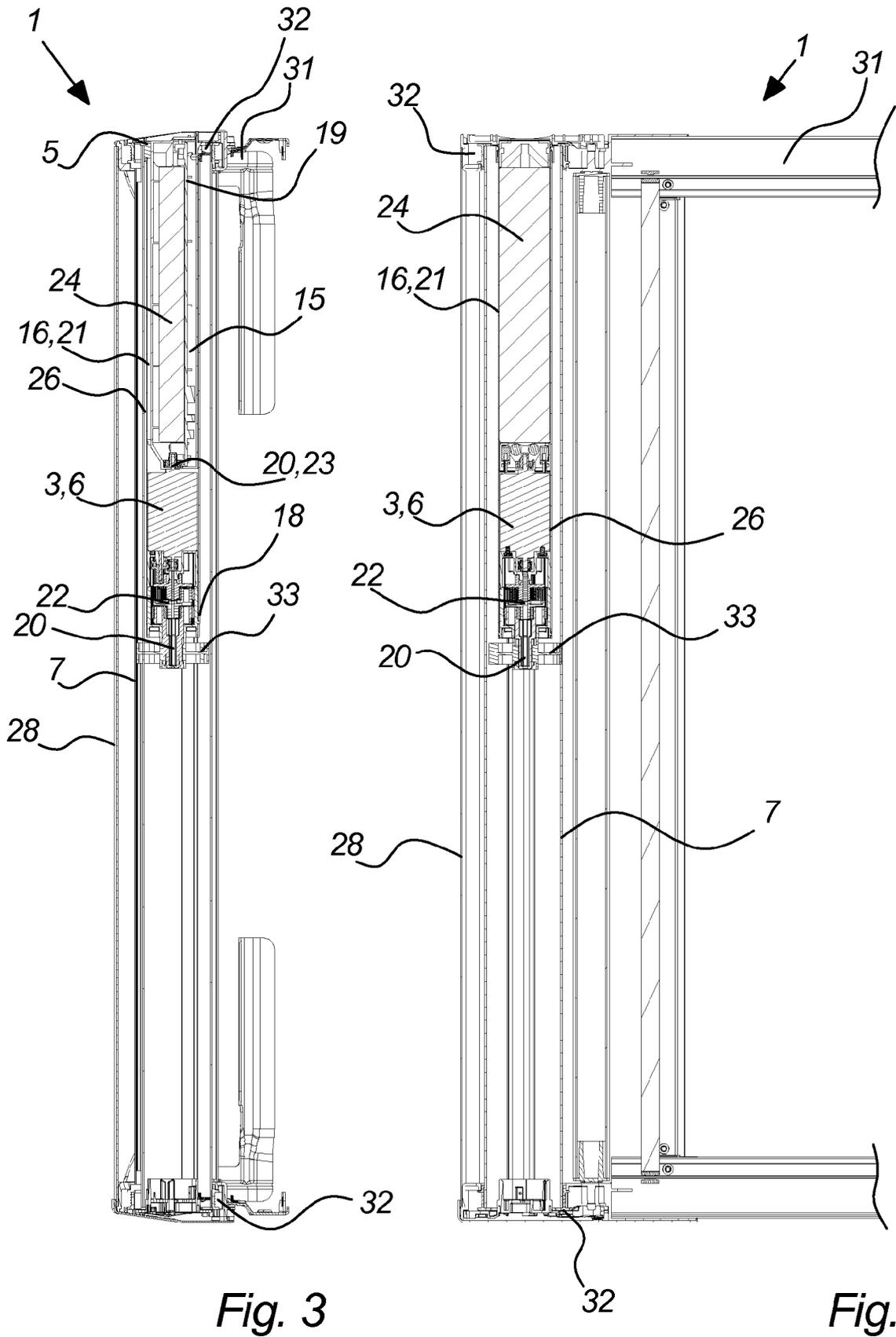


Fig. 3

Fig. 4

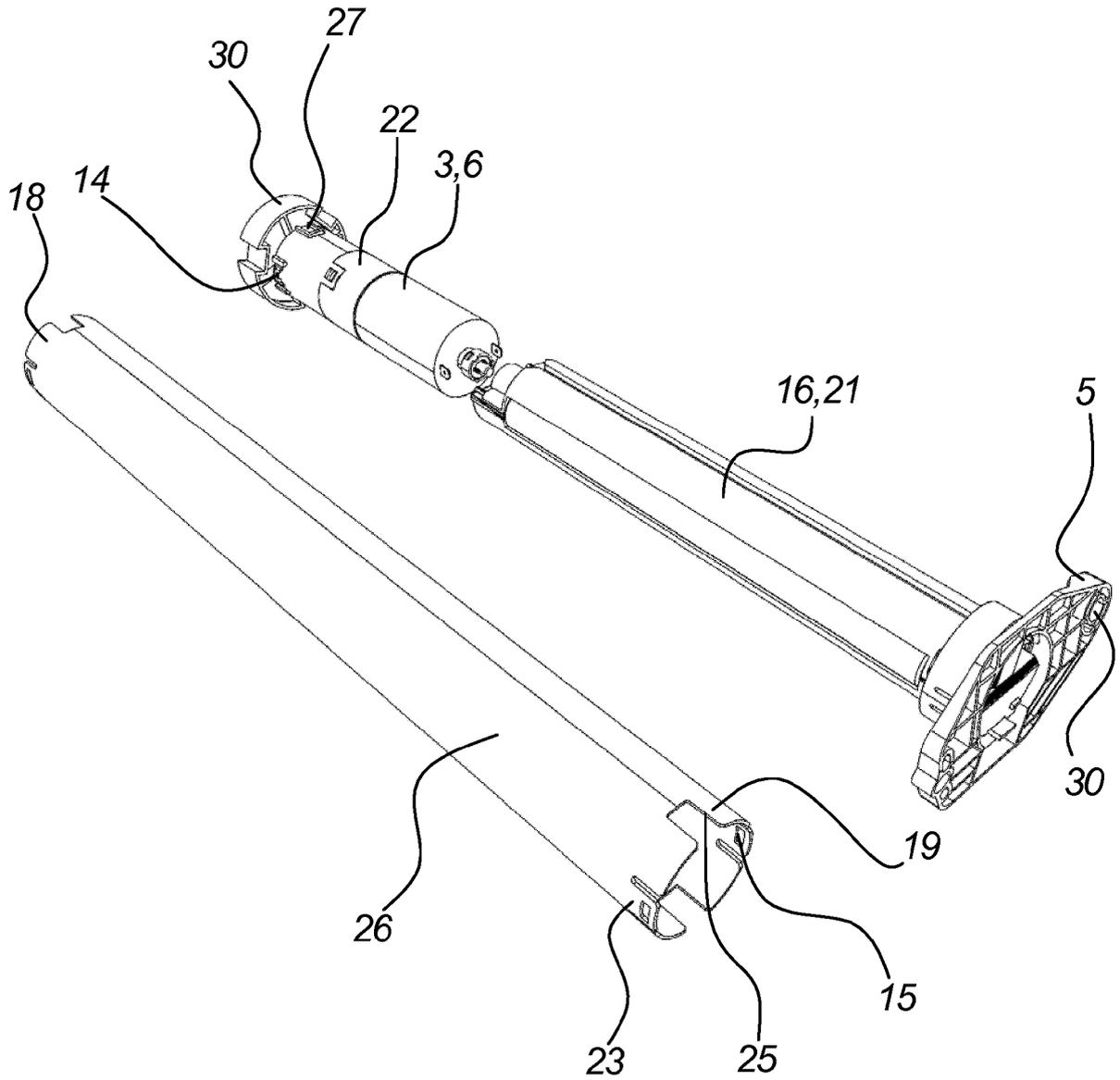


Fig. 5

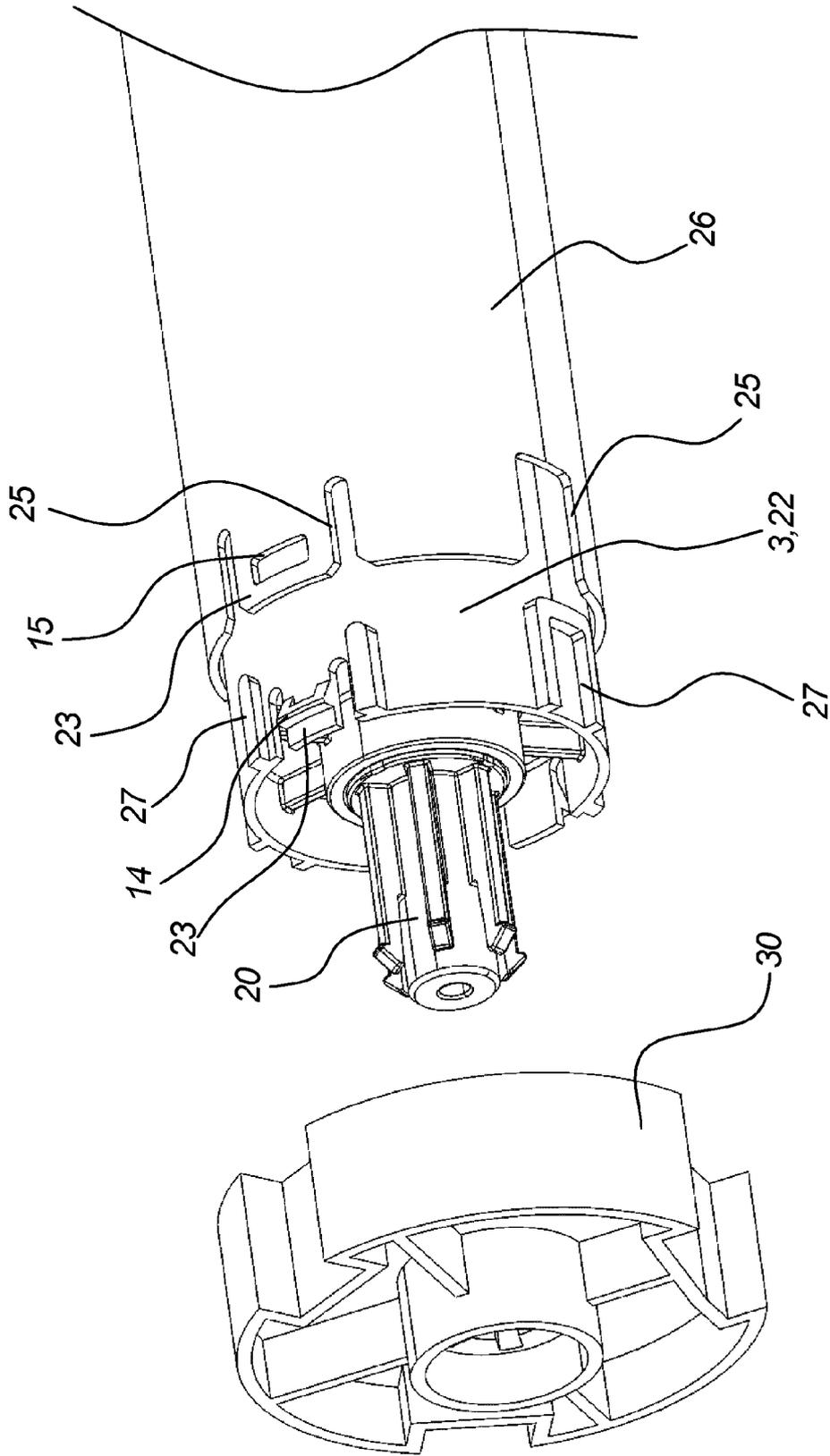


Fig. 6

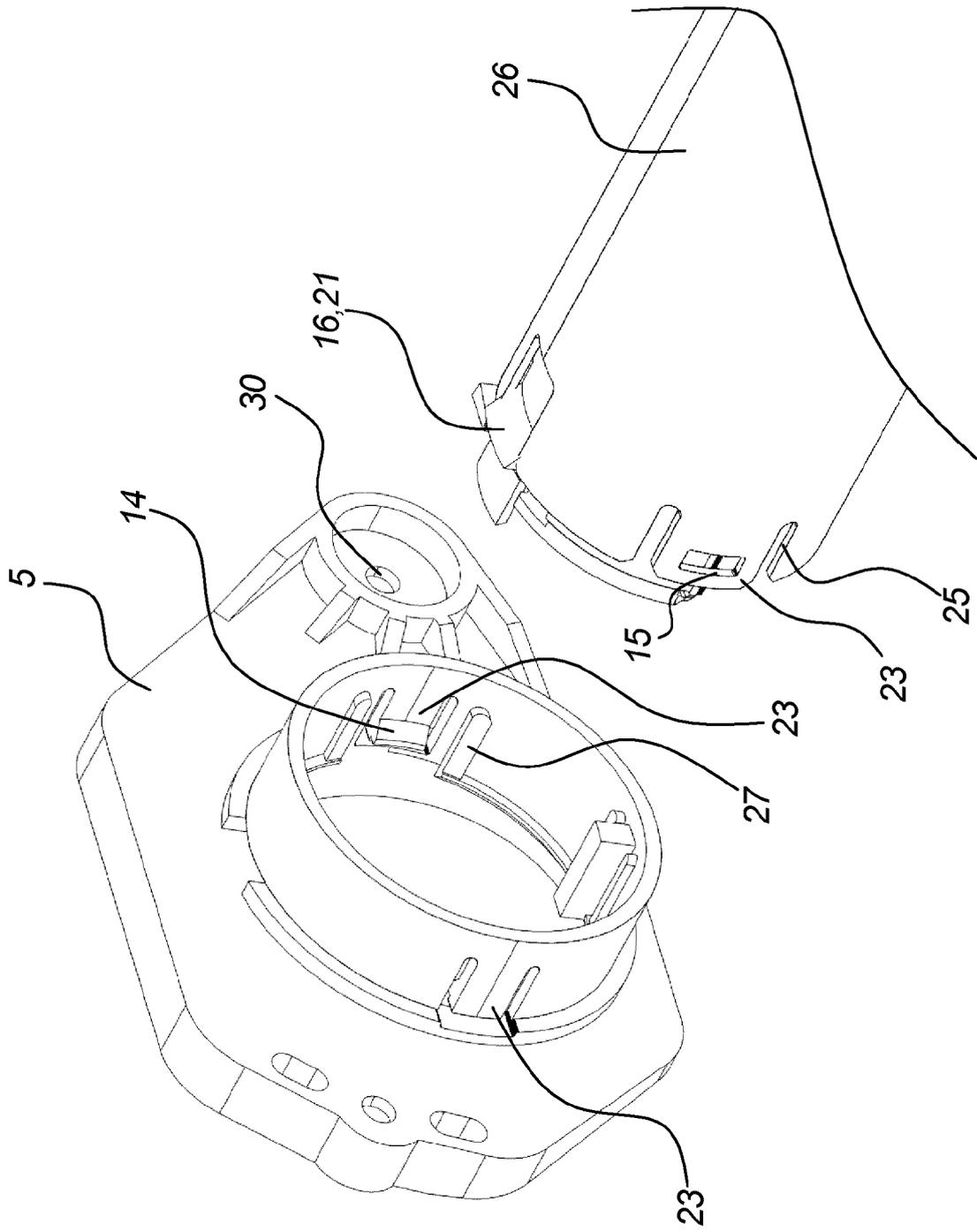


Fig. 7



EUROPEAN SEARCH REPORT

Application Number
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			TECHNICAL FIELDS SEARCHED (IPC)
			E06B E04D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 September 2016	Examiner Schwertfeger, C
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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