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(54) **A SCREENING DEVICE, A ROOF WINDOW COMPRISING SUCH A SCREENING DEVICE AND A METHOD FOR MOUNTING SUCH A SCREENING DEVICE ON A ROOF WINDOW**

(57) A screening device (13) comprising a top element (14) adapted for being mounted on or adjacent to a top frame member (4) of a roof window (1), and a connection device (20) adapted for connecting the screening device (13) to the roof window (1) on or adjacent to the top frame member (4) of the roof window (1) in such a manner that the screening device (13) may be displaced to a position in which it forms an angle with the roof window (1), the connection device (20) comprising at least one rod-shaped element (21) provided on the top element (14) and extending in a longitudinal direction (L) of

the top element (14), a receiving element (23) adapted for being mounted on or adjacent to the top frame member (4) or a side frame member (5, 6) of the roof window (1), and an adapter element (24) comprising a first part (25) adapted for locking engagement with the receiving element (23) and a second part (26) adapted for connection to the rod-shaped element (21) in such a way that the second part (26) is freely rotatable with respect to the at least one rod-shaped element (21) at least after the first part (25) is brought into engagement with the receiving element (23).

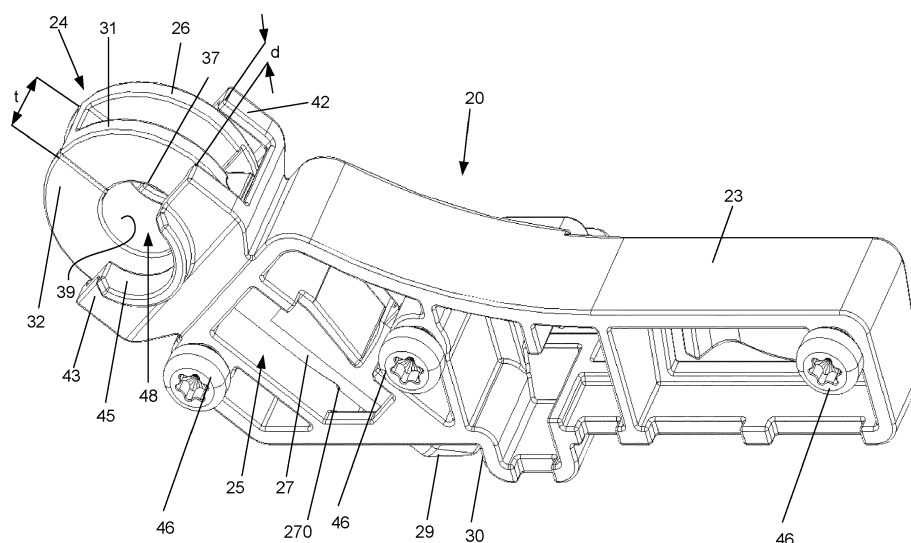


Fig. 4

Description

Technical Field

[0001] The present invention relates to a screening device comprising a top element adapted for being mounted on or adjacent to a top frame member of a roof window, and a connection device adapted for connecting the screening device to the roof window on or adjacent to the top frame member of the roof window in such a manner that the screening device may be displaced to a position in which it forms an angle with the roof window.

Background Art

[0002] Such a screening device may for instance be a roller shutter or an awning blind. Such a screening device constitutes an external screening device to be mounted to the external side of a roof window, which comprises a frame and a sash connected to the frame by means of a set of hinges defining a hinge axis. The screening device is provided with side rails and a top casing. Typically, a bottom bar is positioned at the free end of the screening body. The screening body may e.g. be a shutter body/panzer or an awning cloth. At the bottom member of the sash, connecting elements in the form of mounting fittings, or sliding guides, are provided and on which the side rails may slide.

[0003] The top casing of the roller shutter is rotatably connected to the top member of the frame, and the side rails are rigidly connected to the top casing. Typically, the hinge connection between the top casing and the frame comprises receiving means such as a recess on a mounting element connected to the frame to receive a pin on the top casing.

[0004] During operation of the screening device, the screening body is unwound from its non-screening position in the top casing and guided in the side rails to a screening position. The unwinding and winding-up is carried out either manually or by electrical operation. When the window is opened, the sash is pivoted to a number of desired open positions in which the plane of the sash forms an arbitrary angle with the plane of the frame. During this movement, the screening device follows the movement as the mounting fittings slide in the respective side rail.

[0005] Such a screening device is for instance known from the applicant's patent applications DE 202012010009 U and WO 02/06621 A1.

[0006] Similar screening devices are known from for example EP 3 392 443 A1 and DE 10 2005 037 774 B3.

[0007] While the mounting of roller shutters and awning blinds of the above-mentioned second type is well developed, mounting on the roof window of the unit consisting of the top casing and the side rails of the above-mentioned type of screening devices is often challenging, especially when working at large heights, as tools are needed to complete the mounting. The person mounting the

screening device must thus handle both screening device and tools, which poses a risk of inadvertently dropping the tools.

[0008] It is a general desire to provide an improved and simplified mounting of a screening device of the above-mentioned type in the reception means on the roof window and with which tools are needed to a lesser degree or not needed at all during mounting, and which involves no risk of inadvertent release of the connection between the unit consisting of the top casing and the side rails and the roof window.

Summary of Invention

[0009] It is therefore the object of the invention to provide an improved screening arrangement providing a connection between the top casing of the screening device and the roof window in which no risk of inadvertent release of the connection is involved.

[0010] It is a further object of the invention to provide an improved and simplified mounting of a screening device of the above-mentioned type in the reception means on the roof window where tools are needed to a lesser degree or not needed at all during mounting.

[0011] It is a still further object to ensure secure locking of the connection between the top casing of the screening device and the roof window, and especially such that it may only be disengaged by manual release.

[0012] In a first aspect of the invention the above and other objects are achieved by means of a screening arrangement of the type mentioned by way of introduction where the connection device comprises at least one rod-shaped element provided on the top element and extending in a longitudinal direction of the top element, a receiving element adapted for being mounted on or adjacent to the top frame member or a side frame member of the roof window, and an adapter element comprising a first part adapted for locking engagement with the receiving element and a second part adapted for connection to the rod-shaped element in such a way that the second part of the adapter element is freely rotatable with respect to the at least one rod-shaped element at least after the first part of the adapter element is brought into engagement with the receiving element.

[0013] Thereby, and in particular by providing a connecting element with a rod-shaped element, a receiving element and an adapter element as described above, a screening device is provided having such a construction that, once connected, the adapter element may only be released from the receiving element by manual disengagement of the first part, and that the adapter member may only be released from the top casing by disconnecting the second part from the rod-shaped element. The adapter member is thus connected to the top casing throughout the entire movement range of the top casing during operation of the screening device. In other words, such a locking of the connection between the top casing of the screening device and the roof window provides

that it may only be disengaged by manual release.

[0014] Furthermore, an improved screening arrangement providing a connection between the top casing of the screening device and the roof window in which no risk of inadvertent release of the connection is involved is hereby provided for.

[0015] Also, by providing a connecting element with a rod-shaped element, and a receiving element as described above, and especially with an adapter element as described above, it is ensured that, once the second part of the adapter element is connected to the rod-shaped element, the first part of the adapter element is always hanging freely suspended by gravity from the top element of the screening device, thereby making it easy to connect the first part of the adapter element and the receiving element. Thereby, an improved and simplified mounting of a screening device of the above-mentioned type in the receiving element mounted on or in the roof window where tools are needed to a lesser degree or not needed at all during mounting is achieved.

[0016] In an embodiment, the adapter element comprises a first part adapted for locking engagement with the receiving element and a second part adapted for connection to the rod-shaped element in such a way that the second part of the adapter element is freely rotatable with respect to the at least one rod-shaped element both before and after the first part of the adapter element is brought into engagement with the receiving element.

[0017] Thereby, a screening device is provided which is easier to manufacture and which is especially simple to handle during transport and packaging.

[0018] In an embodiment, the adapter element is an element being separate from both the rod-shaped element and the receiving element.

[0019] Thereby, a further improved screening arrangement providing a connection between the top casing of the screening device and the roof window in which the risk of inadvertent release of the connection is reduced is hereby provided for. In particular so as it thereby becomes possible to deliver such a screening device with the adapter element already attached to the rod-shaped element.

[0020] In an embodiment, the second part of the adapter element comprises two sections adapted for being connected with one another around the rod-shaped element provided on the top element in such a manner as to extend all the way around the rod-shaped element.

[0021] In this way it is ensured that the second part may only be removed from the rod-shaped element by disconnecting the two sections from one another. Thereby a screening device is provided with which the risk of parts getting lost is minimized. Furthermore, the rotatability between the adapter element and the rod-shaped element is ensured in a constructionally particularly simple manner.

[0022] In an embodiment, the two sections of the second part of the adapter element are adapted for being connected with one another by a click-connection or a

snap-locking connection.

[0023] Thereby a screening device is provided with which the adapter element may be attached to the rod-shaped element in a particularly simple and fast manner, whether by the end user or at the factory.

[0024] In an alternative or additional embodiment, the two sections of the second part of the adapter element are semi-annular sections.

[0025] Thereby a screening device is provided with which the adapter element comprises a particularly simple construction allowing for obtaining the above described advantages.

[0026] In an embodiment, the first part of the adapter element is provided on one of the two sections of the second part of the adapter element.

[0027] Thereby a screening device is provided with which the adapter element comprises a particularly simple construction, especially in that it comprises very few parts.

[0028] In an embodiment, the first part of the adapter element and the receiving element are adapted for mutually forming one of a snap-locking engagement, a friction-locking engagement and a magnet-based locking engagement.

[0029] Thereby a screening device is provided which has a particularly simple construction while also providing for a particularly simple connection between the adapter element and the receiving element.

[0030] In an embodiment, the first part of the adapter element is or comprises a rod or leg section, and the receiving element is or comprises a slot.

[0031] In an embodiment, the first part of the adapter element is or comprises a slot, and the receiving element is or comprises a rod or leg section.

[0032] In an embodiment, the first part of the adapter element is or comprises a magnet and the receiving element is or comprises a magnetic material.

[0033] In an embodiment, the first part of the adapter element is or comprises a magnetic material and the receiving element is or comprises a magnet.

[0034] Thereby a screening device is provided which provides for a particularly simple connection between the adapter element and the receiving element, whether the connection is accomplished by the end user or at the factory.

[0035] Furthermore, when the first part of the adapter element is or comprises a magnet and the receiving element is or comprises a magnetic material, or vice versa, an aid in connecting the adapter element and the receiving element is provided in that the magnetic force provided by the magnet on the magnetic material served to guide the first part of the adapter element into the receiving element.

[0036] In an embodiment, the first part and the second part of the adapter element is provided in one piece.

[0037] Thereby a screening device is provided with which the adapter element comprises particularly few parts, which in turn reduces the risk of parts getting lost

during the mounting of the screening device on a roof window.

[0038] In an embodiment, the receiving element comprises a first wall element and a second wall element, where the first wall element and the second wall element are spaced apart with a distance corresponding to at least a thickness of the second section, where the first wall element and the second wall element each comprise a cut-out, and where the cut-outs are provided to leave free an opening formed by the second part of the adapter element in the assembled state of the connection device.

[0039] Thereby a screening device is provided with which the connection between adapter element and receiving device, and thus in practice between screening device and roof window, may be accomplished in a particularly simple and straight forward manner reducing the risk of inadvertently mounting the screening device incorrectly.

[0040] In a second aspect of the invention, the above and other objects are achieved by means of a roof window comprising a stationary frame adapted to be built into a structure and having a top frame member, two side frame members and a bottom frame member, and a screening device according to the first aspect of the invention.

[0041] In an embodiment of such a roof window, the receiving element of the connection device of the screening device is mounted on the top frame member or one of the two side frame members of the roof window,

[0042] In an alternative embodiment of such a roof window the receiving element of the connection device of the screening device is integrated in the top frame member or in one of the two side frame members of the roof window.

[0043] These two embodiments both provide for a screening device with which the receiving element may be mounted on the roof window at the factory. This in turn allows for delivery of a screening device with particularly few loose parts to be mounted, which in turn reduces the risk of parts getting lost during the mounting of the screening device on a roof window.

[0044] In yet another alternative embodiment, the receiving element of the connection device of the screening device is mounted on or integrated in a side rail of the screening device, on or in a part of the side rail which in a mounted position of the side rail on a roof window is arranged adjacent to one of the two side frame member and/or the top frame member of the roof window.

[0045] This embodiment provides for a screening device with which the receiving element may be mounted on the screening device at the factory. This in turn allows for delivery of a screening device with particularly few loose parts to be mounted, which in turn reduces the risk of parts getting lost during the mounting of the screening device on a roof window.

[0046] In a third aspect of the invention, the above and other objects are achieved by means of a method for mounting a screening device on a roof window, the method

comprising the steps of:

- a) providing a roof window comprising a stationary frame adapted to be built into a structure and having a top frame member, two side frame members and a bottom frame member,
- b) providing a screening device according to the first aspect of the invention,
- c) mounting the receiving element on or adjacent to, or integrating the receiving element in, the top frame member or one of the two side frame members of the roof window, and
- d) connecting the top element of the screening element with roof window by connecting the first part of the adapter element hanging from the rod-shaped element to the receiving element.

[0047] In an embodiment, the method comprises the further step of:

- e) connecting the second part of the adapter element to the rod-shaped element provided on the top element in such a way that the second part is freely rotatable with respect to the at least one rod-shaped element.

[0048] Step e) may be performed before step b) when producing the screening device or, alternatively, after step b) on-site during mounting of the screening device on the roof window.

[0049] In an embodiment, step e) may be performed by gripping the two sections of the second part from either side of the rod-shaped element and bringing the two sections of the second part into mutual engagement around the rod-shaped element in such a way that the second part is freely rotatable with respect to the at least one rod-shaped element.

[0050] In an embodiment, step d) may be performed by inserting the first part of the adapter element into the slot of the receiving element.

Brief Description of Drawings

[0051] In the following description embodiments of the invention will be described with reference to the schematic drawings, in which

Fig. 1 shows a perspective view seen from above of a roof window in a closed position and comprising a screening device according to the first aspect of the invention, the roof window being top hung.

Fig. 2 shows a perspective view seen from above of a screening device according to the first aspect of the invention in a closed position.

Fig. 3 is a close-up perspective view of a section of the top element of a screening device of Fig. 1 and comprising a connection device.

Fig. 4 is a perspective view of a connection device of the screening device of Fig. 1 in the assembled state.

Fig. 5 is an exploded view of the connection device

of Fig. 4 showing a receiving element and an adapter element with a first section, a second section and a rod or leg section.

Fig. 6 is perspective view of the first section of the adapter element of the connection device of Figs. 4 and 5.

Fig. 7 is perspective view of the second section and the rod or leg section of the adapter element of the connection device of Figs. 4 and 5.

Fig. 8 is a perspective view of a receiving element of the adapter element of the connection device of Figs. 4 and 5.

Fig. 9 is a perspective view from another angle of view of the receiving element of Fig. 8.

Fig. 10 is a perspective view of a receiving element of the adapter element of the connection device according to the invention mounted on a side rail of a screening device.

Description of Embodiments

[0052] The roof window 1 shown in Fig. 1 is adapted for mounting in an inclined roof. The roof window 1 comprises a frame 2 and an openable sash 3 supporting a glass pane 12. The sash 3 may be top hung, center hung or both top hung and center hung, but is in the embodiment shown in Fig. 1 top hung. The frame 2 comprises a top frame member 4, a bottom frame member 5 and two side frame members. Only the side frame member 6 is visible on Fig. 1. The sash 3 comprises a top sash member 8, a bottom sash member 11 and two side sash members. Only the side sash member 9 is visible on Fig. 1.

[0053] The roof window 1 further comprises a screening device 13, which may in principle be any feasible type of screening device 13. In one embodiment the screening device is a roller shutter. In other embodiments the screening device may be a roller blind or an awning.

[0054] Turning now to Fig. 2, an embodiment of a screening device 13 according to the invention will be described in more detail. The screening device 13 generally comprises a screening body 19, a top element 14, two side covers 15, 16, two side rails 17, 18 and a connection device 20. The top element 14 comprises opposite ends 141 and 142 with respective end pieces 145 and 146 and respective end covers 143 and 144. The top element 14 further comprises a longitudinal extension or direction L. It is noted that in principle, the two side covers 15, 16 and/or the two side rails 17, 18 are optional elements.

[0055] The screening body 19 comprises opposite side sections guided in longitudinal slots of the side rails 17, 18 and is movable between a rolled up position in the top element 14 and a rolled out position covering the pane 12 of the window 1. The screening body 19 may be a one-piece screening body or it may comprise a plurality of slats.

[0056] The screening device 13 may further comprise

a bottom element (not shown) and a bottom profile (not shown) arranged extending between the respective side rails 17 and 18 at an end opposite to the top element 14, as well as a supporting element (not visible) arranged extending in a longitudinal direction L of the top element 14 between the opposite side covers 15, 16 or side rails 17, 18. It is noted that the bottom element, supporting element and bottom profile are all optional elements which in some embodiments may be omitted.

[0057] Turning now to Fig. 3, a perspective view of an end section, particularly the end 141 with the end cover 143 (Fig. 2) removed, of the top element 14 of a screening device 13 according to the invention and comprising a connection device 20 is shown. The screening device 13 more particularly comprises two connection devices 20, one at each longitudinal end 141, 142 of the top element 14. As shown, the connection device 20 is arranged at a top member 4 of the frame 2. Alternatively, the connection device 20 may be arranged at a side member 5 or 6 of the frame 2. In any event the connection device 20 connects the screening device 13 and the window 1 in the mounted condition of the screening device 13 in such a manner that the screening device 13 may be displaced to a position in which it forms an angle with the roof window 1.

[0058] The connection device 20 comprises at least one rod-shaped element 21 provided on the top element 14 of the screening device 13. The rod-shaped element 21 extends in the longitudinal direction L of the top element 14. The rod-shaped element 21 further extends in a direction inward from the end 141, 142 of the top element 14, i.e. away from the end covers 143, 144 (Fig. 2) or the surface 147 of the end piece 145 (Fig. 3). In the embodiment shown on the figures there is provided a rod-shaped element 21 at each longitudinal end 141, 142 of the top element 14. In an alternative embodiment there may be provided one rod-shaped element 21 extending between the longitudinal ends 141, 142 of the top element 14.

[0059] The connection device 20 further comprises a receiving element 23 adapted for being mounted on a side or top frame member 4, 5, 6 of the roof window 1. In an alternative embodiment the receiving element 23 may be adapted for being integrated in a side or top frame member 4, 5, 6 of the roof window 1, for instance by being moulded into or in one piece with a side or top frame member 4, 5, 6 of the roof window 1. In embodiments where the receiving element 23 is adapted for being integrated in a side frame member 5, 6 of the roof window 1, the receiving element 23 is thus adapted to be mounted adjacent to the top frame member 4 of the roof window 1.

[0060] In other alternative embodiments, the receiving element 23 may be adapted for being mounted on or integrated in a side rail 17, 18 of the screening device 13, on or in a part 171, 181 of the side rail 17, 18 which in a mounted position of the side rail 17, 18 on a roof window 1 is arranged adjacent to a side or top frame member 4, 5, 6 of the roof window 1 - cf. Fig. 10. In such

embodiments, the receiving element 23 is thus adapted to be mounted adjacent to a side or top frame member 4, 5, 6 of the roof window 1.

[0061] Referring to Fig. 5, the connection device 20 further comprises an adapter element 24. The adapter element 24 comprises a first part 25 adapted for locking engagement with the receiving element 23 and a second part 26 adapted for connection to the rod-shaped element 21 in such a way that the second part 26 is freely rotatable with respect to the rod-shaped element 21. The second part 26 of the adapter element 24 may be connected to the rod-shaped element 21 at the factory where the screening device is produced, or alternatively on-site by the person mounting the screening device 13 on the roof window 1.

[0062] Referring particularly to Fig. 5, it is clear that the rod-shaped element 21, the adapter element 24 and the receiving element 23 are mutually separate elements.

[0063] The adapter element 24 is shown in further detail in Fig. 4 showing an assembled state of the connection device 20, Fig. 5 showing an exploded view and Figs. 6 and 7 showing an exploded view of the adapter element 24.

[0064] Referring particularly to Fig. 7 the first part 25 of the adapter element 24 comprises a rod or leg section 27. The leg section 27 is provided with at least one recess 270 forming part of a snap-locking mechanism for locking together the first part 25 and the receiving element 23. The other part of this snap-locking mechanism is provided in the form of a slot 28 of the receiving element 23 and will be described further below. In the embodiment shown, the leg section 27 is provided with two such recesses 270 arranged on diametrically opposite sides of the leg section 27. Alternative embodiments include omitting one of the two recesses 270 or providing one circumferentially extending recess. The rod or leg section 27 may be circular in cross-section such as to achieve an improved taking up of tolerances during the mounting process.

[0065] The first part 25 of the adapter element 24 further comprises a free end 29 opposite the second part 26 of the adapter element 24. The end 29 is adapted for abutting engagement with an end stop 30 provided on the receiving element 23. The free end 29 may be tapered such as to allow for easier insertion of the first part 25 of the adapter element 24 into the slot 28 of the receiving element 23. Also, the slot 28 may be tapering towards a bottom end where the end stop 30 is provided to a geometry and/or shape substantially corresponding to the shape of the first part 25, or at least the free end 29 of the first part 25, of the adapter element 24. The slot 28 may for instance be funnel-shaped.

[0066] In some embodiments, the end 29 may be provided as a magnet or a magnetic material, while the end stop 30 is provided as a magnetic material or a magnet, such as to provide a magnetic locking mechanism for locking together the first part 25 and the receiving element 23. In such an embodiment, the snap-locking mechanism

may in principle be omitted.

[0067] In some embodiments where the end 29 is provided as a magnetic material or a magnet, a magnet or a piece of magnetic material may be arranged in the slot 28, particularly at an upper end, i.e. close to the opening, of the slot 28, of the receiving element 23 such as to attract the magnetic material of the end 29 for easy mating of the first part 25 and the receiving element 23.

[0068] Referring to Fig. 5, the second part 26 of the adapter element 24 comprises a first section 31 and a second section 32, both being semi-annular sections. Referring now particularly to Figs. 6 and 7, The first and second section 31 and 32 are adapted for being connected to the rod-shaped element 21 by being clicked around the rod-shaped element 21. To this end, the first section 31 comprises a protrusion 33 and a slot 34, and likewise the second section 32 comprises a protrusion 35 and a slot 36. When connecting the adapter element 24 and the rod-shaped element 21, the protrusion 33 of the first section 31 and the slot 36 of the second section 32, respectively the slot 34 of the first section 31 and the protrusion 35 of the second section 32, are brought into mutual engagement. A click- or snap-locking connection is enabled in that a nose 330, 350 provided on the respective protrusion 33, 35 is brought to engage a notch in the respective slot 34, 36. The notch of the slot 36 is on Fig. 7 denoted 360, while the notch of the slot 34 is denoted 340 on Fig. 6 and may be formed by an edge of the slot 34.

[0069] In the embodiment shown, the first and second section 31 and 32 are semi-annular with a semi-circular inner surface 37 and 39, respectively, and a semi-circular outer surface 38 and 40, respectively. More generally, the respective inner surfaces 37 and 39 should be shaped in such a way that the first and second sections 31, 32 are assembled, the respective inner surfaces 37 and 39 form an opening having a shape conforming to the outer circumference of the rod-shaped element 21 in such a way that the second part 26, when connected to the rod-shaped element 21, is freely rotatable with respect to the rod-shaped element 21. The respective outer surfaces 38 and 40 may in principle have any shape, and are thus not limited to being semi-circular, but may for instance also be semi-rectangular or semi-triangular.

[0070] The first and second section 31 and 32 of the second part 26 of the adapter element 24 may also be provided, such as moulded or cast, in one piece. If the first and second section 31 and 32 are provided in one piece, the receiving element 23 may be provided as a rod extending from the end piece, and the end cover 143 or 144 may provide or work as a locking mechanism for locking together the first part 25 and the receiving element 23. A separate snap-locking or friction-locking mechanism for locking together the first part 25 and the receiving element 23 may in this case in principle be omitted. The adapter element 24 and the receiving element 23 may be connected and the respective end covers 143 and 144 may be mounted on the screening device on-site or at the factory. The second part 26 may further be

circular in cross-section such as to achieve an improved taking up of tolerances during the mounting process.

[0071] The receiving element 23 is shown in further detail in Figs. 4, 8 and 9 showing the receiving element 23 from different angles of view as well as in Fig. 5 showing an exploded view of the connection device 20.

[0072] The receiving element 23 further comprises the slot 28 (seen best in Fig. 8) adapted for receiving the first part 25 of the adapter element. The slot comprises a resilient member 280 adapted for engaging with the recess 270 provided on the leg section 27 of the first part 25 such as to form a snap-locking mechanism for locking together the first part 25 and the receiving element 23. Furthermore, the receiving element 23 comprises an end stop 30. The end stop is adapted for abutting engagement with the end 29 of the leg section 27 of the adapter element 24.

[0073] The snap-locking mechanism for locking together the first part 25 and the receiving element 23 may alternatively be provided as a spring mechanism, particularly a substantially omega-shaped spring mechanism comprising two legs and rounded section connected by a narrowed intermediate section. In yet another alternative, the locking mechanism for locking together the first part 25 and the receiving element 23 may be a snap-locking or friction-locking mechanism. Such a friction-locking mechanism may for instance be provided in that the receiving element 23 is provided as a substantially key-hole shaped opening, and that the first part 25 is inserted into the wider part of the receiving element 23 and slid towards the narrower part of the receiving element 23 such that the first part 25 and the receiving element 23 are locked together by friction or snap-locking.

[0074] The snap-locking or friction-locking mechanism for locking together the first part 25 and the receiving element 23 may be releasable. The snap-locking mechanism may be releasable by means of hand power or by means of a suitable tool. The snap-locking or friction-locking mechanism for locking together the first part 25 and the receiving element 23 may further be biased towards or locked in the locked position such as to avoid undue release of the snap-locking or friction-locking mechanism.

[0075] Referring particularly to Fig. 9, at an end of the slot 28 opposite the end stop 30, the receiving element 23 is furthermore provided with a structure 47 adapted for accommodating the second section 26 of the adapter element 24 in the assembled condition of the connection device 20. This structure 47 comprises a first wall element 42 and a second wall element 43 spaced apart with a distance d corresponding to the thickness t (cf. also Fig. 4) of the second section 26, optionally plus an amount of play, thus allowing easy insertion of the leg section 27 into the slot 28 and easy reception of the second section 26 between the wall elements 42 and 43. The wall elements 42 and 43 each comprise a cut-out 44 and 45, respectively. The cut-outs 44 and 45 are provided to

leave free the opening 48 formed by the respective inner surfaces 37 and 39 in the assembled state of the connection device 20 (cf. Fig. 4). Thereby, it is ensured that in the assembled state of the connection device 20, the second part 26 remains freely rotatable with respect to the rod-shaped element 21.

[0076] The receiving element 23 is further provided with one or more holes 41 (Fig. 9) adapted for receiving fastening members, such as screws 46 (Fig. 4) or the like, such as to attach the receiving element 23 to a frame member 4, 5, 6 of a roof window 1. The holes 41 may be through or blind. Also, the holes 41 may optionally be provided with a threading.

[0077] The connection device 20 may be made of a suitable metal. Alternatively, the connection device 20 may be moulded in a suitable plastic material. If the connection device 20 is moulded in a plastic material, it is even feasible that the connection device 20 may be moulded in one piece with a moulded frame structure of a roof window 1. In this case it is also possible to omit the holes 41 in the receiving element 23.

[0078] The respective receiving elements 23, adapter elements 24 and the respective end covers 143 and 144 may be mounted on the screening device on-site or at the factory.

[0079] The person skilled in the art realizes that the present invention by no means is limited to the preferred embodiments described above. On the contrary, many modifications and variations are possible within the scope of the appended claims.

List of reference numerals

[0080]

- | | |
|----------|--------------------------|
| 1 | roof window |
| 2 | frame |
| 3 | sash |
| 4 | top frame member |
| 5 | bottom frame member |
| 6 | side member |
| 8 | top sash member |
| 9 | side sash member |
| 11 | bottom sash member |
| 12 | glass pane |
| 13 | screening device |
| 14 | top element |
| 141, 142 | opposite ends |
| 143, 144 | end covers |
| 145, 146 | end pieces |
| 147 | surface of end piece 145 |
| 15 | side cover |
| 16 | side cover |
| 17 | side rail |
| 18 | side rail |
| 171, 181 | part of side rail |

19	screening body				
20	connection device				
21	rod-shaped element				
23	receiving element				
24	adapter element	5			
25	first part				
26	second part				
27	leg section				
	270 recesses				
28	slot	10			
29	end				
30	end stop				
31	first section				
32	second section				
33	protrusion	15			
	330 nose				
34	slot				
	340 notch				
35	protrusion	20			
	350 nose				
36	slot				
	360 notch				
37	semi-circular inner surface				
38	semi-circular outer surface	25			
39	semi-circular inner surface				
40	semi-circular outer surface				
41	holes				
42	first wall element				
43	second wall element	30			
44	cut-out				
45	cut-out				
46	screws				
47	structure	35			
48	opening				
L	longitudinal direction				
d	distance				
t	thickness	40			

Claims

1. A screening device (13) comprising a top element (14) adapted for being mounted on or adjacent to a top frame member (4) of a roof window (1), and a connection device (20) adapted for connecting the screening device (13) to the roof window (1) on or adjacent to the top frame member (4) of the roof window (1) in such a manner that the screening device (13) may be displaced to a position in which it forms an angle with the roof window (1), wherein the connection device (20) comprises:
 - a) at least one rod-shaped element (21) provided on the top element (14) and extending in a longitudinal direction (L) of the top element (14),
 - b) a receiving element (23) adapted for being mounted on or adjacent to the top frame member (4) or a side frame member (5, 6) of the roof window (1), and **characterized in that** the connection device (20) further comprises:
 - c) an adapter element (24) comprising a first part (25) adapted for locking engagement with the receiving element (23) and a second part (26) adapted for connection to the rod-shaped element (21) in such a way that the second part (26) is freely rotatable with respect to the at least one rod-shaped element (21) at least after the first part (25) is brought into engagement with the receiving element (23).
2. A screening device according to claim 1, wherein the adapter element (24) comprises a first part (25) adapted for locking engagement with the receiving element (23) and a second part (26) adapted for connection to the rod-shaped element (21) in such a way that the second part (26) is freely rotatable with respect to the at least one rod-shaped element (21) both before and after the first part (25) is brought into engagement with the receiving element (23).
3. A screening device according to claim 1 or 2, wherein the adapter element (24) is an element being separate from both the rod-shaped element (21) and the receiving element (23).
4. A screening device according to any one of the above claims, wherein the second part (26) of the adapter element (24) comprises two sections (31, 32) adapted for being connected with one another around the rod-shaped element (21) in such a manner as to extend all the way around the rod-shaped element (21).
5. A screening device according to claim 4, wherein the two sections (31, 32) of the second part (26) of the adapter element (24) are adapted for being connected with one another by a click-connection or a snap-locking connection, and/or wherein the two sections (31, 32) of the second part (26) of the adapter element (24) are semi-annular sections.
6. A screening device according to any one of claims 4 to 5, wherein the first part (25) of the adapter element (24) is provided on one of the two sections (31, 32) of the second part (26) of the adapter element (24).
7. A screening device according to any one of the above claims, wherein the first part (25) of the adapter element (24) and the receiving element (23) are adapted for mutually forming one of a snap-locking engagement, a friction-locking engagement and a magnet-based locking engagement.

8. A screening device according to claim 7, wherein the first part (25) of the adapter element (24) is or comprises a rod or leg section (33), and the receiving element (23) is or comprises a slot (28), or wherein the first part (25) of the adapter element (24) is or comprises a slot, and the receiving element (23) is or comprises a rod or leg section, or wherein the first part (25) of the adapter element (24) is or comprises a magnet (29) and the receiving element (23) is or comprises a magnetic material (30), or wherein the first part (25) of the adapter element (24) is or comprises a magnetic material (29) and the receiving element (23) is or comprises a magnet (30).
9. A screening device according to any one of the above claims, wherein the first part (25) and the second part (26) of the adapter element (24) is provided in one piece.
10. A screening device according to any one of the above claims, wherein the receiving element (23) comprises a first wall element (42) and a second wall element (43), wherein the first wall element (42) and the second wall element (43) are spaced apart with a distance (d) corresponding to at least a thickness (t) of the second section (32), wherein the first wall element (42) and the second wall element (43) each comprise a cut-out (44; 45), and wherein the cut-outs (44; 45) are provided to leave free an opening (48) formed by the second part (26) of the adapter element (24) in the assembled state of the connection device (20).
11. A roof window (1) comprising:
a stationary frame (2) adapted to be built into a structure and having a top frame member (4), two side frame members (5, 6) and a bottom frame member (7), and
a screening device (13) according to any one of the above claims.
12. A roof window according to claim 11, wherein the receiving element (23) of the connection device (20) of the screening device (13) is mounted on the top frame member (4) or one of the two side frame members (5, 6) of the roof window (1), or wherein the receiving element (23) of the connection device (20) of the screening device (13) is integrated in the top frame member (4) or in one of the two side frame members (5, 6) of the roof window (1), or wherein the receiving element (23) of the connection device (20) of the screening device (13) is mounted on or integrated in a side rail (17, 18) of the screening device (13), on or in a part (171, 181) of the side rail (17, 18) which in a mounted position of the side rail (17, 18) on a roof window (1) is arranged adjacent to one of the two side frame member (5, 6) and/or the top frame member (4) of the roof window (1).
13. A method for mounting a screening device on a roof window, the method comprising the steps of:
a) providing a roof window (1) comprising a stationary frame (2) adapted to be built into a structure and having a top frame member (4), two side frame members (5, 6) and a bottom frame member (7),
b) providing a screening device (13) according to any one of claims 1-9,
c) mounting the receiving element (23) on or adjacent to, or integrating the receiving element (23) in, the top frame member (4) or one of the two side frame members (5, 6) of the roof window (1), and
d) connecting the top element (14) of the screening element (13) with the roof window (1) by connecting the first part (25) of the adapter element (24) hanging from the rod-shaped element (21) to the receiving element (23).
14. A method according to claim 13, and comprising the further step of:
e) connecting the second part (26) of the adapter element (24) to the rod-shaped element (21) provided on the top element (14) in such a way that the second part (26) is freely rotatable with respect to the at least one rod-shaped element (21), wherein step e) is performed before step b) when producing the screening device or after step b) on-site during mounting of the screening device on the roof window.
15. A method according to claim 14, wherein step e) is performed by gripping the two sections (31, 32) of the second part (26) from either side of the rod-shaped element (21) and bringing the two sections (31, 32) of the second part (26) into mutual engagement around the rod-shaped element (21) in such a way that the second part (26) is freely rotatable with respect to the at least one rod-shaped element (21), and/or
step d) is performed by inserting the first part (25) of the adapter element (24) into a slot (28) of the receiving element (23).

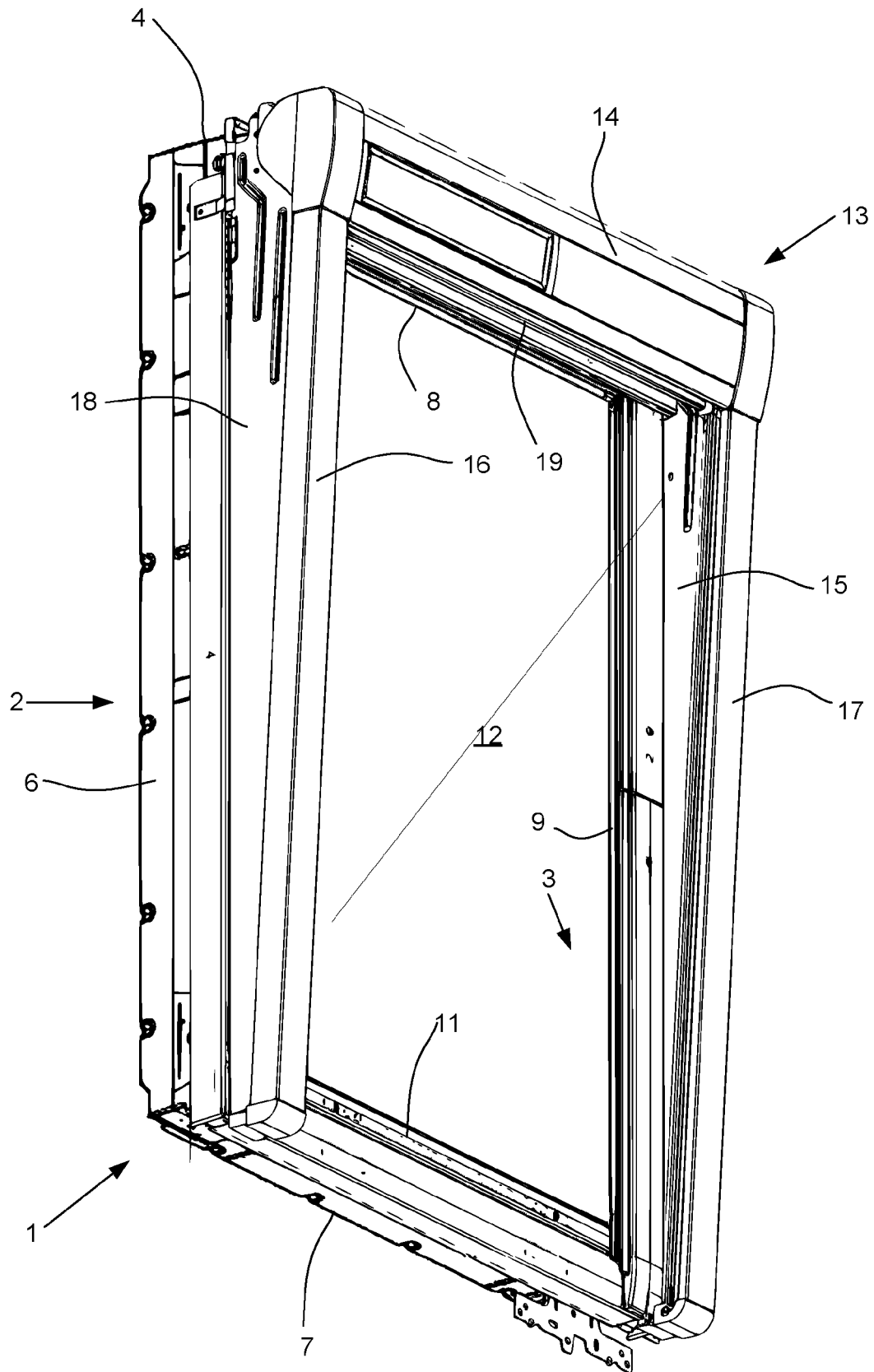


Fig. 1

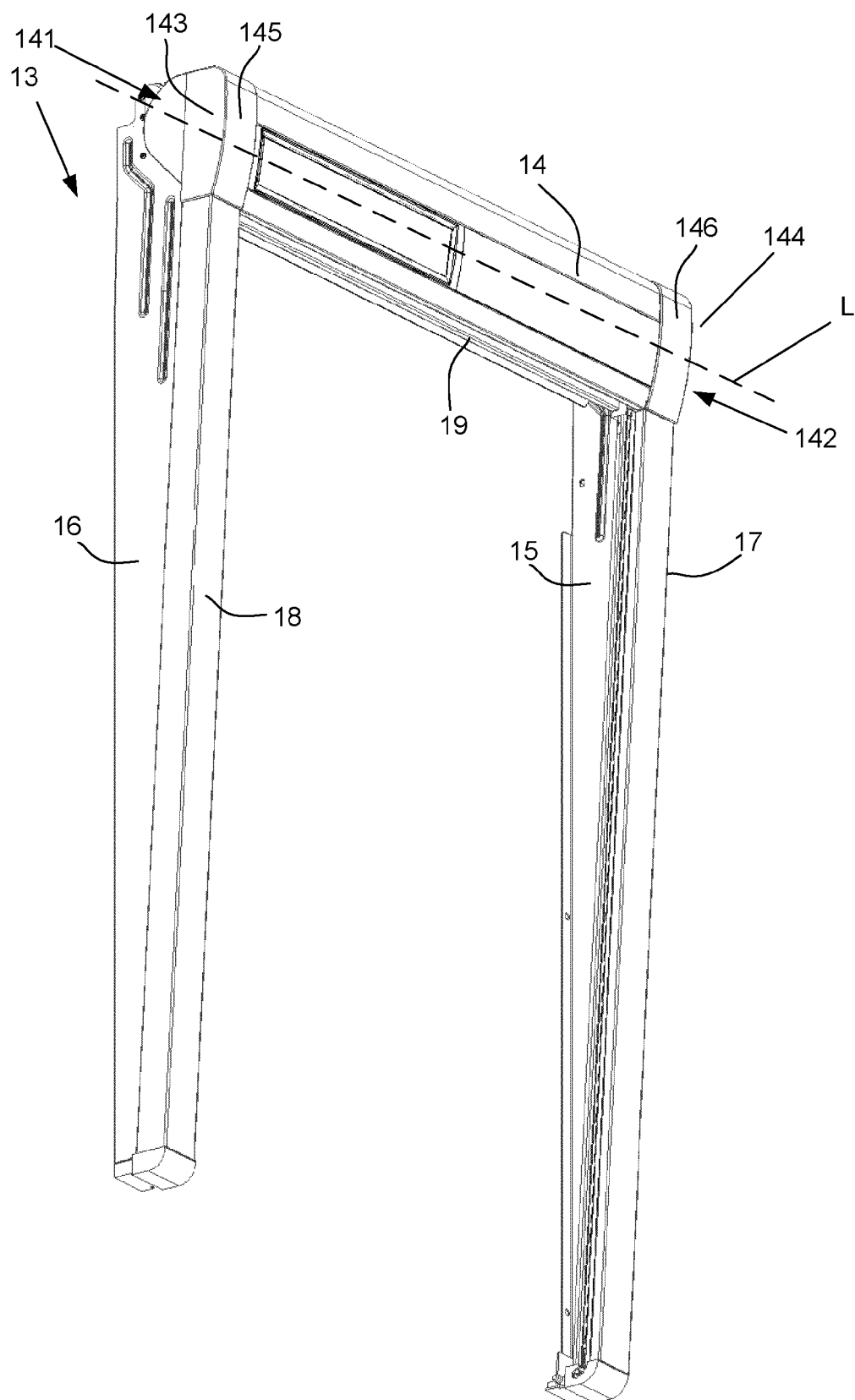


Fig. 2

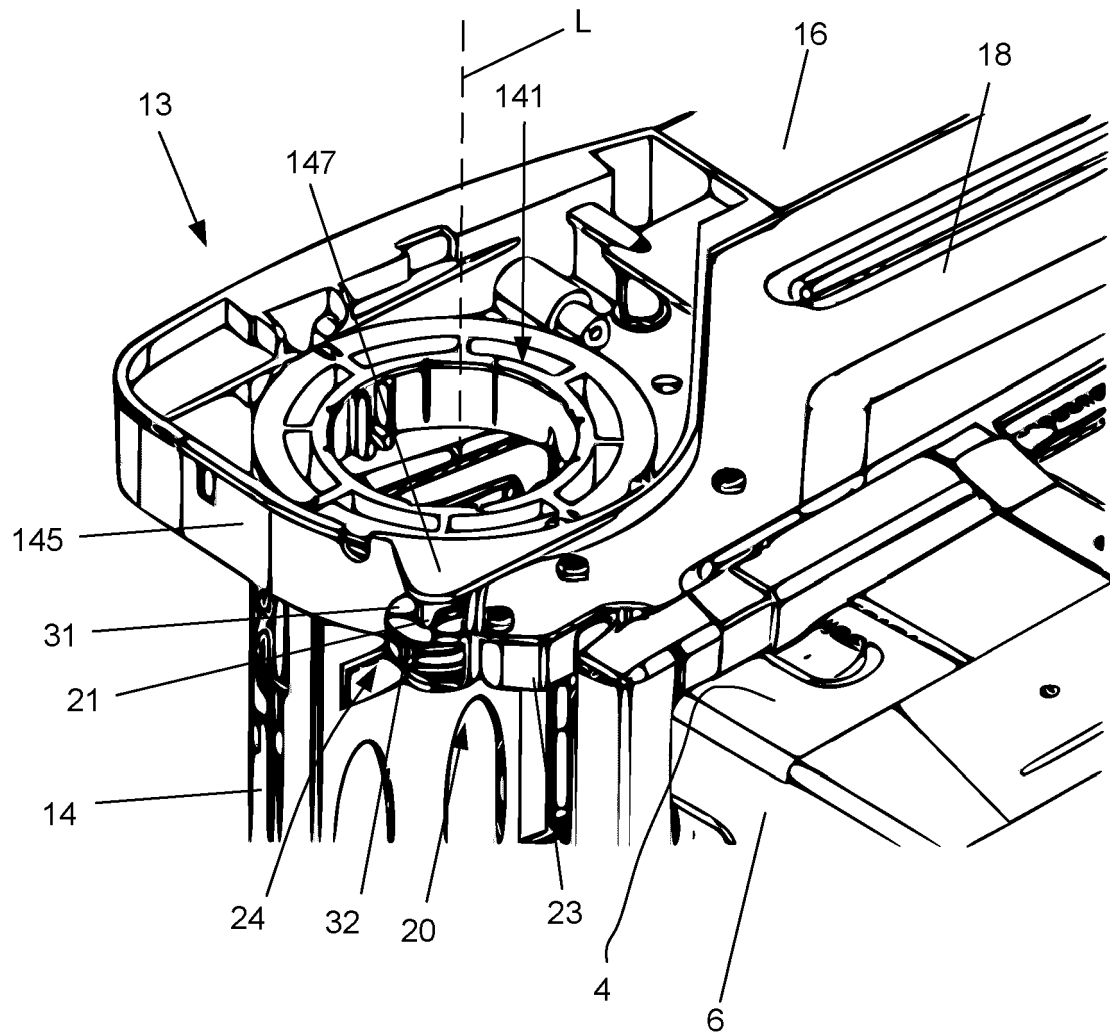


Fig. 3

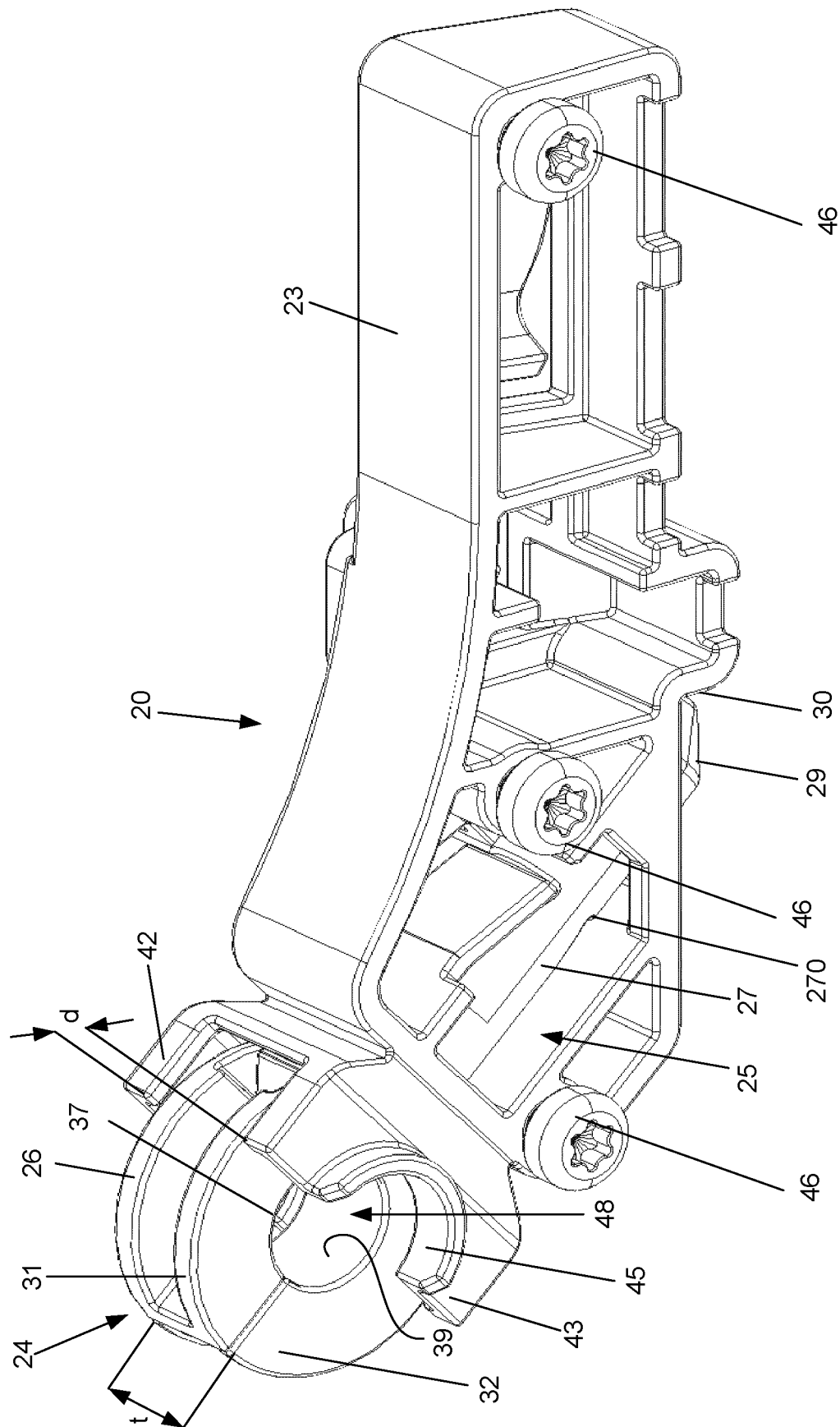


Fig. 4

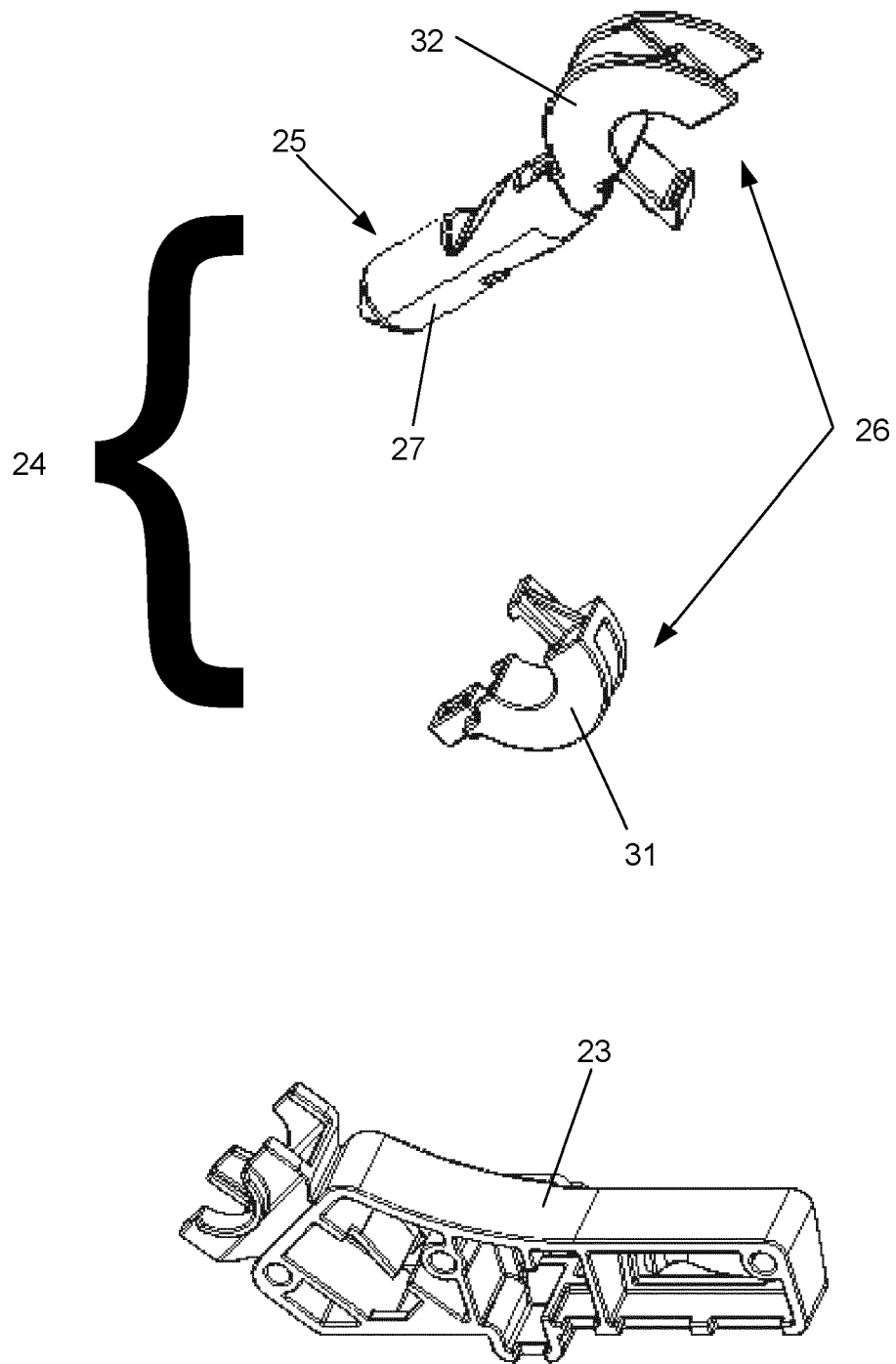


Fig. 5

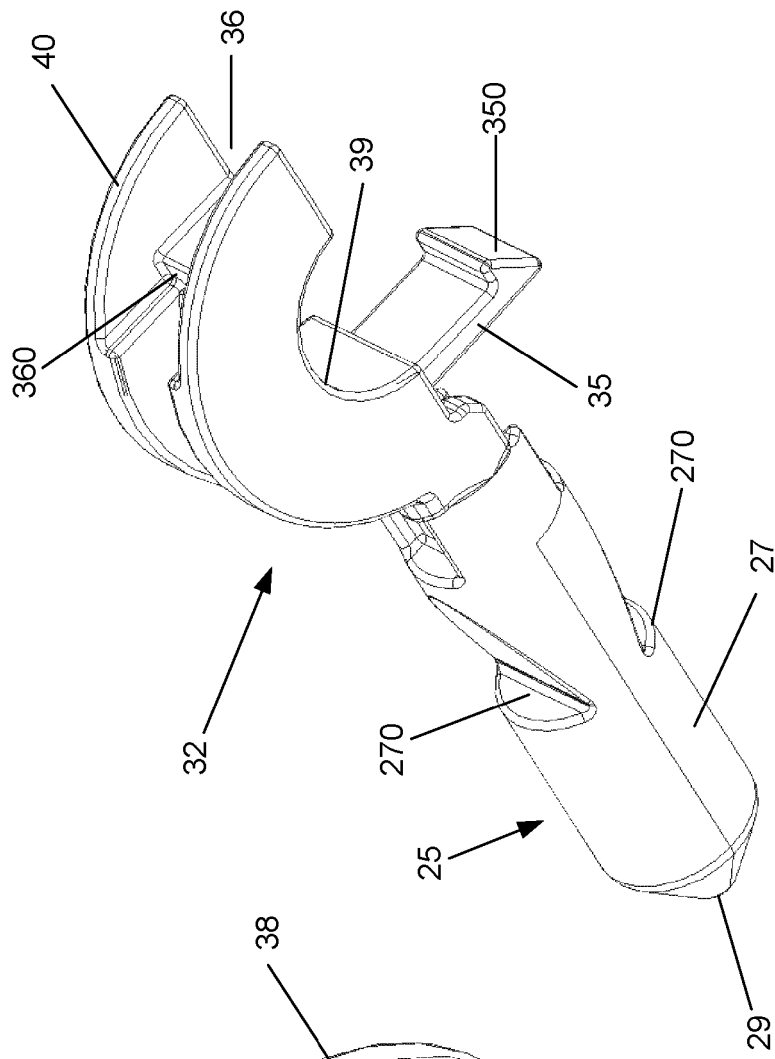


Fig. 7

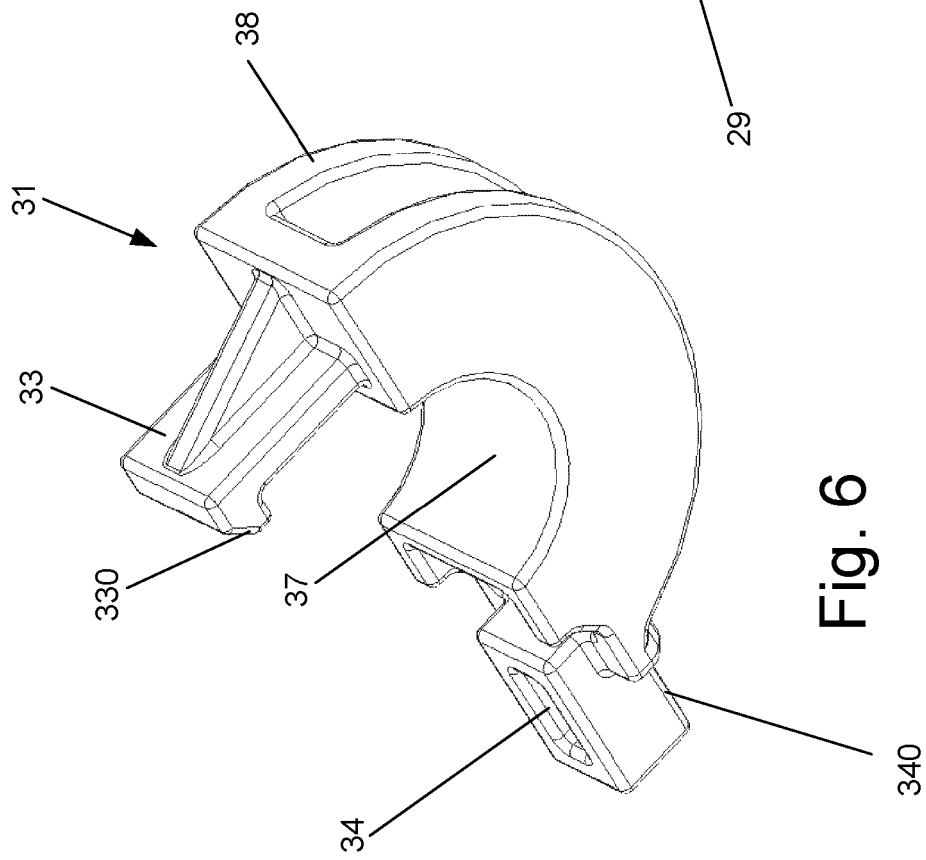


Fig. 6

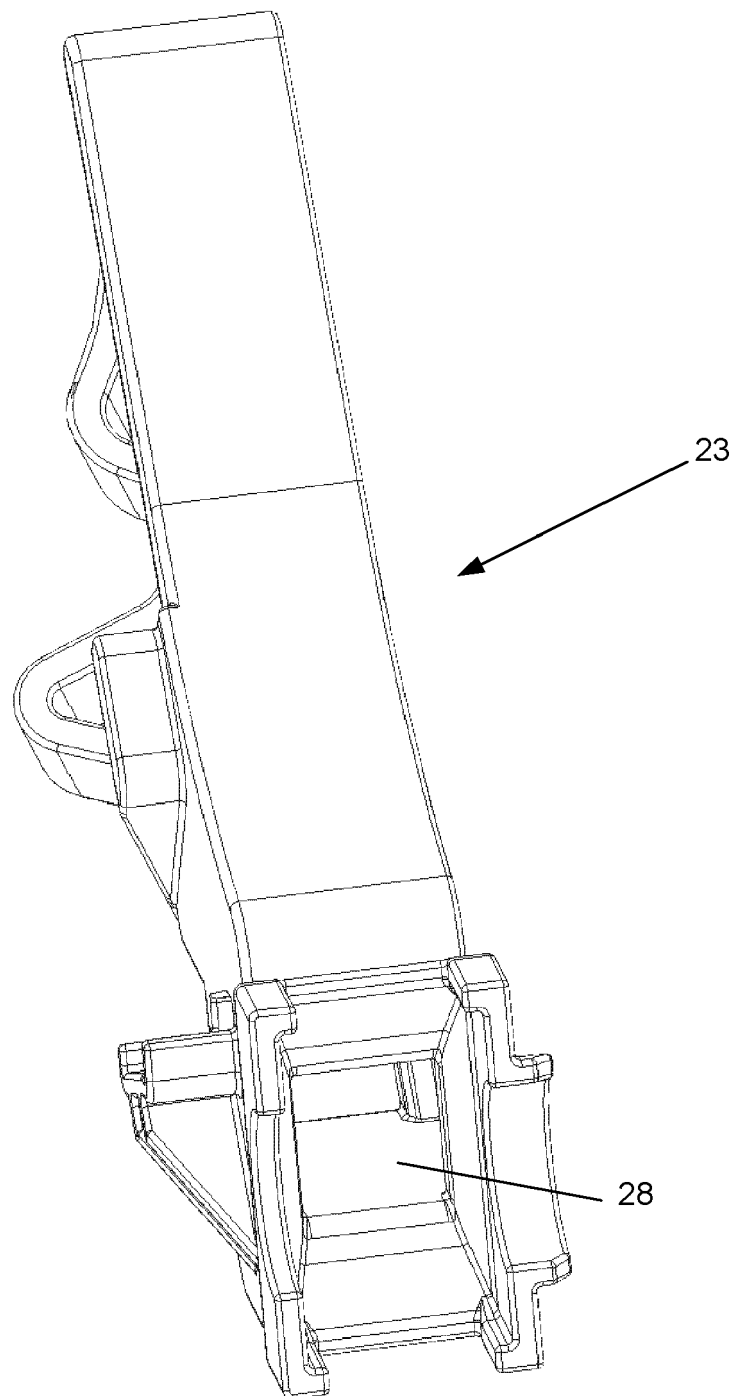


Fig. 8

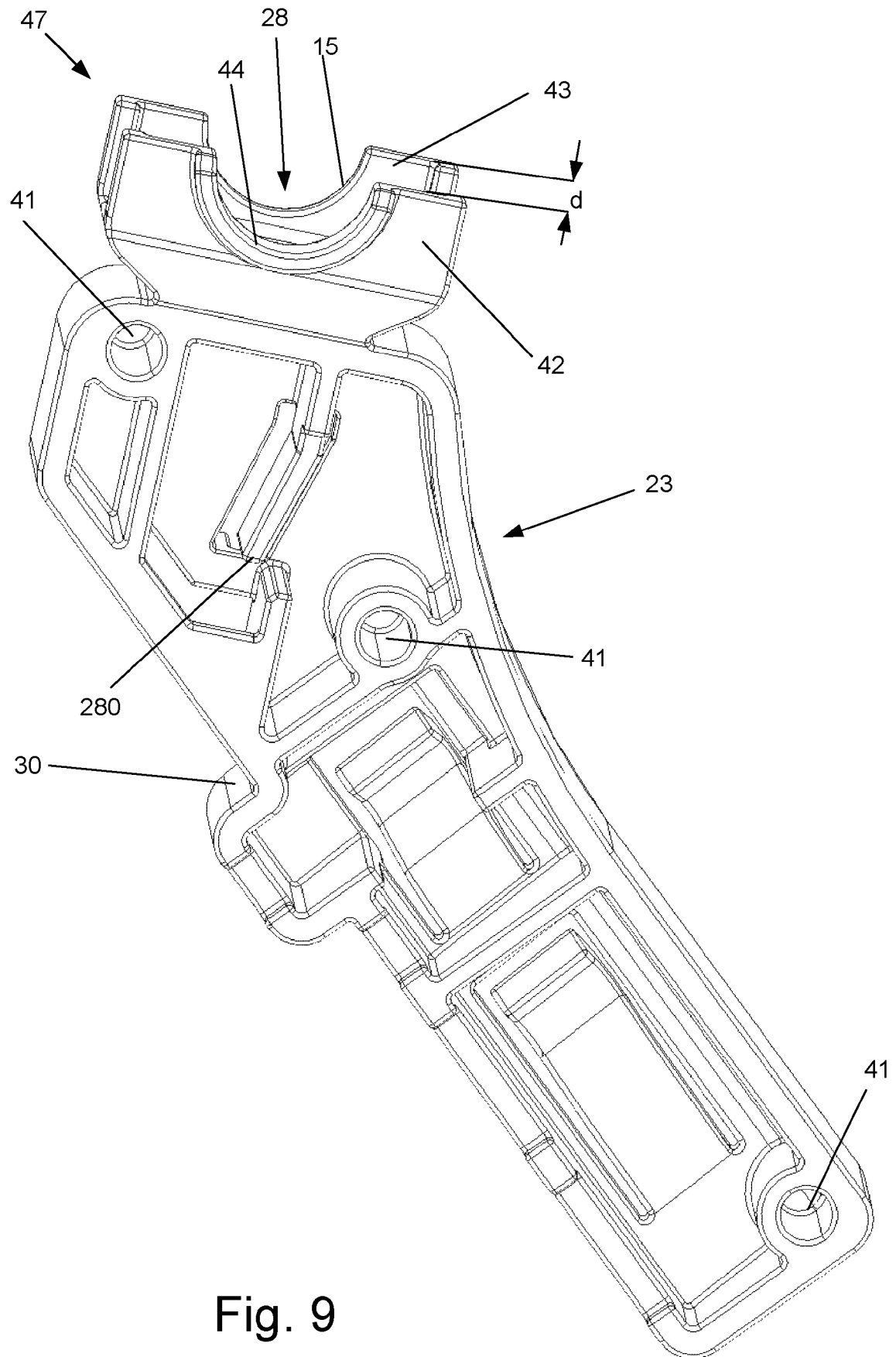


Fig. 9

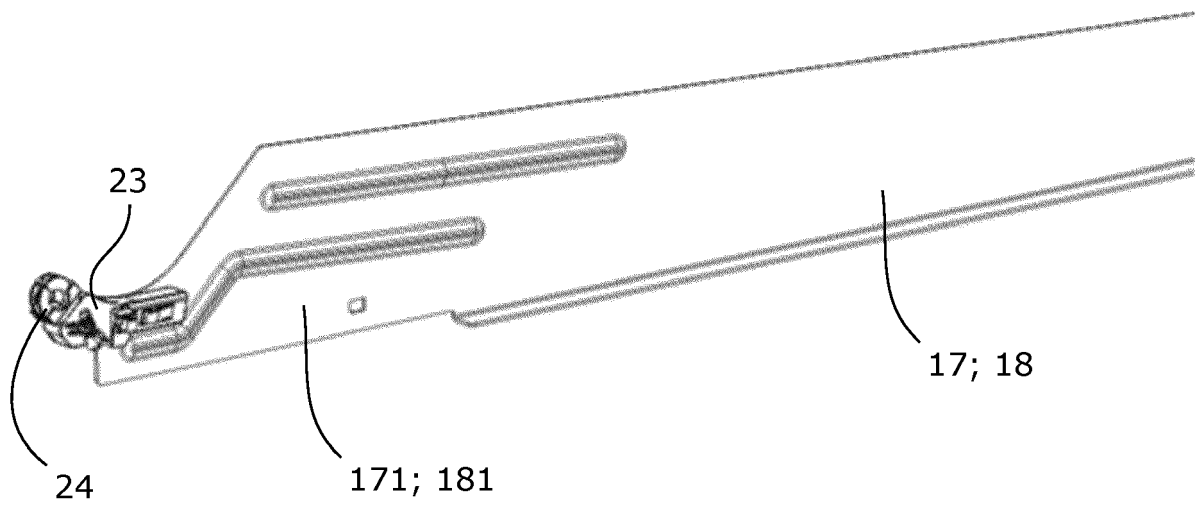


Fig. 10

REFERENCES CITED IN THE DESCRIPTION

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