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(54) **A ROLLER BLIND AND A PROCESS FOR MOUNTING A ROLLER BLIND**

(57) Roller blind (1) comprising two support bodies (2), two support heads (3), mechanically connected to the support bodies (2), a winding roller (4), rotatable around a revolution axis (R) and supported by the support heads (3), and a sheet (5) windable around the winding roller (4). Each support body (2) comprises a first coupling portion (21) and a first retention portion (22) spaced from each other and each support head (3) comprises a second coupling portion (31) mechanically engaged with the first coupling portion (21) and a second retention portion (32), facing the first retention portion (22) to delimit an

engagement seat (6). In addition, the roller blind (1) comprises an engagement insert (7) inserted within the engagement seat (6) and blocking means (8) arranged for blocking the engagement insert (7) in the engagement seat (6). In particular, the blocking means (8) are provided with a blocking hole (81, 82), made in one between the first retention portion and the second retention portion (22, 32), and a blocking body (83, 84) mechanically constrained to the engagement insert (7) and inserted in the blocking hole (81, 82), or vice versa, in order to prevent the sliding of the blocking insert (7).

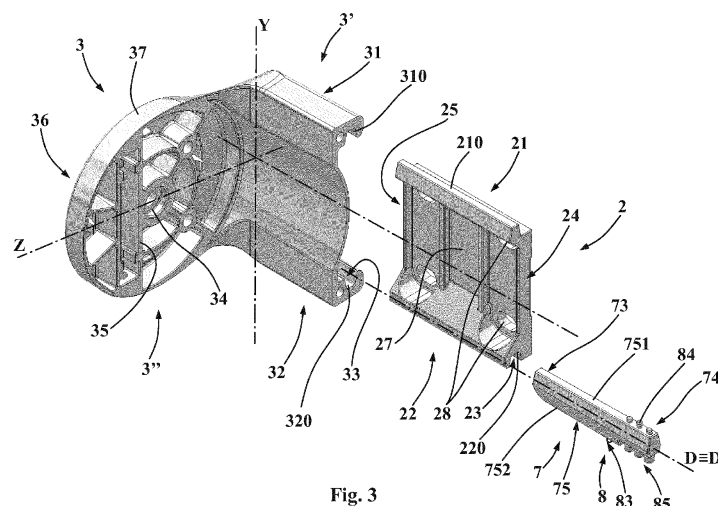


Fig. 3

Description

Field of application

[0001] The present invention regards a roller blind and a process for mounting a roller blind, according to the preamble of the respective independent claims.

[0002] The present roller blind is intended to be advantageously employed for covering external surfaces to be protected from atmospheric agents and in particular from the sun and rain.

[0003] More in detail, the present roller blind is preferably intended to be fixed to the wall or ceiling of a building above an opening, such as a door or a window, in order to cover the opening itself or an external surface adjacent to the wall itself and accessible from the opening, such as a terrace or a garden, a veranda, etc.

[0004] The present roller blind is therefore intended to be inserted in the industrial field of production of accessories for the home, in the field of doors/windows/shutters and in the field of production of sheets for protecting from the sun or similar applications.

State of the art

[0005] As is known, roller blinds are provided with two support brackets, intended to be fixed to a wall or to a ceiling, and carrying a take-up roller mounted thereon, on which a covering sheet is wound, with two articulated arms connected to the sheet in order to pull it when the latter is unwound from the take-up roller (such blinds are therefore termed "with arms").

[0006] More in detail, the sheet is fixed with a rear edge thereof to the take-up roller and with a front edge thereof to a transverse bar, and is movable, following the rotation of the take-up roller, between a closed position, in which the sheet is wound around the roller, and an open position, in which the sheet is unwound from the roller to cover the underlying surface of an opening above which the blind is mounted.

[0007] In addition, the articulated arms of the blind are provided with a first end hinged to the support profile and with an opposite second end hinged to the aforesaid transverse bar, and they are movable between an extended position, in which they push the transverse bar away from the take-up roller in order to pull the sheet into the open position, and a collected position, in which their second end connected to the transverse bar is brought adjacent to the roller when the sheet is placed in the closed position.

[0008] Also known are blinds termed "fall", which are not provided with articulated arms. Such blinds are instead generally provided with two lateral guides, vertical or tilted, in which the ends of the transverse bar are slidably constrained, which guide the sheet in its unwinding and winding, i.e. in the passage from the closed position to the open position and vice versa. In this case, the sheet always remains tensioned due to gravity, by the weight

of the transverse bar.

[0009] Such blinds can also be provided with further tensioning devices connected to the transverse bar in order to apply a greater tensioning load to the sheet.

[0010] Conventionally, both in the case of blinds with arms and in the case of fall blinds, the blind comprises two support heads, each of which comprises an attachment portion, fixed to the corresponding support bracket, and a support portion, on which the corresponding end of the take-up roller is rotatably mounted.

[0011] Generally, each attachment portion of each support head is provided with a curved edge, which is coupled to a corresponding engagement edge of the support bracket, and an opposite shaped edge, which is placed across from a corresponding shaped edge of the support bracket, in a manner such that the two shaped edges define an engagement seat between them.

[0012] Generally, in order to fix the support head to the support bracket, a substantially wedge-shaped insert is inserted in the aforesaid engagement seat, which is subsequently fastened by means of two thrust setscrews that are transverse thereto. The latter, pushing against the support bracket, ensure that the insert remains in the engagement seat due to friction with the shaped edge of the support head.

[0013] In particular, the insert has a shape that is tapered from one end to the other, and the shaped edges of the support head and of the support bracket are shaped in a manner such to define a corresponding tapered shape of the engagement seat.

[0014] An example of a roller blind of the abovementioned type is described in the patent application EP 1122376 A2.

[0015] The above-described roller blinds have in practice shown that they do not lack drawbacks.

[0016] A main drawback of the above-described blinds lies in the fact that the insert can be unthreaded from the engagement seat. Indeed, following the continuous stresses to which the blind is subjected, in particular due to the movement of the sheet between the open and closed positions, due to the wind and other weather conditions, the insert is subjected to continuous vibrations that bring it to slowly be unthreaded from the engagement seat, overcoming the friction force with the shaped edges, thus causing the falling of the blind.

[0017] Such drawback is also encountered during the mounting of the blind, i.e. when the inserts are inserted in the engagement seats at the corresponding ends of the blind, but are not yet fixed with the thrust setscrews. Therefore, in such case, the inserts are still easily unthreadable, representing a risk for the operator assigned with the mounting.

[0018] A further drawback is tied to the fact that, in some installation configurations of the blind, it is necessary to reverse the positions of the support brackets and of the corresponding support heads with respect to the ends of the winding roller. Nevertheless, in the event in which the operator reverses the position of the support

brackets, but not of the support heads, the shape of the engagement seat would no longer be exactly corresponding to that of the insert. Such inconsistency sometimes is not noted by the operator, since it is still possible to partially insert the insert of the engagement seat. Indeed, the engagement seat is always defined between the shaped edges of the support heads and of the support brackets, even if its shape is no longer suitable for suitably receiving the insert. In these cases, nevertheless, the insert is not firmly coupled in the engagement seat and, analogous to that described above, following the stresses that the blind can sustain during use, it can exit from the seat, causing the fall of the blind. Such drawback is as undesired as it is dangerous for those who are situated nearby.

[0019] Such drawback is once again intensified by the fact that, following continuous vibrations due to the force of the wind or atmospheric agents, the insert is further stressed to be unthreaded from the engagement seat.

Presentation of the invention

[0020] In this situation, the problem underlying the present invention is to provide a roller blind and a process for mounting a blind which allow fixing the blind in a stable and secure manner to the wall or to the ceiling, possibly also in the case of installation that is not entirely correct by the operators.

[0021] A further object of the present invention is to provide a roller blind which maintains strong stability even in the presence of vibrations.

[0022] A further object of the present invention is to provide a roller blind which is entirely reliable in operation.

[0023] A further object of the present invention is to provide a roller blind which is structurally simple and inexpensive to attain.

[0024] A further object of the present invention is to provide a process for mounting a roller blind, which allows preventing the incorrect mounting of the blind.

[0025] A further object of the present invention is to provide a process for mounting a roller blind that is simple to attain.

Brief description of the drawings

[0026] The technical characteristics of the invention, according to the aforesaid objects, can be clearly seen in the contents of the below-reported claims and the advantages thereof will be more evident in the following detailed description, made with reference to the enclosed drawings, which represent a merely exemplifying and non-limiting embodiment of the invention, in which:

- figure 1a shows a top perspective view of the roller blind, object of the present invention, in open position;
- figure 1b shows a bottom perspective view of the roller blind, object of the present invention, in open

position;

- figures 2a-c show top perspective views of the roller blind in closed position, in three different installation configurations, in which figure 2a shows a wall installation and figures 2b and 2c show two different ceiling configurations;
- figure 3 shows a top perspective view of a detail, shown exploded, relative to a support body, a support head and an engagement insert of the roller blind of figure 1;
- figure 4 shows a bottom perspective view of the detail of the roller blind illustrated in figure 3;
- figure 5 shows a side view of the roller blind illustrated in figure 1 with the engagement insert removed, with a part of the support head sectioned in order to better appreciate the underlying components and with an enlarged detail;
- figure 6 shows a side view of the detail of the roller blind illustrated in figure 3 shown assembled;
- figures 7, 8, 9 and 10 show, in a bottom perspective view, the detail of the roller blind illustrated in figure 3, during four different moments of a step for blocking the engagement insert of the blind, according to the process, object of the invention (in which figures 8, 9 and 10 show the blind partially in section).

Detailed description of a preferred embodiment

[0027] With reference to the enclosed drawings, reference number 1 overall indicates the roller blind, object of the present invention.

[0028] The present roller blind 1 is advantageously intended to be fixed to a support structure, such as for example a wall of a building, in order to adjustably cover a surface of the ground adjacent to the support structure, protecting it from the sun, from the rain, etc. In addition, the present roller blind 1 is preferably intended to be arranged above an opening, such as in particular of a door, a window, a glass or the like, made on the aforesaid support structure in order to protect such opening from the sun. Of course, in addition to a wall, the present roller blind 1 can also be mounted on a ceiling, for example under the frame of the opening, under a terrace, at a door, at a cornice, etc. With reference to the embodiment illustrated in the enclosed figures, the roller blind 1 comprises at least two support bodies 2, intended to be fixed to the support structure.

[0029] In addition, the roller blind 1 comprises two support heads 3, each of which mechanically connected to a corresponding support body 2 and comprises an attachment portion 3' fixed to the corresponding support body 2 and a support portion 3", extended starting from the attachment portion 3' away from the support body 2.

[0030] In addition, the roller blind 1 comprises a winding roller 4, extended along a revolution axis R (substantially horizontal) between two terminal portions 4' rotatably supported by the support portions 3" of the corresponding support heads 3, and a sheet 5 having an edge

fixed to the winding roller 4 and susceptible of being wound around the winding roller 4 itself.

[0031] In accordance with the preferred embodiment illustrated in the enclosed figures, the support bodies 2 are intended to be placed spaced from each other along a first main direction X parallel to the revolution axis R.

[0032] Advantageously, each support body 2 is extended, preferably along the first main direction X, between one internal end 24 directed towards the internal end 24 of the other support body 2 and one external end 25 opposite the corresponding internal end 24.

[0033] Advantageously, the support body 2 is extended, according to a second main direction Y that is transverse with respect to the first main direction X, between two opposite longitudinal edges that connect together the two ends 24, 25 of the support body 2 itself. Preferably, the second main direction Y is substantially vertical in case of installation of the blind 1 on the wall (as in the examples of figures 2a), or it is substantially horizontal in the case of installation of the blind 1 on the ceiling (as in the examples of figures 2b-c).

[0034] Advantageously, the support body 2 has substantially plate-like shape with main dimensions along the main directions X and Y, and is extended, thickness-wise, along a third main direction Z, transverse with respect to the first and second main direction X, Y, between an attachment face 26, intended to be fixed to the support structure, and a front face 27.

[0035] Preferably, the third main direction Z is substantially horizontal in case of installation of the blind 1 on the wall (as in the examples of figures 2a), or it is substantially vertical in case of installation of the blind 1 on the ceiling (as in the examples of figures 2b-c).

[0036] In addition, the support body 2 is advantageously provided with a plurality of fixing holes 28, preferably passing between the attachment face 26 and the front face 27 for the passage of suitable fixing means (non-illustrated), for example screws, in order to fix the support body 2 to the support structure.

[0037] Of course, without departing from the protective scope of the present invention, the support bodies 2 can be fixed to the support structure also indirectly (for example by means of intermediate supports) and/or by means of different fixing means.

[0038] According to the invention, each support body 2 comprises a first coupling portion 21 and a first retention portion 22 spaced from each other (in particular with respect to the second main direction Y). Preferably, the first coupling portion 21 and the first retention portion 22 are extended substantially along directions parallel to each other and advantageously along the first main direction X. Advantageously, in addition, the first coupling portion 21 and the first retention portion 22 are extended between the internal end 24 and the external end 25 of the support body 2.

[0039] Advantageously, in case of installation of the blind 1 on the wall, the first coupling portion 21 is placed at an elevation higher than the first retention portion 22,

in particular with the first coupling portion 21 directed upward and the second coupling portion 22 directed downward (as in the example of figure 2a). In case of installation on the ceiling, the first coupling portion 21 is placed on the front side with respect to the first retention portion 22 (as in the example of figure 2b), or vice versa (as in the example of figure 2c).

[0040] Suitably, the first coupling portion 21 and the first retention portion 22 are extended along the respective longitudinal edges of the support body 2.

[0041] In accordance with the embodiment illustrated in the enclosed figures, the first coupling and retention portions 21, 22 of the support body 2 have directions parallel to the first main direction X, in particular substantially horizontal.

[0042] In accordance with one possible embodiment variant, non-illustrated, the first coupling portion 21 and the first retention portion 22 can be placed respectively at the internal end 24 and at the external end 25 of the support body 2 and be extended along the second main direction Y.

[0043] In accordance with the embodiment illustrated in the enclosed figures, the two support bodies 2 are attained with two separate components, spatially separated from each other. In accordance with a different non-illustrated embodiment, the support bodies 2 can be connected with each other, possibly attained in a single body, being constituted for example by two terminal parts of a support bar extended along the first main direction X from one of the terminal portions 4' of the winding roller 4 to the other.

[0044] In accordance with a further possible non-illustrated embodiment, the blind is provided with at least one intermediate support body placed between the two support bodies 2 (formed by two distinct and separate components) to which the support heads 3 are constrained, and advantageously shaped as such support bodies 2. In addition, the blind 1 advantageously comprises at least one intermediate support element, shaped substantially like the attachment portion 3' of one of the support heads 3 and fixed to the aforesaid intermediate support body.

[0045] In accordance with further embodiment variants, at least one of the support bodies 2 and/or at least one of the support heads 3 can be attained, each in multiple distinct and separate parts.

[0046] According to the invention, the attachment portion 3' of each support head 3 comprises a second coupling portion 31 mechanically engaged with the first coupling portion 21 of the corresponding support body 2.

[0047] Advantageously, the second coupling portion 31 is extended, parallel to the first coupling portion 21, along the first main direction X.

[0048] More in detail, at least one between the first and the second coupling portion 21, 31, preferably the first coupling portion 21, comprises a first coupling surface 210 with convex shape. Advantageously, the other between the first and the second coupling portion 21, 31, preferably the second coupling portion 31, comprises a

second coupling surface 310 with concave shape, mechanically engaged with the first coupling surface 210 and preferably coupled to the latter via shape coupling.

[0049] In accordance with further embodiment variants, one between the first and the second coupling surface 210, 310 can comprise concave sections and convex sections, opposite corresponding convex sections and concave sections provided on the other between the first and the second coupling surface 210, 310.

[0050] Preferably, the first and the second coupling surface 210, 310 are substantially counter-shaped.

[0051] According to the invention, the attachment portion 3' of each support head 3 comprises, in addition, a second retention portion 32, which is placed at least facing the first retention portion 22 of the corresponding support body 2 and delimits, with the first retention portion 22, an engagement seat 6 extended along an engagement direction D, advantageously parallel to the first main direction X, between a first end 61 and a second end 62 provided with an insertion opening 60.

[0052] In accordance with an embodiment not illustrated in the enclosed figures, the engagement direction D of the engagement seat 6 can be tilted with respect to the main direction X (e.g. within an angular interval comprised between -90° and $+90^\circ$, and more preferably between -45° and $+45^\circ$).

[0053] Advantageously, the second retention portion 32 is extended, parallel to the first retention portion 22, along the first main direction X.

[0054] Preferably, the first retention portion 22 is provided with a first cavity 23 and the second retention portion 32 is provided with a second cavity 33 which faces the first cavity 23 and defines, with the first cavity 23, the engagement seat 6.

[0055] In accordance with the preferred embodiment illustrated in the enclosed figures, the first retention portion 22 is provided with a first retention surface 220, at least partially concave, defining the first cavity 23 and advantageously extended along the engagement direction D.

[0056] Advantageously, in addition, the engagement seat 6 is provided, transverse with respect to the engagement direction D, at least with one section substantially convex profile, preferably polygonal and still more preferably hexagonal. More in detail, the first and the second cavity 23, 33 have shape mirrored to each other and each define half of the engagement seat.

[0057] Of course, without departing from the protective scope of the invention, the cross section of the engagement seat 6 can have profile of any other shape, e.g. rectangular, elliptical or even with one or more concavities.

[0058] Advantageously, the first retention portion 22, and preferably the first retention surface 220, is extended along the engagement direction D with extension greater than the second cavity 33 beyond the insertion opening 60 of the second end 62 of the engagement seat 6 and in direction opposite the first end 61.

[0059] More in detail, the first retention surface 220 of the first retention portion 22 is provided with an external portion 221 placed outside the engagement seat 6 and in position opposite the first end 61 of the engagement seat 6 itself.

[0060] The roller blind 1 also comprises an engagement insert 7 inserted via sliding along the engagement direction D through the insertion opening 60, within the engagement seat 6 interfering, in shape relationship, with the first retention portion 22 and with the second retention portion 32.

[0061] More in detail, the engagement insert 7 is extended along an extension axis D' between a first end portion 73 and an opposite second end portion 74.

[0062] Advantageously, with the engagement insert 7 inserted in the engagement seat 6, the extension axis D' of the engagement insert 7 itself is parallel to the engagement direction D of the engagement seat 6. In particular, the first end portion 73 is placed at the first end 61 of the engagement seat 6 and the second end portion 74 is placed at the second end 62 of the engagement seat 6, preferably projecting outside the engagement seat 6.

[0063] In accordance with the preferred embodiment illustrated in the enclosed figures, the engagement insert 7 both engages the first cavity 23 and the second cavity 33. Advantageously, the engagement insert 7 is also provided with a lateral surface 75 extended around the extension axis D' and provided with a first lateral portion 751 substantially facing the first retention surface 220 of the first retention portion 22 and a second lateral surface 752 facing the second retention surface 320 of the second retention portion 32 and preferably placed in abutment against the latter.

[0064] Preferably, the engagement insert 7 is substantially counter-shaped with respect to the engagement seat 6.

[0065] Advantageously, in addition, the engagement insert 7 is provided, transverse with respect to the extension axis D', at least with one section with substantially convex shape, preferably polygonal and still more preferably hexagonal.

[0066] Advantageously, the engagement insert 7 has cross section (on a plane orthogonal to the extension axis D') which is tapered (or is thinned) from the second end portion 74 towards the first end portion 73.

[0067] In particular, the lateral surface 75 is tapered along the engagement direction D from the second end portion 74 to the first end portion 73 of the engagement insert 7, in a manner such that the section of the second end portion 74 is greater than the section of the first end portion 73.

[0068] Suitably, the engagement seat 6 has cross section (on a plane orthogonal to the engagement direction D) which is tapered from the second end 62 towards the first end 61, in particular such to have shape corresponding to that of the engagement insert 7.

[0069] In particular, the first and the second retention surface 220, 320 of the engagement seat 6 are tapered

along the engagement direction D from the second end 62 towards the first end 61 of the engagement seat 6, in a manner such that the section of the insertion opening 60 is greater than the section of the first end 62.

[0070] According to the invention, the roller blind 1 comprises blocking means 8 arranged for blocking the engagement insert 7 in the engagement seat 6 with respect to movements parallel to the engagement direction D of the engagement seat 6 itself.

[0071] In accordance with the idea underlying the present invention, the blocking means 8 are provided with at least one blocking hole 81, 82, which is axially extended along a blocking direction T substantially transverse with respect to the engagement direction D of the engagement seat 6, and with at least one blocking body 83, 84, which is at least partially inserted within the blocking hole 81, 82 in order to prevent the sliding of the blocking insert 7 along the engagement direction D.

[0072] The blocking hole 84, 82 can be made at least in one of the aforesaid first and second retention portions 22, 32 or in the engagement insert 7; in the first case (embodiment) the blocking body 83, 84 is arranged engaged (e.g. fixed) to the blocking insert 17, while in the second case (embodiment) the blocking body 83, 84 is arranged engaged (e.g. fixed) to the first or second retention portion 22, 32.

[0073] As indicated above, the blocking direction T of the blocking hole 81, 82 is "substantially transverse" with respect to the engagement direction D of the engagement seat 6, in this case it being intended for substantially transverse a tilt comprised in the interval between $-45^\circ + 45^\circ$ with respect to the orthogonal condition at 90° . Advantageously, the aforesaid blocking direction T is substantially parallel to the second main direction Y, and in particular substantially vertical.

[0074] Advantageously, the blocking hole 81, 82 has elongated shape along the engagement direction D. For example, the blocking hole 81, 82 has substantially slot shape, in particular substantially elliptical or rectangular.

[0075] Preferably, in accordance with the embodiment illustrated in the enclosed figures (corresponding to the aforesaid first embodiment case), the blocking hole 81, 82 is made in at least one between the first retention portion 22 and the second retention portion 32. In addition, the blocking body 83, 84 is mechanically constrained to the engagement insert 7 and at least partially inserted within the blocking hole 81, 82 in order to prevent the sliding of the blocking insert 7 along the engagement direction D.

[0076] Advantageously, the blocking body 83, 84 is movable, along the blocking direction T, between a disengagement position, in which the blocking body 83, 84 is placed outside the blocking hole 81, 82, and an engagement position, in which the blocking body 83, 84 is at least partially inserted in the blocking hole 81, 82.

[0077] Advantageously, in addition, the engagement insert 7 is provided with at least one housing hole 71, 72 which is placed aligned with the blocking hole 81, 82 and

in which the blocking body 83, 84 is at least partially inserted.

[0078] In accordance with the preferred embodiment illustrated in the enclosed figures, the blocking hole 81, 82 comprises a first blocking hole 81, which is attained on the second retention portion 32. In addition, the blocking body 83, 84 advantageously comprises a first blocking body 83 constrained to the engagement insert 7 and inserted in the first blocking hole 81 in order to block the engagement insert 7 and the attachment portion 3' of the support head 3 with respect to movements parallel to the engagement direction D.

[0079] More in detail, the first blocking hole 81 is attained on the second retention portion 32 in proximity to the second end 62 of the engagement seat 6 and preferably passes along the entire thickness of the aforesaid second retention portion 32. In addition, the first blocking hole 81, 82 has elongated shape along the engagement direction D and is attained in elongated slot form.

[0080] Advantageously, in addition, the housing hole 71, 72 comprises a first housing hole 71 which is aligned with the first blocking hole 81 and at least partially houses the first blocking body 83. In particular, the first housing hole is attained on the second lateral portion 752 of the lateral surface 75 of the engagement insert 7.

[0081] Preferably, the first housing hole 71 and the first blocking hole 81 are aligned along the blocking direction T. In addition, also the first housing hole 71 and the first blocking body 83 are advantageously aligned along the blocking direction T and placed transverse to the extension axis D' of the engagement insert 7.

[0082] As illustrated in the enclosed figures 7-10, the first blocking body 83 advantageously comprises an elastic clamp 830 provided with an interference pin 831 slidably constrained in the first housing hole 71, in order to be moved between the engagement position and the disengagement position. Advantageously, the elastic clamp 830 is provided with an elastic element 832, preferably placed within the first housing hole 71, mechanically constrained to the engagement insert 7 and acting on the interference pin 831, acting the aforesaid interference pin 831 towards the engagement position.

[0083] In accordance with an embodiment variant, non-illustrated, the first blocking body 83 does not have to comprise an elastic element and can simply be slidably inserted in the first housing hole 71 in a manner such to be moved towards the engagement position due to gravity, for example if the roller blind 1 is mounted such that the engagement direction D is horizontal and the second retention portion 32 is placed below the first retention portion 22.

[0084] In addition, in accordance with a further non-illustrated embodiment, the first blocking body 83 comprises, preferably in place of the elastic clamp 830, a blocking screw, which is inserted in a through manner within the first blocking hole 81 and mechanically removably constrained with a stem portion to the engagement insert 7, preferably by placing the stem portion within the

first housing hole 71. In such case, the blocking screw in the engagement position is advantageously at least partially inserted with the stem portion in the first housing hole 71 and in the disengagement position the blocking screw is placed outside the first housing hole 71.

[0085] In accordance with the preferred embodiment illustrated in the enclosed figures, the blocking hole 81, 82 comprises at least one second blocking hole 82 made on the first retention portion 22 of the support body 2, and the blocking body 83, 84 comprises at least one second blocking body 84 mechanically constrained to the engagement insert 7 and at least partially inserted within the second blocking hole 82 in order to block the engagement insert 7 and the support body 2 with respect to movements parallel to the engagement direction D.

[0086] More in detail, the second blocking hole 82 is attained on the first retention portion 32 outside with respect to the engagement seat 6 and preferably is extended starting from the external portion 221 of the first retention surface 220.

[0087] Advantageously, the housing hole 71, 72 also comprises at least one second housing hole 72, which is made in a through manner in the engagement insert 7 and in which the second blocking body 84 is at least partially inserted. As illustrated in the enclosed figures 3 and 4, the second housing hole 72 is advantageously attained on the second end portion 74 of the engagement insert 7, preferably on the first lateral portion 751 of the lateral surface 75 thereof.

[0088] Preferably, the second housing hole 72 and the second blocking hole 82 are aligned along the blocking direction T. In addition, also the second housing hole 72 and the second blocking body 84 are advantageously aligned along the blocking direction T and placed transverse to the extension axis D' of the engagement insert.

[0089] Advantageously, at least one between the second housing hole 72 and the second blocking hole 82 is provided with an internal thread and the second blocking body 84 comprises a threaded portion engaged via screwing with the internal thread of the second housing hole 72 and/or of the second blocking hole 82. In particular, the second blocking body 84 can be attained in screw or threaded setscrew form. Suitably, the second blocking hole 82 is provided with the internal thread (in order to be engaged with the threaded portion of the second blocking body 84) and the second housing hole 72 is smooth in order to allow the slidable insertion of the second blocking body 84.

[0090] Of course, without departing from the protective scope of the invention, the second blocking body 84 can be an elastic clamp of the above-described type associated with the first retention portion 22 or with the engagement insert 7, in particular with the first lateral portion 751 of the lateral surface 75 thereof.

[0091] Suitably, the blocking means 8 can also be provided only with the first blocking body 83 or only with the second blocking body 84.

[0092] Advantageously, by means of the claimed con-

figuration of at least one of the blocking bodies 83, 84, one prevents the unthreading of the engagement insert 7 from the engagement seat 6 and hence the risk of falling of the roller blind 1.

[0093] In addition, the presence of the second blocking hole 82 advantageously in the retention portion 22 of the support body 2 allows distinguishing the retention portion 22 itself from the coupling portion 21, preventing the mounting in an incorrect manner of the roller blind 1.

[0094] In accordance with an embodiment not illustrated in the enclosed figures (corresponding to the aforesaid second embodiment case), the blocking hole 81, 82 is made in the engagement insert 7, and the blocking body 83, 84 (inserted in such blocking hole 81, 82 of the engagement insert 7) is mechanically constrained to at least one between the first retention portion 22 and the second retention portion 32.

[0095] In such case, the blocking means 8 are configured in a manner opposite that described above and therefore of course all the combinations and variants described above are possible. For example, in accordance with the latter embodiment, the first blocking hole 81 is made in a through manner on the engagement insert 7 and the first blocking body 83 (advantageously attained in elastic clamp or screw form) is constrained to the second retention portion 32 of the support head 3. In addition, the second blocking hole 82 is attained on the engagement insert 7 and the second blocking body 84 is constrained to the first retention portion 22 of the support body 2.

[0096] Advantageously, the blocking means 8 comprise, in addition, in a per se known manner, at least one thrust body 85, mechanically constrained to the engagement insert 7 and acting in abutment against one between the first retention portion 22 and the second retention portion 32, preferably the first retention portion 22, in order to constrain via friction the engagement insert 7 in the engagement seat 6.

[0097] As an alternative, the thrust body 85 can be mechanically constrained to the first or to the second retention portion 22, 32 and act in abutment with the lateral surface 75 of the engagement insert 7.

[0098] For example, the thrust body 85 comprises at least one thrust screw 86, preferably two, and the engagement insert 6 comprises at least one corresponding threaded seat 76 in which the thrust screw 86 is screwed. In operation, the screwing of the thrust screw 86 in the threaded seat 76 carries the thrust screw 86 itself in abutment against the first or the second retention surface 220, 320, preferably the first retention surface 220, exerting a thrust force that increases the friction between the engagement insert 7 and the retention surfaces 220, 320 defining the engagement seat 6.

[0099] Preferably, the thrust body 85 is placed at the second end portion 74 of the engagement insert 7 and preferably acts in abutment against the external portion 221 of the first retention surface 220.

[0100] In accordance with the preferred embodiment

illustrated in the enclosed figures, the support portion 3" of the support head 3 is extended starting from the attachment portion 3' advantageously by means of an elbow bend. Advantageously, the attachment portion 3' and the support portion 3" are extended respectively along the first main direction X and the second main direction Y and are attained in a single body with each other and, in particular, each support head 3 is preferably made of metallic material, e.g. aluminum (in particular by means of melting and forming via casting).

[0101] Advantageously, the support portion 3" of each support head 3 is provided with a rotation seat 34, preferably aligned with the revolution axis R of the winding roller 4, in which each terminal portion 4 of the winding roller 4 itself is rotatably mounted.

[0102] In accordance with the preferred embodiment illustrated in the enclosed figures, the support portion 3" is provided with a first face 35 directed towards the end portion 4' of the winding roller 4 and a second face 36, opposite the first face 35. Advantageously, the support portion 3" is also provided with a perimeter face 37 extended between the first and the second face 35, 36, to connect the latter.

[0103] As indicated above, the roller blind 1 also comprises a sheet 5, preferably with rectangular shape, susceptible of being wound around the winding roller 4.

[0104] In particular, the sheet 5 of the roller blind 1 is movable by means of rotation of the winding roller 4 around the revolution axis R thereof between a closed position, in which the sheet 5 is completely wound around the winding roller 4, and an open position, in which the sheet 5 is at least partially unwound, advantageously to cover the surface of the ground adjacent to the support structure, for example to the wall, and/or to the opening made on the aforesaid support structure, in order to protect them from the different weather conditions.

[0105] In operation, the winding roller 4 of the roller blind 1 can be actuated to rotate around the revolution axis R thereof by means of a motor or manually (e.g. by means of a control rod engaged through an articulation to the winding roller 4), in order to unwind or wind the sheet 5 around the winding roller 4 itself.

[0106] Advantageously, the roller blind 1 is also provided with a front bar 9 and the sheet 5 is provided with a second edge opposite the first edge and fixed to the front bar 9.

[0107] In accordance with the embodiment solution illustrated in figure 2, the roller blind 1 comprises at least two articulated arms 90, each provided with a first end 90' constrained (in particular rotatably) to the corresponding support head 3 or to the support structure and with a second end 90" carrying the front bar 9 mounted thereon (and in particular connected to the latter via hinging). Advantageously, articulated arms 90 are movable between an extended position, in which the articulated arms 90 are extended in order to pull the sheet 5 into open position, bringing the front bar 9 away from the winding roller 4, and a collected position, in which the articulated arms

90 place the front bar 9 adjacent to the winding roller 4 when the sheet 5 is wound in closed position around the winding roller 4 itself.

[0108] In particular, each articulated arm 90 comprises two tubular sections 91 hinged to each other at a central elbow 92 of the articulated arm 90 itself, and preferably comprises elastic extension elements, for example constituted by elastic transmissions placed within the tubular sections 91 in a manner per se known to the man skilled in the art of the field, which are arranged for exerting, on the corresponding articulated arm 90, an elastic force which tends to bring the articulated arm 90 into the extended position.

[0109] Of course, without departing from the protective scope of the invention, the roller blind 1 does not have to be provided with articulated arms 90, but rather can be a roller blind 1 of the type termed "fall" in jargon, i.e. in which the sheet, in moving from the closed position to the open position, slides vertically via gravity and is advantageously tensioned by the weight of the front bar 9. In accordance with a further embodiment variant, non-illustrated, the front bar 9 can be provided with opposite ends slidably mounted on lateral guides in use placed in vertical, horizontal or oblique position with respect to the ground.

[0110] Also forming the object of the present finding is a process for mounting the above-described aforesaid roller blind 1, regarding which the same reference numbers will be maintained for the sake of description simplicity.

[0111] According to the invention, the process comprises a step for fixing the support bodies 2 to the support structure. Advantageously, the fixing step provides for fixing the support bodies 2, spaced from each other, to a vertical wall or a ceiling (as in the examples of the figures 2a-c, described above).

[0112] For example, the support bodies 2 are fixed to the support structure by means of screws passing through the fixing holes 28.

[0113] The process also comprises a step for coupling each support head 3 to the support body 2, in which the second coupling portion 31 of the attachment portion 3' of the support head 3 is constrained to the first coupling portion 21 of the support body 2.

[0114] More in detail, the coupling step provides for at least partially abutting the second coupling surface 310 of the second coupling portion 31 against the first coupling surface 210 of the first coupling portion 21, preferably coupling the concavity of the second coupling surface 310 with the convexity of the first coupling surface 210. Advantageously, the coupling step is executed, preferably with the winding roller 4 already mounted on the support heads 3, by abutting the second coupling portion 31 of the support head 3 against the first coupling portion 21 of the corresponding support body 21 (from above in case of installation on a wall, or on the front or rear part in case of installation on a ceiling). In such operation, the attachment portions 3' of the support heads 3 are main-

tained slightly tilted with respect to the attachment body 2 in order to prevent the retention portions 22, 33 from interfering with each other.

[0115] The process comprises, in addition, a positioning step, in which the second retention portion 32 of the attachment portion 3' of the support head 3 is placed facing the first retention portion 22 of the support body 2, and the first and second retention portions 22, 32 together define the engagement seat 6.

[0116] Advantageously, the positioning step provides for aligning the first and the second cavity 23, 33 along the first main direction X, by means of rotation of the support head 3 around the second coupling portion 31 thereof.

[0117] As an alternative, the positioning step can occur simultaneously with the coupling step, providing for the alignment of the first and second cavities 23, 33 by means of sliding of the support head 3 along the first main direction X with the coupling portions 21, 31 and retention portions 22, 32 already aligned along the second main direction Y.

[0118] The process also comprises a blocking step, in which the engagement insert 7 is inserted in the engagement seat 6 through the insertion opening 60.

[0119] Advantageously, as illustrated in figures 7 and 8, in the blocking step the engagement insert 7 is inserted within the engagement seat 6 via sliding along the engagement direction D.

[0120] Advantageously, in addition, in the blocking step the engagement insert 7 is placed with the extension axis D' thereof parallel to the engagement direction D and preferably with the first end portion 73 thereof placed at the first end 61 of the engagement seat 6.

[0121] In particular, the engagement insert 7 is placed with the first lateral portion 751 of the lateral surface 75 in contact with the first retention surface 220 and/or with the second lateral portion 752 of the lateral surface 75 in contact with the second retention surface 320.

[0122] In accordance with the idea underlying the present invention, in the blocking step, following the insertion of the engagement insert 7 in the engagement seat 6, the blocking body 83, 84 is inserted in the blocking hole 81, 82 in order to block movements of the engagement insert 7 in the engagement seat 6 along the engagement direction D.

[0123] More in detail, in accordance with the embodiment illustrated in the enclosed figures, in the blocking step, before or during of the insertion of the engagement insert 7 in the engagement seat 6, the first blocking body 83 is moved into the disengagement position (e.g. by an operator) in order to slide the engagement insert 7 in the engagement seat 6, and, subsequently, when the first blocking body 83 is aligned with the first blocking hole 81, the first blocking body 83 is moved towards the engagement position.

[0124] In particular, in the event in which the first blocking body 83 is an elastic clamp 830, the movement of the interference pin 831 towards the engagement position

advantageously occurs automatically by means of the elastic element 832 when the first blocking body 83 is aligned with the first blocking hole 81.

[0125] Advantageously, in the blocking step, following the insertion of the engagement insert 7 in the engagement seat 6, the second blocking body 84 is inserted in the second blocking hole 82 in order to further prevent the relative sliding between the engagement insert 7 and the support body 2.

[0126] Preferably, the blocking step provides for screwing the threaded portion of the second blocking body 84 in the internal thread of the second housing hole 72 and/or of the second blocking hole 82.

[0127] In accordance with the preferred embodiment, illustrated in figures 9 and 10, the first blocking body 83 is inserted in the first blocking hole 81 before the second blocking body 84 is inserted in the second blocking hole 82.

[0128] Of course, without departing from the protective scope of the invention, it is possible to first insert the second blocking body 84 and then the first blocking body 83, for example if the second blocking body 84 is an elastic clamp and the first blocking body 83 is a threaded screw. In addition, it is possible to provide for the insertion of only one between the first and the second blocking body 83, 84 in the respective hole. Advantageously, the blocking step in addition provides for, preferably after having brought the first and/or the second blocking body 83, 84 into the respective blocking hole 81, 82, bringing the thrust body 85 in abutment against the first or the second retention surface 220, 320 in order to generate a thrust force adapted to increase the friction between the engagement insert 7 and the engagement seat 6.

[0129] The process can also comprise further steps that are per se known to the man skilled in the art of the field and therefore not described.

[0130] The invention thus conceived therefore attains the pre-established objects.

Claims

1. Roller blind (1), which comprises:

- at least two support bodies (2) intended to be fixed to a support structure;
- two support heads (3), each of which is mechanically connected to a corresponding said support body (2) and comprises:

- an attachment portion (3') fixed to the corresponding said support body (2); and
- a support portion (3''), extended starting from said attachment portion (3') away from said support body (2);

said roller blind (1) also comprising:

- a winding roller (4), extended along a revolution axis (R) between two terminal portions (4') rotatably supported by the support portions (3") of the corresponding said support heads (3);
- a sheet (5) having an edge fixed to said winding roller (4) and susceptible of being wound around said winding roller (4);

wherein each said support body (2) comprises a first coupling portion (21) and a first retention portion (22) spaced from each other; wherein the attachment portion (3') of each said support head (3) comprises a second coupling portion (31) mechanically engaged with the first coupling portion (21) of the corresponding said support body (2), and a second retention portion (32), which is placed at least facing the first retention portion (22) of the corresponding said support body (2) and delimits, with said first retention portion (22), an engagement seat (6) extended along an engagement direction (D) between a first end (61) and a second end (62) provided with an insertion opening (60); wherein said roller blind (1) also comprises:

- an engagement insert (7) inserted via sliding along said engagement direction (D) through said insertion opening (60), within said engagement seat (6), interfering in shape relationship with said first retention portion (22) and with said second retention portion (32);
- blocking means (8) arranged for blocking said engagement insert (7) in said engagement seat (6) with respect to movements parallel to said engagement direction (D);

said roller blind (1) **being characterized in that** said blocking means (8) are provided with:

- at least one blocking hole (81, 82), which is axially extended along a blocking direction (T) that is transverse with respect to said engagement direction (D), and is made in one from between
 - at least one of said first retention portion (22) and said second retention portion (32), and
 - said engagement insert (7);
- at least one blocking body (83, 84), which is mechanically constrained to the other from between
 - said at least one of said first retention portion (22) and said second retention

- portion (32), and
- said engagement insert (7),

and is at least partially inserted within said at least one blocking hole (81, 82) in order to prevent the sliding of said blocking insert (7) along said engagement direction (D).

2. Roller blind (1) according to claim 1, **characterized in that** said at least one blocking body (83, 84) is movable, along said blocking direction (T), between a disengagement position, wherein said at least one blocking body (83, 84) is placed outside said at least one blocking hole (81, 82), and an engagement position, wherein said at least one blocking body (83, 84) is at least partially inserted in said at least one blocking hole (81, 82).

3. Roller blind (1) according to claim 1 or 2, **characterized in that** said at least one blocking hole (81, 82) is made in at least one from between said first retention portion (22) and said second retention portion (32), and **in that** said at least one blocking body (83, 84) is mechanically constrained to said engagement insert (7) and at least partially inserted within said at least one blocking hole (81, 82).

4. Roller blind (1) according to claim 3, **characterized in that** said engagement insert (7) is provided with at least one housing hole (71, 72) which is placed aligned with said at least one blocking hole (81, 82), and in which said at least one blocking body (83, 84) is at least partially inserted.

5. Roller blind (1) according to claim 3 or 4, **characterized in that** said at least one blocking hole (81, 82) comprises a first blocking hole (81), which is made on said second retention portion (32) and said at least one blocking body (83, 84) comprises a first blocking body (83) constrained to said engagement insert (7) and inserted in said first blocking hole (81) in order to block said engagement insert (7) and the attachment portion (3') of said support head (3) with respect to movements parallel to said engagement direction (D).

6. Roller blind (1) according to claims 4 and 5, **characterized in that** said at least one housing hole (71, 72) comprises a first housing hole (71) which is aligned with said first blocking hole (81) and at least partially houses said first blocking body (83).

7. Roller blind (1) according to claims 2 and 6, **characterized in that** said first blocking body (83) comprises an elastic clamp (830) provided with:

- an interference pin (831) slidably constrained in said first housing hole (71);

- an elastic element (832) mechanically constrained to said engagement insert (7) and acting on said interference pin (831), forcing said interference pin (831) towards said engagement position. 5
8. Roller blind (1) according to any one of the claims 3 to 7, **characterized in that** said at least one blocking hole (81, 82) comprises at least one second blocking hole (82) made on the first retention portion (22) of said support body (2), and said at least one blocking body (83, 84) comprises at least one second blocking body (84) mechanically constrained to said engagement insert (7) and at least partially inserted within said second blocking hole (82) in order to block said engagement insert (7) and said support body (2) with respect to movements parallel to said engagement direction (D). 10 15
9. Roller blind (1) according to claims 4 and 8, **characterized in that** said at least one housing hole (71, 72) comprises at least one second housing hole (72), which is made in a through manner in said engagement insert (7) and in which said second blocking body (84) is at least partially inserted; 20 25
wherein at least one from between said second housing hole (72) and said second blocking hole (82) is provided with an internal thread and said second blocking body (84) comprises a threaded portion engaged via screwing with the internal thread of said second housing hole (72) and/or of said second blocking hole (82). 30
10. Roller blind (1) according to any one of the preceding claims, **characterized in that** said at least one blocking hole (81, 82) has elongated shape along said engagement direction (D). 35
11. Process for mounting a roller blind (1) according to any one of the preceding claims, said process comprising: 40
- a step for fixing said support bodies (2) to said support structure;
 - a step for coupling each said support head (3) to said support body (2), wherein the second coupling portion (31) of the attachment portion (3') of said support head (3) is constrained to the first coupling portion (21) of said support body (2); 45 50
 - a positioning step, wherein the second retention portion (32) of the attachment portion (3') of said support head (3) is placed facing the first retention portion (22) of said support body (2), said first and second retention portions (22, 32) defining said engagement seat (6) between them; 55
 - a blocking step, wherein said engagement in-

sert (7) is inserted in said engagement seat (6) through said insertion opening (60);

said process being **characterized in that** in said blocking step, following the insertion of said engagement insert (7) in said engagement seat (6), said at least one blocking body (83, 84) is inserted in said at least one blocking hole (81, 82) in order to block movements of said engagement insert (7) in said engagement seat (6) along said engagement direction (D).

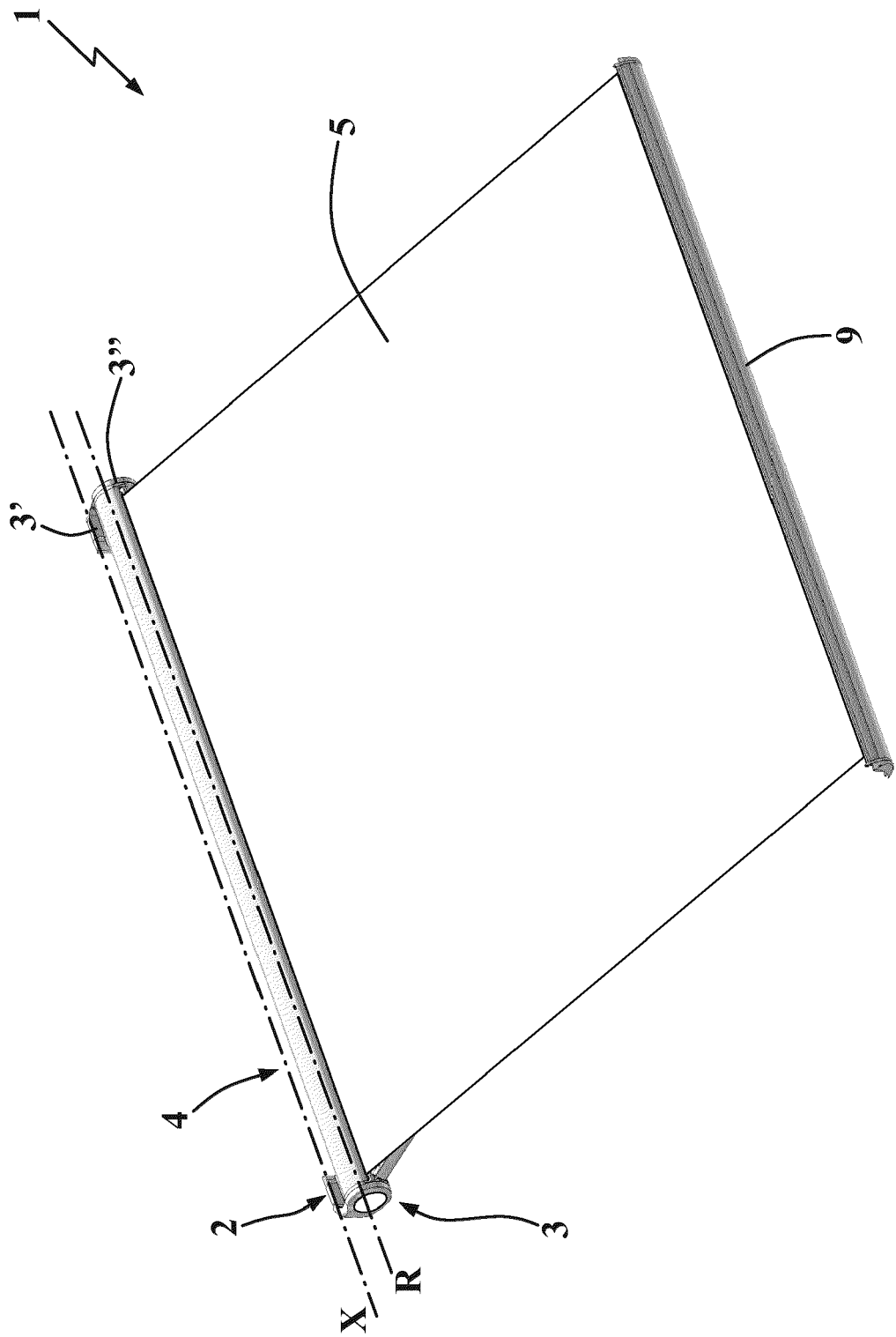


Fig. 1a

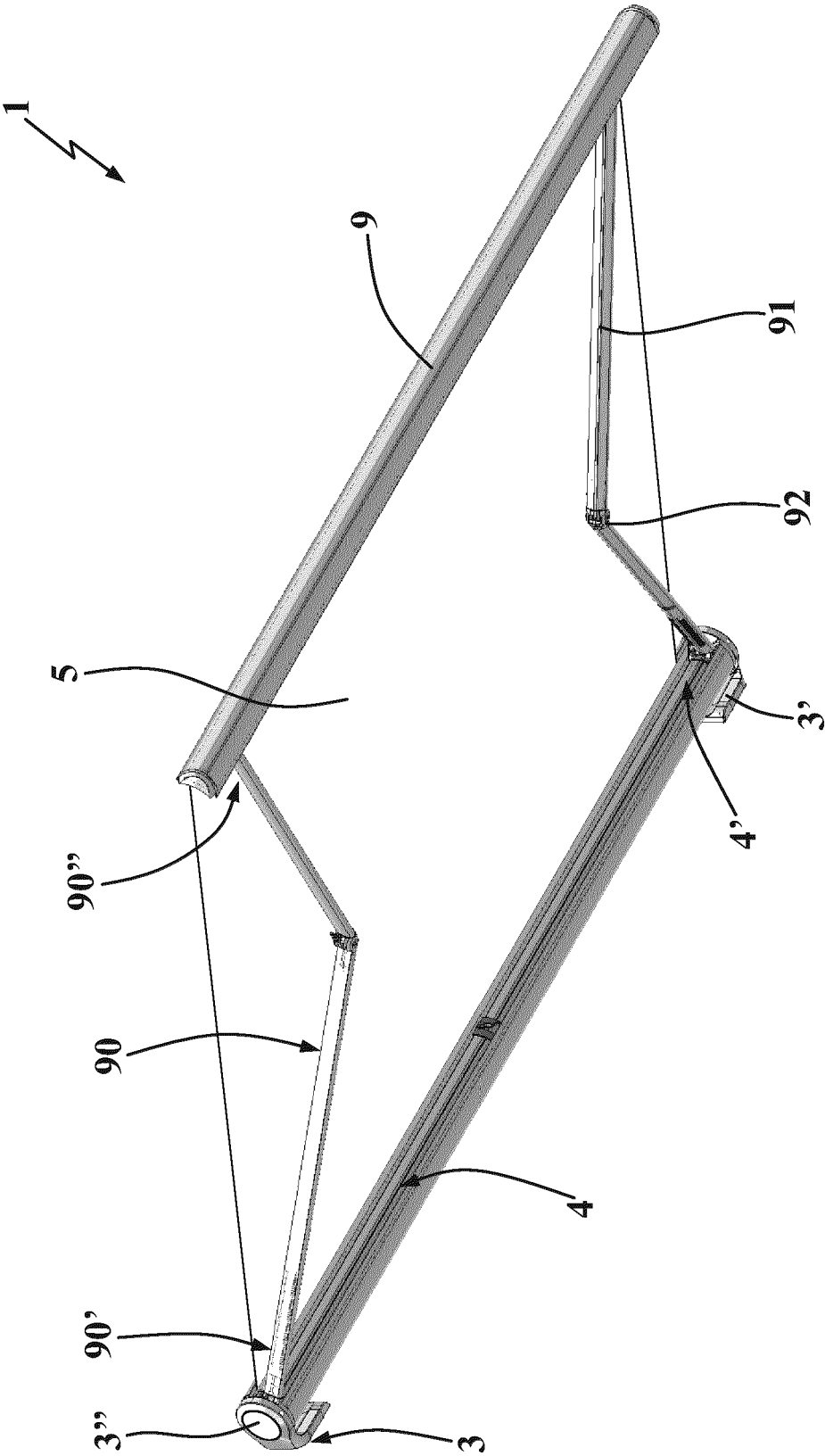


Fig. 1b

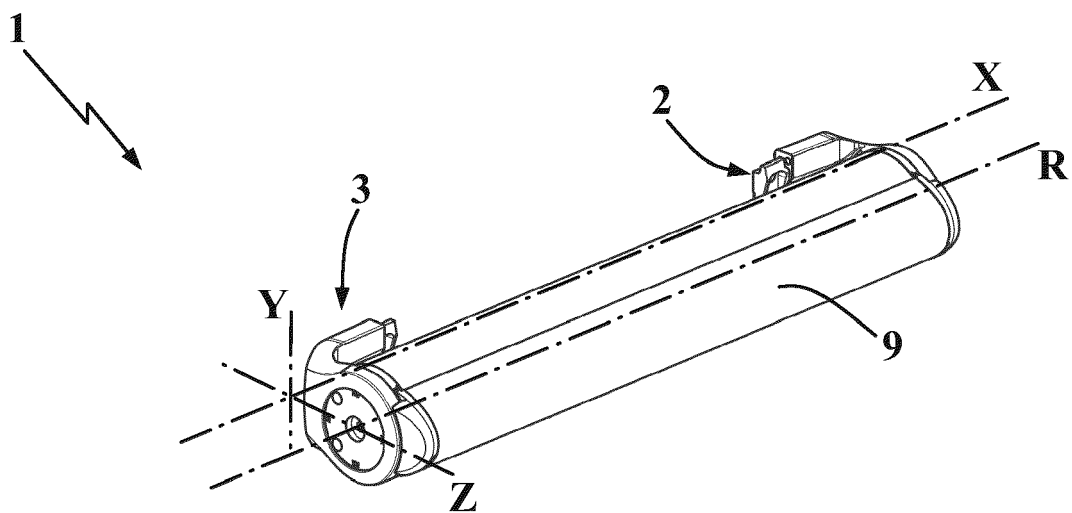


Fig. 2a

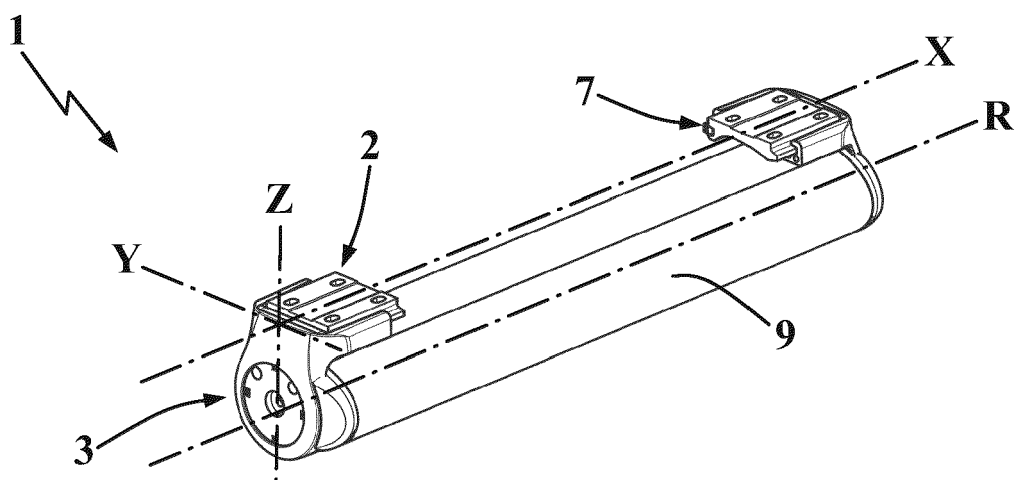


Fig. 2b

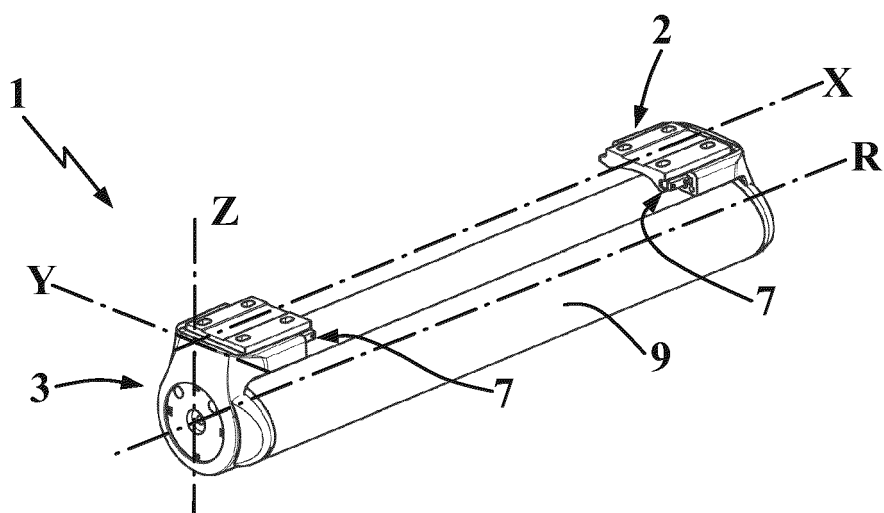


Fig. 2c

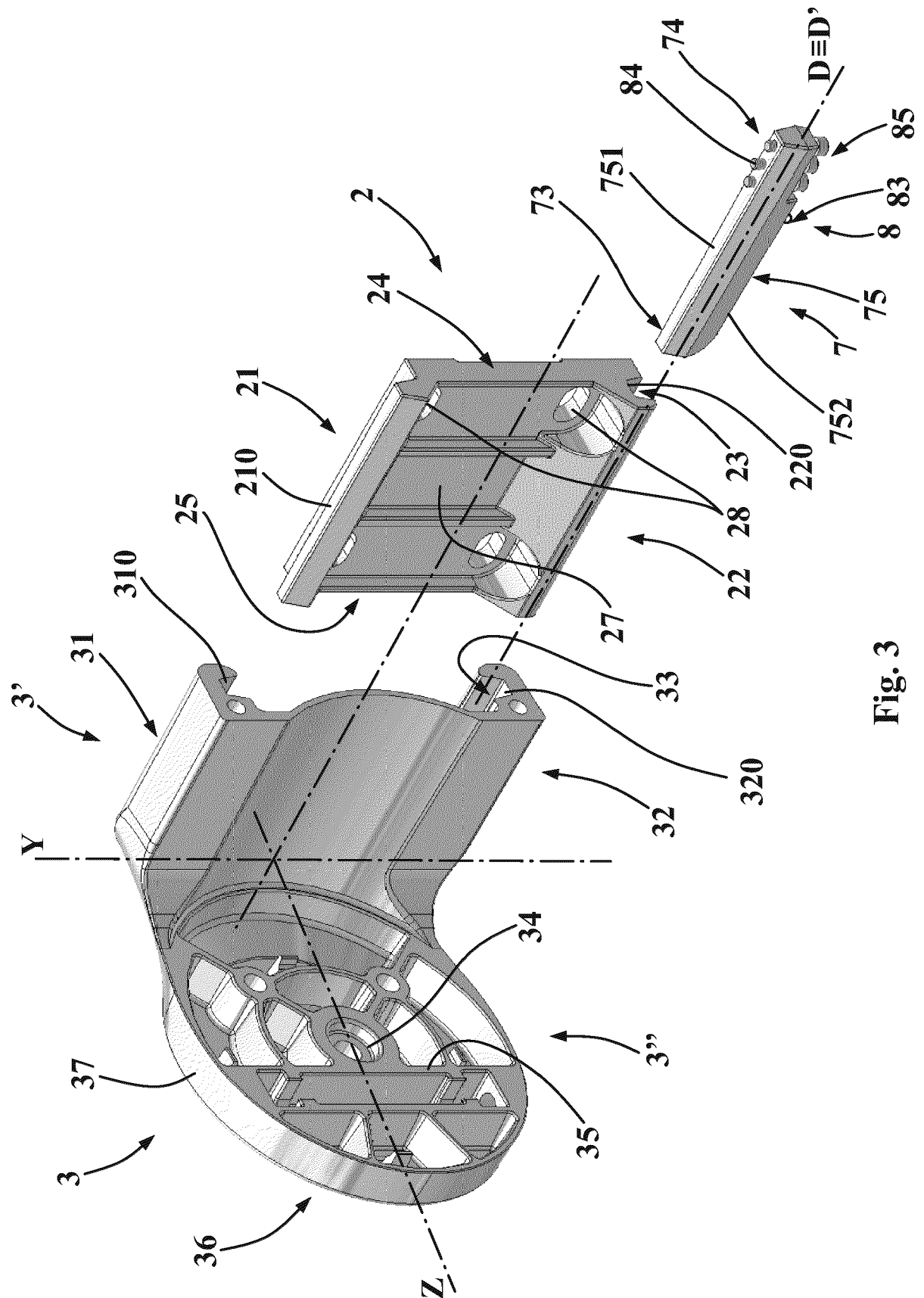


Fig. 3

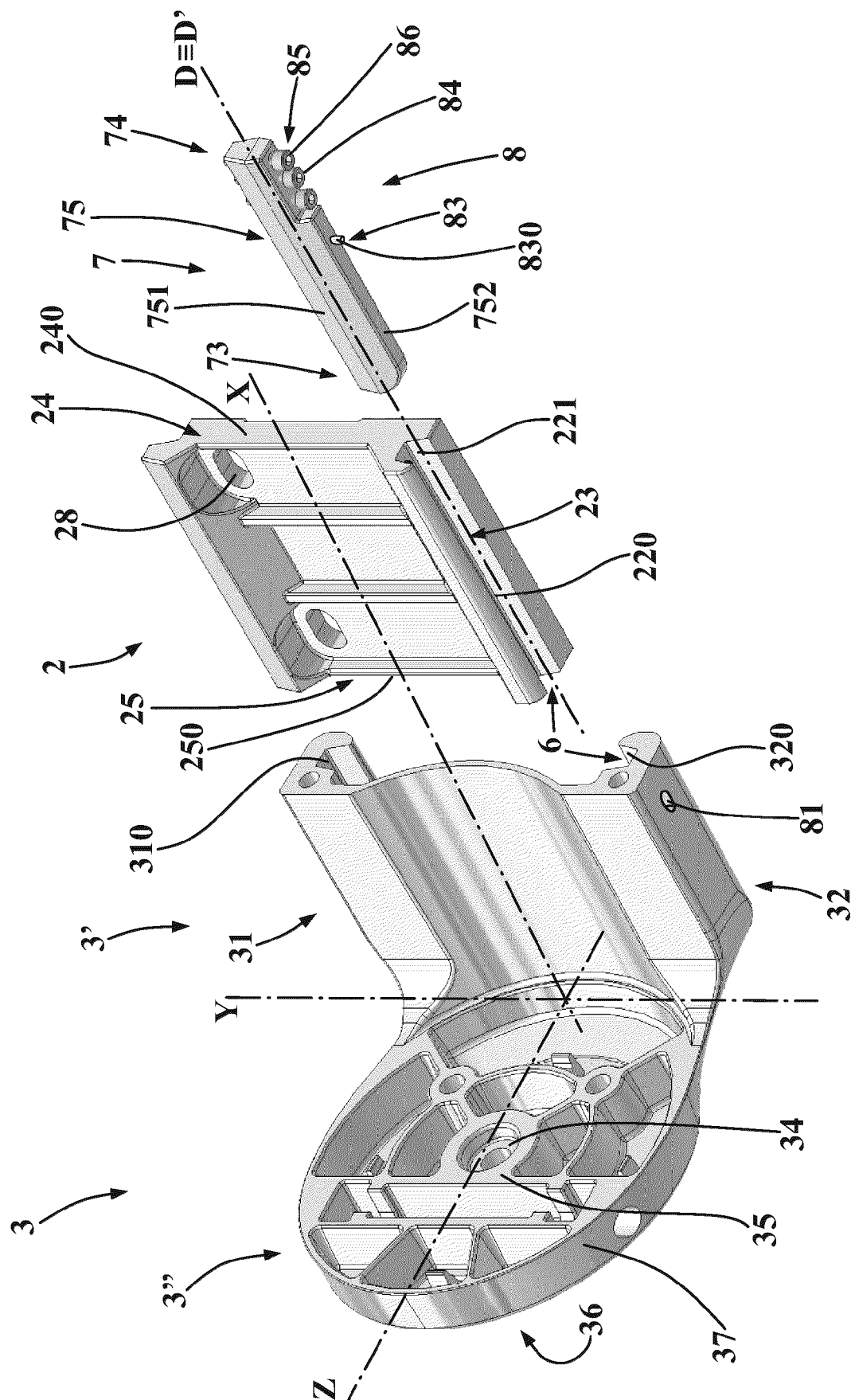


Fig. 4

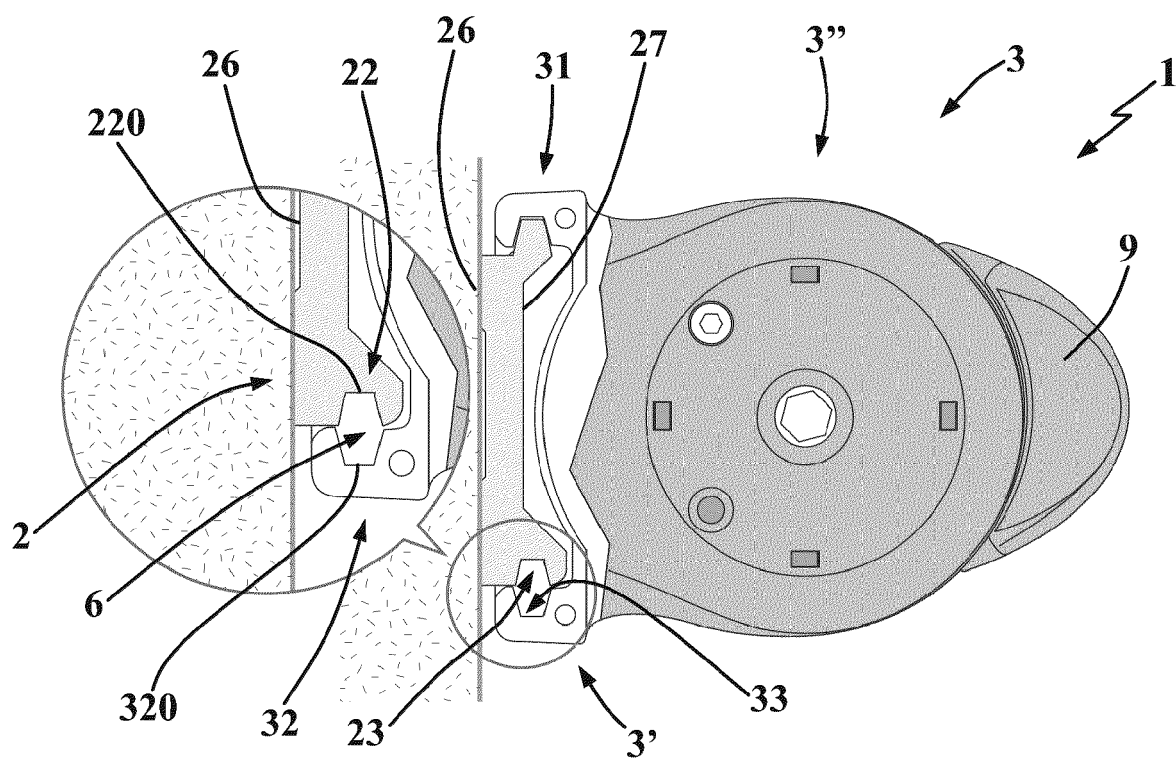


Fig. 5

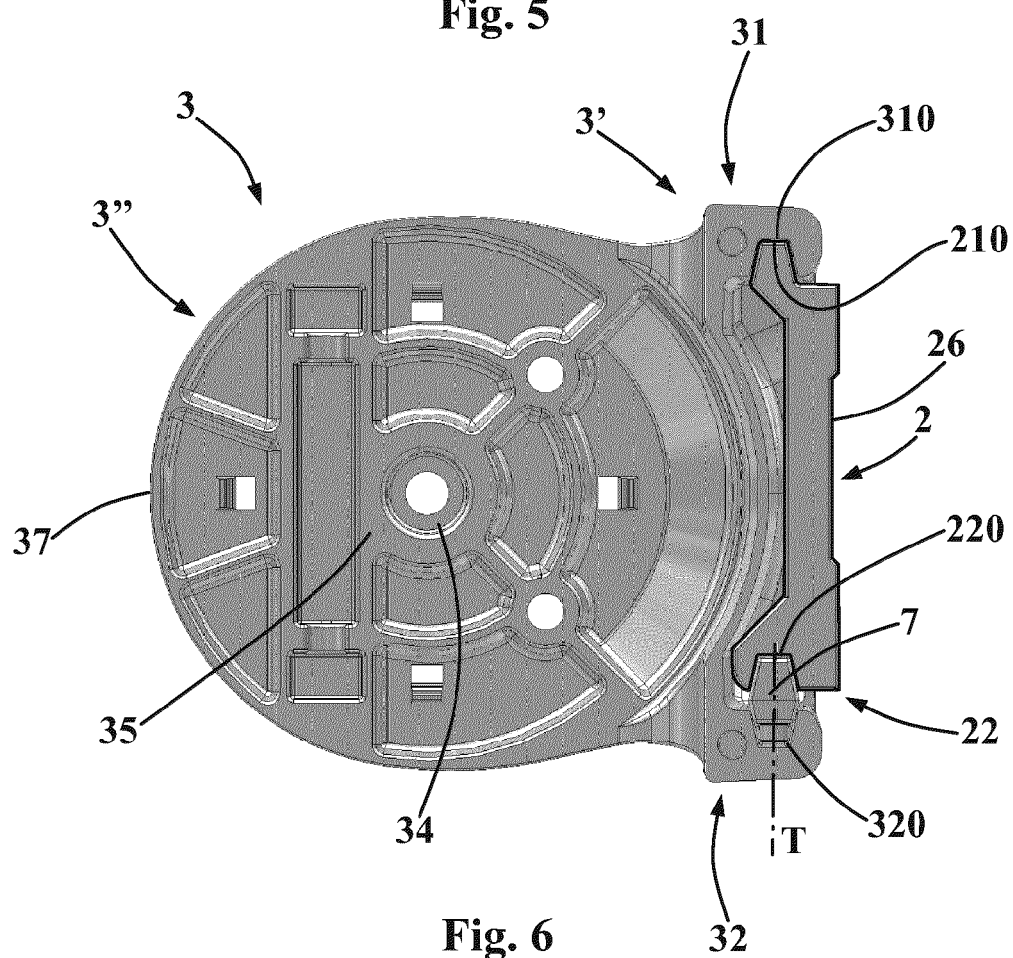


Fig. 6

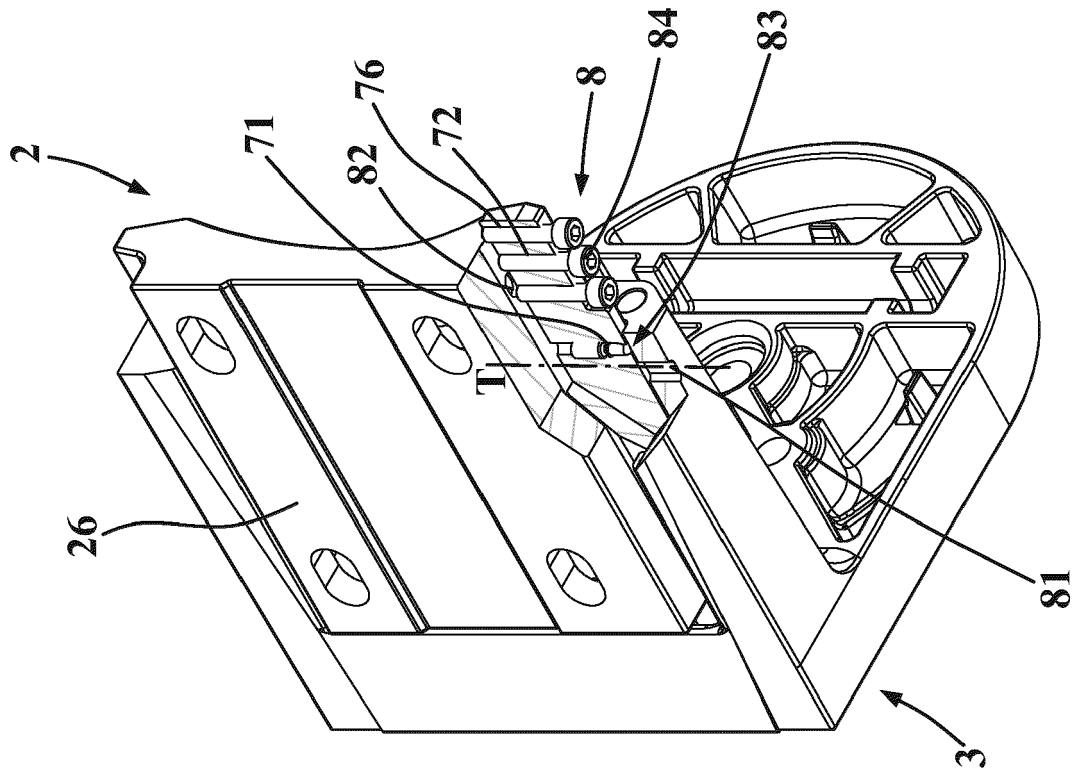


Fig. 8

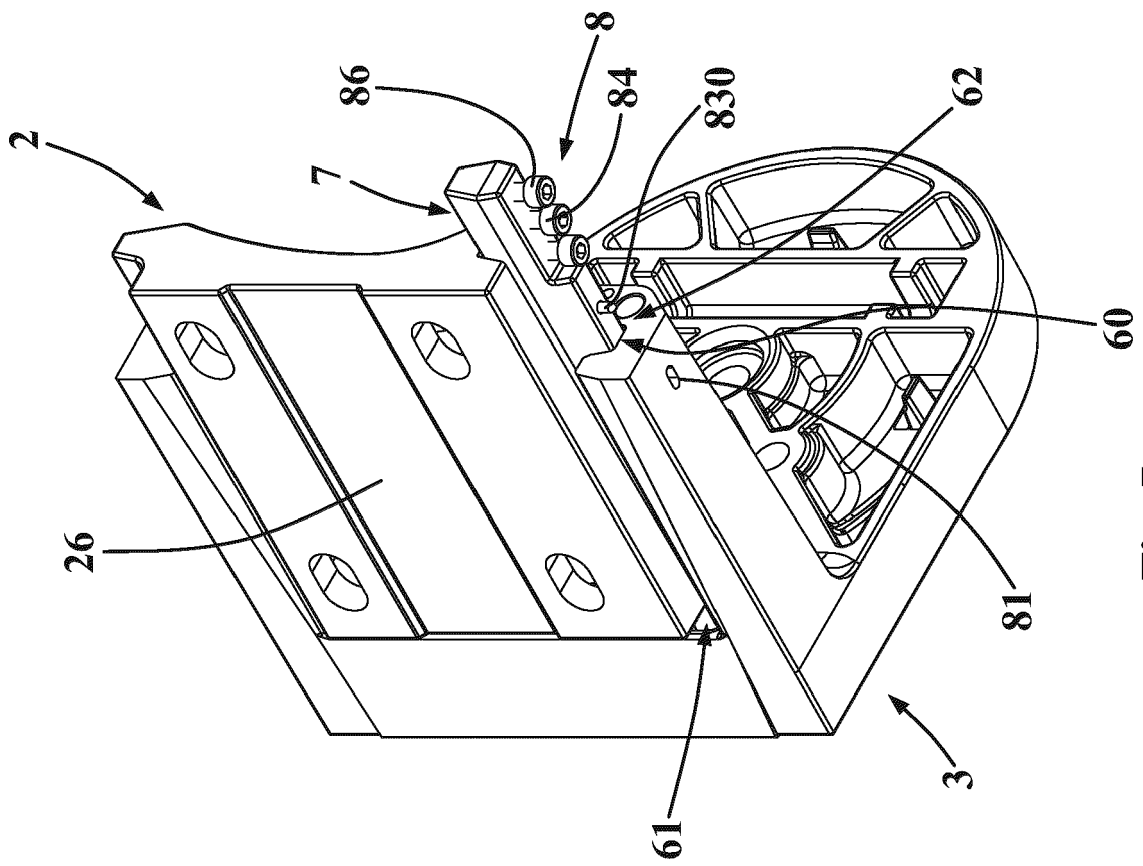
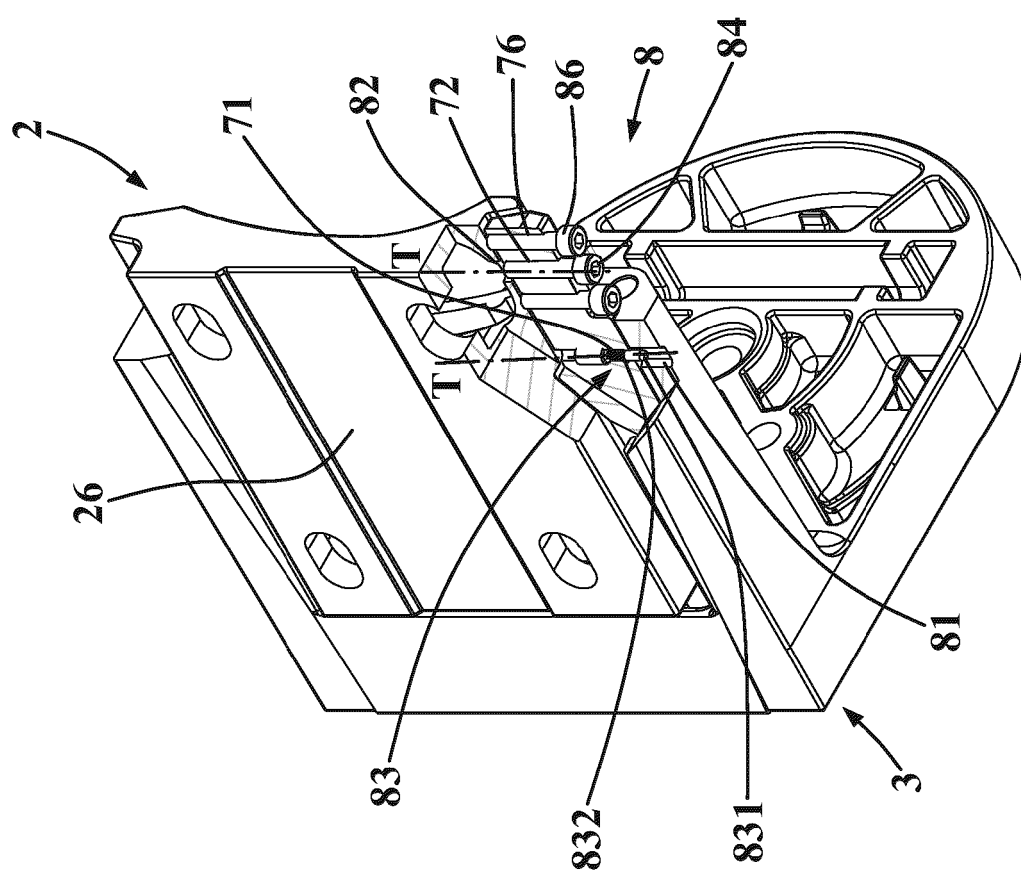
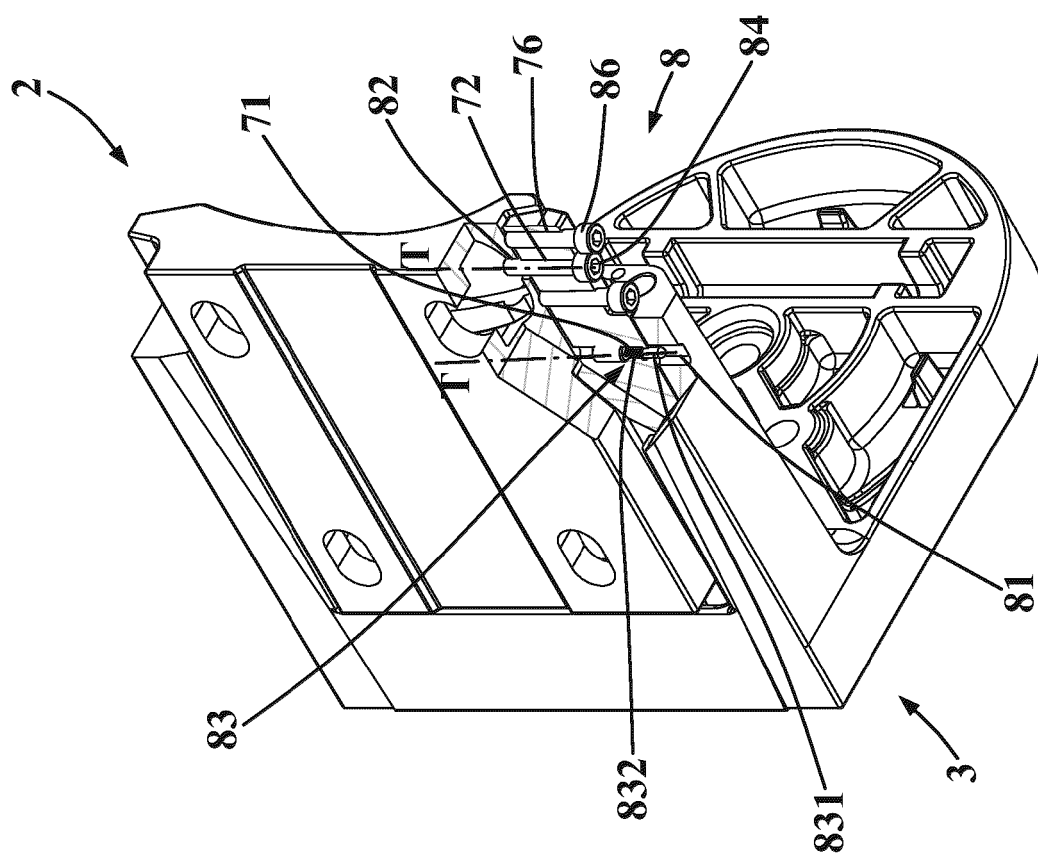


Fig. 7





EUROPEAN SEARCH REPORT

Application Number

EP 21 21 6176

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 1 122 376 A2 (DOLENZ GOLLNER GMBH [AT]) 8 August 2001 (2001-08-08) * figures 1-4 * * paragraphs [0001], [0037], [0046] * -----	1-11	INV. E04F10/06 E06B9/50
A	FR 2 759 402 A1 (MITJAVILA SA [FR]) 14 August 1998 (1998-08-14) * abstract * * figures 4,5 * -----	1-11	

TECHNICAL FIELDS SEARCHED (IPC)

E04F
E06B

The present search report has been drawn up for all claims

1

Place of search

Munich

Date of completion of the search

29 April 2022

Examiner

Cornu, Olivier

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 21 21 6176

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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29-04-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1122376 A2	08-08-2001	DE 10004197 A1 EP 1122376 A2	02-08-2001 08-08-2001
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REFERENCES CITED IN THE DESCRIPTION

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- EP 1122376 A2 [0014]