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(71) Applicant: **Alban Giacomo S.p.A.**
36060 Romano d'Ezzelino (VI) (IT)

(72) Inventor: **ALBAN, Giacomo Mario**
36060 Romano d'Ezzelino (IT)

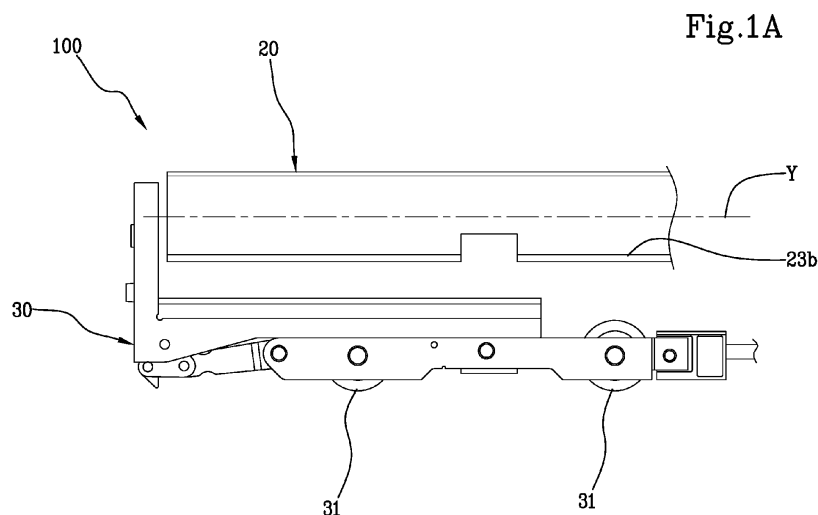
(74) Representative: **Lissandrini, Marco**
Bugnion S.p.A.
Via Pancaldo 68
37138 Verona (IT)

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(54) **GUIDING AND LIFTING DEVICE FOR A LEAF OF A DOOR OR WINDOW OF THE LIFT-AND-SLIDE TYPE AND METHOD FOR INCREASING A GLAZED PORTION THEREOF**

(57) A guiding and lifting device (100) for a leaf (A) of a door or window of the lift-and-slide type, said device being configured to be applied below a lower crosspiece (T) of a leaf (A) and comprising: at least one carriage (30) configured to permit sliding of said leaf (A) along an opening and closing direction (X) of the door or window; at least one lifting element (40) operationally associated with said carriage (30) and movable in lifting and lowering so that a displacement of the carriage (30) relative to the lifting element (40), performed by manoeuvring means (50), causes a lifting or lowering of the lifting element (40) and thus of the leaf (A). Further, the device (100) comprises a support element (20) extending along a main

extension direction (Y) parallel to a rolling direction of the carriage (30) and defining a cavity operationally facing downwards within which the carriage (30) and the lifting element (40) are housed; said support element (20) being configured to be inserted within a corresponding lower receiving seat (S) for receiving the leaf (A) and said lifting element (40) engaging abutting against an inner surface of the support element (20) in a lifting configuration of the lifting element (40) corresponding to a lifted position of the leaf (A). Further, an object of the invention is a method for lifting the glazed portion of a leaf of a door or window of the lift-and-slide type.



Description

[0001] The object of the present invention is a guiding and lifting device for a leaf of a door or window of the lift-and-slide type that is used in the field of doors and windows. Further, the present invention relates to a method for increasing the glazed portion in a leaf for a door or window of the lift-and-slide type.

[0002] In particular, the present invention relates to the movement of a lift-and-slide window or door, i.e. in which the leaf in the closed position is in the lowered position and rests on the lower base of the casing of the door or window, while in order to slide from the closed position to the open position the leaf must be lifted relative to the lower base of the casing, generally known as "threshold".

[0003] In the sector of doors and windows, using sliding doors and windows is known, in particular for French windows, in which the leaf is made from a glass panel surrounded by a frame having both a structural and a housing and connecting function for housing and connecting the devices that are necessary for sliding the leaf and locking the leaf in the closed position. Normally, the lower crosspiece of the frame is made so as to have a first seat configured to retain a lower side of the glass panel and a second seat, opposite the first seat, configured to receive the devices for the sliding of the leaf. In such a situation, the lower crosspiece accordingly has a substantially "H"-shaped section in which the horizontal portion of the "H" is made of the same wood with which the lower crosspiece itself is made.

[0004] In accordance with the prior art, one or more carriages are inserted into the second seat obtained on the lower crosspiece of the frame of the leaf. Such carriages are provided with wheels and are configured to move on the threshold of the casing and to switch between a sliding position and a stationary position, in which they enable the leaf to be lifted or lowered. Carriages of known type comprise a lifting element adapted to be fixed to the leaf and operationally associated with the carriage by an inclined plane means. In greater detail, the lifting element is movable along the inclined plane means to lift up or lower relative to the wheels of the carriage; in particular, in the lifting step, the lifting element lifts up until it intercepts the horizontal portion of the "H"-shaped section of the lower crosspiece, causing a lifting motion of the crosspiece itself and thus of the leaf associated therewith. On the other hand, in the lowering step, the lifting element lowers interrupting its thrust action on the lower crosspiece and causing the lowering of the leaf.

[0005] A particularly perceived need in the sector of windows or doors is that of increasing the glass surface as much as possible while maintaining the functionality and resistance of standard windows or doors.

[0006] To meet this need, leaves have been devised in which the frame has significantly smaller dimensions than those of standard windows or doors. Disadvantageously, reducing the height of the frame of the leaf, specially below a value equal to about 74mm, has significant

drawbacks.

[0007] In fact, in order to reduce the frame of the leaf, it is necessary to reduce the thickness of the horizontal portion of the "H"-shaped section of the lower crosspiece of the frame. In such a situation, using the carriages described above, at the moment of lifting the lifting element against the horizontal portion of the "H"-shaped section of the lower crosspiece, the latter could be too thin and thus not be able to support the thrust imposed by the lifting element. At the moment of the thrust therefore, near the lifting element, the horizontal portion could break and the lifting element would thus come into contact with the glass panel placed in the first seat of the lower crosspiece, damaging the glass panel, chipping the glass panel. Disadvantageously, in some cases, the desired height of the frame of the leaf is so reduced that in order to house the carriages, it would even be necessary to eliminate the horizontal portion of the "H"-shaped section. This solution is not however practical because it would not be possible to lift the leaf.

[0008] Currently, in order to increase significantly the glazed portion of the leaf, it is necessary to modify radically the design of the leaf, for example by using sliding non-lifting doors and windows, or doors and windows in which the lifting system is located in the upper part of the door or window or else below the walking surface.

[0009] One of the objects of the present invention is thus to propose a guiding and lifting device that enables the dimensions of the frame of a lift-and-slide door or window to be reduced, also noticeably.

[0010] A further object of the present invention is to make a guiding and lifting device that is able to maximise the glazed surface, ensuring at the same time a correct and optimum operation of the door or window.

[0011] These objects are substantially attained by a guiding and lifting device comprising the technical characteristics as set out in one or more of the accompanying claims. The dependent claims correspond to possible embodiments of the invention.

[0012] Further characteristics and advantages of the present invention will more fully emerge from the approximate and hence non-limiting description of an embodiment of a guiding and lifting device, as illustrated in the accompanying drawings, in which:

- Figures 1A and 1B show respectively an exploded view of a guiding and lifting device that is an object of the present invention and a perspective view of a detail of this device;
- Figures 2A and 2B show, respectively, section views of two embodiments of a guiding and lifting device according to the invention;
- Figures 3A and 3B show frontal views of a portion of a lift-and-slide door or window on which the guiding and lifting device, the object of the present invention is mounted, in two different configurations;
- Figures 4A and 4B show respectively a perspective view and a section view of a further embodiment of

the invention;

- Figures 5A and 5B show frontal views of the guiding and lifting device according to the embodiment of figures 4A and 4B.

[0013] With particular reference to figures 1A-2A, 100 indicates a guiding and lifting device for a leaf "A" of a door or window of the lift-and-slide type. In particular, the guiding and lifting device is configured to be applied below a lower crosspiece "T" of the leaf "A".

[0014] The term "door or window of the lift-and-slide type" means a door or window comprising a leaf "A" and a casing provided with a lower rail "B" arranged below a leaf "A" on the aforesaid "threshold" of the door or window. In this type of door or window, the leaf "A" is slidable between a closed position, in which the leaf "A" is in contact with a vertical upright "M" to cause a closing of the access, and an open position, in which the leaf "A" is moved away from the vertical upright "M" and moved near an opposite upright "M" so as to enable access.

[0015] The device 100 comprises at least one carriage 30 configured to permit sliding of the leaf "A" along an opening and closing direction "X" of the door or window.

[0016] According to one aspect of the invention shown in figure 1A, the carriage 30 is provided with a rolling means 31, such as for example wheels, so as to be able to slide in contact with the lower rail "B" of the door or window during opening or closing of the leaf "A".

[0017] With reference to a further aspect shown in figures 1A, 3A-3B, the device 100 is further provided with at least one lifting element 40 operationally associated with the carriage 30 by cam or tilted plane means 32. In greater detail, the lifting element 40 is so configured that, at a displacement of the carriage 30 relative to the lifting element that is performed by manoeuvring means (for example levers controlled by a handle, as disclosed below), a lifting or lowering of the lifting element 40 and thus of the leaf "A" is caused.

[0018] With particular reference to figures 3A-3B, the connection between the carriage 30 and the lifting element 40 is made by an inclined plane, in particular, by an inclined slot 40a obtained in the lifting element 40 and slidably associated with a slider 32a associated with the carriage 30. In other words, the inclined slot 40a defines a means that exploits the concept of "inclined plane" to guide the movement of another element, in this case the slider 32a. According to one aspect of the invention shown in figures 3A and 3B, the carriage 30 performs a displacement motion between a stationary position (figure 3A), in which the lifting element 40 lowered, the slider 32a is in the upper part of the inclined slot 40a and the leaf "A" rests on the lower rail "B", and a sliding position (figure 3B), in which the slider 32a is in the lower part of the inclined slot 40a and the lifting element 40 is raised, causing a lifting of the leaf "A" relative to the lower rail "B".

[0019] In other words, displacing the carriage 30 between the stationary position and the sliding position and vice versa causes respectively a lowering and a lifting of

the lifting element 40 and consequently of the leaf "A" along a direction that is vertical and perpendicular to the opening and closing direction "X" of the door or window.

[0020] Once the leaf "A" is lifted relative to the lower rail "B" (figure 3B), the carriage performs a rolling motion along the opening and closing direction "X" of the door or window, so as to slide the leaf "A" between the closed position and the open position.

[0021] According to one aspect of the invention shown in figures 1A-1B, the device 100 further comprises a support element 20 extending along a main extension direction "Y" parallel to a rolling direction of the carriage 30 (which coincides with the opening and closing direction "X" of the door or window) and defining a cavity operationally facing downwards and configured to house the carriage 30 and the lifting element 40.

[0022] As shown in figures 2A, 2B, the support element 20 is configured to be inserted in a corresponding lower receiving seat "S" of the leaf "A". Preferably, the support element 20 is fixable to the leaf "A" by interference with the lower receiving seat "S", such that the support element 20 is solidly constrained to the leaf "A".

[0023] According to one aspect shown in figure 1B, the support element 20 comprises a metal profile shaped as an upturned "U".

[0024] According to a further aspect, an external surface of the support element 20 intended to come into contact with walls of the lower receiving seat "S" can be provided with knurling or with other suitable means to increase the interference between the support element 20 and the seat "S".

[0025] In such a situation, once the carriage 30 and the lifting element 40 are housed within the cavity defined by the support element 20, the lifting element 40 in the lifting configuration engages abutting against an inner upper surface (in other words against the surface that defines the horizontal part of the upturned "U") of the support element 20, thus enabling the leaf "A" to be lifted up, as will be disclosed in detail below. According to one aspect of the invention shown in figures 1A-1B, 2A-2B, the support element 20 has at the bottom a pair of opposite external projections 23a, 23b defining respective support abutments for the lower crosspiece "T" of the leaf "A". According to one aspect of the invention, the projections 23a, 23b act as support and lifting points for the leaf "A" because, at the moment of lifting of the lifting element 40 and thus of the support element 20, the projections 23a, 23b act on the lower crosspiece "T", and thus on the leaf "A", so as to lift the leaf "A". In other words, at the moment of opening of the leaf "A", the lifting element 40 imposes an upward thrust on the support element 20 that, supporting the leaf "A" and/or the lower crosspiece "T" thereof owing to the projections 23a, 23b, lifts the leaf "A" removing the leaf "A" from the lower rail "B".

[0026] With reference to figure 1B, preferably the support element 20 has at least one hole 21, preferably three holes 21, adapted to enable the carriage 30 to be fixed. In greater detail, the lifting element 40 on the carriage 30

comprises a plate (not shown) solidly constrained to the lifting element 40 and adapted to be fixed to the support element 20. In this manner, the support element 20 is made movable in lifting and lowering relative to the wheels of the carriage 30 by means of the lifting element 40. Thus in use, to operate the guiding and lifting device 100, the latter is applied stably to a lower receiving seat "S" of the leaf "A" by stable anchoring of the support element 20 on the lower crosspiece "T" of the leaf "A". Subsequently, the guiding and lifting device 100 is actuated so as to move longitudinally the carriage 30 relative to the support element 20 causing a lifting of the leaf "A". During actuation of the guiding and lifting device 100, the carriage 30 moves from the stationary position to the sliding position and the lifting element 40 lifts up, coming to abut on the inner upper surface of the support element 20 intercepting the support element 20 (figure 3B). In such a situation, the lifting element 40 imposes a thrust on the support element 20 determining lifting thereof. As the support element 20 is inserted and fixed within the lower receiving seat "S" for receiving the leaf "A", at the moment of lifting up the support element 20, also the leaf "A" is lifted up with the support element 20. Upon reaching an end-of-stroke point of the carriage 30, i.e. upon reaching the sliding position of the carriage 30, the leaf "A" is lifted with respect to the underlying lower rail "B" of the door or window and can thus slide. In other words, upon reaching the sliding position (figure 3B), the carriage 30 can perform a rolling motion so as to translate the leaf "A" with respect to the lower rail "B" of the casing.

[0027] According to another aspect of the invention, the carriage 30 can further displace itself from the sliding position to the stationary position. In such a situation (figure 3A), the slider 32a moves to the upper part of the slot 40a and the lifting element 40 lowers, interrupting the thrust action on the support element 20 and thus also on the leaf "A" of the door or window, which lowers to the lower rail "B", until it comes to rest thereupon. Advantageously, the fact that the lifting element 40 lies on the support element 20 during the lifting motion thereof and not directly on the wood of the lower crosspiece "T" of the leaf "A" (for example, on the horizontal portion of the "H"-shaped section) enables the dimensions of the frame of the leaf "A" to be reduced, increasing the glazed surface and also enabling the leaf "A" to be lifted. In a further advantageous mode, the height of the lower crosspiece "T" of the frame of the leaf "A" can be reduced to a value equal to 50 mm. In particular, as shown in figure 2B, owing to the presence of the projections 23a, 23b it is possible to eliminate totally the wooden horizontal portion of the "H"-shaped section of the lower crosspiece "T" of the leaf "A" because the leaf "A" lifts up owing to the force imposed by the projections 23a, 23b on the leaf "A", following the thrust exerted by the lifting element 40 on the support element. In such a situation, as shown in figure 2B, between the support element 20 and the lower edge of a glass panel "P" of the leaf "A" there is an empty space (about 1mm in height) so that the support element 20

does not come into contact with the glass panel "P" and so as to avoid tension problems arising from the heat expansion of the glass panel "P" of the leaf "A". Advantageously, the thrust action of the lifting element 40 on the support element 20 further enables the loads arising from the leaf "A" at the moment of lifting thereof to be distributed more evenly and in a more weighted manner.

[0028] According to one aspect of the invention, the projections 23a, 23b are defined by folded end portions of the support element 20.

[0029] Preferably, the projections 23a, 23b, just like the profile of the support element 20, are obtained by a folding or extrusion process.

[0030] Still more preferably, the support element 20 is subjected to processing so as to obtain knurling on the surface in contact with the lower receiving seat "S", the knurling being configured to maintain the support element 20 in position within the lower receiving seat "S".

[0031] Preferably, the metal material used for making the support element 20, and also the pair of external projections 23a, 23b, is a metal material having a mechanical resistance that is able to withstand the thrust action of the lifting element 40, and able to support the load determined by the leaf "A" of the door or window during lifting of the lifting element 40.

[0032] Still more preferably, the material used for the metal profile is an aluminium alloy.

[0033] Advantageously, using an aluminium alloy makes the support element 20 easy to shape and to make, but at the same time resistant and able to support the loads arising from the leaf "A" of the door or window.

[0034] As shown in figures 3A and 3B, the device 100 further comprises manoeuvring means 50, in particular articulated traction and pushing levers, housed inside the cavity of the support element 20 and connected to the carriage 30 to perform a longitudinal movement of the carriage 30 relative to the support element 20.

[0035] According to one aspect, the manoeuvring means 50 comprises a connecting rod 51 connected to the carriage 30 and activatable by activating a handle "G" mounted on the leaf "A", as will be disclosed in detail below.

[0036] According to a further embodiment, shown in figures 4A-5B, the guiding and lifting device further comprises fixing means 70a, 70b, 71a, 71b housed inside the cavity of the support element 20 and configured to connect operationally the carriage 30 to the support element 20.

[0037] In such a situation, at the moment of insertion of the guiding and lifting device 100 within the seat "S" of the leaf "A", the carriage 30 and the support element 20 are inserted simultaneously as a single body within the seat "S", so as to speed up and facilitate the installation operations of the guiding and lifting device 100.

[0038] According to one aspect, the fixing means 70a, 71a, 70b, 71b is solidly movable with the support element 20, as will be disclosed in detail below. Preferably, as shown for example in figures 4B and 5A-5B, each fixing

means 70a, 71a, 70b, 71b comprises a pin 71a, 71b extending along a movement direction of the lifting element 40. This pin 71a, 71b moreover has an upper end projecting at least partially from the cavity of the support element 20 (figures 4A and 4B).

[0039] According to a further particularly advantageous aspect, if the wooden horizontal portion of the "H"-shaped section of the lower crosspiece "T" of the leaf "A" is eliminated, each fixing means 70a, 71a, 70b, 71b further comprises a plate 70a, 70b constrained to an upper end of the pin 71a, 71b and engaged abutting against an upper surface of the lower receiving seat "S" of the leaf "A" (figure 4A).

[0040] The plate 70a, 70b of each fixing means 70a, 71a, 70b, 71b is movable in rotation between an assembly position, in which it is oriented along the main extension direction "Y" of the support element 20, and a fixing position, in which it is rotated so as to be arranged transversely to the main extension direction "Y".

[0041] At the moment of the installation of the guiding and lifting device 100, the carriage 30, together with the support element 20, is inserted within the lower receiving seat "S" for receiving the leaf "A". In such a situation, the upper end of each pin 71a, 71b projects so that a respective plate 70a, 70b can be restrained there. Each plate 70a, 70b is then placed in the assembly position and is subsequently rotated as far as the fixing position so as to fix firmly the guiding and lifting device 100 to the leaf "A". Advantageously, the possibility of rotating the plates 70a, 70b enables assembly of the guiding and lifting device 100 to be facilitated and speeded up.

[0042] As shown in the accompanying drawings, in use, at the moment of actuation of the guiding and lifting device 100, the carriage 30 is moved longitudinally relative to the support element 20, determining lifting of the leaf "A". During actuation of the guiding and lifting device 100, the carriage 30 moves from the stationary position to the sliding position and the lifting element 40 lifts up, thus coming to abut on the inner upper surface of the support element 20, i.e. intercepts the support element 20. In such a situation, the lifting element 40 imposes a thrust on the support element 20 determining lifting of the latter and of the leaf "A", as the support element 20 is solidly fixed to the leaf "A" itself. Further, as the fixing means 70a, 70b, 71a, 71b is solidly constrained to the support element 20, at the moment of lifting of the support element 20, also the fixing means 70a, 70b, 71a, 71b is lifted (figure 5B).

[0043] In the same manner, when the carriage 30 moves from the sliding position to the stationary position and the lifting element 40 lowers, interrupting its thrust action against the support element 20, the latter lowers together with the leaf "A" and with fixing means 70a, 70b, 71a, 71b (figure 5A). Advantageously, the presence of the fixing means 70a, 70b, 71a, 71b enables the device 100 to be installed in a single step, because the carriage 30 and the support element 20 are engaged operationally with one another without thereby harming the correct op-

eration of the entire assembly.

[0044] A sliding leaf "A" for a door or window is also an object of the present invention. The leaf "A" comprises at least one guiding and lifting device 100 according to what has been disclosed above.

[0045] In the preferred embodiment, the guiding and lifting device 100 comprises two carriages 30 connected together by an arm 60 so as to be simultaneously movable along the rolling direction.

[0046] The leaf "A" further comprises a glass panel "P" and a frame for the glass panel "P". The frame comprises a lower crosspiece "T" in which the seat "S" is obtained in which guiding and lifting device 100 is stably inserted by fixing the support element 20 in the seat "S".

[0047] In one possible embodiment, the seat "S" is made as a longitudinal groove obtained directly within the lower crosspiece "T" of the frame.

[0048] As shown in figure 2A, the lower crosspiece "T" is stably connected to the glass panel "P" and houses the support element 20. In greater detail, a pair of lower surfaces of the lower crosspiece "T" abut on the respective opposite external projections 23a, 23b of the support element 20.

[0049] Owing to the presence of the support element 20 that is insertable inside the seat "S", the lower crosspiece "T" can have a height comprised between 74 mm and 48 mm, preferably equal to about 50 mm. Advantageously, the leaf "A" disclosed above has a glazed surface that is greater than the leaves "A" of a lift-and-slide door or window of known type.

[0050] In the preferred embodiment, the leaf "A" further comprises control rods 52 that are operationally connected to the respective manoeuvring means 50 of each carriage 30 and are activatable by a user via the handle "G" of the leaf "A".

[0051] In detail, by the rotation of the handles "G", a first control rod 52, near the handle "G", causes actuation of the manoeuvring means 50 of the carriage 30 connected directly thereto, and in particular of the connecting rod 51. In such a situation, the carriage 30 is commanded to activate a displacement of the slider 32a in the inclined slot 40a, causing lifting of the lifting element 40 and thus of the support element 20 and of the leaf "A". As the carriages 30 are connected together by the bar 60, also the other carriage 30 is moved so as to cause a lifting of the corresponding lifting element 40. At this point, the leaf "A" can slide along the lower rail "B" by means of the rolling means 31 as far as the desired position.

[0052] On the other hand, to return the leaf "A" to the lowered position, the handle "G" is again rotated (in a direction opposite the preceding direction). In this manner, a second control rod 52, opposite the handle "G", causes the actuation of the manoeuvring means 50 of the carriage 30 and connected directly thereto, and in particular of the connecting rod 51.

[0053] In such a situation, the carriage 30 is pushed to adopt the stationary position in which the slider 32a flows in the inclined slot 40a, causing lowering of the lifting

element 40 and thus of the support element 20 and of the leaf "A". As the carriages 30 are connected together by the bar 60, also the other carriage 30 is moved, so as to cause a lowering of the relative lifting element 40.

[0054] Further, an object of the present invention is a method for increasing the glazed portion in a leaf "A" of a door or window of the lift-and-slide type. In particular, as disclosed previously, the leaf "A" is configured to house the glass panel "P" and is provided with a frame for said panel equipped with a lower crosspiece T, in which a lower receiving seat "S" is obtained to house the carriage 30. Further, the lower crosspiece "T" has a substantially "H"-shaped section having a horizontal portion.

[0055] According to the invention and what has been disclosed in the preceding paragraphs, the method comprises the steps of:

- partially removing or eliminating the horizontal portion of the "H"-shaped section of the lower crosspiece "T";
- stably applying a guiding and lifting device 100, according to what was disclosed above, in the lower receiving seat "S" of the leaf "A" by stable anchoring of the support element 20 on the lower crosspiece "T", such that the leaf "A", during the lifting step, rests operationally on the lifting element 40 of the carriage 30 by means of the support element 20.

[0056] The present invention achieves the proposed objects, eliminating the drawbacks that have emerged from the known art.

[0057] The presence of the support element 20 enables the section of the frame and in particular the height of the lower crosspiece "T" of the leaf "A" to increase the glazed surface to be reduced. In particular, the presence of the support element 20 enables the height of the lower crosspiece "T" of the leaf "A" to be reduced to a value of about 50mm.

Claims

1. A guiding and lifting device (100) for a leaf (A) of a door or window of the lift-and-slide type, said device being configured to be applied below a lower crosspiece (T) of a leaf (A) and comprising:

- at least one carriage (30) configured to permit a sliding of said leaf (A) along an opening and closing direction (X) of the door or window;
- at least one lifting element (40) operationally associated with said carriage (30) and movable by lifting and lowering so that a displacement of the carriage (30) relative to the lifting element (40), performed by manoeuvring means (50), causes a lifting or lowering of the lifting element (40) and thus of the leaf (A);

characterised in that it further comprises a support element (20) extending along a main extension direction (Y) parallel to a rolling direction of the carriage (30) and defining a cavity operationally facing downwards within which the carriage (30) and the lifting element (40) are housed; said support element (20) being configured to be inserted within a corresponding lower receiving seat (S) for receiving the leaf (A) and said lifting element (40) engaging abutting against an inner surface of the support element (20) in a lifting configuration of the lifting element (40) corresponding to a lifted position of the leaf (A).

2. The device (100) according to claim 1, wherein said support element (20) comprises a profile shaped as an upturned "U", preferably made of aluminium alloy.
3. The device (100) according to any one of the preceding claims, wherein said support element (20) has a pair of opposite external projections (23a, 23b) defining respective support abutments for said leaf (A) and/or for a lower crosspiece (T) of said leaf (A), preferably said projections (23a, 23b) being defined by folded end portions of the support element (20).
4. The device (100) according to any one of the preceding claims, further comprising a manoeuvring means (50), in particular articulated traction and pushing levers, housed inside the cavity of the support element (20) and connected to the carriage (30) to perform a longitudinal movement of the carriage (30) relative to the support element (20).
5. The device (100) according to any one of the preceding claims, wherein the lifting element (40) is operationally associated with said carriage (30) by a cam or inclined plane means (32).
6. The device (100) according to any one of the preceding claims, wherein an external surface of the support element (20) adapted to come into contact with walls of the lower receiving seat (S) of the leaf (A) is provided with a knurled means to increase the interference between the support element (20) and the seat "S".
7. The device (100) according to any one of the preceding claims, comprising a fixing means (70a, 71a, 70b, 71b) housed inside the cavity of the support element (20) and configured to connect operationally said carriage (30) to said support element (20).
8. The device (100) according to claim 7, wherein the fixing means (70a, 71a, 70b, 71b) is movable solidly with said support element (20).
9. The device (100) according to claim 6 or 7, wherein each fixing means (70a, 71a, 70b, 71b) comprises:

- a pin (71a, 71b) extending along a movement direction of said lifting element (40) and having an upper end projecting at least partially from said cavity of the support element (20);
 - a plate (70a, 70b) constrained to an upper end of the pin (71a, 71b) and engageable abutting against an upper surface of said lower receiving seat (S) of the leaf (A), said plate (70a, 70b) being movable in rotation between an assembly position, in which said plate (71a, 71b) is oriented along the main extension direction (Y) of the support element (20), and a fixing position, in which said plate (71a, 71b) is rotated so as to be arranged transversely to the main extension direction (Y).

lower receiving seat (S) is obtained for a receiving a carriage (30), and wherein said lower crosspiece (T) has a substantially "H"-shaped section having a horizontal portion, said method comprising the steps of:

- partially removing or eliminating said horizontal portion of the "H"-shaped section of the lower crosspiece (T);
 - stably applying a guiding and lifting device (100) according to any one of claims 1-6 in the lower receiving seat (S) for receiving the leaf (A) by stable anchoring of the support element (20) on the lower crosspiece (T) such that the leaf, during the lifting step, rests operationally on a lifting element (40) of the carriage (30) by means of the support element (20).

10. A sliding leaf (A) for door or window, comprising:

- at least one guiding and lifting device (100) according to one or more of the preceding claims;
 - a glass panel (P);
 - a frame for said glass panel (P) comprising a lower crosspiece (T) in which a seat (S) is obtained in which said guiding and lifting device (100) is inserted stably by fixing the support element (20) in the seat (S).

11. The leaf (A) according to claim 10, wherein said lower crosspiece (T) has a height comprised between 74 mm and 48 mm, preferably equal to about 50 mm.

12. The leaf (A) according to claim 10 or 11, wherein said guiding and lifting device (100) comprises two carriages (30) that are each provided with a support element (20) and connected together by an arm (60) so as to be simultaneously movable along said rolling direction.

13. The leaf (A) according to any one of the preceding claims 10 to 12, wherein said support element (20) has at the bottom a pair of opposite external projections (23a, 23b) defining respective support abutments for said leaf (A) and/or for a lower crosspiece (T) of said leaf (A), preferably said projections (23a, 23b) being defined by folded end portions of the support element (20), and wherein said lower crosspiece (T) is stably connected to the glass panel (P) and rests on the support element (20) by abutment of at least one pair of lower surfaces of the lower crosspiece (T) on the respective opposite external projections (23a, 23b) of the support element (20).

14. A method for increasing the glazed portion in a leaf (A) of a door or window of the lift-and-slide type, wherein the leaf (A) is configured to house a glass panel (P) and is provided with a frame for said panel (P) equipped with a lower crosspiece (T) in which a

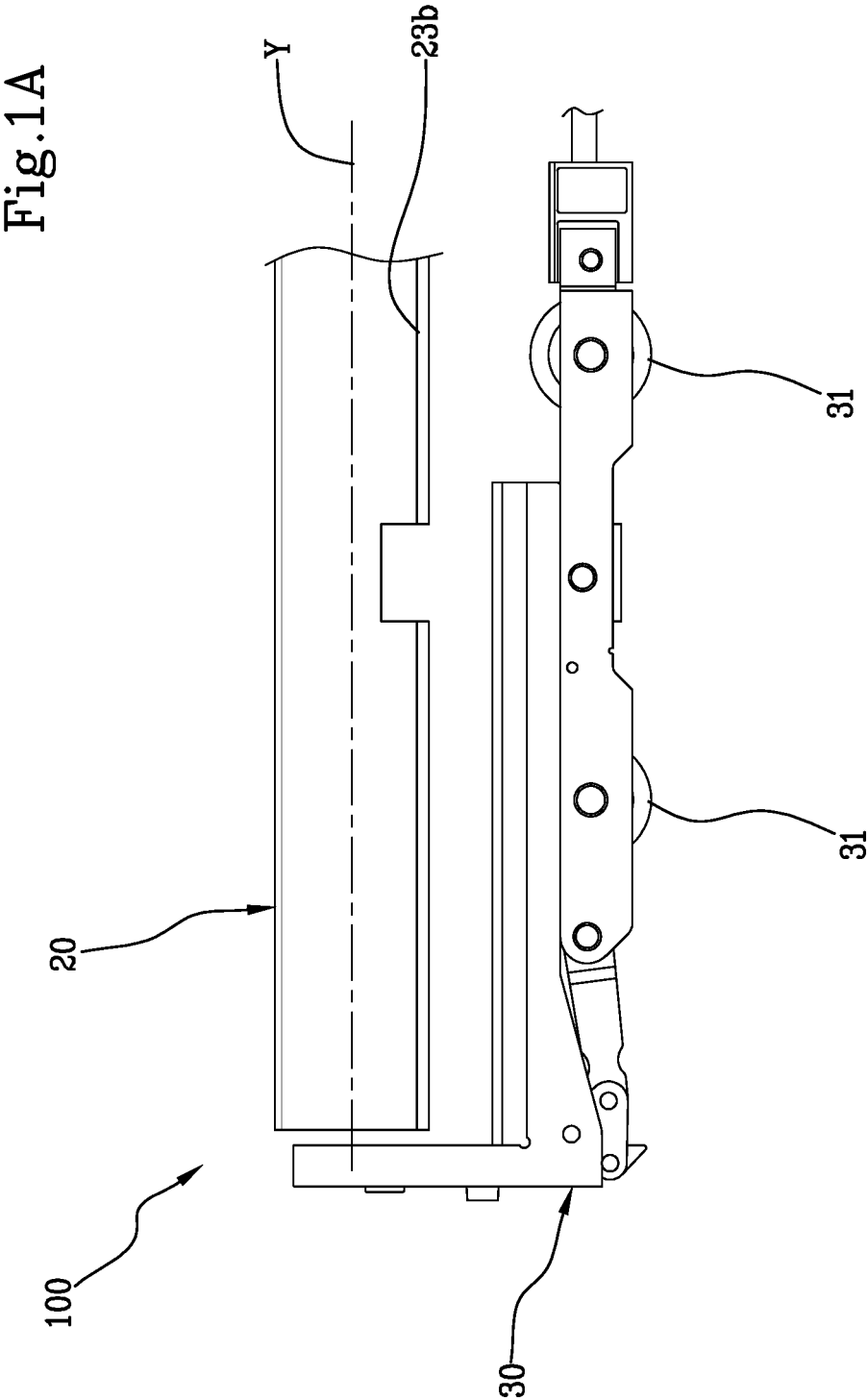


Fig.1B

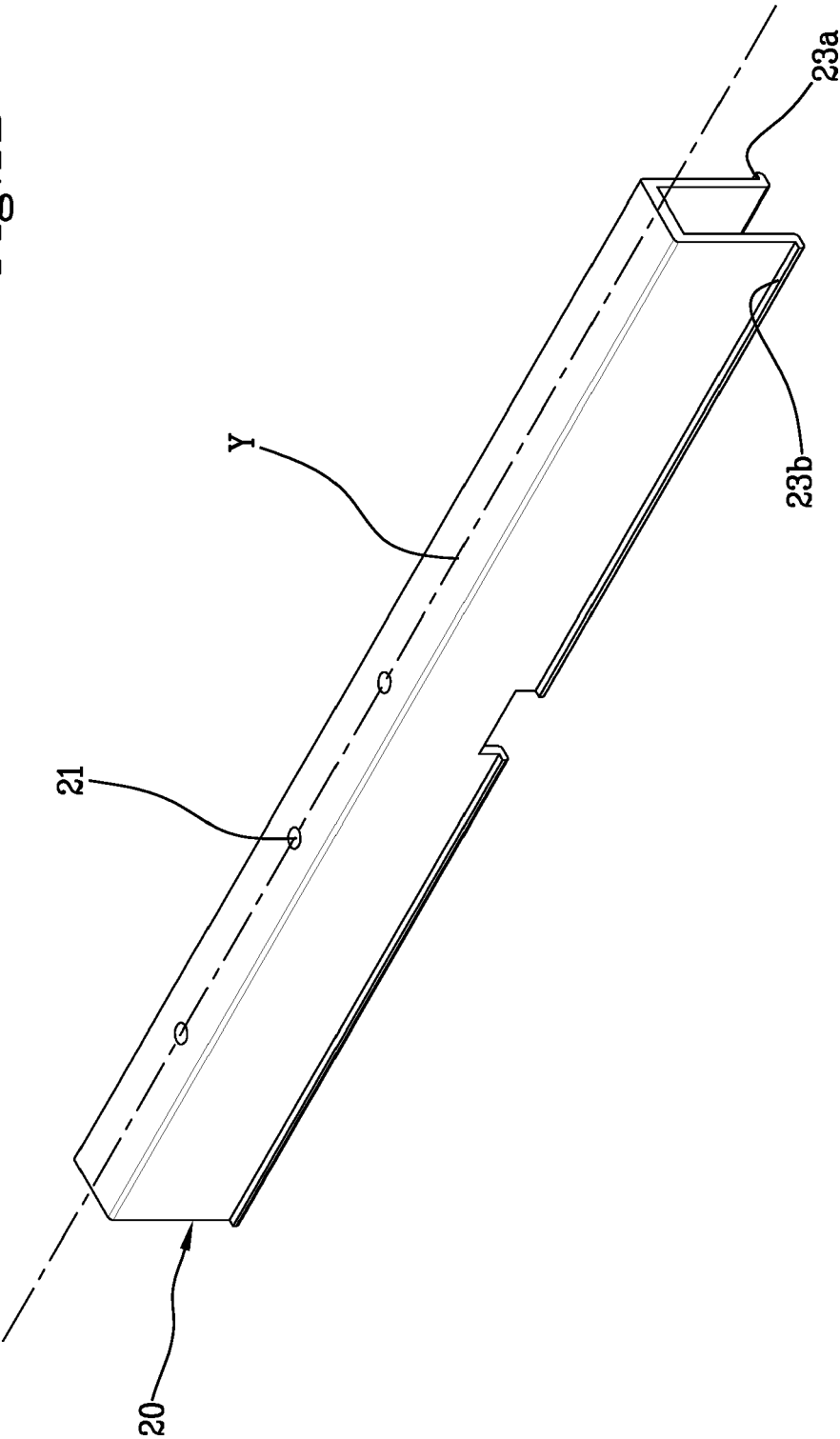


Fig.2A

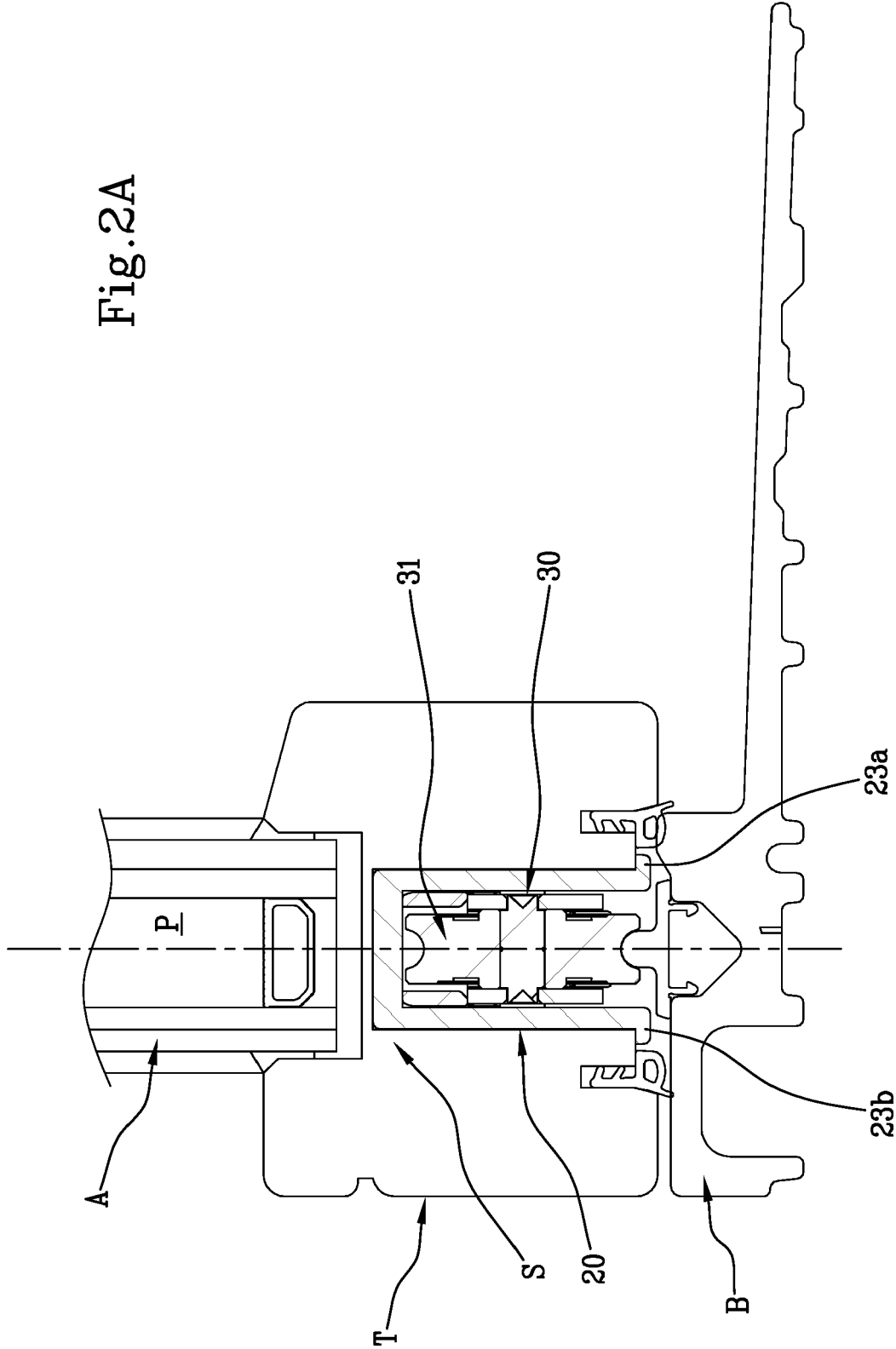
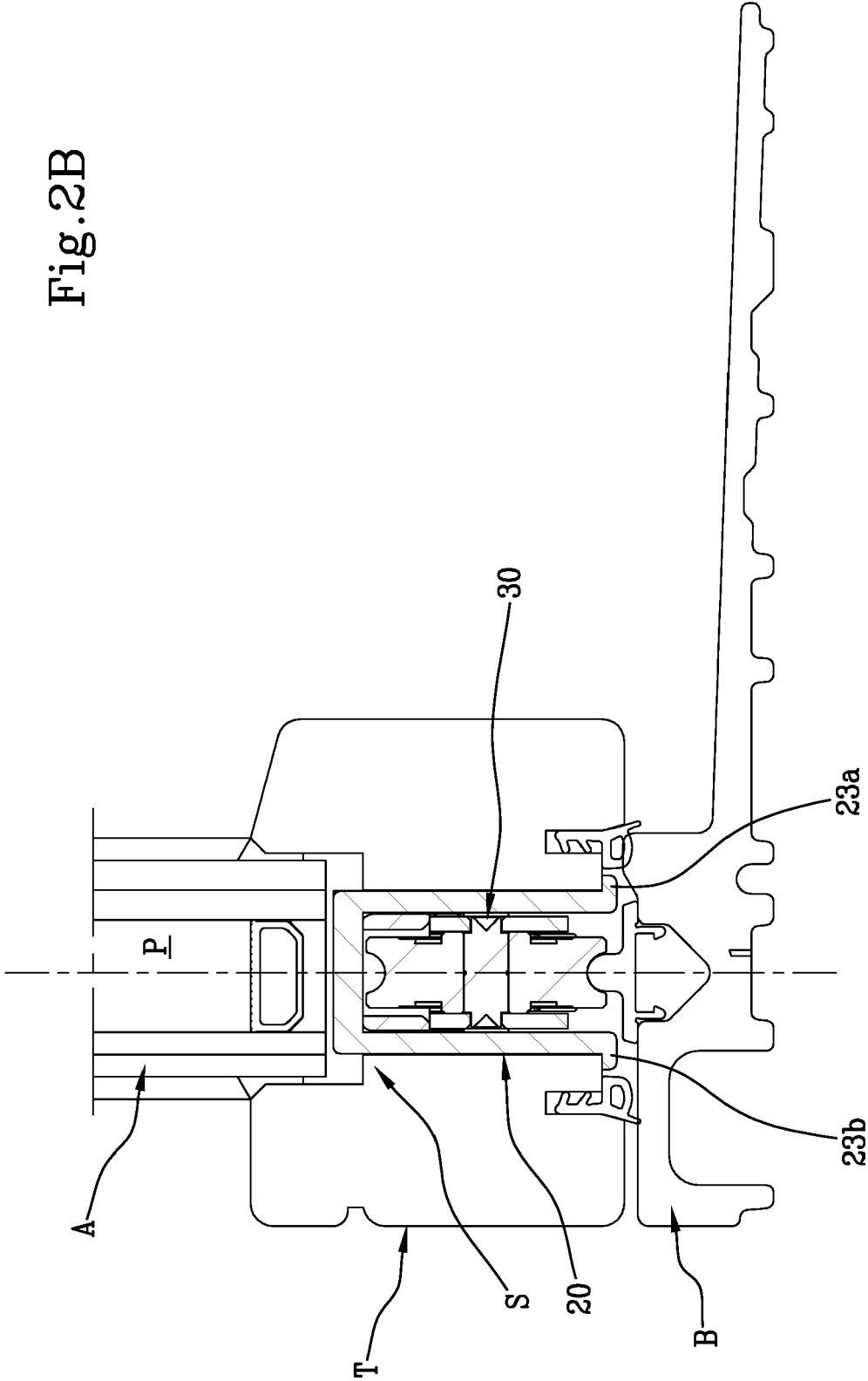
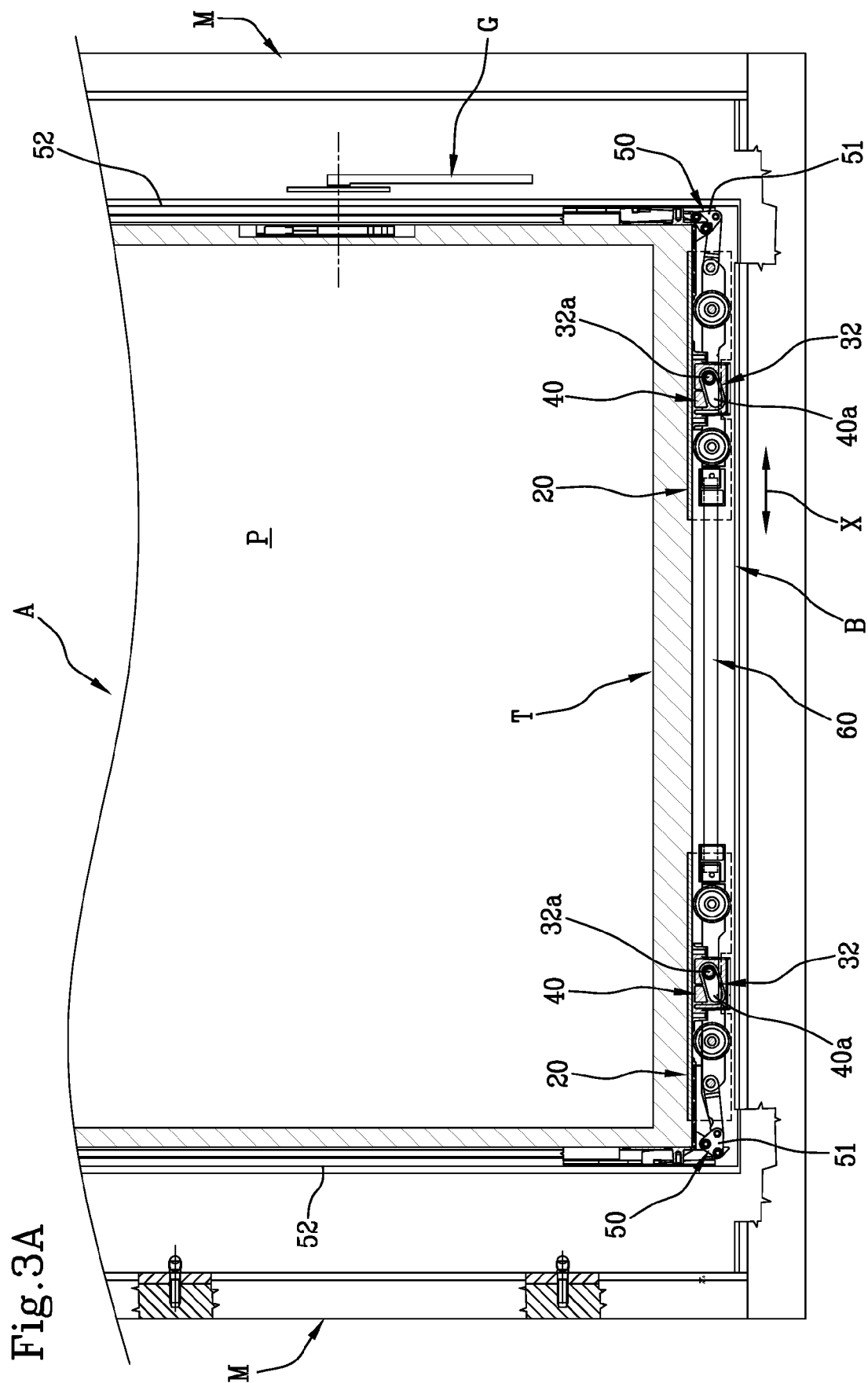


Fig.2B





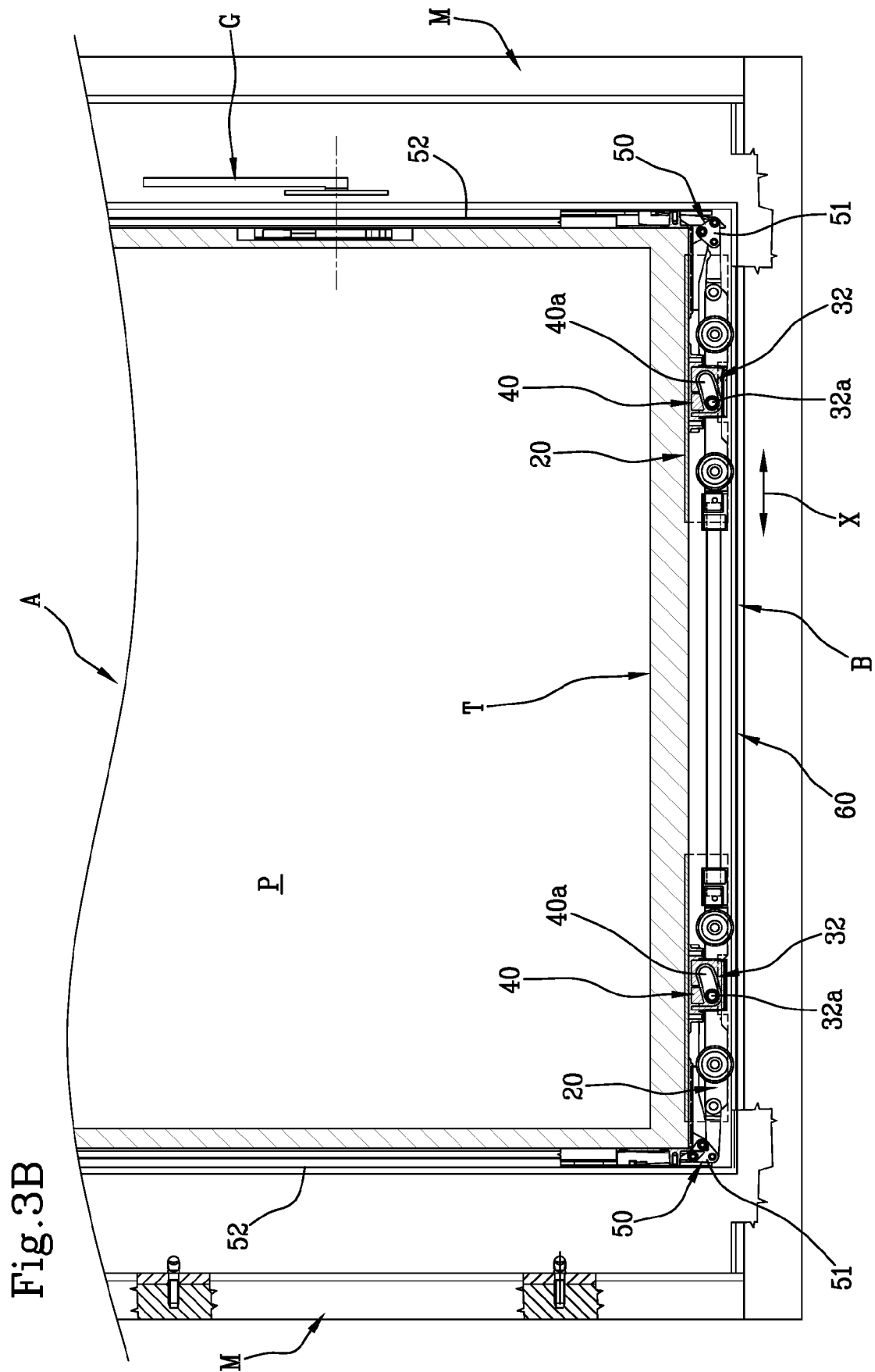


Fig. 4A

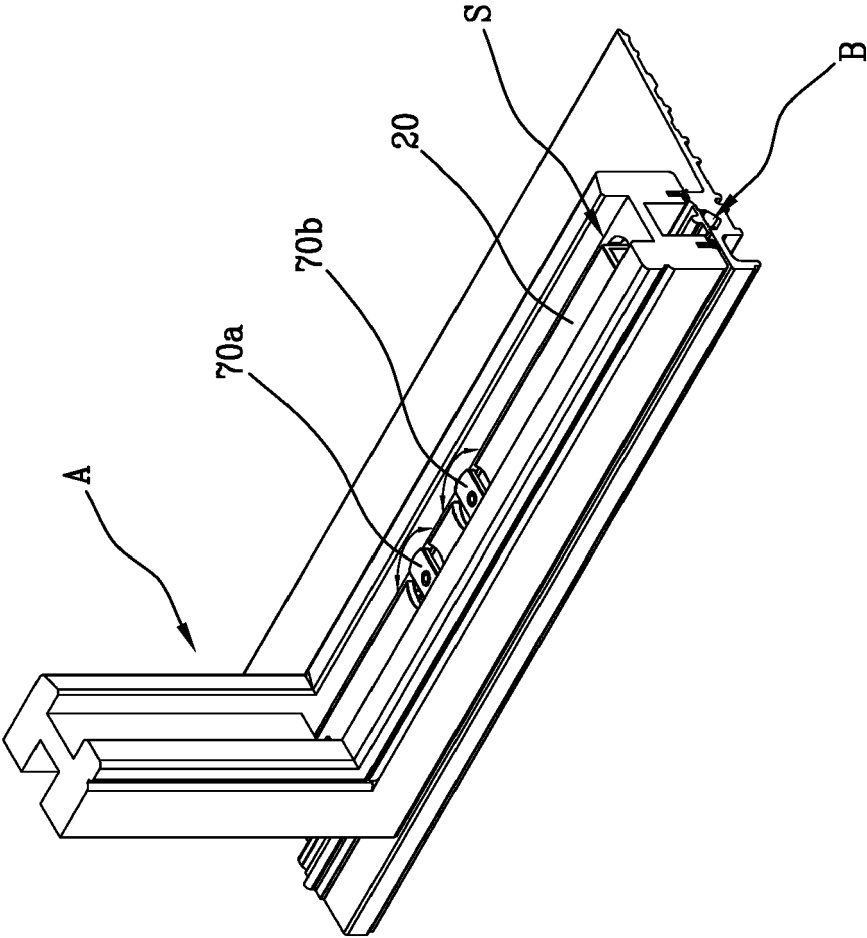
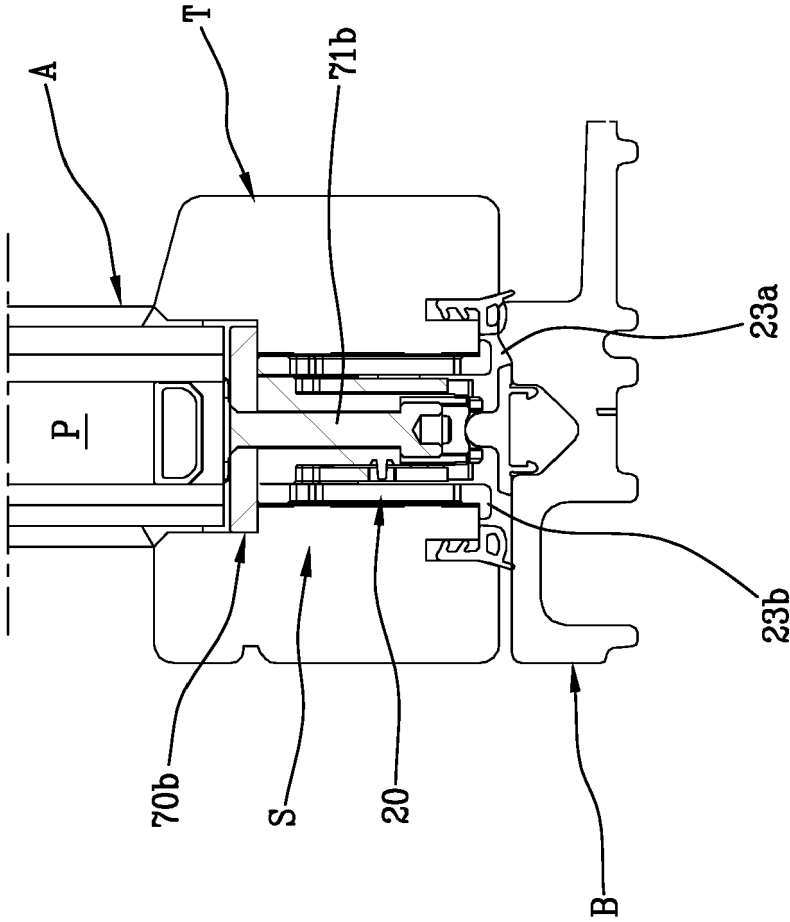


Fig.4B



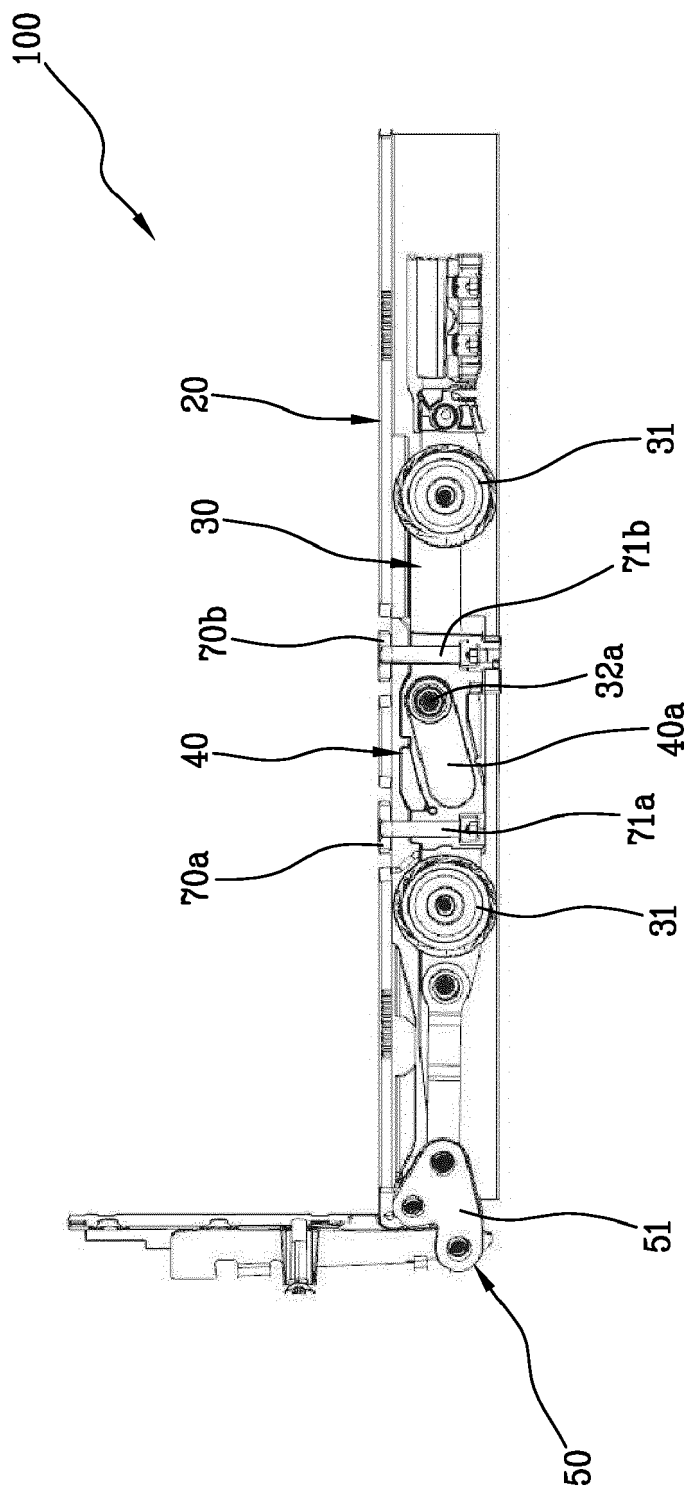
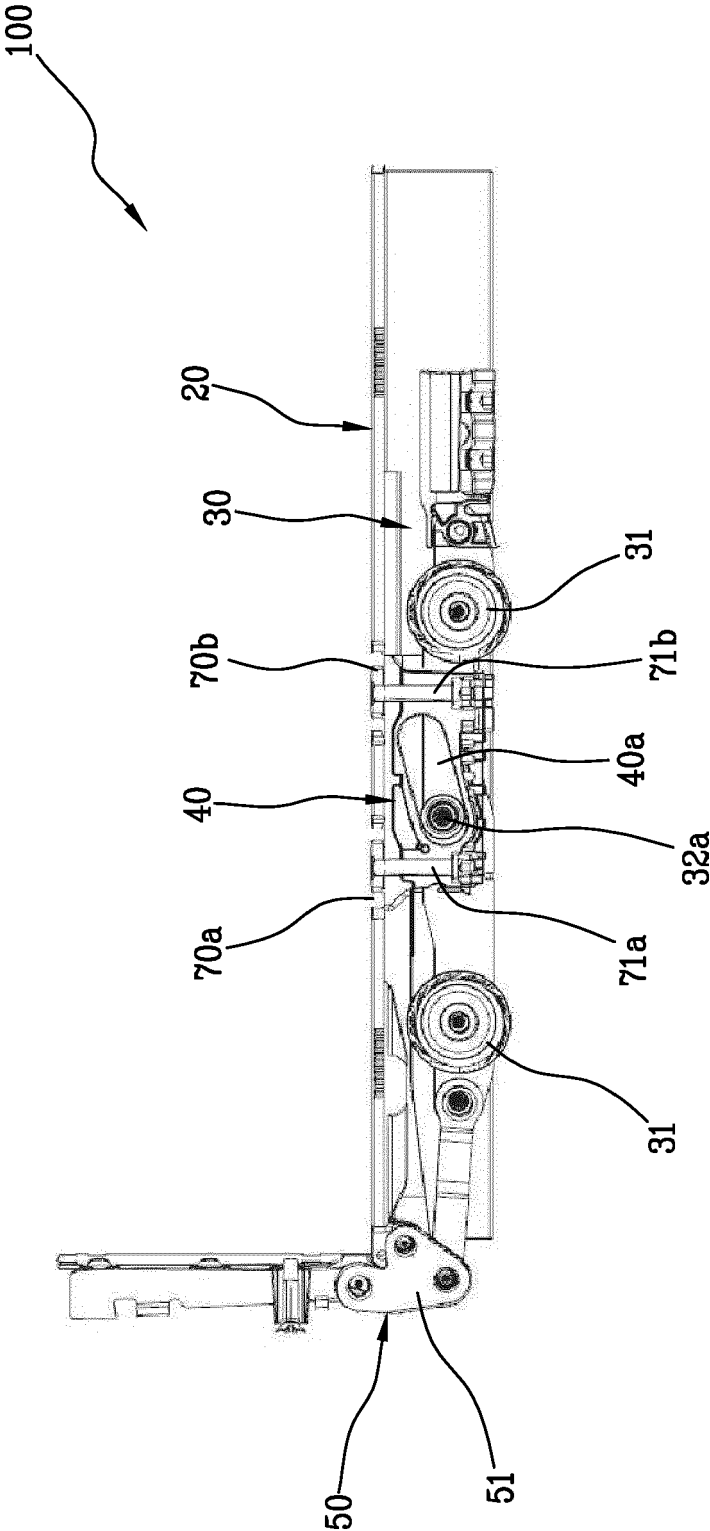


Fig. 5A

Fig.5B





EUROPEAN SEARCH REPORT

Application Number

EP 22 15 8037

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Y	WO 2011/023301 A1 (REHAU AG & CO [DE]; BECKER STEPHAN [DE] ET AL.) 3 March 2011 (2011-03-03)	1-6, 10-14	
A	* page 9, line 6 - page 10, line 29; figures 1-4 *	7-9	

			TECHNICAL FIELDS SEARCHED (IPC)
			E05D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 29 June 2022	Examiner Klemke, Beate
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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29-06-2022

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