(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 875 718 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
08.09.2021 Bulletin 2021/36

(51) Int Cl.:
E05D 15/58 *(2006.01)*

(21) Application number: **21160621.5**

(22) Date of filing: **04.03.2021**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **05.03.2020 IT 202000004726**

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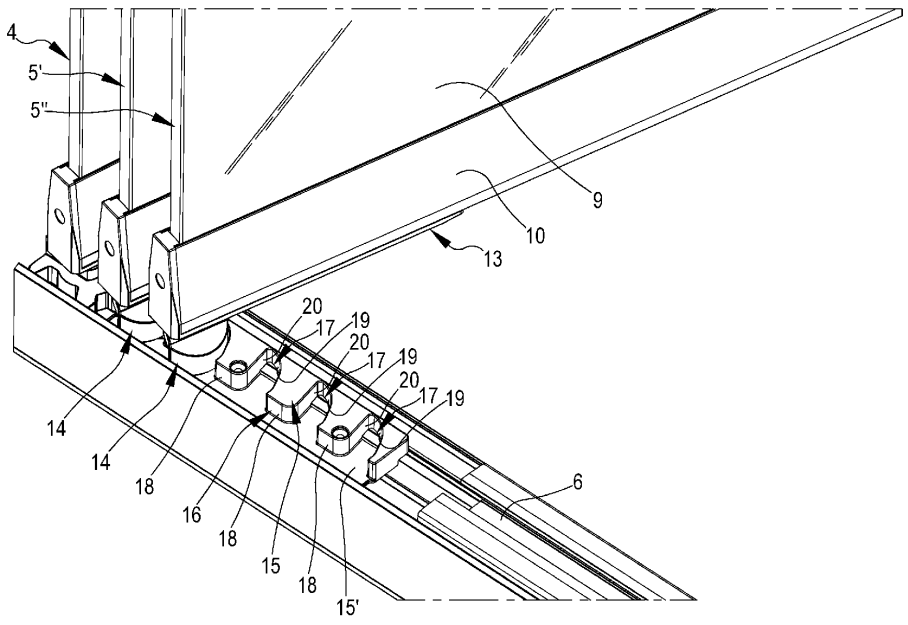
(54) **SLIDING AND PACKABLE PANEL WALL**

(57) A sliding and packable panel wall comprises a plurality of panels (5', 5", 5"') placed between a first guide (2) and a second guide (3) and positionable in a packed configuration. Each panel (5', 5", 5"') comprises at least one guide element (14) bound to a first rotation pin (7) and/or to a second rotation pin (8) of the panel and having a movable arc-shaped surface (23) coaxial with a rotation axis (Y). A fixed shaped profile (16) is associated with the first guide (2) and/or with the second guide (3) and delimits a plurality of seats (17) each having a fixed arc-shaped surface (19) complementary to the movable arc-shaped surface (23) of the guide element (14). The guide element (14) is engageable in a respective seat (17) by means of sliding of the movable arc-shaped surface (23) on the fixed arc-shaped surface (19) during the rotation of the panel (5', 5", 5"'), brought at the fixed shaped profile (16), around the respective rotation axis (Y).

FIG.3



EP 3 875 718 A1

Description

Field of the finding

[0001] The object of the present invention is a sliding and packable panel wall. The present invention has in particular but not exclusively application in the context of glass walls which can be, for example, installed on balconies, terraces, porches, pergolas or used for the division of internal spaces.

Background of the finding

[0002] Structures with sliding and packable panels are known.

[0003] For example, the public document EP2436962 illustrates a screen system formed by independent panels which can be manually moved and can slide along an upper guide and a lower guide. The panels can be rotated and packed in a position perpendicular to the direction of the guides.

[0004] The public document EP3231974 illustrates a movable panel for a movable panel closure system that can be opened when all the other panels are closed. Such movable panel comprises an upper profile, a lower profile, a lower rotary assembly and a lower guide fixed to the lower profile, an upper rotary assembly and an upper guide fixed to the upper profile.

[0005] The document EP3168408 illustrates a panel system comprising a lower guide, an upper guide and at least one panel which is situated between the lower guide and the upper guide. The system comprises a hinge element which is fixed to the panel and allows the panel to be opened by rotating around a rotation axis. The system also comprises at least two locking slots positioned in succession on the upper guide. The locking slots comprise two opposite locking recesses which define a circle, between which a passage is delimited. The hinge element can pass from one locking slot to the other through the passage. The distance between the locking slots is configured to be less than twice the abovementioned radius. The hinge element comprises two locking cams and a guide edge interposed therebetween.

[0006] The document US3060521 illustrates a wall formed by foldable/packable panels which comprises an upper guide in which plates slide which are rigidly fixed to blocks and to the panels. In one embodiment, each panel comprises a pin which is spaced from a rotation axis of the panel itself and comes to be engaged against a surface. In one embodiment, each panel comprises two pins arranged on an upper edge of the panel and spaced from a rotation axis of the panel itself. One of the pins is configured for being engaged in a respective groove. The other pin is configured for being engaged in a channel, in a manner such to guide the rotation of the panel around an axis thereof.

[0007] The document EP1892362 illustrates a further panel system.

Summary

[0008] In such context, the Applicant has observed that the structures with sliding and packable panels of known type, like those described above, can be improved with regard to several aspects, in particular with reference to the precision and fluidity of the movements of the panels, in particular of the movements which allow said panels to be laterally moved and rotated in order to be packed.

[0009] In such context, the Applicant has therefore perceived the need to make a sliding panel wall:

- which allows maneuvering the panels, in particular for packing/unpacking them, in an easy and simple manner;
- which ensures precise and fluid movements, i.e. without jamming;
- which ensures the operation for a long time period and without requiring frequent maintenance and/or cleaning operations for the mechanisms;
- which is of high structural quality and hence also reliable and robust.

[0010] The Applicant has found that the above-indicated objectives and still others can be achieved by means of a sliding and packable panel wall according to one or more of the enclosed claims and/or of the following aspects.

[0011] In particular, the object of the present invention is a sliding panel wall, comprising: a first guide; a second guide parallel to and spaced from the first guide; a plurality of panels placed between the first guide and the second guide and having opposite edges engaged with the first guide and with the second guide in order to slide along a sliding direction parallel to said first guide and said second guide.

[0012] The panels can be positioned in a slide configuration, in which they lie aligned with the first guide and with the second guide and can be made to slide along said first guide and second guide.

[0013] The panels can be positioned in a packed configuration, in which they lie transverse to the sliding direction and are placed next to each other.

[0014] Each panel comprises: a first rotation pin placed near the first guide and a second rotation pin placed near the second guide, the first rotation pin and the second rotation pin being coaxially aligned along a rotation axis of said panel perpendicular to the first guide and to the second guide; at least one guide element bound to the first rotation pin and/or to the second rotation pin and having a movable arc-shaped surface coaxial with the rotation axis.

[0015] The sliding panel wall comprises at least one fixed shaped profile associated with the first guide and/or with the second guide and delimiting a plurality of seats, each having a fixed arc-shaped surface complementary to the movable arc-shaped surface of the guide element.

[0016] Said at least one guide element of each panel

being engageable in a respective of said seats by means of sliding of the movable arc-shaped surface on the fixed arc-shaped surface during the rotation of the panel, brought at the fixed shaped profile, around the respective rotation axis.

[0017] The Applicant has verified that the engagement of the guide element with the fixed shaped profile during the rotation of the panel ensures a fluid and precise movement of the panel itself. The panel is correctly supported and guided in rotation and thus the user is capable of maneuvering such panel in a simple, easy and quick manner. The Applicant has also verified that the wall according to the invention is of high structural quality and hence also reliable and robust.

[0018] The Applicant has in particular verified that the invention ensures the operation of the wall for a long time period and without requiring frequent maintenance and/or cleaning operations for the mechanisms.

[0019] Further non-limiting aspects of the invention are listed hereinbelow.

[0020] In one aspect, the guide element is rotatable, together with the respective panel, between a first position, in which the guide element lies outside the respective seat, and a second position, in which at least one part of the guide element lies inside the respective seat, with the movable arc-shaped surface associated with the fixed arc-shaped surface.

[0021] In one aspect, the movable arc-shaped surface has an angle at the center comprised between 90° and 130°, optionally 110°.

[0022] In one aspect, the fixed arc-shaped surface has an angle at the center comprised between 70° and 100°, optionally 90°.

[0023] In one aspect, when the guide element is in the first position, the panel is free to slide along the first guide and the second guide.

[0024] In one aspect, when the guide element is in the first position, the panel is in slide configuration.

[0025] In one aspect, when the guide element is in the second position, the panel lies transverse to the sliding direction and cannot slide along the first guide and the second guide.

[0026] In one aspect, when the panels are in the packed configuration, the respective guide elements are in the second position.

[0027] In one aspect, when the panels are in the packed configuration, said panels are engaged with the fixed shaped profile.

[0028] In one aspect, the fixed shaped profile has a toothed or rack shape delimiting said plurality of seats.

[0029] In one aspect, the fixed shaped profile is defined by a wall having said toothed or rack shape and parallel to the rotation axis.

[0030] In one aspect, the fixed shaped profile is asymmetrical with respect to a sliding trajectory of the panels.

[0031] In one aspect, the seat has a stop surface, optionally flat, substantially facing the fixed arc-shaped surface.

[0032] In one aspect, the seat has a substantially arched or knife-like shape.

[0033] In one aspect, the seat with substantially arched or knife-like shape is delimited by said fixed arc-shaped surface and said stop surface.

[0034] In one aspect, the fixed shaped profile has guide surfaces aligned with the sliding direction and arranged between successive seats.

[0035] In one aspect, the guide surfaces are outside the seats.

[0036] In one aspect, the guide surfaces, the stop surfaces and the fixed arc-shaped surfaces are part of the wall having said toothed or rack shape.

[0037] In one aspect, the seats are defined by indentations, with respect to the guide surfaces, of said wall.

[0038] In one aspect, at least one shaped plate is provided, comprising the fixed shaped profile.

[0039] In one aspect, the part of the guide element engageable in the respective seat has said movable arc-shaped surface and an auxiliary surface, optionally flat, facing the opposite side with respect to the movable arc-shaped surface.

[0040] In one aspect, when the guide element is in the second position, the auxiliary surface is associated with the stop surface to prevent a further rotation of the guide element and of the panel.

[0041] In one aspect, when the guide element is in the first position, the auxiliary surface is parallel to the guide surfaces so that it can slide along said guide surfaces.

[0042] In one aspect, the guide element comprises a portion directly connected to the respective first or second rotation pin and configured to always remain outside the respective seat.

[0043] In one aspect, the part of the guide element engageable in the respective seat is integral with said portion, optionally it forms a single body with said portion.

[0044] In one aspect, the part of the guide element engageable in the respective seat is positioned, with respect to said portion, on the side opposite the respective first or second rotation pin.

[0045] In one aspect, the first guide is a lower guide and the second guide is an upper guide.

[0046] In one aspect, the panel comprises at least one sliding shoe slidably coupled to the first guide and/or to the second guide.

[0047] In one aspect, the first guide and/or the second guide comprises/comprise a profile. In one aspect, the profile houses the fixed shaped profile at its interior.

[0048] In one aspect, the profile houses the guide element at its interior.

[0049] In one aspect, the shaped plate is housed within the profile.

[0050] In one aspect, through holes are made in the shaped plate to allow water and/or dirt to drain off.

[0051] In one aspect, the through holes are arranged in portions of the plate placed between the seats.

[0052] In one aspect, the portion of the guide element directly connected to the respective first or second rota-

tion pin is superimposed on the respective hole when the guide element is situated at the respective seat.

[0053] In one aspect, an external surface of the profile is configured for receiving the panel, optionally the sliding shoe, in abutment.

[0054] In one aspect, said external surface of the profile has a longitudinal groove, wherein the first rotation pin and/or the second rotation pin is/are positioned in the longitudinal groove in order to slide along said longitudinal groove.

[0055] In one aspect, the sliding shoe abuts against opposite edges of the external surface, delimiting the longitudinal groove.

[0056] In one aspect, each panel comprises a first locking pin spaced from the first rotation pin and slidably engageable with the first guide and/or a second locking pin spaced from the second rotation pin and slidably engageable with the second guide.

[0057] In one aspect, the first locking pin and/or the second locking pin is/are positioned in the longitudinal groove in order to slide along said longitudinal groove.

[0058] In one aspect, the first guide, optionally the longitudinal groove, has a side opening and/or in which the second guide has a side opening in order to allow the exit of the first locking pin from the first guide and/or of the second locking pin from the second guide and the rotation of the panel around the respective rotation axis when said at least one guide element is engaged in the respective seat.

[0059] In one aspect, a distance between the first rotation pin and the first locking pin and/or between the second rotation pin and the second locking pin of a panel is equal to a distance between the respective seat and the respective side opening.

[0060] In one aspect, the sliding shoe is extended substantially along the respective edge of the panel.

[0061] In one aspect, each panel has a plurality of first slots configured for receiving the first locking pin and/or a plurality of second slots configured for receiving the second locking pin.

[0062] In one aspect, the configured first slots and/or the second slots are made in the respective sliding shoe.

[0063] In one aspect, a distance between successive first slots and/or a distance between successive second slots is equal to a distance between successive seats.

[0064] In one aspect, the first locking pin and/or the second locking pin of a panel are positioned in a respective first slot and/or in a respective second slot different from that/those of another panel of the wall. The placement of the first locking pin and/or of the second locking pin of a panel is decided as a function of the position of the panel of the wall.

[0065] In one aspect, the wall comprises at least one auxiliary panel mounted between the first guide and the second guide so as to be able to rotate around a respective rotation axis perpendicular to the first guide and to the second guide. A sliding of said at least one auxiliary panel along the sliding direction is prevented. Such panel is an end panel of the wall and can only rotate.

[0066] In one aspect, said at least one fixed shaped profile is positioned near said at least one auxiliary panel.

[0067] Further characteristics and advantages will be more evident from the detailed description of preferred but non-limiting embodiments of a sliding and packable panel wall according to the present invention.

Description of the drawings

[0068] Such description will be set forth hereinbelow with reference to the enclosed drawings, provided only as a non-limiting example, in which:

- figure 1 schematically illustrates, in its entirety, a sliding and packable panel wall according to the invention in a partially closed configuration;
- figure 2 illustrates the wall of figure 1 in an open configuration with the panels moved to the side and packed;
- figure 3 is an enlargement of a portion of figure 2;
- figure 4 illustrates the portion of figure 3 with several elements removed in order to better illustrate other elements;
- figure 5 is a different enlargement of a portion of figure 2 with several elements removed in order to better illustrate other elements;
- figure 6 partially illustrates a panel of the wall of the preceding figures;
- figure 7 is a bottom three-dimensional view of a portion of the wall in the configuration of figure 2;
- figures 8a and 8b are three-dimensional views of one of the elements which constitute the wall of the preceding figures;
- figure 9 is a sectional view of the portion of figure 1;
- figure 10 shows an enlarged element of the panel of figure 6;
- figure 11 is a section of a part of the panel of figure 6.

Detailed description

[0069] With reference to the abovementioned figures, reference number 1 overall indicates a sliding and packable panel wall in accordance with the present invention.

[0070] The illustrated wall 1 comprises a first guide 2, or lower guide, a second guide 3, or upper guide, parallel to and spaced from the first guide 2, and panels 4, 5', 5", 5"' placed between the first guide 2 and the second guide 3.

[0071] The first guide 2 and the second guide 3 are part of a more complex, not-illustrated support structure. For example, such support structure is a building or a pergola. The first guide 2 and the second guide 3 are defined by respective metal profiles with square or rectangular section. Each profile has an external surface facing respective panels 4, 5', 5", 5"' and provided with a longitudinal groove or opening 6 (visible in figures 2, 3

and 9). The longitudinal groove 6 defines the sliding trajectory of the panels 5', 5", 5"'.

[0072] The panels 4, 5', 5", 5"' comprise an auxiliary panel 4 hinged to the first guide 2 and to the second guide 3 so as to be able to rotate around a respective rotation axis "X" perpendicular to the first guide 2 and to the second guide 3. The auxiliary panel 4 can therefore rotate between a closed position and an open position (figure 2) in which it lies transverse to the first guide 2 and to the second guide 3 and cannot slide along the first and the second guide 2, 3. As illustrated in figures 1 and 2, such auxiliary panel 4 is an end or side panel.

[0073] The panels 4, 5', 5", 5"' also comprise a plurality of sliding panels 5', 5", 5"' which can slide along the first guide 2 and the second guide 3. In particular, the sliding panels 5', 5", 5"' of said plurality have opposite edges engaged with the first guide 2 and with the second guide 3 so that it can slide according to a sliding direction "d" and along a sliding trajectory parallel to said first guide 2 and said second guide 3. The sliding panels 5', 5", 5"' can therefore be positioned in a slide configuration, in which they lie aligned with the first guide 2 and with the second guide 3 and each of which can be made to slide manually along said first guide 2 and second guide 3 (figure 1). The sliding panels 5', 5", 5"' can also be positioned in a packed configuration, in which they lie transverse to the sliding direction and are placed next to each other (figure 2).

[0074] In particular, once the auxiliary panel 4 is rotated in the open position, the panels 5', 5", 5"' can be translated one at a time towards the auxiliary panel 4, and hence they too are rotated up to arranging them all in the packed configuration (figure 2). Each panel 5', 5", 5"' comprises (figure 6) a first rotation pin 7 placed near the first guide 2 and engaged in the respective longitudinal groove 6 and a second rotation pin 8 placed near the second guide 3 and engaged in the respective longitudinal groove 6. The first rotation pin 7 and the second rotation pin 8 are coaxially aligned along a respective rotation axis "Y" of said panel 5', 5", 5"'. Such rotation axis "Y" lies perpendicular to the first guide 2 and to the second guide 3.

[0075] Since the structure of each panel 5', 5", 5"' is symmetrical and since it is substantially identical for each panel 5', 5", 5"', the structure of only the panel 5' closest to the auxiliary panel 4 and of only the lower edge of such panel 5' will be described hereinbelow.

[0076] The panel 5' comprises a crystal plate 9 placed between two grippers 10 defined by respective metal profiles and placed on the upper edge and on the lower edge of the crystal plate 9 (figures 6, 9 and 11).

[0077] With reference to figures 9 and 11, a lower cross section of the gripper 10 has a first upper space 11 for the edge of the crystal plate 9 and a second lower space 12 for two sliding shoes 13 (better visible in figure 7). The gripper 10 is locked on the lower edge of the crystal plate 9. Each sliding shoe 13 (figures 9 and 10) is a bar made of plastic material housed in the lower space 12 such to be substantially extended at least partially along the respective edge of the panel 5'. Each of the two sliding shoes 13 is also configured for closing one end of the lower gripper 10. One of the sliding shoes 13 also has a hole which houses and retains the first rotation pin 7.

[0078] A guide element 14 is bound to the first rotation pin 7 (figures 3 - 6, 8a, 8b and 9). The guide element 14 is integral with a lower end of the first rotation pin 7. As better visible in figure 9, the sliding shoe 13 rests on opposite flaps of the external surface of the first guide 2 which delimit the longitudinal groove 6 and the first rotation pin 7 is positioned in the longitudinal groove 6 in order to slide along said longitudinal groove 6. The guide element 14 is hung on the sliding shoe 13 and is placed within the first guide 2.

[0079] Within the first guide 2 and near the rotation axis "X" of the auxiliary panel 4, a shaped plate 15 is placed, comprising a fixed shaped profile 16 (fixed with respect to the first guide 2). As is visible in figures 3, 4, 5, the shaped plate 15 has a base 15' abutted against a bottom wall of the profile defining the first guide 2 and from which the fixed shaped profile 16 is extended, perpendicular thereto. The fixed shaped profile 16 is defined by a wall that has a toothed or rack shape and delimits a plurality of seats 17. Such wall is asymmetric with respect to the sliding trajectory of the sliding panels 5', 5", 5"'.

[0080] The wall of the fixed shaped profile 16 has guide surfaces 18 aligned with the sliding direction "d" and arranged between successive seats 17 and the seats 17 are defined by indentations, with respect to the guide surfaces 18, of said wall. The guide surfaces 18 are therefore outside the seats 17.

[0081] In other words and with reference to figures 3, 4 and 5, the seats 17 are opened laterally between the guide surfaces 18 and in addition they are opened upward. The shaped plate 15 has a smaller thickness at the seats 17, substantially equal to that of the base 15', and portions with greater thickness placed between successive seats 17.

[0082] Each seat 17 is delimited by a fixed arc-shaped surface 19 and by a flat stop surface 20, both part of the fixed shaped profile 16. It follows that each seat 17 has a substantially arched or knife-like shape.

[0083] The guide element 14 is configured for operating/interacting with the fixed shaped profile 16 when the panel 5' is brought at the shaped plate 15. In particular, each guide element 14 is configured for being engaged in a respective seat 17.

[0084] The guide element 14 comprises (figures 8a and 8b) a portion 21 directly connected to the respective first rotation pin 7 and configured to always remain outside the respective seat 17. The guide element 14 also comprises a part 22 which forms a single body with said portion 21 and is engageable in the respective seat 17. In figures 3, 4 and 5, the portion 21 is arranged above the shaped plate 15 and the part 22 projects below the portion 21, i.e. on the side opposite the respective first rotation pin 7. In figure 4 one of the guide elements 14

has been represented without the respective first pin 7 and without the panel 5"' that lies above it.

[0085] The part 22 is moved to the side with respect to the first pin 7 and to the rotation axis "Y" and has a movable arc-shaped surface 23 coaxial with the first pin 7 and with the rotation axis "Y". The movable arc-shaped surface 23 is therefore extended partially around the rotation axis "Y". The part 22 also has a flat auxiliary surface 24, facing the opposite side with respect to the movable arc-shaped surface 23 and parallel to the rotation axis "Y". The flat auxiliary surface 24 is spaced from said rotation axis "Y" and the part 22 is delimited between the flat auxiliary surface 24 and the movable arc-shaped surface 23. The fixed arc-shaped surface 19 of each seat 17 is complementary to the movable arc-shaped surface 23 of the guide element 14. The movable arc-shaped surface 23 has an angle at the center, e.g. 110°. The fixed arc-shaped surface 19 has an angle at the center, e.g. 90°.

[0086] The panel 5' comprises a first locking pin 25 spaced from the first rotation pin 7 and slidably engageable in the longitudinal groove 6 of the first guide 2 and a second locking pin 26 spaced from the second rotation pin 8 and slidably engageable in the longitudinal groove, not illustrated, of the second guide 3 (figures 6 and 7). Since the structure of the panel 5' is symmetric, only the part relative to the first locking pin 25 will be described hereinbelow. An identical or substantially identical structure (guide element 14, sliding shoe 13 etc.) is associated with the second rotation pin 8.

[0087] The sliding shoe 13 opposite that which bears the first rotation pin 7 has (figure 7 and 10) a plurality of first slots 27 mutually aligned and configured for receiving and retaining the first locking pin 25 in a manner such that it projects below the sliding shoe 13. The first slot 27 in which the first locking pin 25 is mounted is different from panel to panel, as will be clarified hereinbelow and a distance between successive first slots 27 is equal to a distance between successive seats 17.

[0088] When the panel 5' is in the slide configuration, the first locking pin 25 is in the longitudinal groove 6.

[0089] The longitudinal groove 6 of the first guide 2 has a side opening 28 defined in a suitable block 29 mounted on the first guide 2 (figure 5 and 7). The block 29 is shaped for allowing the exit of the first locking pin 25 when is brought at said side opening 28.

[0090] Once the panel 5' is brought, by means of sliding, near the auxiliary panel 4 which lies in the open position, the guide element 14 is substantially found in front of the seat 17 of the shaped plate 15 closer to the auxiliary panel 4 and the first locking pin 25 comes to be situated at the side opening 28. The panel 5' is still parallel to the sliding direction with the first rotation pin 7 and also the first locking pin 25 engaged in the longitudinal groove 6 of the first guide 2. The guide element 14 is situated in a first position, in which the part 22 of said guide element 14 lies outside the respective seat 17 and the auxiliary surface 24 is parallel to the guide surfaces 18 in a manner such to be able to still slide along said guide surfaces 18, i.e. the panel 5' can still translate along the sliding direction "d".

[0091] The guide element 14 can however also rotate together with the panel 5' around the respective rotation axis "Y" when it is manually actuated by a user. The position of the part 22 with respect to the seat 17 is such to allow such part 22 to enter, rotating around the rotation axis "Y" in the seat 17 itself (arrow of figure 4). The first locking pin 25 does not prevent such rotation, since it is free to exit from the longitudinal groove 6 through the side opening 28. The movable arc-shaped surface 23 slides on the fixed arc-shaped surface 19 during the rotation of the panel 5' until the auxiliary surface 24 enters in contact with the stop surface 20, blocking the rotation. At this point, the guide element 14 is situated in a second position, in which the part 22 of the guide element 14 lies inside the respective seat 17 with the movable arc-shaped surface 23 associated with/facing the fixed arc-shaped surface 19 and the panel 5' lies transverse to the sliding direction "d" and to the first and second guides 2, 3. When the guide element 14 is in the second position, the panel 5' cannot slide along the first guide 2 and along the second guide 3.

[0092] In addition, when the guide element 14 is in the second position, the portion 21 of said guide element 14 directly connected to the respective first rotation pin 7 is superimposed on the portions with greater thickness of the shaped plate 15. Through holes 30 are made in the shaped plate 15 to allow water and/or dirt to drain off. Such through holes 30 are made through several of the portions with greater thickness of the shaped plate 15 in a manner such to be able to unload the dirt that has accumulated between the portion 21 of said guide element 14 directly connected to the respective first rotation pin 7 and the shaped plate 15 itself. Once the panel 5' is brought into the rotated position, also the other panels 5", 5"' can be brought one at a time at the respective seats 17 and rotated in the same manner, i.e. all brought in the packed configuration. When the panels 5', 5", 5"' are in the packed configuration, said panels 5', 5", 5"' are all engaged with the fixed shaped profile 16 of the shaped plate 15.

[0093] For each panel 5', 5", 5'", a distance between the first rotation pin 7 thereof and the first locking pin 25 thereof is equal to a distance between the respective seat 17 and the side opening 28. Since there is only one side opening 28 and it is fixed on the first guide 2 and the seats 17 are found at different distances from the side opening 28, the abovementioned distance between the first rotation pin 7 and the first locking pin 25 is not equal for all the panels 5', 5", 5'". That is why the first slot 27, in which the first locking pin 25 is mounted, is different from panel to panel.

[0094] List of elements

1	sliding and packable panel wall
2	first guide

3	second guide
4	auxiliary panel
5’ 5" 5"’	plurality of sliding panels
6	longitudinal groove
7	first rotation pin
8	second rotation pin
9	crystal plate
10	gripper
11	first space
12	second space
13	sliding shoe
14	guide element
15	shaped plate
16	fixed shaped profile
17	seat
18	guide surface
19	fixed arc-shaped surface
20	stop surface
21	portion guide element
22	guide element part
23	movable arc-shaped surface
24	auxiliary surface
25	first locking pin
26	second locking pin
27	first and second slots
28	side opening
29	block
30	through holes
d	sliding direction
X	rotation axis panel 4
Y	rotation axis panels 5’ 5" 5"’

Claims

1. Sliding and packable panel wall, comprising:

a first guide (2);
a second guide (3) parallel to and spaced from the first guide (2);
a plurality of panels (5’, 5", 5") placed between the first guide (2) and the second guide (3) and having opposite edges engaged with the first guide (2) and the second guide (3) in order to slide along a sliding direction (d) parallel to said first guide (2) and said second guide (3); wherein the panels (5’, 5", 5") can be positioned in a packed configuration, in which they lie transverse to the sliding direction (d) and are placed next to each other;
each panel (5’, 5", 5") comprising:

a first rotation pin (7) placed near the first guide (2) and a second rotation pin (8) placed near the second guide (3), the first rotation pin (7) and the second rotation pin (8) being coaxially aligned along a rotation axis (Y) of said panel (5’, 5", 5") perpendicular to the first guide (2) and the second guide (3);
at least one guide element (14) bound to the first rotation pin (7) and/or to the second rotation pin (8) and having a movable arc-shaped surface (23) coaxial
with the rotation axis (Y);

at least one fixed shaped profile (16) associated with the first guide (2) and/or the second guide (3) and delimiting a plurality of seats (17) each having a fixed arc-shaped surface (19) complementary to the movable arc-shaped surface (23) of the guide element (14); said at least one guide element (14) of each panel (5’, 5", 5") being engaged in a respective one of said seats (17) by sliding of the movable arc-shaped surface (23) on the fixed arc-shaped surface (19) during the rotation of the panel (5’, 5", 5"), brought at the fixed shaped profile (16), around the respective rotation axis (Y);
wherein the guide element (14) is rotatable, together with the respective panel (5’, 5", 5"), between a first position, in which the guide element (14) lies outside the respective seat (17), and a second position, in which at least a part (22) of the guide element (14) lies inside the respective seat (17), with the movable arch-shaped surface (23) associated with the fixed arch-shaped surface (19); wherein, when the guide element (14) is in the first position, the panel (5’, 5", 5") is free to slide along the first guide (2) and the second guide (3); wherein, when the guide element (14) is in the second position, the panel (5’, 5", 5") lies transverse to the sliding direction (d) and cannot slide along the first guide (2) and the second guide (3);
wherein the part (22) of the guide element (14) engageable in the respective seat (17) has said movable arch-shaped surface (23) and an auxiliary surface (24) facing the opposite side with respect to the movable arch-shaped surface (23); wherein the seat (17) has a stop surface (20) substantially facing the fixed arch-shaped surface (19); wherein, when the guide element (14) is in the second position, the auxiliary surface (24) is associated with the stop surface (20) to prevent further rotation of the guide element (14) and of the panel (5’, 5", 5").

2. Wall according to claim 1, wherein the auxiliary surface (24) is flat.

3. Wall according to claim 1 or 2, wherein the stop surface (20) is flat.

4. Wall according to claim 1, 2 or 3, wherein the fixed shaped profile (16) has guide surfaces (18) aligned

with the sliding direction (d) and arranged between successive seats (17); wherein, when the guide element (14) is in the first position, the auxiliary surface (24) is parallel to the guide surfaces (18) so that it can slide along said guide surfaces (18).

5. Wall according to one of claims 1 to 4, comprising at least one shaped plate (15) comprising the fixed shaped profile (16); wherein through holes (30) are made in the shaped plate (15) to allow water and/or dirt to drain off.

6. Wall according to one of the claims from 1 to 5, wherein each panel (5', 5", 5") comprises a first locking pin (25) spaced from the first rotation pin (7) and slidably engageable with the first guide (2) and/or a second locking pin (26) spaced from the second rotation pin (8) and engageable with the second guide (3); wherein the first guide (2) has a side opening (28) and/or wherein the second guide (3) has a side opening (28) to allow the first locking pin (25) to exit from the first guide (2) and/or the second locking pin (26) from the second guide (3) and the rotation of the panel (5', 5", 5") around the respective rotation axis (Y) when said at least one guide element (14) engages in the respective seat (17).

7. Wall according to claim 6, wherein a distance between the first rotation pin (7) and the first locking pin (25) and/or between the second rotation pin (8) and the second locking pin (26) of a panel (5', 5", 5") is equal to a distance between the respective seat (17) and the respective side opening (28).

8. Wall according to claim 6 or 7, wherein each panel (5', 5", 5") has a plurality of first slots (27) configured to receive the first locking pin (25) and/or a plurality of second slots (27) configured to receive the second locking pin (26); wherein a distance between successive first slots (27) and/or a distance between successive second slots (27) is equal to a distance between successive slots (17).

9. Wall according to one of the claims from 1 to 8, wherein the panel (5', 5", 5") comprises at least one sliding shoe (13) slidably coupled to the respective first guide (2) and/or to the respective second guide (3).

10. Wall according to one of the claims from 1 to 9, comprising at least one auxiliary panel (4) mounted between the first guide (2) and the second guide (3) in order to rotate around a respective rotation axis (X) perpendicular to the first guide (2) and the second guide (3); wherein a sliding of said at least one auxiliary panel (4) along the sliding direction (d) is prevented; wherein said at least one fixed shaped profile (16) is positioned near said at least one auxiliary panel (4).

11. Wall according to one of the claims from 1 to 10, wherein the fixed shaped profile (16) has a toothed or rack shape delimiting said plurality of seats (17).

12. Wall according to claim 11, wherein the fixed shaped profile (16) is defined by a wall having said toothed or rack shape and parallel to the rotation axis (X).

13. Wall according to one of the claims from 1 to 12, wherein the seat (17) has a substantially arched or knife-like shape and is delimited by said fixed arc-shaped surface (19) or stop surface (20).

14. Wall according to one of the claims from 1 to 13, wherein the guide element (14) comprises a portion (21) directly connected to the respective first or second rotation pin (7, 8) and configured to always remain outside the respective seat (17).

15. Wall according to claim 14, wherein the portion (22) of the guide element (14) engageable in the respective seat (17) is integral with said portion (21), optionally forming a single body with said portion (21).

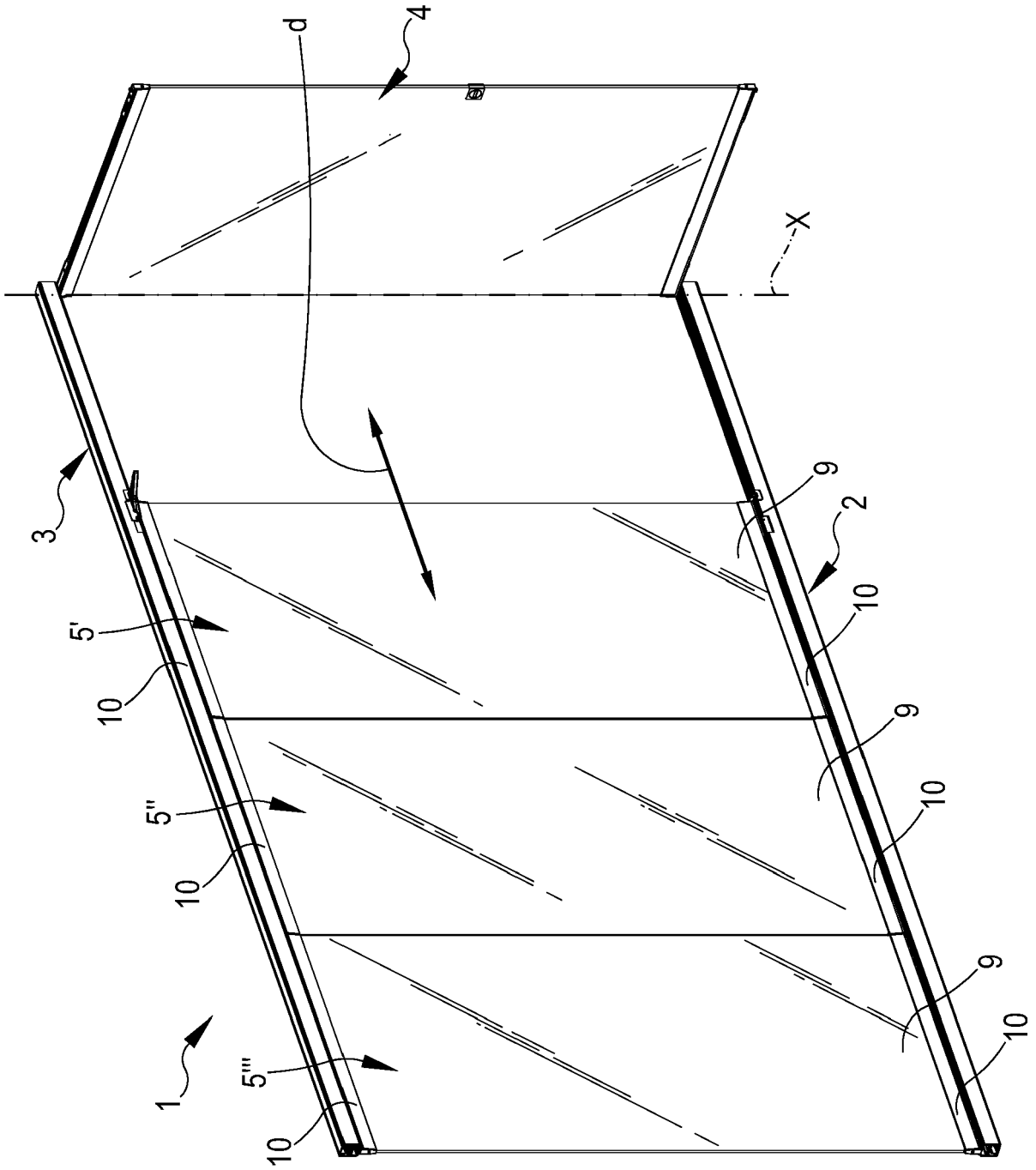


FIG.1

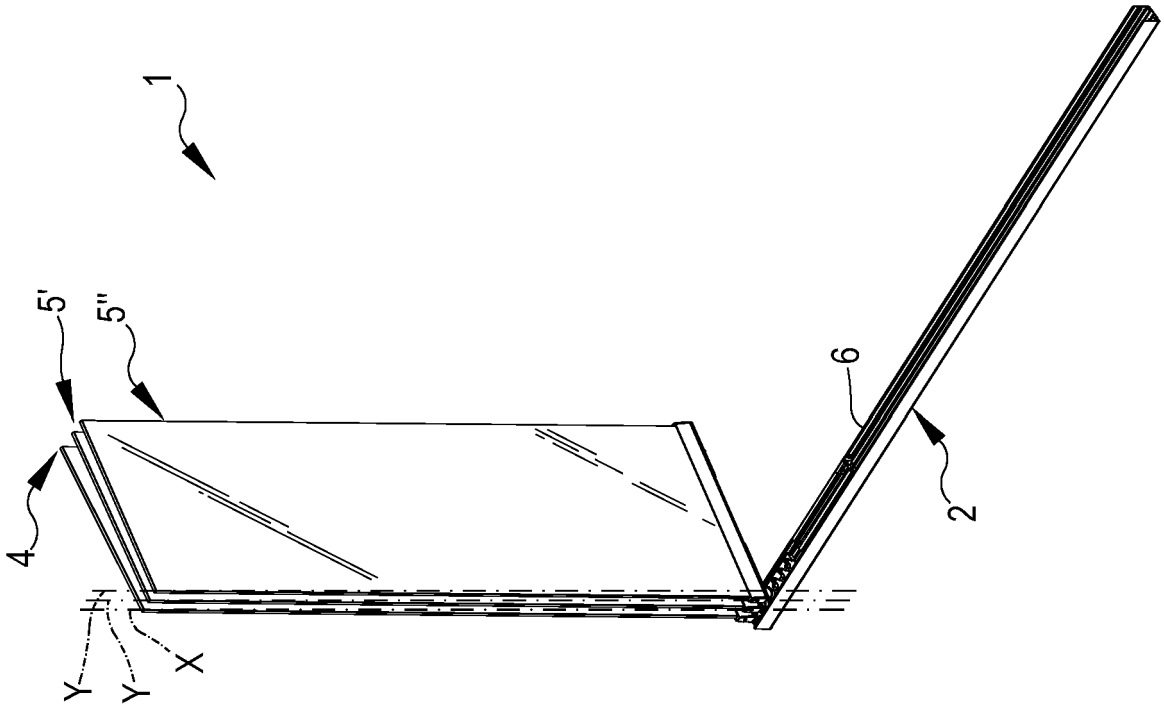


FIG.2

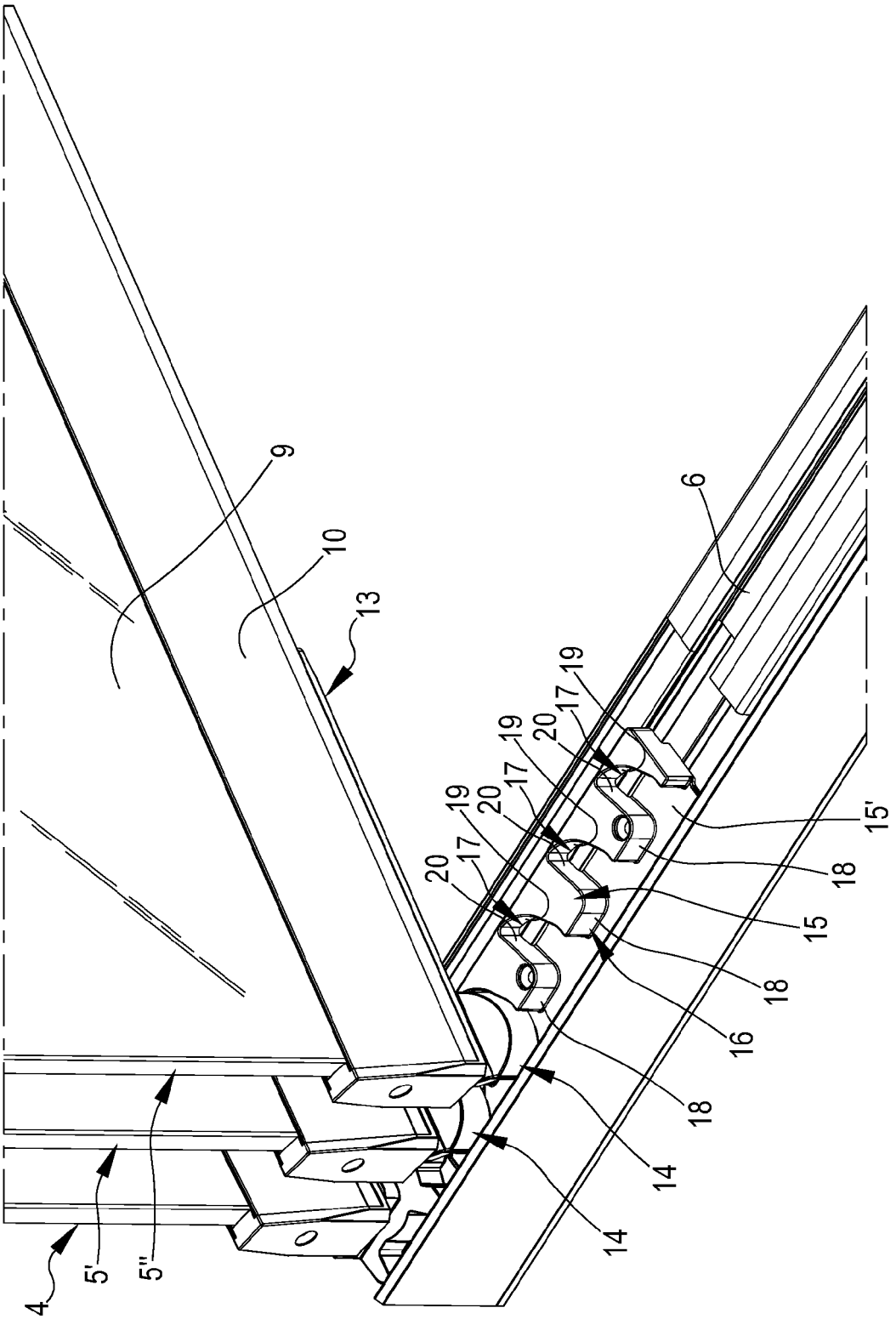


FIG.3

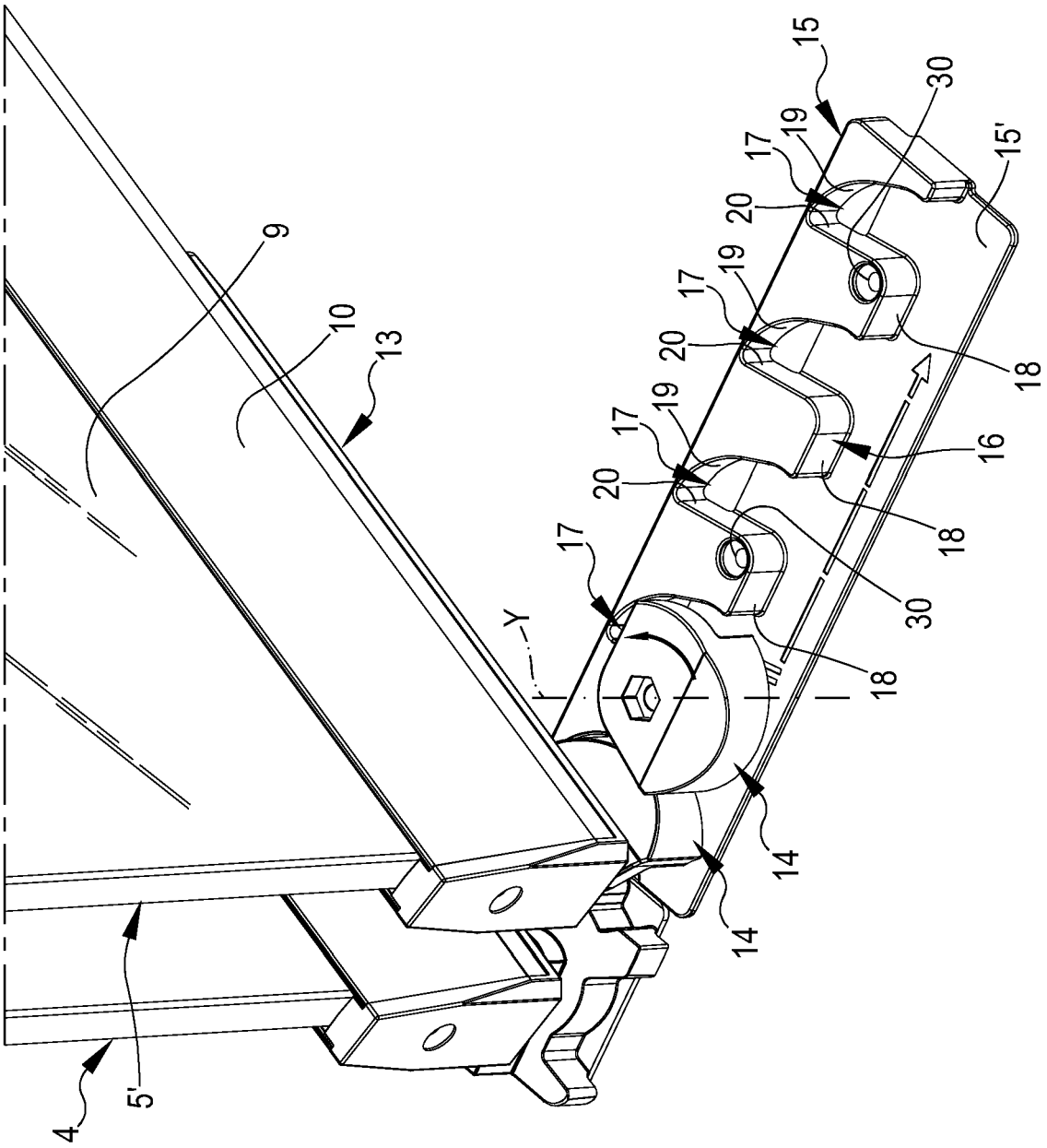


FIG.4

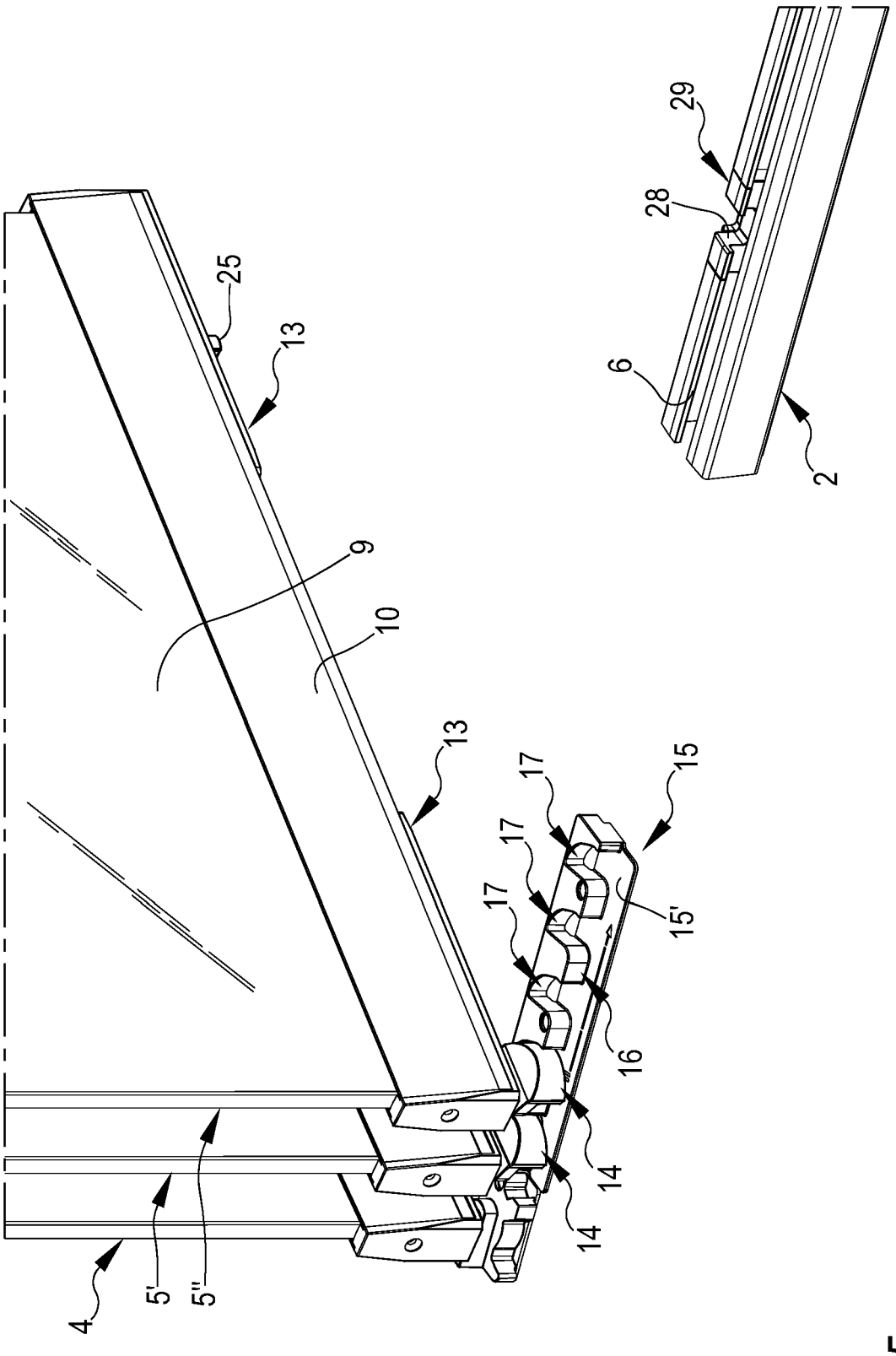


FIG.5

FIG.6

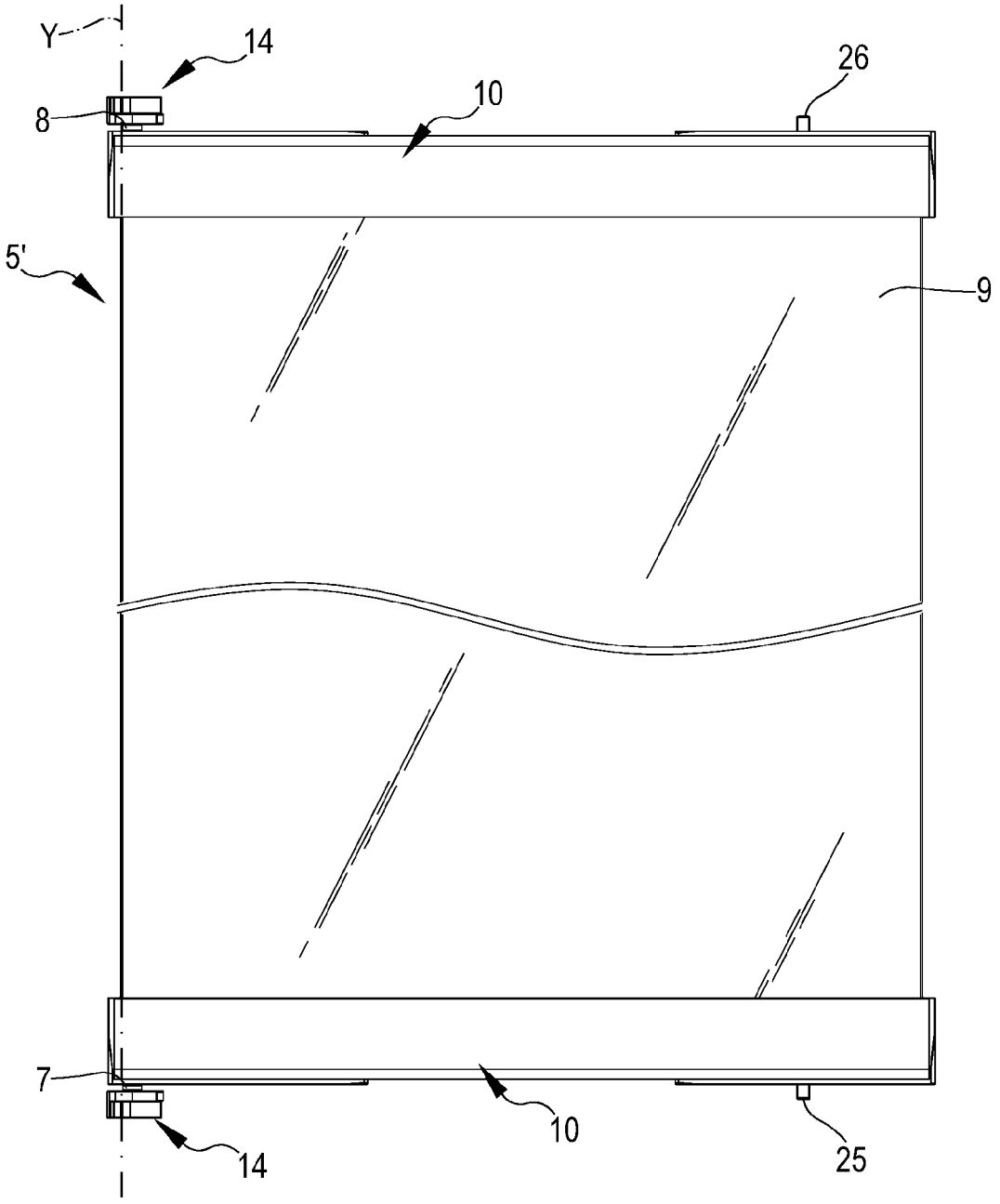


FIG.6

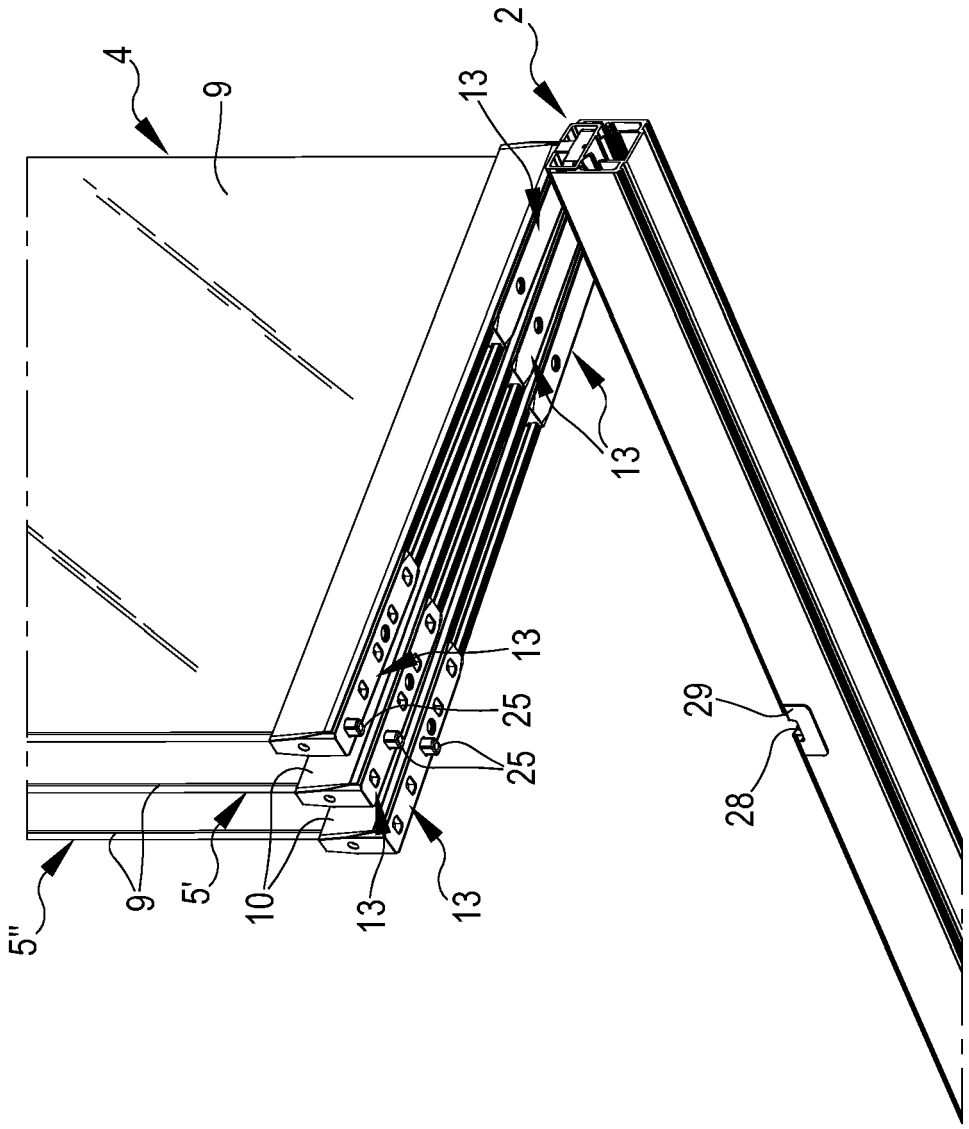


FIG.7

FIG.8a

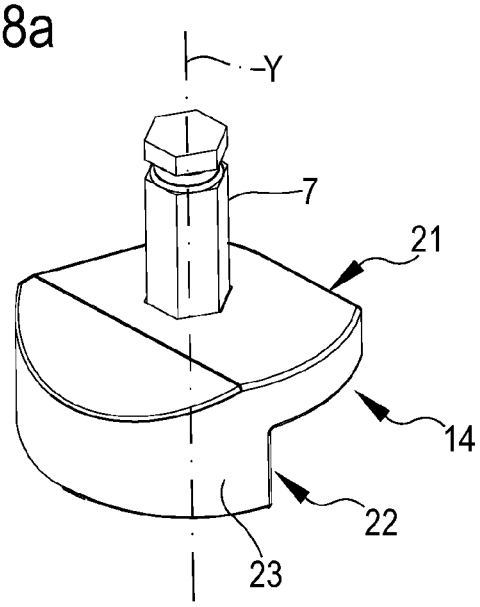
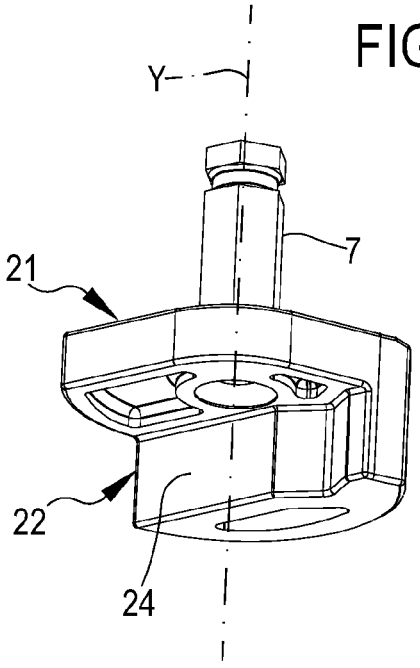


FIG.8b



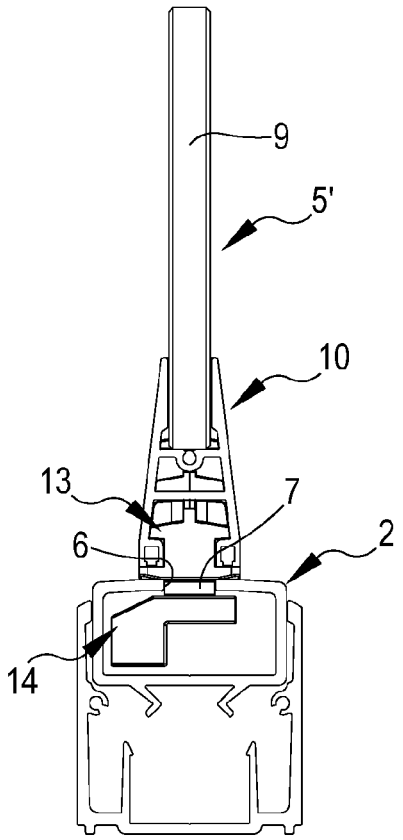
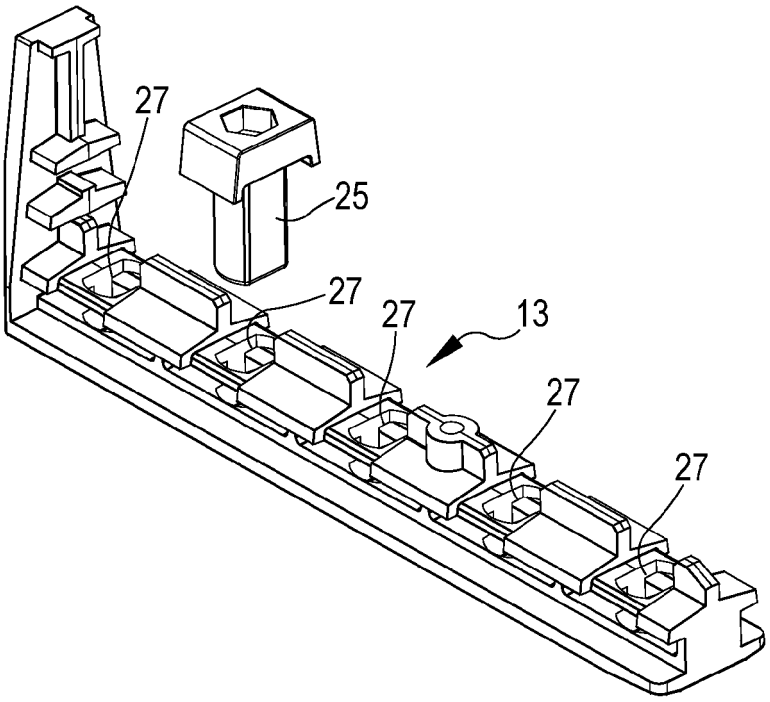


FIG.9

FIG.10



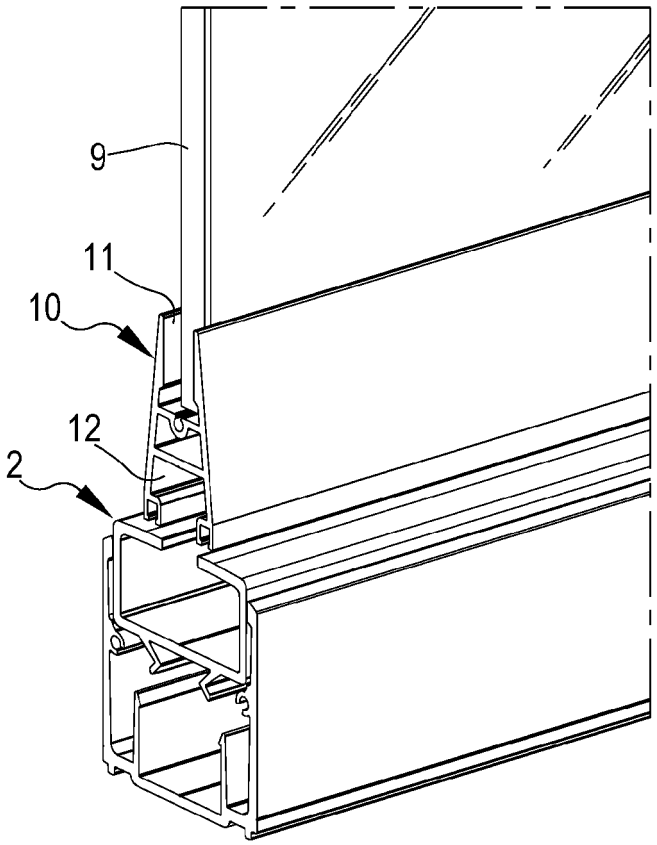


FIG.11

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EUROPEAN SEARCH REPORT

Application Number
EP 21 16 0621

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 3 060 521 A (MICHAEL GRECO) 30 October 1962 (1962-10-30) * column 1, line 60 - column 3, line 41; figures 1-10 *	1-5,9, 11-15 6-8,10	INV. E05D15/58
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E05D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15 June 2021	Rémondot, Xavier

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15-06-2021

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