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(54) APPARATUS AND A METHOD FOR ASSEMBLING A WINDOW UNIT

VORRICHTUNG UND VERFAHREN ZUR MONTAGE EINER FENSTEREINHEIT

APPAREIL ET PROCÉDÉ D'ASSEMBLAGE D'UNE UNITÉ DE FENÊTRE

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(56) References cited:
WO-A1-01/28391
WO-A1-97/00368
WO-A1-2004/001175
DE-A1-102009 045 746
FR-A5- 2 095 958

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EP 3 061 900 B1

Description

FIELD OF THE INVENTION

[0001] Embodiments of the present invention relate to apparatus, a method for assembling a window unit, a toothed track and a module for forming a toothed track. In particular, they relate to an apparatus, a method for assembling a window unit, a toothed track and a module for forming a toothed track in window blind installations.

BACKGROUND TO THE INVENTION

[0002] Double glazed (or insulated glass) window assemblies are known in which a blind (or shade) is located between two sheets of glass. The blind may be attached to a bar that is provided with magnets and the assembly also includes a handle (or operator bar) having magnets. The handle is located on the outside of one of the sheets of glass and the magnets of the handle magnetically interact with the magnets of the blind, so that a user may adjust the position of the blind by moving the handle. Such a configuration is known from US 2005/0028944 A1.

[0003] DE 199 52 414 A1 discloses a roller blind having along its sides a toothed guide and a handle provided with a shaft and wheels. DE102009045746 discloses an arrangement having a curtain element wound and unwound to/from a winding shaft, where the winding shaft is movable relative to a surface to be covered for winding and unwinding the curtain element. The winding shaft has engaging elements i.e. gear wheels, connected in an area of ends in a torque-proof manner. The engaging elements engage in linear guiding elements in a form-fit manner for winding and unwinding the curtain element, where the guiding elements are rigidly arranged with respect to the surface to be covered. This also discloses an insulating glass unit comprising a glass section with a set of individual panes having a roller blind arrangement and a method for winding and unwinding a curtain element.

[0004] WO97/00368 discloses a sun baffle for use in a double glazing unit, comprising pivotable slats mounted in a frame consisting of vertical frame members and horizontal frame members containing means for supporting and controlling the position of the slats. The slats are supported and controlled by means of a straight rack movable between two positions and engageable by a plurality of cogs with a shaft supporting the end of each slat. A motor is used to control the movement of the side racks.

[0005] WO01/28391 discloses an architectural covering insert primarily adapted for use in simulated divided light openings. The insert includes an outer framework with horizontal and vertical dividers, a plurality of horizontally or vertically disposed shade components associated with one or more dividers and control means for moving the shade components between extended and retracted positions across simulated openings defined by the vertical and horizontal dividers. The shade components can be of the roller shade type or collapsible cellular type with the net result being that, from a visual standpoint, there are shade components associated with each individual simulated opening defined by the horizontal and vertical dividers, as opposed to a single shade that covers the entire architectural opening.

[0006] FR2095958 discloses an insulating panel comprising two panes and an interposed louvre.

BRIEF DESCRIPTION OF VARIOUS EMBODIMENTS OF THE INVENTION

[0007] According to various, but not necessarily all, embodiments of the invention there is provided an apparatus as claimed in claim 1.

[0008] This provides the advantages that the handle is only moveable in a direction parallel with the toothed tracks and the handle cannot be inadvertently rotated from its desired orientation.

[0009] The apparatus may be for providing a mechanism for adjusting a blind located within a window unit.

[0010] In some embodiments, the control mechanism comprises a shaft to which the toothed wheels are rigidly attached.

[0011] In some embodiments, the apparatus further comprises a rail having a plurality of magnets and a blind attached to the rail, and the handle has magnets arranged to magnetically interact with the magnets located in the rail.

[0012] The apparatus may further comprise a first transparent panel, a first slide track and a second slide track arranged parallel to the first slide track, and the rail has surfaces configured to slide along the first and second slide tracks, wherein the first and second slide tracks are configured to hold the rail away from the first transparent panel to prevent contact.

[0013] The first transparent panel may comprise a pane of glass.

[0014] The apparatus may further comprise a second transparent panel arranged parallel to the first transparent panel, a first barrier member and a second barrier member, wherein the first and second barrier members extend perpendicular to the rail and the first and second barrier members are configured to prevent the rail contacting the second transparent panel when the magnetic interaction between the magnets of the handle and the magnets of the rail is broken.

[0015] The apparatus may further comprise a first spacer bar and a second spacer bar extending parallel to the first spacer bar, wherein the first and second panels are spaced apart by the first and second spacer bars, and at least one of the first slide track and/or the first barrier member form an integral part of the first spacer bar and at least one of the second slide track and/or the second barrier member form an integral part of the second spacer bar.

[0016] The rail may have a first end portion extending through a first gap between the first slide track and the first barrier member; the first barrier member comprises a lip extending away from the second transparent panel; and the rail has a first interlocking member extending from the first end portion toward the second transparent panel.

[0017] The rail may have a second end portion extending through a second gap between the second slide track and the second barrier member; the second barrier member comprises a lip extending away from the second transparent panel; and the rail has a second interlocking member extending from the second end portion toward the second transparent panel.

[0018] The first interlocking member may comprise a wheel.

[0019] The magnets of the handle and the magnets of the rail may magnetically interact to hold the rail in position during use.

[0020] The rail may be configured to fall if the magnetic interaction between the magnets of the rail and the magnets of the handle is broken, and the apparatus comprises a surface to support the rail after the magnetic interaction between the magnets of the rail and the magnets of the handle is broken, said surface being parallel to the handle.

[0021] The apparatus may further comprise: a first cover member extending over the first toothed track and a part of the handle; and a second cover member extending over the second toothed track and another part of the handle, wherein the first and second cover members limit the movement of the handle away from the toothed tracks to prevent the toothed wheels from disengaging from the toothed tracks.

[0022] The handle may have a main body, and the apparatus may further comprise: a first cover member extending over the first toothed track and a first end of the main body of the handle; and a second cover member extending over the second toothed track and a second end of the main body of the handle.

[0023] The apparatus may further comprise a second handle arranged to change the configuration of the window blind, wherein the second handle is provided with a first toothed wheel configured to engage the first toothed track, a second toothed wheel configured to engage the second toothed track and a control mechanism to operatively connect the first toothed wheel and the second toothed wheel to cause the first and second toothed wheels to be rotatable only at the same rate.

[0024] The rail may be a first rail and the apparatus may further comprise a second rail having a plurality of magnets, wherein the second handle has magnets arranged to magnetically interact with the magnets located in the second rail, and the first rail is attached to a first end of the blind and the second rail is attached to a second end of the blind.

[0025] In some embodiments, the blind comprises a pleated sheet.

[0026] In some embodiments, the first toothed track comprises a first toothed part having one end connected to one end of a second toothed part, wherein the one end of the first toothed part and/or the second toothed part defines a recess containing a connecting tab connecting the first toothed part to the second toothed part.

[0027] The first toothed part may have teeth extending from one side and the recess is formed in the opposite side of the toothed part.

[0028] The first toothed part may define the recess and the connecting tab is an integral part of the second toothed part.

[0029] In some embodiments, the connecting tab has an enlarged head portion and a relatively narrow neck portion and the recess is correspondingly shaped to receive the head portion and the neck portion.

[0030] According to various, but not necessarily all, embodiments of the invention there is provided a method of assembling a window unit as claimed in claim 22.

[0031] This provides the advantage that a window unit may be provided with a handle for changing a position of a blind, such that the handle is maintained in a desired orientation.

[0032] In some embodiments, the first toothed track is positioned adjacent to one edge of the transparent panel and the second toothed track is positioned adjacent to an opposite edge of the transparent panel.

[0033] In some embodiments, the handle comprises magnets and the blind is attached to a rail comprising magnets, and said operatively connecting a blind to the handle comprises bringing the handle within a magnetic field generated by the magnets of the rail.

[0034] According to various, but not necessarily all, embodiments of the invention there is provided a toothed track as claimed in claim 25.

[0035] This provides the advantage that the tooth track does not have to be formed, such as by moulding or casting, in a single piece.

[0036] In some embodiments, the first module has teeth extending from one side and the recess is formed in the opposite side of the module.

[0037] In some embodiments, the first module defines the recess and the connecting tab is an integral part of the second module.

[0038] In some embodiments, the connecting tab has an enlarged head portion and a relatively narrow neck portion and the recess is correspondingly shaped to receive the head portion and the neck portion.

[0039] According to various, but not necessarily all, embodiments of the invention there is provided a module for connection to a similar module to form a toothed track, as claimed in claim 29.

[0040] This provides the advantage that a tooth track of any length may be formed, but the equipment to manufacture the track may be kept relatively small and inexpensive.

[0041] In some embodiments, the connecting tab has an enlarged head portion and a relatively narrow neck

portion and the recess is correspondingly shaped to receive the head portion and the neck portion of a second identically formed module.

[0042] In some embodiments, the module is formed of a polymeric material. The polymeric material may comprise polyoxymethylene (or acetal).

[0043] According to various, but not necessarily all, embodiments of the invention there is provided a method of manufacturing a module as claimed in claim 33.

[0044] This provides the advantage of forming all features of the module in a single process.

BRIEF DESCRIPTION OF THE DRAWINGS

[0045] For a better understanding of various examples of embodiments of the present invention reference will now be made by way of example only to the accompanying drawings in which:

Fig. 1 shows an example apparatus 101 in a schematic cross-sectional view;
Figs. 1A and 1B show enlarged views of left and right end portions of the apparatus 101;
Figs. 2A and 2B show left and right end portions of an alternative apparatus 101;
Figs. 2C and 2D show left and right end portions of an alternative apparatus 101;
Fig. 3 shows a perspective view of a first end 201E of a further alternative rail 109C;
Fig. 4 shows a perspective view of a first end 201F of a further alternative rail 109D;
Figs. 5A and 5B show the apparatus 101 of Fig. 1 in a front view and a rear view,
Fig. 5C shows a cross-sectional view of a portion of the rail 109 and the blind 104 corresponding to dashed line 501 of Fig. 5B;
Figs. 6A, 6B, 6C and 6D show an example of a module 601 a bottom view, a side view a top view and an end view respectively;
Figs. 6E and 6F show top and bottom views of a module 601 connected to a second module 601' to form a toothed track;
Fig. 7 shows a perspective view of the first end of a handle 103;
Figs. 8A and 8B show an alternative example apparatus 101A in a front view and a rear view respectively;
Fig. 8C shows a cross-sectional view of the blind 104 and rails 109E and 109F of Fig. 8B;
Figs. 9, 10 and 11 show an end portion of an apparatus 101B a cross-sectional view, a perspective cross-sectional view and a front view respectively;
Fig. 12A shows an example of a clip 906;
Fig. 12B shows the clip 906 attached to a support rail 930;
Fig. 13 shows the apparatus 101B with the lower handle 103A separated from the lower rail 109D; and
Fig. 14 shows a flow chart illustrating a method 1400 of assembling a window unit.

DETAILED DESCRIPTION OF VARIOUS EMBODIMENTS OF THE INVENTION

[0046] The Figures illustrate an apparatus 101 comprising: a first toothed track 102A; a second toothed track 102B arranged parallel to the first toothed track 102A; and a handle 103 to change the configuration of a window blind 104, wherein the handle 103 is provided with a first toothed wheel 105A configured to engage the first toothed track 102A, a second toothed wheel 105B configured to engage the second toothed track 102B and a control mechanism 106 to cause the first and second toothed wheels 105A, 105B to be rotatable only at the same rate.

[0047] An example apparatus 101 is shown in a schematic cross-sectional view in Fig. 1, and left and right end portions of the apparatus 101 are shown in enlarged views in Figs. 1A and 1B. The example apparatus 101 of Fig. 1 is also shown in a front view in Fig. 5A and a rear view in Fig. 5B, while a portion of the rail 109 and the blind 104 corresponding to dashed line 501 of Fig. 5B is shown in the cross-sectional view of Fig. 5C.

[0048] The apparatus 101 comprises a first toothed track 102A and a second toothed track 102B arranged parallel to the first toothed track 102A. A handle 103 is provided to enable a user to change the configuration of a window blind 104. The handle 103 comprises a main body 151, a first toothed wheel 105A configured to engage the first toothed track 102A and a second toothed wheel 105B configured to engage the second toothed track 102B. A control mechanism 106 operatively connects the first toothed wheel 105A and the second toothed wheel 105B to cause the first and second toothed wheels 105A, 105B to be rotatable only at the same rate. That is, for every revolution of the toothed wheel 105A, the toothed wheel 105B must also perform a revolution.

[0049] In the illustrated examples, the control mechanism comprises a single axle or shaft 106 that is rigidly fixed to each of the toothed wheels so that they cannot rotate relative to the shaft. The shaft 106 is mounted in bearings 152 located within the main body 151 of the handle 103. In examples, the main body 151 of the handle 103 comprises an extrusion or moulded part having cylindrical bore, such that the bearing extends substantially along the whole length of the shaft 106. In alternative embodiments the control mechanism may comprise more than one shaft operatively connected for example by gears.

[0050] In the present example, the handle 103 is intended to be moved manually, but in other examples the handle may be provided with one or more electric motors arranged to drive the toothed wheels, and the control mechanism comprises the electric motor/s.

[0051] The handle 103 also contains one or more (in the present case 2) brakes 107. The breaks prevent the axle from rotating in the absence of an applied force, and

also provide some resistance to a force applied to the handle by a user. The brakes 107 will be described in further detail below with respect to Fig. 9.

[0052] The toothed tracks 102A and 102B are supported by a supporting rail 130A and 130B respectively which extend along the length of the toothed tracks 102A and 102B. The supporting rails 130A and 130B each have a respective supporting surface 131A and 131B. The handle 103 is provided with a first control surface 132A towards its first end and a second control surface 132B towards its second end. The control surfaces 132A and 132B are arranged to be in contact, or close proximity, to the supporting surfaces 131A and 131B so that the handle 103 is prevented from rotating about the axis of the shaft 106.

[0053] A detailed perspective view of the first end of the handle 103 is shown in Fig. 7. The toothed wheel 105A and the end of the shaft 106 may also be seen in Fig. 7, as well as an edge of the surface 132A.

[0054] In some examples, the handle 103 may be directly attached to a blind for a window, but in the illustrated examples, the handle is operatively connected to a blind by a magnetic mechanism. Therefore, as shown in Fig. 1, the handle comprises a plurality of magnets 108A, 108B, 108C and 108D, and a rail 109 attached to the blind 104 also contains a plurality of magnets 110A, 110B, 110C and 110D. The rail 109 is arranged to extend parallel to the handle 103 and the magnets 108A to 108D of the handle 103 are mutually spaced with the same spacing as the magnets 110A to 110D of the rail 109. Therefore the two sets of magnets may be aligned as shown in Fig. 1 and interact with one another.

[0055] The magnets may be arranged in groups towards the ends of the handle and the rail. In the present example, a group of two magnets 108A and 108B is located towards a first end of the handle and a group of two magnets 110A and 110B is located towards the first end of the rail 109. Similarly, a group of two magnets 108C and 108D is located towards a second end of the handle 103 and a group of two magnets 110C and 110D is located towards the second end of the rail 109. The magnets 108A to 108D of the handle 103 may be arranged to have the same pole (such as north poles) facing the rail 109. The magnets 110A to 110D of the rail 109 are arranged so that their poles which face the magnets 108A to 108D of the handle 103 are attracted to the magnets of the handle. For example, the magnets of the handle may have north poles facing the rail, and the magnets of the rail may have south poles facing the handle.

[0056] The magnets in the present example are arranged in groups of two in the handle and in the rail, but groups of more or less than two magnets may be used in other embodiments.

[0057] The apparatus 101 may also comprise a first transparent panel 111, which may be a pane of glass or a sheet of a transparent polymeric material used to form a window. The panel 111 has a first side 120A facing the handle 103 and a second side 120B facing the rail 109.

[0058] The supporting rails 130A and 130B supporting the toothed tracks 102A and 102B may be fixed to the first side 120A of the panel 111, for example by an adhesive or by a clips as will be described below.

[0059] A first slide track 112A of the apparatus 101 is fixed adjacent to the second side 120A of the panel 111 and a second slide track 112B is fixed adjacent to the second side 120B of the panel 111 and arranged parallel to the first track. The tracks 112A and 112B have smooth surfaces 113A and 113B respectively arranged to face end portions 114A and 114B of the rail 109, and the rail 109 has sliding surfaces 121A and 121B configured to slide along the first and second slide tracks 112A and 112B (in a direction into and/or out of the page in the view of Fig. 1).

[0060] The rail 109 has a middle portion having a front face 122 facing the panel 111. The surfaces 113A and 113B of the slide tracks 112A and 112B are spaced from the second side 120B of the panel 111 by a distance that is larger than the spacing between the sliding surfaces 121A and 121B and the front face 122 of the rail 109. Consequently, the first and second tracks 112A and 112B prevent the rail 109 from contacting the panel 111.

[0061] The apparatus 101 also comprises a second transparent panel 115 arranged parallel to the first transparent panel 111. The second panel 115 has a first side 117A facing the first transparent panel 111 and a second side 117B forming an exterior surface of the apparatus 101. The second panel 115 may be formed of the same material as the first panel 111.

[0062] A first barrier member 116A and a second barrier member 116B may be fixed relative to the second first side of the second panel 115. Respective surfaces 118A and 118B of the first barrier member 116A and the second barrier member 116B may be arranged to extend parallel to the first surface 117A of the second panel 115 and parallel to the slide members 112A and 112B. The first slide member 112A and the first barrier member 116A may form a gap 202 through which the end portion 114A of the rail extends. Similarly the second slide member 112B and the second barrier member 116B may form a gap 202 through which the end portion 114B of the rail extends.

[0063] Advantageously, the end portions 114A and 114B are dimensioned to be a loose fit within the gaps 202. Consequently, if the magnetic interaction between the magnets of the handle 103 and the magnets of the rail 109 are broken, the rail 109 is free to fall within the apparatus 101 until it comes to rest on a horizontal surface. This will be further described below.

[0064] A central rear surface 119 of the rail 109 faces the second panel 119 and a respective surface 124A and 124B of the end portions 114A and 114B of the rail 109 face the barrier members 116A and 116B. The central rear surface 119 of the rail 109 is spaced from the surfaces 124A and 124B of the end portions 114A and 114B by a distance that is smaller than the spacing between the surfaces 118A and 118B of the barrier members 116A

and 116B and the face 117A of the second panel 115. Consequently, in situations where the magnetic interaction between the magnets of the handle and the magnets of the rail is broken, the first and second barrier members 116A and 116B prevent the rail contacting the second transparent panel 115.

[0065] The second panel 115 is spaced from the first panel 111 by spacer bars 125A and 125B extending between the two panels 111 and 115 along two opposing edges of the panels. In the illustrated example of Fig. 1, the first slide track 112A and the first barrier member 116A form an integral part of the first spacer bar 125A. Similarly the second track 112B and the second barrier member 116B form an integral part of the second spacer bar 125B. However, it will be understood that the slide tracks 112A, 112B and/or the barrier members 116A, 116B may be formed separately. Furthermore the spacer bars may be extruded in a first material and the slide track and/or the barrier members may be formed of different materials to the first material. In an example, the spacer bar may be extruded from a polymeric material and the slide track may be formed of extruded aluminium.

[0066] End portions of an alternative apparatus 101 are shown in Figs. 2A and 2B. The apparatus of Figs. 2A and 2B is the same as the apparatus 101 of Fig. 1 except for it has a different rail 109A. A first end 201A of the rail 109A with an alternative first end portion 114C is shown in Fig 2A and the opposite second end 201B of rail 109A with a similar alternative end portion 114C is shown in Fig 2B. The rail 109A has a first end 201A extending through a first gap 202 defined by the first slide track 112A and the first barrier member 116A. The first barrier member 116A comprises a lip 203 extending away from the second transparent panel 115. The rail 109A has an interlocking member 204 extending from its end 201A toward the second transparent panel 115, and the lip 203 prevents the interlocking member 204 from being removed from the first gap 202.

[0067] The opposite second end 201B of the rail 109A is similarly configured to the first end 201A. Therefore the rail 109A has a second end extending through a second gap 202 defined by the second track 112B and the second barrier member 116B. The second barrier member also comprises a lip 203 extending away from the second transparent panel 115 and the rail 109A has another interlocking member 204 extending from its second end toward the second transparent panel 115. Therefore the lip 203 prevents the interlocking member 204 of the second end of the rail from being removed from the second gap 202 defined by the second slide track 112B and the second barrier member 116B.

[0068] In normal use, the rail 109A is maintained in position by the magnetic interaction between its magnets 110A to 110D and the magnets 108A and 108D of the handle 103. However, in situations where the magnetic interaction between the two sets of magnets is broken, mechanical interaction between the interlocking member 204 at the first end of the rail and the lip of the first barrier member 116A prevents the first end 201A from passing through the gap 202, and similarly the interaction between the interlocking member 204 at the opposite second end of the rail 109A and the lip of the second barrier member 116B prevents the second end from passing through the gap 202.

[0069] End portions of an alternative apparatus 101 are shown in Figs. 2C and 2D. The apparatus of Figs. 2C and 2D is the same as the apparatus of Fig. 1 except it has a different rail 109B. The rail 109B is similar to rail 109A but it has, at each of its ends, two interlocking members 204A and 204B. The interlocking member 204A may be configured in the same way as interlocking member 204 of rail 109A.

[0070] The interlocking member 204B extends from the first end 201C of the rail 109B towards the first panel 111 and in normal use it extends into a space behind the slide rail 112A. Therefore the first and second interlocking members 204A and 204B extend from the end portion 114E of the rail 109B to form a T-shape as shown in Fig 2C.

[0071] Similarly an interlocking member 204B extends from the second end 201D of the rail 109B towards the first panel 111 and in normal use it extends into a space behind the slide rail 112B. Therefore the first and second interlocking members 204A and 204B extend from the second end portion 114E of the rail 109B to form a T-shape as shown in Fig 2D.

[0072] In normal use there may be no contact between the second interlocking members 204B and the slide tracks 112A and 112B. However, in the event that the magnetic interaction between the magnets 110A to 110D of the rail 109B and the magnets 108A to 108D of the handle 103 is broken, the second interlocking member 204B may interact with the slide track 112A, and the first interlocking member 204A may interact with the barrier member 116A, such that the end 201A of the rail 109B is prevented from passing through the gap 202 formed by the first slide track 112A and the first barrier member 116A.

[0073] A first end 201E of a further alternative rail 109C is shown in a perspective view in Fig. 3. The two ends of the rail 109C are similarly configured and therefore only the illustrated end will be described. The rail 109C has the same construction as rail 109B but differs in the detail of its interlocking members.

[0074] Therefore, like the rail 109B, rail 109C has a central portion 331 that has substantially the same width across its whole length and end portions 114E that have a smaller width. In the present example the width of the end portion is defined by outer surfaces 332 of a V-shaped rib formed on each side of the end portion 114E.

[0075] A first two interlocking members 204A extend from the end of the end portion 114E substantially perpendicular to its surfaces 332 and second two interlocking members 204B extend from the end of the end portion 114E in the opposite direction to the first two interlocking members 204A.

[0076] Each of the interlocking members 204A, 204B may have a cylindrical outer surface which extend around axes that are perpendicular to the length of the rail.

[0077] In normal use, the interlocking members 204A, 204B do not touch any other components of the apparatus, and they perform no function. In instances where the magnetic interaction between the magnets of the handle 103 and the magnets of the rail 109C is broken and the rail falls out of its desired position, the interlocking members 204A and 204B may impact upon surfaces such as those of the spacer bar 125A, the slide rail 112A and the barrier member 116A. However, by providing round surfaces on the interlocking members 204A, 204B there are no sharp edges that might otherwise cause the rail to become jammed. Consequently the rail is free to fall in such instances.

[0078] A first end 201F of a further alternative rail 109D is shown in a perspective view in Fig. 4. The two ends of the rail 109D are similarly configured and therefore only the illustrated end will be described. The rail 109D has the same construction as rail 109C but differs in the detail of its interlocking members.

[0079] In the above-described rails 109A, 109B and 109C, the interlocking members are rigidly fixed to the end portions of the rails. For example the interlocking members and the end portions of the rails may be moulded as a single item. However, the rail 109D has interlocking members 404A and 404B that are pivotally mounted on the end portion 114E. Axles 401 extend perpendicularly from the end portion 114E and the axles support interlocking members 404A and 404B, which are provided in the form of moulded wheels. For example the wheels may be formed of a suitable polymer material such as nylon and the axles 401 may be formed of a metal.

[0080] Two of the interlocking members 404A extend on parallel axels to one side of the end portion 114E and two interlocking members 404B extend on parallel axels to the other side of the end portion 114E.

[0081] The wheels 404A and 404B are arranged to be free to rotate on their axles.

[0082] In instances where magnetic interaction between the magnets of the handle 103 and the magnets of the rail 109D is broken and the rail falls out of its desired position, the interlocking members 404A and 404B may impact upon surfaces such as those of the spacer bar 125A, the slide rail 112A and the barrier member 116A. However the rail 109D will not become jammed because the interlocking members 404A, 404B are able to roll over these surfaces. Consequently the rail 109D is free to fall in such instances.

[0083] As will be understood from the previous description, the apparatus 101 comprises a window unit that may be used as a window in a building, or vehicle such as a caravan. The window unit being double glazed unit (insulating glazing unit) having a blind 104 located between two transparent panels 111 and 115.

[0084] As illustrated in Fig. 5B, one end of the blind 104 may be attached to a fixed rail 502 and the opposite end may be attached to the moveable rail 109. In the present example the fixed rail 502 is extends horizontally across the top of end of the blind 104. The fixed rail 502 may be permanently fixed to a spacer bar 503 that extends across the top edge of the panels 111 and 115.

[0085] As illustrated in Fig. 5A, the handle 103 may be horizontally orientated and due to the magnetic attraction between its magnets and those of moveable rail 109, the moveable rail 109 is held in a horizontal orientation. As the handle 103 is moved, the rail 109 is moved due to the magnetic attraction between the magnets of the handle 103 and the magnets of the rail 109.

[0086] The handle 103 extends between the toothed tracks 102A and 102B, so that it is perpendicular to the toothed tracks and the toothed wheels 105A and 105B are in engagement with the toothed tracks.

[0087] The blind 104 is shown in Figs. 5A and 5B in a partially closed configuration such that about two thirds of the panels 111 and 115 are obscured by the blind. The blind may be further opened or closed from the illustrated configuration by moving the handle 103 upward or downwards respectively. Such a movement causes the toothed wheels 105A and 105B to roll along the toothed tracks 102A and 102B respectively. The toothed wheel 105A has the same dimensions as toothed wheel 105B, and the two toothed wheels are connected such that they rotate at the same rate, as described above. Consequently, the handle 103 is maintained in an orientation perpendicular to the toothed tracks 102A and 102B during its movement.

[0088] In the present example, the blind 104 is formed of a pleated sheet of material as illustrated in Fig. 5C. The blind 104 may be attached to the rail 109 by forcing several pleats of the material through a slot 504 into a compartment 505 formed in the rail. However, in alternative embodiments other types of blind (or screen) may be used. For example in one alternative embodiment the blind is a cellular blind. In another alternative embodiment the blind is a roller blind.

[0089] In alternative examples the bottom end of the blind 104 may be attached to a fixed rail located along the bottom edge of the apparatus and the moving rail may be attached to the top end of the blind. In further alternative examples the apparatus 101 is arranged in an orientation that is 90 degrees rotated from that shown in Figs. 5A and 5B so that the moving rail 109 extends vertically and the blind closes by a horizontal movement of the rail 109.

[0090] Each of the toothed rails 102A and 102B may be formed of a single length of moulded material, but, beyond relatively short lengths, such toothed rails are expensive to produce. This problem may be overcome by forming the first toothed track from a first toothed part (or first module) having one end connected to one end of a second toothed part (or second module), wherein the one end of the first toothed part and/or the second toothed part defines a recess containing a connecting

tab connecting the first toothed part to the second toothed part. That is, the toothed track may be formed of modules, or parts, connected end to end.

[0091] An example of a toothed part, or module, 601 which may be connected with a similar module 601 to form a longer toothed track is shown in the bottom view of Fig. 6A, the side view of Fig. 6B, the top view of Fig. 6C and the end view of Fig. 6D. The module 601 has teeth 602 extending from one side and a recess 603 formed in the opposite side at a first end 604 of the part 601. As may be seen by comparing Figs. 6A and 6C, the recess does not extend completely through the depth of the track 601, and so there are teeth 602A which extend over the portion of the track that defines the recess 603.

[0092] The module 601 has a connecting tab 605 at its second end 606. The tab 605 has a similar outline to that of the recess 603 such that the tab 605 is able to be located in a recess 603 of a similarly formed module 601. The connecting tab 605 may be an integral part of the module 601. For example, the whole of the module may be formed by moulding a suitable polymeric material, such as a polymeric material comprising acetal (or polyoxymethylene), or by casting a suitable metal, such as aluminium alloy.

[0093] The connecting tab 605 has an enlarged head portion 607 and a relatively narrow neck portion 608. The recess 603 is correspondingly shaped with a relatively narrow opening 609 at the first end 604 to receive the neck portion 608 and a wider opening 610 inset from the first end to receive the head portion 607.

[0094] The module 601 is shown connected to an identically formed second module 601' in the top view of Fig. 6E and bottom view of Fig. 6F. The connecting tab 605 of module 601 is located within the recess 603 of the second module 601'. It will be understood that other similar modules may be connected to the recess of the first module 601 or the connecting tab 605 of the second module 601'. Consequently, a toothed track of longer lengths may be formed by connecting many modules 601 together.

[0095] Also, end ones of the modules may be cut to length and therefore any required length of toothed track may be formed from a sufficient number of the modules 601. Because only a relatively small mould is used to create the modules, this method enables long tracks of various lengths to be produced at a relatively low cost.

[0096] An alternative example apparatus 101A is shown in the front view of Fig. 8A and the rear view of Fig. 8B. The apparatus 101A is similarly formed to apparatus 101 of Fig. 1 except that it has a blind 104 that has a first end attached to a first moveable rail 109E and a second end attached to a second moveable rail 109F. The rails 109E and 109F may similar to each other and similarly configured to the above-described rails 109, 109A, 109B, 109C or 109D.

[0097] The apparatus 101A also has two handles 103A and 103B which may be similarly configured to the handle 103 of Fig. 1. As shown in Fig. 8A, each of the handles 103A, 103B has a toothed wheel 105A at a first end and a toothed wheel 105B at a second end. The toothed wheels 105A are located on a toothed track 102A and the toothed wheels 105B are located on a toothed track 102B. The first handle 103A has magnets magnetically attracted to magnets located in the first rail 109E, and the second handle 103B has magnets magnetically attracted to magnets located in the second rail 109F.

[0098] In the present example, the handles 103A, 103B and hence the rails 109E, 109F are horizontally arranged. Thus, the position of the top end of the blind 104 may be adjusted by moving the upper handle 103B and the bottom end of the blind may be adjusted by moving the lower handle 103A. The blind may be fully closed by moving the upper handle 103B upwards and the lower handle 103A downwards. Alternatively, for example, both handles 103A and 103B may be moved upwards or downwards as far as they can go to fully open the blind.

[0099] In an alternative arrangement, the apparatus 101A may be rotated through 90 degrees such that the rails 109E and 109F and the handles 103A and 103B extend vertically. In this arrangement, the portion of the window unit 101A that is obscured by the blind 104 may be moved from left to right and right to left using the handles 103A and 103B.

[0100] An end portion of an apparatus 101B is shown in the cross-sectional view of Fig. 9, a perspective cross-sectional view of Fig. 10 and a front view of Fig 11. It should be understood that the apparatus 101B like apparatus 101 and 101A is symmetrical and therefor the apparatus 101B has a second end portion like that shown in Figs. 9 and 10.

[0101] The apparatus 101B may have all of the features described previously for apparatus 101 and apparatus 101A. Specifically it has a first handle 103A and a second handle 103B which has magnets (such as 108A and 108B) arranged to magnetically connect with magnets (such as magnets 110A and 110B) of a respective one of two rails 109D.

[0102] Each handle 103A, 103B has a toothed wheel (such as 105A) at each end and the toothed wheels at each end of a handle are operatively connected to rotate at the same rate; the toothed wheels of each handle being connected by a shaft 106.

[0103] The apparatus 101B differs from apparatus 101 and 101A in that it has two covers 901 extending over each of its toothed wheels (such as 105A) and over its toothed tracks (such as track 102A). The covers 901 are rigidly attached to the support rails 930 which also support the toothed tracks 102A. In the present example the cover 901 is attached to the respective support rail 930 by screws 902.The cover 901 has a surface 903 arranged to be in contact with or in close proximity to an outer surface 904 of the main body 150 of the handles 103A, 103B. In this way, the handles 103A, 103B are prevented from being pulled away from the panel 111 and the teeth of the toothed wheels (such as 105A) are prevented from being lifted out of the toothed track (such as 102A).

[0104] Further details of the brake 107 are shown in Fig. 9. The brake comprises a block 909 formed of rubber, or synthetic rubber, located on one side of the shaft 106. The block 909 is provided with a surface shaped to fit closely around the cylindrical surface of the shaft 106. In an embodiment, the surface extends approximately half way around the shaft 106. The block may define at least one recess 910 in a face that is on the opposite side to the shaft 106, and the one or more recesses may each contain a spring 911 (such as a helical spring) that is in a compressed state, such that the one or more springs 911 urge the block against the shaft 106 and create a frictional force between the block 909 and the shaft 106.

[0105] The frictional force provided by the brakes 107 may prevent the handle (such as handle103A) from moving in the absence of an applied force. The brakes 107 may also prevent some sudden movements of the handle that may otherwise occur due to excessive forces applied by a user, and which would break the magnetic interaction between the magnets of the handle and the magnets of the rail.

[0106] The apparatus 101B is shown in Fig. 9, 10 and 11 located within a window frame 905. As previously mentioned, the support rails 930 (which support the toothed tracks) may be fixed to the transparent panel 111 by an adhesive. However, in the example of Figs. 9, 10 and 11 the support rails 930 are attached by means of clips 906. The clips have tongues 908 that are configured to be pushed in between the panel 111 and the window frame 905.

[0107] An example of a clip 906 is shown in Fig. 12A and the clip 906 is shown in Fig. 12B attached to a support rail 930. The clip 906 has a flat base portion 1201 from which extend tongues 908 from two adjacent ones of its four sides. Two hooks 1202 extend perpendicularly upwards from the base 1201, with one of the hooks on each side of a tongue 908. A third hook 1203 extends up from the opposite side of the base 1201.

[0108] As shown in Fig. 12B the support rail 930 has a width configured to fit between the two hooks 1202 on one side and the third hook 1203 on the other side. The support rail 930 defined shoulders to enable the hooks 1202 and 1203 to clip around and retain the support rail.

[0109] The apparatus 101B of Figs. 9, 10 and 11 is shown again in Fig. 13 after being misused. If the handles 103A and 103B are smoothly pushed by a user, the rails 109D will follow the movement of the handles. However, if a person moves a handle with an excessive force, the magnetic interaction between the handle and the respective rail may be broken by the sudden movement of the handle. Thus, as shown in Fig. 13, the lower handle 103A may become separated from the lower rail 109D.

[0110] In the event that a rail 109D loses magnetic connection with a handle 103A or 103B the rail is configured to fall within the apparatus until it reaches a horizontal surface provide by the apparatus. In the present example, the lower rail 109D has fallen onto the horizontal surface provided by a space bar extending along the lower edge of the panels 111 and 115. Because the rail 109D falls down onto a horizontal surface and therefore takes up a horizontal orientation, the magnets of the rail 109D may be simply reconnected with the magnets of the handle 103A by moving the handle 103A down to the rail.

[0111] It should be understood that to achieve this function, the rails 109D are arranged to be free to fall, and therefore the ends of the rail are loosely positioned so that they cannot jam against any surfaces during the fall. In the present example, this is possible by the rail having interlocking members formed as wheels as described with reference to Fig. 4, but alternatively the interlocking members may be fixed and rounded as described for rail 109C of Fig. 3.

[0112] A method 1400 of assembling a window unit is shown in the flow chart of Fig. 14. The method comprises a process 1401 in which a first toothed track (such as toothed track 102A) is positioned along a transparent panel (such as panel 111). Typically the first toothed track is positioned adjacent to one edge of the transparent panel. In a similar process 1402, a second toothed track (such as toothed track 102B) is positioned along the transparent panel, parallel to the first toothed track. Typically, the second toothed track is positioned adjacent to an opposite edge of the transparent panel.

[0113] In a further process 1403, a first toothed wheel of a handle (such as toothed wheel 105A of handle 103) is positioned on the first toothed track and a second toothed wheel (such as toothed wheel 105B) of the handle is positioned on the second toothed track. As indicated at block 1404 of the flow chart, the handle is operatively connected to a blind, so that the handle may be used to adjust the position of the blind.

[0114] In a method suitable for assembling the apparatus of Fig. 1, in which the handle comprises magnets and the blind is attached to a rail comprising magnets, the process of operatively connecting a blind to the handle comprises bringing the handle within a magnetic field generated by the magnets of the rail.

[0115] Therefore although blocks 1403 and 1404 are shown as two separate blocks in Fig. 14, it will be understood that the two processes identified by blocks 1403 and 1404 may be performed simultaneously.

[0116] However, for different arrangements of blinds, blocks 1403 and 1404 may be performed in different orders. For example, where an apparatus comprises a blind that is directly attached to a handle, the handle may be connected to the blind before or after the toothed wheels are located on the toothed tracks.

[0117] Therefore the illustration of a particular order to the blocks of Fig. 14 does not necessarily imply that there is a required or preferred order for the blocks and the order and arrangement of the block may be varied. Furthermore, it may be possible for some steps to be omitted.

[0118] Although embodiments of the present invention have been described in the preceding paragraphs with reference to various examples, it should be appreciated that modifications to the examples given can be made

without departing from the scope of the invention as claimed.

Claims

1. An apparatus (101) comprising:

   a first toothed track (102A);
   a second toothed track (102B) arranged parallel to the first toothed track (102A);
   a handle (103) arranged to change the configuration of a window blind (104), wherein the handle (103) is provided with a first toothed wheel (105A) configured to engage the first toothed track (102A), a second toothed wheel (105B) configured to engage the second toothed track (102B) and a control mechanism (106) to cause the first and second toothed wheels (105A, 105B) to be rotatable only at the same rate;
   wherein the control mechanism (106) comprises a shaft to which the toothed wheels (105A, 105B) are rigidly attached; **characterised in that** the apparatus further comprises a rail (109) having a plurality of magnets (110A, 110B) and a blind (104) attached to the rail (109), and the handle (103) has magnets (108A-108D) arranged to magnetically interact with the magnets (110A, 110B) located in the rail (109); and
   a first cover member (901) extending over the first toothed track (102A) and a part of the handle (103); and a second cover member (901) extending over the second toothed track (102B) and another part of the handle (103), wherein the first and second cover members (901) limit the movement of the handle (103) away from the toothed tracks (102A, 102B) to prevent the toothed wheels (105A, 105B) from disengaging from the toothed tracks (102A, 102B).

2. The apparatus (101) according to claim 1, further comprising a first transparent panel (111), a first slide track (112A) and a second slide track (112B) arranged parallel to the first slide track, and the rail has surfaces configured to slide along the first and second slide tracks, wherein the first and second slide tracks are configured to hold the rail away from the first transparent panel to prevent contact.

3. The apparatus (101) according to claim 2 further comprising a second transparent panel (115) arranged parallel to the first transparent panel, a first barrier member (116A) and a second barrier member (116B), wherein the first and second barrier members extend perpendicular to the rail and the first and second barrier members are configured to prevent the rail contacting the second transparent panel when the magnetic interaction between the magnets of the handle and the magnets of the rail is broken.

4. The apparatus (101) according to claim 3, wherein the rail has a first end portion (114A) extending through a first gap (202) between the first slide track and the first barrier member; the first barrier member comprises a lip (203) extending away from the second transparent panel; and the rail has a first interlocking member (204) extending from the first end portion toward the second transparent panel.

5. The apparatus (101) according to claim 4, wherein the rail has a second end portion (114B) extending through a second gap (202) between the second slide track and the second barrier member; the second barrier member comprises a lip (203) extending away from the second transparent panel; and the rail has a second interlocking member (204) extending from the second end portion toward the second transparent panel.

6. The apparatus (101) according to any one of claims 1 to 5 wherein the rail is configured to fall if the magnetic interaction between the magnets of the rail and the magnets of the handle is broken, and the apparatus comprises a surface to support the rail after the magnetic interaction between the magnets of the rail and the magnets of the handle is broken, said surface being parallel to the handle.

7. The apparatus (101) according to any one of claims 1 to 6, wherein the handle has a main body (151), and the apparatus further comprises: a first cover member (901) extending over the first toothed track and a first end of the main body of the handle; and a second cover member (901) extending over the second toothed track and a second end of the main body of the handle.

8. The apparatus (101) according to any one of claims 1 to 7, wherein the apparatus further comprises a second handle (103B) arranged to change the configuration of the window blind, wherein the second handle is provided with a first toothed wheel (105A) configured to engage the first toothed track (102A), a second toothed wheel (105B) configured to engage the second toothed track (102B) and a control mechanism (106) to operatively connect the first toothed wheel and the second toothed wheel to cause the first and second toothed wheels to be rotatable only at the same rate.

9. The apparatus (101) according to any one of claims 1 to 8, wherein the first toothed track comprises a first toothed part (601) having one end connected to one end of a second toothed part, wherein the one end of the first toothed part and/or the second toothed part defines a recess (603) containing a con-

necting tab (605) connecting the first toothed part to the second toothed part.

10. The apparatus (101) according to claim 9, wherein the first toothed part has teeth extending from one side, the recess is formed in the opposite side of the first toothed part and the connecting tab is an integral part of the second toothed part.

11. The apparatus (101) according to any one of claims 1 to 10, wherein the connecting tab has an enlarged head portion (607) and a relatively narrow neck portion (608) and the recess is correspondingly shaped to receive the head portion and the neck portion.

12. The apparatus (101) according to any one of claims 1 to 11, wherein the first interlocking member comprises a cylindrical outer surface.

13. The apparatus (101) according to any one of claims 1 to 12, wherein the first interlocking member comprises a wheel.

14. A method of assembling a window unit (101A) comprising:

positioning a first toothed track(102A) along a transparent panel (111);
positioning a second toothed track (102B) along the transparent panel (111);
positioning a first toothed wheel (105A) of a handle (103) on the first toothed track (102A) and a second toothed wheel (105B) of the handle (103) on the second toothed track (102B);
operatively connecting a blind (104) to the handle (103);
providing a control mechanism to cause the first and second toothed wheels to be rotatable only at the same rate;
wherein the control mechanism (106) comprises a shaft to which the toothed wheels (105A, 105B) are rigidly attached;
providing a rail (109) having a plurality of magnets (110A, 110B) and a blind (104) attached to the rail (109), and the handle (103) has magnets (108A - 108D) arranged to magnetically interact with the magnets (108A, 108B) located in the rail (109); and
providing a first cover member (901) extending over the first toothed track (102A) and a part of the handle (103); and a second cover member (901) extending over the second toothed track (102B) and another part of the handle (103), wherein the first and second cover members (901) limit the movement of the handle (103) away from the toothed tracks (102A, 102B) to prevent the toothed wheels (105A, 105B) from disengaging from the toothed tracks (102A, 102B).

Patentansprüche

1. Apparat (101) aufweisend:

eine erste gezahnte Führung (102A);
eine parallel zur ersten gezahnten Führung (102A) angeordnete zweite gezahnte Führung (102B);
einen zum Ändern der Konfiguration einer Fensterblende (104) angeordneten Griff (103), wobei der Griff (103) mit einem ersten Zahnrad (105A) zum Eingreifen in die erste gezahnte Führung (102A) ausgestattet ist, einem zweiten Zahnrad (105B) zum Eingreifen in die zweite gezahnte Führung (102B) und
einem Kontrollmechanismus (106), der bewirkt, dass das erste und zweite Zahnrad (105A, 105B) nur mit derselben Geschwindigkeit drehbar sind;
wobei der Kontrollmechanismus (106) eine Achse aufweist mit der die Zahnräder (105A, 105B) starr verbunden sind;
dadurch gekennzeichnet, dass
der Apparat ferner eine Schiene (109) mit einer Vielzahl an Magneten (110A, 110B) und eine mit der Schiene (109) verbundene Blende (104) aufweist, wobei der Griff (103) Magnete (108A-108D) hat, angeordnet, um mit den in der Schiene (109) angeordneten Magneten (110A, 110B) magnetisch zu interagieren; und
einem ersten sich über die erste gezahnte Führung (102A) und einen Teil des Griffs (103) erstreckenden Abdeckelement (901); und einem zweiten sich über die zweite gezahnte Führung (102B) und einen anderen Teil des Griffs (103) erstreckenden Abdeckelement (901), wobei das erste und zweite Abdeckelement (901) die Bewegung des Griffs (103) weg von den gezahnten Führungen (102A, 102B) limitieren, um zu verhindern, dass sich die Zahnräder (105A, 105B) von den gezahnten Führungen (102A, 102B) lösen.

2. Apparat (101) nach Anspruch 1, ferner aufweisend eine erste transparente Platte (111), eine erste Führungsschiene (112A) und eine zu der ersten Führungsschiene parallel angeordnete zweite Führungsschiene (112B), und die Schiene Oberflächen aufweist, ausgestaltet, um an der ersten und zweiten Führungsschiene entlang zu gleiten, wobei die erste und die zweite Führungsschiene ausgestaltet sind, die Schiene, zur Verhinderung eines Kontakts, weg von der ersten transparenten Platte zu halten.

3. Apparat (101) nach Anspruch 2, ferner aufweisend

eine zu der ersten transparenten Platte parallel angeordnete zweite transparente Platte (115), ein erstes Sperrelement (116A) und ein zweites Sperrelement (116B), wobei das erste und das zweite Sperrelement lotrecht zur Schiene verlaufen und das erste und das zweite Sperrelement dazu ausgestaltet sind, um einen Kontakt der Schiene zum zweiten transparenten Element zu verhindern, sobald eine magnetische Interaktion zwischen den Magneten des Griffs und den Magneten der Schiene unterbrochen ist.

4. Apparat (101) nach Anspruch 3, wobei die Schiene einen sich durch einen ersten Spalt (202) zwischen der ersten Führungsschiene und dem ersten Sperrelement erstreckenden ersten Endabschnitt (114A) aufweist; das erste Sperrelement umfasst eine sich von der zweiten transparenten Platte weg erstreckende Lippe (203); und die Schiene weist ein sich vom ersten Endabschnitt zur zweiten transparenten Platte erstreckendes, erstes sicherndes Teil (204) auf.

5. Apparat (101) nach Anspruch 4, wobei die Schiene einen sich durch einen zweiten Spalt (202) zwischen der zweiten Führungsschiene und dem zweiten Sperrelement erstreckenden zweiten Endabschnitt (114B) aufweist; das zweite Sperrelement umfasst eine sich von der zweiten transparenten Platte weg erstreckende Lippe (203); und die Schiene weist ein sich vom zweiten Endabschnitt zur zweiten transparenten Platte erstreckendes, zweites sicherndes Teil (204) auf.

6. Apparat (101) nach einem der Ansprüche 1 bis 5, wobei die Schiene derart konfiguriert ist, dass sie absinkt, wenn die magnetische Interaktion zwischen den Magneten der Schiene und den Magneten des Griffs unterbrochen ist, und der Apparat eine parallel zum Griff verlaufende, die Schiene unterstützende Oberfläche aufweist nachdem eine magnetische Interaktion zwischen den Magneten der Schiene und den Magneten des Griffs unterbrochen ist.

7. Apparat (101) nach einem der Ansprüche 1 bis 6, wobei der Griff einen Hauptkörper (151) aufweist und der Apparat ferner umfasst: ein erstes sich über die erste gezahnte Führung und ein erstes Ende des Hauptkörpers des Griffs erstreckendes Abdeckelement (901); und ein zweites sich über die zweite gezahnte Führung und ein zweites Ende des Hauptkörpers des Griffs erstreckendes Abdeckelement (901).

8. Apparat (101) nach einem der Ansprüche 1 bis 7, wobei der Apparat ferner einen zur Änderung der Konfiguration der Fensterblende angeordneten zweiten Griff (103B) aufweist, wobei der zweite Griff mit einem in die erste gezahnte Führung (102A) eingreifenden ersten Zahnrad (105A) ausgestattet ist, einem in die zweite gezahnte Führung (102B) eingreifenden zweiten Zahnrad (105B) ausgestattet ist und einem das erste Zahnrad und das zweite Zahnrad wirksam verbindenden Kontrollmechanismus (106), der bewirkt, dass das erste und zweite Zahnrad nur mit derselben Geschwindigkeit drehbar sind.

9. Apparat (101) nach einem der Ansprüche 1 bis 8, wobei die erste gezahnte Führung einen ersten gezahnten Teil (601) mit einem mit einem Ende eines zweiten gezahnten Teils verbundenen Ende aufweist, wobei das eine Ende des ersten gezahnten Teils und/oder des zweiten gezahnten Teils einen einen das erste gezahnte Teil und das zweite gezahnte Teil verbindenden Verbindungsanschluss (605) enthaltenden Ausschnitt (603) definiert.

10. Apparat (101) nach Anspruch 9, wobei das erste gezahnte Teil sich von einer Seite erstreckende Zähne aufweist, der Ausschnitt in der gegenüberliegenden Seite des ersten gezahnten Teils ausgebildet und der Verbindungsanschluss ein integraler Teil des zweiten gezahnten Teils ist.

11. Apparat (101) nach einem der Ansprüche 1 bis 10, wobei der Verbindungsanschluss ein vergrößertes Kopfteil (607) und ein relativ schmales Halsteil (608) aufweist und der Ausschnitt für eine Aufnahme des Kopf- und des Halsteils entsprechend geformt ist.

12. Apparat (101) nach einem der Ansprüche 1 bis 11, wobei das erste sichernde Teil eine zylindrische äußere Oberfläche aufweist.

13. Apparat (101) nach einem der Ansprüche 1 bis 12, wobei das erste sichernde Teil ein Rad aufweist.

14. Verfahren zum Zusammenbauen einer Fenstereinheit (101A) aufweisend:

Positionieren einer ersten gezahnten Führung (102A) entlang einer transparenten Platte (111);
Positionieren einer zweiten gezahnten Führung (102B) entlang der transparenten Platte (111);
Positionieren eines ersten Zahnrades (105A) eines Griffs (103) an der ersten gezahnten Führung (102A) und eines zweiten Zahnrades (105B) des Griffs (103) an der zweiten gezahnten Führung (102B);
wirksames Verbinden einer Blende (104) mit dem Griff (103);
Bereitstellen eines Kontrollmechanismus, der bewirkt, dass das erste und zweite Zahnrad nur mit derselben Geschwindigkeit drehbar sind;
wobei der Kontrollmechanismus (106) eine Welle aufweist, an der die Zahnräder (105A, 105B)

fest angebracht sind;
Bereitstellen einer Schiene (109) mit einer Vielzahl an Magneten (110A, 110B) und einer an der Schiene (109) angeordneten Blende (104), wobei der Griff (103) Magnete (108A - 108D) hat, angeordnet, um mit den in der Schiene (109) angeordneten Magneten (108A, 108B) magnetisch zu interagieren; und
Bereitstellen eines sich über die erste gezahnte Führung (102A) und einen Teil des Griffs (103) erstreckenden ersten Abdeckelements (901); und eines sich über die zweite gezahnte Führung (102B) und einen anderen Teil des Griffs (103) erstreckenden zweiten Abdeckelements (901), wobei das erste und das zweite Abdeckelement (901) die Bewegung des Griffs (103) weg von den gezahnten Führungen (102A, 102B) begrenzen, um zu verhindern, dass sich die Zahnräder (105A, 105B) von den gezahnten Führungen (102A, 102B) lösen.

Revendications

1. Appareil (101) comprenant :

une première piste dentée (102A) ;
une seconde piste dentée (102B) agencée parallèlement à la première piste dentée (102A) ;
une poignée (103) agencée pour changer la configuration d'un store (104) de fenêtre, dans lequel la poignée (103) est pourvue d'une première roue dentée (105A) configurée pour se mettre en prise avec la première piste dentée (102A), une seconde roue dentée (105B) configurée pour se mettre en prise avec la seconde piste dentée (102B) et un mécanisme de commande (106) pour amener les première et seconde roues dentées (105A, 105B) à pouvoir tourner uniquement à la même vitesse ;
dans lequel le mécanisme de commande (106) comprend un arbre auquel les roues dentées (105A, 105B) sont rigidement attachées ;
caractérisé en ce que
l'appareil comprend en outre un rail (109) ayant une pluralité d'aimants (110A, 110B) et un store (104) fixé au rail (109), et la poignée (103) a des aimants (108A-108D) agencés pour interagir magnétiquement avec les aimants (110A, 110B) situés dans le rail (109) ; et
un premier élément de recouvrement (901) s'étendant sur la première piste dentée (102A) et une partie de la poignée (103) ; et un second élément de recouvrement (901) s'étendant sur la seconde piste dentée (102B) et une autre partie de la poignée (103), dans lequel les premier et second éléments de recouvrement (901) limitent le déplacement de la poignée (103) à distance des pistes (102A, 102B) pour empêcher les roues dentées (105A, 105B) de se désengager des pistes dentées (102A, 102B).

2. Appareil (101) selon la revendication 1, comprenant en outre un premier panneau transparent (111), une première glissière (112A) et une seconde glissière (112B) agencée parallèlement à la première glissière, et le rail a des surfaces configurées pour coulisser le long des première et seconde glissières, dans lequel les première et seconde glissières sont configurées pour maintenir le rail à distance du premier panneau transparent pour empêcher le contact.

3. Appareil (101) selon la revendication 2, comprenant en outre un second panneau transparent (115) agencé parallèlement au premier panneau transparent, un premier élément formant barrière (116A) et un second élément formant barrière (116B), dans lequel les premier et second éléments formant barrières s'étendent perpendiculairement au rail et les premier et second éléments formant barrière sont configurés pour empêcher le rail de venir en contact avec le second panneau transparent lorsque l'interaction magnétique entre les aimants de la poignée et les aimants du rail est rompue.

4. Appareil (101) selon la revendication 3, dans lequel le rail a une première partie d'extrémité (114A) s'étendant au travers d'un premier espace (202) entre la première glissière et le premier élément formant barrière ; le premier élément formant barrière comprend une lèvre (203) s'étendant à distance du second panneau transparent ; et le rail a un premier élément d'inter-verrouillage (204) s'étendant depuis la première partie d'extrémité vers le second panneau transparent.

5. Appareil (101) selon la revendication 4, dans lequel le rail a une seconde partie d'extrémité (114B) s'étendant au travers d'un second espace (202) entre la seconde glissière et le second élément formant barrière ; le second élément formant barrière comprend une lèvre (203) s'étendant à distance du second panneau transparent ; et le rail a un second élément d'inter-verrouillage (204) s'étendant depuis la seconde partie d'extrémité vers le second panneau transparent.

6. L'appareil (101) selon l'une quelconque des revendications 1 à 5 dans lequel le rail est configuré pour tomber si l'interaction magnétique entre les aimants du rail et les aimants de la poignée est rompue, et l'appareil comprend une surface pour supporter le rail après rupture de l'interaction magnétique entre les aimants du rail et les aimants de la poignée, ladite surface étant parallèle à la poignée.

7. Appareil (101) selon l'une quelconque des revendications 1 à 6, dans lequel la poignée a un corps principal (151), et l'appareil comprend en outre : un premier élément de recouvrement (901) s'étendant sur la première piste dentée et une première extrémité du corps principal de la poignée ; et un second élément de recouvrement (901) s'étendant sur la seconde piste dentée et une seconde extrémité du corps principal de la poignée.

8. Appareil (101) selon l'une quelconque des revendications 1 à 7, dans lequel l'appareil comprend en outre une seconde poignée (103B) agencée pour changer la configuration du store de fenêtre, dans lequel la seconde poignée est munie d'une première roue dentée (105A) configurée pour se mettre en prise avec la première piste dentée (102A), une seconde roue dentée (105B) configurée pour se mettre en prise avec la seconde piste dentée (102B) et un mécanisme de commande (106) pour relier de manière fonctionnelle la première roue dentée et la seconde roue dentée pour amener les première et seconde roues dentées à pouvoir tourner uniquement à la même vitesse.

9. Appareil (101) selon l'une quelconque des revendications 1 à 8, dans lequel la première piste dentée comprend une première partie dentée (601) ayant une extrémité reliée à une extrémité d'une seconde partie dentée, dans lequel ladite une des extrémités de la première partie dentée et / ou de la seconde partie dentée définissent un évidement (603) comportant une patte de liaison (605) reliant la première partie dentée à la seconde partie dentée.

10. Appareil (101) selon la revendication 9, dans lequel la première partie dentée a des dents s'étendant depuis un côté, l'évidement est formé du côté opposé de la première partie dentée et la patte de liaison fait partie intégrante de la seconde partie dentée.

11. Appareil (101) selon l'une quelconque des revendications 1 à 10, dans lequel la patte de liaison a une partie de tête élargie (607) et une partie de col relativement étroite (608) et l'évidement est conformé de manière correspondante pour recevoir la partie de tête et la partie du cou.

12. Appareil (101) selon l'une quelconque des revendications 1 à 11, dans lequel le premier élément d'interverrouillage comprend une surface externe cylindrique.

13. Appareil (101) selon l'une quelconque des revendications 1 à 12, dans lequel le premier élément d'interverrouillage comprend une roue.

14. Procédé d'assemblage d'une unité de fenêtre (101A) comprenant les étapes consistant à :

positionner une première piste dentée (102A) le long d'un panneau transparent (111) ;
positionner une seconde piste dentée (102B) le long du panneau transparent (111) ;
positionner une première roue dentée (105A) d'une poignée (103) sur la première piste dentée (102A) et une seconde roue dentée (105B) de la poignée (103) sur la seconde piste dentée (102B) ;
relier de manière fonctionnelle un store (104) à la poignée (103) ;
fournir un mécanisme de commande pour amener les première et seconde roues dentées à pouvoir tourner uniquement à la même vitesse ; dans lequel le mécanisme de commande (106) comprend un arbre auquel les roues dentées (105A, 105B) sont rigidement attachées ;
fournir un rail (109) ayant une pluralité d'aimants (110A, 110B) et un store (104) fixé au rail (109), et la poignée (103) a des aimants (108A - 108D) agencés pour interagir magnétiquement avec les aimants (108A, 108B) situés dans le rail (109) ; et
prévoir un premier élément de recouvrement (901) s'étendant sur la première piste dentée (102A) et une partie de la poignée (103) ; et un second élément de recouvrement (901) s'étendant sur la seconde piste dentée (102B) et une autre partie de la poignée (103), dans lequel les premier et second éléments de recouvrement (901) limitent le mouvement de la poignée (103) à distance des pistes (102A, 102B) pour empêcher les roues dentées (105A, 105B) de se désengager des pistes dentées (102A, 102B).

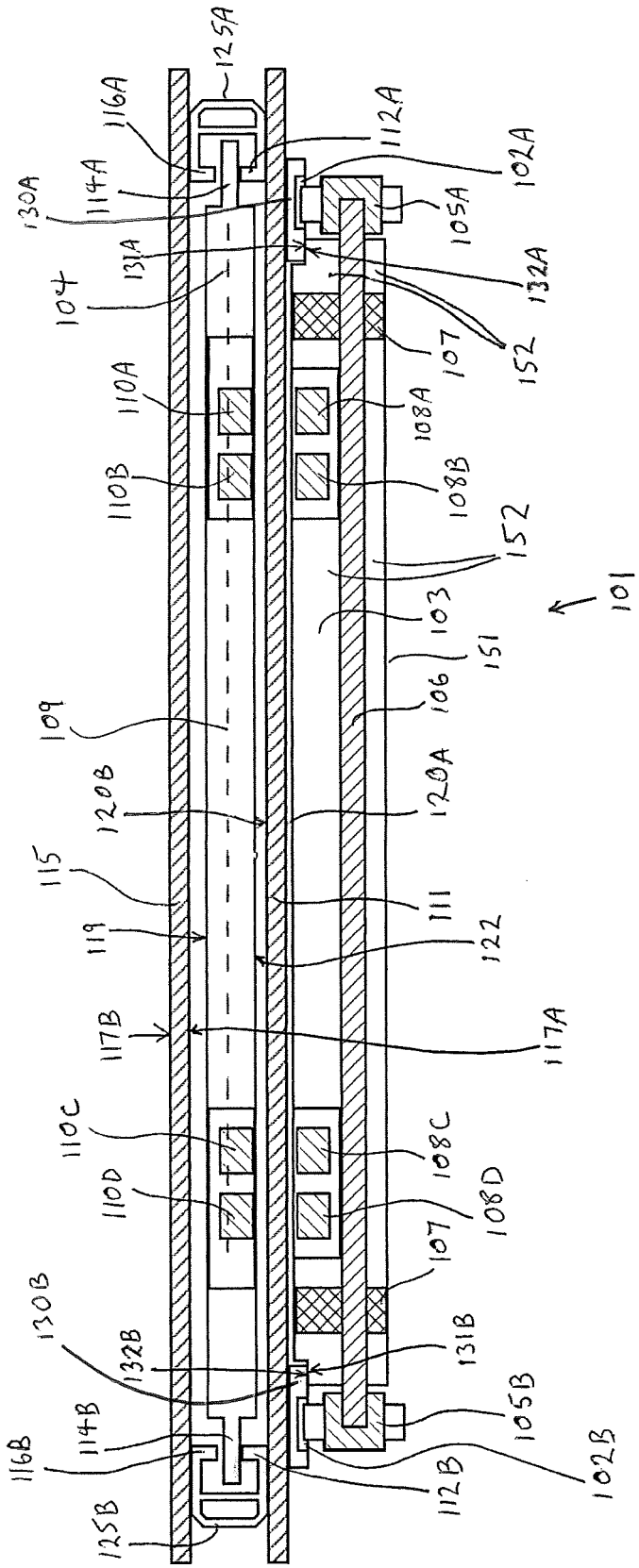

125A
116A
112A
102A
130A
114A
105A
131A
132A
104
107
152
110A
108A
110B
108B
152
101
103
151
106
109
120B
120A
115
111
119
122
117B
117A
110C
108C
110D
108D
107
130B
131B
132B
105B
114B
116B
102B
112B
125B

FIG. 1

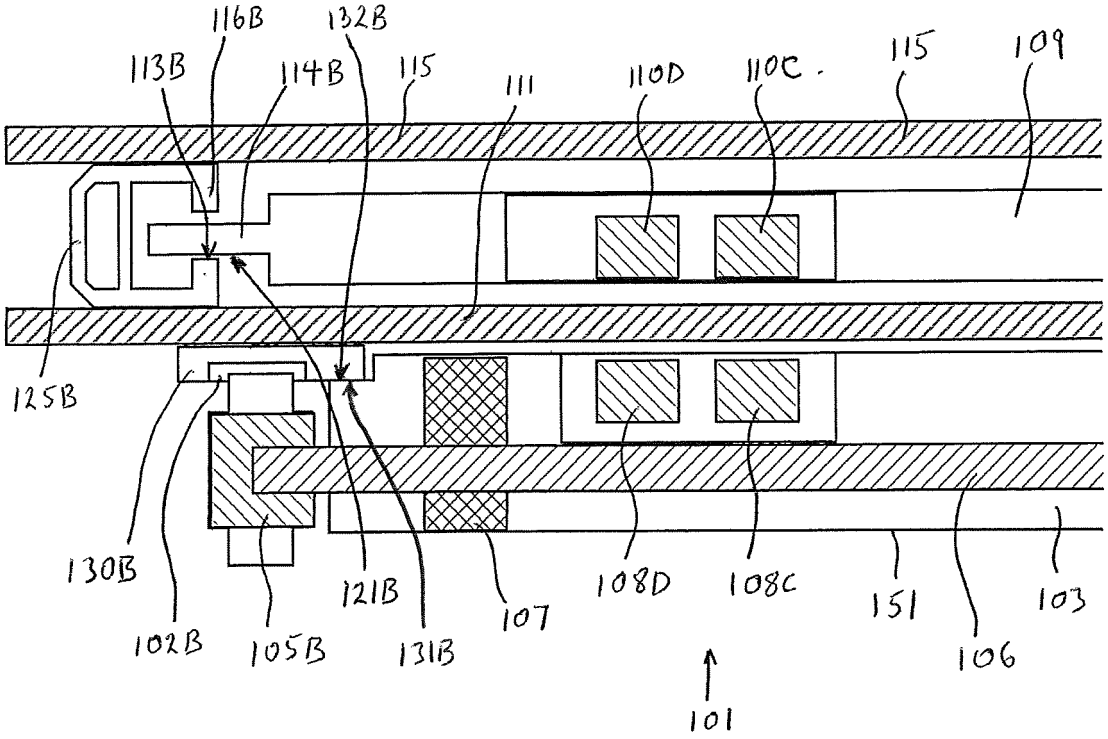

116B
132B
113B
114B
115
111
110D
110C
115
109
125B
130B
102B
105B
121B
131B
107
108D
108C
151
103
106
101

FIG. 1A

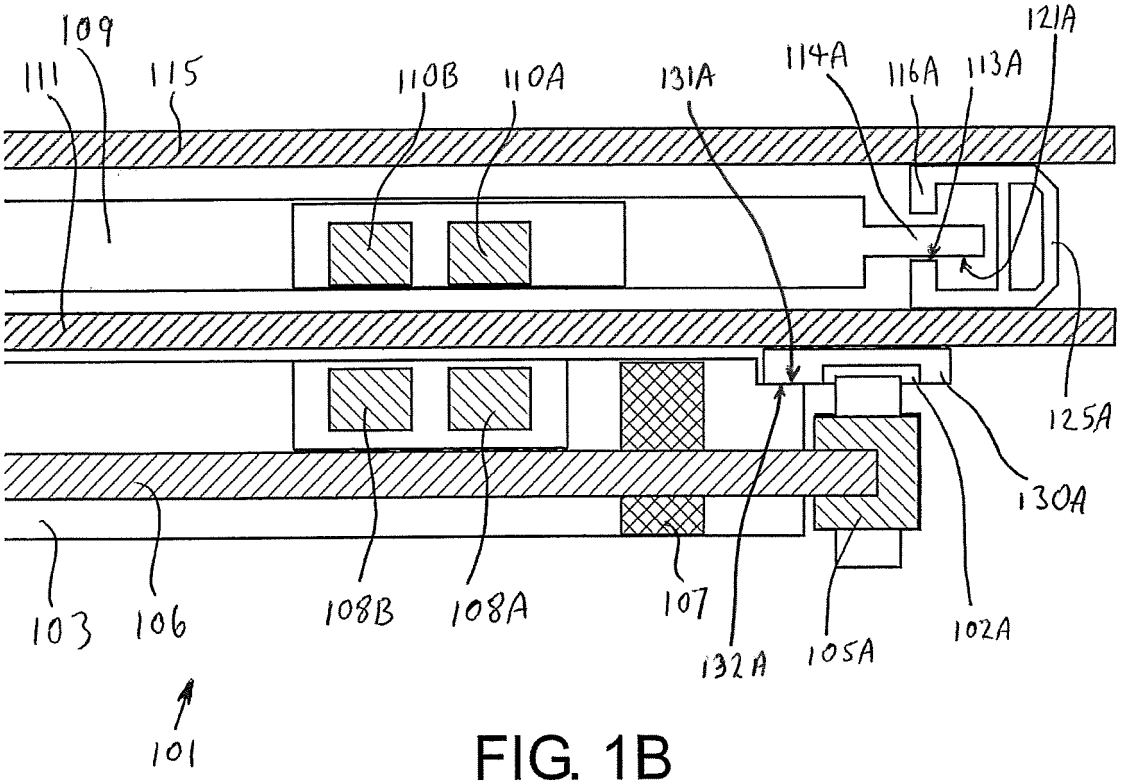

109
111
115
110B
110A
131A
114A
116A
113A
121A
125A
130A
103
106
108B
108A
107
132A
105A
102A
101

FIG. 1B

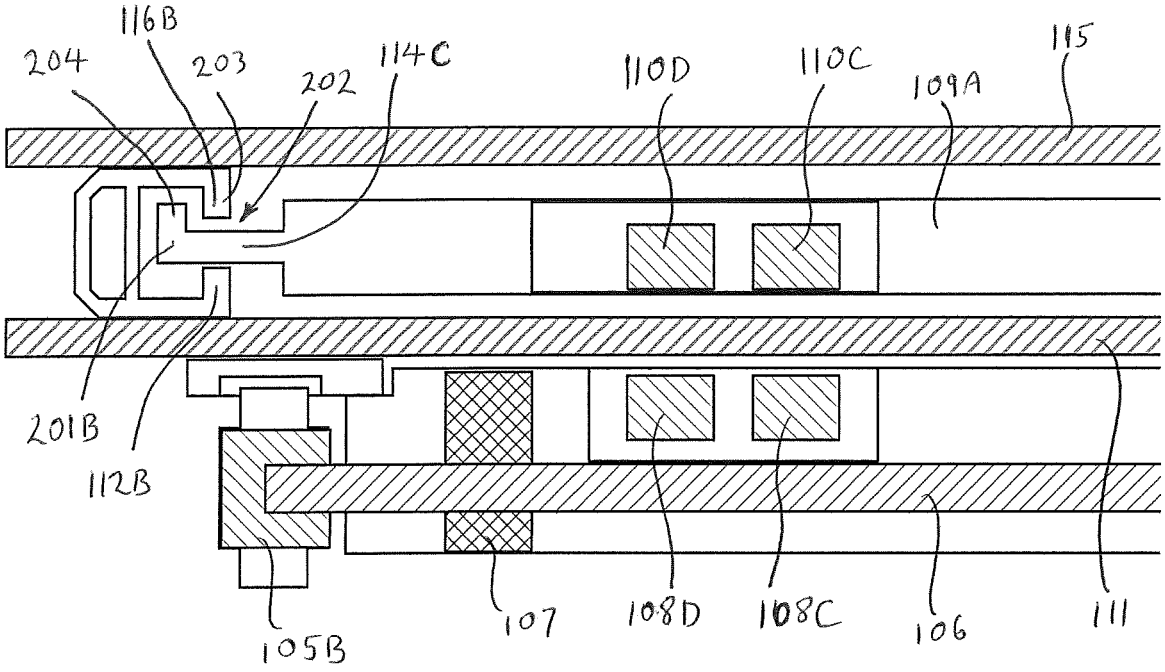

116B
204
203
202
114C
110D
110C
109A
115
201B
112B
105B
107
108D
108C
106
111

FIG. 2A

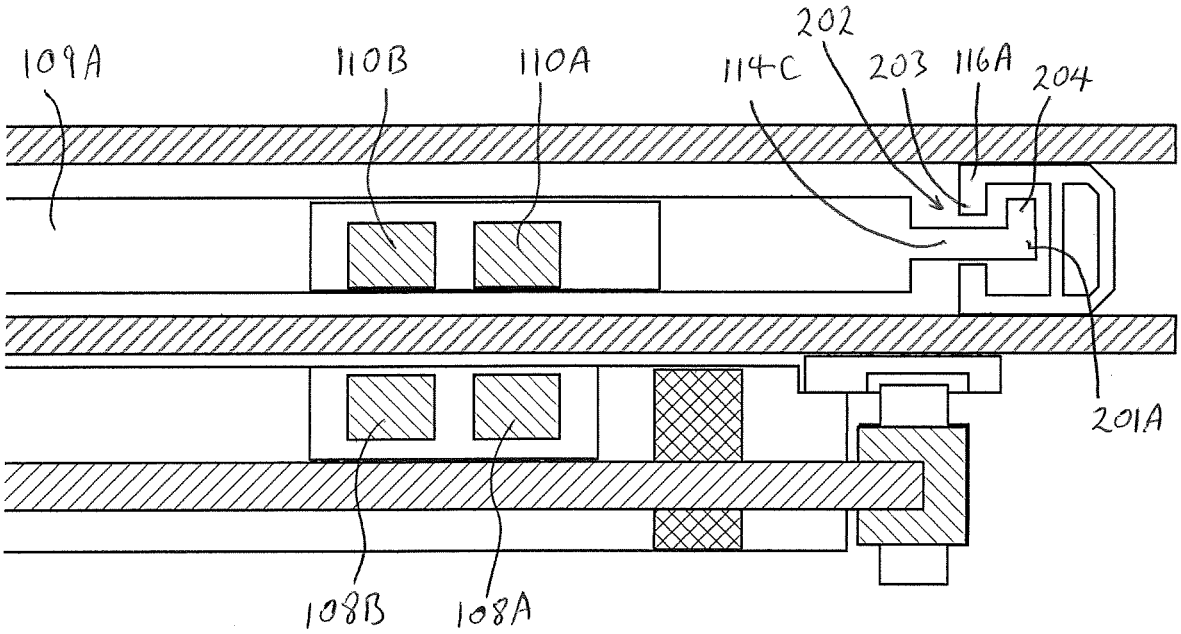

109A
110B
110A
202
114C
203
116A
204
201A
108B
108A

FIG. 2B

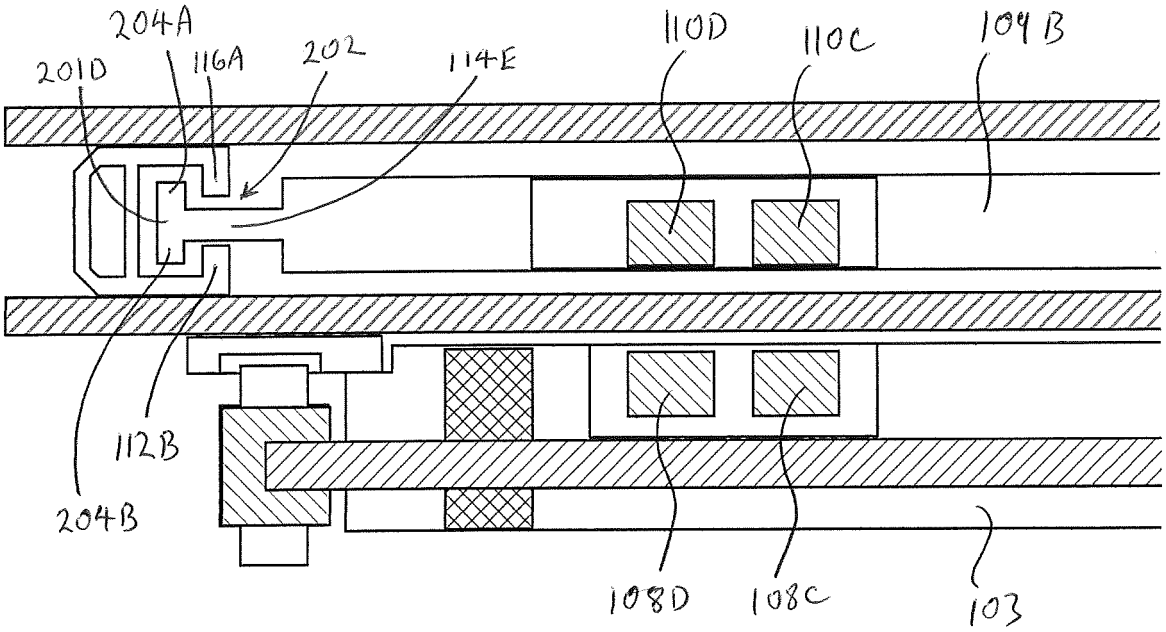

204A
201D
116A
202
114E
110D
110C
109B
112B
204B
108D
108C
103

FIG. 2C

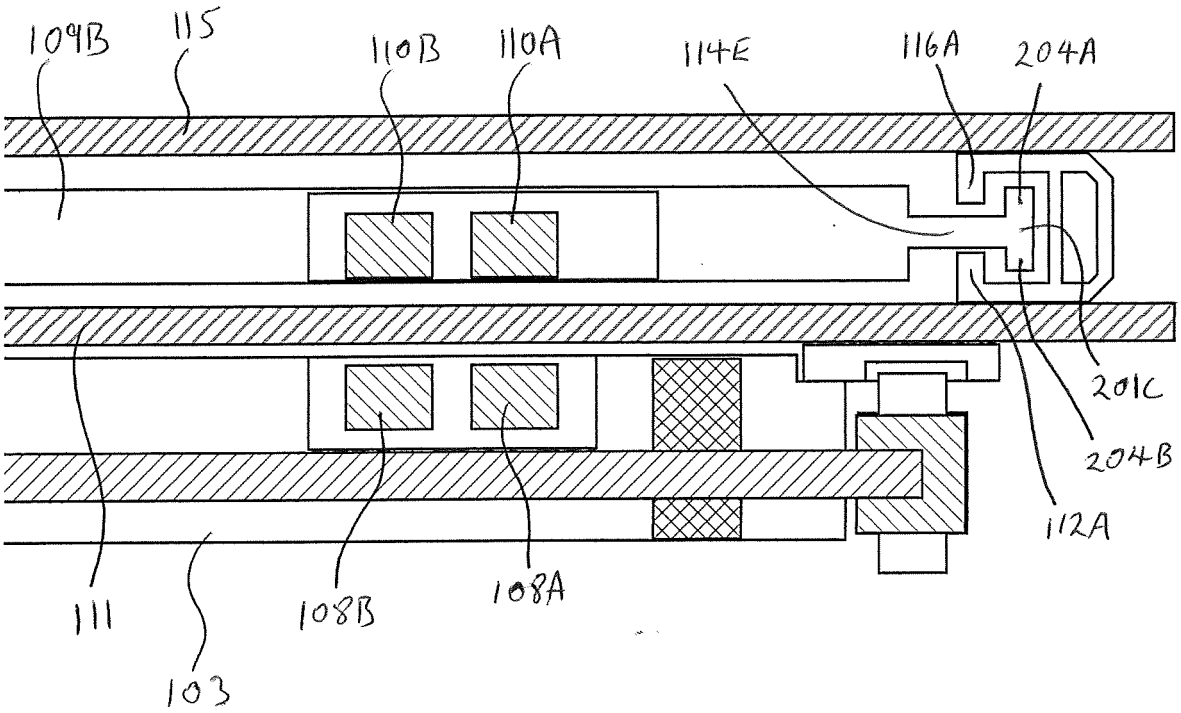

109B
115
110B
110A
114E
116A
204A
201C
204B
112A
111
108B
108A
103

FIG. 2D

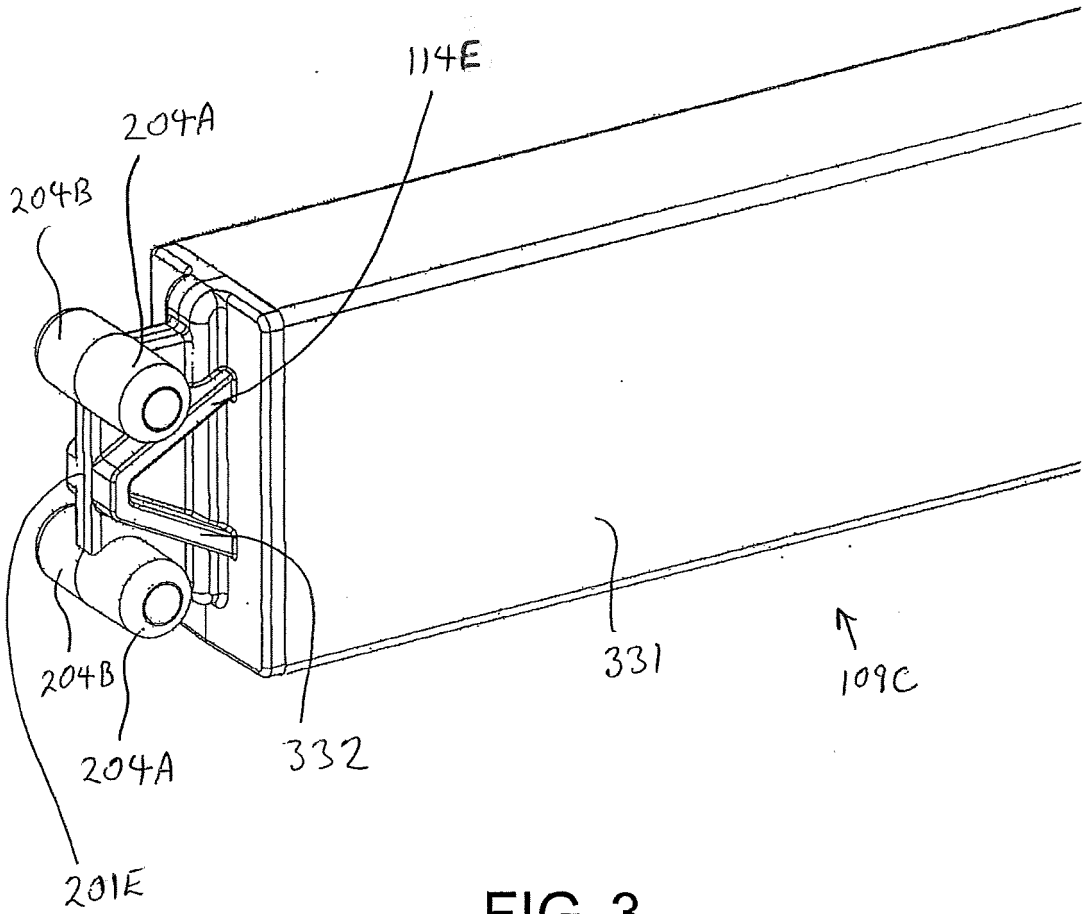


FIG. 3

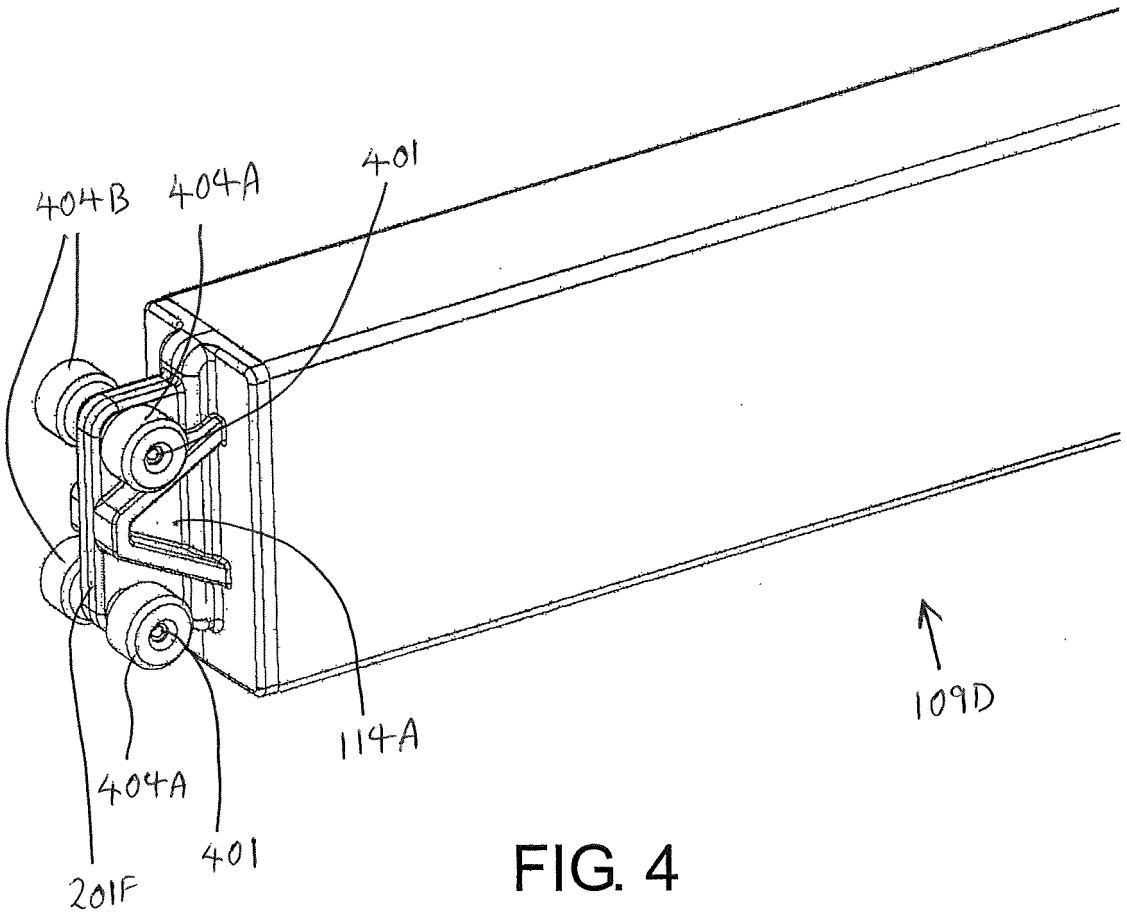


FIG. 4

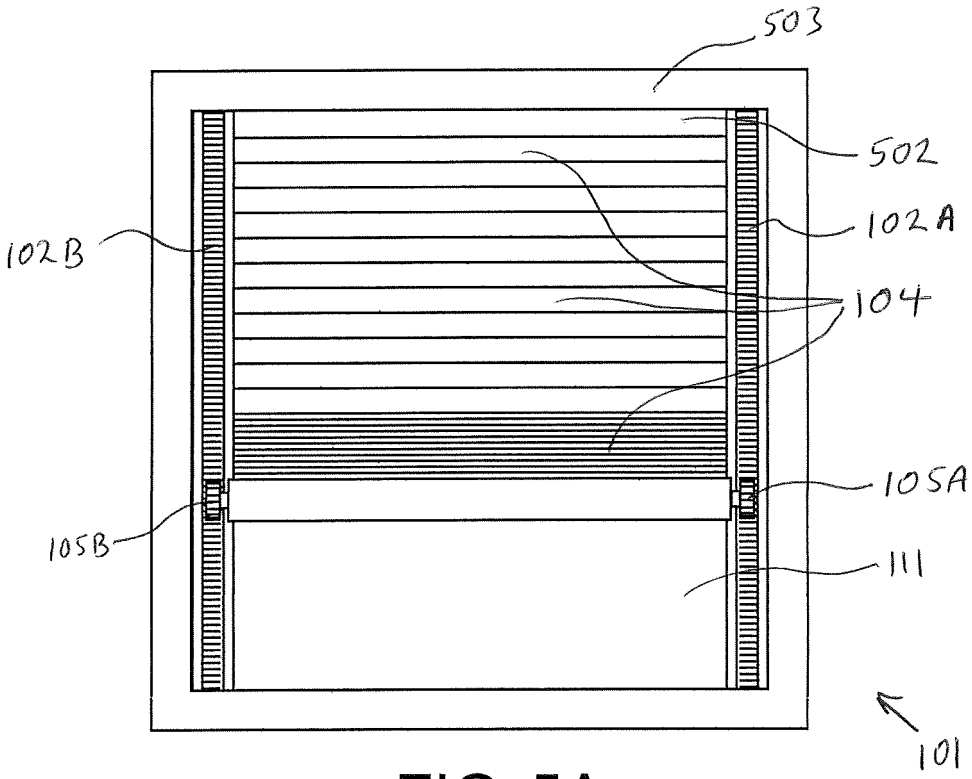


FIG. 5A

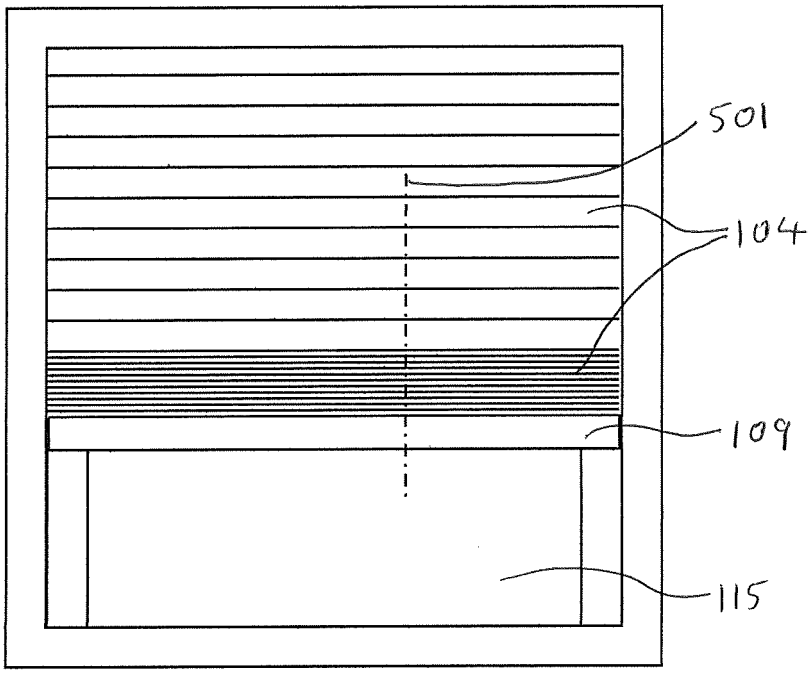


FIG. 5B

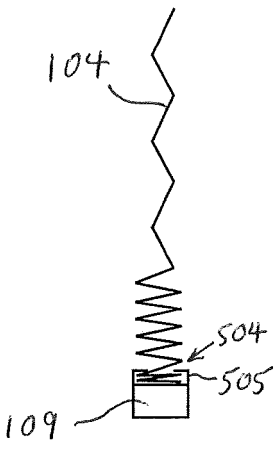


FIG. 5C

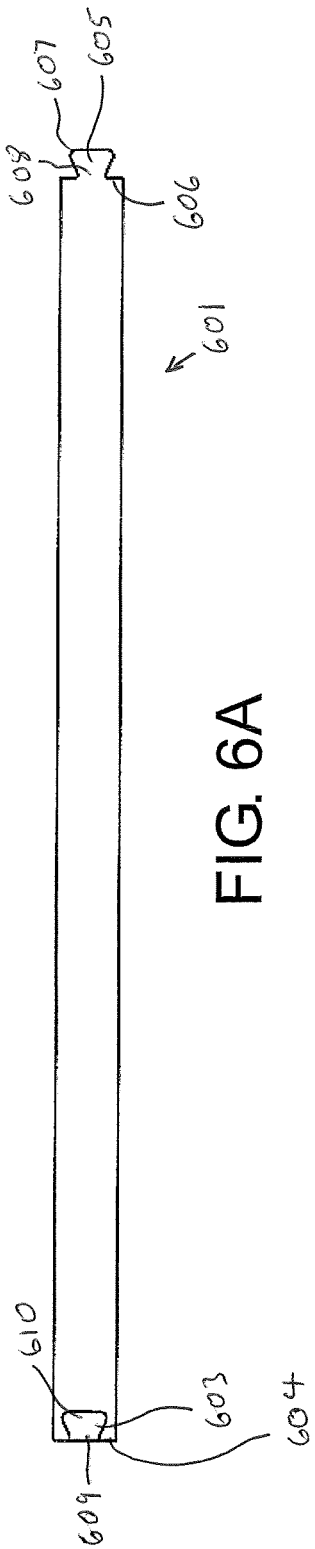


FIG. 6A

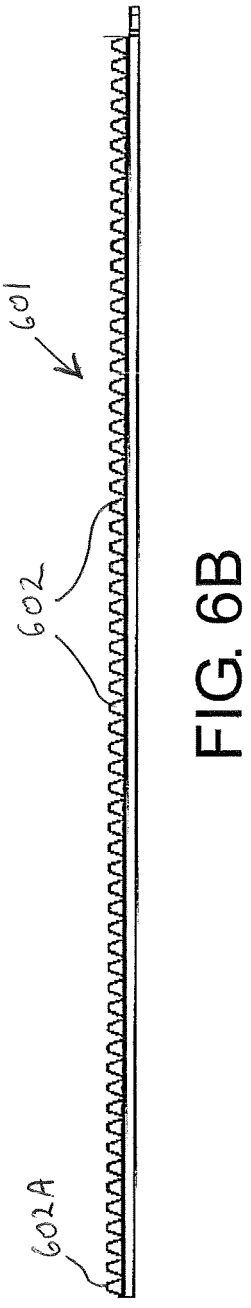


FIG. 6B

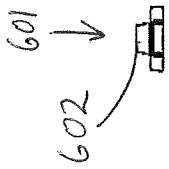


FIG. 6D

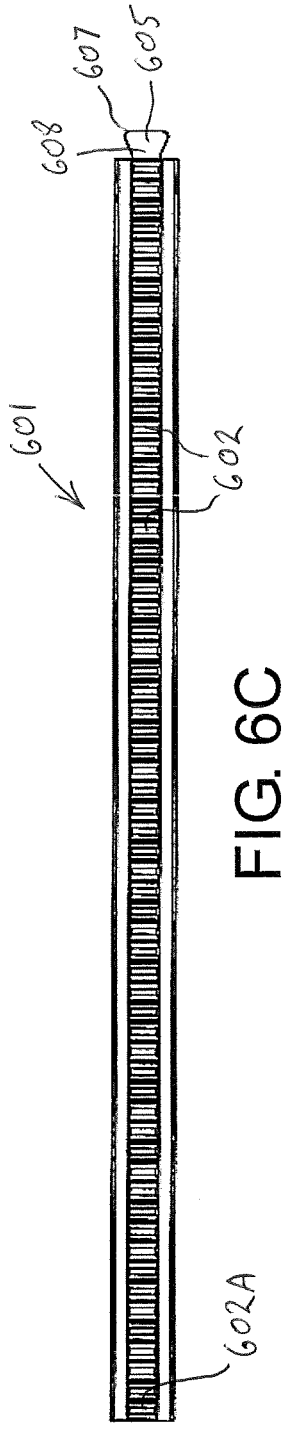


FIG. 6C

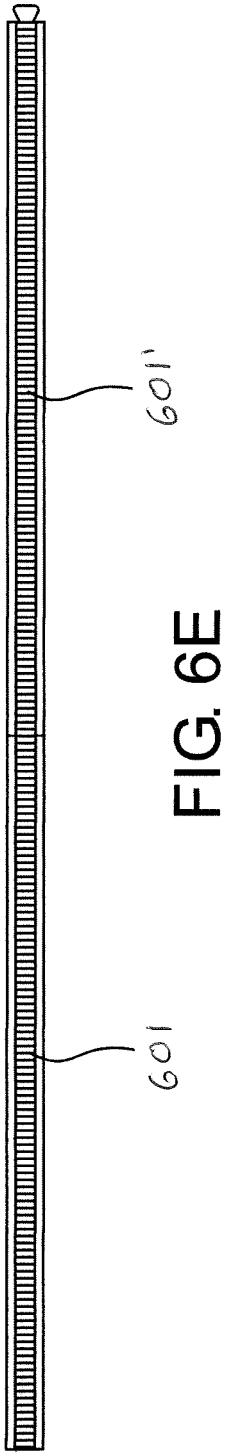


FIG. 6E

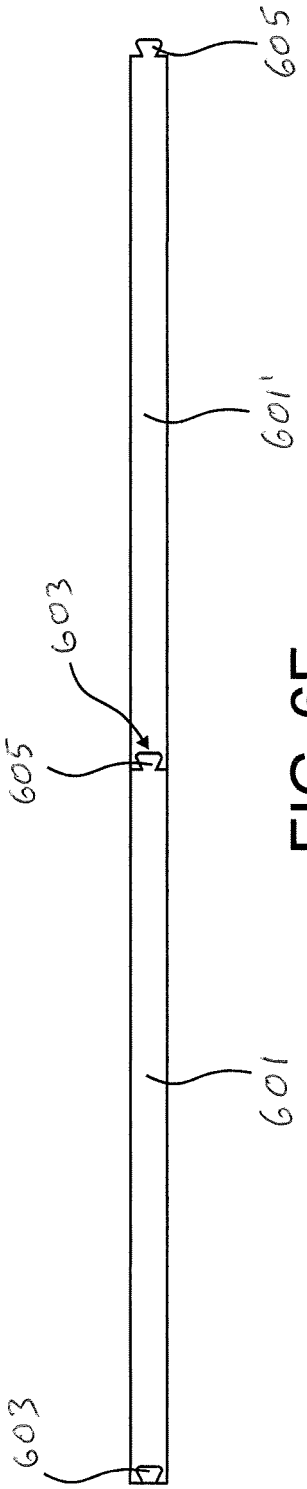


FIG. 6F

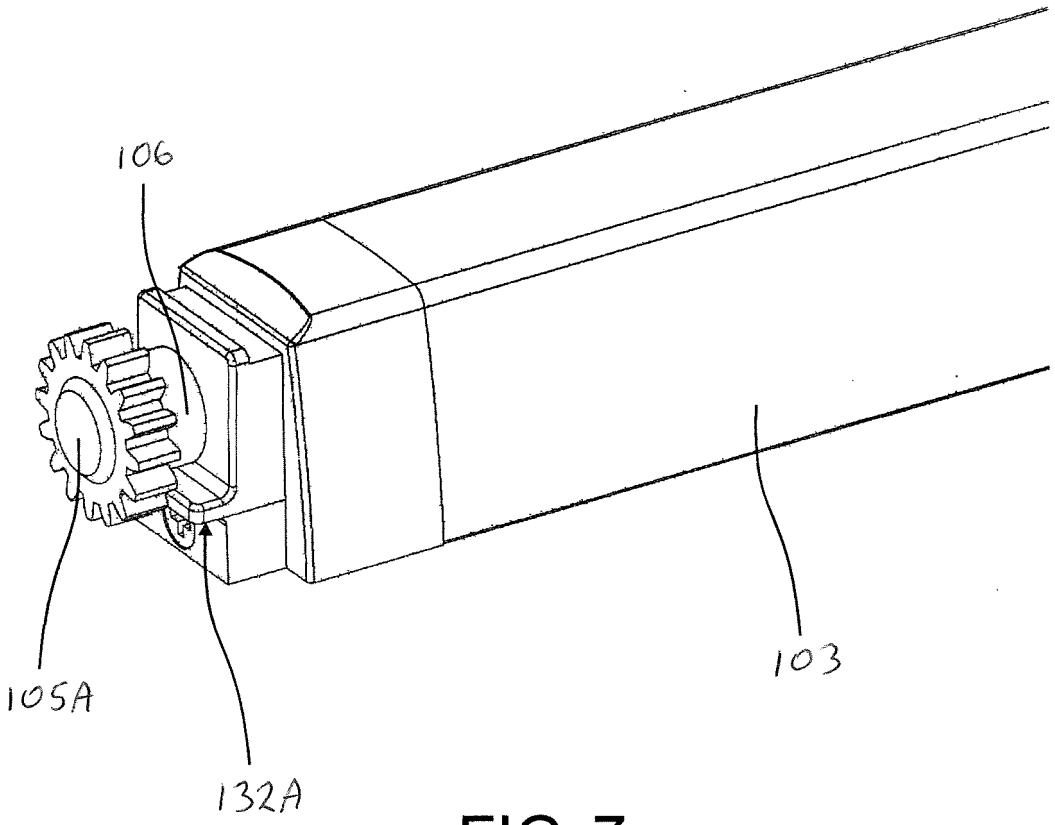


FIG. 7

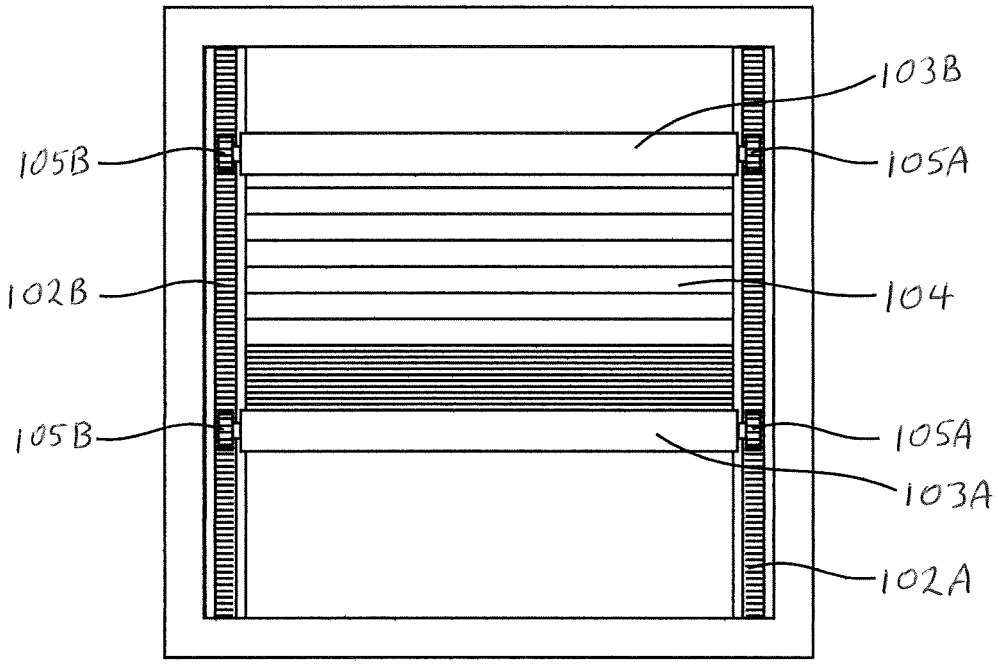


FIG. 8A

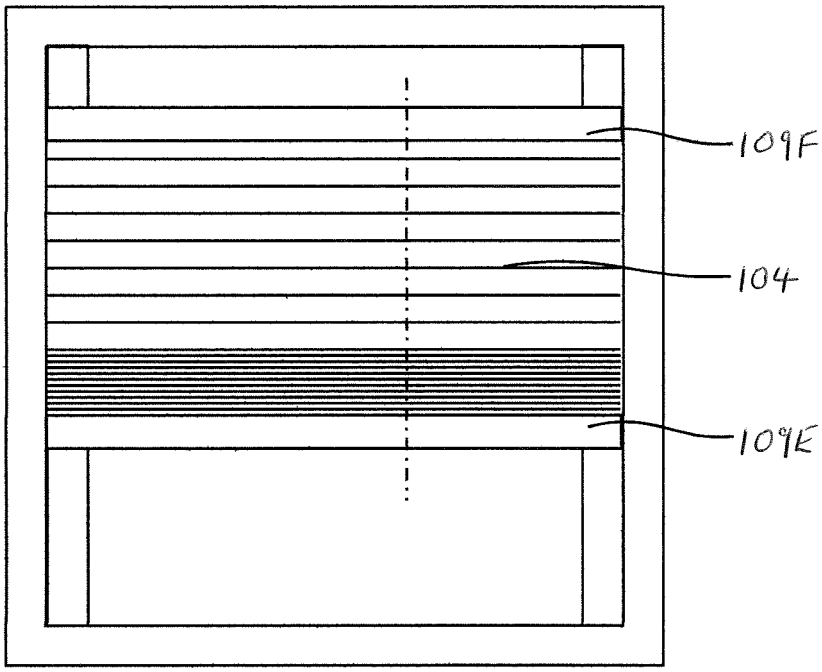


FIG. 8B

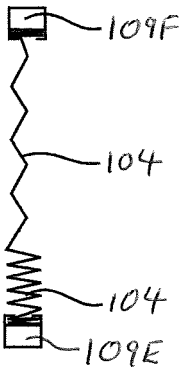


FIG. 8C

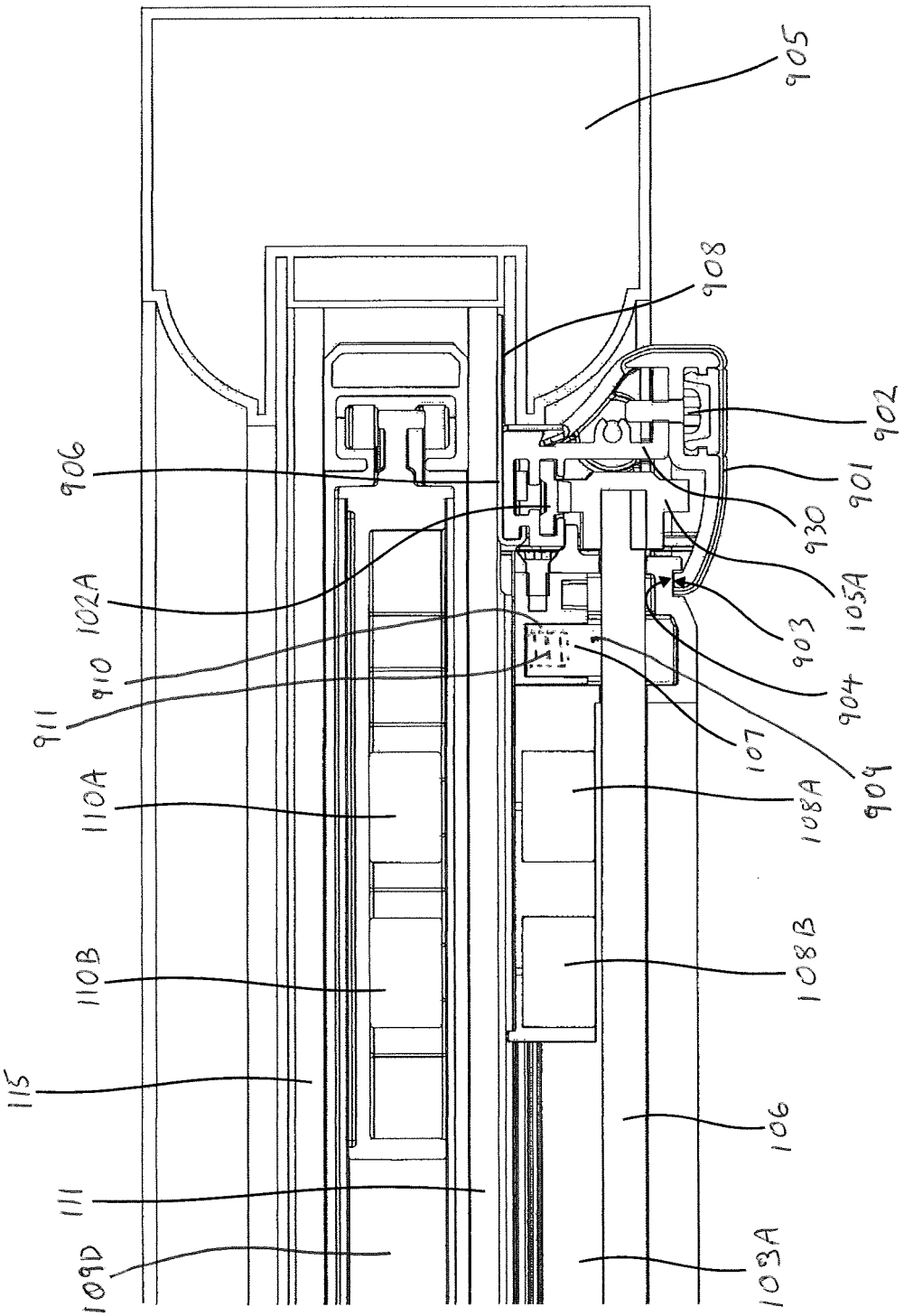

905
908
902
906
901
930
102A
105A
903
910
904
911
107
909
110A
108A
110B
108B
115
106
111
109D
108A

FIG. 9

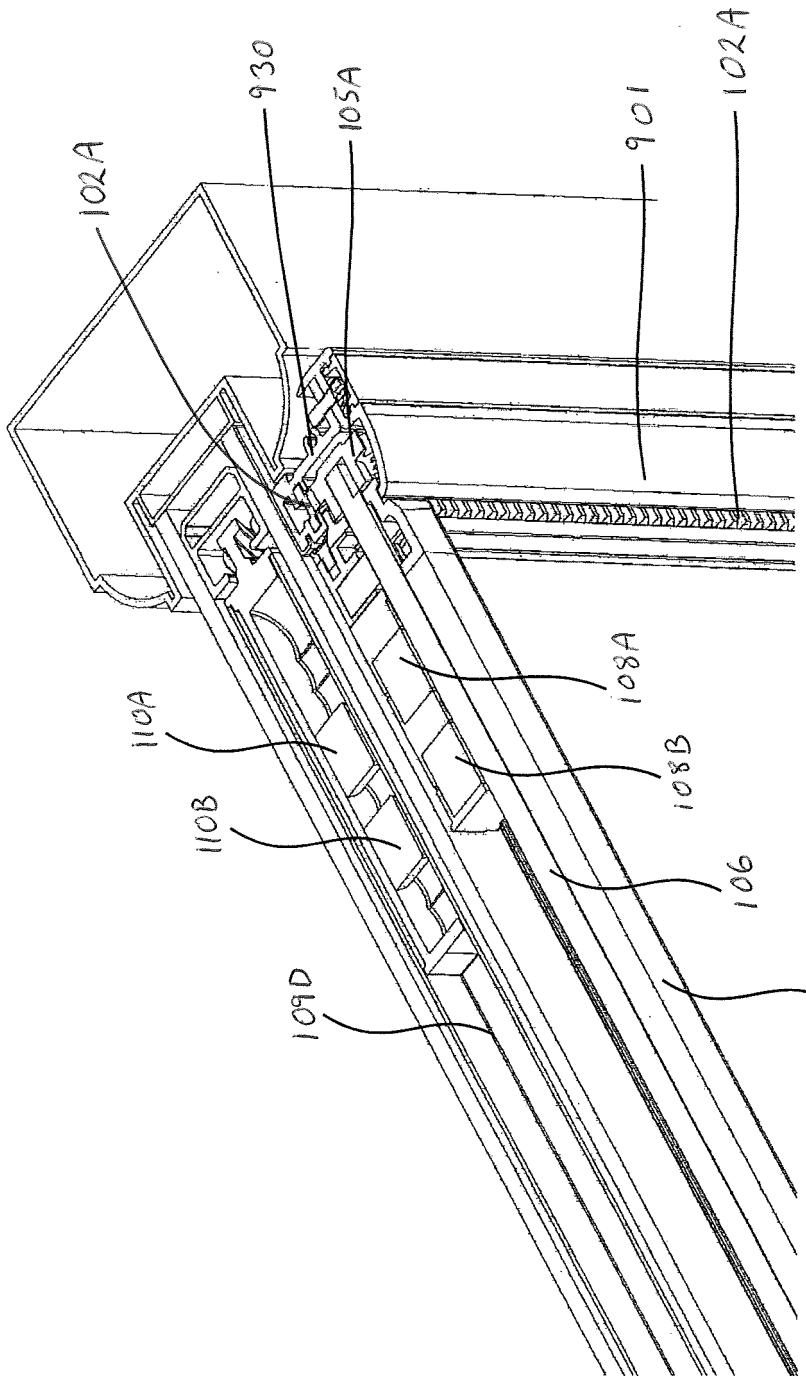


FIG. 10

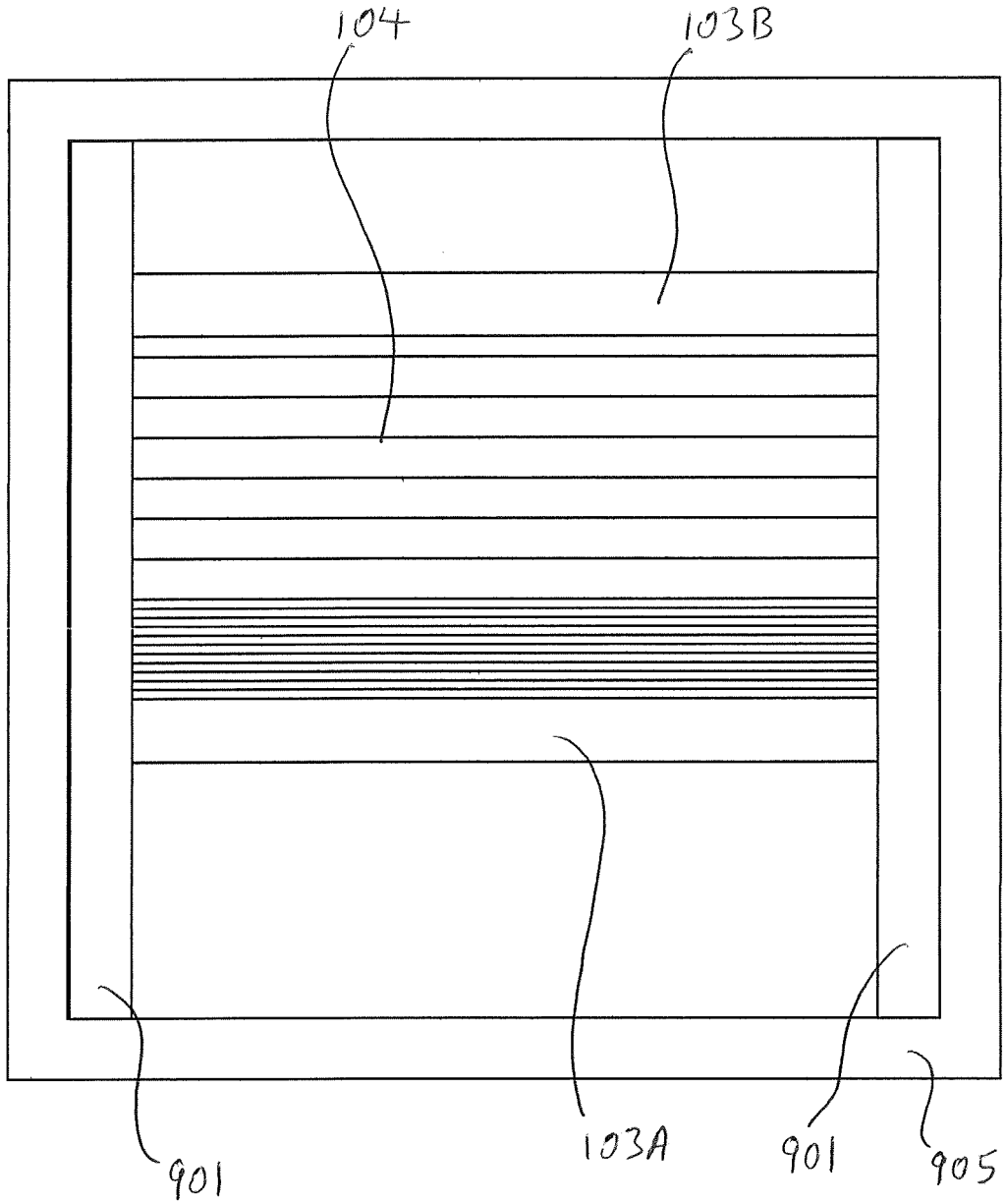


FIG. 11

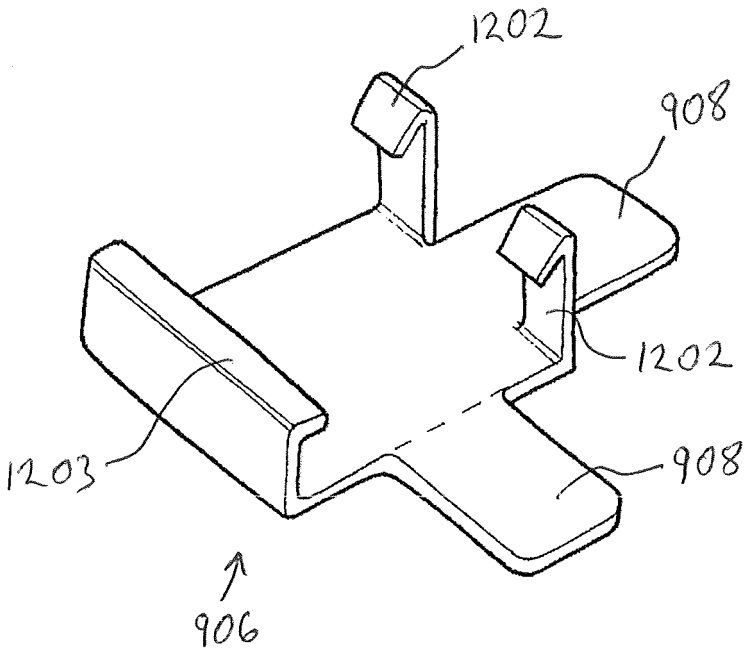


FIG. 12A

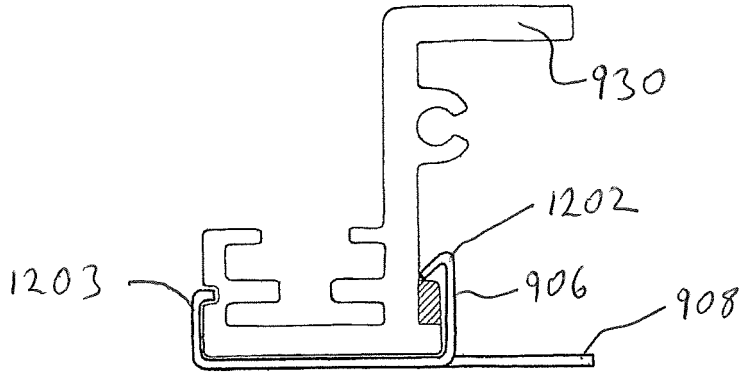


FIG. 12B

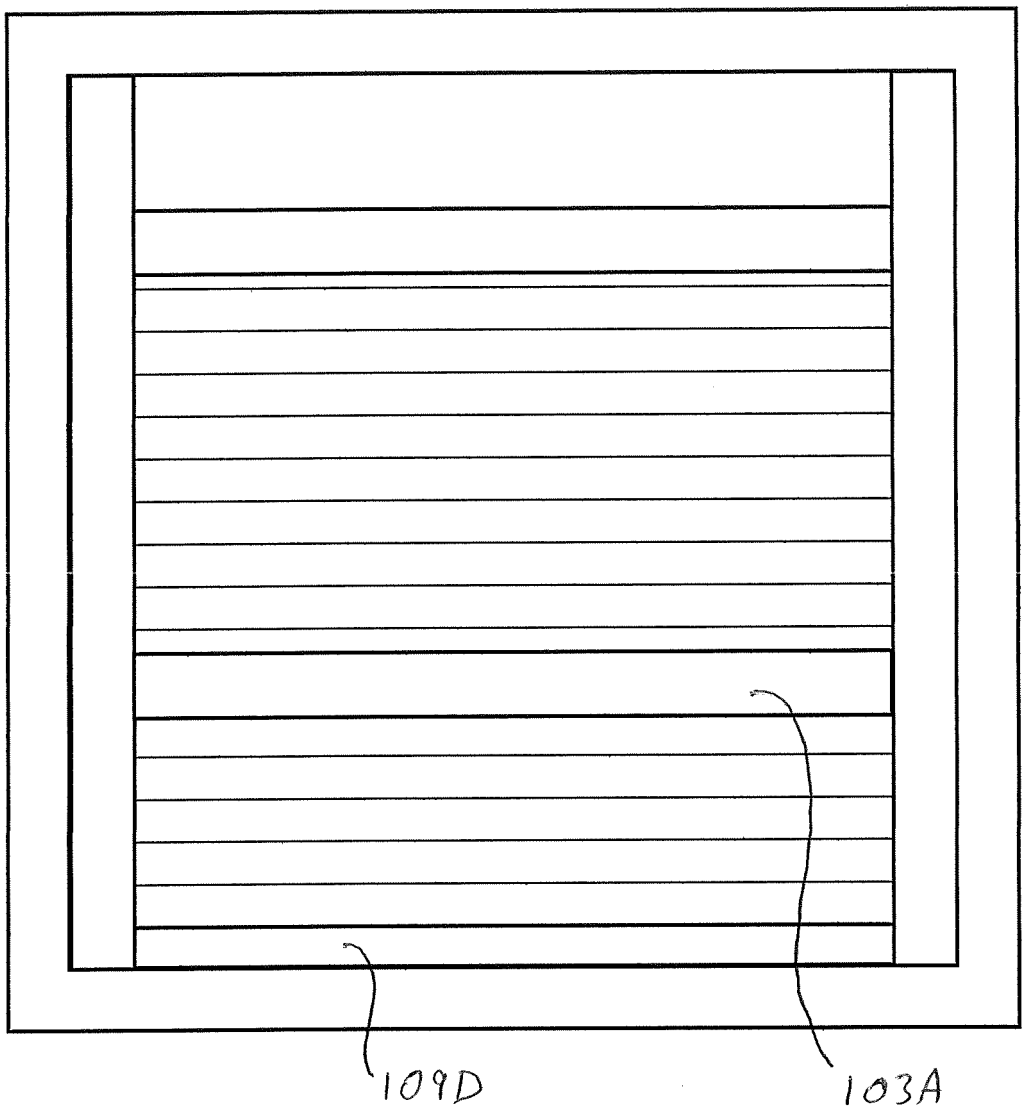


FIG. 13

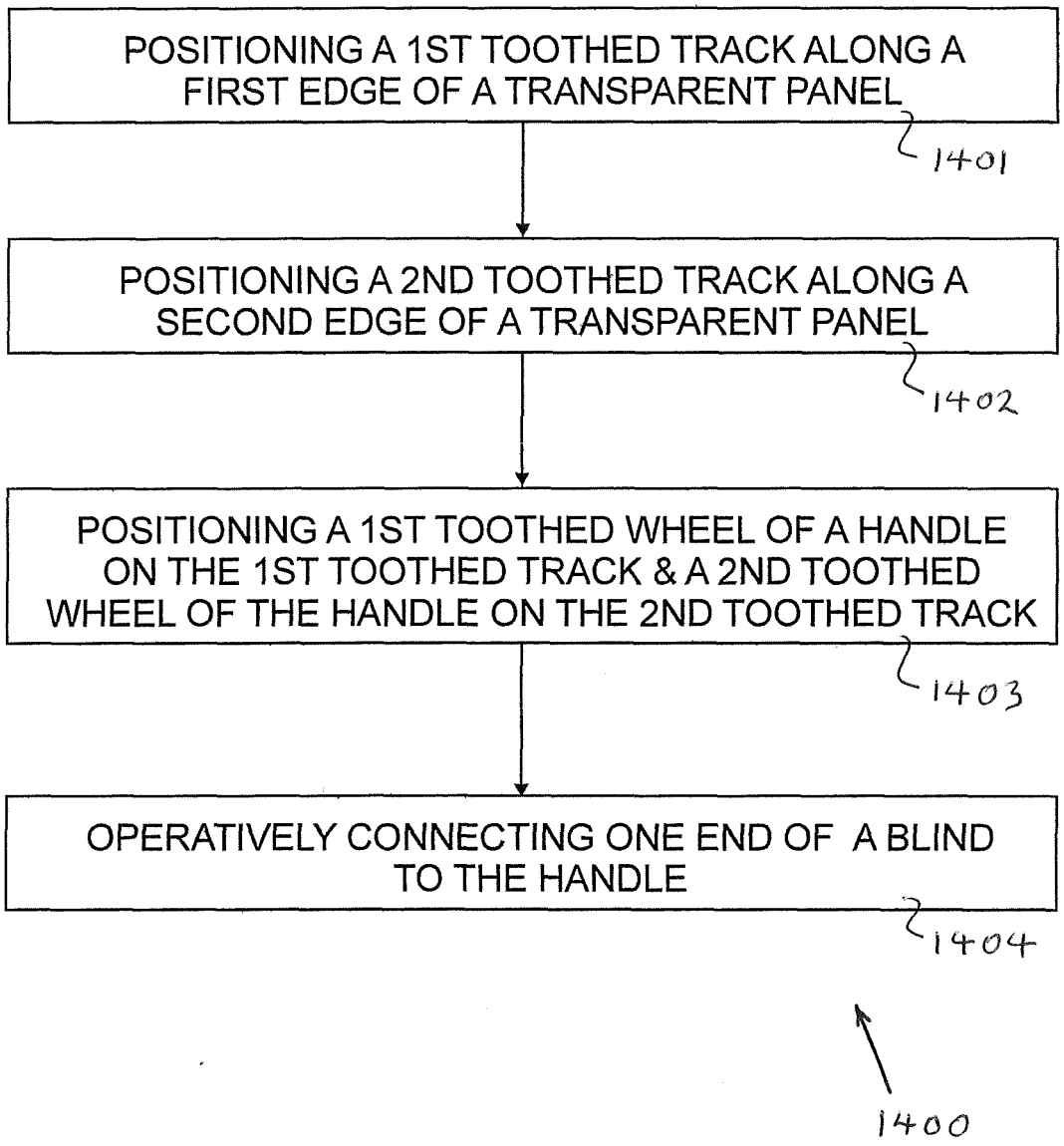

POSITIONING A 1ST TOOTHED TRACK ALONG A FIRST EDGE OF A TRANSPARENT PANEL
1401
POSITIONING A 2ND TOOTHED TRACK ALONG A SECOND EDGE OF A TRANSPARENT PANEL
1402
POSITIONING A 1ST TOOTHED WHEEL OF A HANDLE ON THE 1ST TOOTHED TRACK & A 2ND TOOTHED WHEEL OF THE HANDLE ON THE 2ND TOOTHED TRACK
1403
OPERATIVELY CONNECTING ONE END OF A BLIND TO THE HANDLE
1404
1400

FIG. 14

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20050028944 A1 **[0002]**
- DE 19952414 A1 **[0003]**
- DE 102009045746 **[0003]**
- WO 9700368 A **[0004]**
- WO 0128391 A **[0005]**
- FR 2095958 **[0006]**