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(71) Applicant: **Neri, Antonio**
00135 Rome (IT)

(72) Inventor: **Neri, Antonio**
00135 Rome (IT)

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(74) Representative: **Romano, Giuseppe et al**
Società Italiana Brevetti S.p.A
Piazza di Pietra, 39
I-00186 Roma (IT)

(54) **Moving mechanism**

(57) The present invention relates to a moving mechanism. Preferably, the present invention finds particular application in furniture components or the like. The mechanism according to the invention, associated to a wall having thereinside a containing compartment for putting

away items of various type, is apt to move a cover element between a first position wherein it lies substantially flush with the wall for closing the compartment, and a second raised position such as to make the compartment accessible from the outside.

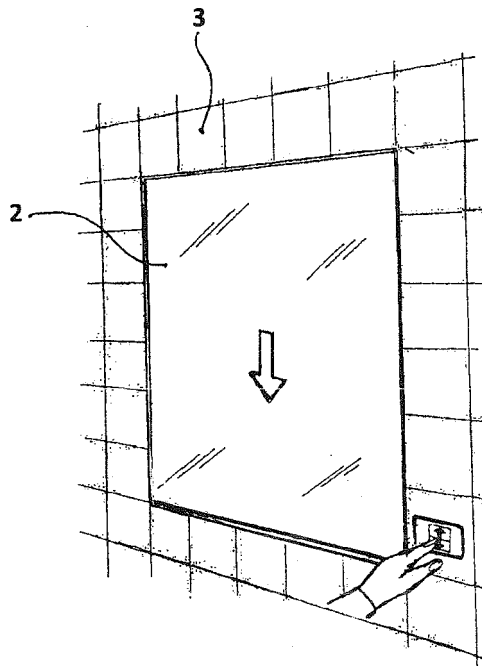


FIG. 1

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Description

[0001] The present invention relates to a moving mechanism. Preferably, the present invention finds particular application in furniture components or the like.

Summary of the Invention

[0002] The mechanism according to the invention, associated to a wall having therein a holding compartment for putting away items of various type, is apt to move a cover element between a first position wherein it lies substantially flush with the wall for closing the compartment, and a second raised position such as to make the compartment accessible from the outside. According to a first preferred embodiment shown herein by way of example and not for limitative purposes, the mechanism subject of the invention, by the arrangement of internal guides inside which a carriage integral to the cover element slides, allows a final tilt of the cover element of only 15° and a partial sliding away thereof inside the wall. According to a second preferred embodiment, the mechanism subject of the present invention allows a configuration of the cover element, in the raised position, substantially parallel to the wall and the partial sliding away thereof inside the wall. A third preferred embodiment of the mechanism subject of the present invention allows a configuration of the cover element, in the raised position, substantially parallel to the wall, and the positioning thereof outside the wall.

Brief Description of the Drawings

[0003] Still further advantages, as well as the features and the modes of the employ of the present invention will be made evident in the following detailed description of a preferred embodiment thereof, given by way of example and not for limitative purposes, reference being made to the figures of the annexed drawings, wherein:

Figure 1 depicts a perspective view of a wall having a compartment comprising a cover element in a lowered position such as to close the compartment itself; Figure 2 depicts the perspective view of the wall of Figure 1, comprising a cover element in a raised position such as to make accessible the compartment according to a first preferred embodiment of the present invention;

Figure 3 shows a rear view of the wall of Figure 1, comprising a moving mechanism according to a first preferred embodiment of the present invention in a raised position, when the cover element is positioned for opening the compartment;

Figure 4 shows a side view of the mechanism of Figure 3;

Figure 5 shows a rear view of the wall of Figure 1, comprising the moving mechanism according to a first preferred embodiment of the present invention

in a lowered position, when the cover element is positioned for closing the compartment;

Figures 6--8 show details of the moving mechanism of which in the preceding figures; and

Figure 9 shows the mechanism in the side view of Figure 5, in which the moving sequence of the cover element is highlighted;

Figure 10A depicts the perspective view of the wall of Figure 1, comprising a cover element in a raised position such as to make accessible the compartment according to a second preferred embodiment of the present invention;

Figure 10B depicts a perspective view of the closure element of Figure 10A in an open configuration;

Figure 11 shows a rear view of the wall of Figure 10, comprising a moving mechanism according to a second preferred embodiment of the present invention in a lowered position;

Figure 12 shows the mechanism of Figure 11 in a raised position;

Figure 13 shows the mechanism of Figure 11 in a side view in which the moving sequence of the cover element is highlighted;

Figure 13A shows an enlarged schematic view of configurations of the element 50 at some positions (raised and lowered) of the cover element of Figure 13;

Figure 14 depicts the perspective view of the wall of Figure 1, comprising a cover element in a raised position such as to make accessible the compartment according to a third preferred embodiment of the present invention;

Figure 14A shows a perspective rear view of the third embodiment of Figure 14;

Figure 15 shows the mechanism of Figure 14 in a side view in which the moving sequence of the cover element is highlighted.

Detailed description of the drawings

[0004] Referring to Figure 1, a wall 3 having a compartment comprising a cover element 2 in a lowered position such as to close the compartment itself is shown. In Figure 2, the cover element in a raised position and a moving mechanism according to a first preferred embodiment of the present invention, generally denoted by number reference 1, are shown.

[0005] As it will be evident from the detailed description of preferred embodiments thereof given herein by way of example and not for limiting purposes, the mechanism 1, 10, 100 is apt to be arranged inside a wall 3, or the like, set on a tread floor (not shown) and having a compartment 4. The compartment 4 is advantageously useful as space for putting away items. Inside the compartment 4 a box 41, having the front side open, is preferably fixed, the box being finished with materials of choice.

[0006] The moving mechanism 1, 10, 100 is configured for moving a cover element 2, in the present example a

mirror, between a first position wherein the mirror lies substantially flush with the wall for closing the compartment 4, and a second raised position wherein such compartment 4 is accessible from the outside (position illustrated in Figures 2, 10, 14, respectively for the first, the second and the third preferred embodiment).

[0007] Referring to next Figure 3, the mechanism 1 is shown from the inside of the wall, in the raised position. In particular, the mechanism 1 comprises a carriage, generally denoted by 11, connected to the mirror 2 and comprising a first top member 111 and a second bottom member 112. The mechanism 1 further comprises substantially rectilinear guide means, e.g. a first rectilinear top slide guide 12, in which the first top member 111 is apt to slide, and a second rectilinear bottom slide guide 13, in which the second bottom member 112 is apt to slide, further comprising a partitioning element 5 apt to outline the abovementioned top and bottom guides.

[0008] The mechanism comprises a moving system 14 associated to the carriage 11, apt to move the mirror between the first and the second position. Preferably, in the example shown the moving system 14 comprises an octagonal roller motor 141, connected to the first top member 111 by steel ropes 142.

[0009] Referring to Figure 4, the mechanism 1 is visible from a side view. The first top slide guide 12 further comprises, as shown in Figure 4, near the partitioning element 5, a portion tilted by a first angle α , greater than zero, with respect to the tread floor. In particular, the partitioning element 5 itself, shaped like a portion of rectilinear track, is positioned with a tilt equal to a first angle α , greater than zero, with respect to the tread floor. Preferably, the partitioning element 5 itself defines the upwards-tilted path of the tilted portion of the first top guide. In order to allow the desired tilt of the cover element, the first angle α with respect to the tread floor is preferably equal to 30° . As shown in Figure 4, at the top end of the mirror, also the edge of the compartment obtained in the wall has a tilt, e.g. of a second angle β , preferably equal to 45° , such as to allow the tilt of the mirror and the introduction of the mirror itself inside the wall. With such an arrangement, a mirror tilted of only 15° when raised in the second position and its partial sliding away inside the wall are advantageously obtained.

[0010] Referring now to Figure 5, the moving mechanism 1 according to the first embodiment of the invention is shown, when the mirror is positioned to cover the compartment.

[0011] The first top member comprises a top bar 111, which at its ends has a pair of wheels 1111, preferably made of Teflon. The top guide 12 comprises a pair of tracks 12 opposite to each other and integral to the wall, each wheel 1111 being apt to slide inside the respective track.

[0012] Likewise, the second bottom member comprises a bottom bar 112, having at its ends a pair of wheels 1121, preferably made of Teflon. The bottom guide comprises a pair of tracks 13 opposite to each other and in-

tegral to the wall, each wheel 1121 being apt to slide inside the respective track.

[0013] As it is clearly visible in Figures 3 and 5, the motor 141 raises the bar 111, which is forced to slide inside the guide 12. Such sliding also causes the sliding of the bottom bar 112 inside the respective tracks 13. In fact, the bars 111 and 112 are both connected to the mirror and therefore integral thereto during its moving.

[0014] According to an aspect of the invention, the carriage 11 (comprising the bars 111 and 112) is advantageously removably connected to the mirror. In particular, such a connection is made by an extractable joining element 15, preferably having a fork-type shape.

[0015] As best shown in Figure 6 on the left, the mirror 2 is advantageously mounted on a frame 21 having a pair of top 211 and bottom 212 seats. Correspondingly, the bar 111 has top seats 1115, and likewise the bar 112 has respective bottom seats 1125. The top seats of the frame 21 and of the bar 111 are positioned so as to be normally aligned. Likewise, the bottom seats of the frame 21 and of the bottom bar 112 are positioned so as to be normally aligned. As it is well visible in Figure 6 on the left, the fork-shaped element 15 comprises a pair of top pins 151 and of bottom pins 152 facing downwards, arranged so as to be capable of being inserted each inside the respective housing, formed by the seats 211 and 212 of the frame when aligned respectively with the seats 1115 and 1125 of the top and bottom bars. The insertion of the pins of the fork-shaped element 15 inside said housings ensures the integral connection of the carriage 11, comprising the pair of bars 111 and 112, to the frame 21 and therefore to the mirror 2. Thus, it will be appreciated how the raising of the bar 111 by the motor (not shown) determines the raising of the mirror, along the path defined by the guides, as detailed above.

[0016] The extraction of the fork-shaped element 15 therefore determines the disconnection between the frame and the carriage. In particular, such extraction is easily actuatable by translating the fork upwards, so as to disengage its pins from the respective housings. According to an aspect of the invention, the moving mechanism further comprises a pair of locking means apt to lock the fork 15 when extracted from the carriage. Preferably, such locking means comprises a pair of magnets 159, onto which the fork connects precisely when extracted from the carriage. In such a preferred embodiment, the fork is made of magnetic or ferromagnetic material, so as to magnetically cooperate with the magnets 159. Therefore, the extraction of the fork enables an easy disconnection of the carriage from the mirror, so as to simply and effectively enable any servicing operation to the mechanism internally to the wall in which it is arranged.

[0017] Referring to Figure 6 on the right, the top bar 111 is shown in a perspective view inside the respective top guide 12. In the preferred embodiment shown herein by way of example and not for limitative purposes, the top guide 12 has a first rectilinear portion tilted upwards by a first angle α , to which follows a substantially vertical

section, denoted in figure by number reference 125. It will be appreciated that what described relative to the guide 12 in figure holds true also for any guide of the mechanism according to the invention.

[0018] In Figure 7 is instead reported a detail of the fork 15, showing the pin 151 when extracted (figure on the left) and when inserted (figure on the right) inside the housing made up of the top seat 211 of the frame 21 (on which the mirror is mounted) and of the top seat 1115 of the bar 111 when aligned.

[0019] Figure 8 shows an inspection box for controlling electrical connections (Figure 8, on the left) and a motor-tuning box 141 (Figure 8, on the right). The moving system could further comprise a pushbutton-driven control, obtained e.g. on the external face of the wall near the mirror, for driving the motor 14 and therefore moving the mirror between the closed position and the raised position, so as to enable or not to enable access to the compartment.

[0020] Finally, Figure 9 shows in an A-B-C-D sequence the moving of the mirror 2 by the moving system 14, according to what described in detail above.

[0021] In Figure 10 are depicted the cover element in a raised position and a moving mechanism according to a second preferred embodiment of the present invention, generally denoted by number reference 10.

[0022] Referring to next Figure 11, the mechanism 10 is shown from inside the wall, when the cover element 2, in a raised position, is positioned for closing the compartment.

[0023] In particular, the mechanism 10 comprises a carriage, generally denoted by 11', connected to the mirror 2 and comprising a first top member 111' and a second bottom member 112'. The mechanism 10 further comprises substantially rectilinear guide means, e.g. a first rectilinear top slide guide 12, in which the first top member 111' is apt to slide, and a second rectilinear bottom slide guide 13, in which the second bottom member 112' is apt to slide, further comprising a partitioning element 50 apt to outline the aforesaid top and bottom guides.

[0024] In particular, the partitioning element 50 is a rotatable exchange element, shaped so as to have a first and a second arm positioned therebetween at a second angle β , as shown in Figure 13A.

[0025] In particular, the second angle β of the partitioning element is preferably equal to $90^\circ +$ the aforesaid first angle α , the first angle α being the angle of tilt of the portion tilted with respect to the tread floor, as better described hereinafter.

[0026] In Figure 12 the mechanism 10 is shown from inside the wall, when the cover element 2 is in a raised position, allowing access to the compartment 4.

[0027] As shown in Figures 11 and 12, the partitioning element 50 is apt to assume a first exchange position 50 (A) for allowing a sliding of the first top member 111' in the first top guide 11 and a second exchange position 50 (B) for allowing a sliding of the second bottom member 112' in the same first top guide 12. Advantageously,

therefore, in the raised configuration of the mirror, also the bottom member 112' slides inside the top guide 12 - as will be better described hereinafter - thereby allowing the mirror to position itself inside the wall in a configuration substantially vertical to the tread floor and parallel to the wall 3 itself.

[0028] The mechanism 10 comprises a moving system 14' associated to the carriage 11', apt to move the mirror between the lowered position and the raised position. Preferably, in the example shown the moving system 14' comprises an octagonal roller motor 141', e.g. positioned in the bottom part of the compartment, connected to the second bottom member 112' by ropes 142', preferably of steel. Advantageously, the positioning of the motor 141' in the bottom part of the compartment makes a top space of the compartment itself available for the guides and therefore for the raising of the mirror. As shown in Figure 11, in the lowered position, the bottom member 112' is held in position by a pair of retaining elements 170, preferably U-shaped. Such elements are positioned at a bottom end of the second bottom guide 11, so as to prevent a protrusion of the carriage 11' from the guide means. Moreover, the retaining elements 17 are mounted on a slot obtained on the frame 21 so as to allow a displacement thereof with respect to the plane defined by the wall and enable an adjustment of the positioning of the carriage 11', and therefore of the mirror, with respect to the wall itself. The ropes 142', e.g. chains or belts, as shown in Figures 11 and 12, are fixed to a bottom end of the frame 21 and, via transmission means 171, e.g. rollers or gear wheels, drive the frame in the mirror raising and/or lowering operations for allowing the compartment opening and/or closing operation.

[0029] The bottom member 112' is constrained to the frame by means of rod-like elements 190 hinged at the bottom end of the frame. Such rod-like elements are rotatably connected to the bottom member 112', so as to allow a relative rotation thereof, e.g. by hinges inside which the member 112' can rotate about a main axis thereof.

[0030] Moreover, further rod-like elements 191 are provided for a connection of the bottom member 112' to a top end of the frame 21. Such rod-like elements 191 are hinged at their ends, respectively to the bottom member 112' and to the frame 21, for allowing a relative rotation thereof.

[0031] The hinges arranged at the ends of the rod-like elements 191 are removable, that is, can be taken down for allowing detachment of the carriage 11' from the frame 21 of the mirror 2. Alternatively, a connection of the carriage 11' to the frame of the mirror 2 is provided by an extractable joining element 15, having preferably a fork-type shape, as described above with reference to the first embodiment of the present invention.

[0032] The carriage 11' further comprises still further rod-like elements positioned for connecting the above-mentioned top 111' and bottom members 112'.

[0033] At a bottom edge of the compartment obtained

in the wall, snap elements 160, e.g. magnetic snap elements, are provided for opening the mirror under maintenance conditions. In that case, from the lowered configuration shown in Figure 11, it will be possible to proceed to an opening of the mirror by rotation of the frame 21 about the hinges of the further rod-like elements. By removal of the rods 193, which are slidably inserted in the ends of the top 111' and bottom 112' elements, it will therefore be possible to allow a protrusion of the ends of the elements themselves from the respective guide and provide for all maintenance operations required. Advantageously, it will therefore be possible to proceed to a manual opening of the mirror, as shown in Figure 10B, and access to the compartment 41 also under power cut conditions.

[0034] Referring to Figure 13, the moving of the mirror 2 by the moving system 10 is shown in sequence A-B-C-D, from a completely raised configuration of Figure 13 A to a completely lowered configuration of Figure 13 C.

[0035] Preferably, the partitioning element 50 itself defines the upwards-tilted path of the tilted portion of the first top guide. The aforesaid first angle α with respect to the tread floor is preferably equal to 30° .

[0036] Finally, Figure 13A shows the mechanism 10 in a side view. The first top slide guide 12 comprises, near of the partitioning element 50, a portion tilted by a first angle α , greater than zero, with respect to the tread floor.

[0037] In Figure 14 there are depicted the cover element in a raised position and a moving mechanism according to a third preferred embodiment of the present invention, generally denoted by number reference 100.

[0038] The third preferred embodiment provides a configuration of the guide means and of the partitioning element substantially symmetrical with respect to the configuration of the aforesaid second embodiment. The first top slide guide 12 comprises, near the partitioning element 50', a portion tilted by a first angle α' , greater than zero, with respect to the tread floor, as shown in Figure 15. The carriage 11' further comprises at least one spacer 70 for spacing the cover element 2 from the aforesaid first top member 111' and second bottom member 112', so as to allow a protrusion of the cover element 2 from the wall 3 at a raised position of the cover element 2 itself.

[0039] Preferably, the partitioning element 50' itself defines the upwards-tilted path of the tilted portion of the first top guide. The aforesaid first angle α' with respect to the tread floor, as shown in Figure 15B, is preferably equal to 30° .

[0040] The partitioning element 50' is a rotatable exchange element, shaped so as to have a first and a second arm positioned therebetween at a second angle β' .

[0041] In particular, the second angle β' of the partitioning element is preferably equal to $90^\circ +$ the aforesaid first angle α' , α' greater than zero, being the angle of tilt of the portion tilted with respect to the tread floor.

[0042] In Figure 15 a side view of the mechanism 100 is shown, respectively when the cover element 2 is in a lowered position and when the cover element 2 is in a

raised position, allowing access to the compartment 4.

[0043] As shown in figure, the partitioning element 50' is apt to assume a first exchange position 50' (Figure 15A) for allowing a sliding of the first top member 111' in the first top guide 12 and a second exchange position 50' (fig 15C) for allowing a sliding of the second bottom member 112' inside the same first top guide 12. Advantageously, therefore, in the raised configuration of the mirror, also the bottom member 112' slides inside the top guide 12, thereby allowing the mirror to position itself in a configuration substantially vertical to the tread floor and parallel to the wall 3 itself.

[0044] As shown in Figure 15, in a lowered position, the second bottom member 112' is positioned at a bottom portion of the second bottom slide guide 13 and the first top member 111' is positioned at the aforesaid tilted portion.

[0045] In the raising operations, the specific arrangement of the elements and the orientation of the tilt of the top guide portion bring the closure element toward the outside of the wall.

[0046] Therefore, a still further advantage of the third embodiment is that the mirror is in no way limited by the height of the compartment in its passing to the raised configuration; therefore, it will be possible to obtain a compartment 4 with a greater useful height.

[0047] It will be appreciated that the moving mechanism according to the invention, comprising a plurality of parts interconnected to each other, could also be provided in the form of an assembly kit.

[0048] The present invention has been hereto described with reference to a preferred embodiment thereof. It is understood that other embodiments might exist, all falling within the concept of the same invention, and all comprised within the protective scope of the claims hereinafter.

Claims

1. A moving mechanism (1, 10, 100) for moving a cover element (2), the mechanism (1, 10, 100) being apt to be arranged inside a wall (3) set on a tread floor and having a compartment (4) obtained therein and configured so as to move the cover element (2) between a first position wherein it lies substantially flush with the wall (3) for closing the compartment (4), and a second raised position such as to make the compartment (4) accessible from the outside, said mechanism (1) comprising:

- a carriage (11, 11') connected to said cover element (2) and comprising a first top member (111, 111') and a second bottom member (112, 112');
- substantially rectilinear guide means comprising a partitioning element (5, 50), apt to outline a first top guide (12) for allowing a sliding of at

- least said first top member (111) and a second bottom guide (13) for allowing a sliding of said second bottom member (112), said first top guide comprising near said partitioning element a portion tilted by a first angle (α, α'), greater than zero, with respect to the tread floor;
- a moving system (14) associated to said carriage (11), apt to move said cover element (2) between said first and second position.
2. The moving mechanism (1, 10, 100) according to the preceding claim, wherein said first top guide comprises a first pair of tracks (12) opposite to each other and integral to the wall (3), said first top member comprising a top bar (111) having a pair of ends, each apt to slide inside the respective track (12).
 3. The moving mechanism (1, 10, 100) according to the preceding claim, wherein said first top bar (111) comprises a pair of Teflon wheels (1111), positioned at the ends thereof.
 4. The moving mechanism (1, 10, 100) according to one of the claims 1 to 3, wherein said second bottom guide comprises a second pair of tracks (13) opposite to each other and integral to the wall (3), said second bottom member (112) comprising a bottom bar (112) having a pair of ends, each apt to slide inside the respective track (13).
 5. The moving mechanism (1, 10, 100) according to the preceding claim, wherein said second bottom bar (112) comprises a pair of Teflon wheels (1121), positioned at the ends thereof.
 6. The moving mechanism (1, 10, 100) according to any one of the preceding claims, wherein said carriage (11) is removably connected to the cover element (2).
 7. The moving mechanism (1, 10, 100) according to the preceding claim, wherein said carriage (11) is connected to the cover element (2) by an extractable joining element (15, 150).
 8. The moving mechanism (1) according to the preceding claim, wherein said extractable joining element (15) is fork-shaped.
 9. The moving mechanism (1) according to claims 7 or 8, further comprising means (159) apt to lock said joining element (15) when extracted from said carriage (11).
 10. The moving mechanism (1) according to the preceding claim, wherein said means (159) comprises one or more magnets (159), positioned integrally to the cover element (2), the joining element (15) being made of magnetic or ferromagnetic material.
 11. The moving mechanism (10, 100) according to any one of the preceding claims, wherein said partitioning element (50) is a rotatable exchange element, shaped so as to have a first and a second arm positioned therebetween at a second angle (β, β'), said partitioning element (50, 50') being apt to assume a first exchange position (A) for allowing a sliding of said first top member (111') in said first top guide (12) and a second exchange position (B) for allowing a sliding of said second bottom member (112') in said second bottom guide (13).
 12. The moving mechanism (10, 100) according to the preceding claim, wherein said second angle ($\beta; \beta'$) of said partitioning element is equal to $90^\circ +$ said first angle (α, α'), said first angle ($\alpha; \alpha'$) being the angle of tilt of said portion tilted with respect to the tread floor.
 13. The moving mechanism (100) according to one of the claims 11 or 12, further comprising a spacer (70) for spacing said cover element (2) from said first top member (111') and said second bottom member (112') so as to allow a protrusion of the cover element (2) from the wall (3) at a raised position of the cover element (2) itself.
 14. The moving mechanism (1, 10, 100) according to any one of the preceding claims, which is provided in the form of an assembly kit.

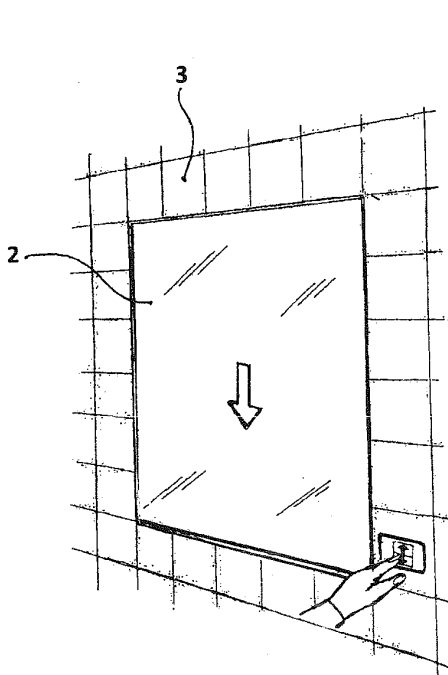


FIG. 1

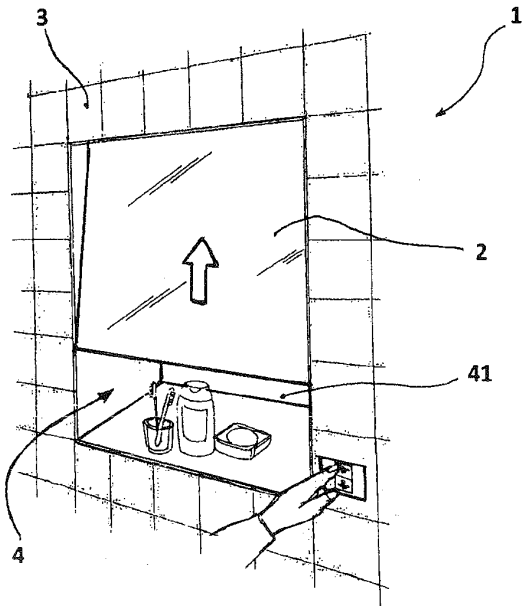


FIG. 2

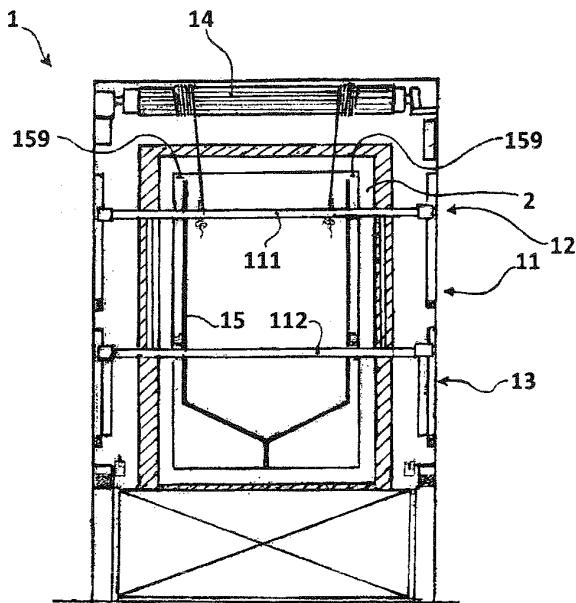


FIG. 3

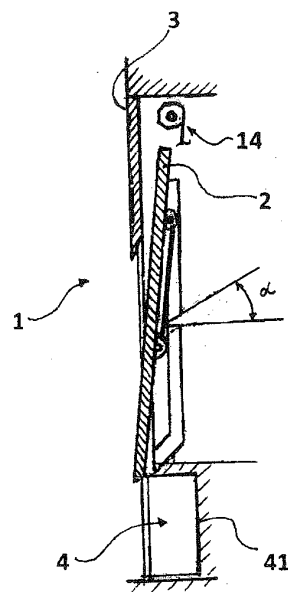


FIG. 4

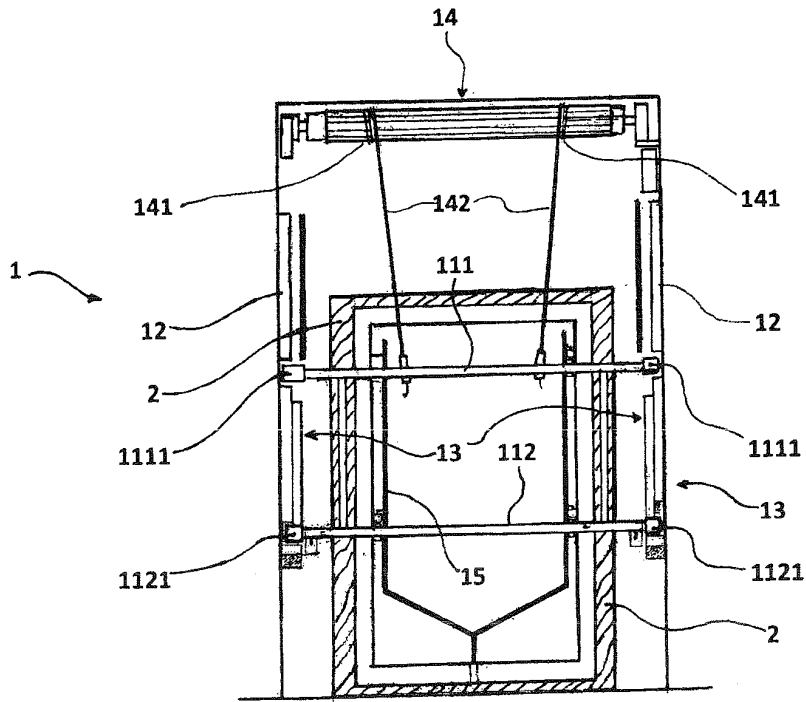


FIG. 5

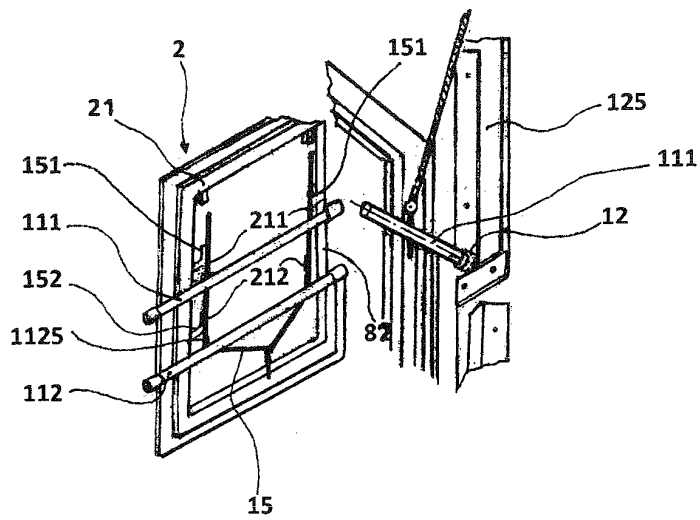


FIG. 6

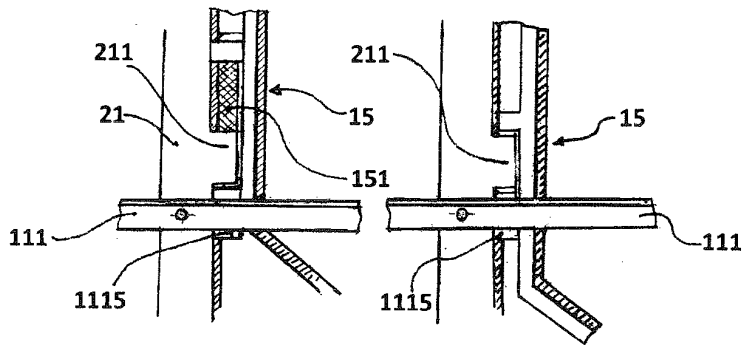


FIG. 7

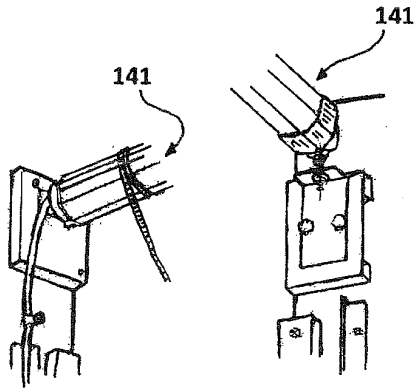


FIG. 8

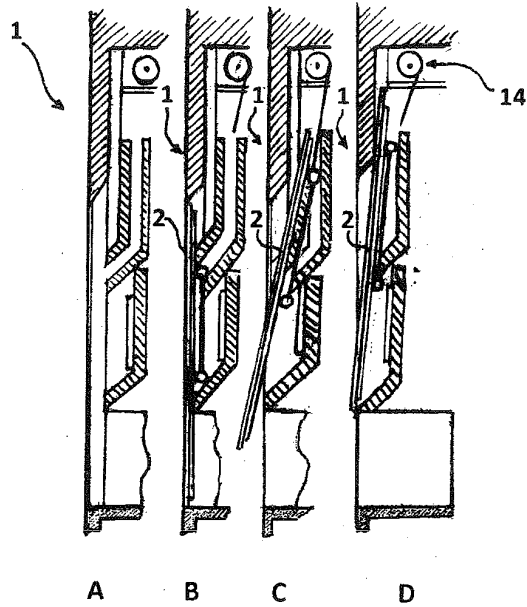


FIG. 9

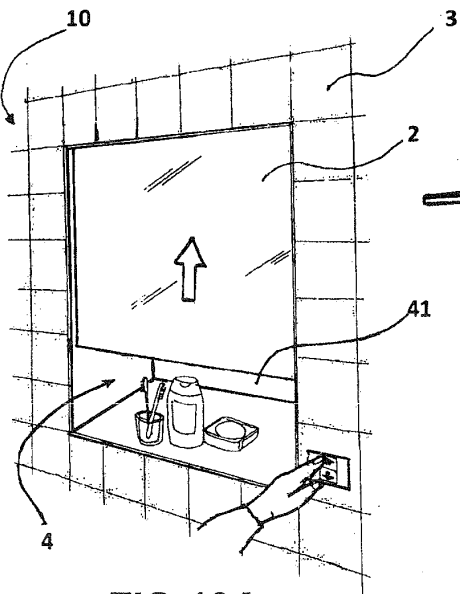


FIG. 10A

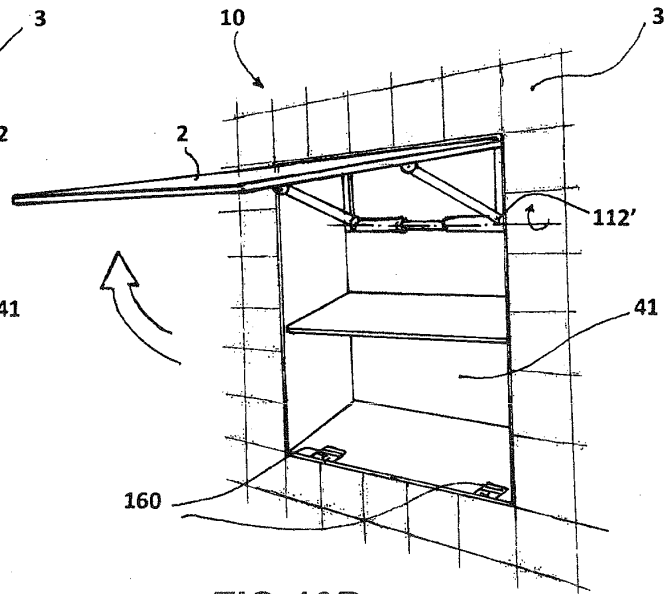


FIG. 10B

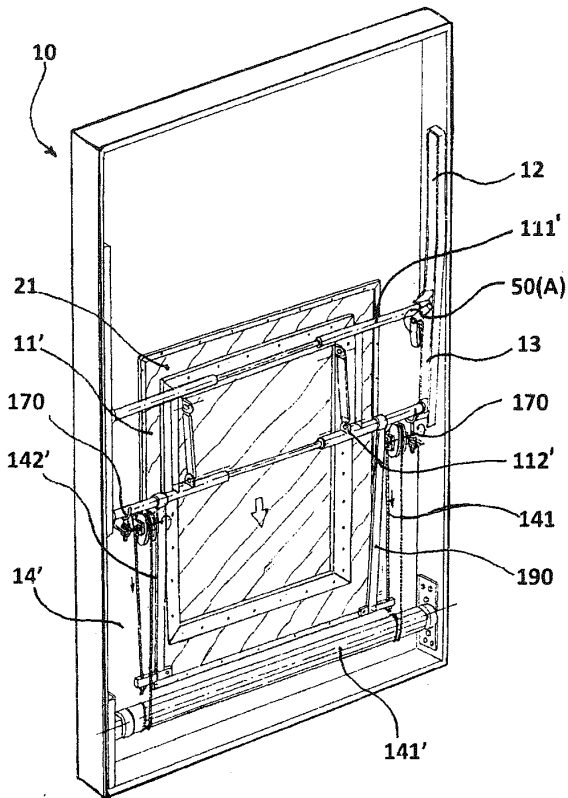


FIG. 11

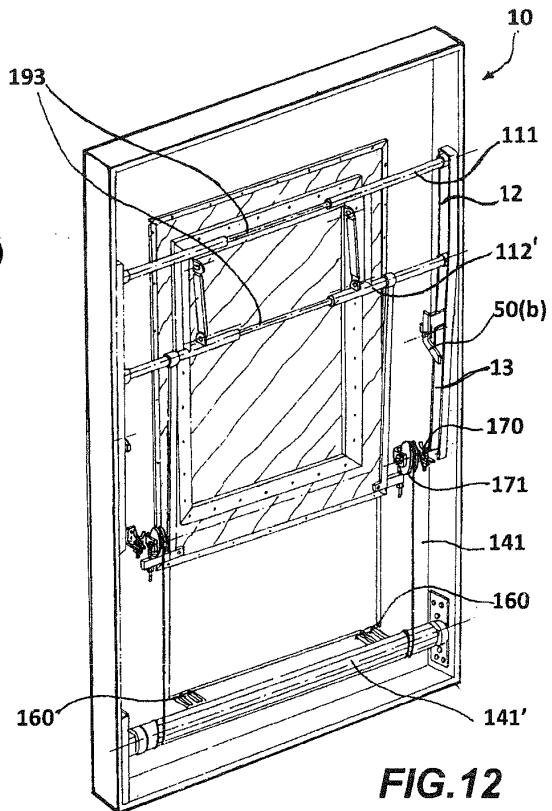


FIG. 12

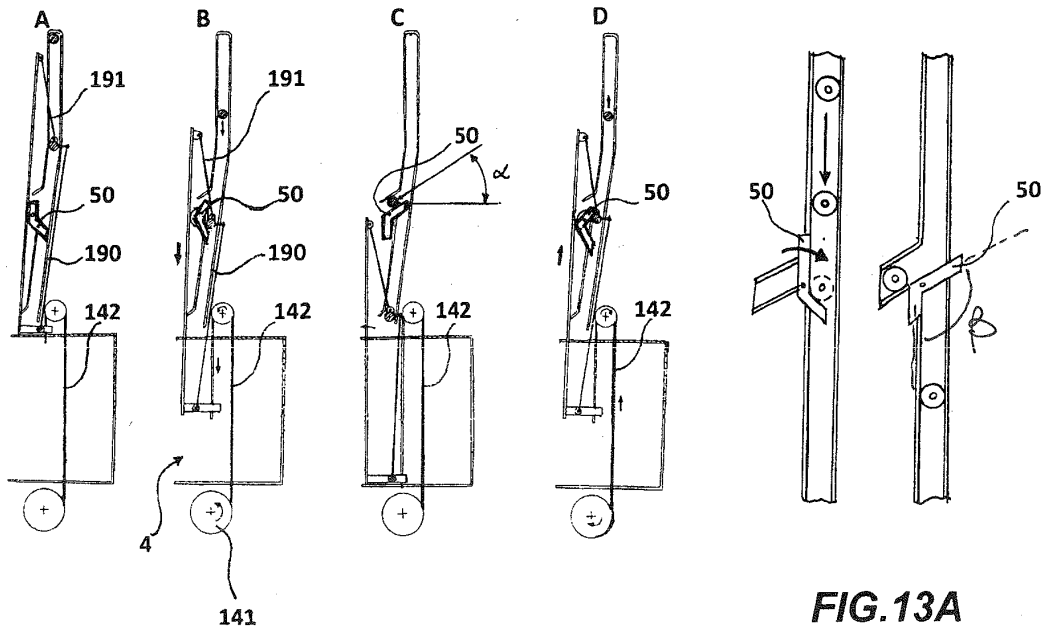
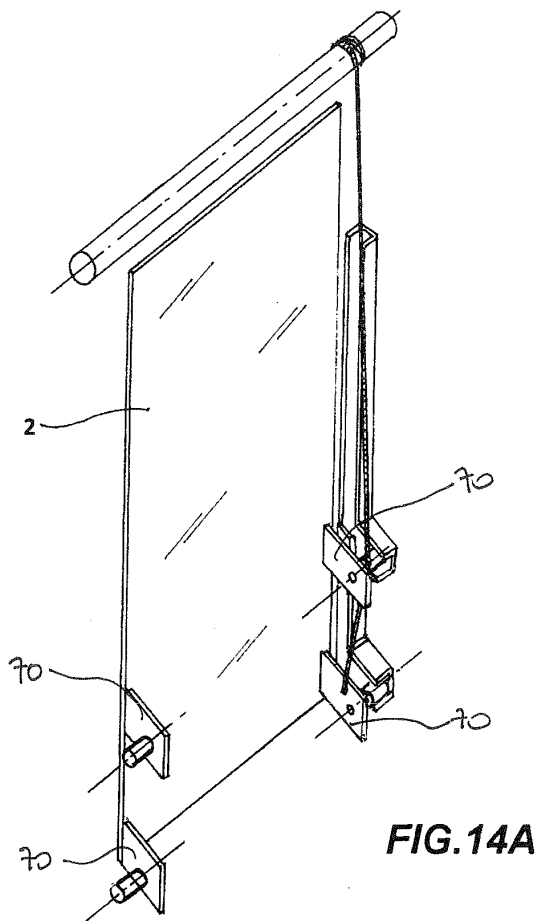
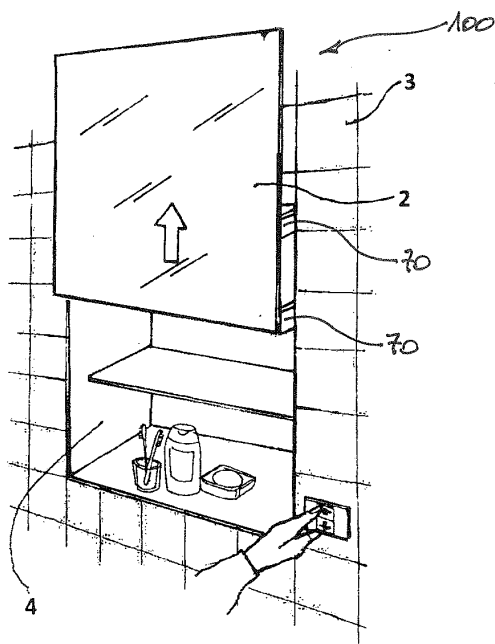


FIG. 13



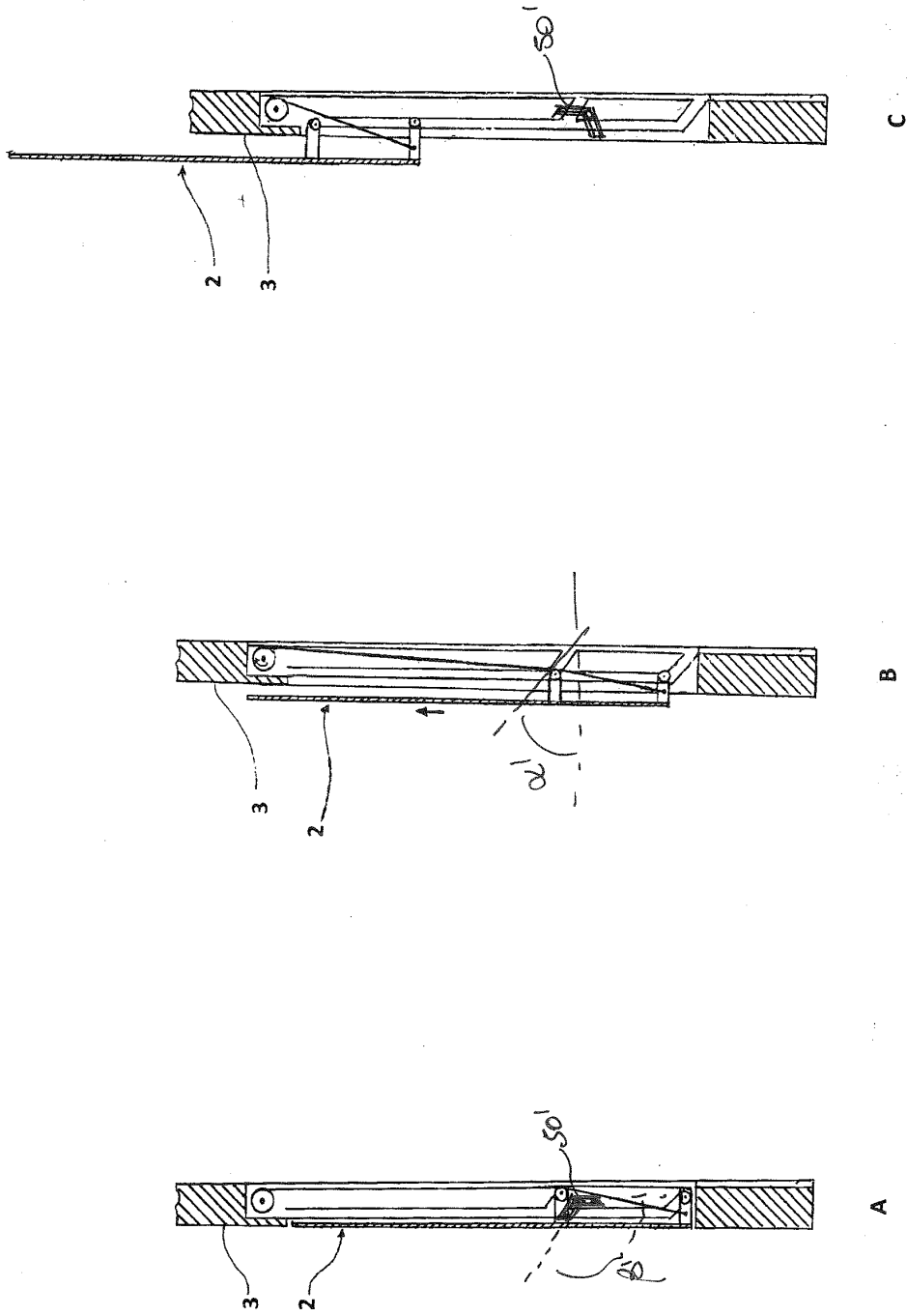


FIG.15



EUROPEAN SEARCH REPORT

Application Number
EP 13 15 4873

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 146 723 C (GENERAL & SCHAETZE) 30 December 1903 (1903-12-30)	1-9,13, 14	INV. E05D15/20
Y	* page 2, lines 19-45; figures 1-3 *	11,12	A47B67/00 E06B3/44
X	----- US 3 802 125 A (BAKER I) 9 April 1974 (1974-04-09) * figures 2-3 *	1,2,4,13	E05D15/16
Y	----- US 3 279 123 A (JOHN GENISON) 18 October 1966 (1966-10-18) * figures 2,5 *	11,12	
A	----- NL 41 907 C (GENBERG O.A.) 15 November 1937 (1937-11-15) * figures 1-6 *	2-9,13	
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