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(54) Title: ACCESS DOORS

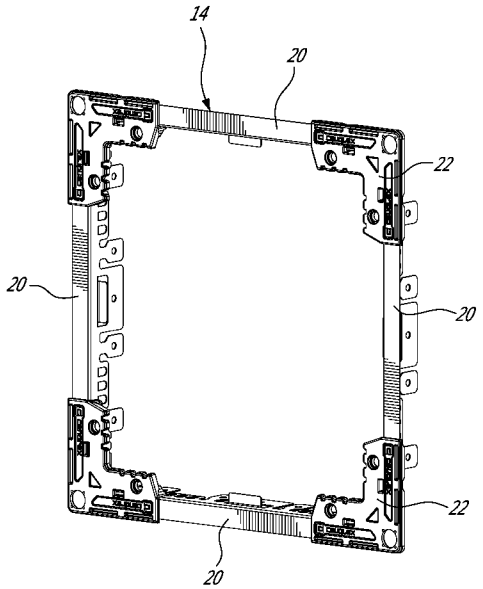

Fig. 1d

(57) Abstract: An access door adjustable to an opening having a size defined by a width and a height, comprising a frame adjustable to the width and the height of the opening; and a door panel, of a size at least the size of the opening, wherein the frame comprises side members and corner members; each side member having a section adapted to receive an edge of the opening and comprising a first part adapted to lay flat on an outer surface of the edge of the opening and a second part extending within the opening, the second part comprising engagement positions along a length thereof, the engagement positions being adapted to engage the corner members between a maximum length for each side of the frame by using outermost engagement positions along the length of the side member on each side of the side member and a minimum length for each side of the frame by using innermost engagement positions on each side of the side member, depending on the size of the opening, the frame receiving the door panel for closing the opening.

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TITLE OF THE INVENTION

Access doors

FIELD OF THE INVENTION

[0001] The present invention relates to adjustable frames and access doors.

BACKGROUND OF THE INVENTION

[0002] Access doors are used to allow an easy and clean access to walls and ceilings, floor and roof hatches, for maintenance or repair purposes for example.

[0003] Conventional access doors comprise a rigid frame secured to a door by hinges, and the frame needs to be nailed about an opening in the wall, ceiling or floor.

[0004] There is still a need in the art for adjustable frames and access doors.

SUMMARY OF THE INVENTION

[0005] More specifically, in accordance with the present invention, there is provided an access door adjustable to an opening having a size defined by a width and a height, comprising a frame adjustable to the width and the height of the opening; and a door panel, of a size at least the size of the opening, wherein the frame comprises side members and corner members; each side member having a section adapted to receive an edge of the opening and comprising a first part adapted to lay flat on an outer surface of the edge of the opening and a second part extending within the opening, the second part comprising engagement positions along a length thereof, the engagement positions being adapted to engage the corner members between a maximum length for each side of the frame by using outermost

engagement positions along the length of the side member on each side of the side member and a minimum length for each side of the frame by using innermost engagement positions on each side of the side member, depending on the size of the opening, the frame receiving the door panel for closing the opening.

[0006] There is further provided a method for closing an opening having relatively straight edges in a panel, comprising: a) aligning a first side member and a first corner member, the side member comprising a first part and a second part, the second part comprising engagement positions; b) engaging one of the engagement positions of the side member with the corner member based on the size of the opening, and snapping the corner member and the side member together; c) repeating steps a) and b) with a second, third and fourth side members and a second, third and fourth corner members to form a frame of the size of the opening; d) positioning the frame within the opening, the corners members fitting with the corners of the opening, the first part of each side member sitting on an outer surface of the edge of the opening, and the second part of each side member extending into the opening; e) aligning at least one glide provided on an inner surface of a door panel with a notch of at least one corner member based on the size of the frame and engaging a distal end of the glide in the notch; and f) moving the door panel against the frame.

[0007] There is further provided a frame for an opening, comprising sides having a section adapted to receive an edge of the opening and comprising a first part adapted to lay flat on an outer surface of the edge of the opening, and a second part extending within the opening; the second part comprising positioning slots; and corners, each corner comprising two arms at a substantially right angle, each arm comprising a positioning pin adapted to engage a positioning slot of a side; wherein the sides are connected two by two by the corners by selecting a positioning slot of the sides for engagement by the positioning pin based on a size of the opening.

[0008] There is further provided a method for adjusting a frame about an opening, comprising: a) aligning a first side member and a first corner member, the side member comprising a first

part and a second part, the second part comprising positioning slots; and the corner member comprising two arms each having a positioning pin; b) engaging a positioning slot of the side member with the positioning pin of an arm of the corner member based on the size of the opening, and snapping the corner member and the side member together; and c) repeating steps a) and b) with a second, third and fourth side members and a second, third and fourth corner members to form a frame.

[0009] Other objects, advantages and features of the present invention will become more apparent upon reading of the following non-restrictive description of specific embodiments thereof, given by way of example only with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] In the appended drawings:

[0011] Figures 1 show a) a door panel, b) corners, c) sides of a frame; Figure 1d shows an assembled frame according to an embodiment of an aspect of the present invention;

[0012] Figure 2 shows an opening in a wall, ceiling or floor panel;

[0013] Figures 3 show a) a perspective view, b) a side view, and c) a cross section view of a side member of a frame according to an embodiment of an aspect of the present invention;

[0014] Figures 4 show a) a perspective view, b) a side view, and c) a cross section view of a side member of a frame according to an embodiment of an aspect of the present invention;

[0015] Figures 5 show a) a perspective view, b) a side view, and c) a cross section view of a side member of a frame according to an embodiment of an aspect of the present invention;

[0016] Figures 6 show a) a perspective view, b) a side view, and c) a cross section view of a side member of a frame according to an embodiment of an aspect of the present invention;

[0017] Figures 7 show a) a perspective view of the inner surface, b) the outer surface, and c) a side view, of a corner member of a frame according to an embodiment of an aspect of the present invention;

[0018] Figures 8 show) a perspective view, b) a top view of a lock according to an embodiment of an aspect of the present invention;

[0019] Figures 9 show a set of side members according to an embodiment of an aspect of the present invention;

[0020] Figures 10 a) - f) show steps for assembling a frame according to an embodiment of an aspect of the present invention;

[0021] Figures 11 a) - c) show steps for assembling a locking mechanism onto a door panel of an access door according to an embodiment of an aspect of the present invention;

[0022] Figures 12 a)- d)) show steps for installation of an assembled frame in an opening according to an embodiment of an aspect of the present invention;

[0023] Figure 13 a) - e) show steps for installing a door panel into an assembled frame according to an embodiment of an aspect of the present invention; and

[0024] Figures 14 show a) a perspective view and b) a side view of a glide for a door panel according to an embodiment of an aspect of the present invention.

DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0025] According to an embodiment of an aspect of the present invention, an adjustable frame 14, shown assembled in Figure 1d, comprises side members 20 (see Figure 1c) connected two by two by corner members 22 (see Figure 1b). The side members 20 may be metallic members and the corners 22 plastic members for example. Other materials may be used.

[0026] The side members 20 are rigid members which, by interaction with the corners 22, adjust to a desired frame size. In the case of a frame for an opening (C) in a panel (W) as shown in Figure 2 for example, the corners members 22 adapt to the corners of the opening (C), and the side members 20 adjust to the length and thickness of the edges of the opening (C) as will be discussed hereinbelow.

[0027] Figures 3-6 illustrate embodiments of side members 20 having a L section (see Figures 3c, 4c, 5c, and 6c), and comprising a first part 22a adapted to sit flat on the outer surface, i.e. the visible surface, of the edge of an opening, and a second part 22b adapted to extend within the opening and comprising foldable tabs 24 and positioning slots 27 along its length. The L section provides protecting the material on the edge on the perimeter of the opening (C), with the tabs 24 being foldable inside the opening against the inner surface, i.e. behind the wall, ceiling or floor panel, of the edge of the opening thereby maintaining the side member 20 about the opening, as will be described hereinbelow. The positioning slots 27 provide different positions for securing the side member to two corner members on each side thereof, as will be described hereinbelow, between a maximum length for a side by using the outermost positioning slots 27o along the length of the side member on each side of the side member, for engagement with the corner members, and a minimum length for a side by using the inner most positioning slots 27i on each side of the side member, for engagement with the corner members.

[0028] In Figures 7, a corner member 22 is shown as a symmetric element relative to an

axis (X) shown in Figure 7b, comprising two arms at a substantially right angle, each arm adapted to connect with an extremity of a side member. Each arm comprises a positioning pin 21 on an inner surface, i.e. the surface directed towards the opening (best seen Figures 7a and 7c) and notches 40 on the inner edge of each arm (best seen in Figure 7b). In the illustration of Figure 7a, each positioning pin 21 extends perpendicularly from the inner surface of the corner member, at a distance from the outer edge of the corner member occupied by a surface 23 adapted to slidingly receive a part 22a of a side member 20 as will be discussed hereinbelow. Moreover, the positioning pin 21 may be provided with a detent 29 for easy access to the positioning pin 21, once the part 22b of a side member 20 is snapped thereto, as discussed hereinbelow. It may also comprise an embedded magnet 42, or other element adapted to retain a door panel, as will be discussed hereinbelow. Apertures 37, or other feature for securing a cable, may further be provided on each arm, as will be discussed hereinbelow.

[0029] The positioning pin 21 of each arm of a corner member 22 is adapted to receive a positioning slot 27 of a respective side member 20 to adapt to the size of the opening (C) as will be described hereinbelow in relation to Figures 9 and 10 for example.

[0030] The side member 20 may also comprise a locking slot 26. In Figures 3 and 4, the locking slot 26 is shown covered by a tab 25, while in Figures 5 and 6 the locking slot 26 is shown with the tab 25 folded away, so that the locking slot 26 is adapted to receive a lock 30 as will be described hereinbelow in relation to Figures 11.

[0031] An access door basically comprises a frame (Figure 1d) supporting a door panel (Figure 1a) used to cover an opening (C), into a panel (W), such as a wall, a ceiling or a floor panel for example (Figure 2). The opening (C) has a width w_c and a height h_c.

[0032] The door panel 12 may be metallic for example, or in other rigid material, such as wood, board or plastic for example. The door panel is of a generally rectangular or square shape, with a

width w_p and a height h_p, of a size at least the size of the opening to be covered: i.e. w_p is at least equal to w_c and h_p is at least equal to h_c.

[0033] According to an embodiment of the present invention, the door panel 12 comprises at least one glide, two glides 38 being shown in Figures 11 and 13 for example, on its inner surface, i.e. its surface intended to be facing the opening. As shown in Figures 14, a glide 38 comprises a part 41 rising from the inner surface of the door panel 12 and having a distal end 43. As will be described hereinbelow in relation to Figures 13, a glide 38 ensures centering of the door panel 12 relative to the frame 14 by engaging a corner member. Depending on the size of the frame 14, the distal end 43 of the glide 38 engages a corresponding notch 40 of a corner member 22, thereby securing the door panel 12 to the frame 14, and stabilizing the access door 14, once installed. The glide 38 may also comprise an attachment for a cable, such as an opening 39, shown in Figures 14.

[0034] A locking mechanism may be provided, by positioning a lock 30 on the inner surface of the door panel 12. The lock 30 shown in Figures 8 comprise a slot 33 at a distal end thereof and a series of holes 34 along its length allowing different locations, depending on the size of the frame 14, for securing the lock 30 to the door panel 12 by its proximal end 35 so that the distal end 33 can engage the locking slot 26 of a side member 22, as will be described hereinbelow in relation to Figures 11.

[0035] For installation, no framing or construction is necessary provided the edges of the wall opening (C) are relatively straight, and square to each other for best fit, otherwise the door may be out of square when installed. The edges of the opening should also be square to surrounding walls, ceilings or floors to ensure that the frame and/or the access door look level when finished.

[0036] In an embodiment of the present invention, the frame 14 can be selected to fit the size h_c and w_c of the opening (C), in increments corresponding to the positions of the positioning slots 27

of the side members 22, for example in increments of 3/8" of an inch, between a minimum size and a maximum size for a given model depending on the positions of the connection between side members and corner members as described hereinabove (see Figures 9), in width and/or height. The opening (C) can be square or rectangular in shape.

[0037] The panel door 12 can be painted or wallpapered to match the color or finish of the wall, ceiling or floor panel.

[0038] For assembling the frame 14, a side member 20 is aligned with an arm of a corner member 22, for example by sliding on the surface 23 in the embodiment illustrated in Figures 7 (see arrow (B) in Figure 7a), based on a required sizing (see Figure 10d) so as to engage the positioning pin 21 on this arm of the corner member 22 into one of the positioning slots 27 of the side member 22 (Figures 10a-10b), and the corner member 22 and the side member 20 are then snapped together. A clicking sound indicates that they are connected. Once connected the two members can be easily disconnected, if necessary, for example by action with a finger on the detent 29 of the positioning pin 21 as illustrated in Figures 7, and reconnected (see Figure 10c). The remaining corners and sides are connected in the same way, so as to end up with a full frame 14 of a size adjusted to the size of the opening to be covered (see Figure 1b).

[0039] A safety cable 36 may be attached to at least one corner 22, by inserting the cable 36 through an opening 37 in an arm of the corner member 22 for example (Figures 10e-10f).

[0040] If using a locking mechanism, the door panel 12 is laid with its outer surface down and the frame 14 is put squarely into position (see Figures 11) about its inner surface, in order to determine which hole 34 of the lock 30 is the correct distance for the proximal end 35 thereof to be fastened to the panel 12, so that the distal end 33 of the lock 30 is able to engage the frame 14 (see Figure 10c). Then the lock 30 is fastened to the panel 12 with a screw for example through the

corresponding hole 34 in the proximal end 35 (see Figure 11b), so that it may rotate, about the screw position, from a locking position, in which the distal end 33 of the lock 30 engages the frame 14, to an unlocking position, in which the distal end 33 of the lock 30 is not connected to the frame 14 (see arrow A in Figure 11b).

[0041] Then, as shown in Figures 12, with or without a locking mechanism, the frame 14 is positioned within the opening (C) (Figure 12a) and tabs 24 are folded behind the wall, ceiling or floor panel, to lock the frame 14 into place within the opening (Figure 12b). If there is an obstacle (O) in the opening (C), tabs 24 may be bent outwards as needed (Figure 12d). If there is a solid structure (S) present, the frame 14 can be screwed in to it through holes of the tabs 24 for example (Figure 12c).

[0042] To close the door, each safety cable 36 secured to a corner member 22 is connected to a door glide 38 (Figure 13a-13b). The glides 38 of the door panel 12 are aligned to respective notches 40 on the corner members 22 depending on the size of the frame (Figure 13c) and engaged therein (Figure 13d). Then the door panel is moved against the frame, thereby closing the access door. Figures 13d and 13e show views from inside of the wall, floor or ceiling once the door is thus closed.

[0043] In case of a metallic door panel, magnets 42 embedded in the corner members 22 as illustrated for example in Figures 7 may further retain the door panel 12 in place for better stability. Other retaining elements between the frame members and the door panel may be contemplated depending on the different materials used and on the different requirements of a specific application.

[0044] The access door is now installed. It is a removable door which gives access to the interior of the panel.

[0045] For specific applications, such as an access door in a ceiling panel for example,

securing means such as cables 36 allow further securing the access door once in place by catching the access door should it become dislodged from its opening for example.

[0046] To open the door, the door panel 12 is pulled outward, by inserting a fingernail or a small flat screwdriver into a corner of the door panel, which may be identified beforehand for simplicity purposes, since corners of the door panel located away from where the door panel is connected to a corner member of the frame by a glide on the inner side thereof, as described hereinabove, offer easier opening.

[0047] In case a locking mechanism as described hereinabove is used, a slotted or flat head screw driver may be used to lock or unlock the access door from the outside, to disengage the distal end 33 of the lock 30 from the frame 14 on the inner surface of the door panel inside the opening, as described hereinabove.

[0048] As people in the art will appreciate, the present access door is installed quickly, without specific tools, and easily by virtually anyone regardless of skill level.

[0049] The present access door is adjustable and may apply for a range of sizes. In the examples illustrated herein for way of examples, there are five different side dimensions, with five possible adjustments by an increment of 3/8". On the vertical and horizontal axes, for a given size of side members, the possible positions for an 8X 9.5 -inch frame are: 8, 8.375, 8.75, 9,125 and 9.5 inches (see embodiments illustrated in Figures 9).

[0050] The invention was described hereinabove using positioning slots in sides of the frame and positioning pins in corners of the frame for adjustability of the size of the frame. Other controllable and reversible engagement mechanisms between sides and corners may be contemplated. Also, the sides, or the corners, may comprise telescopic parts, which length can be adjusted prior to, or

after, connection between sides and corners.

[0051] As people in the art will now be in a position to appreciate, the present adjustable frame and access door allow overcoming obstacles that may be encountered in walls, ceilings or floors, such as, for example, posts and beams and pipes, and generally any space constraints. Moreover, the present adjustable frame allows accommodating a range of panel thickness.

[0052] Although the present invention has been described hereinabove by way of embodiments thereof, it may be modified, without departing from the nature and teachings of the subject invention as recited herein.

WHAT IS CLAIMED IS:

1. An access door adjustable to an opening having a size defined by a width and a height, comprising:

a frame adjustable to the width and the height of the opening; and

a door panel, of a size at least the size of the opening;

wherein said frame comprises side members and corner members; each side member having a section adapted to receive an edge of the opening and comprising a first part adapted to lay flat on an outer surface of the edge of the opening and a second part extending within the opening, said second part comprising engagement positions along a length thereof, said engagement positions being adapted to engage the corner members between a maximum length for each side of the frame by using outermost engagement positions along the length of the side member on each side of the side member and a minimum length for each side of the frame by using innermost engagement positions on each side of the side member, depending on the size of the opening, said frame receiving said door panel for closing said opening.

2. The access door of claim 1, wherein said second part of said side member comprises foldable tabs.

3. The access door of any one of claims 1 and 2, wherein said door panel comprises at least one glide on an inner surface thereof, and at least one corner member comprises notches, the glide having a distal end adapted to engage a corresponding notch of the corner member depending on the size of the opening.

4. The access door of claim 3, further comprising at least one cable connected between the corner member and said glide.

5. The access door of any one of claims 1 to 4, wherein said door panel comprises a lock on an inner surface thereof, and at least one side member comprises a locking slot adapted to receive said lock.

6. The access door of claim 5, wherein said lock comprises a slot at a distal end

thereof and a series of holes along a length thereof, allowing different locations, depending on the size of the frame, for securing the lock to the door panel by a proximal end of the lock so that a distal end of the lock is able to engage the locking slot of the side member.

7. The access door of any one of claims 1 to 6, wherein said side members are metallic members and said corner members are plastic members.

8. The access door of claim 7, wherein said door panel is metallic and at least one corner member comprises an embedded magnet.

9. A method for closing an opening having relatively straight edges in a panel, comprising:

a) aligning a first side member and a first corner member, the side member comprising a first part and a second part, the second part comprising engagement positions;

b) engaging one of the engagement positions of the side member with the corner member based on the size of the opening, and snapping the corner member and the side member together;

c) repeating steps a) and b) with a second, third and fourth side members and a second, third and fourth corner members to form a frame of the size of the opening;

d) positioning the frame within the opening, the corners members fitting with the corners of the opening, the first part of each side member sitting on an outer surface of the edge of the opening, and the second part of each side member extending into the opening;

e) aligning at least one glide provided on an inner surface of a door panel with a notch of at least one corner member based on the size of the frame and engaging a distal end of the glide in the notch; and

f) moving the door panel against the frame.

10. The method of claim 9, wherein the second part comprises foldable tabs, said step d) further comprising folding at least one tab inside the opening to lock the frame into place within the opening.

11. The method of any one of claims 9 and 10, wherein the second part comprises

foldable tabs, said step d) further comprising folding at least one tab outward of the opening.

12. The method of any one of claims 9 to 11, further comprising, before step f), connecting a cable between at least one corner member and the glide.

13. The method of any one of claims 9 to 12, further comprising, before said step d), determining a position of a lock on the inner surface of the door panel allowing a distal end of the lock to engage the frame, and fastening the lock to the door panel at the determined position.

14. The method of claim 13, further comprising locking the access door by driving, from the outside, the lock into a locking position in which the distal end of the lock engages the frame.

15. The method of any one of claims 9 to 14, further comprising, before step f) securing the frame to a solid structure in the opening.

16. A frame for an opening, comprising:

sides having a section adapted to receive an edge of the opening and comprising a first part adapted to lay flat on an outer surface of the edge of the opening, and a second part extending within the opening; said second part comprising positioning slots; and

corners, each corner comprising two arms at a substantially right angle, each arm comprising a positioning pin adapted to engage a positioning slot of a side;

wherein said sides are connected two by two by said corners by selecting a positioning slot of the sides for engagement by said positioning pin based on a size of the opening.

17. The frame of claim 16, wherein the second part of at least one of the sides comprises at least one tab adapted to be foldable inward inside the opening to lock the frame into place within the opening.

18. The frame of any one of claims 16 to 18, wherein the second part of at least one of the sides comprises at least one tab adapted to be foldable outward of the opening.

19. The frame of any one of claims 16 to 18, wherein at least one of i) said corners and ii) said sides comprises telescopic parts.

20. The frame of any one of claims 16 to 19, wherein the positioning pin extends perpendicularly from an inner surface of the corner, separated from an edge of the corner by a surface adapted to slidingly receive the second part of a side.

21. The frame of any one of claims 16 to 20, wherein the positioning pin comprises a detent.

22. The frame of any one of claims 16 to 21, wherein at least one corner comprises a notch adapted to receive a glide provided on an inner surface of a door panel.

23. A method for adjusting a frame about an opening, comprising:

a) aligning a first side member and a first corner member, the side member comprising a first part and a second part, the second part comprising positioning slots; and the corner member comprising two arms each having a positioning pin;

b) engaging a positioning slot of the side member with the positioning pin of an arm of the corner member based on the size of the opening, and snapping the corner member and the side member together; and

c) repeating steps a) and b) with a second, third and fourth side members and a second, third and fourth corner members to form a frame.

24. The method of claim 23, wherein the second part further comprises foldable tabs, said method further comprising:

d) positioning the frame within the opening, the corners members fitting with the corners of the opening, the first part of each side member sitting on an outer surface of the edge of the opening, and the second part of each side member extending into the opening; and

e) folding at least one tab inside the opening to lock the frame into place within the opening.

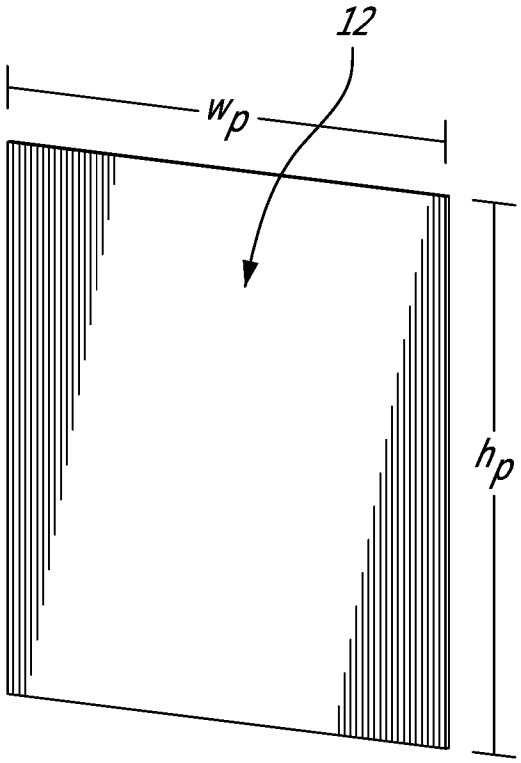

Fig. 1a

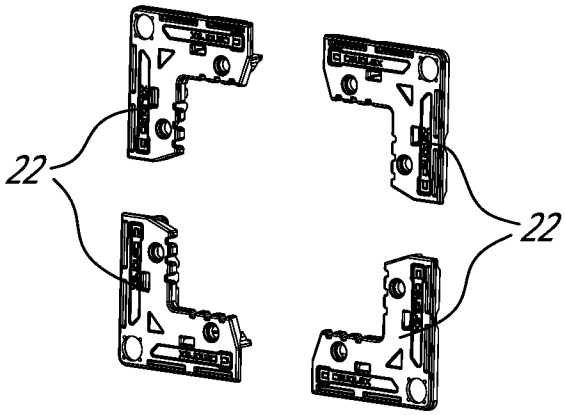

Fig. 1b

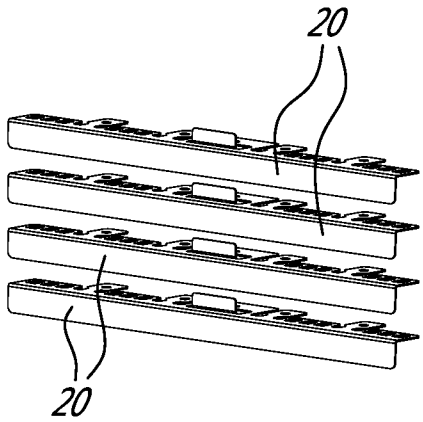

Fig. 1c

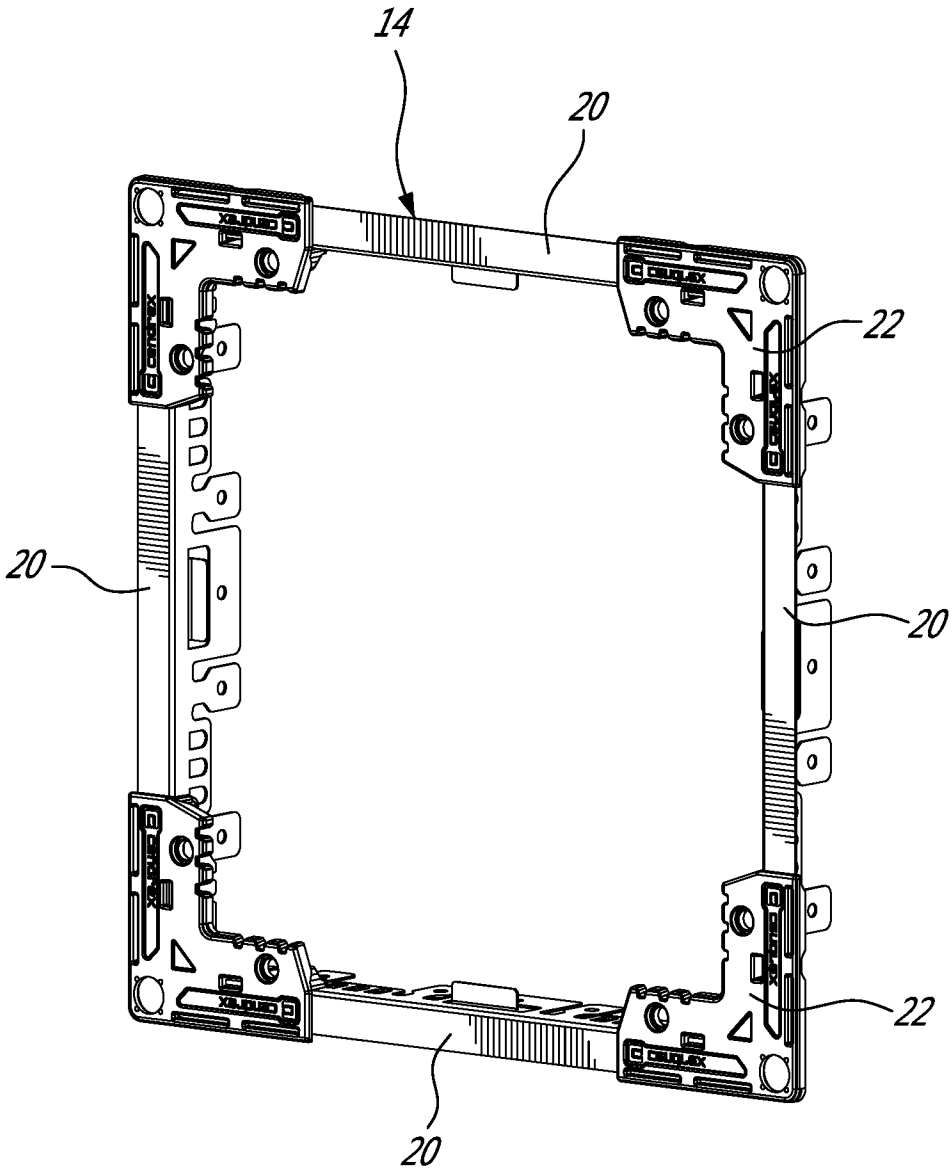

Fig. 1d

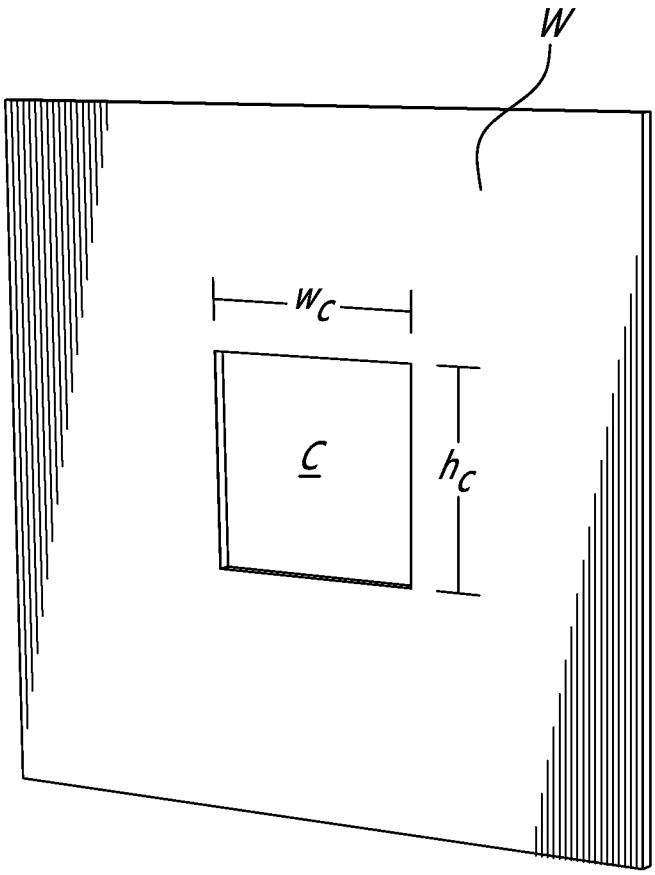

Fig. 2

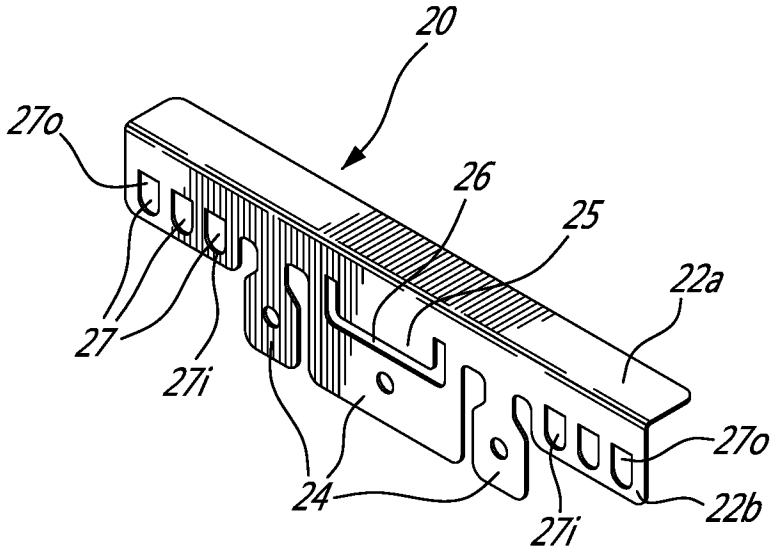

Fig. 3a

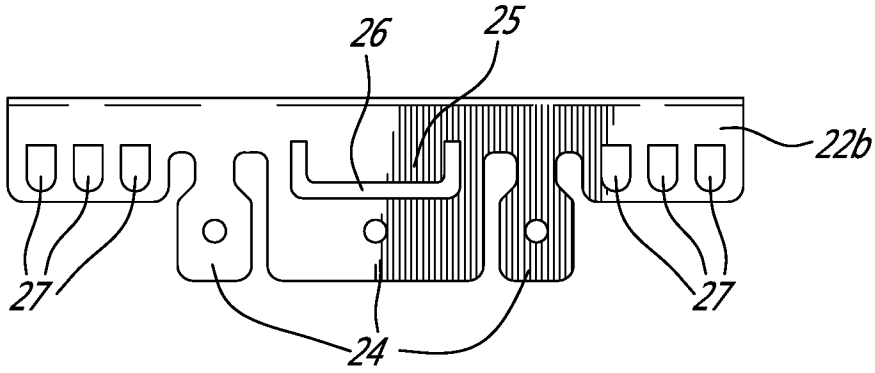

Fig. 3b

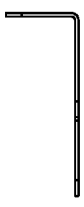

Fig. 3c

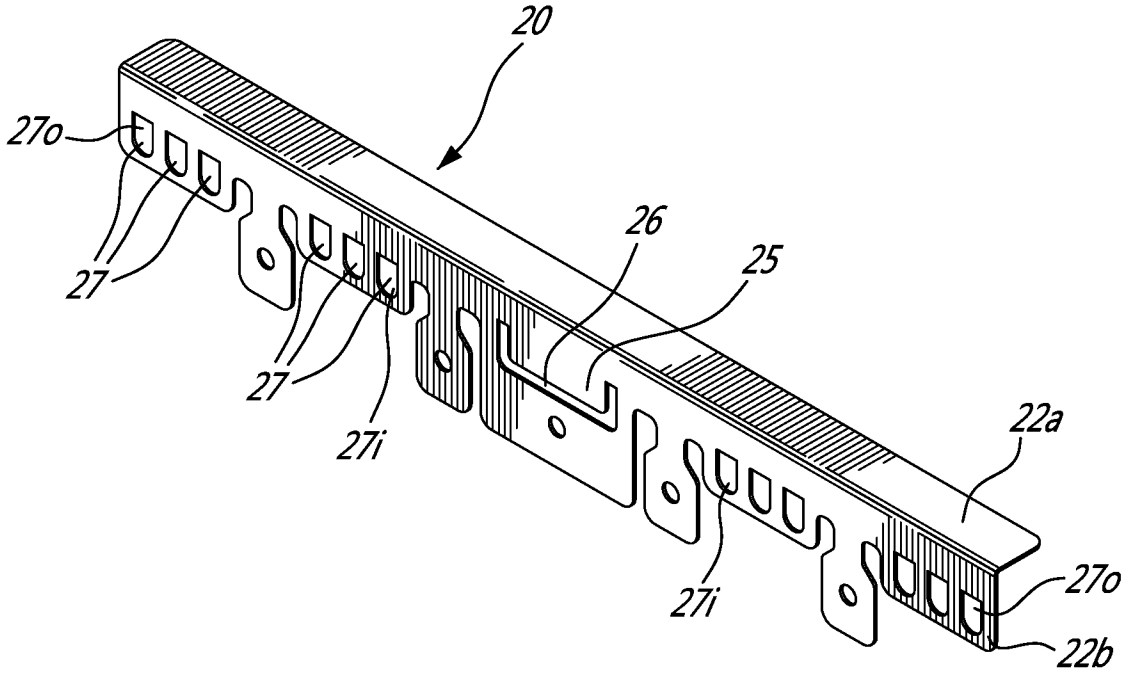

Fig. 4a

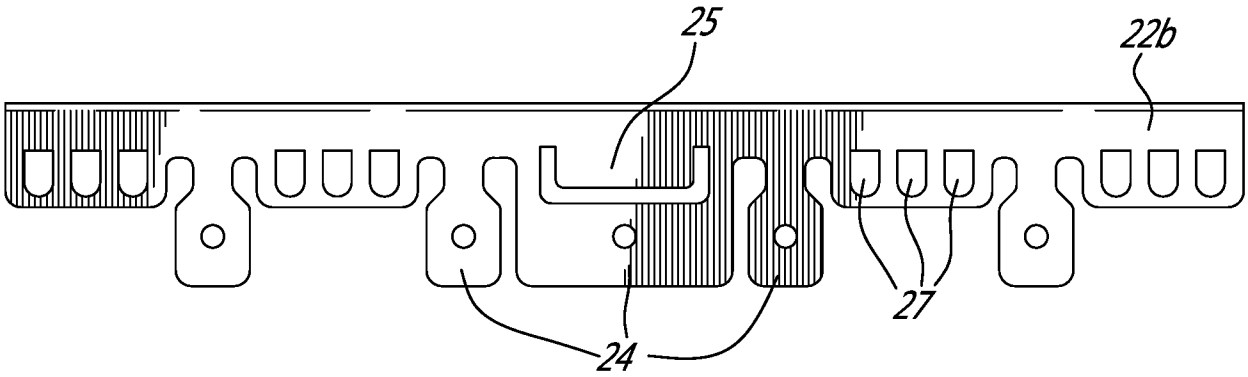

Fig. 4b

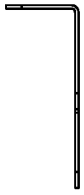

Fig. 4c

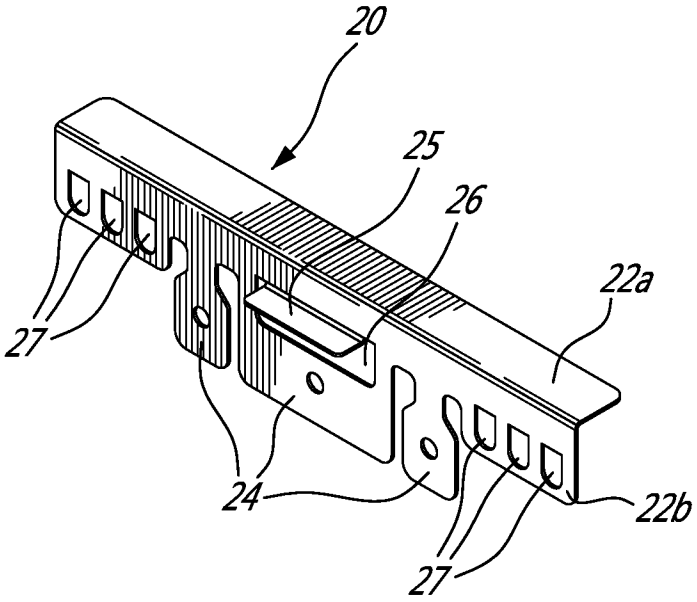

Fig. 5a

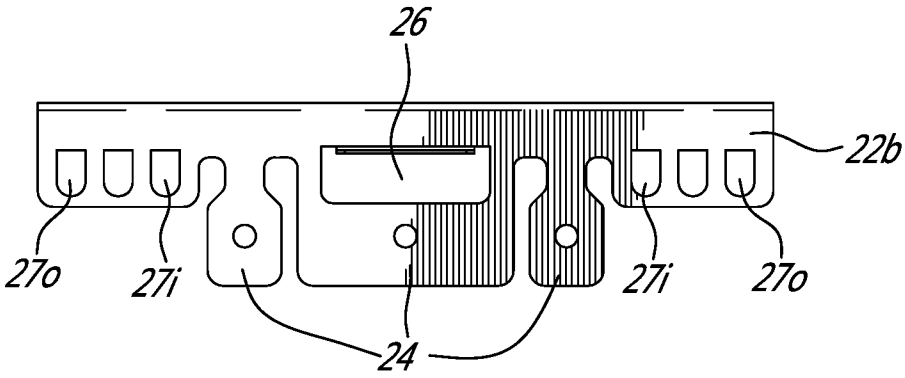

Fig. 5b

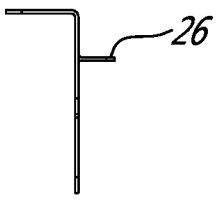

Fig. 5c

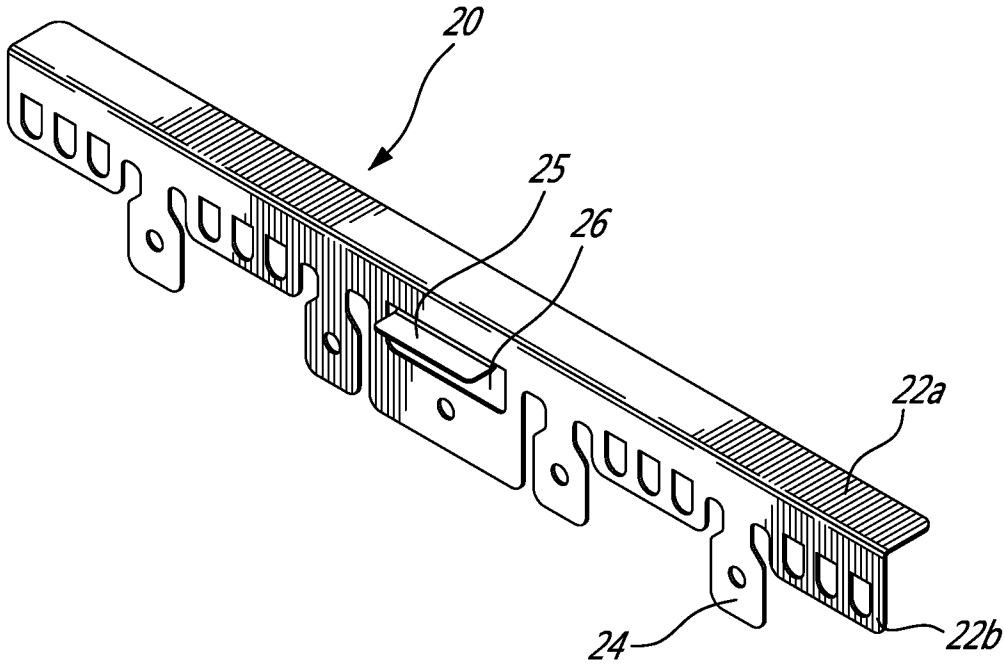

Fig. 6a

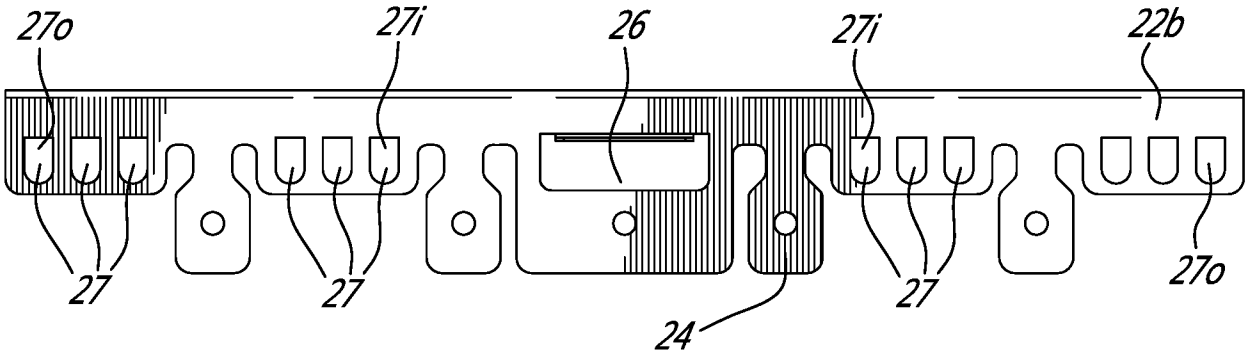

Fig. 6b

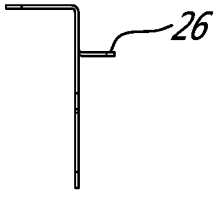

Fig. 6c

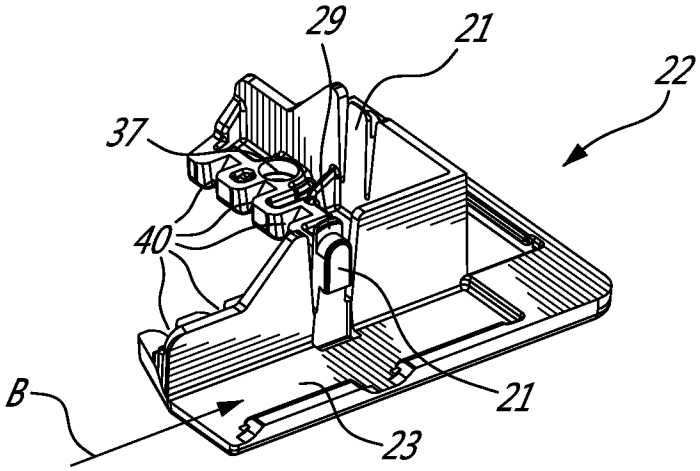

Fig. 7a

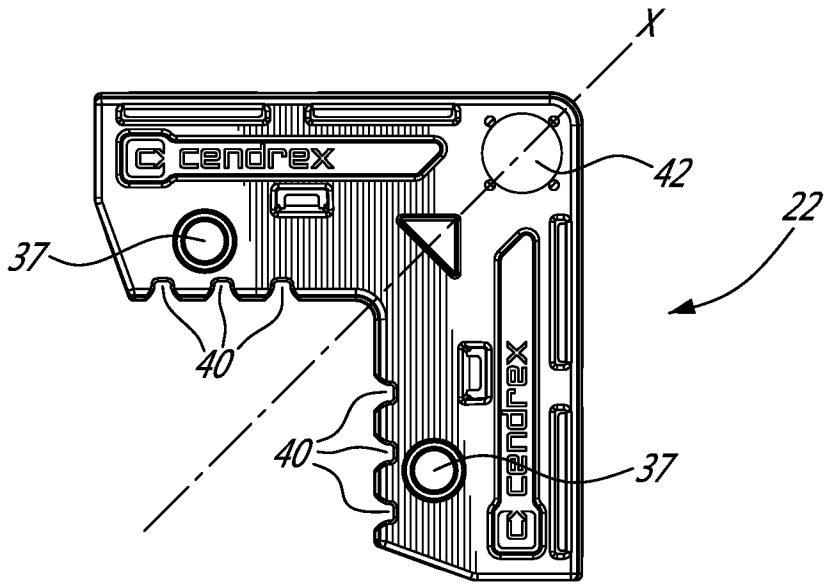

Fig. 7b

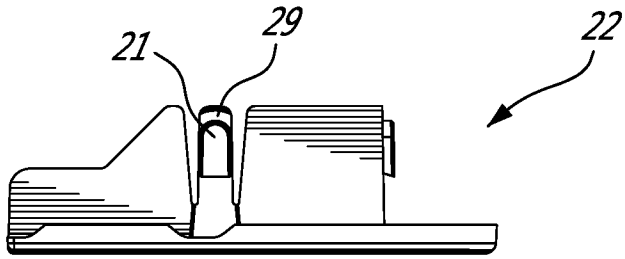

Fig. 7c

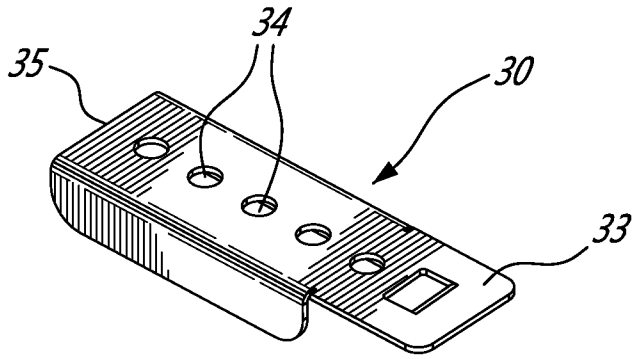

Fig. 8a

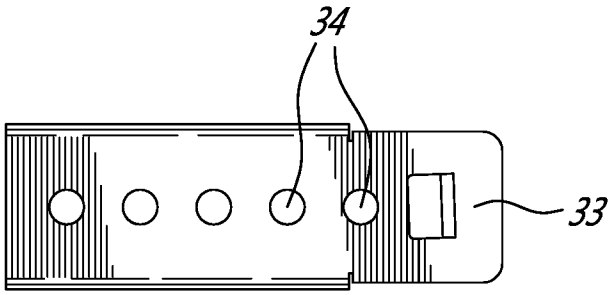

Fig. 8b

		min/Min	Inch / Pouce / Plug			max/Max
		A	B	C	D	E
6X7.5		6''	6.375''	6.75''	7.125''	7.5
8X9.5		8''	8.375''	8.75''	9.125''	9.5
10X11.5		10''	1.375''	10.75''	11.125''	11.5
12X13.5		12''	12.375'	12.75''	13.125''	13.5
14X15.5		14''	14.375''	14.75''	15.125''	15.5

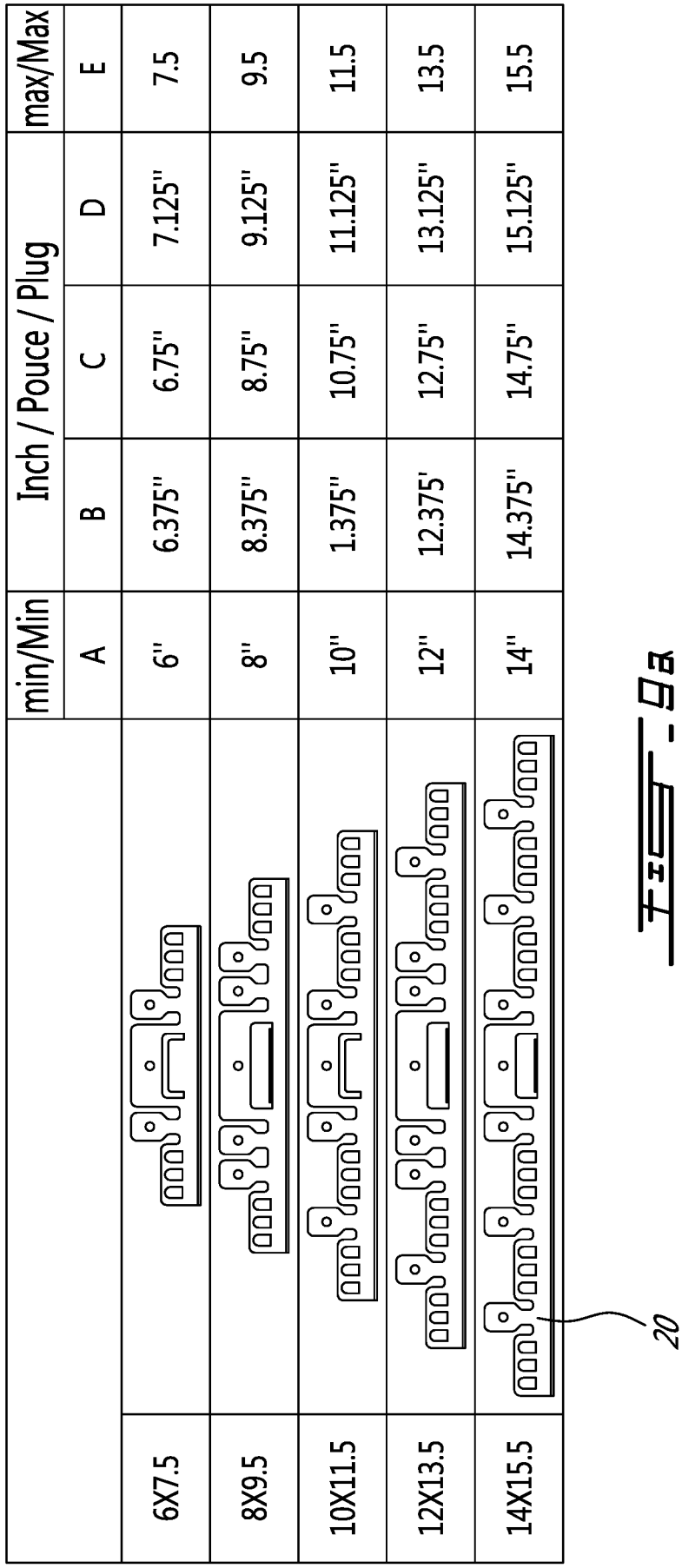

Fig - 9a

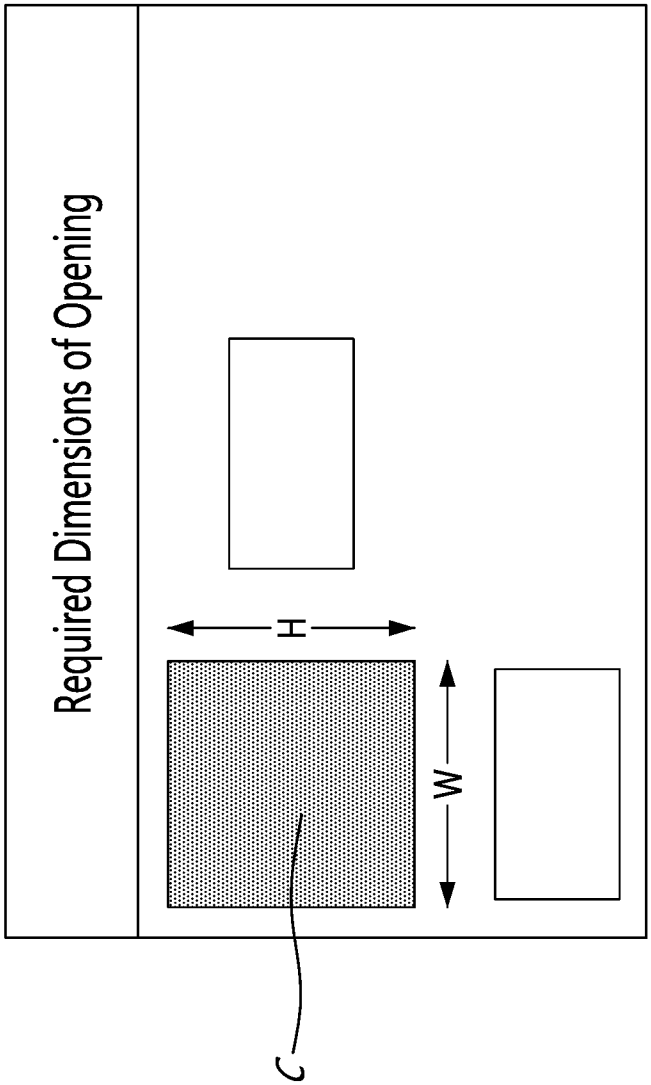

Fig - 9b

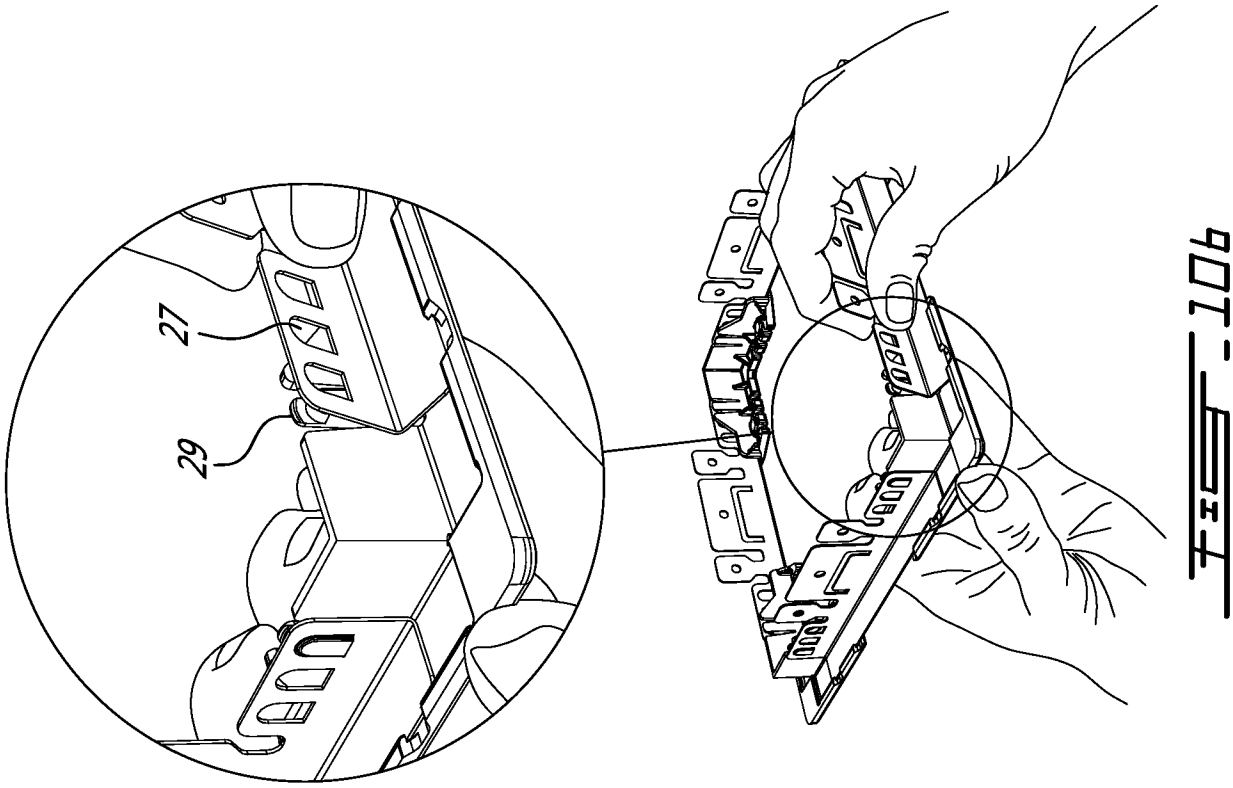

Fig. 10b

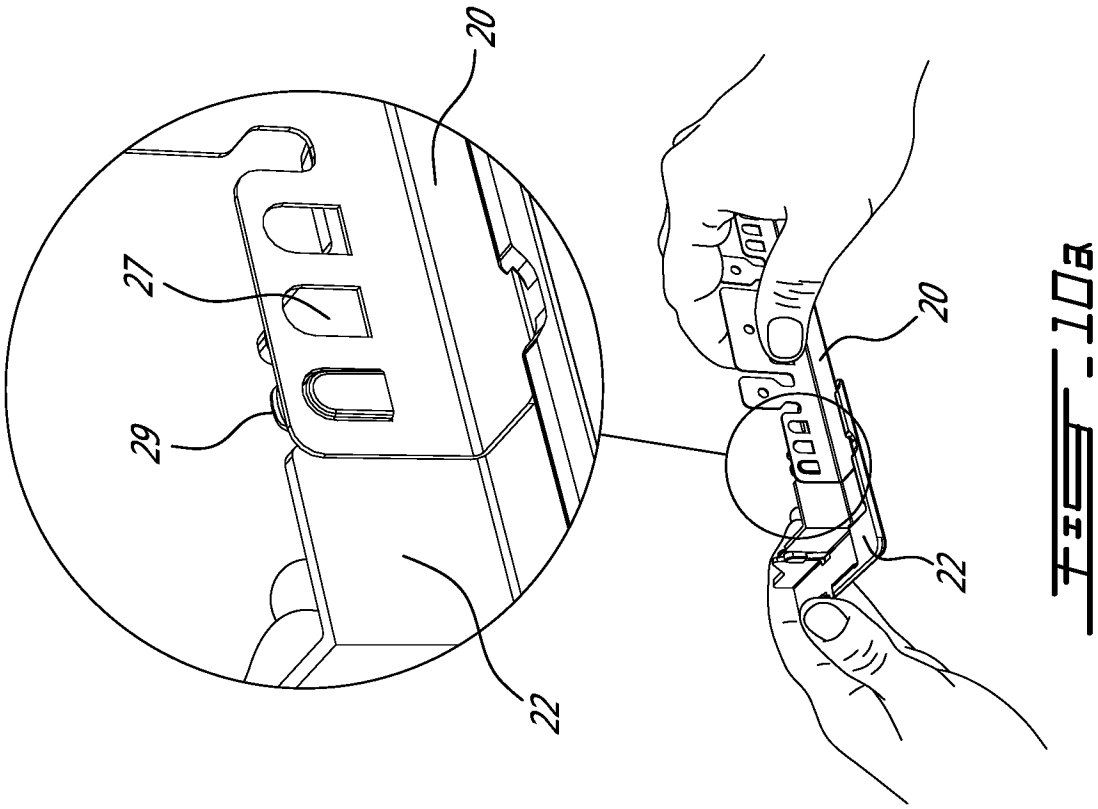

Fig. 10a

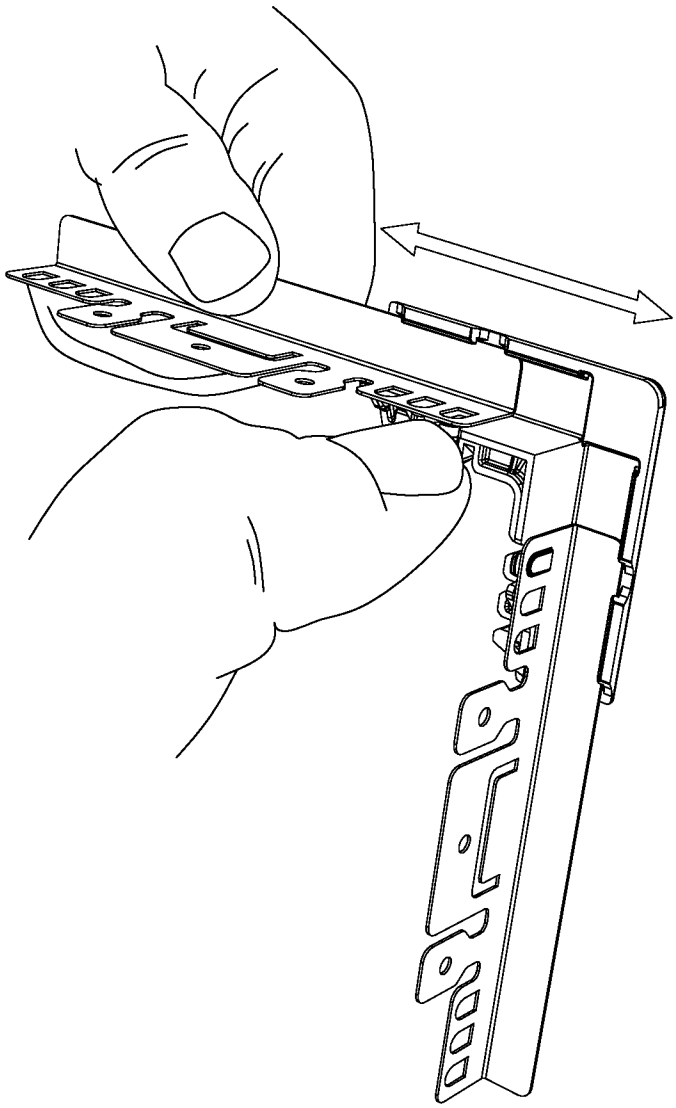

Fig. 10c

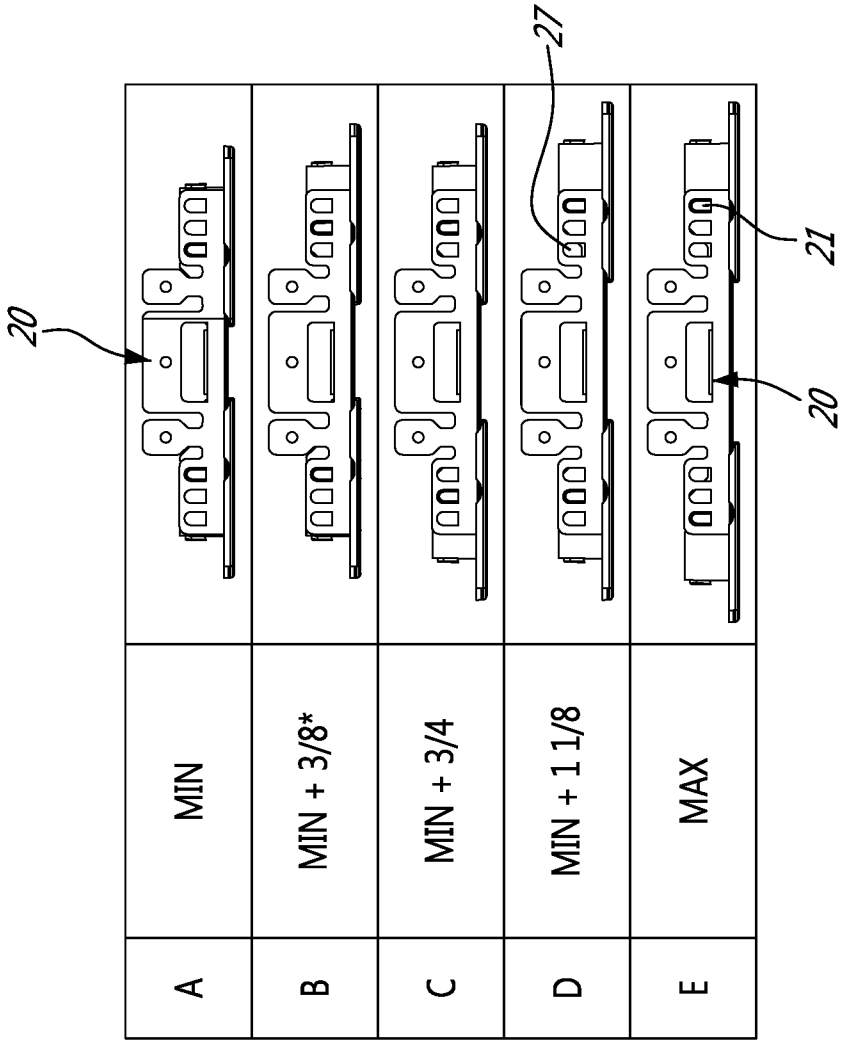

Fig. 10d

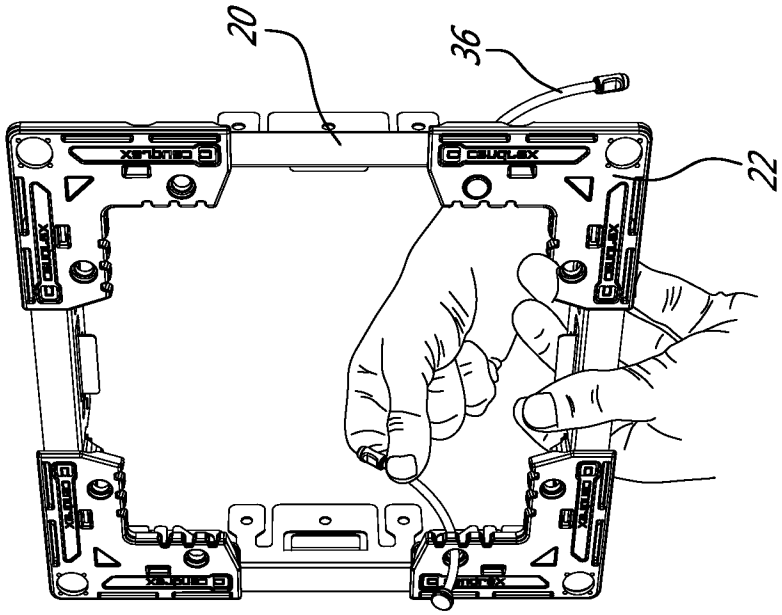

Fig. 10F

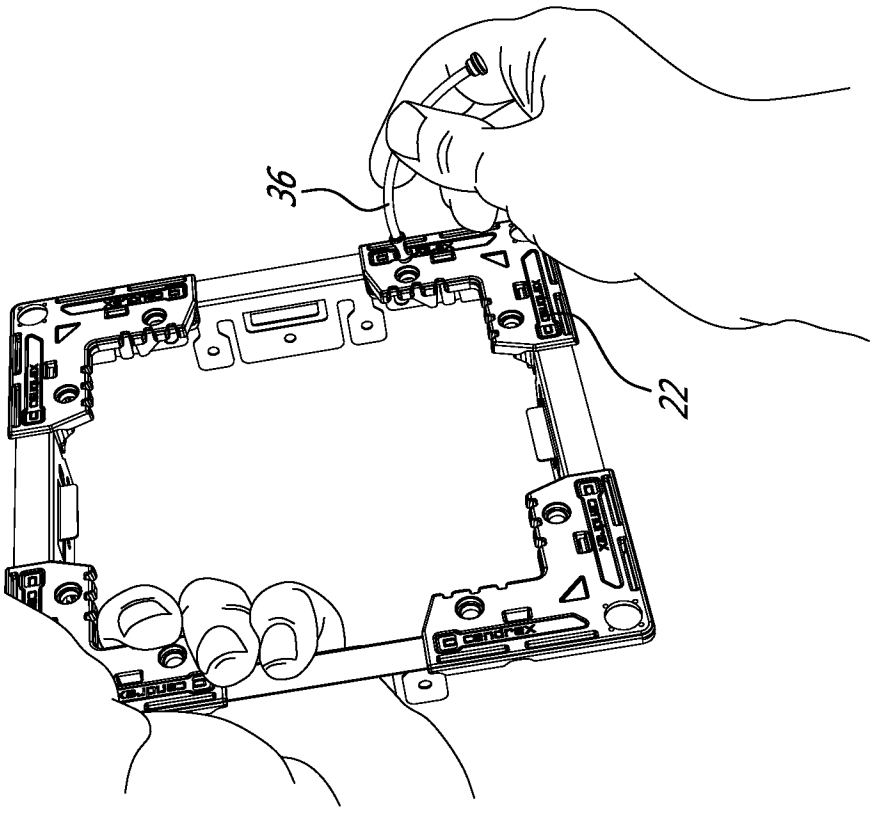

Fig. 10E

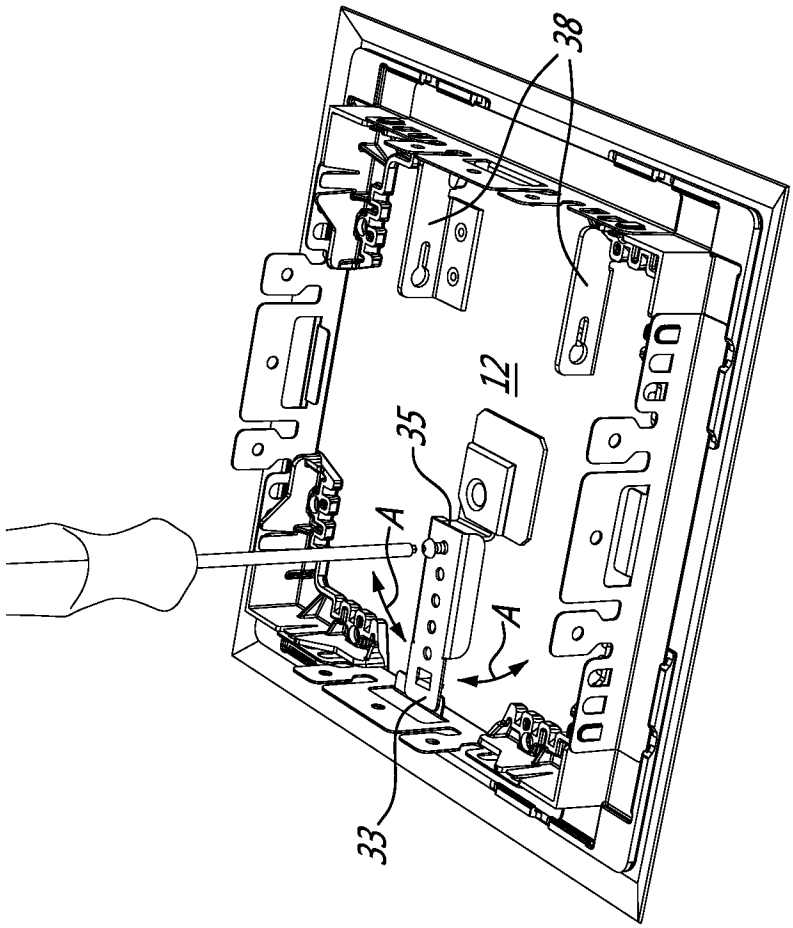

Fig. 11b

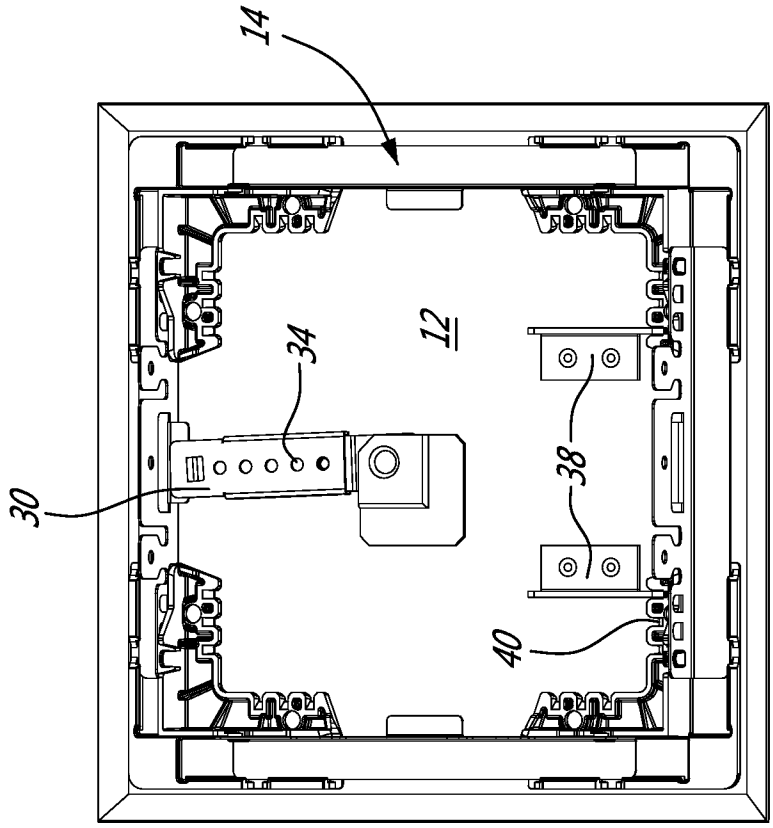

Fig. 11a

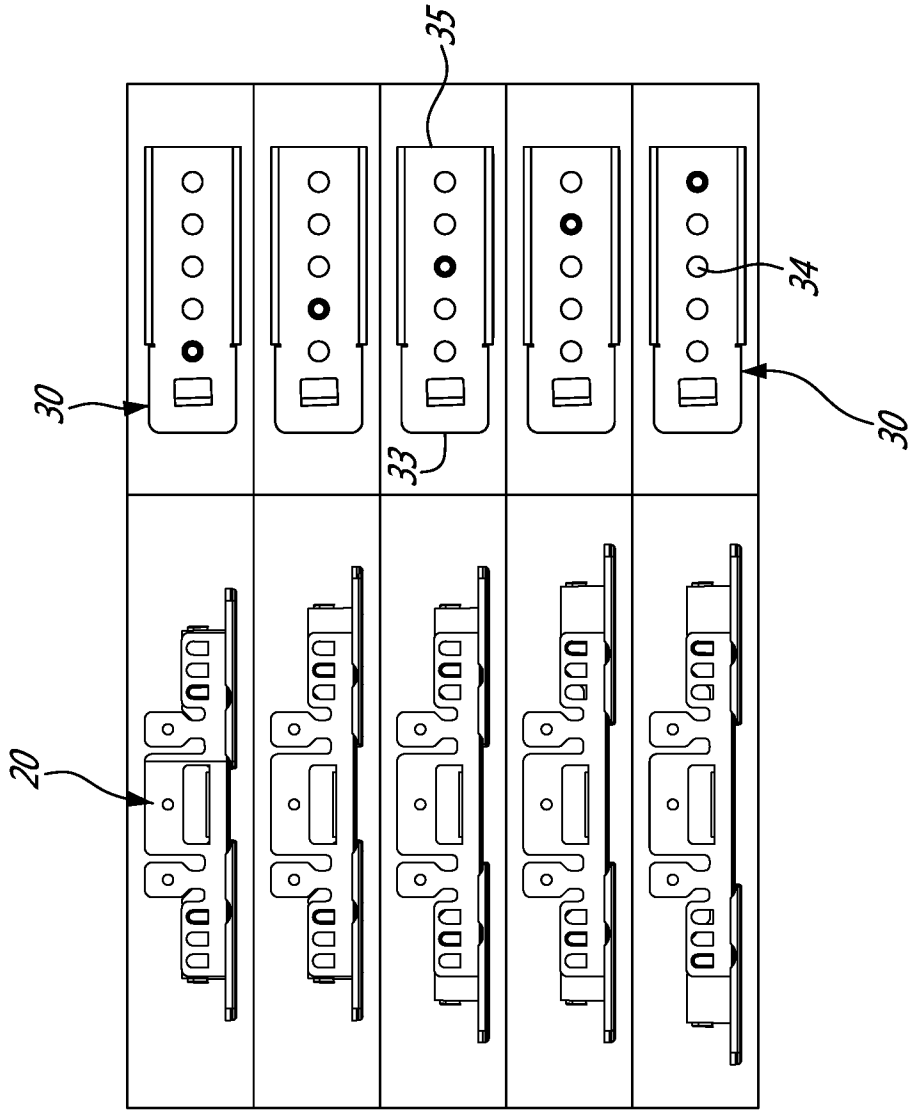

Fig - 11c

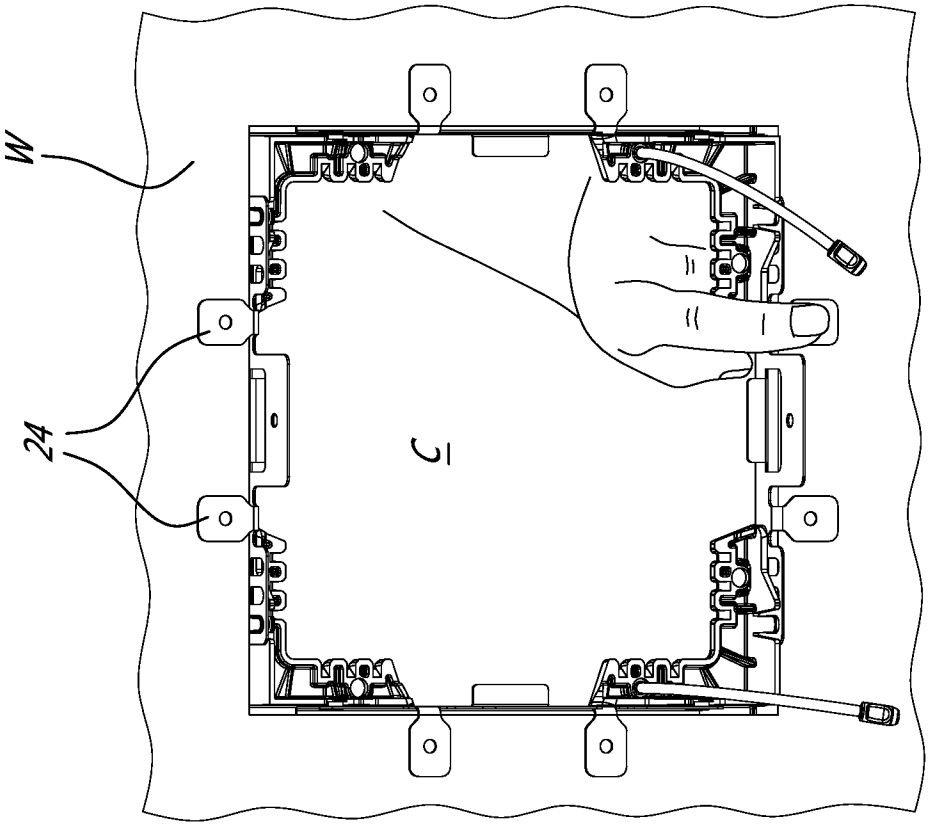

Fig. 12A

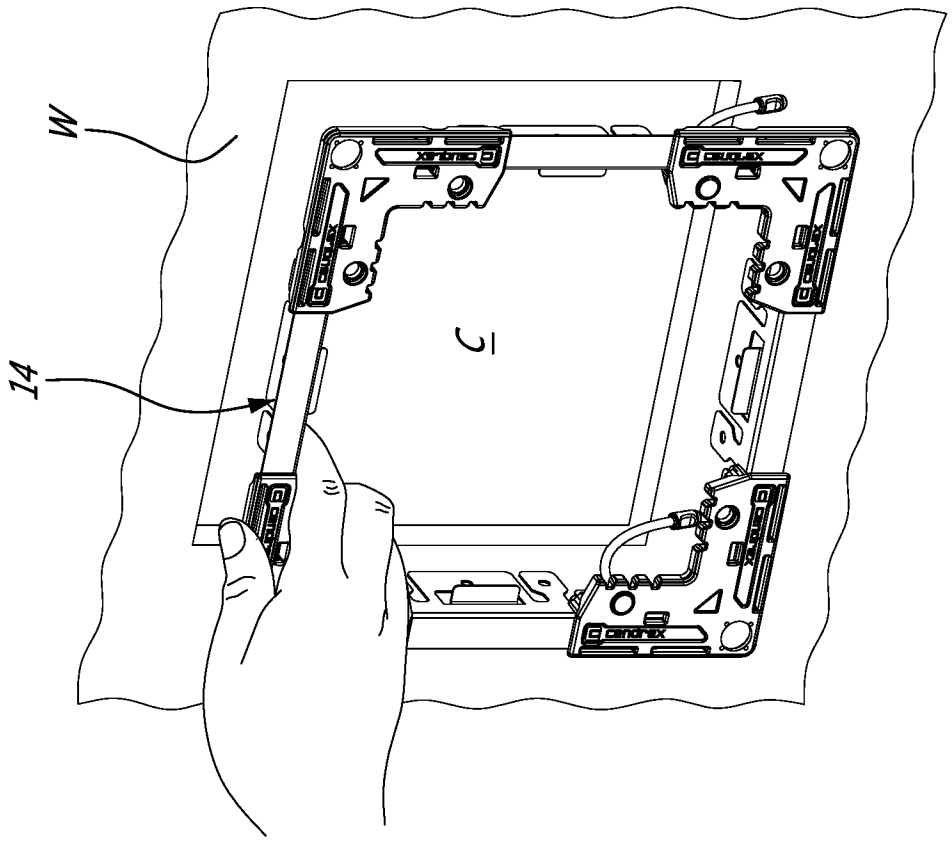

Fig. 12B

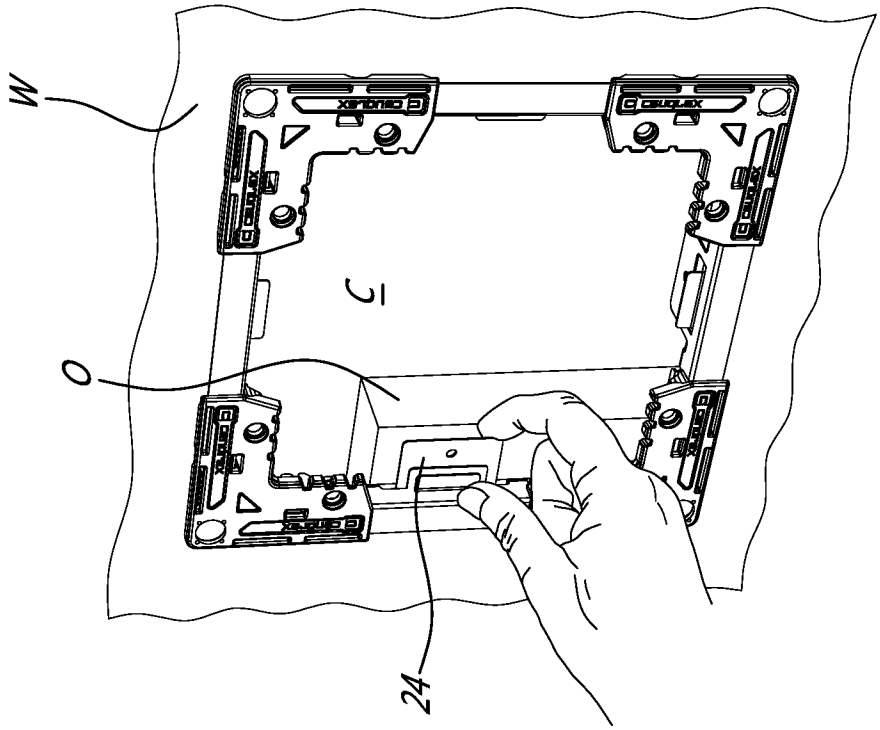

Fig. 12d

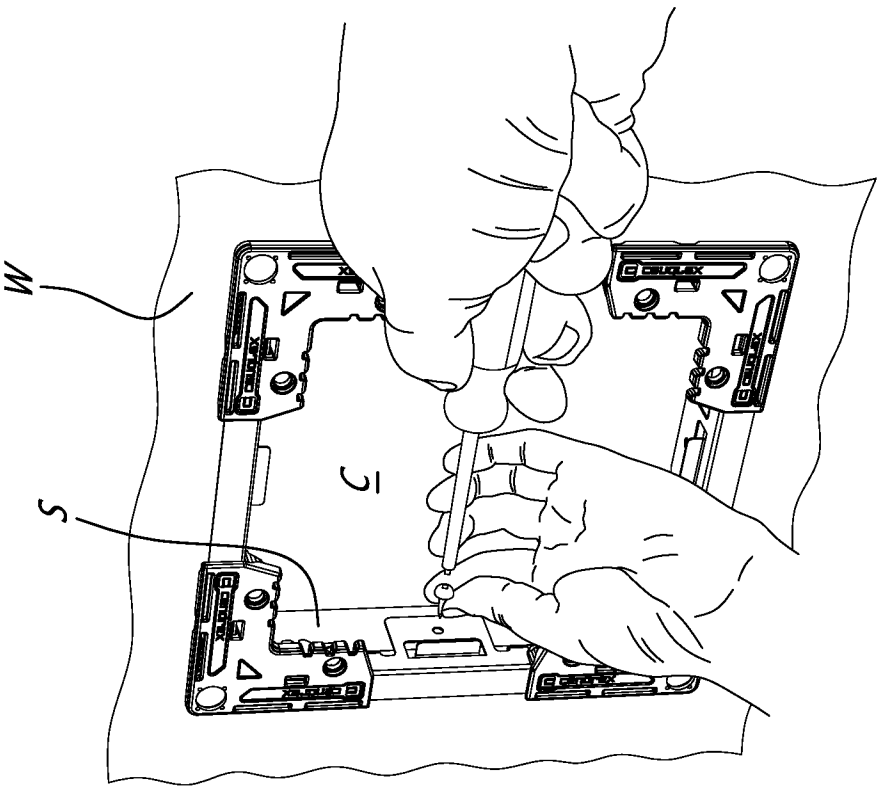

Fig. 12c

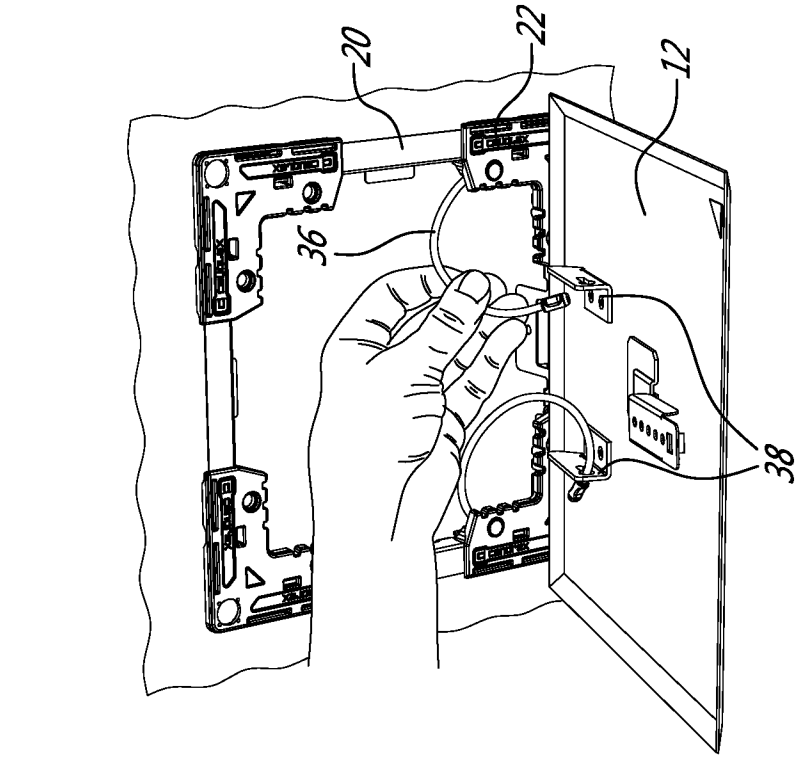

Fig-13b

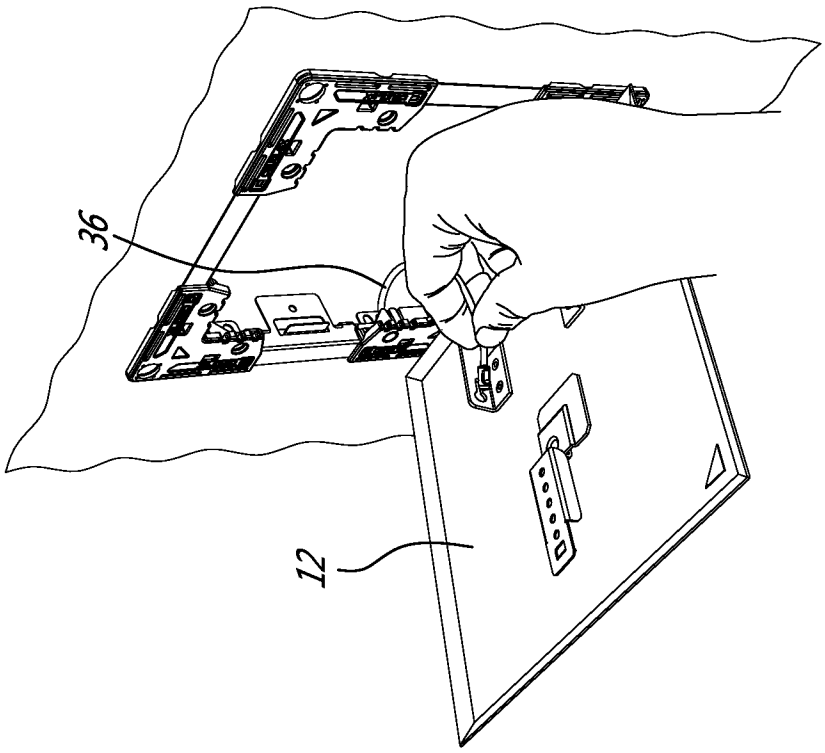

Fig-13a

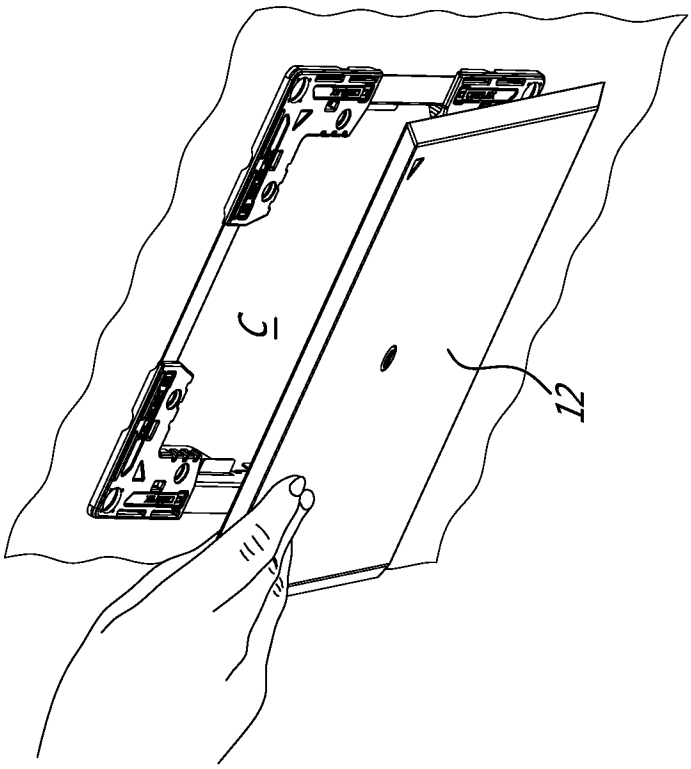

Fig. 13c

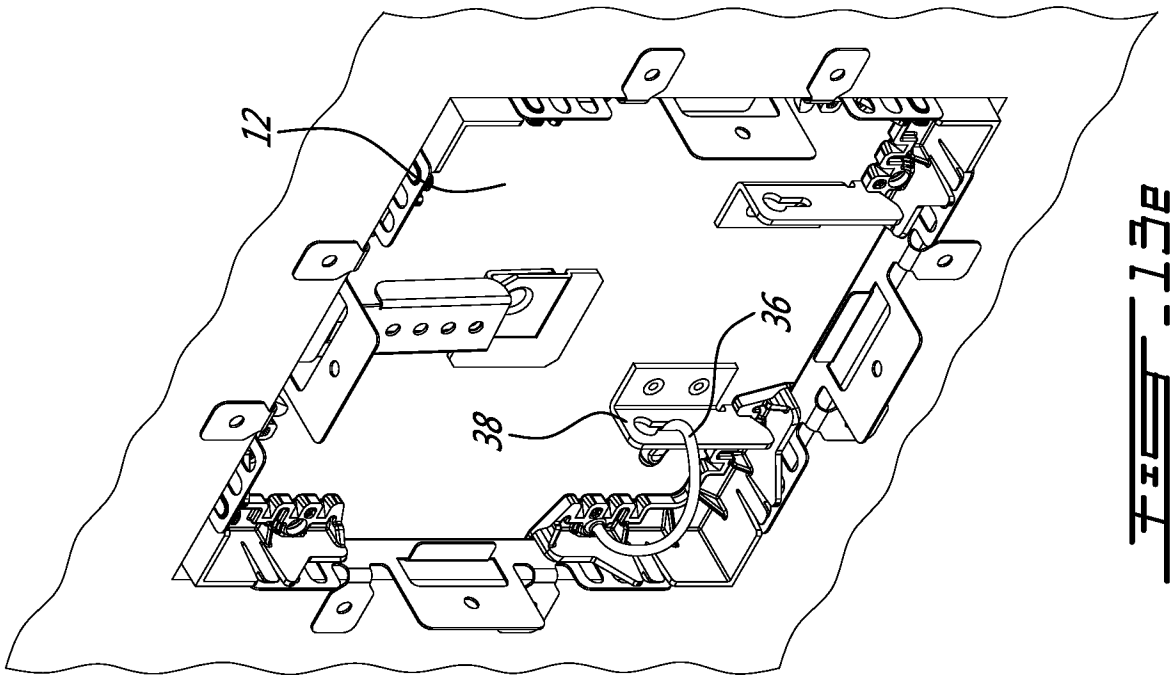

FIG-13a

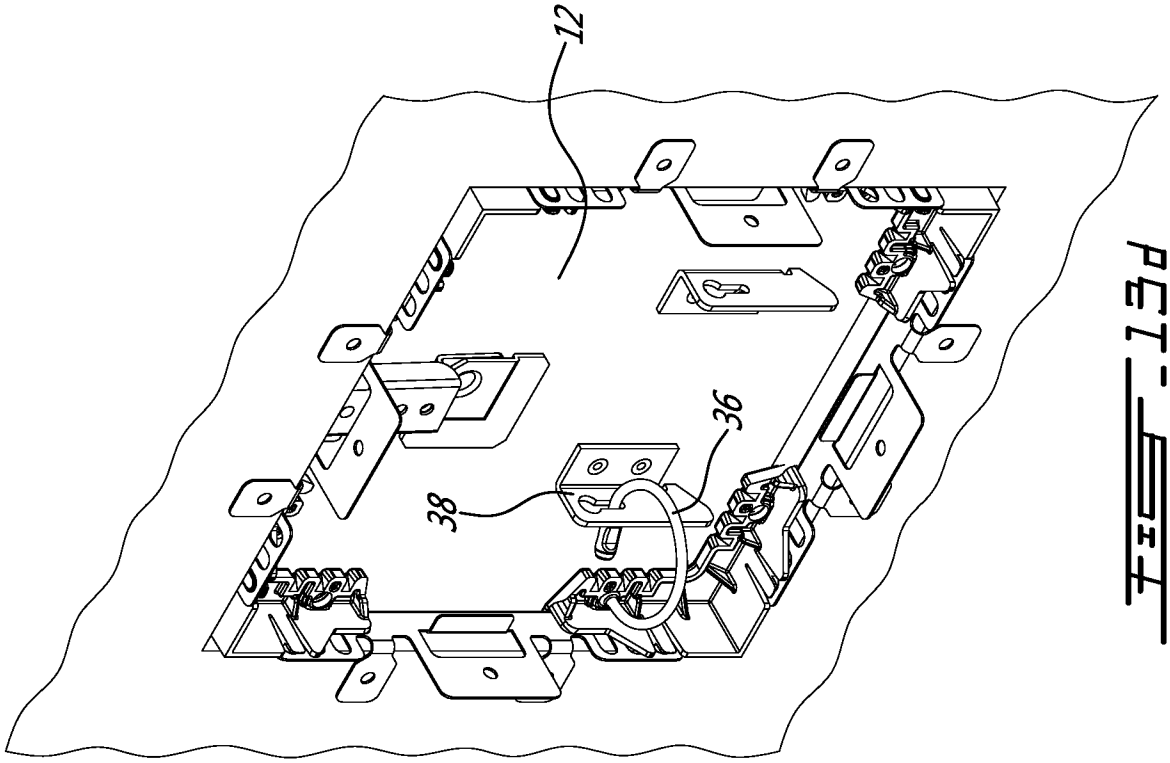

FIG-13b

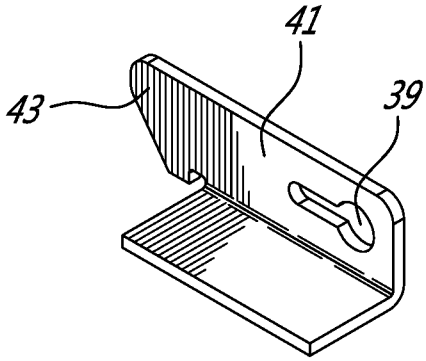

Fig. 14a

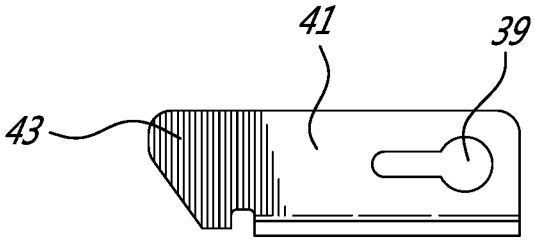

Fig. 14b

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2012/050757

A. CLASSIFICATION OF SUBJECT MATTER

IPC: ***E06B 5/00*** (2006.01) , ***E04G 21/00*** (2006.01) , ***E06B 1/52*** (2006.01) , ***E06B 1/56*** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: ***E06B 5/00*** (2006.01) , ***E04G 21/00*** (2006.01) , ***E06B 1/52*** (2006.01) , ***E06B 1/56*** (2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)

Canadian Patent Database, Epodoc; frame, adjust, size, access, door, frame, corner, length, opening, pin, snap

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2090641 A (POND, A.) 14 July 1982 (14.07.1982)) (Figure 2)	23
A	US 4222209 A (Peterson W.H.) 16 September 1980 (16-09-1980) whole document	1-24
A	US 5671580 A (CHOU, K.) 30 September 1997 (30-09-1987) whole document	1-24
A	US 7146774 B2 (FREDETTE, R.) 12 December 2006 (12-12-2006) whole document	1-24
A	GB 492538 (MACKENZIE, K.) 22 September 1938 (22-09-1938) whole document	1-24

[ ] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 December 2012 (11-12-2012)	18 January 2013 (18-01-2013)

Name and mailing address of the ISA/CA	Authorized officer
Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001-819-953-2476	Bruce M. Brown (819) 997-2167

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2012/050757

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
GB2090641A	14 July 1982 (14-07-1982)	None	
US4222209A	16 September 1980 (16-09-1980)	CA1143221A1	22 March 1983 (22-03-1983)
		GB2015687A	12 September 1979 (12-09-1979)
		GB2015687B	16 June 1982 (16-06-1982)
US5671580A	30 September 1997 (30-09-1997)	GB9624376D0	08 January 1997 (08-01-1997)
		GB2319553A	27 May 1998 (27-05-1998)
US7146774B2	12 December 2006 (12-12-2006)	US2004221541A1	1 November 2004 (11-11-2004)
GB 492538	(22 September 1938 (22-09-1938)	None	