



(11) **EP 3 330 453 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
06.06.2018 Bulletin 2018/23

(51) Int Cl.:
E04F 13/08 (2006.01) E04B 1/61 (2006.01)

(21) Application number: **17202197.4**

(22) Date of filing: **16.11.2017**

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

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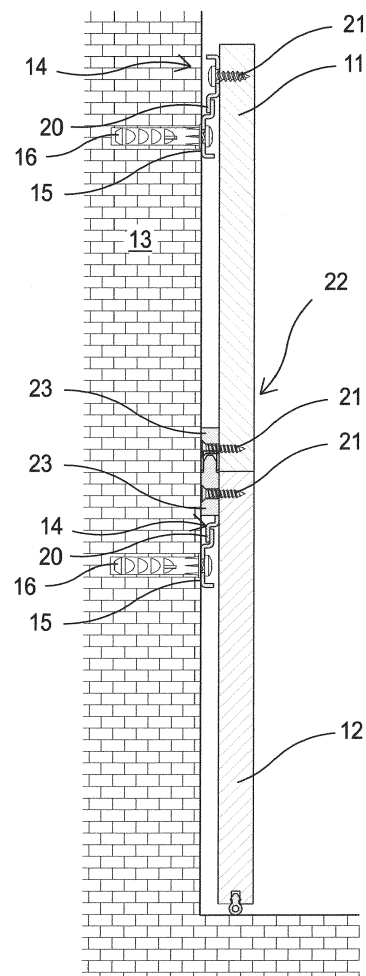
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(30) Priority: **30.11.2016 IT 201600121487**

(54) **ALIGNMENT AND JOINING SYSTEM FOR CLADDING PANELS HUNG TO WALL**

(57) An alignment and joining system for cladding panels hung to a wall of the type wherein a plurality of panels (11,12) are hung above each other on a supporting wall (13) by means of suspension devices (14) so that horizontal edges of the panels (11,12) are opposingly abutted against each other, at least one alignment and joining unit (22,122) composed of at least one base (23,123,223) for each panel (11, 12), cooperates in combination with the suspension devices (14), wherein at least one hole (25,125) and one pin (26,126) extending from the side, are present on a side of each base (23,123,223), the base (23,123,223) being fixed to each panel in correspondence with the horizontal edges so that at least one pin (26,126) of a base (23,123,223) of a panel (11,12) is inserted in the at least one hole (25,125) of the base (23,123,223) of the opposite panel (12,11) and viceversa.

Fig. 3



EP 3 330 453 A1

Description

[0001] The present invention relates to an alignment and joining system for cladding panels hung to a wall.

[0002] The wall assembly of panels, particularly but not exclusively, panels for interior furnishing, entail a series of problems associated with their positioning during assembly and their final position.

[0003] The document US2016/244967 discloses a hanging system for securing cladding panel on a building structure, the cladding panel having a mounting channel extending at least partly across a surface thereof.

A cladding assembly system may facilitating the hanging of one or more cladding panels onto a building structure. The system may include an embedded anchor block within a cladding panel and a hanging clip removably connected or fastened to the anchor block by a fastener.

[0004] To date, assembly systems have been developed, comprising a panel bracket or suspension device and a supporting element or plate.

[0005] The panel bracket or suspension device is destined for being fixed to the panel itself, whereas the plate or supporting element is destined for being fixed to the wall for receiving the panel bracket.

[0006] A panel-bracket device of this type is described, for example, in European Patent EP 2568095.

[0007] Figure 1 shows a device of this type wherein two panels 11, 12 are arranged superimposed. The two panels 11, 12 are constrained to a wall 13 by means of panel-bracket or suspension devices 14 which are engaged in a plate 15 fixed to the wall 13 by means of dowels 16.

[0008] In figure 1, the two panels 11, 12 are not constrained to each other and their alignment is achieved using specific spacers 17, positioned at the rear, for example, of the upper panel 11 which allow its alignment with the lower panel 12. In this way, a uniform distance or gap from the wall 13 is obtained.

[0009] Furthermore, when there is a plurality of panels to be mounted to the wall 13, each panel 11, 12 must provide at least two panel-bracket devices 14 which keep it integral with the wall in the interior environment to be furnished. This causes problems of a correct positioning. This problem increases when the panels are superimposed and must be perfectly aligned.

[0010] Figure 2 shows how attempts have been made to find a solution to this problem by creating a constraint between the two superimposed panels 11, 12.

[0011] The idea was conceived, in fact, of producing a pair of superimposed panels 11, 12 hanging above each other, constrained to each other by means of a strip 18 which is embedded in grooves 19 formed on facing ends of the two superimposed panels 11, 12.

[0012] Further problems arose from the fact that these panels can be either spaced from the wall as seen or they must be positioned perfectly attached to the wall itself.

[0013] It is evident that whatever means or elements

are used, they must be completely concealed when the panels are assembled, i.e. they must not be visible to whoever is looking at the panel.

[0014] The arrangement of superimposed panels, moreover, must have a certain ease of positioning and accessibility, avoiding the use of visible fixing and/or alignment elements.

[0015] Furthermore, the elements used for the positioning of these vertically aligned panels must not only allow a correct placement of the panels in the environment, but they must also ensure that adjacent panels are coplanar and well aligned with each other.

[0016] Furthermore, whatever element is used must have a minimum encumbrance, so that it can be used with the most varied type of panels.

[0017] A further requirement is that a wall-assembly system of panels of this type must have a low cost.

[0018] The general objective of the present invention is to provide an alignment and joining system of panels which is capable of solving the above-mentioned drawbacks of the known art in an extremely simple, economical and particularly functional manner.

[0019] A further objective of the present invention is to provide an alignment and joining system of superimposed panels hung to the wall that can be operatingly positioned with extreme simplicity.

[0020] The above objectives are achieved with an alignment and joining system of panels hung to a wall superimposed with respect to each other, produced according to the independent claim 1 and the following sub-claims.

[0021] The structural and functional characteristics of the present invention and its advantages with respect to the known art will appear even more evident from the following description referring to the enclosed schematic drawings, which show embodiment examples of the same invention. In the drawings:

- figure 1 is a raised section illustrating a pair of panels detached from the wall, hung above each other in a known way and not constrained to each other;
- figure 2 is a raised section illustrating a second known solution of a pair of panels hung above each other, constrained to each other by means of a strip which is embedded in grooves formed on facing ends of the two superimposed panels;
- figures 3 and 4 are a raised section and a front view of a pair of panels arranged superimposed, hanging spaced with respect to a wall with the alignment and joining system according to the present invention;
- figures 5, 6, 7 and 8 show a sectional view (IV-IV), a raised front view, a side view and a view from above of a base or plate used in the alignment and joining system of the invention shown in figures 3 and 4;
- figure 9 is a perspective view of a pair of bases shown in the previous figures, exploded together before being coupled;

- figures 10 and 11 are a raised section and a front view of a pair of panels arranged superimposed, hanging flush with a wall with the alignment and joining system according to a further embodiment of the present invention;
- figures 12, 13, 14, 15, 16, 17 and 18 show a raised front view, a view from the rear, from the side, from above and from below, and also a cross section (XVII-XVII) and a longitudinal section (XVIII-XVIII) of a base or plate used in the alignment and joining system of the invention shown in figures 10 and 11;
- figure 19 is a perspective view of a pair of bases shown in figures 10 to 18, exploded together before being coupled;
- figure 20 shows a perspective view from the rear of one of the bases shown in figure 19;
- figures 21 and 22 are perspective views of two further embodiments of a system according to the present invention;
- figures 23 and 24 are a raised section and a front view of a further application of the alignment and joining system according to the present invention.

[0022] With reference to figures 3 to 9, these show a first example of an alignment and joining system for cladding panels hung on a wall according to the present invention.

[0023] In this system, there must be a plurality of panels 11, 12 (of which only two are shown for the sake of simplicity) hung above each other on a supporting wall 13 by means of suspension devices or panel brackets 14, as previously described.

[0024] Said suspension devices or panel brackets 14 have a hook element 20 which is engaged in a plate 15 fixed to the wall 13 by means of dowels 16.

[0025] There are generally two suspension devices 14 per panel 11, 12, which are fixed to the rear of each panel by means of screws 21 or similar fixing elements.

[0026] This is effected so that facing horizontal edges of the panels 11, 12 are opposingly abutted against each other.

[0027] The present invention provides that, in a totally characteristic manner, an alignment and joining unit indicated as a whole with 22, cooperates in combination with said suspension devices 14. This alignment and joining unit 22 comprises at least one base or plate 23 associated with each panel 11, 12.

[0028] The invention provides, in fact, that, on a side or face 24 of each base 23, for example in the form of a prismatic body, there are at least one hole 25 formed in said side or face 24 and at least one pin 26 which extends protrudingly from said side or face 24.

[0029] In the example shown, the base 23 also provides a pair of holes 27 in which a screw 28, or similar fixing element, is positioned for making the base 23 integral with the relative panel 11, 12 with a screw fixing.

[0030] It should be pointed out that in this way, the base 23, positioned at the rear of the panel 11, 12, is

fixed to each panel 11, 12 in correspondence with its horizontal edges so that at least one pin 26 of a base 23 of a panel 11, 12 is inserted in the at least one hole 25 of the base 23 of the opposite panel 12 or 11 and vice-versa.

[0031] The insertion of a pin 26 of a base 23 in the hole 25 of the opposite base 23 which form an alignment and joining unit 22, defines and creates a completely stable constraint which firmly joins the panels 11, 12, keeping them aligned.

[0032] With this arrangement, the panels 11, 12 are almost automatically positioned at a uniform distance or gap from the wall 13.

[0033] The panels 11, 12 superimposed with respect to each other, are therefore perfectly aligned with each other vertically.

[0034] Figures 10 to 20 show a second embodiment of the system of the invention. In particular, this example relates to the application of panels positioned above each other hung flush with a wall with the alignment and joining system according to the above-mentioned further embodiment of the present invention.

[0035] Also in this example, the system provides the arrangement of an alignment and joining unit 122. This alignment and joining unit 122 also comprises at least one base or plate 123 associated with each panel 11, 12.

[0036] In this case, each base 123 comprises a hollow body 30, for example in cylindrical form or in the form of another solid as desired, which provides a portion 31 of its side surface which is flat. In this flat portion 31, at least one hole 125, formed in said flat portion 31, and at least one pin 126 which extends protrudingly from said flat portion 31, are present.

[0037] The insertion of a pin 126 of a base 123 in the hole 125 of the opposite base 123 which form an alignment and joining unit 122 defines and creates a completely stable constraint which firmly joins the panels 11, 12, keeping them aligned.

[0038] The hollow body 30 of each base 123 provides two perforated seats 127 in each of which a screw 128, or similar fixing element, is positioned, to make the base 123 integral with the relative panel 11, 12 with a screw fixing.

[0039] In particular, there is the provision that each base 123 can be arranged in a housing 32 formed inside the single panel 11, 12.

[0040] Furthermore, each base 123 provides that the hollow body 30 in cylindrical form is provided, for most of its side surface, with teeth 33 protruding outwardly. These teeth 33 allow a pressure-positioning of the base 123 in the housing 32 that can make the provision of the two perforated seats 127 optional.

[0041] Figures 21 and 22 show how, in this type of application of the panel 11, 12 flush with the wall 13, the suspension devices or panel brackets 14 are also positioned inside housings 34 formed in the panels 11, 12.

[0042] In particular, figure 21 shows the positioning of the single base 123 in the relative housing 32 and also

the positioning of a suspension device or panel bracket 114 in the relative housing 34 formed in the wall 11 or 12.

[0043] Figure 22 shows, in a perspective view, a further embodiment of the system according to the present invention wherein the single base 123 has a truncated eight-shaped form which is housed in a truncated double-eight-shaped housing 232.

[0044] Figures 23 and 24 show yet another embodiment wherein the system of the present invention is used for an intermediate panel 40 positioned between the above-mentioned superimposed panels 11, 12.

[0045] This intermediate panel 40 does not provide suspension devices or panel brackets 114 and said intermediate panel 40 is kept connected and aligned with the two upper 11 and lower 12 panels thanks to the provision of alignment and joining units according to the invention.

[0046] The use of an alignment and joining unit 122 is in fact also provided in this example. Said alignment and joining unit 122 comprises, for each panel 11, 12 and 40, at least one base or plate 123 associated with each panel 11, 12.

[0047] Also in this case, each base 123 comprises a hollow body 130, for example in cylindrical form, which provides a portion 131 of its side surface 131 which is flat. In this flat portion 131, at least one hole 125, formed in said flat portion 131, and at least one pin 126 which extends protruding from said flat portion 131, are present.

[0048] The hollow body 130 of each base 123 provides two perforated seats 127 in each of which a screw 128, or similar fixing element, is positioned, to make the base 123 integral with the relative panel 11, 12 and 40 with a screw fixing.

[0049] In particular, there is the provision that each base 123 can be arranged in a housing 132 formed inside the single panel 11, 12 and 40.

[0050] Furthermore, each base 123 provides that the hollow body 130 in cylindrical form is provided, for most of its side surface, with teeth 133 protruding outwardly. These teeth 133 allow a pressure-positioning of the base 123 in the housing 132 that can make the provision of the two perforated seats 127 optional.

[0051] All of these examples show the alignment and joining system for cladding panels hung to a wall according to the present invention.

[0052] The panels 11, 12 and 40 are arranged both at a distance from the wall 13 and also flush with said wall 13, perfectly well aligned in both a vertical and horizontal direction, as alignment and joining units of the system according to the invention can also be positioned on adjacent vertical edges of panels arranged alongside each other.

[0053] The forms of the structure for producing a system of the present invention, as also the materials and assembly modes, can naturally differ from those shown for purely non-limiting purposes in the drawings.

[0054] The objectives mentioned in the preamble of the description have therefore been achieved.

[0055] The protection scope of the present invention is defined by the enclosed claims.

5 Claims

1. An alignment and joining system for cladding panels hung to a wall of the type wherein a plurality of panels (11,12) are hung above each other on a supporting wall (13) by means of suspension devices (14) so that horizontal edges of said panels (11,12) are oppositely abutted against each other, wherein at least one alignment and joining unit (22,122) composed of at least one base (23,123,223) for each panel (11, 12), cooperates in combination with said suspension devices (14), **characterized in that** at least one hole (25,125) and one pin (26,126) extending from said side, are present on a side of each base (23,123,223), said base (23,123,223) being fixed to each panel in correspondence with said horizontal edges so that the at least one pin (26, 126) of a base (23, 123, 223) of a panel (11,12) is inserted in the at least one hole (25,125) of the base (23,123,223) of the opposite panel (12,11) and viceversa.
2. The system according to claim 1, **characterized in that** each base (23) of said alignment and joining unit (22) is positioned at the rear of and associated with said panel (11,12).
3. The system according to claim 1 or 2, **characterized in that** said base (23) comprises a prismatic body which, on one of its sides (24), has said at least one hole (25) and at least one pin (26).
4. The system according to claim 3, **characterized in that** said base (23) provides a pair of holes (27) in which a screw (28), or a similar fixing element, is positioned to make the base (23) integral with the panel (11, 12).
5. The system according to claim 1, **characterized in that** said base (123) of said alignment and joining unit (122) is positioned inside a housing (32) formed inside the single panel (11,12).
6. The system according to claim 5, **characterized in that** said base (123) comprises a hollow body (30) in cylindrical form, which provides a portion (31) of its side surface which is flat, wherein said at least one hole (125) and at least one pin (126) are present in said flat portion (31).
7. The system according to claim 6, **characterized in that** said base (123) provides a pair of holes (127) in which a screw (128) is positioned to make the base (123) integral with the relative panel (11,12).

8. The system according to claim 6, **characterized in that** said base (123) provides teeth (33) protruding outwardly for the pressure-positioning of the base (123) in a housing (32) formed inside the single panel (11, 12). 5
9. The system according to one or more of the claims from 5 to 8, **characterized in that** said suspension devices (114) are also positioned in housings (34) formed inside the single panel (11,12). 10
10. The system according to one or more of the claims from 1 to 9, **characterized in that** said at least one alignment and joining unit (22,122) is also positioned in an intermediate panel (40) facing said panels (11,12) provided with suspension devices (14,114). 15

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Fig. 1

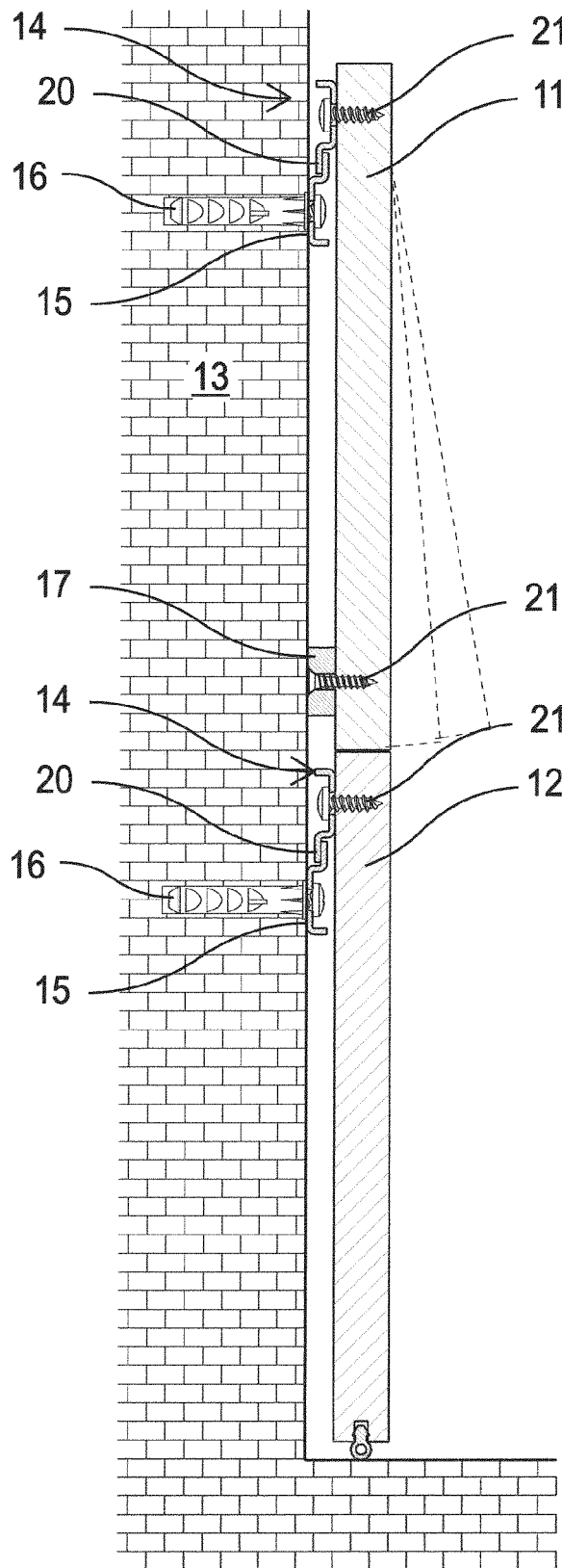


Fig. 2

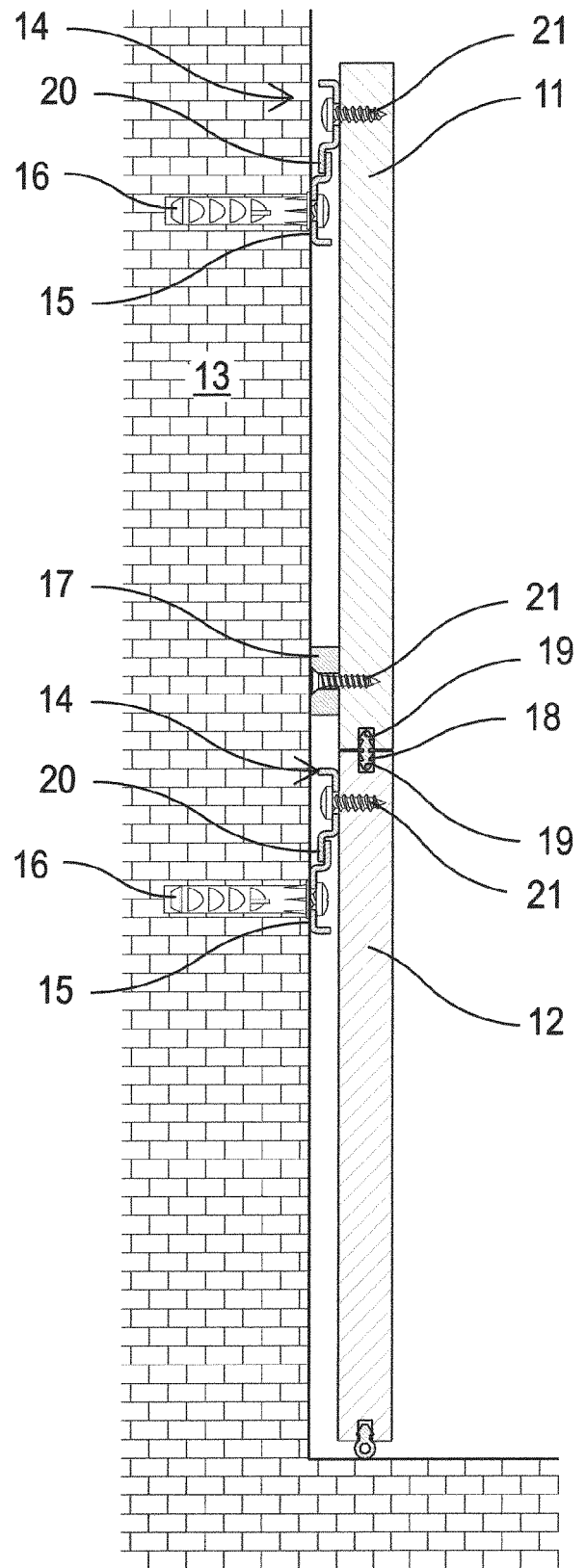


Fig. 3

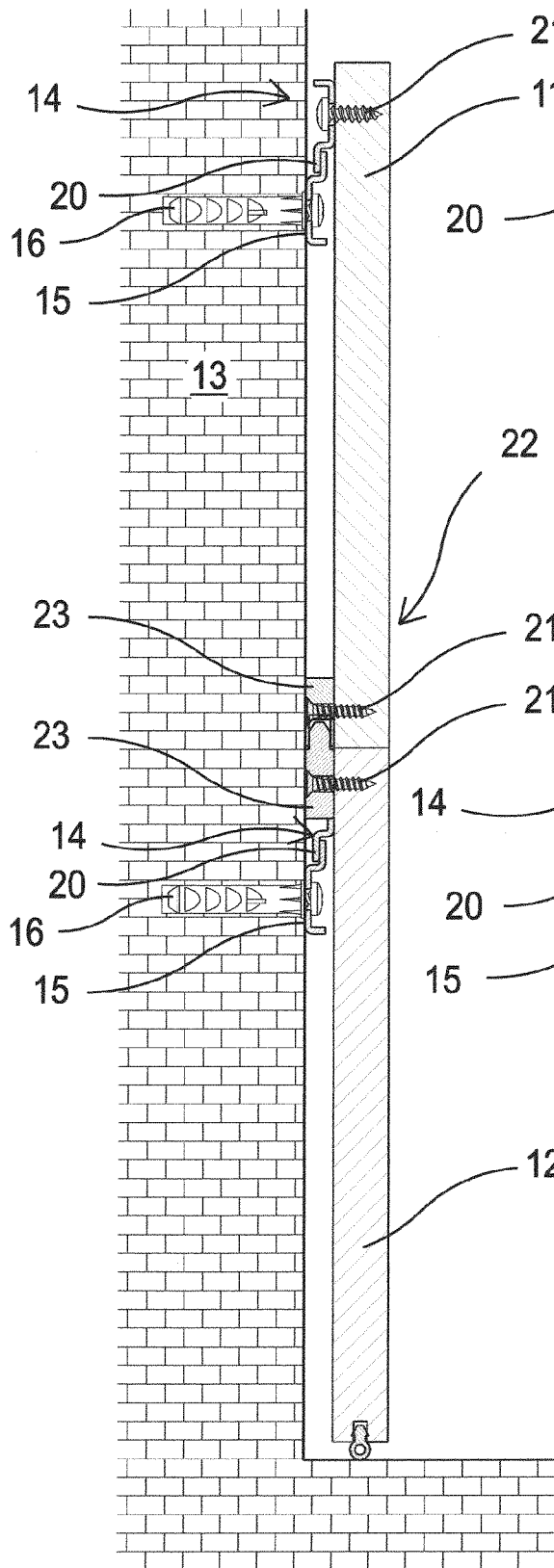


Fig. 4

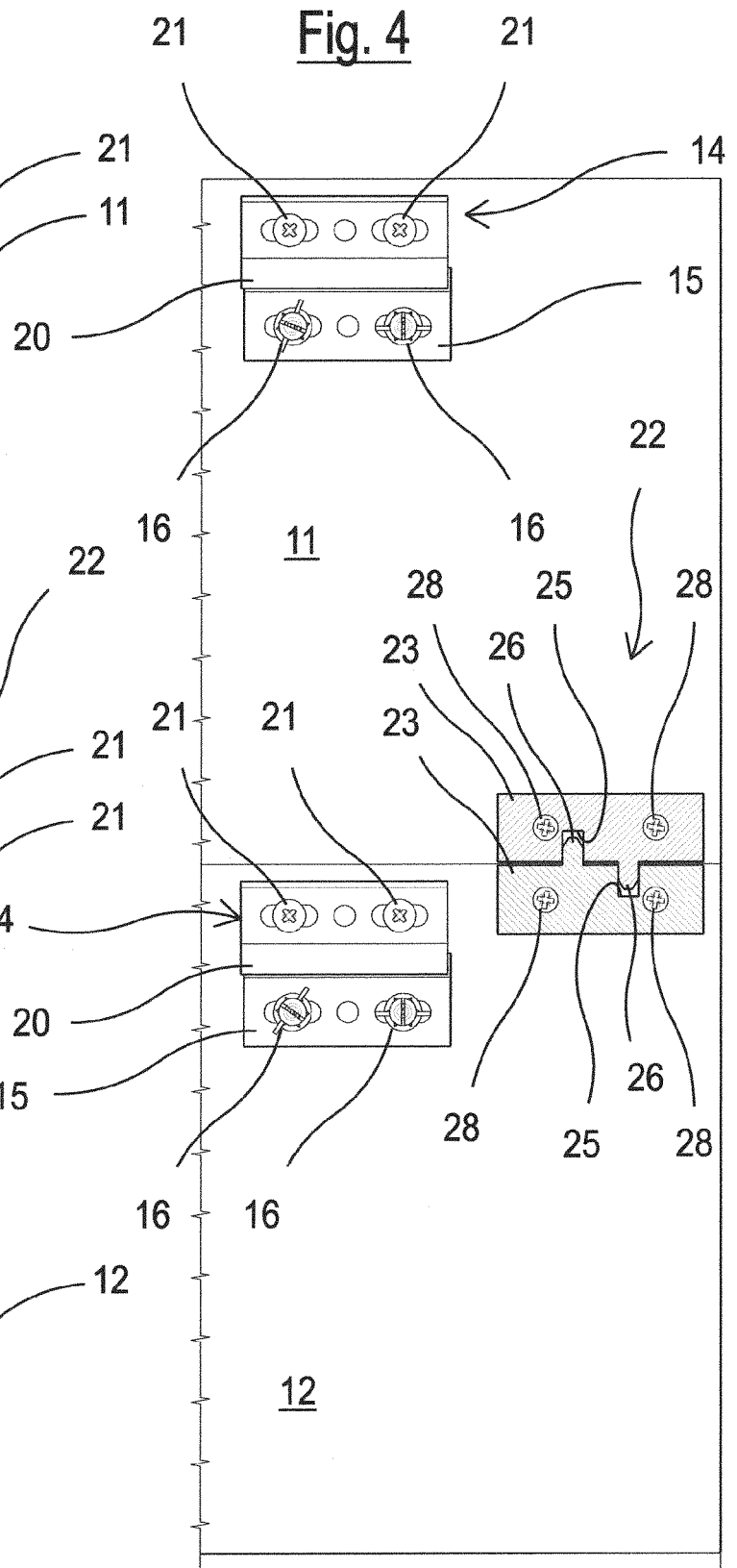


Fig. 5

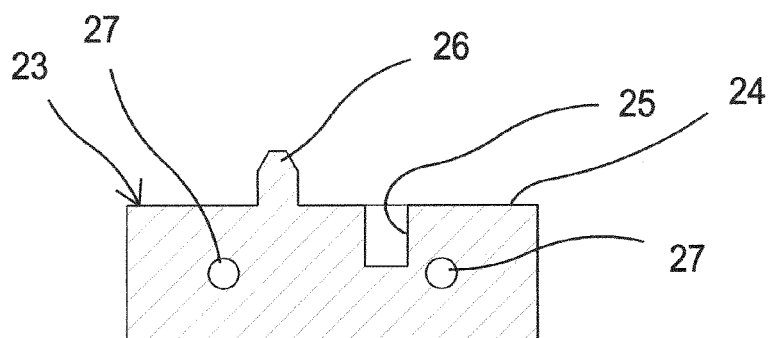


Fig. 6

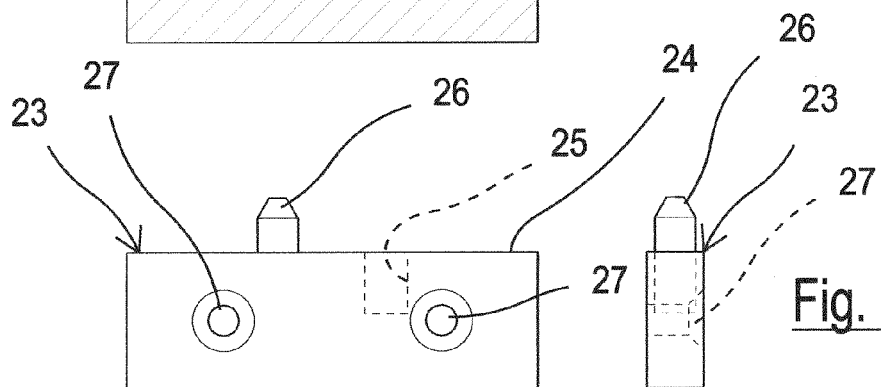


Fig. 7

Fig. 8

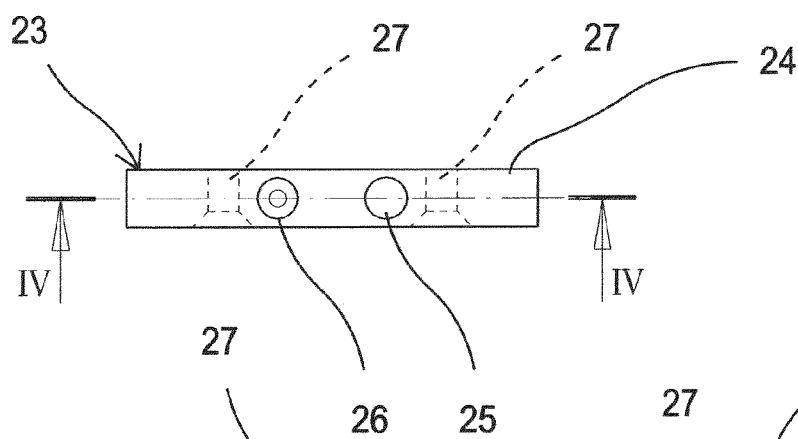


Fig. 9

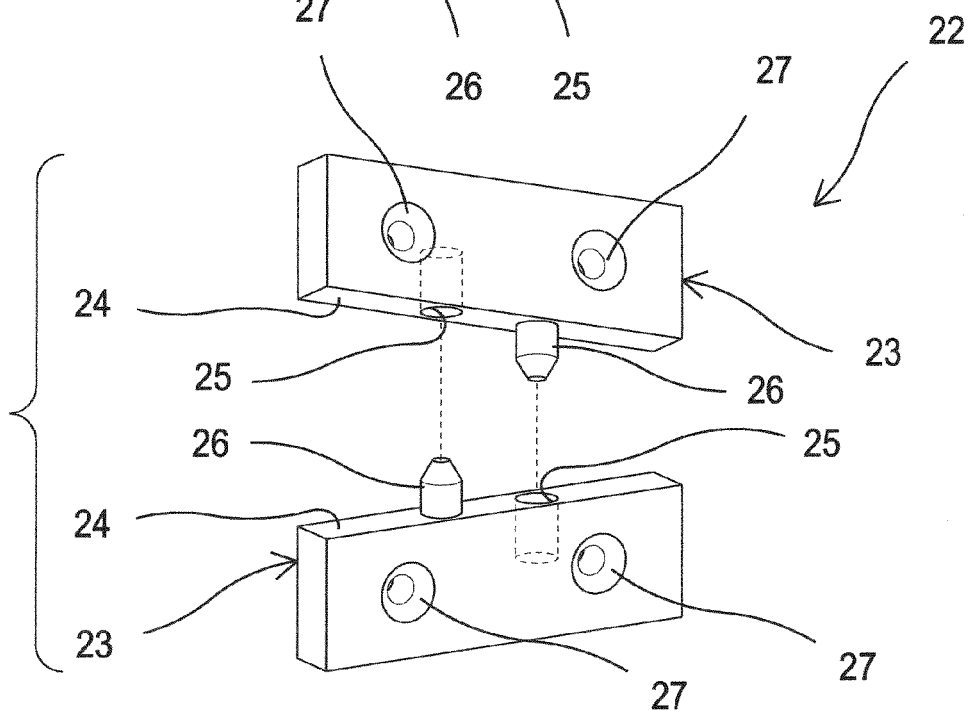


Fig. 10

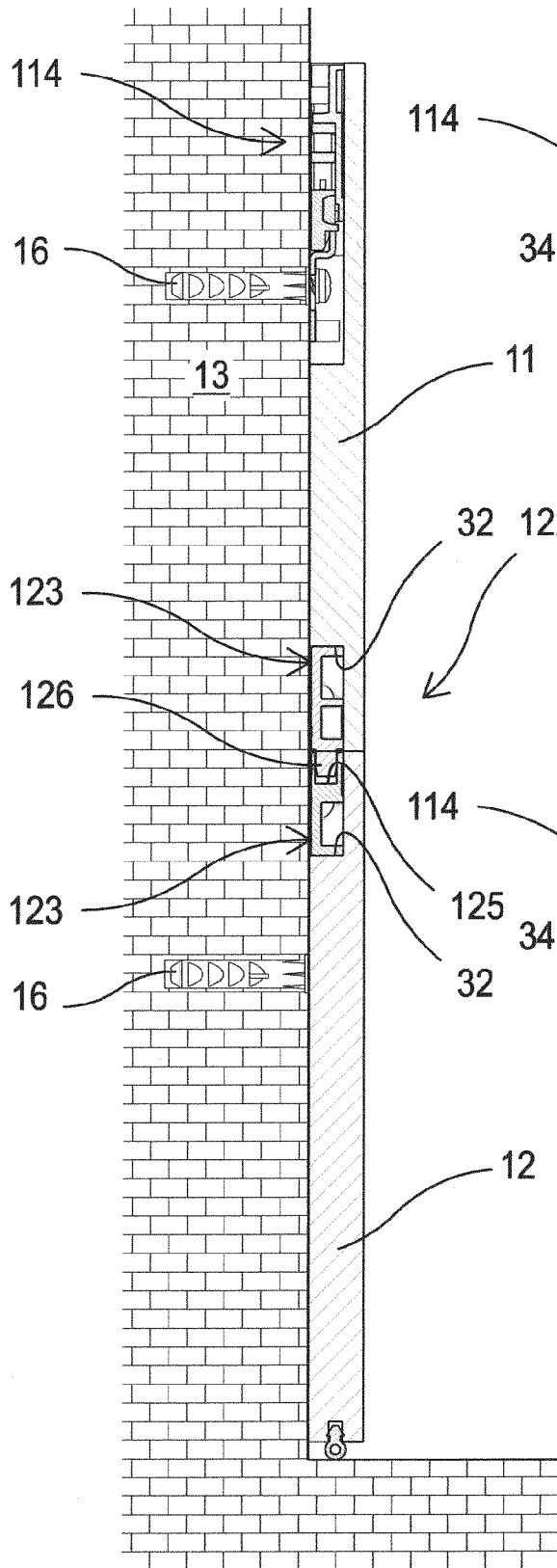


Fig. 11

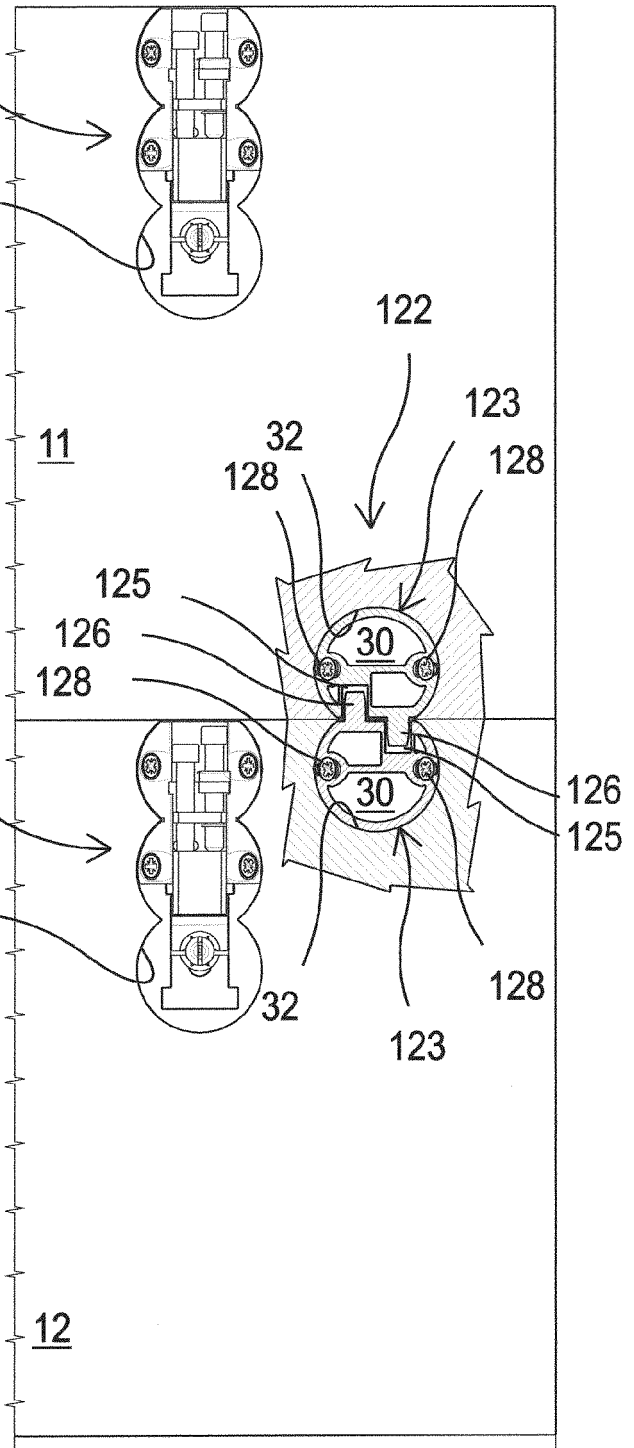


Fig. 12

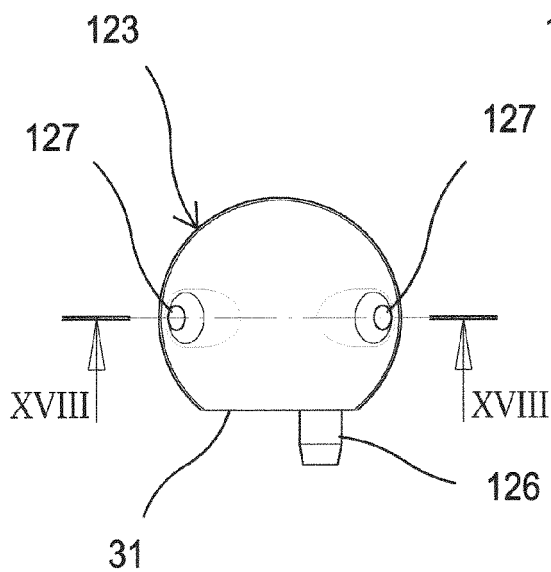


Fig. 13

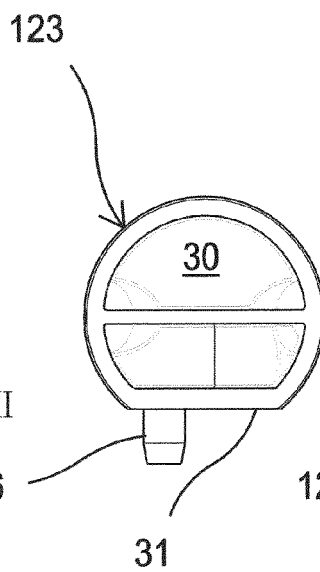


Fig. 14

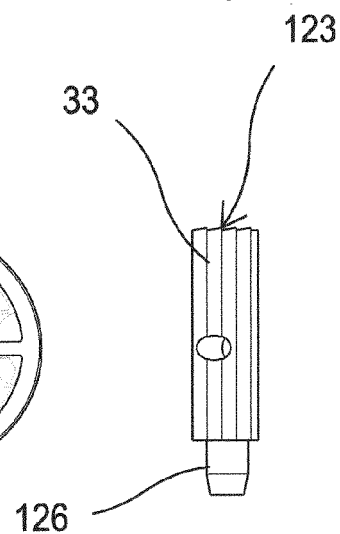


Fig. 15

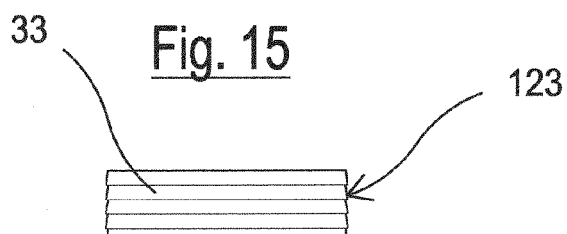


Fig. 16

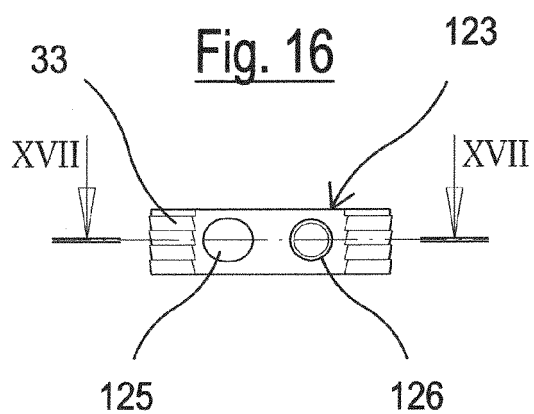


Fig. 18

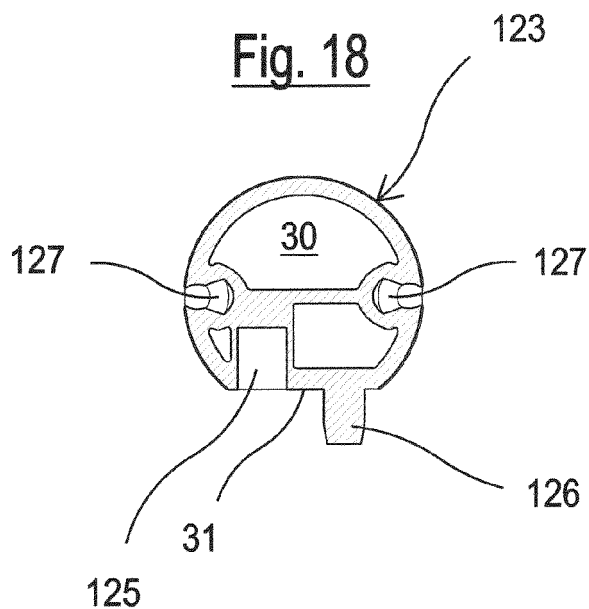
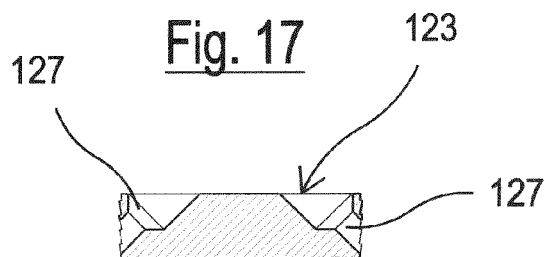
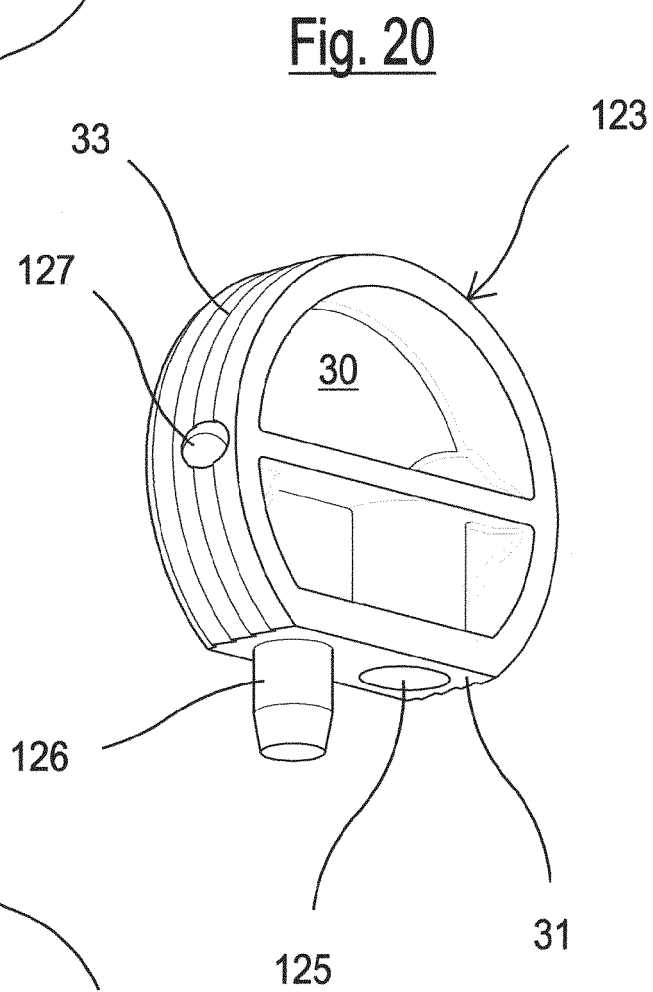
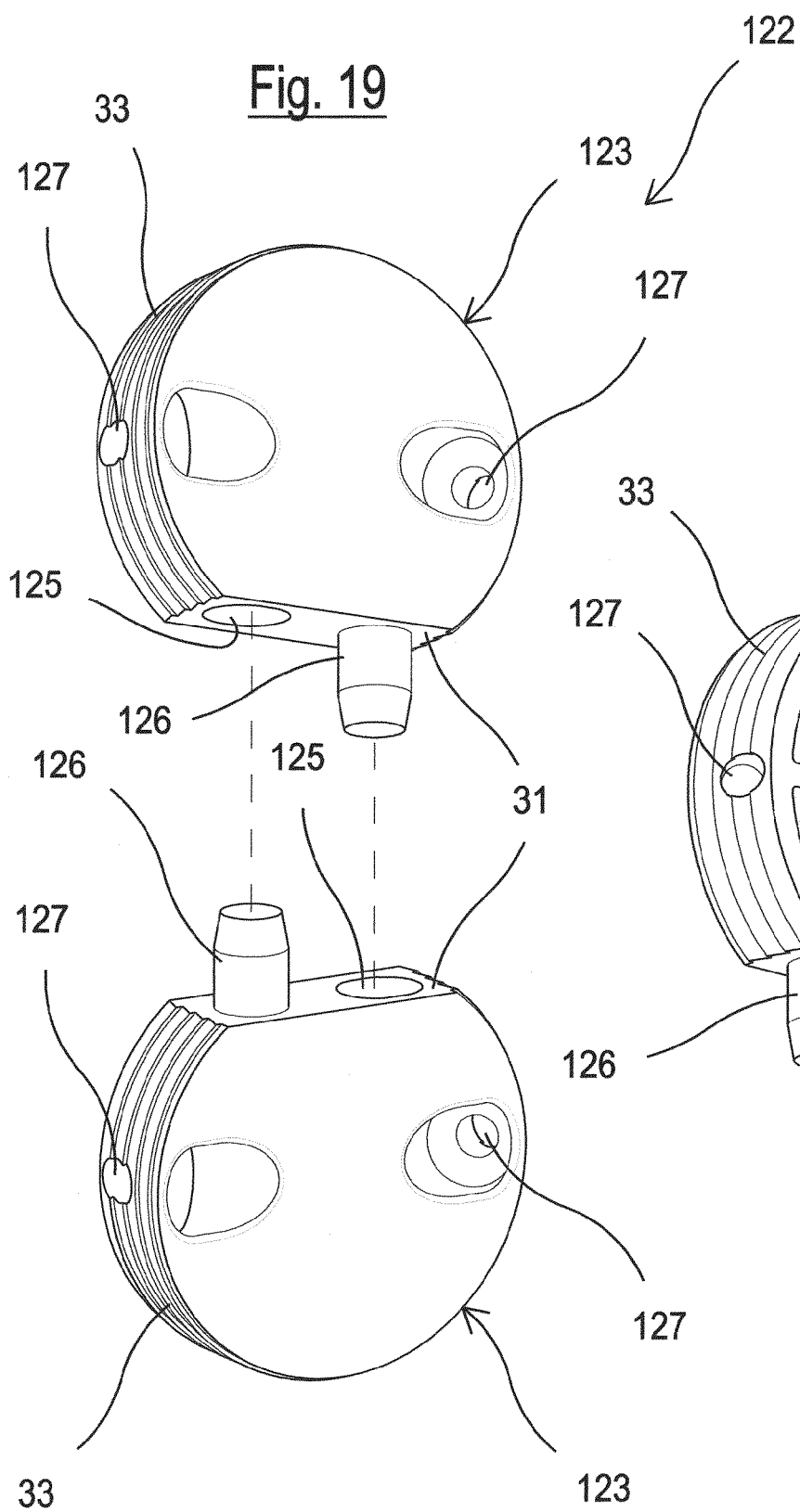


Fig. 17





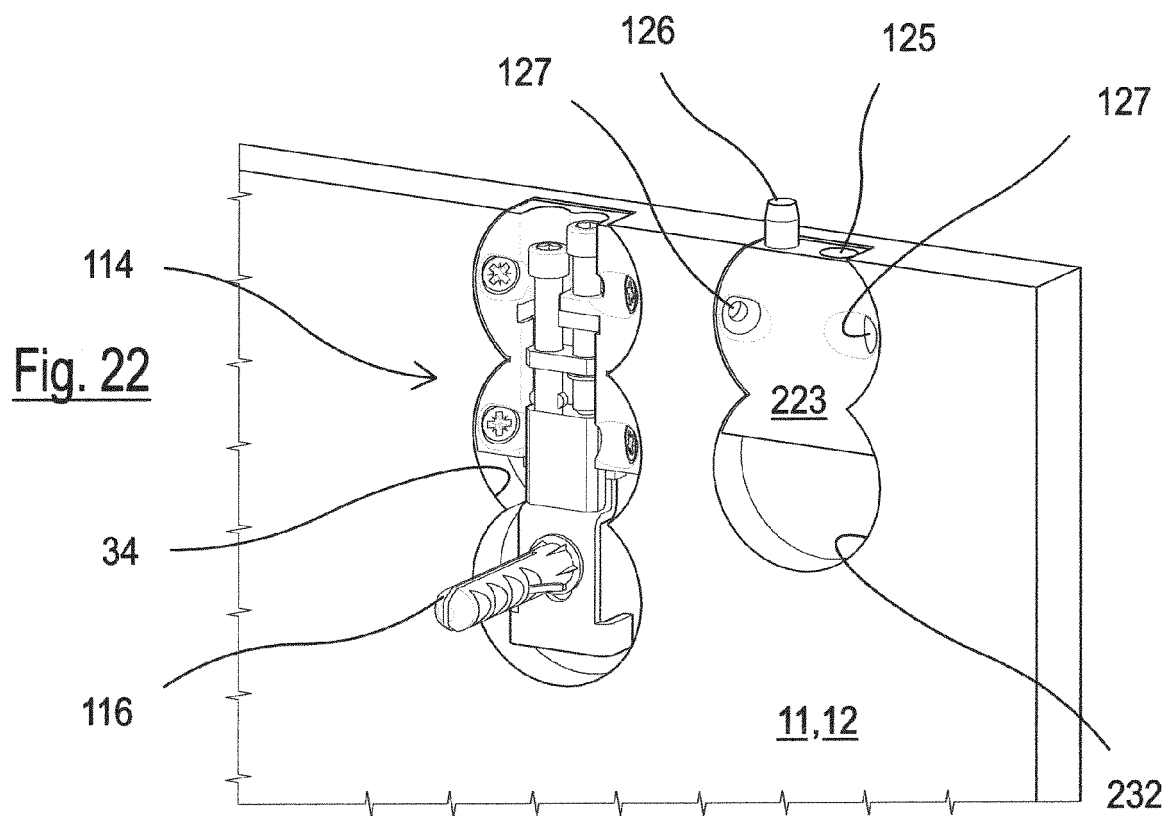
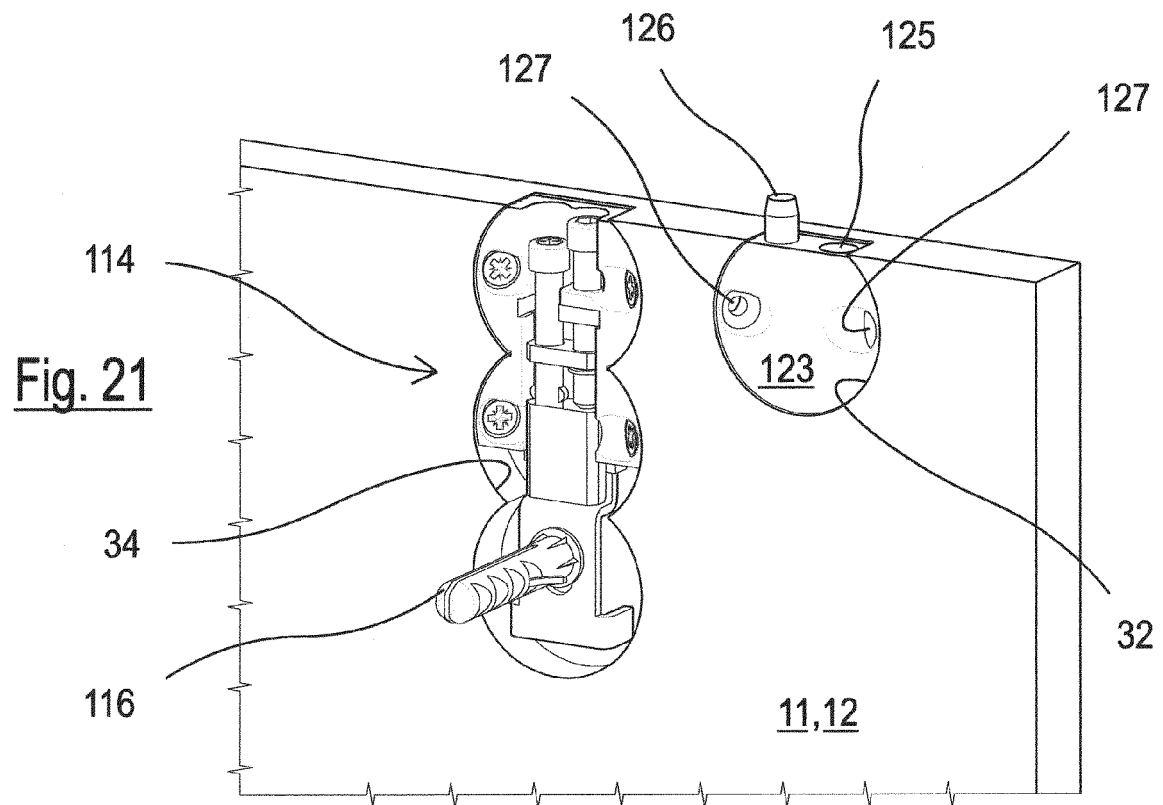


Fig. 23

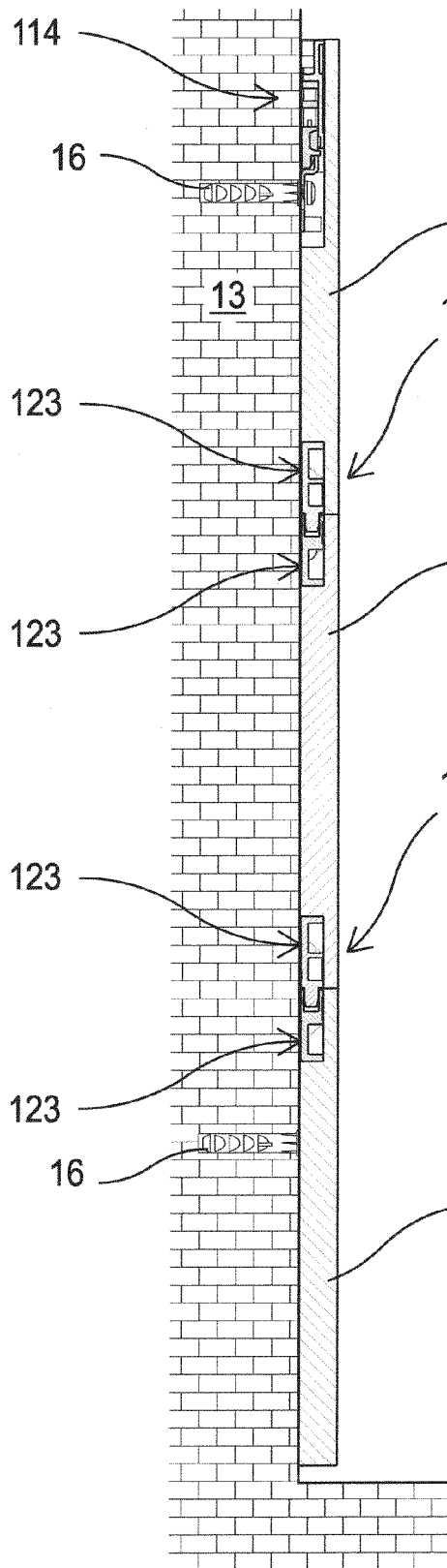
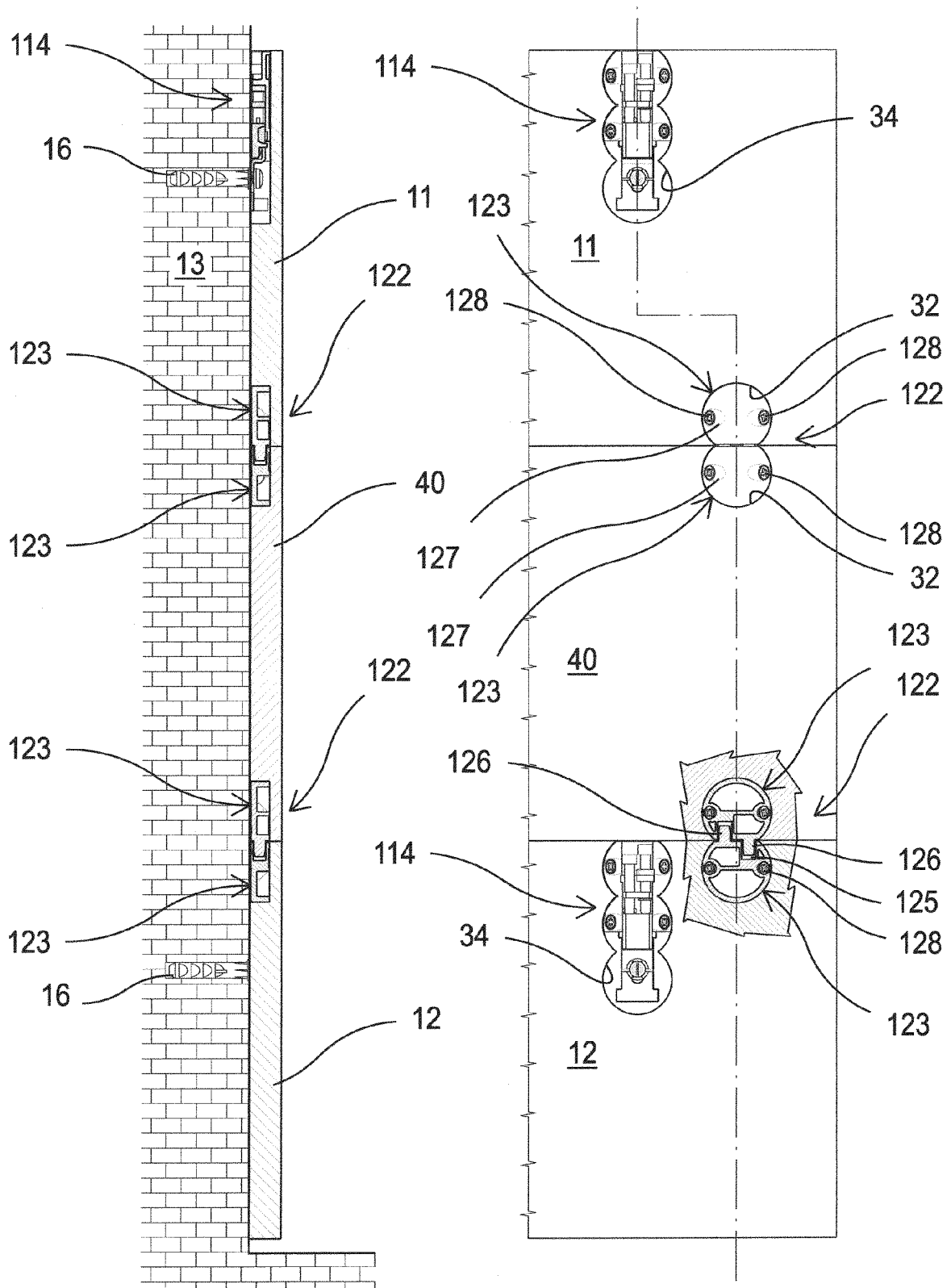


Fig. 24





EUROPEAN SEARCH REPORT

Application Number
EP 17 20 2197

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A	DE 33 36 506 A1 (DOERIG WERNER) 26 April 1984 (1984-04-26) * abstract; figures 1,2 *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04F E04B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 April 2018	Examiner Khera, Daljit
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 17 20 2197

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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