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Description

Field of application

[0001] The object of the present invention is a shutter for windows according to the preamble of the main claim.

[0002] The shutter concerned, also known by the name blinds, is intended to be advantageously used to block light from doors and windows of any kind and for any type of building.

[0003] The aforementioned shutter therefore applies to the industrial field of the production of windows and window accessories and it is intended to be advantageously mounted in a sliding manner, or with leaves, to block light from windows made from metal, in particular aluminium, wood, wood-aluminium or other materials.

[0004] The shutter object of the present invention is also particularly suitable for being produced industrially, whilst still maintaining the versatility of use required by the market, with a finishing function for buildings of any kind like for example houses, apartment buildings, condominiums, skyscrapers, etc.

[0005] The assembly, application and maintenance of the shutter object of the invention are particularly easy for any window fitter.

State of the art

[0006] Shutters conventionally consist of a support frame on which a plurality of transverse profiles, generally made from aluminium or wood, are mounted, suitable for intercepting the light coming in through the windows.

[0007] As known, such transverse profiles can be assembled on the support frame of the shutter in a fixed manner or in an orientable manner and they can be formed from a plurality of thin blades known in the technical jargon by the name "*ovaline*" in the Italian language.

[0008] Bladed shutters are usually formed from leaf-type or sliding mobile wings, having the support frame, made with aluminium profiles and mounted mobile on the masonry, or on the frame of the window, through suitable moving means (hinges, pivots, supports, guides, gaskets, etc.), and from a blade-holding profile assembled on the front snapping onto the inner part of the support frame.

[0009] As known, the blades, generally also obtained with extruded aluminium, can be assembled on the blade-holding profile in a fixed manner or in an orientable manner. In the latter case, mechanisms are foreseen that can be directly actuated from inside the building to move the blades and adjust the amount of light entering through the window as desired.

[0010] The blade-holding profile is peripherally fixed to the support frame and internally mounts the blades through suitable supports.

[0011] For this purpose, the blade-holding profile has a generally U-shaped section in which a pair of pull-rods is housed, on two opposite vertical uprights, said pull-

rods being able to engage on the supports of the blades to rotate them between the possible closed and open positions.

[0012] Some known embodiments of shutters described above are shown for example in models IT MC2003U000035; IT 246396; IT 202041 or else in patent IT MC2005a000011.

[0013] The assembly of the blades of the shutter of the known type described above is quite complex and requires substantial manual ability.

[0014] Moreover, in the case of orientable blades, their assembly needs the supports to be arranged with the foreseen pins slotted into holes in the blade-holding profile as well as requiring that connection means between the aforementioned supports of the blades and the sliding rods be foreseen, to determine the movement of the blades.

[0015] Bladed shutters are known in which the supports of the blades are snap-mounted on the rotary supports. However, also in this case the assembly system is not very easy and requires substantial manual ability of the window fitter.

[0016] Moreover, the support structures of such bladed shutters are not very mechanically strong. Indeed, very often, especially in the case of wings of considerable height, i.e. in the case of door windows, it is necessary to provide a fixed cross member between the two uprights of the blade-holding profile to give the shutter greater rigidity.

[0017] Wooden shutters are also known that are equipped with a support frame that extends in an integrated manner as well as in the formation of the perimeter cornice, aimed at supporting the shutter on the masonry or on the frame, also in the formation of the wooden inner slats, which in this case are irremovably rigidly fixed (for example through glue, pins, etc.) to the remaining wooden part of the support frame of the shutter.

[0018] During their normal use the shutters are subjected to attack from atmospheric agents (sun, rain, humidity, etc.) that, as known, deteriorate the surface of the wood compromising both its appearance and over time its functionality and mechanical characteristics. Consequently, it is necessary to subject such wooden shutters to periodic maintenance, in particular to restore its surface paint. Currently, the slat shutters described above are subjected to maintenance without prior removal of the slats since, as stated, they form an integral part of the support frame to which they are rigidly fixed. The maintenance operations usually require that the shutter be removed from the supports of the masonry, or of the frame of the window, and that the surface finish of the wood be restored through paint-removal, sanding and then repainting operations. Such operations are currently carried out in a cumbersome and imprecise manner given that the slats define slits between them with interfacing surfaces that can only be reached by the work tools with great difficulty.

[0019] The maintenance operations of the wooden

slats must be regularly repeated over the years in order to conserve the shutters perfectly. Therefore, the difficulties and the great deal of manpower required for their maintenance still represent a big problem, particularly serious in the field in reference, which currently remains unsolved.

[0020] Moreover, replacing the wooden slats with slats made from another material, like for example made from extruded aluminium, would not allow the appearance and insulation characteristics given by wood and required by the market to be obtained.

[0021] It should also be kept in mind that shutters with wooden slats of the type currently known require a very burdensome production process to assemble the slats together in a rigidly fastened manner to the frame of the shutters and to mount the shutters on the frames of the masonry.

[0022] Moreover, as known, conventional wooden shutters have many areas in which degradation processes of the film of paint can begin.

[0023] In particular, the tenoning or joint with pins in the corners between uprights and cross members is an area in which the film of paint can easily break. Moreover, the inner parts of such a joint are usually glued and not protected by the paint. Furthermore, the wooden uprights can deform so that the consequent torsion can create tensions in the joints with the cross members and promote the formation of areas not protected by the paint on the ends of the slats that can compromise the lifetime of the shutters.

Presentation of the invention

[0024] In this situation, the essential purpose of the present finding is therefore to avoid the drawbacks of the known solutions quoted above, by providing a shutter for windows, which allows maintenance to be carried out, in particular to restore the surface finish of the shutter, in a quick and easy manner.

[0025] A further purpose of the present finding is to provide a shutter for windows, which is cost-effective, constructively simple to make and operatively entirely reliable.

[0026] Another purpose of the present finding is to provide a shutter that is mechanically strong even in the case of substantial sizes like for example in the case of door windows.

Brief description of the drawings

[0027] The technical characteristics of the finding, according to the aforementioned purposes, can be clearly seen from the content of the claims given below and its advantages will become clearer from the following detailed description, made with reference to the attached drawings, which represent some purely exemplificative and not limiting embodiments, in which:

FIG. 1 shows a perspective view of a first embodiment of a shutter for windows object of the present invention having the slats closed;

FIG. 2 shows an assembly step of the shutter of figure 1, with various parts removed in order to be able to see others better, and illustrating a supporting cross member and a lower slat intended to mechanically couple with one another;

FIG. 3 shows a subsequent assembly step of the shutter of figure 2, with various parts removed in order to be able to see others better, and further illustrating a bottom cross member intended to mechanically couple with the lower slat;

FIG. 4 shows a subsequent assembly step of the shutter of figure 3, with various parts removed in order to be able to see others better, and further illustrating a vertical upright intended to mechanically couple with the ends of the slats;

FIG. 5 shows a subsequent assembly step of the shutter of figure 4, with various parts removed in order to be able to see others better, and further illustrating means for fixing the vertical upright to the supporting cross member;

FIG. 6 shows the shutter assembled according to the steps of the previous figures 2-5 in a perspective view intended to highlight the opposite side to the one where the side upright was arranged;

FIG. 7 shows a subsequent assembly step of the shutter of figure 5, with various parts removed in order to be able to see others better, and further illustrating a joining element between the bottom cross member and the vertical upright;

FIG. 8 shows a subsequent assembly step of the shutter of figure 7, with various parts removed in order to be able to see others better, and further illustrating a closing profile in the insertion step into a guide of the vertical upright;

FIG. 9 shows a perspective view of a second embodiment of a shutter for windows object of the present invention having the slats open;

FIG. 10 shows the shutter of figure 9 with the components of the steps relative to figures 2-5 assembled in an equivalent manner in a perspective view equivalent to that of figure 6;

FIG. 11 shows a cross section view according to a horizontal plane of the shutter of figure 1 or of figure 9;

FIG. 12 shows a perspective view of a third embodiment of a shutter for windows object of the present invention having cross members spaced apart by two slats;

FIGS. 13A-13D show the main assembly steps of the third embodiment of the shutter illustrated in figure 12;

FIGS. 14 and 15 show some slats of the shutter of figure 12, in two different side views, with various parts removed in order to be able to see others better; FIG. 16 shows an enlarged detail of figure 14 relative

to a support beam inserted associated with two slats; FIG. 17 shows a perspective view of a fourth embodiment of a shutter for windows object of the present invention having cross members spaced apart by two slats;

FIGS. 18A-18D show the main assembly steps of the fourth embodiment of the shutter illustrated in figure 17;

FIGS. 19 and 20 show some slats of the shutter of figure 17, in two different side views, with various parts removed in order to be able to see others better; FIG. 21 shows an enlarged detail of figure 19 relative to a support beam inserted associated with two slats; FIGS. 22 and 23 show two further embodiments of a shutter for windows object of the present invention in a partial cross section view according to a horizontal plane.

Detailed description of a preferred embodiment

[0028] With reference to the attached drawings the shutter for window-type structures such as doors, windows, door windows, dormers, skylights or similar, object of the present invention.

[0029] The shutter 1 according to the invention can be mounted, in a per se totally conventional way, onto the frames of the window S or else directly onto the piers of the masonry M (figure 23), in front of the windows to block out light, and it can be of the type with leaves able to open on pivots C (as illustrated in figure 11) or similar means, or it can be of the type sliding in suitable guides to move between an open position and a closed position.

[0030] The shutter is conventionally equipped with an inner face 10 that faces towards the inside of the building when the shutter is in closed position and an outer face that faces towards the outside when the shutter is in closed position.

[0031] In accordance with the example embodiments illustrated in the attached figures, the shutter 1 is provided with a support frame 2, on which means are mounted for connecting to the frame of a window or else to the masonry (for example consisting of pivots), and with a plurality of wooden slats 3, which are easily removably mounted on the support frame, as will be explained hereafter. According to the idea forming the basis of the present invention, the support frame 2 is formed by two vertical uprights 4, made from metal profile, equipped with an outer face 5 perimetally defining the shutter 1 and by two or more supporting cross members 6 arranged horizontally, preferably also made from metal profile and able to be fixed at their ends to the inner faces 7 of the vertical uprights 4 through first removable fastening means 8 (see figure 5).

[0032] Each slat 3 is horizontally arranged between the vertical uprights 4 and is provided with at least one longitudinal groove 9 suitable for at least partially receiving a supporting cross member 6 to support the slat 3 on the support frame 2.

[0033] Each of said metal profiles of the supporting cross members 6 and of the vertical uprights 4 is obtained by extrusion and is preferably made from aluminium.

[0034] The present description gives different possible embodiments, the first of which illustrated in figures 1-8 has the slats completely closed arranged in succession without solution of continuity whereas the second of which, illustrated in figures 9 and 10, has the slats arranged spaced apart by slots 12 suitable for allowing light to partially pass through.

[0035] With reference to the first embodiment, each slat 3 is provided with a first and with a second longitudinal groove, indicated with 9' and 9", arranged on the lower and upper sides 14, 13 of two adjacent slats 3. Correspondingly, each supporting cross member 6 inserts with a first portion 15 into the first longitudinal groove 9' and with a second portion 16 into the second longitudinal groove 9".

[0036] The supporting cross members 6 can in this way be completely embedded inside the two longitudinal grooves 9' and 9" of the slats 3, or else, like in the case of the first embodiment illustrated in the attached figures 1-8, they can have a visible intermediate portion 60 also intended to represent an aesthetic ornament for the shutter 1. In this last case the upper and lower sides 13, 14 of the slats 3 will preferably be slightly tapered as indicated in figure 6, so as to better show the visible intermediate portion of the supporting cross members 6.

[0037] Otherwise, in accordance with the example illustrated in figures 9 and 10, each supporting cross member 6 can be completely inserted into the longitudinal groove 9 of a corresponding slat 3. In this case, the groove 9 will only be foreseen on the lower side 14 of the slat 3. The slat can advantageously be supported, in all embodiments, by the supporting cross member 6 in abutment from below, even just by gravity, without the need to use dedicated fastening means.

[0038] In greater detail, in the metal profile of each supporting cross member 6 a first longitudinal hole 17 is made, in which engage the first removable fastening means 8 consisting of screw means 18 inserted with the shank in first through holes 19 formed correspondingly on the vertical uprights 4.

[0039] Preferably, the supporting cross member 6 is obtained with a symmetrical H-shaped metal profile with the middle wall carrying a first eyelet half way down defining the first longitudinal hole 17.

[0040] In accordance with a preferred embodiment of the present invention, the extruded metal profile of each vertical upright 4 extends longitudinally in its prevalent extension, with a substantially L-shaped generatrix section having a first wall 20, which extends substantially for the thickness of the shutter 1 and that defines the outer face 5 of the profile of the vertical upright 4, and a second wall 21 that extends from the inner face 7 substantially in the plane of the shutter 1 at the visible inner surface 10. The slats 3 can advantageously be provided with a step-shaped end suitable for coupling in a shape rela-

tionship with the L-shaped metal profile of the vertical uprights 4.

[0041] Such characteristics can be easily understood in particular from the section view of figure 11. It should be observed that in such a figure the supporting cross member is indicated rotated by 90° for easy viewing.

[0042] In greater detail, in accordance with a possible section of the metal profile that forms the upright 4, illustrated for example in figure 11, the second wall 21 is formed from a portion of the same extruded profile as the upright 4, and has a rectangular section with two interfacing and parallel walls 23, 24 spaced apart substantially half way along their extension by a transversal wall, which in a central position forms a second eyelet defining a second longitudinal hole 25. The outer wall 24 goes beyond the inner one 23 with an extension part 24' placed on the outer surface 11, and which contains the step-shaped end 22 together with an extension part 20' of the first wall 20 also parallel to the plane on which the shutter 1 lies but placed on the inner wall 10.

[0043] Advantageously, the support frame 2 also comprises two horizontal bottom cross members 26, also obtained with an extruded metal profile and mounted over and under the last upper and lower slats 3' as well as fixed to the upper and lower ends of the vertical uprights 4 through second removable fastening means 27 (see figure 7).

[0044] In accordance with the attached figures, the vertical uprights 4 and the bottom cross members 26 form a continuous perimeter cornice for supporting and holding the slats 3 that is mechanically reinforced by the cross members 6 as well as by the slats 3 themselves inserted with the step-shaped end 22 in the uprights 4 and supported by the cross members 6.

[0045] The second removable fastening means 27 consist of second screw means 28 having the shank inserted in second through holes 29 formed at the ends of the bottom cross members 26 and removably engaged in the second longitudinal holes 25 formed on the second walls 22 of the uprights 4.

[0046] Each bottom cross member 26 is provided with a male part 30 projecting from the inner face and able to insert in a holding relationship, in particular by coupling, in the longitudinal groove 9 of the lower or upper slat 3'. Preferably, for this purpose the male part 30 is formed from two longitudinal flaps that extend along the entire extension of the bottom cross member 26. Such flaps elastically come towards one another during insertion into the groove 9, in which they manage to achieve an optimal coupling thanks also to the presence, on their outer surface, of ribs, knurlings or longitudinal teeth.

[0047] Each bottom cross member 26 is thus advantageously fixed to the shutter 1 both by coupling of the male part 30 in the groove of the last slat 3' and by the presence of the second screw means 28.

[0048] The support frame 2 also preferably also comprises four end joining elements 31, each of which is fixed through third removable fastening means 37 at the close-

together ends of the vertical uprights 4 and of the bottom cross members 26. Preferably, the position of the joining ends 31 is found precisely through two parallel appendices 33 projecting from the joining ends 31 which insert into longitudinal seats 34 formed, in accordance for example with the embodiment of figure 7, in the first wall 20 of the profiles of the vertical uprights 4.

[0049] The first wall 20 of the metal profile of each vertical uprights 4 extends at the vertical outer edges with bends that define, in the most inner part, a longitudinal guide 35, and, in the most outer part, third eyelets suitable for defining two third longitudinal holes 36 for the sealed insertion of two screws.

[0050] Each of the aforementioned third longitudinal holes is therefore able to receive in engagement third removable fastening means 37 consisting of screw means 38 inserted with the shank into third through holes 39 formed correspondingly on the end joining elements 31.

[0051] The screw means 38 are hidden from view through two closing profiles 40, each of which can be mounted in the longitudinal guide 35 of the first wall 20 of the profile of an upright 4.

[0052] With reference to a further embodiment illustrated in figures 12-16, on each face of the shutter pairs of slats 3" appear in view separated by the supporting cross members 6.

[0053] For this purpose, each supporting cross member 6 and each slat 3 have profiles that are not symmetrical with respect to the middle plane parallel to the arrangement of the shutter 1.

[0054] In greater detail, the cross member 9 is again equipped with a first portion 15 arranged on top, which inserts into the first longitudinal groove 9', and with a second portion 16 arranged underneath, which inserts into the second longitudinal groove 9" of the lower and upper sides 14, 13 of two adjacent slats 3 respectively.

[0055] In accordance with this last embodiment a first arm 150 extends from the first portion 15 of the supporting cross member 6, arranged on top, said first arm 150 being equipped with an elbow 151 that separates a connection portion 152, contained in the bulk of the thickness of the slat 3, from a visible portion 153, which preferably, through the corner of the elbow 15, extends lying parallel to a face of the slats 3 or else of the cross member 9.

[0056] Preferably, the upper side 13 of the lower slat 3 defines a convexity facing upwards with the second longitudinal groove 9" formed longitudinally, in a middle position, whereas the lower side 14 of the upper slat 3 defines a concavity facing downwards with the first longitudinal groove 9' formed longitudinally, in a middle position. The two longitudinal grooves 9' and 9" define parts of the lower and upper sides 14, 13 of two adjacent slats 3 that are spaced apart, interfacing and parallel.

[0057] The first longitudinal hole 17, quoted earlier, for the engagement of the first removable fastening means 8 consisting of screw means 18 inserted with the shank in first through holes 19 formed correspondingly on the

vertical uprights 4 is made in the metal profile of the first upper portion 15 of the supporting cross member 6.

[0058] In turn, the second portion 16 arranged underneath in the supporting cross member 6 inserts into the second longitudinal groove 9" of the upper side of the slat 3 arranged underneath through a toothed profile. Preferably, between such a second portion 16 and the second longitudinal groove 9" a sealing gasket 160 is arranged that is suitable for preventing the passage of water and humidity. Preferably, the aforementioned sealing gasket 160 is provided with a second elastically flexible arm 161, which inserts into the space defined between the upper and lower sides 13, 14 of the two contiguous slats, and preferably it is arranged elastically in abutment against the lower side 14 of the upper slat, to further improve the waterproof seal.

[0059] Figures 17-21 illustrate a variant of the previous embodiment in which the supporting cross members 6 appear as separating elements between all of the slats 3.

[0060] In this case, the profiles of the slats and of the supporting cross members are symmetrical with respect to the middle plane parallel to the arrangement of the shutter 1.

[0061] In accordance with this last embodiment two first arms 150 extend on both sides from the first portion 15 of the supporting cross member 6, each arm 150 being equipped with an elbow 151 that separates a connecting portion 152, contained in the bulk of the thickness of the slat 3, from a visible portion 153, which preferably through the corner of the elbow 151 extends lying parallel to a face of the slats 3 or else of the shutter 1.

[0062] Such a first arm 150 therefore inserts between the lower and upper sides 14, 13 of two adjacent slats 3 that are suitably spaced apart thanks to the cross member 9.

[0063] Preferably, the upper side 13 of the lower slat 3 defines a convexity facing upwards with the second longitudinal groove 9" formed longitudinally, in a middle position, whereas the lower side 14 of the upper slat 3 defines a concavity facing downwards with the first longitudinal groove 9' formed longitudinally, in a middle position. The two longitudinal grooves 9' and 9" define parts of the lower and upper sides 14, 13 of two adjacent slats 3 that are equally spaced apart, interfacing and parallel.

[0064] The first longitudinal hole 17, quoted earlier, for the engagement of the first removable fastening means 8 consisting of screw means 18 inserted with the shank in first through holes 19 formed correspondingly on the vertical uprights 4 is made in the metal profile of the first upper portion 15 of the supporting cross member 6.

[0065] In turn, the second portion 16 arranged underneath in the supporting cross member 6 inserts into the second longitudinal groove 9" of the upper side of the slat 3 arranged underneath through a toothed profile. Preferably, a sealing gasket 160, suitable for preventing the passage of water and humidity, is arranged between such a second portion 16 and the second longitudinal groove 9". Similarly to the embodiments of figures 1-11,

the embodiments of figures 12-21 also foresee two horizontal bottom cross members 26, also obtained with an extruded metal profile and mounted over and under the last upper and lower slats 3' as well as fixed to the upper and lower ends of the vertical uprights 4 through second removable fastening means 27, preferably consisting of second screw means 28 having the shank inserted in second through holes 29n formed at the ends of the bottom cross members 26 and removably engaged in the second longitudinal holes 25 formed in the uprights 4.

[0066] In accordance with the embodiments illustrated in figures 12-21 the end joining elements 31 are fixed through third removable fastening means 37 at the close-together ends of the vertical uprights 4 and of the bottom cross members 26. Preferably, the position of the joining ends 31 is found precisely through two parallel appendices 33 projecting from the joining ends 31 which insert in longitudinal seats 34 formed in the bottom cross members 26.

[0067] Mutatis mutandis, similarly to the examples of figures 1-11, the extruded profiles of the bottom cross members 26 defines, at the sides of the longitudinal seats 34, at least two third eyelets suitable for defining two third longitudinal holes 36 for the sealed insertion of two screws.

[0068] Each of the aforementioned third longitudinal holes is therefore able to receive in engagement third removable fastening means 37 consisting of screw means 38 inserted with the shank into third through holes 39 formed correspondingly on the end joining elements 31.

[0069] As in the previous examples of figures 1-11, also in those shown in figures 12-21 each vertical upright 4 extends with bends that define a vertical longitudinal guide 35 for the insertion of two closing profiles 40.

[0070] Similarly, the profiles of the bottom cross members 26 define a horizontal longitudinal guide 35 for the insertion of two analogous closing profiles 40. The screw means 38 thus remain hidden from view by the two closing profiles 40. Preferably, the closing profile 40 of the upper bottom cross member 26 is advantageously the same as the one used for the uprights 4.

[0071] In accordance with an advantageous characteristic of the present invention, the closing profile 40 of the lower bottom cross member mounts a brush seal 171. Preferably, the closing profile 40 of the lower bottom cross member is obtained with a rigid gasket 40' on which the brush seal 171 is mounted in a suitable longitudinal seat 170.

[0072] The brush gasket 171 is intended to avoid the entry of dust, insects, leaves or other undesired material into the free space beneath the shutter 1.

[0073] Advantageously, the profile of the lower bottom cross member 26 is provided, at its ends, or rather at the uprights 4, with holes 180 (for example consisting of two elongated slots) suitable for allowing water or humidity that has entered into the uprights 4 to be discharged and conveyed by them to the bottom cross members 26.

[0074] In accordance with any one of the example embodiments described earlier, the extruded metal profile of each vertical upright 4 can have the section illustrated in figures 22 and 23.

[0075] In greater detail, in accordance with the example of figure 22, the metal profile of the upright 4 will again have an L-shaped section having a first wall 20, which extends substantially for the thickness of the shutter 1 and a second wall 21, which extends substantially in the plane of the shutter 1 at the visible inner surface 10, however in this case the second wall 21 is no longer obtained with two interfacing and parallel walls 23, 24 but with a single wall 21. In accordance with this example embodiment there is no longer any end foreseen for the slats 3 intended to allow coupling in a shape relationship with the L-shaped metal profile of the vertical uprights 4.

[0076] Advantageously, the slats 3 in accordance with such an example insert inside the metal profiles of the vertical uprights 4 between the second wall 21 and an extension part 20' of the first wall 20 parallel to the plane on which the shutter 1 lies and arranged at the inner wall 10.

[0077] The second longitudinal hole 25 for fixing the bottom cross member 26 through the second removable fastening means 27 is formed on the first wall 20, in a preferably central position.

[0078] In the example of figure 23, the extruded metal profile of each vertical upright 4 has a symmetrical section with respect to a middle plane passing through the profile of the shutter with a first wall 20 extending substantially for the thickness of the shutter 1 and a pair of second walls 21, 21' extending substantially in the plane of the shutter 1 at the visible inner surface 10 and at the outer surface 11, respectively. Two extension parts 24' and 20' of such second walls 21, 21' receive the side edge of the slats 3.

[0079] Also in this case, the second longitudinal hole 25 for fixing the bottom cross member 26 through the second removable fastening means 27 is formed on the first wall 20, in a preferably central position.

[0080] Between the extruded metal profile of each vertical upright 4 and the side walls 300, with or without the slats 3 at the end, channels 200 are preferably obtained for draining water towards the profile of the bottom cross member 26, from which the water itself can go out through the holes 180.

[0081] Operatively, to subject the slats 3 of the shutter 1 to maintenance, for example to restore the surface finish with new paint, it will be necessary to remove the wing from the wall in advance. The shutter 1 according to the present invention, thanks to the fact that a metal support structure 2 is foreseen, can use means for connecting to the walls (guides, gaskets, pivots) that are usually used for aluminium windows and that are known to be simpler and more versatile than those intended for wooden windows. Therefore, dismounting the shutter 1 from the wall (or from the window frame) can be easily done by simply removing the pin of the pivot and lifting the shutter 1.

[0082] Once the shutter 1 is removed, it will be possible to easily take it to a properly equipped service centre, like for example a painter.

[0083] There the joining ends 31 can be removed by unscrewing the third screw means 38 and then removing the closing profiles 40, followed by unscrewing the second screw means 18 from the second longitudinal holes 17 of the supporting cross members 6 to then remove at least one vertical upright 4.

[0084] At this point, it will be possible to easily pull out the slats 3, guided with the grooves 9 in the supporting cross members 6, to completely separate them from the shutter 1. The slats 3 can thus be quickly and easily subjected to the usual paint-removal, sanding and repainting operations to restore the surface finish of the wood, before being remounted, in an equally easy manner, by carrying out the assembly operations in reverse to the disassembly described above.

[0085] Thanks to the easy separation of the metal profiles from the wooden slats 3 it is possible to independently and separately carry out optimal maintenance on both materials.

[0086] The shutter object of the present invention combines the advantages of wood, which has a good appearance and is a good insulator, with those of metal profiles that have long-lasting surface treatment and that allow the assembly of the ironware itself of metal windows, which allows easy mounting to the frames of windows or to the masonry. The shutter 1 object of the present invention exploits the advantage of using the assembly components of aluminium shutter whilst still being a shutter substantially made from wood.

[0087] The shutter 1 object of the present invention as described above lends itself to being produced easily with totally automatic or semi-automatic industrial processes and therefore it allows the mounting and assembly times of its components to be substantially reduced.

[0088] The invention also solves the problem of making the shutter 1 structurally strong given that the slats 3 add to the mechanical strength of the support structure 2. The shutter object of the present invention allows simple, practical and extremely versatile assembly of the components to obtain shutters 1 according to the specific sizes and configurations required by customers.

[0089] The low number of components involved in making the shutter in its different possible configurations allows the warehouse management costs to be reduced. Slats 3 that are the same as each other (apart from optionally the top and bottom ones 3' for adjusting the size of the shutter to the size of the window), for example with a height of 115 mm, allow the pieces in storage to be reduced. The method for producing the shutter 1 object of the invention is extremely practical and fast and it allows shutters to be made on demand for the window fitter in widely varying sizes.

[0090] In accordance with the shutter object of the present invention, the slats are completely painted after cutting and possible butt processing and they are thus

completely protected from atmospheric degradation.

[0091] The uprights, advantageously made from aluminium, are designed so as to allow rain water to flow optimally, being discharged by the lower cross member through the wide discharge slots that keep the slats and the wooden lower cross member dry protecting it from getting wet. There are no weak points in which any type of degradation of the film of paint can begin and the joint of the cross members on the aluminium uprights has no stress applied.

Claims

1. Shutter for windows, comprising:

- a support frame (2) intended to be mounted on the frame of a window or else on the masonry of a building;
- a plurality of wooden slats (3) mounted on said support frame (2);

characterised in that said support frame (2) comprises:

- two vertical uprights (4), made from a metal profile, equipped with an outer face (5) peripherally defining said shutter and with an inner face (7);
- two or more horizontal supporting cross members (6), also made from a metal profile, able to be fixed at their ends to the inner faces (5) of said vertical uprights (4) through first removable fastening means (8);

and **characterised in that** each slat (3) of said plurality of slats (3) is horizontally arranged between said vertical uprights (4) and is provided with at least one longitudinal groove (9) able to at least partially receive one of said horizontal supporting cross members (6) suitable for supporting said slat (3) on said support frame (2).

2. Shutter for windows according to claim 1, **characterised in that** in the metal profile of each of said supporting cross members (6) a first longitudinal hole (17) is made that is able to engageably receive said first removable fastening means (8) consisting, in particular, of first screw means (18) inserted with the shank in first through holes (19) formed correspondingly on said vertical uprights (4).

3. Shutter for windows according to claim 1, **characterised in that** the metal profile of each vertical uprights (4) has a longitudinal extension with a substantially L-shaped generatrix section having a first wall (20) that extends substantially for the thickness of said shutter and that defines said outer face (5)

and a second wall (21) that extends from the inner face (7) substantially in the plane of said shutter (1) at a surface thereof, in particular at its first visible inner surface (10).

4. Shutter for windows according to claim 1, **characterised in that** said support frame (2) also comprises two horizontal bottom cross members (26), also made from metal profile, fixed at their ends to said vertical uprights (4) through second removable fastening means (27).

5. Shutter for windows according to claim 4, **characterised in that** in the metal profile of said uprights (4), in particular in a mid-way position of said second wall (22), a second longitudinal hole (25) is made that is able to engageably receive said second removable fastening means (27) consisting, in particular, of second screw means (28) inserted with the shank in second through holes (29) formed at the ends of said bottom cross members (26).

6. Shutter for windows according to claim 4, **characterised in that** each of said bottom cross members (26) is provided with a projecting male part (30) able to insert in a holding relationship, in particular coupling, in the longitudinal groove (9) of one of said slats (3).

7. Shutter for windows according to claim 4, **characterised in that** said support frame (2) also comprises four end fitting elements (31), each of which can be fixed through third removable fastening means (37) at the close-together ends of said vertical uprights (4) and at said bottom cross members (26).

8. Shutter for windows according to claim 1, **characterised in that** said support frame (2) comprises one or more closing profiles (40), each of which can be mounted in its longitudinal guide (35) of its vertical or horizontal metal profile.

9. Shutter for windows according to any one of the previous claims, **characterised in that** said slats (3) are provided with a first and a second longitudinal groove (9', 9'') arranged on its bottom and top sides (14; 13) and **characterised in that** each of said supporting cross members (6) is inserted with a first portion (15) in said first longitudinal groove (9') and with a second portion (16) in said second longitudinal groove (9'').

10. Shutter for windows according to any one of claims 1 to 8, **characterised in that** each of said supporting cross members (6) is completely inserted in the longitudinal groove (9) of a corresponding slat (3).

11. Shutter for windows according to claim 9, **characterised in that**

terised in that on the first portion (15) of said supporting cross members (6) a first arm (150) extends from at least one side, said arm being inserted between the sides of two adjacent slats (3) and being equipped with a visible portion (153), which extends with a visible arrangement from a face of said shutter.

12. Shutter for windows according to claim 9, **characterised in that** it comprises a sealing gasket (160) arranged between the second portion (16) of said supporting cross member (6) and the second longitudinal groove (9") of said slat (3).
13. Shutter for windows according to claim 12, **characterised in that** said sealing gasket (160) is provided with a second arm (161) that inserts between the sides of two contiguous slats (3), in particular elastically in abutment against the bottom side of the upper slat (3).
14. Shutter for windows according to claim 9, **characterised in that** from the first portion (15) of said supporting cross member (6) two first arms (150) extend on both sides, said arms being inserted between the sides of two adjacent slats (3) and each being equipped with a visible portion (153), which extends with a visible arrangement from a corresponding face of said shutter.
15. Shutter for windows according to claim 1, **characterised in that** said bottom cross member (40) is provided, at its ends, with holes (180) for running off water or humidity.

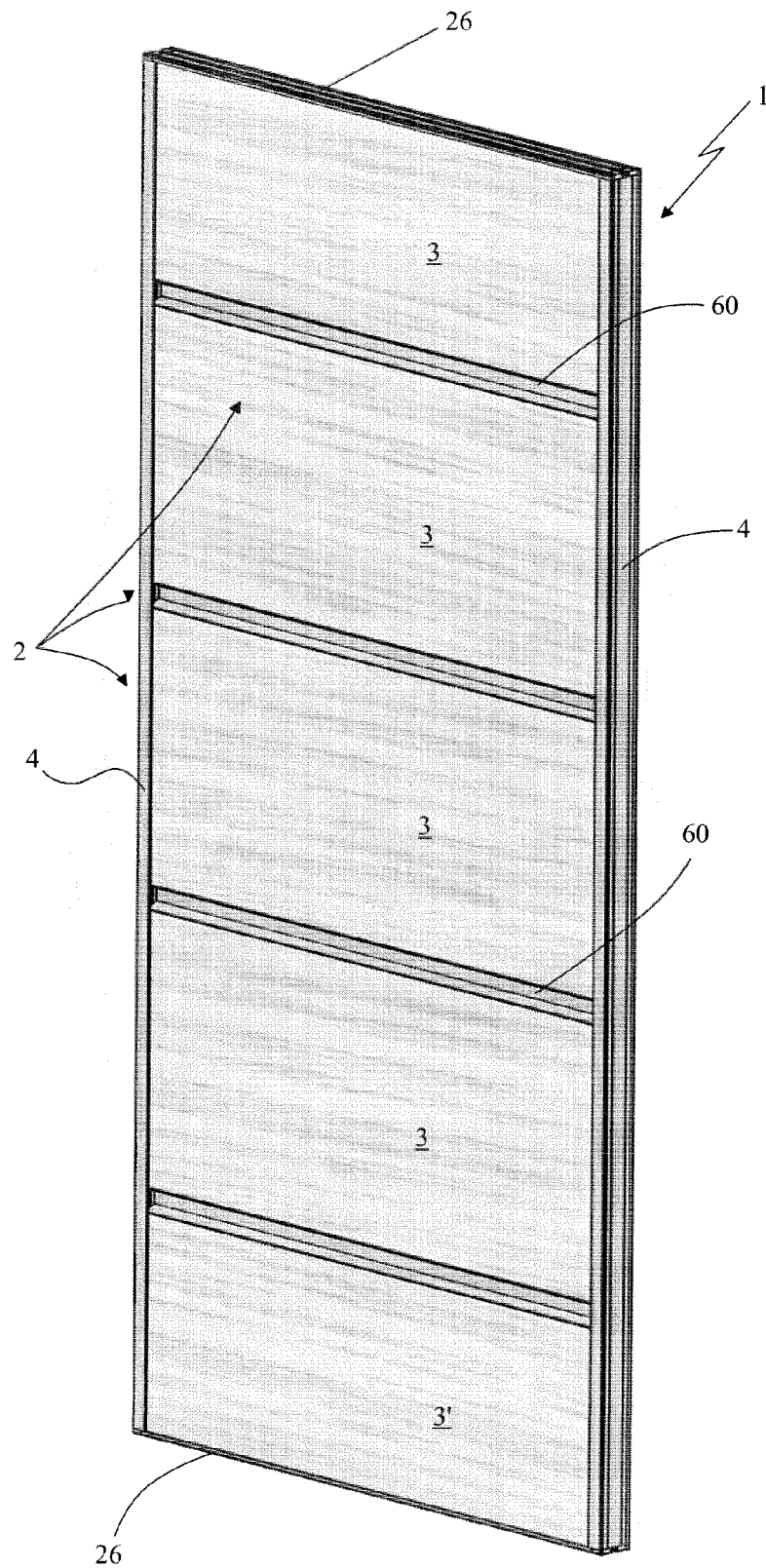


Fig. 1

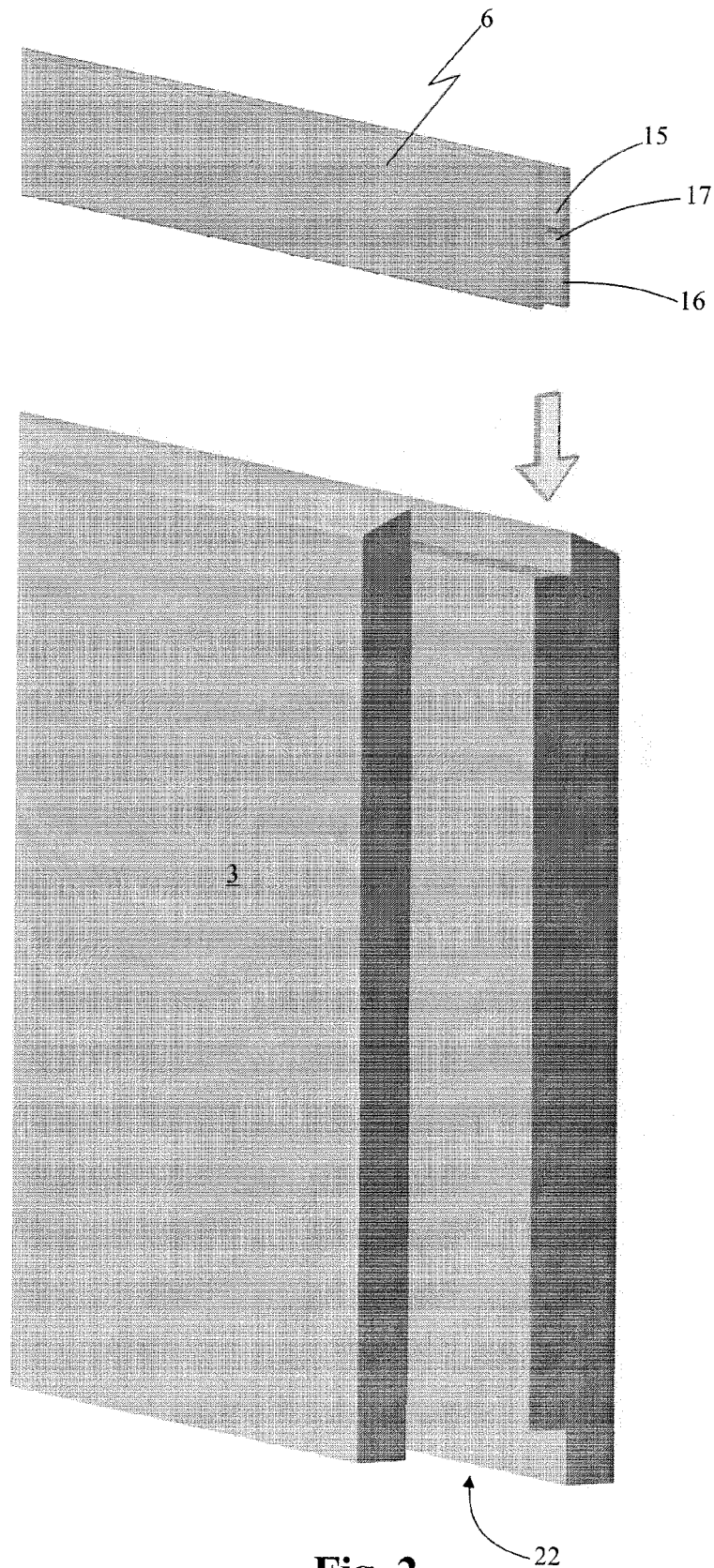


Fig. 2

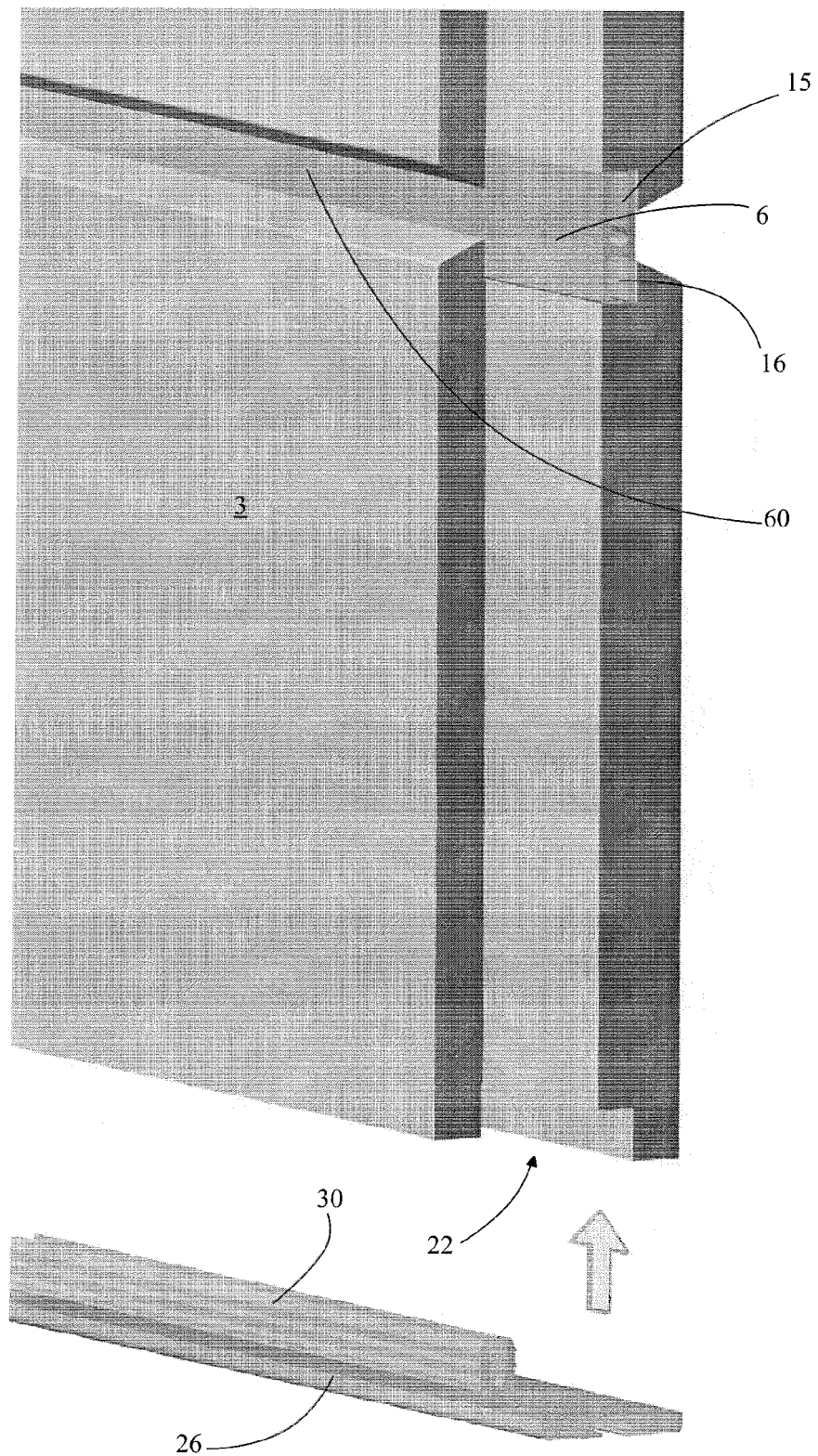


Fig. 3

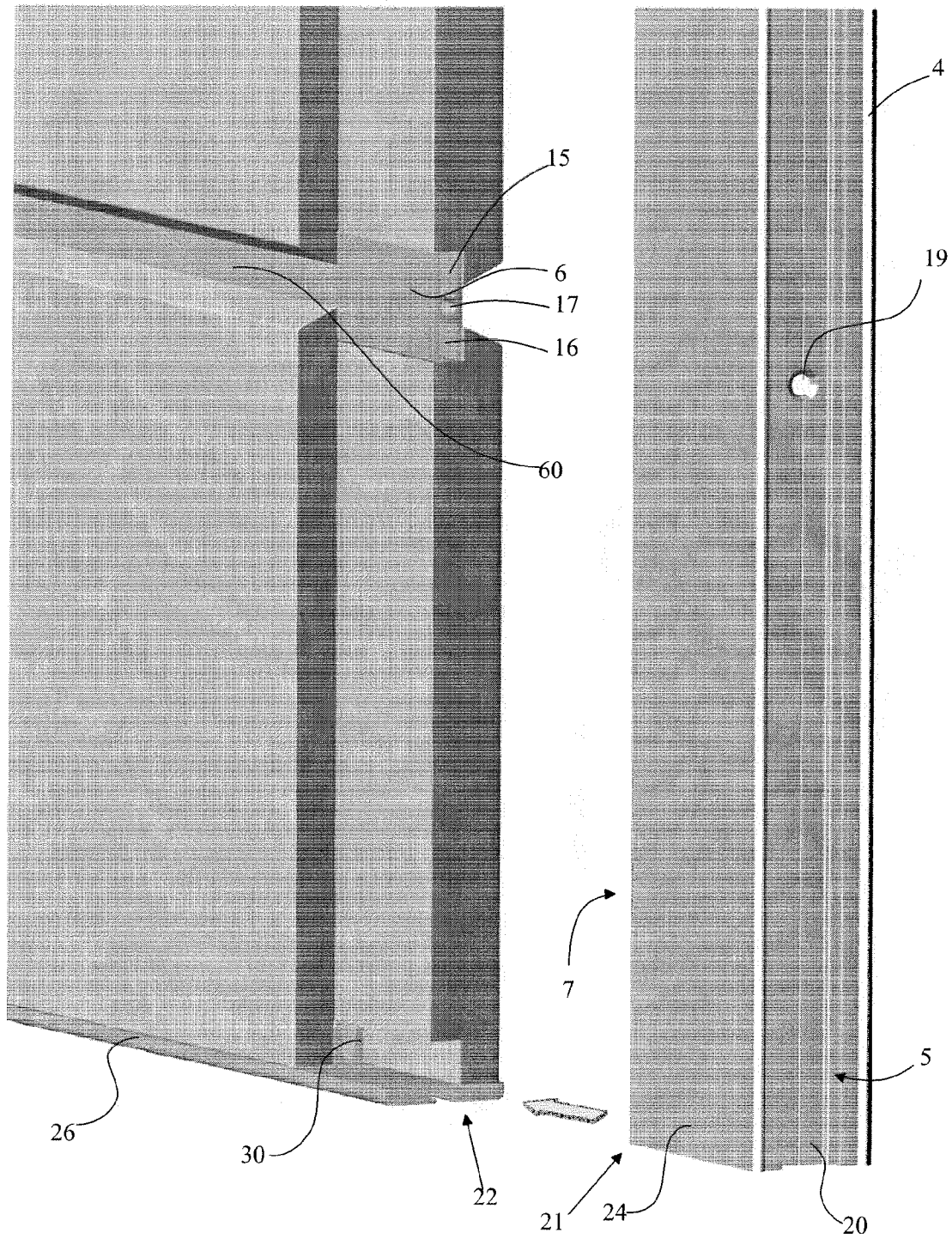


Fig. 4

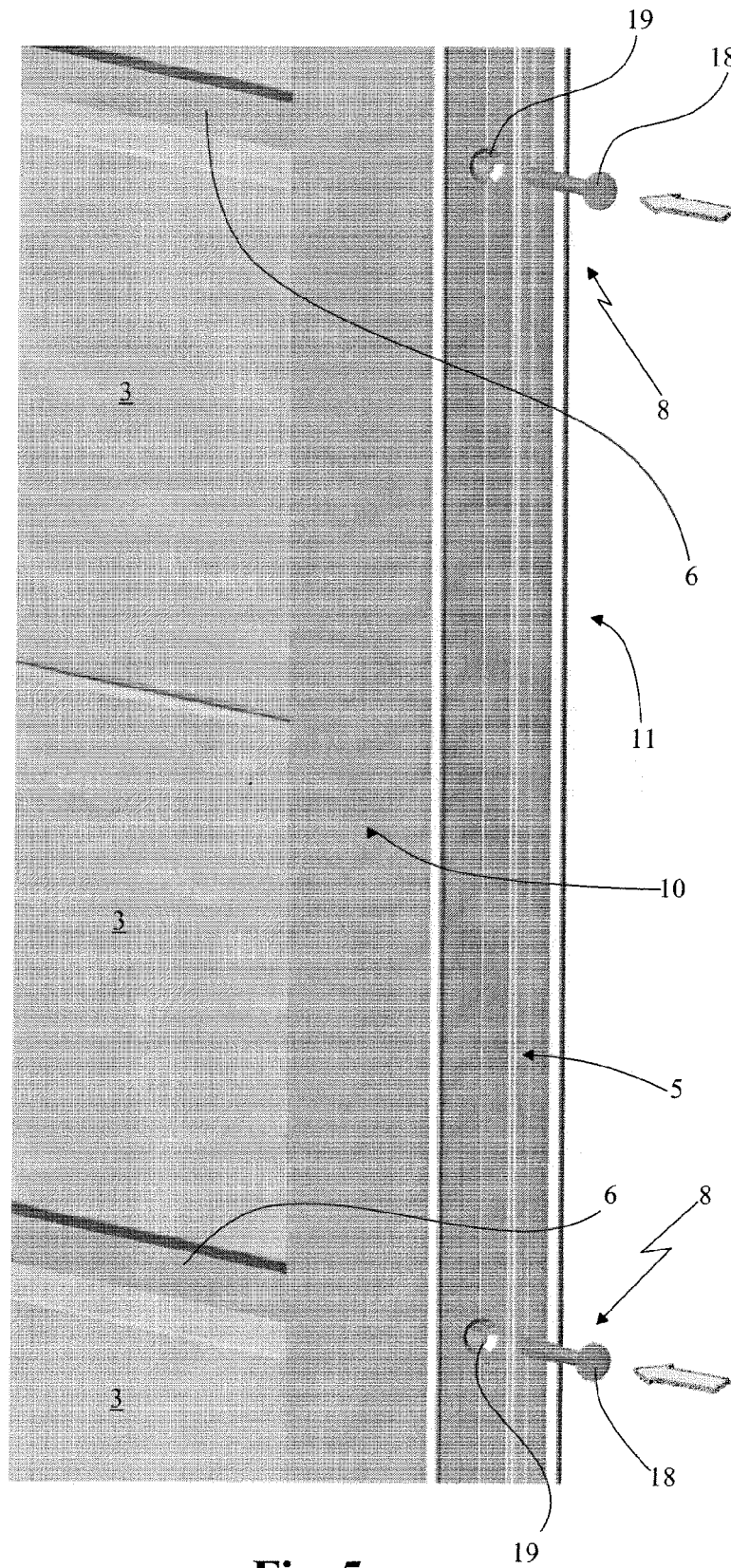


Fig. 5

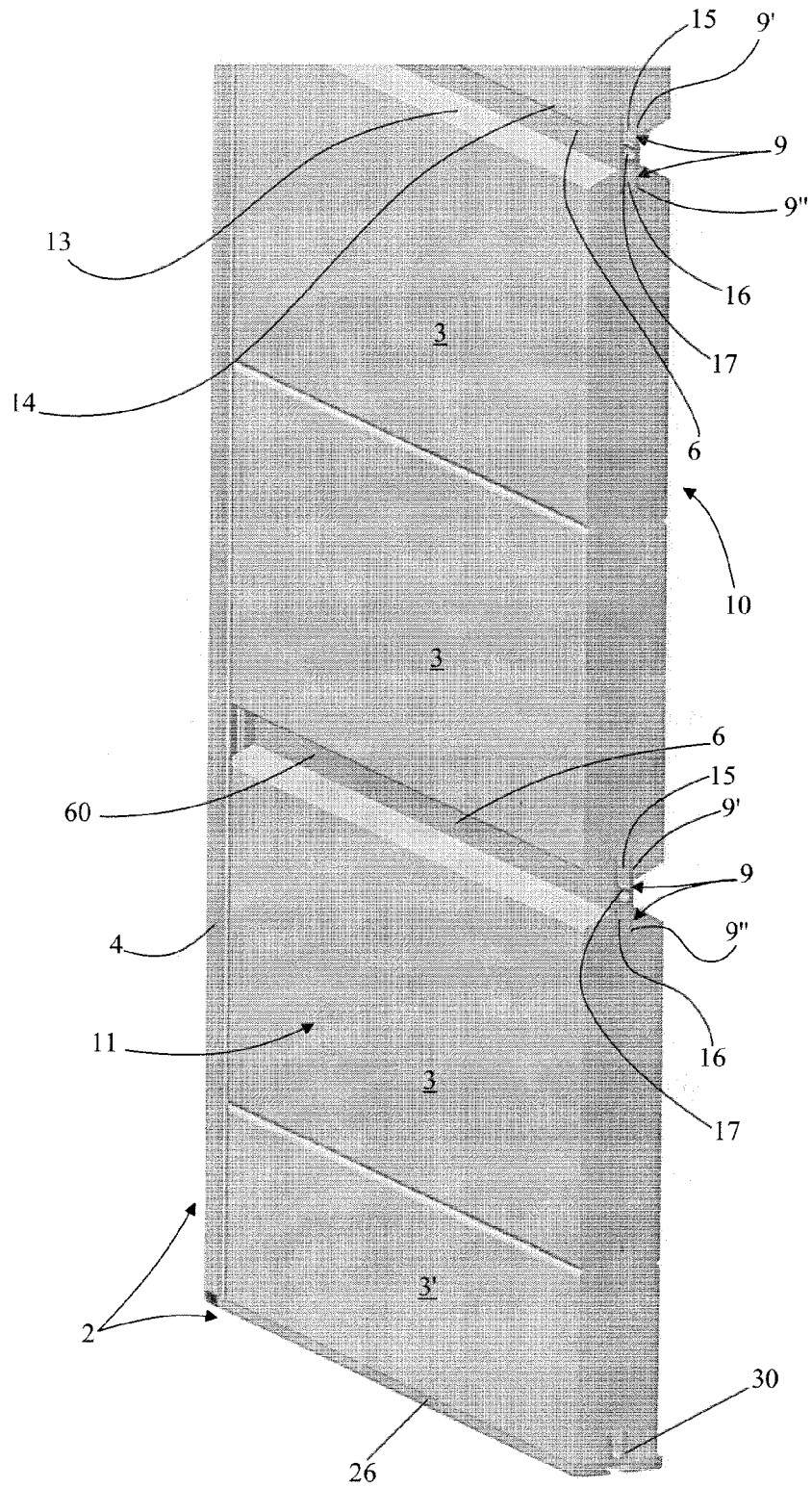


Fig. 6

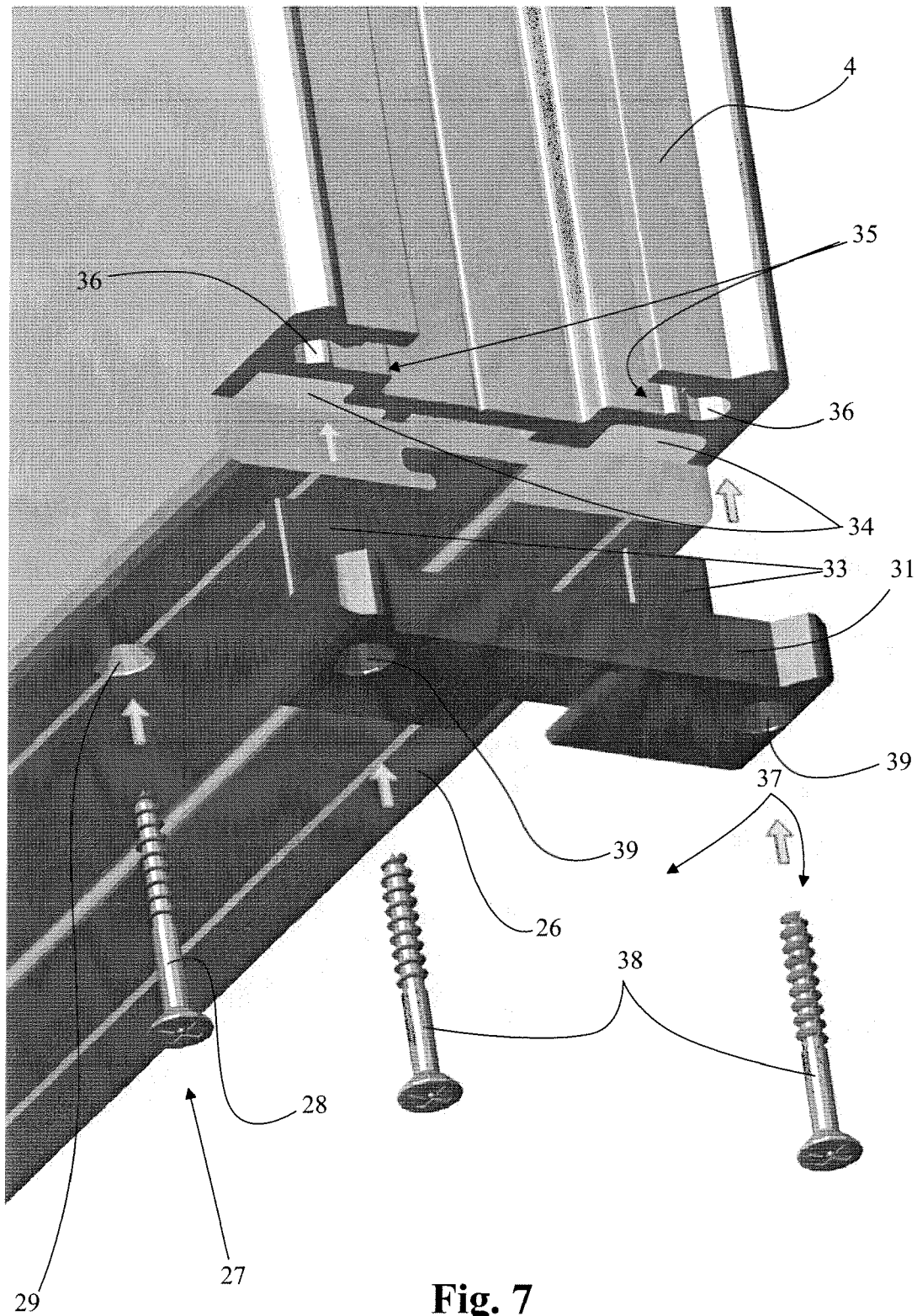
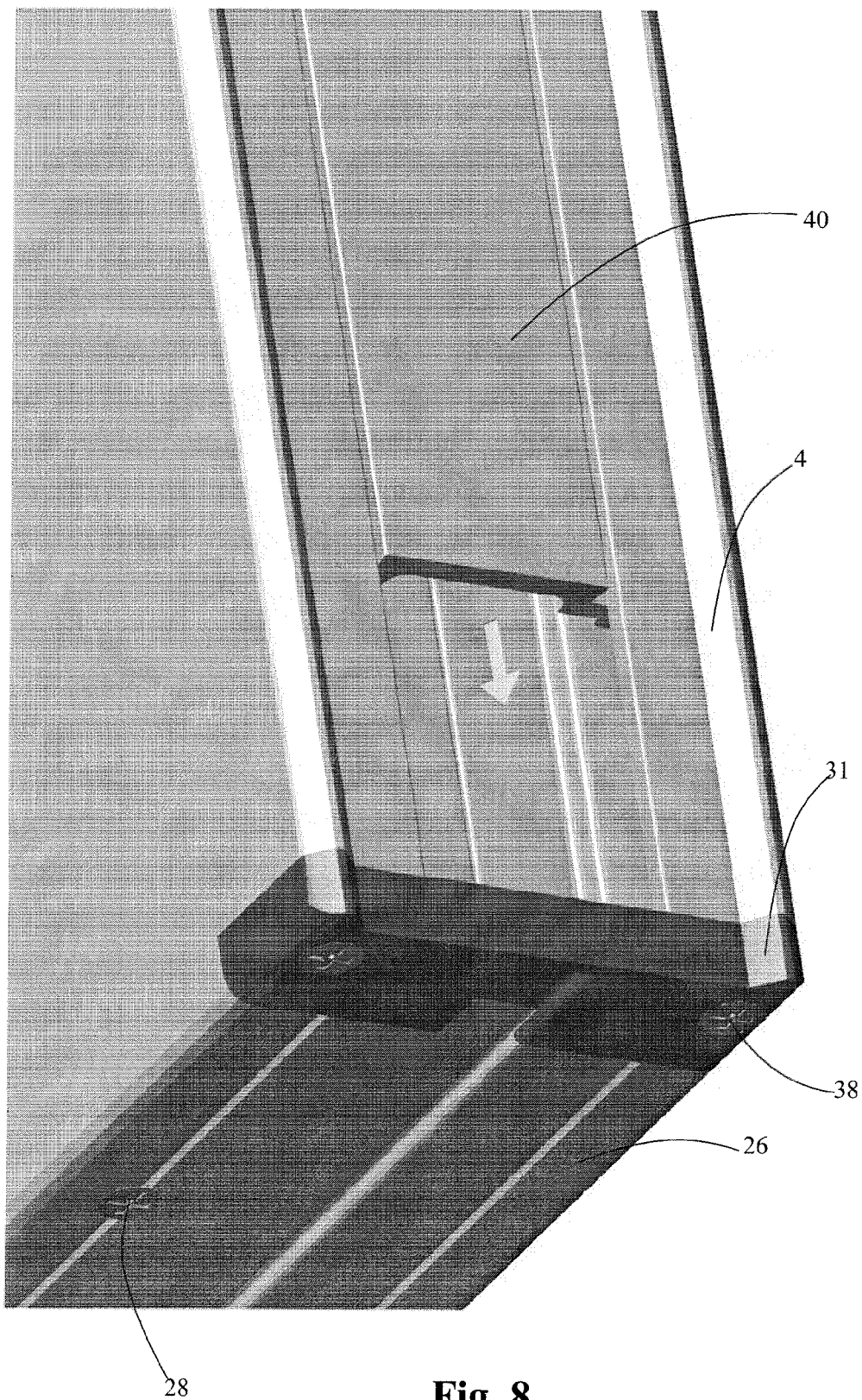


Fig. 7



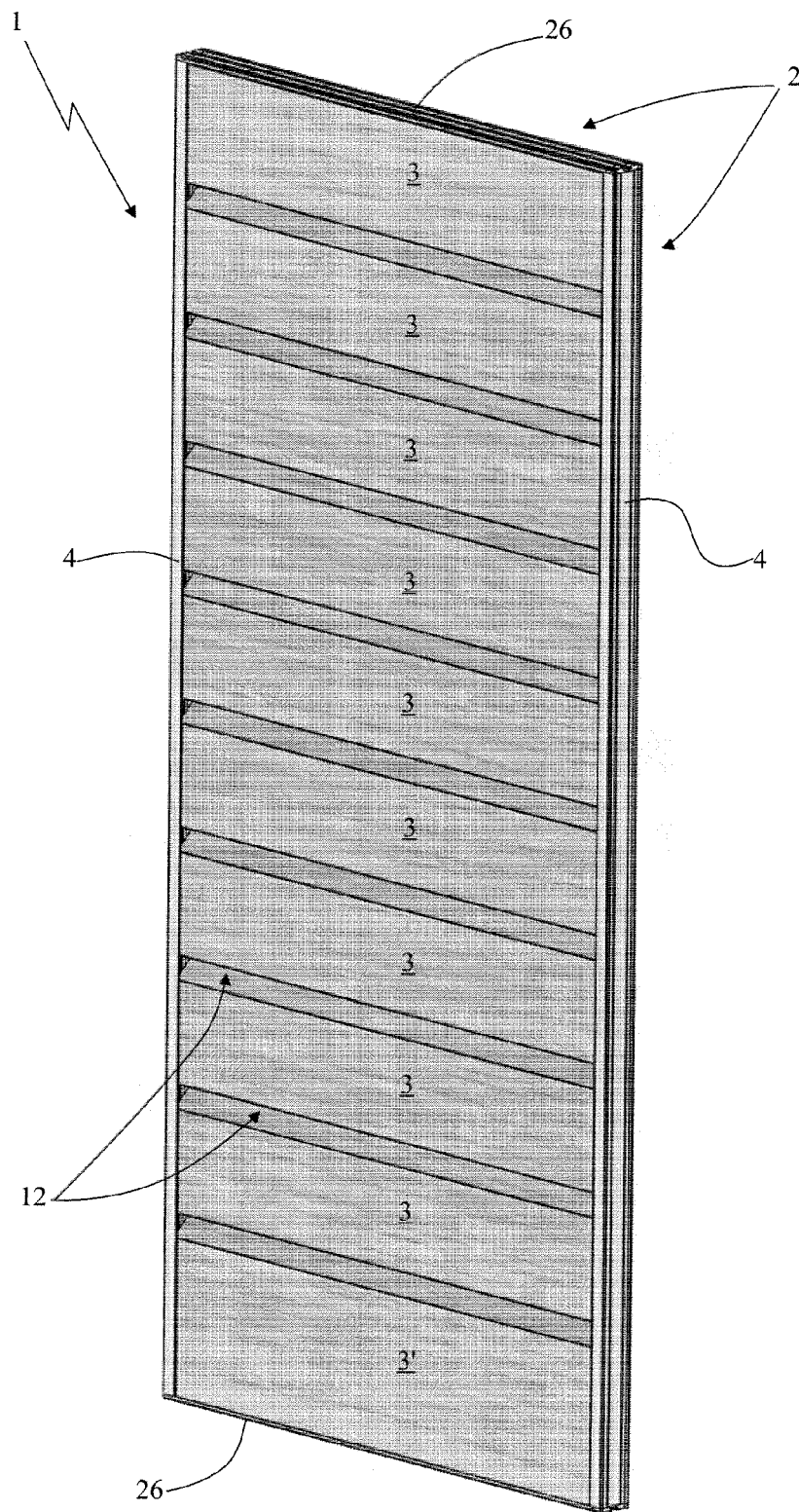


Fig. 9

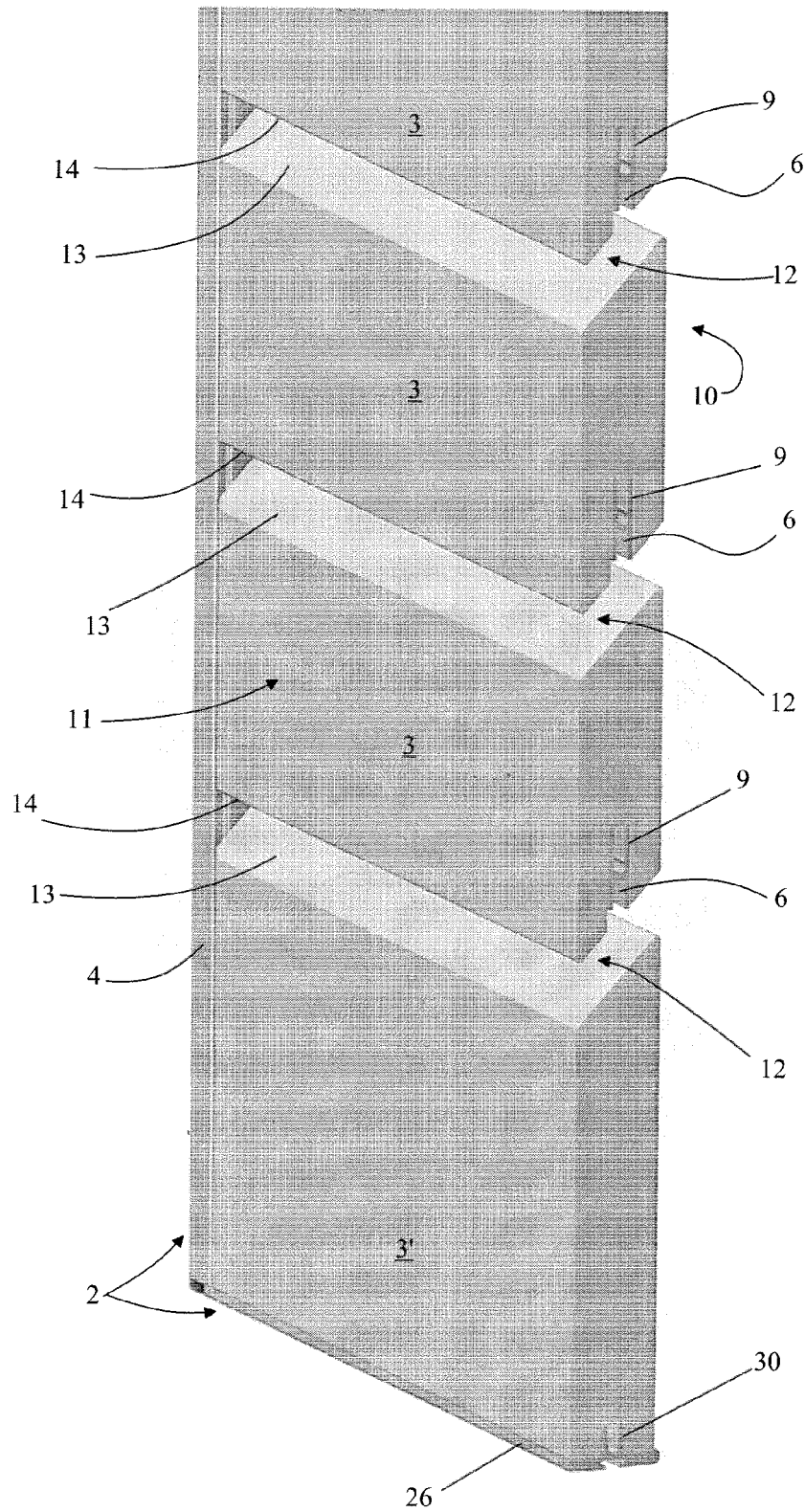


Fig. 10

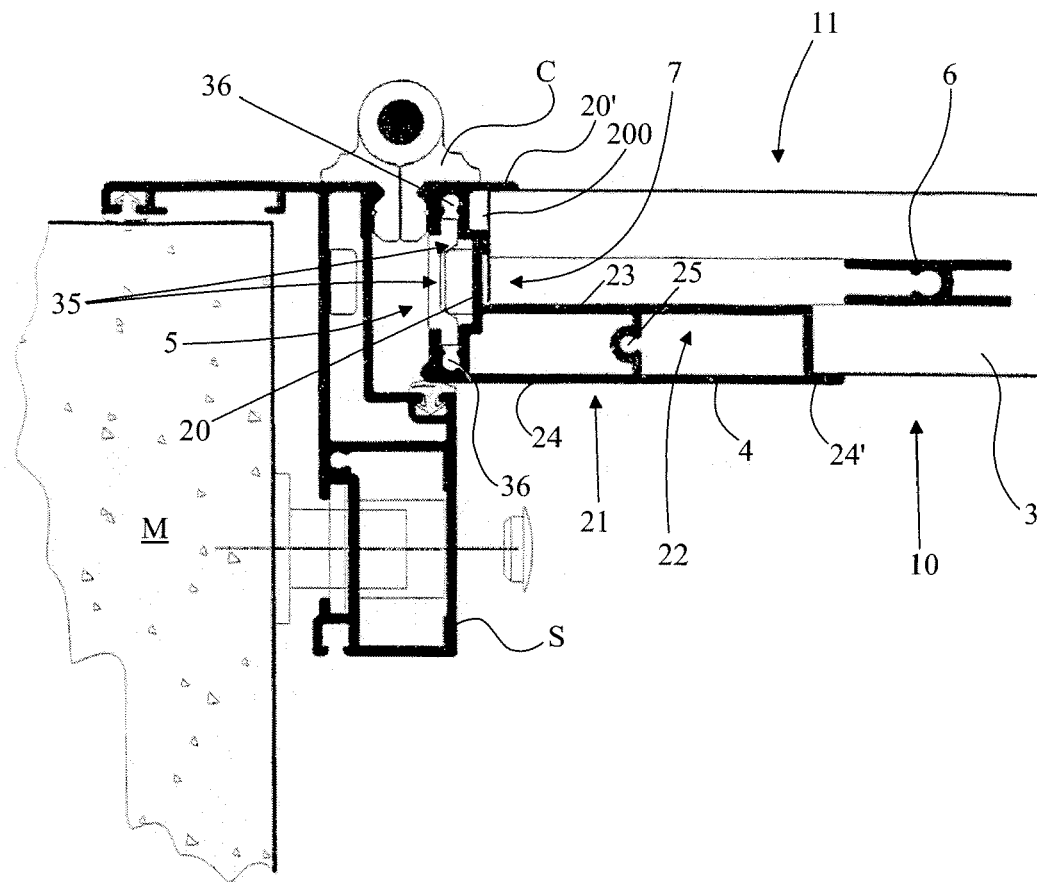


Fig. 11

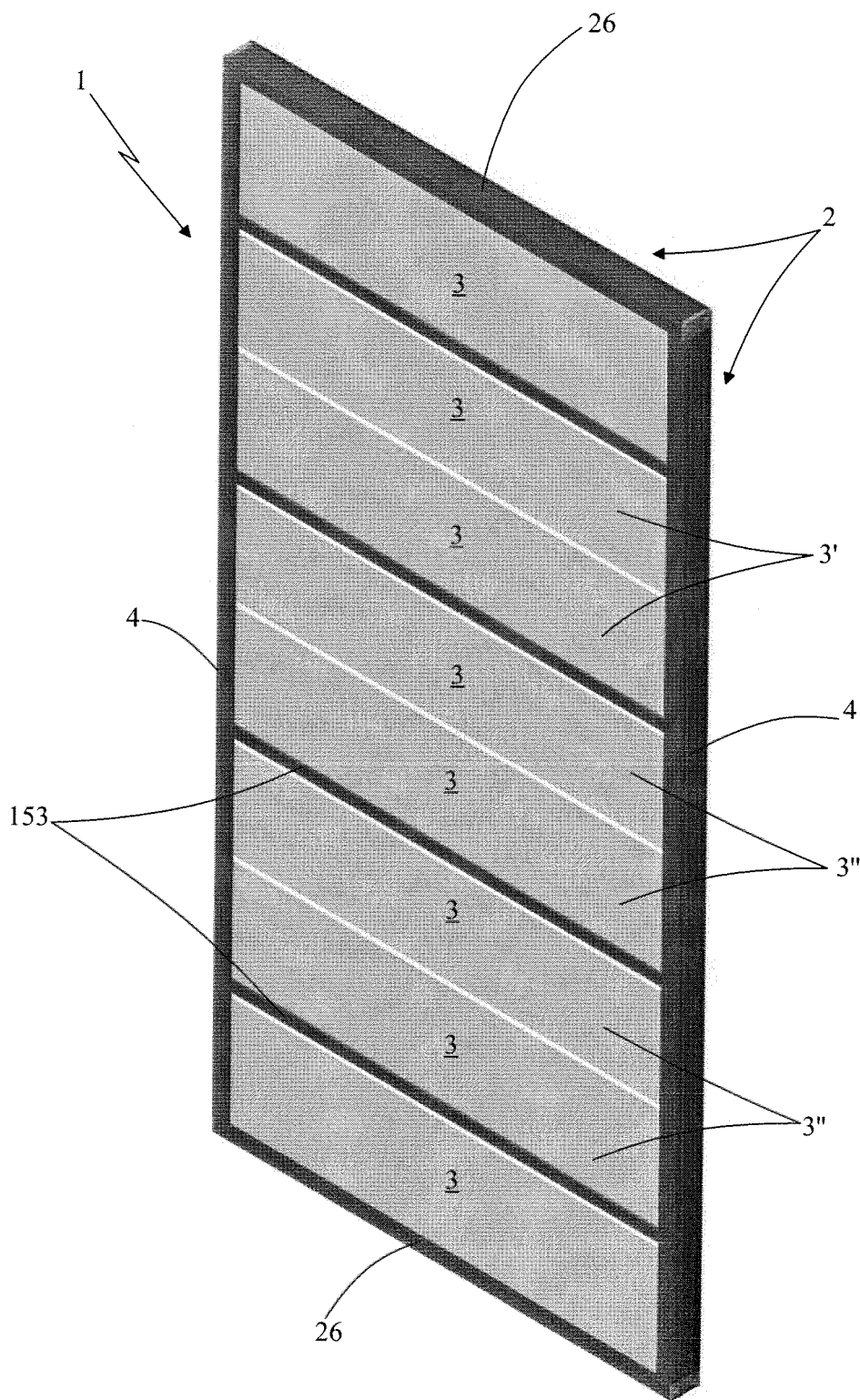


Fig. 12

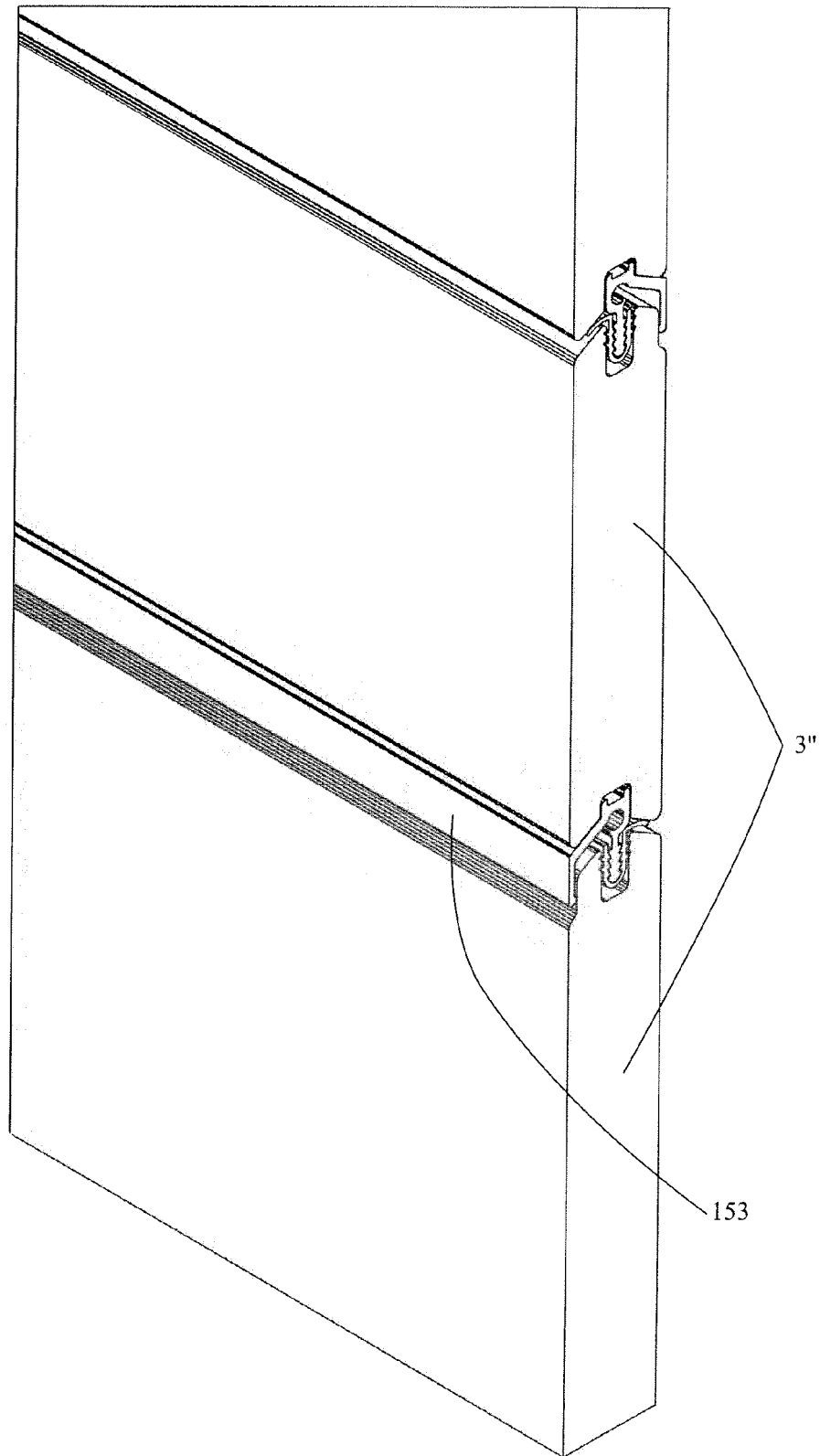


Fig. 13 A

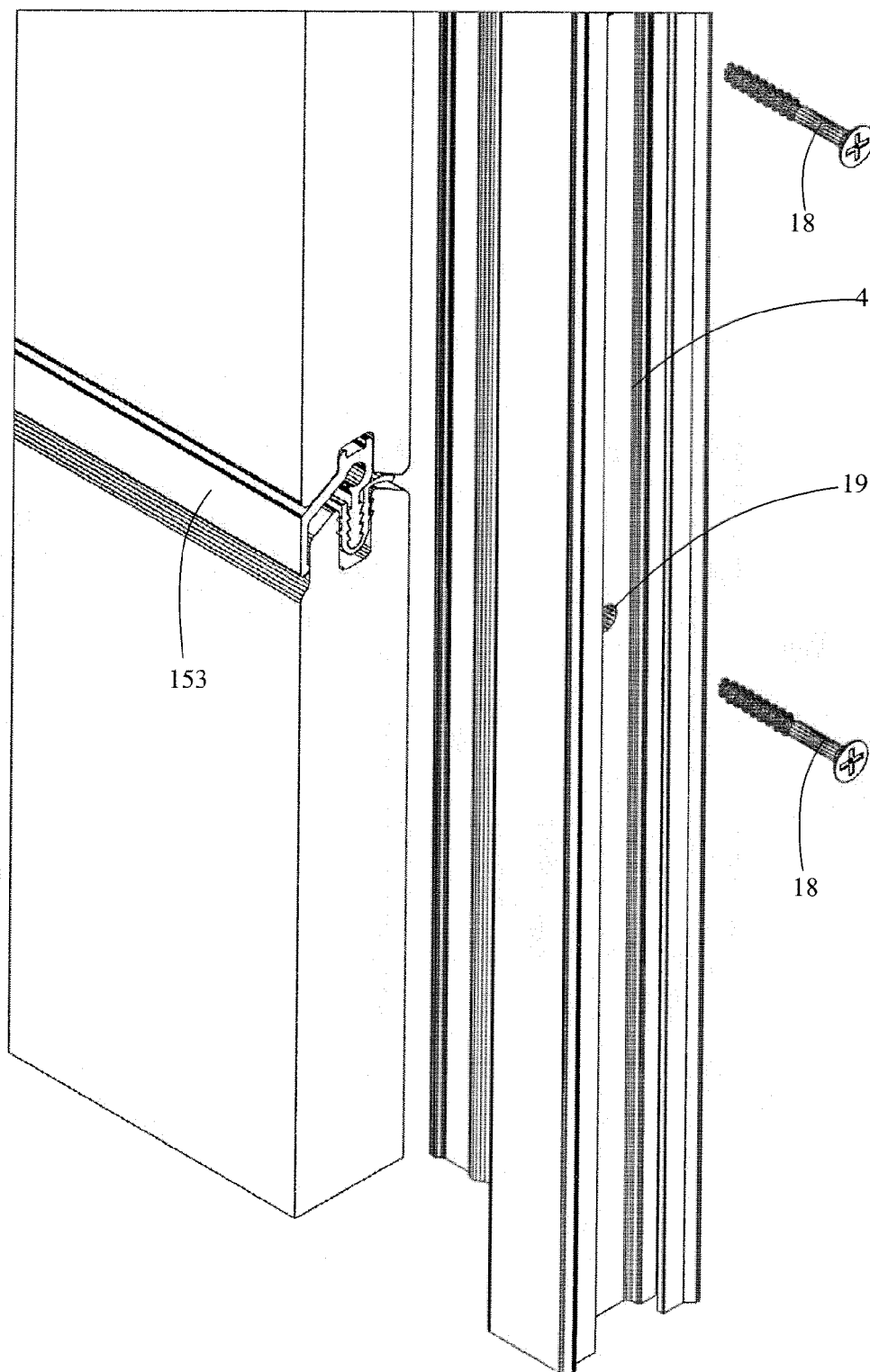


Fig. 13 B

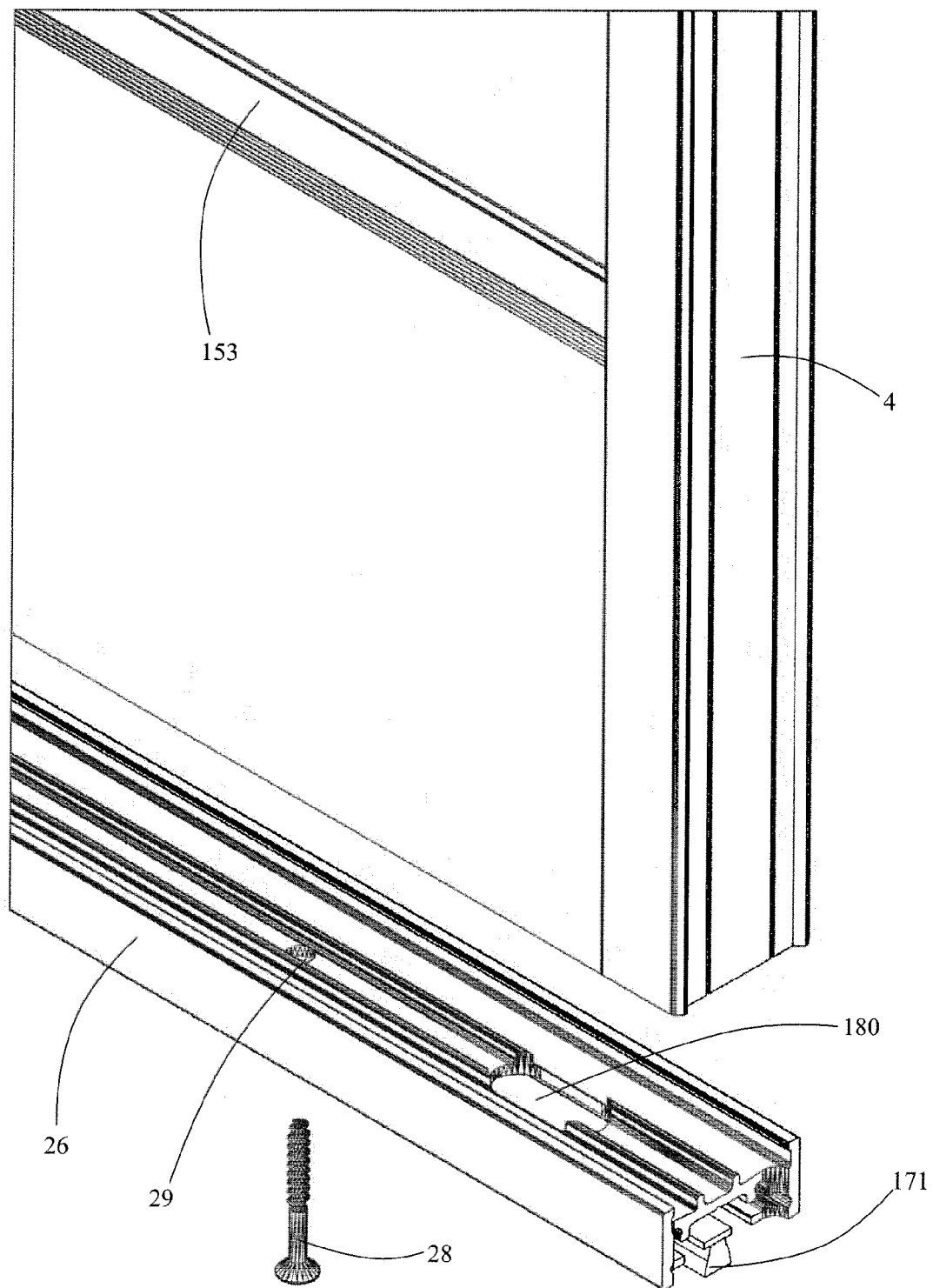


Fig. 13 C

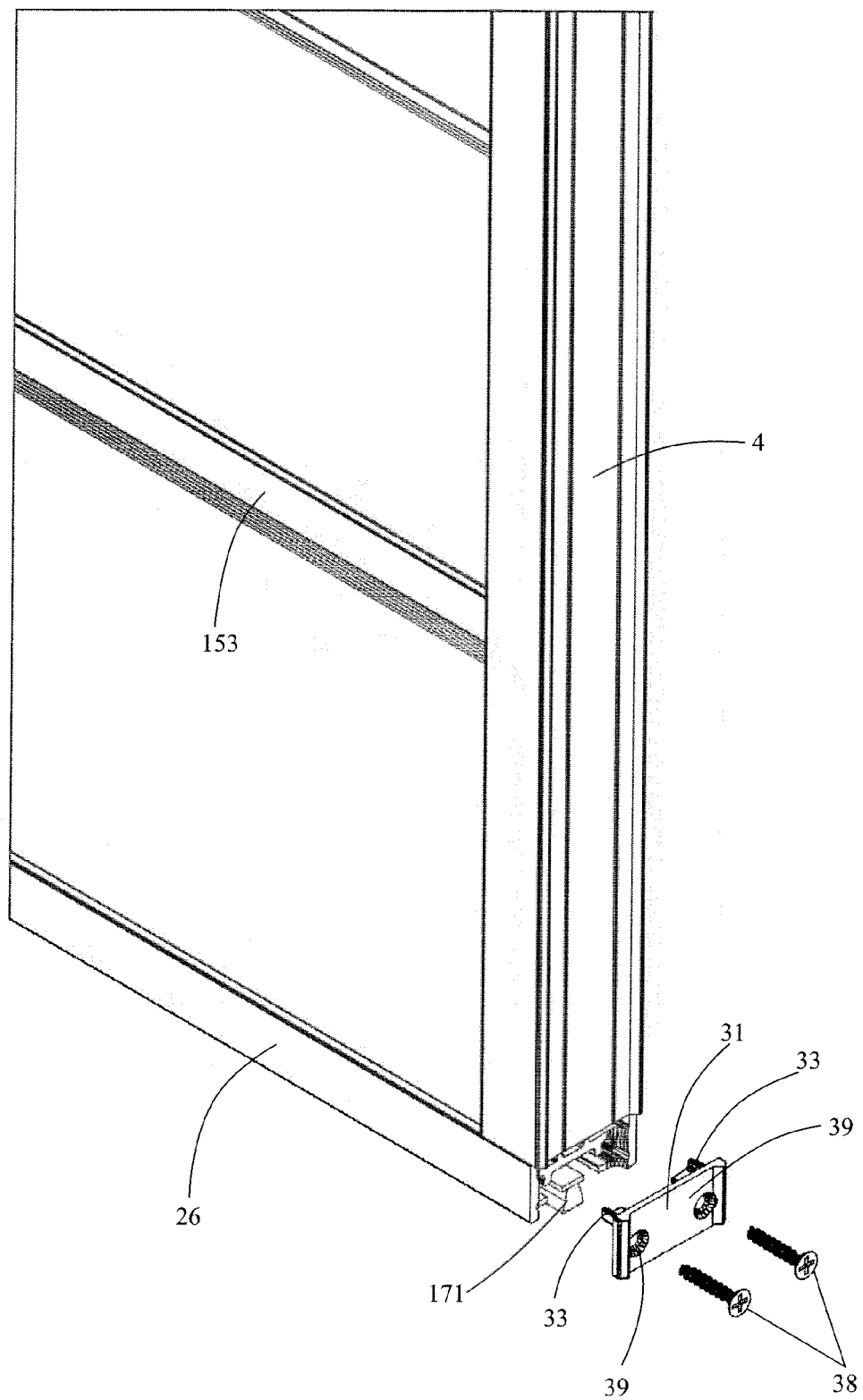


Fig. 13 D

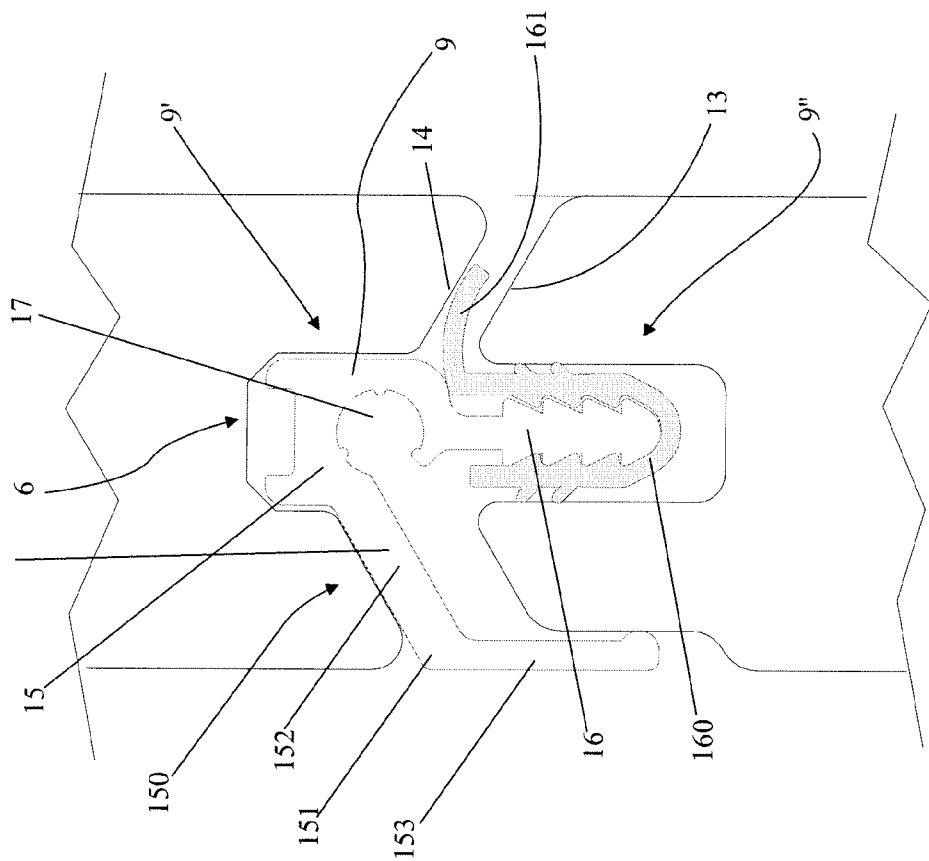


Fig. 16

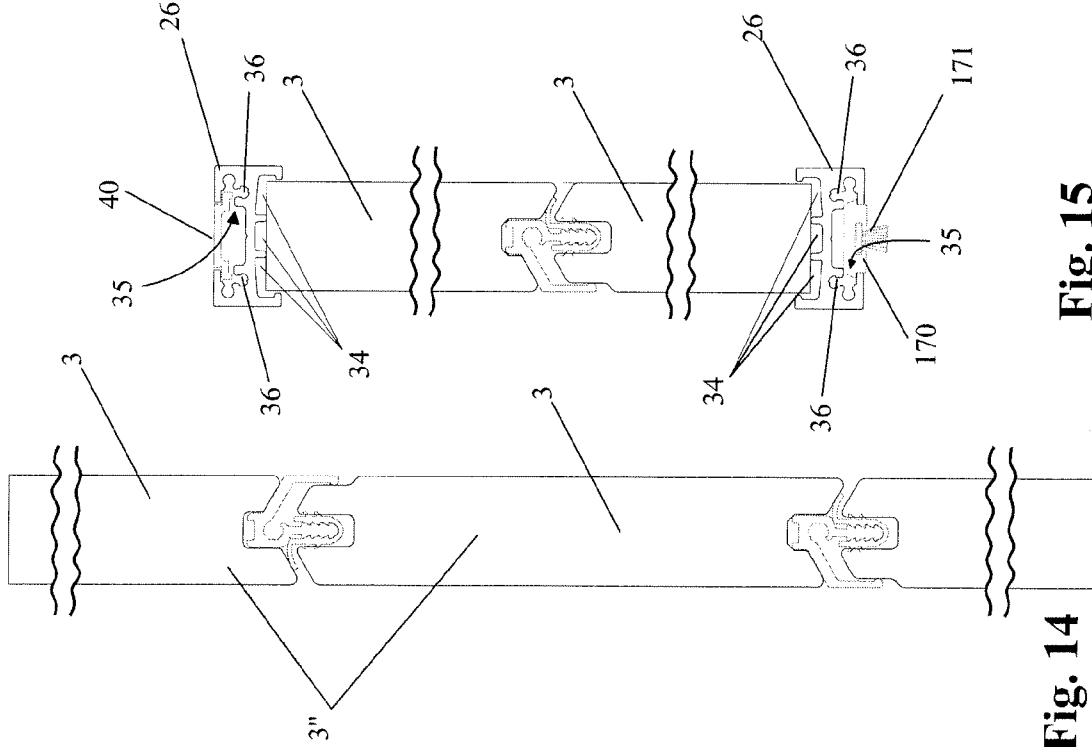


Fig. 15

Fig. 14

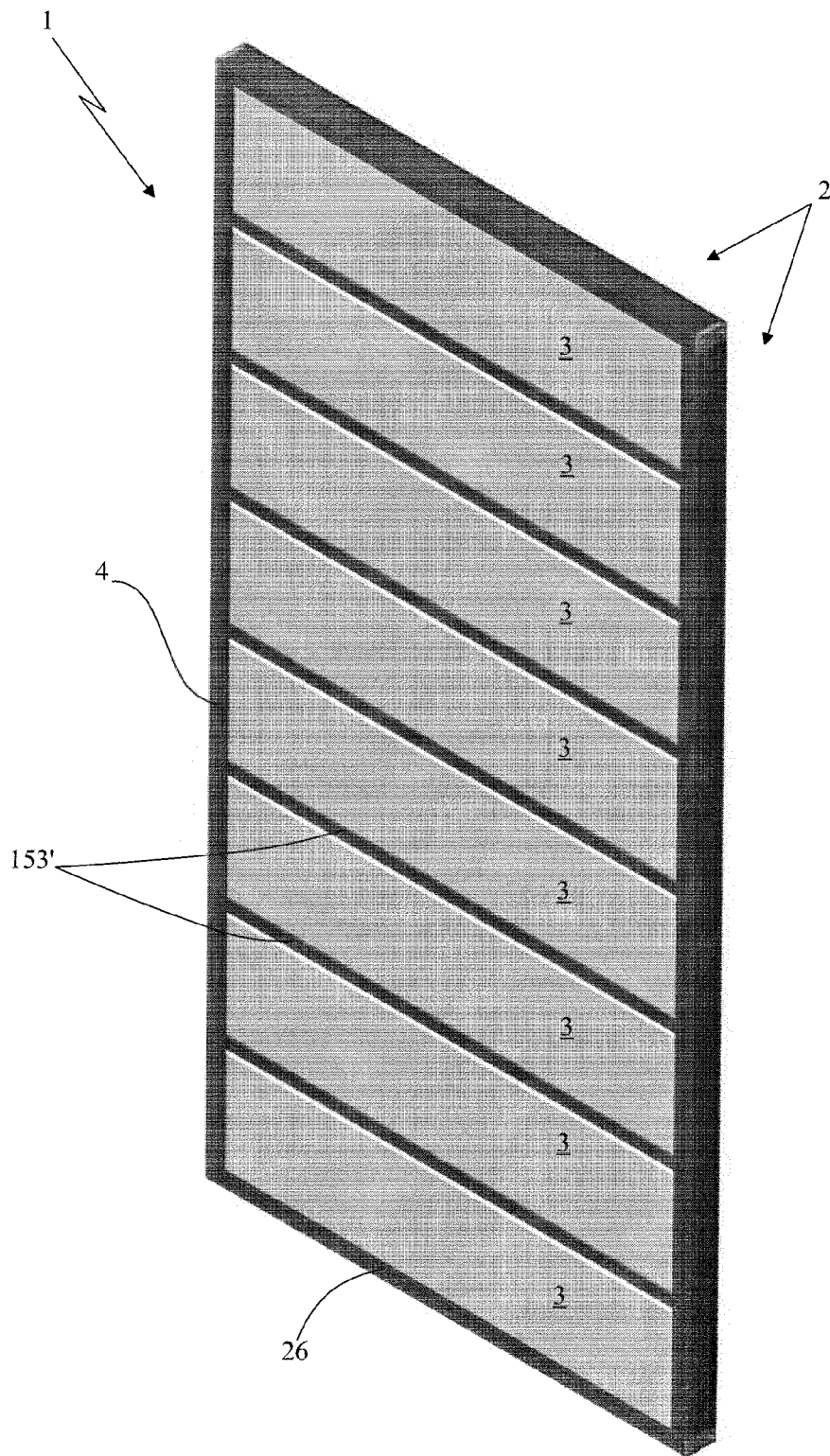


Fig. 17

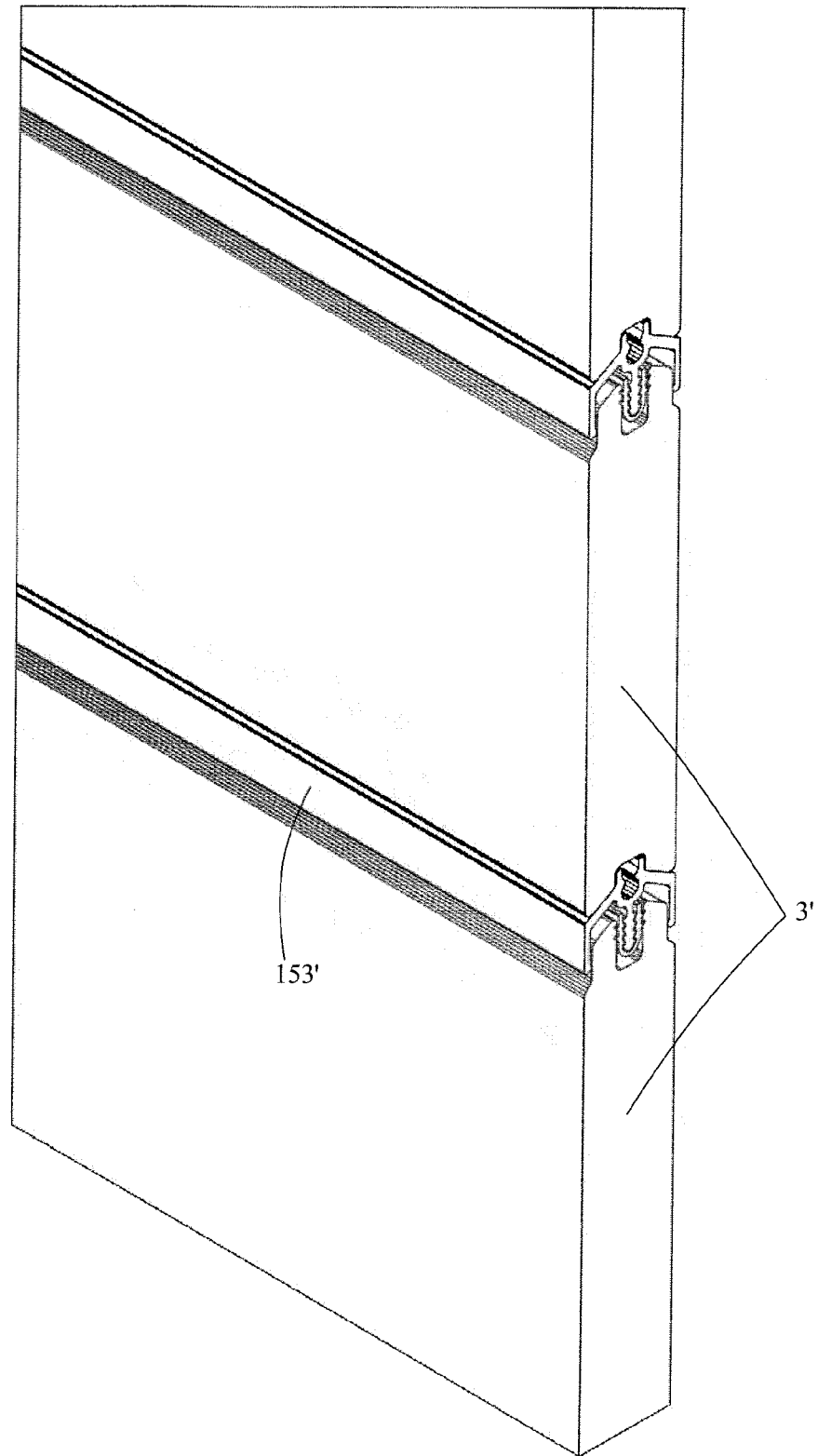


Fig. 18 A

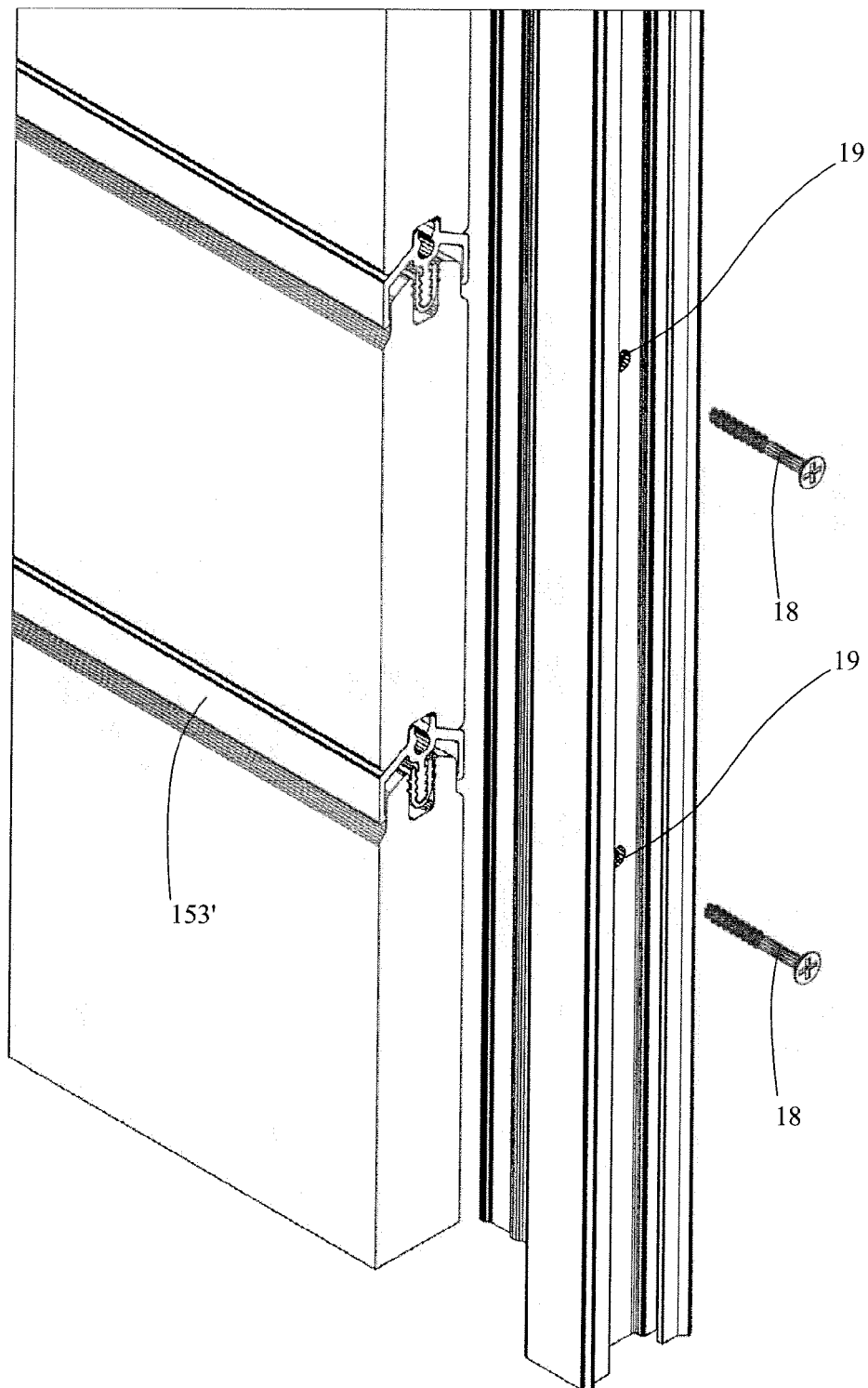


Fig. 18 B

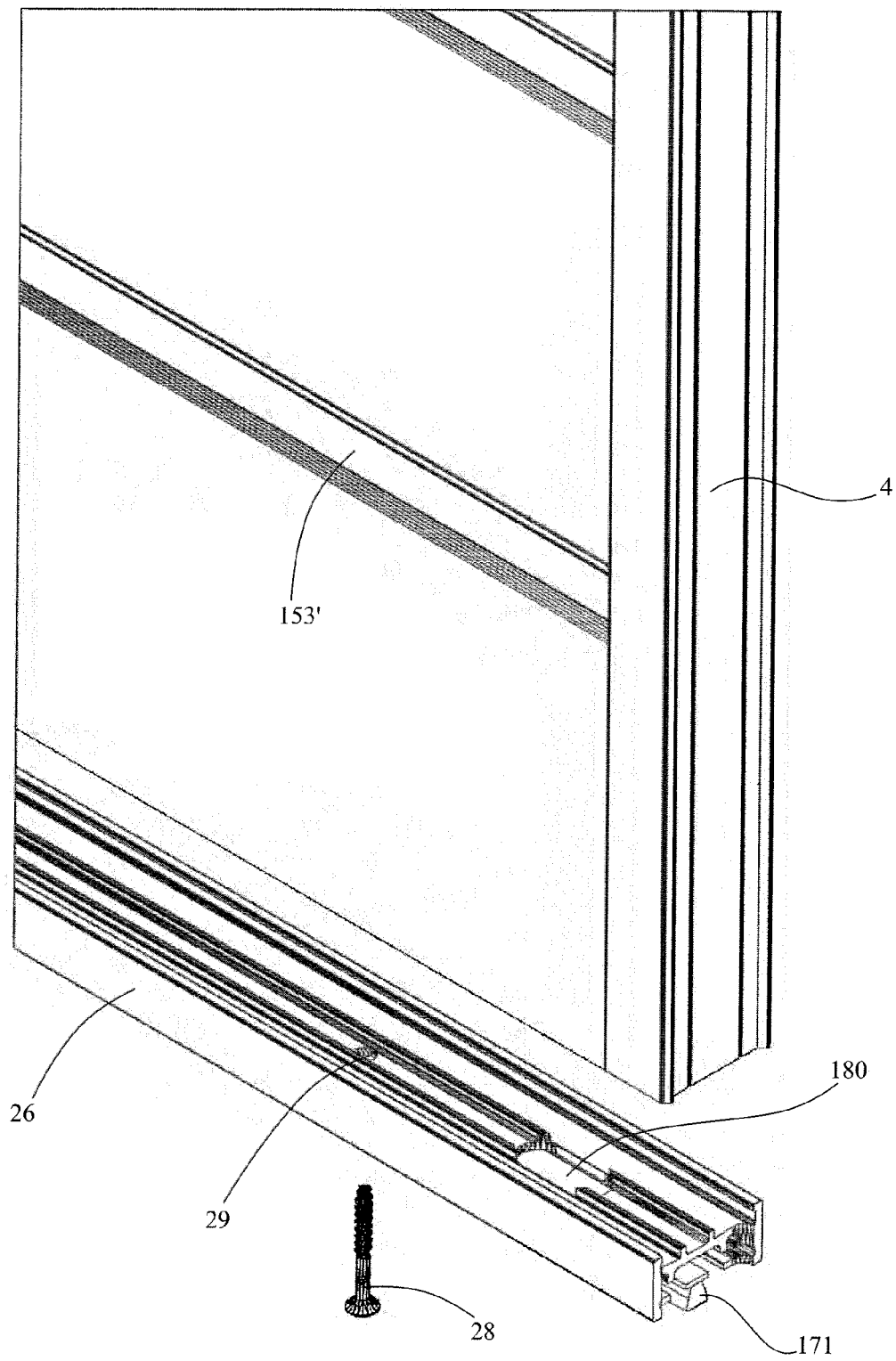


Fig. 18 C

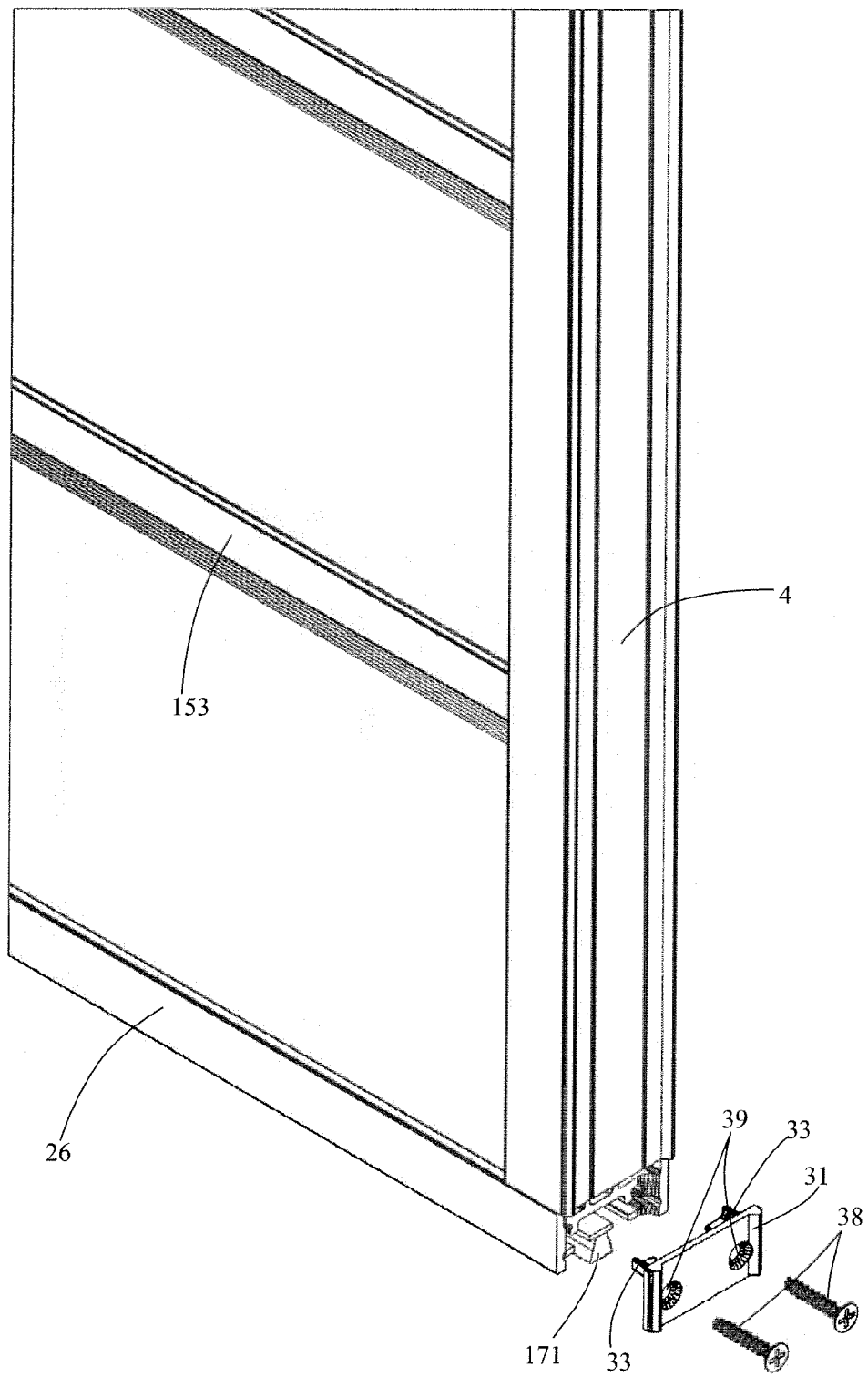


Fig. 18 D

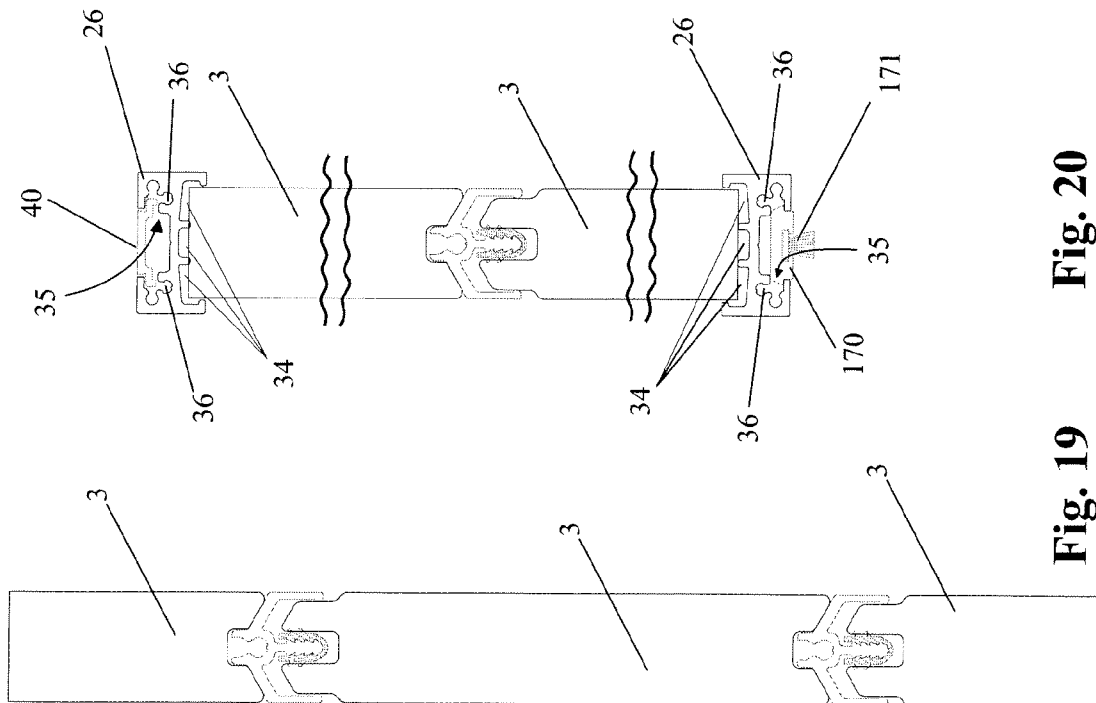
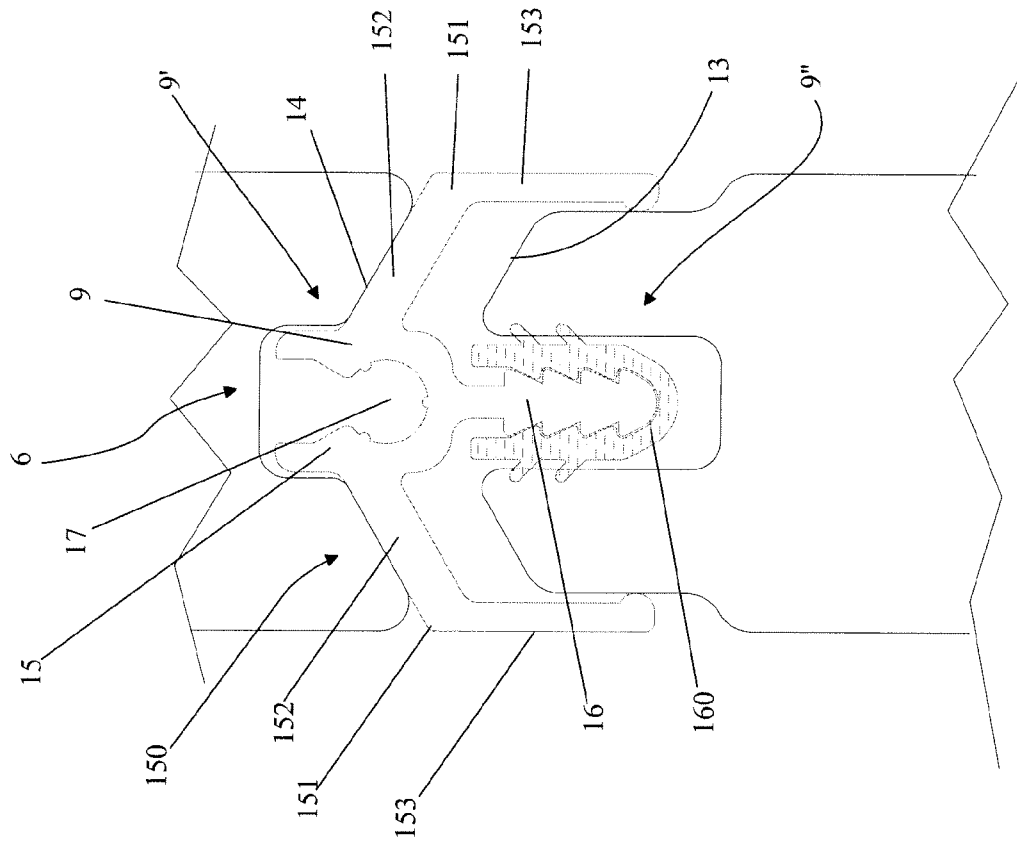


Fig. 19

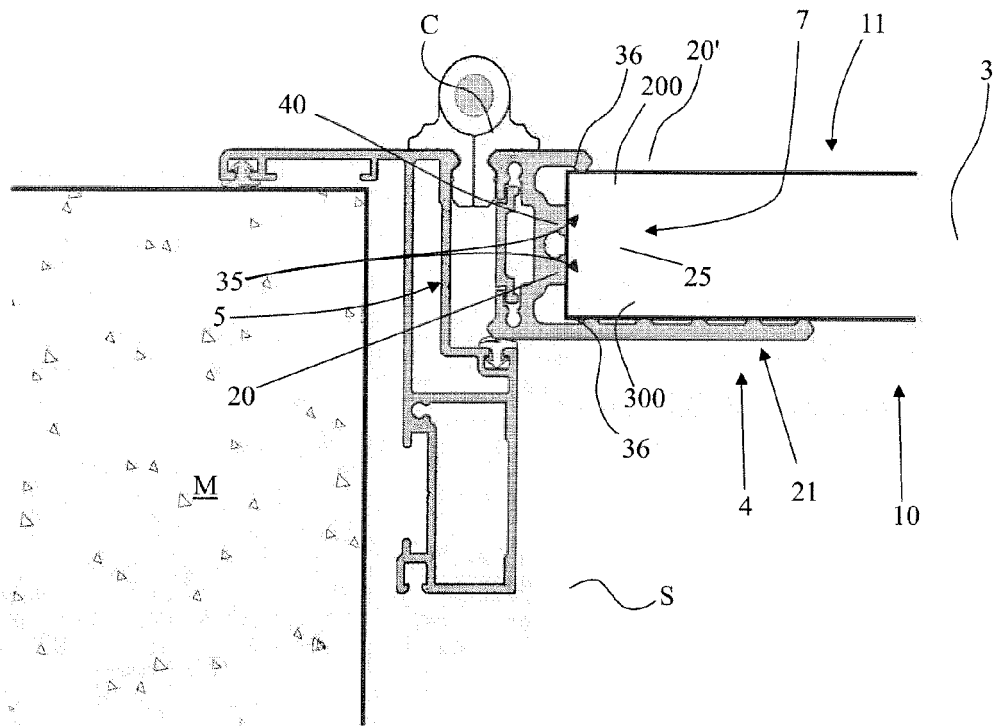


Fig. 22

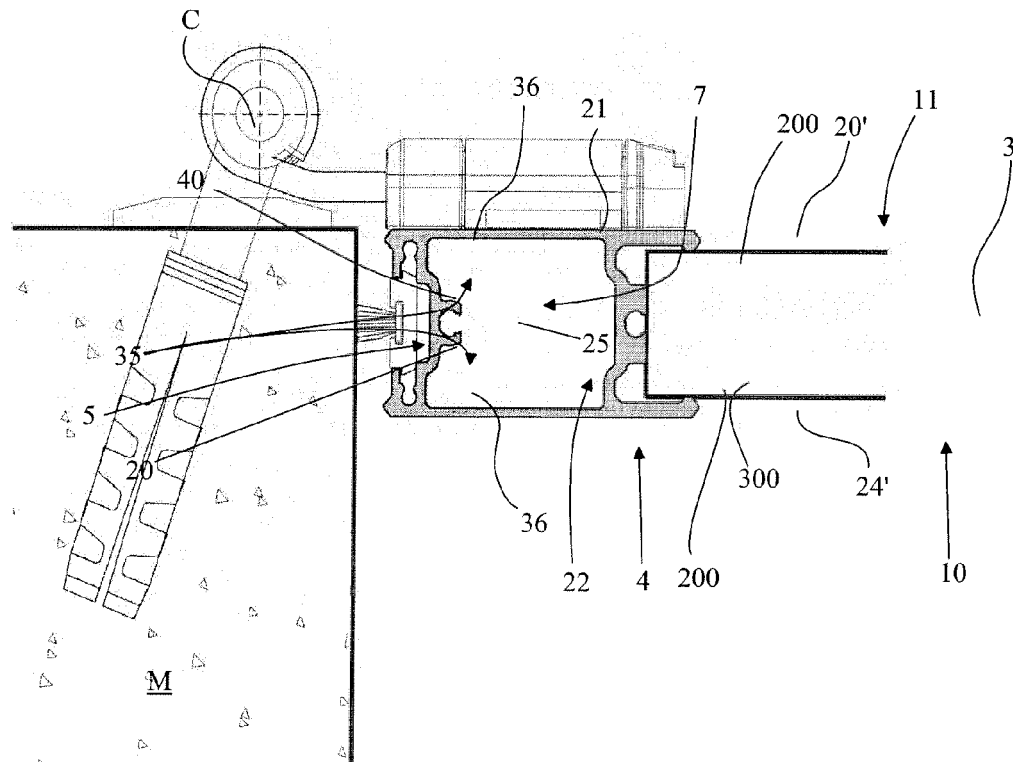


Fig. 23



EUROPEAN SEARCH REPORT

Application Number
EP 10 15 1849

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	DE 201 04 357 U1 (GUTER AUGUST [DE]) 21 June 2001 (2001-06-21) * claims 1,8-10; figures 1,2 *	1-11	
A	WO 2006/071703 A (HAY HENRY M III [US]) 6 July 2006 (2006-07-06) * claims 1,11,12; figures 1a,1b,3,4 *	1-11	
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A	DE 102 34 019 A1 (ZEILHOFER SCHLAF UND JUGENDMOE [DE]) 5 February 2004 (2004-02-05) * figures 1,3,5 *	1-11	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			E06B E01F E04B
Place of search		Date of completion of the search	Examiner
Munich		6 May 2010	Merz, Wolfgang
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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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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The members are as contained in the European Patent Office EDP file on
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REFERENCES CITED IN THE DESCRIPTION

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- IT 202041 [0012]
- IT MC2005A000011 [0012]