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(54) **Surface-mounted door and frame which are particularly suitable for closing inspectable wall recesses**

(57) Surface-mounted door and frame, particularly suitable for closing inspectable wall recesses containing the connections for electrical, telephonic, water or gas supplies installed in buildings, of the type in which the door (S) possesses integrally, on the opposite side to that having the closing means (10-13), a suitable number of L-profile and approximately T-shaped perpendicular hinge arms (9) in a symmetrical arrangement, the wide part of the T of the arms being insertable into the wide part of the similarly T-shaped hinge slots (4) formed in at least one or all sides of the bezel (1-401) of the frame (T) on which the door is placed in the closed position, which slots are oriented so their leg is perpendicular to and away from the frame in such a way that when the door is closed onto the frame, the wide part of the arms of the door comes underneath the leg of said slots, thereby securing the door to the frame but allowing it to be rotated and allowing it to be removed easily in a deliberate operation in which the wide part of said arms is lined up with the wide part of said slots and the door is extracted almost parallel to the frame, which door and frame are **characterized in that** the frame (T) is of a simplified form and can be mounted using screws and wall plugs (3, 103) in holes made directly on the visible face of the wall (M) containing the inspectable recess (V) which is closed by the present surface-mounted system.

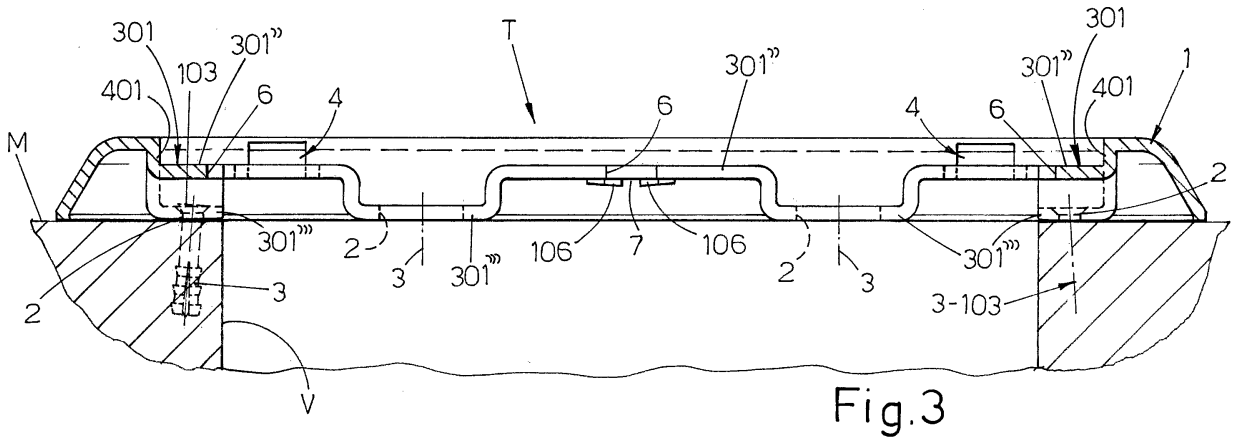

Fig.3

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Description

[0001] The invention relates to a surface-mounted door and frame made by injecting a plastic into a mould or from other suitable materials and which are particularly suitable for closing inspectable wall recesses containing the connections of electrical, telephonic, water or gas supplies installed in buildings. In particular the innovation is concerned with improvements to Italian Patent No. 256,144 belonging to the present applicant, which describes a frame and door for the aforesaid purposes, made for example by injecting a plastic into a mould, both pre-coloured to the desired colour, usually grey or brown, or having embossed surfaces that are easy to paint, in which said door is provided on one side with male L-profile T shaped arms connected at right angles to this door by their leg and which can be inserted into and articulated quickly and removably in corresponding hinge slots formed in the two long sides of a frame, if of rectangular shape, or on all four sides of this frame if of square shape. Said slots may for example be T shaped in plan view, are arranged transversely to the sides of the frame, and have their narrow part towards the outside of said frame. To hinge the door to the frame, all that is required is to insert the heads of said hinge arms of the door into the heads of the slots of the frame and then move the door outwards, in such a way as to position the heads of said arms beneath the legs of the slots. The hinge arms will thus remain secured to the slots but able to rotate in them in the manner of a book, without the danger of accidentally coming free. To remove the door the heads of said arms have to be lined up with the wide inner part of the slots, which means that the door must also be opened a very slight amount. Owing also to careful sizing of the hinge parts, and only on these conditions, these two hinge parts can be disconnected or connected. With this system the operator can attach the frame to the wall in any orientation and can then decide without any restrictions whether the door should open to the right or the left. If the frame and door system is square, the door can also be positioned to open about a horizontal axis, rotating either downwards or upwards. The door can be removed quickly and easily at any time from its frame, thus facilitating its fitting or the unimpeded carrying out of work in the wall recess to which this system is fitted.

[0002] In the patent referred to, the frame has a front bezel which is placed against the wall, and which has, projecting from its rear surface, an annular ledge or collar which fits into the recess let into the wall and which is designed to be able to be fixed to the inside surfaces of this recess using wall plugs and screws or masonry anchors. This operation of fixing said inner annular ledge of the frame has been found to be complicated and neither easy nor quick to carry out. The innovation relates to improvements to the frame, to limit it fundamentally to the bezel only, and hence to simplify its manufacture and enable the cornice to be mounted by means of screws and wall plugs placed in holes cut directly into the visible surface of the wall which contains the inspectable recess that is to be closed by surface-mounting the present system. The holes for the wall plugs are easy and quick to make and the frame is flatter and lighter than in the prior art.

[0003] Other features of the invention and the advantages procured thereby will be made clearer by the following description given with reference to the figures of the attached sheets of drawings, in which:

- Figures 1 and 2 are elevations of the front surface and rear surface, respectively, of the frame according to the innovation;
- Figures 3 and 4 each show further details of construction of the frame taken along the section lines marked III-III and IV-IV in Figure 1;
- Figures 5 and 6 are elevations of the front surface and rear surface, respectively, of the door for the frame shown in the previous figures;
- Figures 7, 8 and 9 show the door and frame system in a cross section taken on the line marked VII-VII in Figure 1, showing successive steps in assembling and opening said door;
- Figures 10 and 11 show other details of the frame and door in section on the line marked X-X in Figure 7, illustrating how they are put together; and
- Figure 12 shows the assembly of the door and frame in section on the line marked XII-XII in Figure 1, in the closed position.

[0004] As can be seen in Figures 1 to 4, the frame T comprises a bezel 1, which in the present example is square but which can be rectangular, which has rounded outer 101 and inner 201 corners, which is in the shape of a frustum of a pyramid and whose inner perimeter has a sunken ledge 301 connected to the outer bezel by a perpendicular wall 401. The ledge 301 has corner portions 301' and middle portions 301" which are coplanar with each other and on which the door S will bear (see below). It also has intermediate portions 301 "' which make contact with the actual surface of the wall M on which the outer edge of the bezel 1 of the frame T bears and which contain holes or slots 2 useful for fixing the frame T to this wall M by means of wall plugs 3 and corresponding screws 103 which engage in said slots 2 (Figure 3). The recess V let into the wall M is the same size as or smaller than the opening of the inner ledge 301 of the frame T. It will be obvious from Figures 3 and 4 that, owing to the corrugated form of the inner ledge 301 of the frame 1, the frame has good resistance to the mechanical stresses of flexing and twisting.

[0005] In the corner regions 301' of the ledge 301, in a symmetrical arrangement, are the T-shaped hinge slots 4, their heads towards the inside opening of the frame and their legs extending as far as the lateral wall 401, which has, in line with the slits, windows 104 which occupy the full height of this wall and have outwardly diverging rounded ends 5 useful for the fitting of the door

S (see below).

[0006] The frame 1 may be made, for example, with an outside dimension of about 220 mm, but it should be understood that it can be made in any other size. If the frame 1 is rectangular, at least one of said hinge slots 4 may also be provided in a middle portion 301" of the ledge 301 characterized by having, on the inner perimeter and on each side, a curved middle concavity 6 where this ledge 301 has, on its underside, wedge-shaped projections 106 separated from each other where their relief is greatest by a void 7 whose function will be described later.

[0007] The door S to be fitted to the frame T as described, is illustrated in Figures 5 and 6 and is identical to that described in the patent cited in the introduction to this description. The door S comprises a square (or rectangular) closing panel 8 whose dimensions fit those of the inner bezel 301, 401 of the frame T. In the closed position the door S bears on the inner ledge 301, is circumscribed by the wall 401 of the frame T, and its outer face is approximately coplanar with that of the bezel 1. On the outer face of the panel 8 of the door S is a low peripheral edge 108 projecting a few tenths of a millimetre and smooth, while the rest of the outer surface of the panel 8 may be suitably embossed. On its inner face, the panel 8 has a projecting peripheral edge 208 which connects with longitudinal and transverse ribs 308 coplanar with said peripheral edge, forming for example a square (or rectangular) grid to improve the mechanical strength of the door S. Referring also to Figures 7, 8 and 9, it will be seen that the door S has L-profile hinge arms 9 integral laterally and perpendicularly with one of its sides (a long side if the door is rectangular), in a distribution corresponding to that of the hinge slots 4 in the frame T. The length of the part 109 of each arm 9 is slightly greater in its free section than the thickness of the wall 401 of the frame T, its width is slightly less than the width of the foot portion of the hinge slots 4, and its position is such as to engage with the extension 104 of these slots occupying the wall 401 when the door S is in position, bearing on the inner ledge 301 via the side provided with the arms 9 and is displaced towards the bezel 1 as in the sequence of Figures 7 and 8. The rounded ends 5 facilitate inserting the part 109 of the arm 9 underneath the bezel 1 (Figure 8) to fix the door S to the frame T. The part 209 of the arms 9, which is perpendicular to the aforesaid initial part 109, has, when seen from its broad face (see also Figures 10 and 11), a T shape, its thickness and width such that this part of the arm can fit through the head of the slot 4. The leg of the arm part 209 is the same width as the part 109 and its height is slightly greater than the thickness of the ledge 301 (Figures 7 and 11), in such a way that the head of this part 209 projects freely beyond this ledge when the side of the door carrying the hinge arms 9 bears on the outer face of this ledge. The height of the head of the part 209 of the hinge arm 9 is conveniently greater than the width of the head of the slot 4 in order that as soon as the door is opened by rotation about the parts 109 of its lateral arms (Figure 9), the head of said arms has a projection on the ledge 301 with dimensions such as to prevent it from being withdrawn from the head of the slots 4, so that the door S remains hinged to the frame T. In order to remove the door S from the frame T, the parts have to be moved back to the positions shown in Figures 7 and 8 by means of which they were connected together. It will be obvious from Figure 9 that the rounded ends 5 are also useful for facilitating the opening rotation of the door S.

[0008] If the door is intended as an inspectable closure for recesses which must be ventilated and/or whose contents must be viewable from the exterior without opening the door, e.g. recesses for fuel gas connections for dwellings, the door S may have in any one or more suitable central or symmetrical positions, either at the top or at the bottom, as illustrated in dashed lines in Figure 5, areas G and G' designed to contain gratings or infills of transparent material or infills with wording and/or designs visible from the exterior. Said areas G and G' may be provided with pieces of air gratings having fins oriented in contrary directions and diverging from each other towards the interior of the door and such as to oppose the passage of rainwater independently of whichever of the two short sides of the door is at the top. In a different embodiment, said areas G and G' can be provided with windows positioned for example on the inside surface in any way suitable for supporting, for example in such a way that they can be removed only from the inside, transparent infills, customized infills or air gratings, and these components can be fitted in a desired number, orientation and position, according to requirements.

[0009] Figures 5, 6 and 12 show the door S can be locked in the closed position by a lock with a rotating barrel, of any suitable type, housed in a cylindrical seat 10 formed in the middle of the opposite side with the hinge arms 9. It has a collar 110 projecting from the inside face of the cover, further than the reinforcing grid 308. The seat 10 is characterized by an internal width which decreases towards the collar 110, allowing to house a rotating barrel 11 containing an axial seat 11 of prismatic section, open to the exterior, in which the mating shaft 112 of a turning key 12 can be engaged. On the inward end of this barrel are opposing hooked protrusions 211 onto which a bush 13 can be snapped via its hole 113 of prismatic plan view, allowing the bush 13 to revolve on the collar 110 and keeping the barrel 11 in position. Projecting radially from the bush 13 is a bolt 213, and that face of the latter which is towards the outside face of the cover has a protrusion 313 of e.g. spherical cap shape. As Figures 1 and 2 show, the curved concavities 6 on the inner ledge 301 of the frame T are to avoid interference with said door S closing means 13, 110. The circular arc-shaped tracks 106 on the underside of the ledge 301, concentric with the cavities 6, are of such a size that when the bolt 213 is turned to the closed position, its spherical protrusion 313 is gradually lifted by said tracks 106 and snaps into position when it reaches the sunken middle

part 7, thus giving the person closing the door the tactile and acoustic sensation that the bolt has reached the closed position. It will be understood that the lock illustrated can be replaced by a lock with a number key of standardized type easily available on the market, which can be allowed for when deciding the dimensions of the seat 10.

Claims

1. Surface-mounted door and frame, particularly suitable for closing inspectable wall recesses containing the connections for electrical, telephonic, water or gas supplies installed in buildings, of the type in which the door (S) possesses integrally, on the opposite side to that having the closing means (10-13), a suitable number of L-profile and approximately T-shaped perpendicular hinge arms (9) in a symmetrical arrangement, the wide part of the T of the arms being insertable into the wide part of the similarly T-shaped hinge slots (4) formed in at least one or all sides of the bezel (1-401) of the frame (T) on which the door is placed in the closed position, which slots are oriented so their leg is perpendicular to and away from the frame in such a way that when the door is closed onto the frame, the wide part of the arms of the door comes underneath the leg of said slots, thereby securing the door to the frame but allowing it to be rotated and allowing it to be removed easily in a deliberate operation in which the wide part of said arms is lined up with the wide part of said slots and the door is extracted almost parallel to the frame, which door and frame are **characterized in that** the frame (T) is of a simplified form and can be mounted using screws and wall plugs (3, 103) in holes made directly on the visible face of the wall (M) containing the inspectable recess (V) which is closed by the present surface-mounted system.

2. Surface-mounted door and frame according to Claim 1, **characterized in that** the frame (T) comprises a bezel (1) in the shape of a frustum of a pyramid with a square or rectangular base, with rounded outer and inner corners (101, 201) and whose inner perimeter has a sunken ledge (301) connected to said bezel by at least one perpendicular wall (401), said ledge (301) being **characterized by** having corner portions (301') and middle portions (301 ") which are coplanar with each other and on which the door (S) will bear, which ledge is also provided with intermediate portions (301"') which make contact with the actual surface of the wall (M) on which the outer edge of the bezel (1) of the frame (T) bears and which contain holes or slots (2) useful for fixing the frame to this wall (M) by means of wall plugs (3) and corresponding screws (103) which engage in said slots (2).

3. Surface-mounted door and frame according to Claim 2, **characterized in that** in the corner regions (301') of the inner ledge (301), in a symmetrical arrangement, are the T-shaped hinge slots (4), their heads towards the inside opening of the frame and their legs extending as far as the inner lateral wall (401), which has, in line with the slits, windows (104) which occupy the full height of this wall and have outwardly diverging rounded ends (5) useful for facilitating the fitting and operation of the door (S).

4. Surface-mounted door and frame according to one or more of the preceding claims, **characterized in that** said inner ledge (301) of the frame (T) has on the inner sides a middle concavity (6) to avoid interference with the door (S) closing means where this ledge (301) has, on its underside, wedge-shaped and arcuate projections (106) separated from each other where their relief is greatest by a void (7) able to be engaged by the lock bolt (213, 313) of said door (S) closing means.

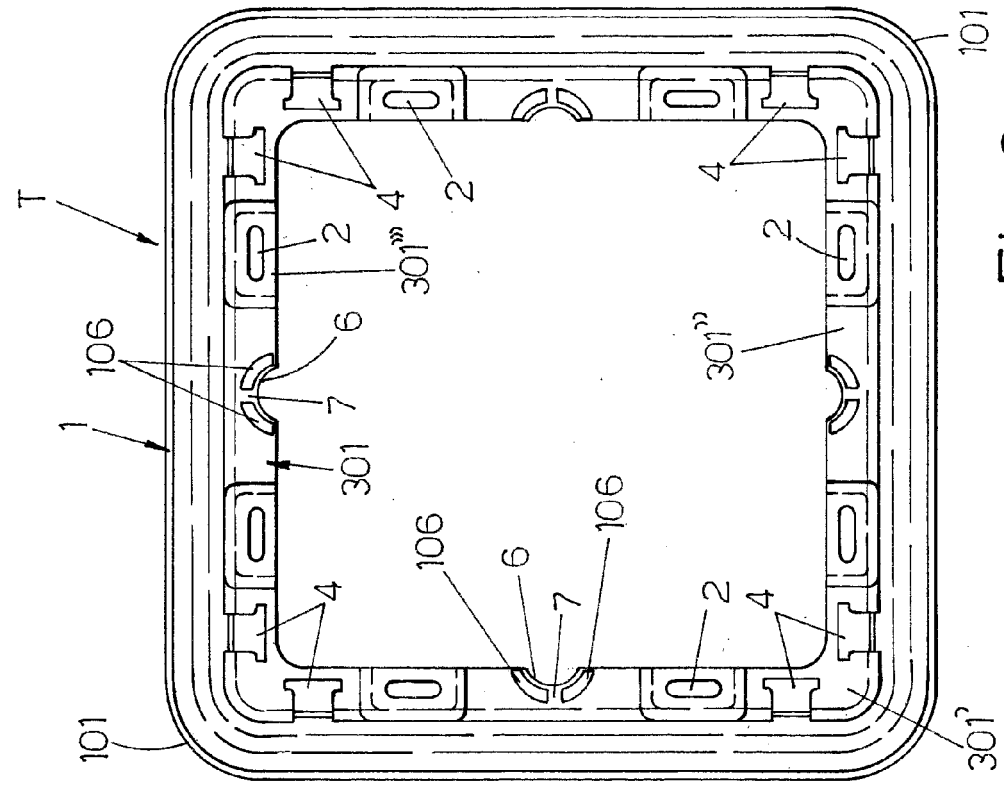
T
1
101
106
2
4
6
7
301
301'
301''
301'''

Fig.2

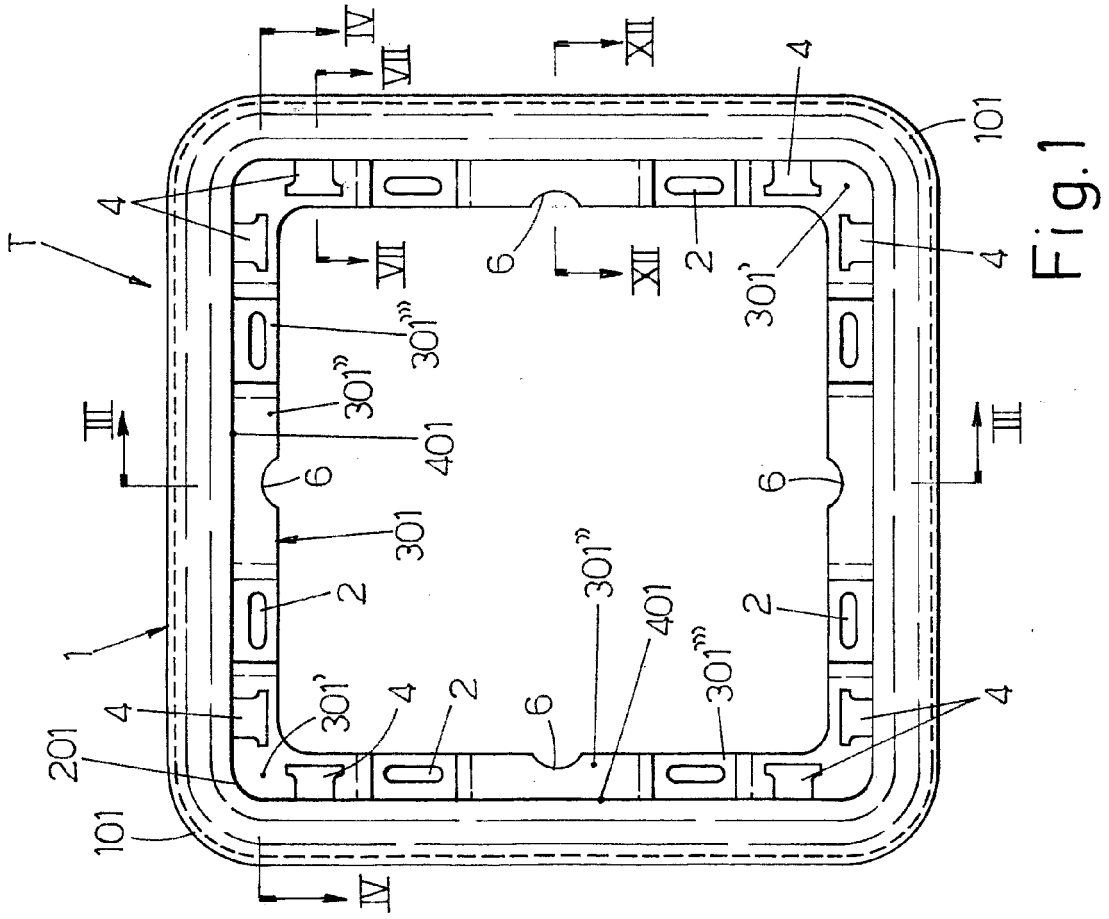
T
1
101
201
2
4
6
7
III
IV
VII
XII
301
301'
301''
301'''
401

Fig.1

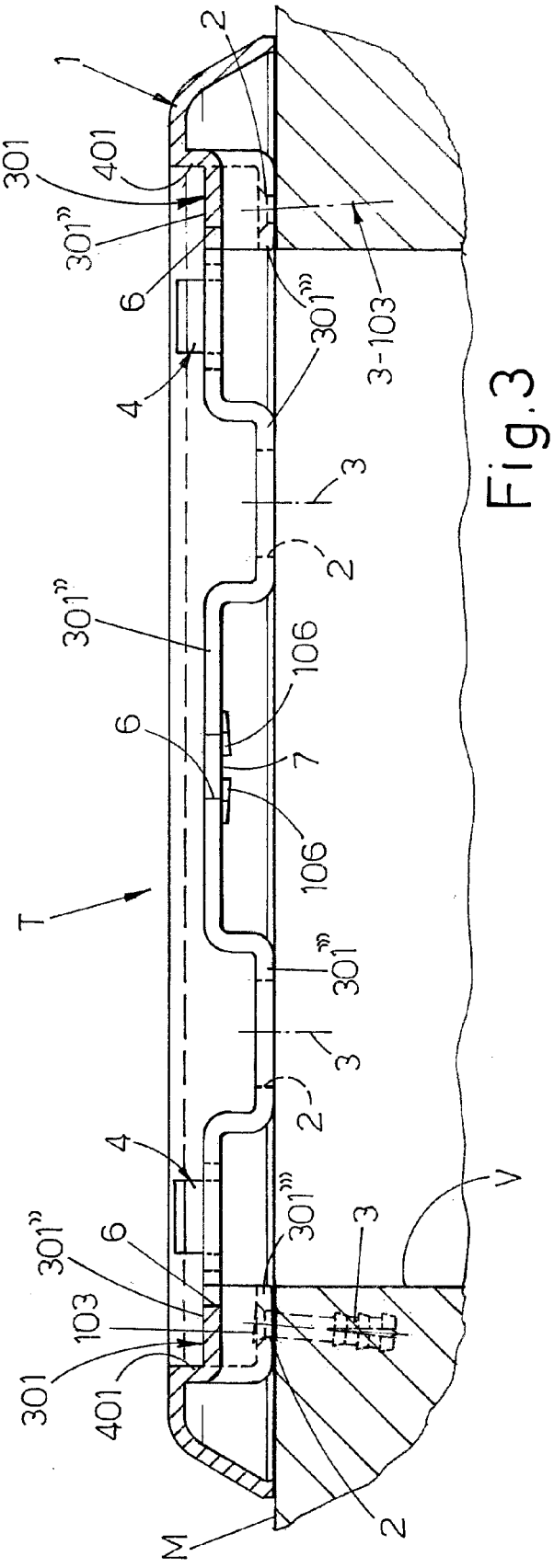
1
2
301
401
301''
6
4
301'''
3-103
3
2'
106
7
T
V
M
103

Fig.3

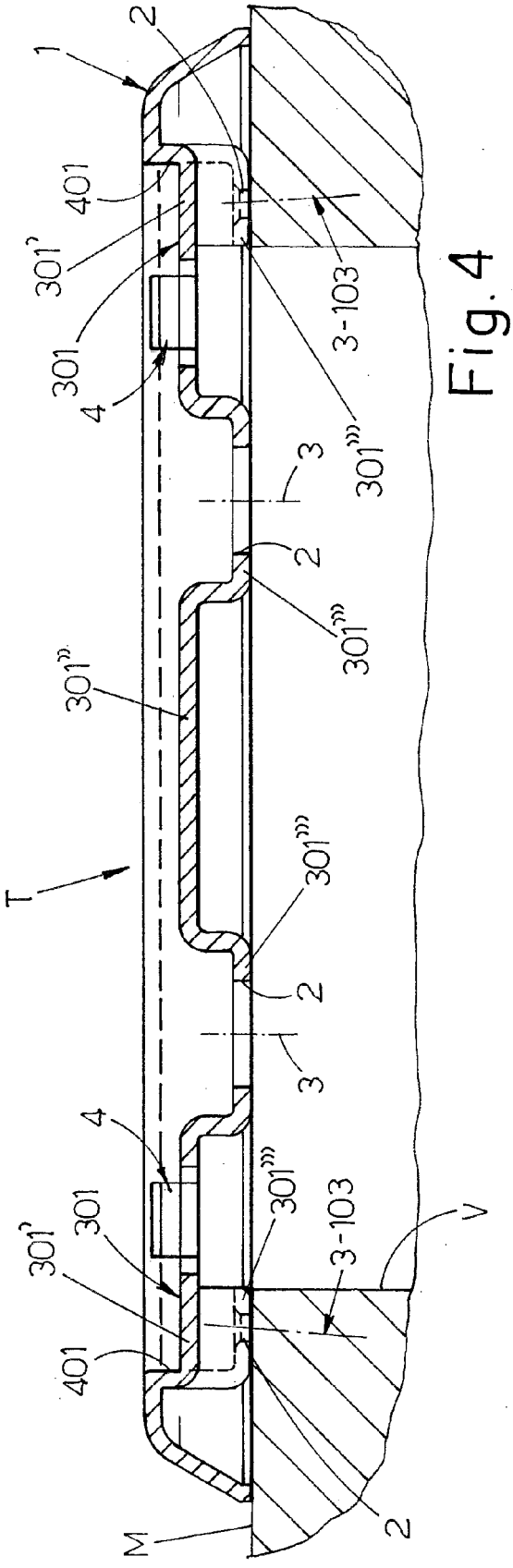
1
2
401
301'
301
4
3-103
301'''
3
2
301''
T
V
M

Fig.4

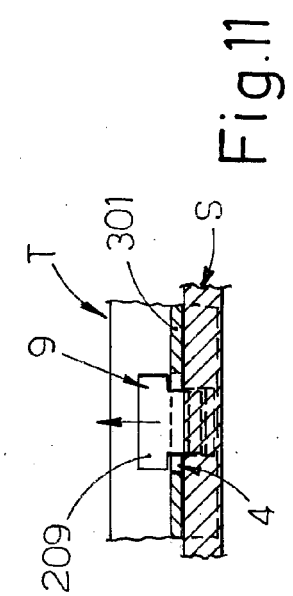

Fig.11

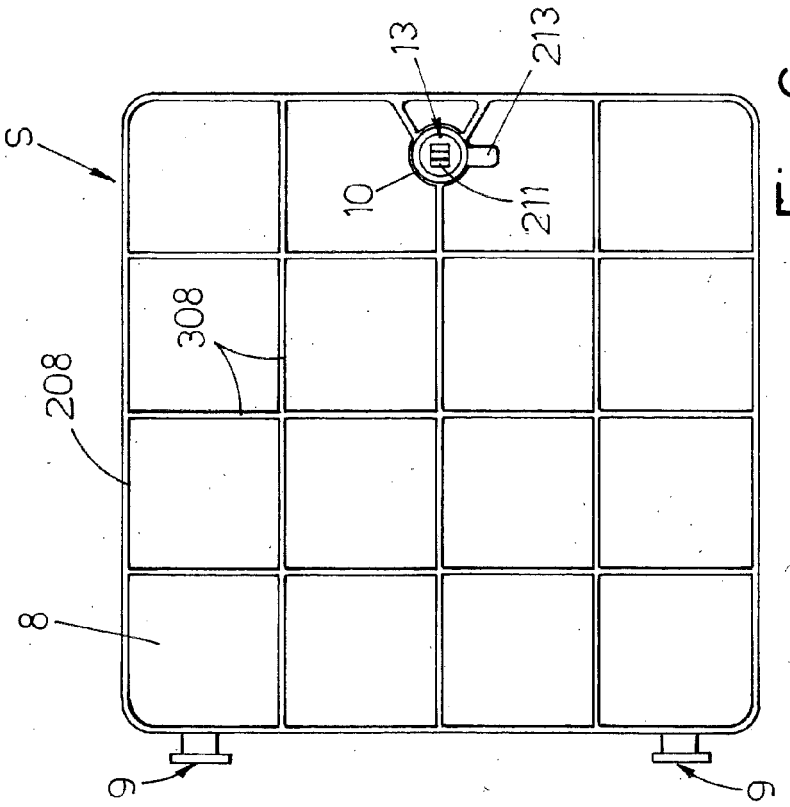

Fig.6

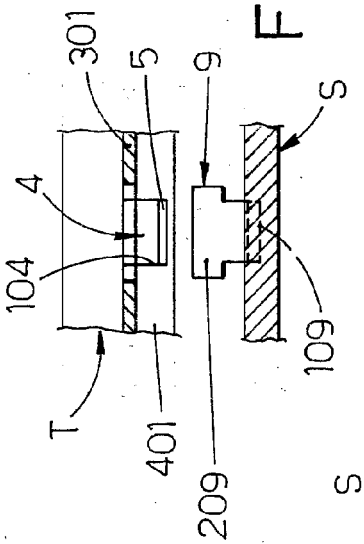

Fig.10

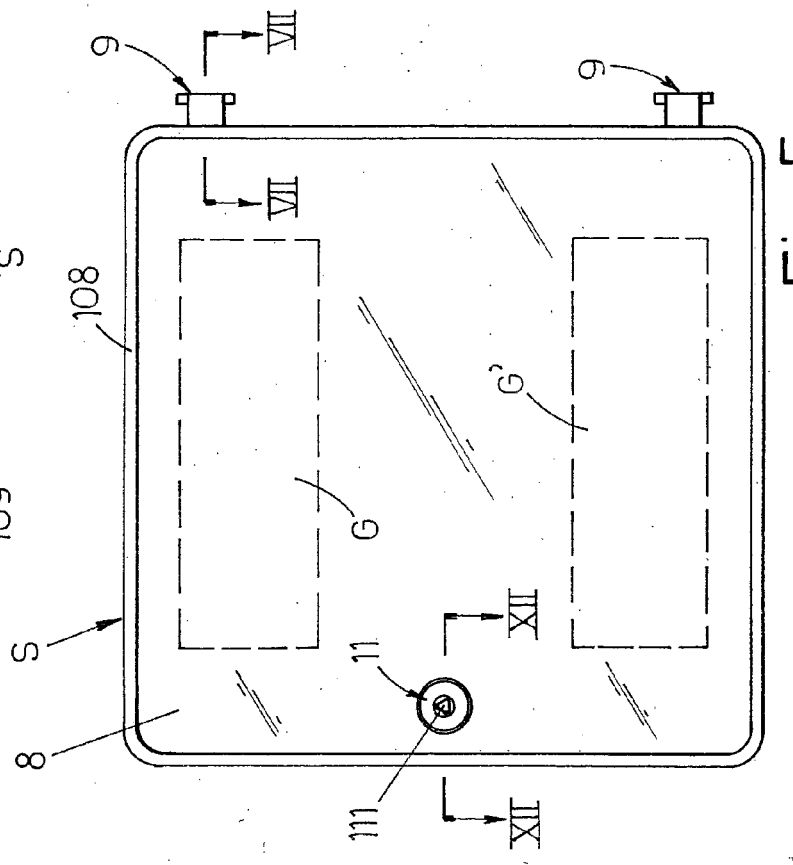

Fig.5

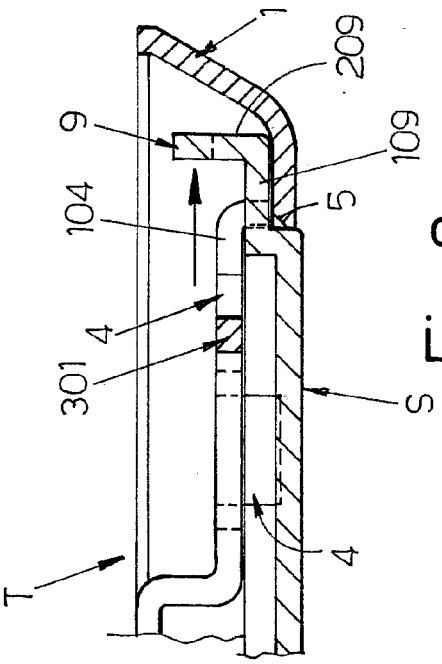

Fig.8

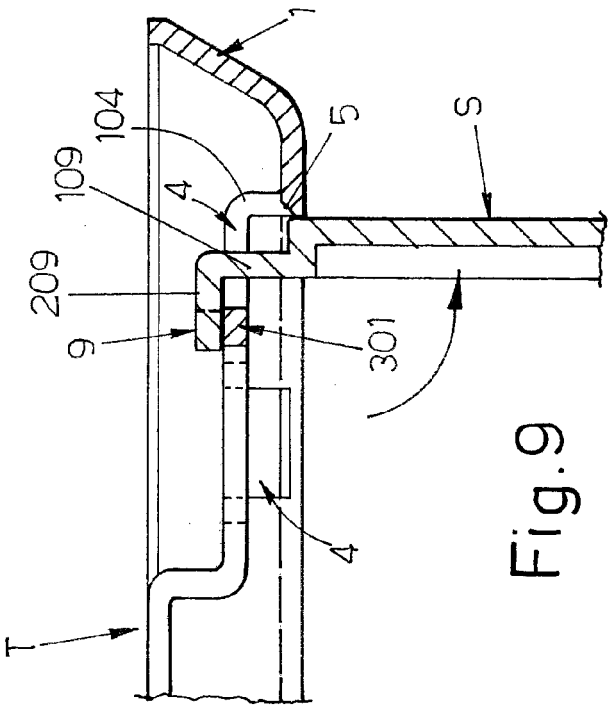

Fig.9

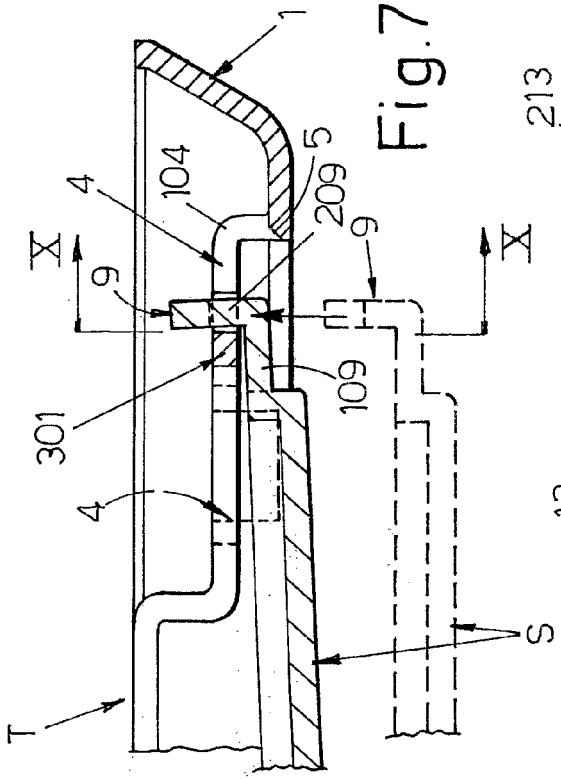

Fig.7

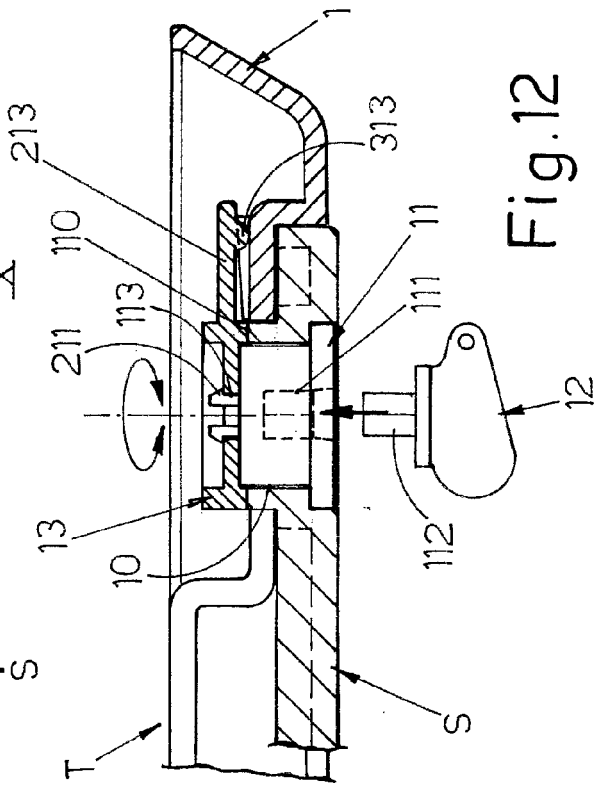

Fig.12

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT 256144 **[0001]**