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(71) Applicant : **MERLONI ELETTRODOMESTICI**
S.p.A.
Viale Aristide Merloni, 45
I-60044 Fabriano (AN) (IT)

(72) Inventor : **Frairia, Carlo**
Via Caprilli 19
I-10064 Pinerolo (TO) (IT)

(54) **System for fixing a front panel to the door of a household appliance.**

(57) A fixing system of a frontal panel to the door of an electric appliance is described, in particular a dish-washing machine for domestic use ; the described fixing system provides one or more fixing elements (10;11) on the panel (12), that couple to a corresponding number of fixing elements (3;20) on the door (1), in order to realise a hooking device by means of translation of the panel respect to the door.

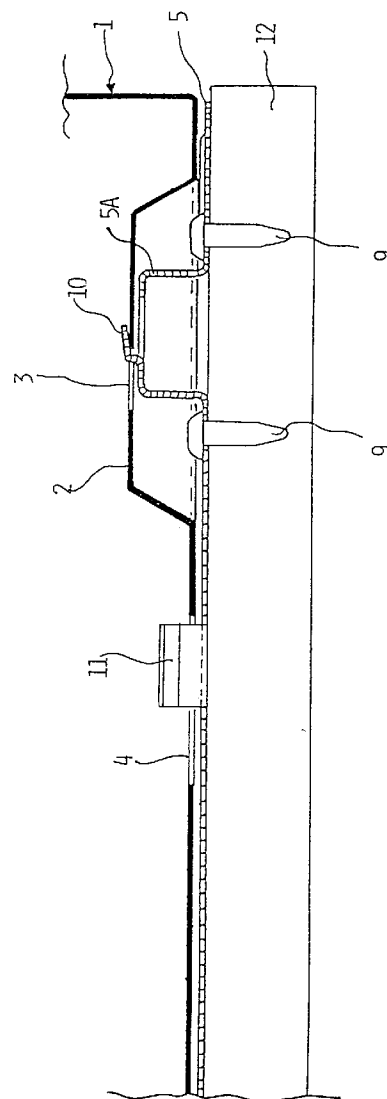


FIG. 3

The present invention refers to a system for fixing a frontal panel to the door of a household appliance, in particular a dishwasher for domestic use.

It is known that with washing machines, in particular dishwashers, it is customary practice to apply a decorative panel on the door at the moment of installation, a panel that matches the decor of the other elements of the environment, usually a kitchen, where the machine is installed. The application and the fixing of such decorative element must therefore be the easiest and safest possible, for obvious reasons of cost and reliability.

It is also known that, depending on the type of washing machine, the problems of fixing the decorative panel can be numerous; for example, in the case of dish-washing machines, different adaptations must be utilised for the so-called "integrated" machines and for those being "built in": in the first case the door of the dish-washing machine has a command panel, beneath which the decorative panel must be fixed; with the built in machines the door must be fully covered by the decorative panel (the commands, in such type of machine, are arranged on the upper edge of the door).

Various fixing systems have been proposed that, however, are often complicated, or of an assembly being rather difficult, or unreliable, or expensive, or unfit for being used on machines having different characteristics.

The aim of the present invention is that of illustrating a fixing system of a decorative panel to the door of an electric appliance, in particular a dish-washing machine for domestic use, that results in being very simple, economic, safe and versatile.

In view to realise such aim the present invention has for its subject a fixing system of a frontal panel to the door of an electric appliance, in particular a dish-washing machine for domestic use, characterised in that it provides one or more fixing elements on the panel, that couple to a corresponding number of fixing elements on the door, in order to realise a hooking device by means of translation of the panel respect to the door.

The characteristics and advantages of the fixing system according to invention will appear in the description that follows, carried out with regards to the annexed drawings, that are supplied as a purely explanatory and non-limiting example, in which:

- figure 1 schematically represents the lower part of a door of a dish-washing machine and a supportive cross member, making up part of the system according to invention, in one of its first modes of use;
- figure 2 schematically represents the coupling between the door and the cross member of figure 1;
- figure 3 schematically represents in a horizontal sectioned view the coupling between the

door and the cross member fixed to the decorative panel;

- figure 4 schematically represents in a vertical sectioned view the upper part of the decorative panel secured to the door of figure 1, utilising the fixing system subject of the invention;
- figure 5 schematically represents the lower side of the door and the supportive cross member, making up part of the system according to the invention, in one of its second modes of use;
- figure 6 schematically represents the coupling between the door and the cross member of figure 5;
- figure 7 schematically represents a partial horizontal sectioned view of the coupling between the door and the cross member fixed to the decorative panel, according to the mode of use of figure 5.

In figure 1, reference number 1 indicates the lower part of a door in sheetplate of a dish-washing machine; with reference number 2 two drawings present in such door 1 are indicated; with 3 and 4 two pairs of slits are shown, realised on the door; slits 3 are realised inside of the drawings 2.

In the lower part of Figure 1, 5 indicates a cross member, or longheron, in sheetplate, that is fixed, in use, horizontally to a decorative panel; for this purpose the longheron 5 has holes 6 for the fixing to the panel with simple drive-screws; two of such screws are visible in figure 3, with reference number 9.

The longheron 5 has two double folded elements (one of which, indicated with number 5A, is visible in Figure 3 between the two drive-screws 9) on each of which a horizontal tongue is obtained by notching: such two tongues are shown with reference numbers 10; on the longheron 5 two vertical tongues 11 are obtained in a similar way, the function of which will be clarified later on, with reference to the illustrated mode of use in figure 5.

Figure 2 schematically represents the coupling between the longheron 5 and the door 1, in the leftmost part of the latter: the decorative panel 12 (figure 3), to which the longheron 5 is screwed, is placed on the door in order that tongues 10 fit into the slits 3; the panel is successively horizontally positioned in order that tongues 10 become engaged in the edge of slits 3.

In this way the panel is applied to the door and is held in position; during such operation, the tongues 11 are inserted in the slits 4 and are able to move in said slits during the horizontal translation, but without becoming engaged on the door and without causing obstacles, due to the fact that the slits 4 are of a greater horizontal size than that of the two tongues.

The situation as described, of the coupling between the longheron 5 and the door 1, in the right hand part of the latter, is schematically represented in

figure 3 by way of a horizontal sectioned view.

For completing the fixing, the upper part of the panel 12 is fixed in the correct position on the door 1 by means of two screws, as shown in figure 4.

In such figure 4, reference number 13 indicates a small plastic cylinder that is inserted, from the inside of the door 1, in a hole arranged in the door itself. A drive-screw 14 is inserted in the small cylinder 13 and screwed to the panel 12, thus engaging it to the door 1; the hole in the door is then closed with a plastic plug 15.

A second similar screw, not shown in the figure, cooperating with a second small cylinder and a second plug, engages the panel on its other side.

In figure 4, with reference number 16 the command panel of the machine is indicated: in the case up to now illustrated, in fact, the system according to the invention is shown in the case of use on an integrated type dish-washing machine.

The simple provision on the door of the machine of slits being of a different form, allows to utilise the means of the fixing system as described also on different types of machines, for example the built in type. Such a case is illustrated in figure 5.

In such figure, for the greater part, the same numbers are used as the previous figures, inasmuch the elements shown are the same as previously described.

With 20 and 21 two slits are indicated, of a form and position being different if compared to those visible in figure 1; slits 21 are realised inside of the usual drawings 2.

The longheron 5 is the same as in the previous figures, but for use on a built in machine it has been rotated 180°.

Figure 6 schematically represents the coupling between the longheron 5 and the door 1, in the left part of the latter: the decorative panel 12, to which the longheron 5 is screwed, is placed on the door in order that the tongues 11 fit into the slits 20; the panel is successively permitted a vertical downwards translation, in order that tongues 11 become engaged with the edges of slits 20.

Also in this case, the panel is thus applied to the door and held in position; during the operation, tongues 10 are inserted in slits 21 and can move in them, during the vertical translation, without being engaged on the door and without causing obstacles, inasmuch the slits 21 are of a greater vertical size than that of the two tongues.

The described situation for built in machines, of coupling between the longheron 5 and the door 1, in the left part of the latter, is schematically represented in figure 7 by way of a partial horizontal sectioned view.

As in the case just described, for completing the fixing, the upper part of the panel 12 is fixed to the door 1 by means of two screws, as shown in figure 4.

Naturally, in such case there will not be a command panel, that is not provided with totally built in type machines.

The functioning, the characteristics and advantages of the fixing system according to invention are clear from the given description and annexed drawings.

As is clear from the given description, the fixing system according to the invention, has the substantial advantage of allowing in a very economical way the application and the fixing of the panel to the door of the machine; such fixing is furthermore very easy, inasmuch the operation of tightening the screws 13 may be carried out by the installer in all tranquillity, being as that in such phase the panel is already hooked to the door.

Another substantial advantage consists in that the different constitutive elements of the system according to the invention can be used on different types of machines, without any increase in costs.

In fact, the only difference for the two described applications concerns the form and the position of the slits 3-4 and 20-21 that are realised on the surface of the door 1: the door could however be realised with all four of the cited openings, thus ensuring the maximum productive standardisation.

It is obvious that, remaining with the principle of the invention, numerous variations are possible to the fixing system of a decorative panel to the door of an electrical appliance as described by way of example, without for this departing from the scope of novelty inherent in the innovative idea. It is also clear that in the practical realisation of the invention the forms and the sizes of the components can be different and can be replaced with technically equivalent elements.

Claims

1. Fixing system of a frontal panel to the door of an electrical appliance, in particular a dish-washing machine for domestic use, characterised in that it provides one or more fixing elements (10;11) on the panel (12), that couple to a corresponding number of fixing elements (3;20) on the door (1), in order to realise a hooking device by means of translation of the panel with respect to the door.
2. Fixing system, according to claim 1, characterised in that said elements on the panel (12) include a sheetplate cross member (5) equipped with at least one tongue (10;11) and/or comprising elements in double folded sheetplate (5A), having in particular a tongue (10).
3. Fixing system, according to claim 2, characterised in that said tongue (10;11) is obtained by notching the sheetplate of the cross member (5)

and/or of the corresponding double folded element (5A).

4. Fixing system, according to claim 1, characterised in that said elements on the door (1) include drawings (2). 5
5. Fixing system, according to claim 1 or 2, characterised in that said elements on the door (1) include at least one louver (3;20), in which said tongue (10;11) is engaged. 10
6. Fixing system, according to claim 1, characterised in that said panel (12) is fastened to the door (1) by means of screws (14). 15
7. Fixing system, according to the previous claim, characterised in that all of said screws (14) are inserted in a small plastic cylinder (13), inserted in a hole arranged in said door (12), said hole in the door being in particular plugged by means of a plastic plug (15). 20
8. Fixing system, according to at least one of the previous claims, characterised in that said translation takes place in a horizontal direction. 25
9. Fixing system, according to at least one of the previous claims, characterised in that said translation takes place in a vertical direction. 30
10. Fixing system, according to at least one of the previous claims, characterised in that said elements (10,11) on the panel (12) and said elements (3,20) on the door (1), with the relative hooking devices, are realised in order that the translation of the panel respect the door can take place both in the horizontal sense and in the vertical sense, depending of the necessity of the fixing. 35
40
11. Fixing system, according to claim 10, characterised in that said elements on the panel (12) include an element in sheetplate (5), in particular a cross member, supplied with one or more tongues (10) directed horizontally and one or more tongues (11) directed vertically, said tongues (10,11) being in particular obtained by notching the sheetplate of the cross member (5). 45
50
12. Fixing system, according to claim 11, characterised in that said elements on the door (12) include one or more slits (3) in which said tongues (10) directed horizontally can be engaged and one or more slits (20) in which said tongues (11) directed vertically can be engaged. 55

13. Fixing system, according to at least one of previ-

ous claims, characterised in that one or more slits (4,21) are provided on the door (12) within which said tongues (10) directed horizontally and/or said tongues (11) directed vertically can be inserted without becoming engaged.

14. Fixing system, according to one or more of the previous claims, characterised in that the orientation of said cross member (5), for the hooking by way of horizontal translation of the panel respect the door, is inverted (180°) respect the orientation of said cross member for the hooking by way of vertical translation.

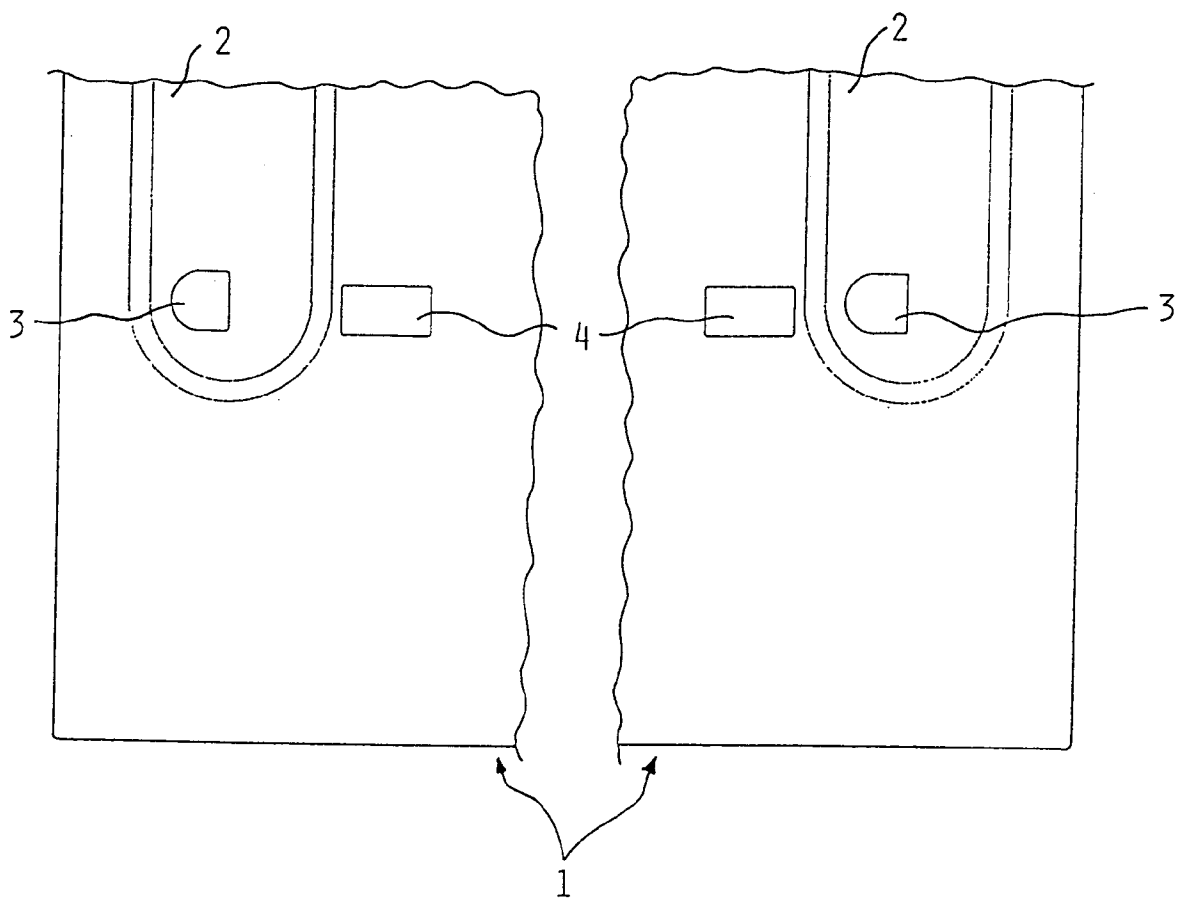
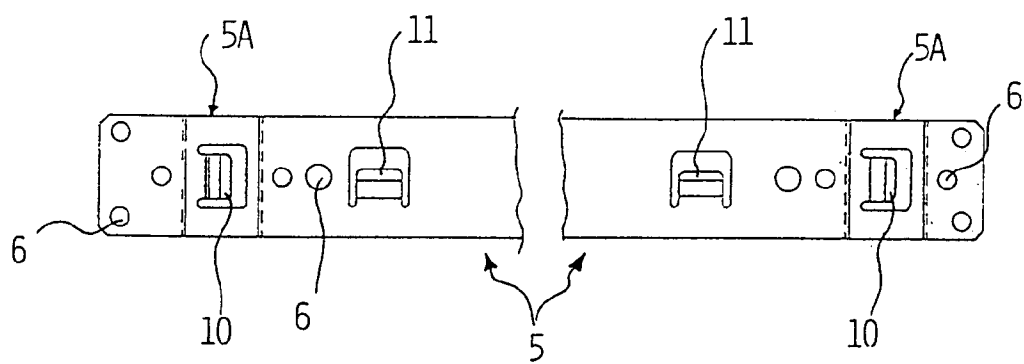


FIG. 1



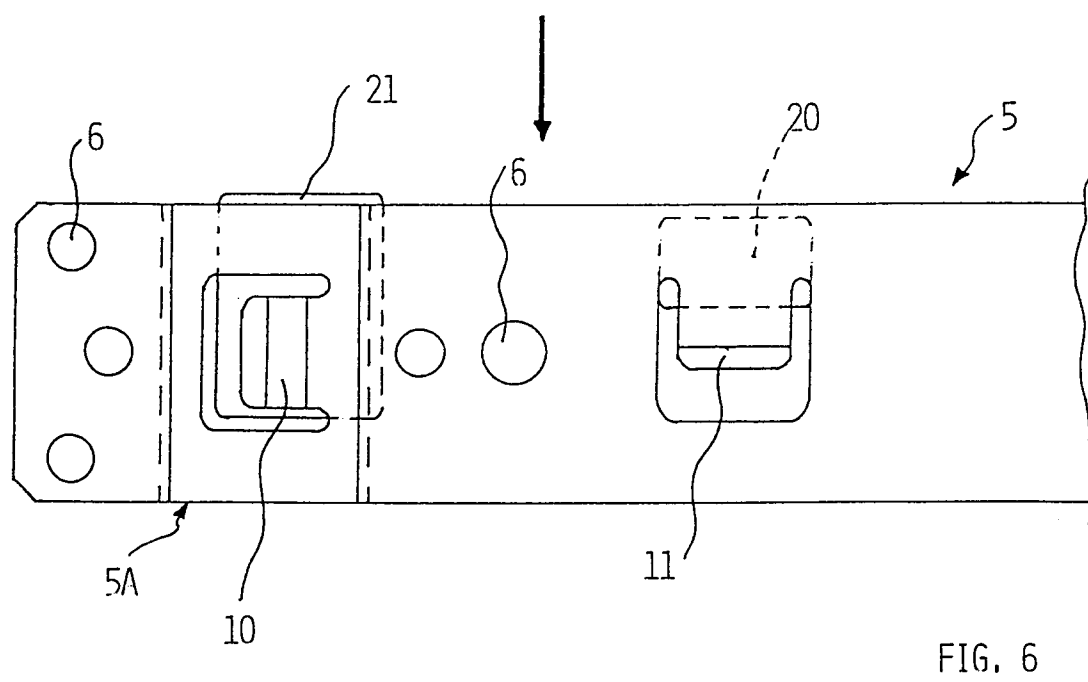
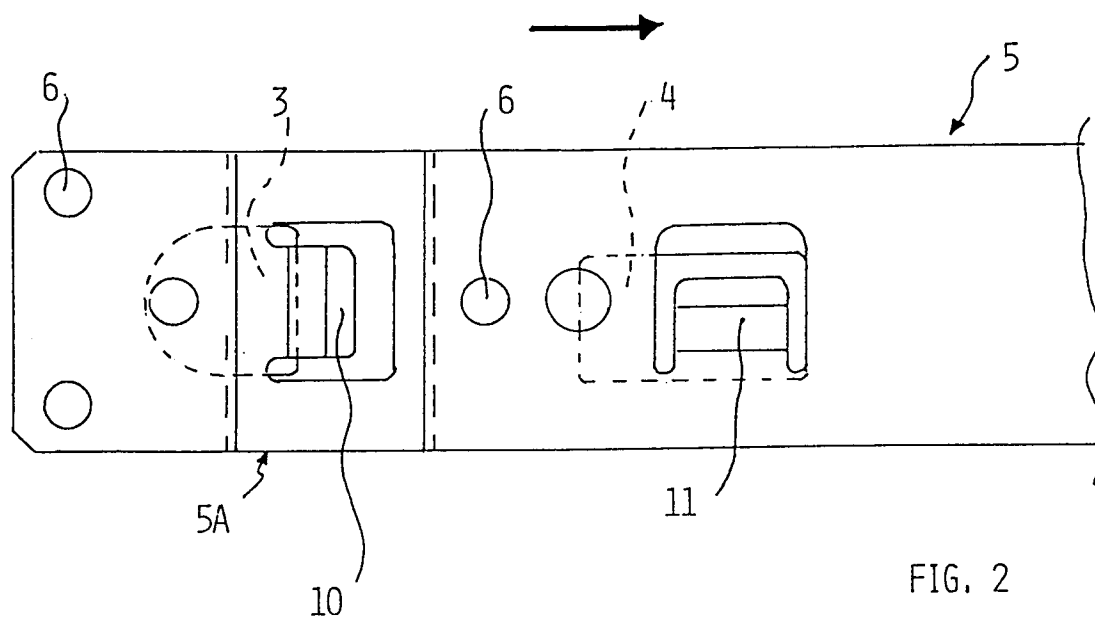


FIG. 3

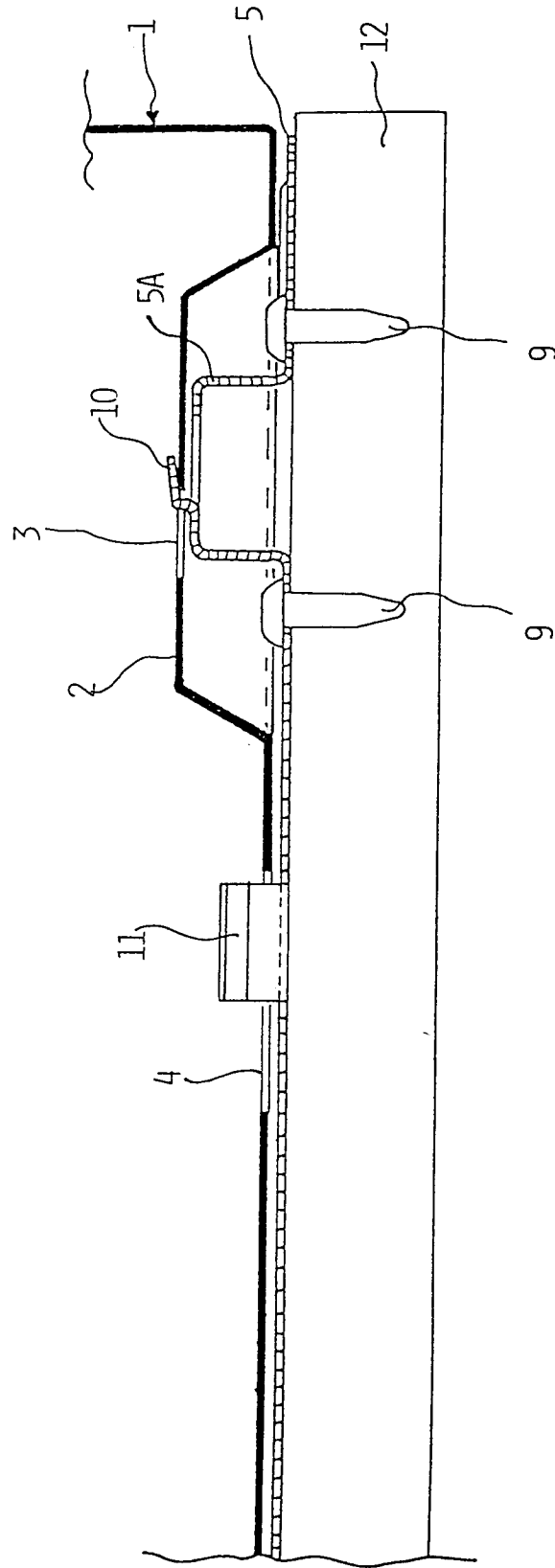
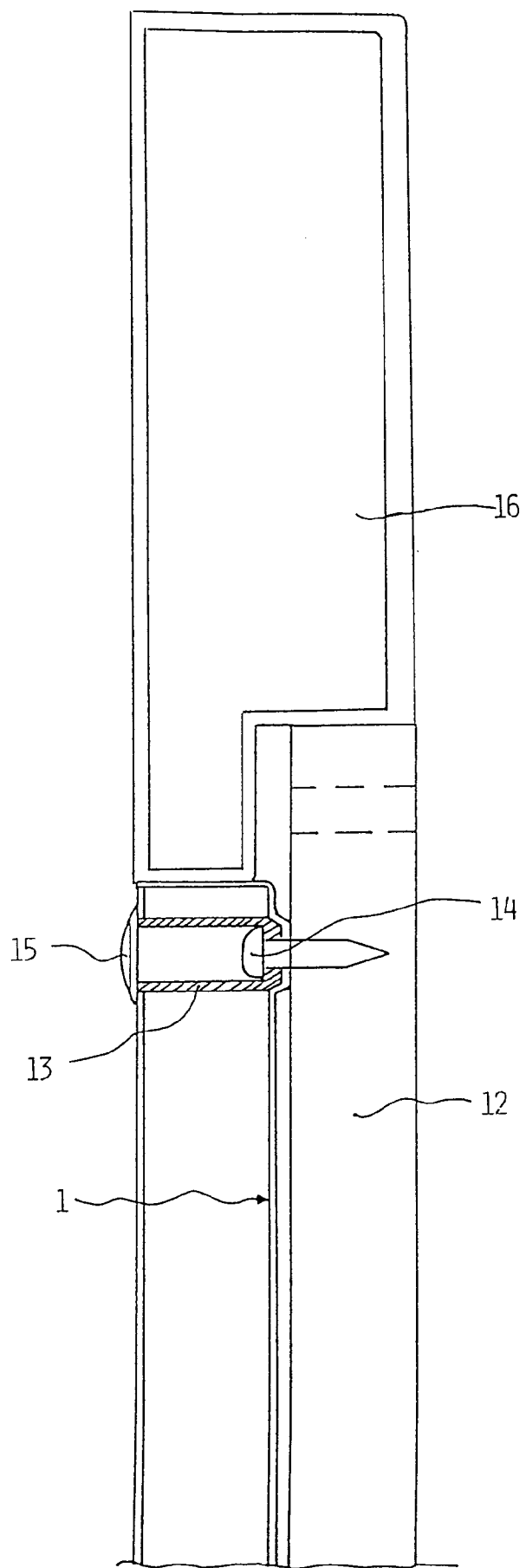


FIG. 4



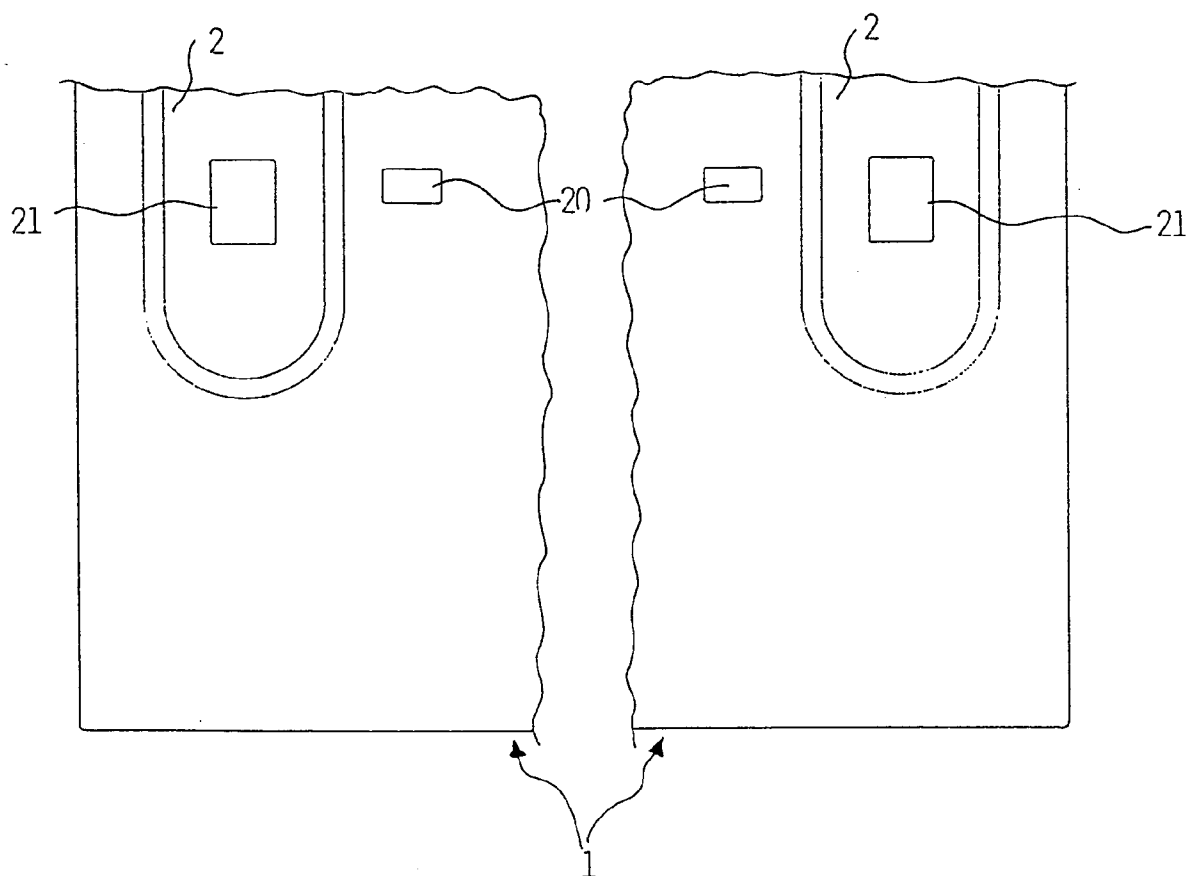


FIG. 5

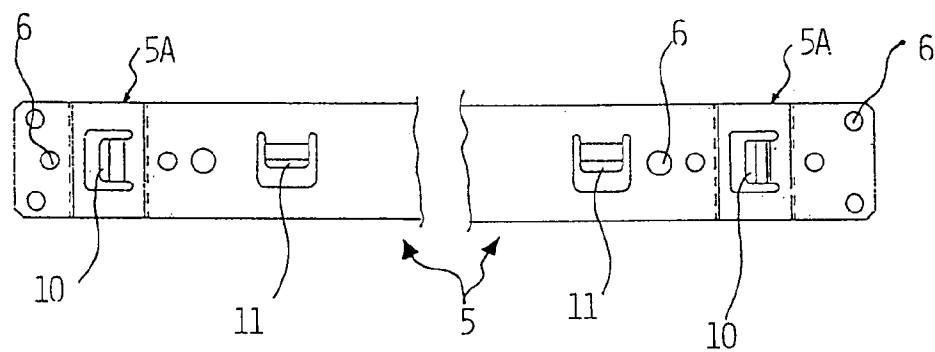
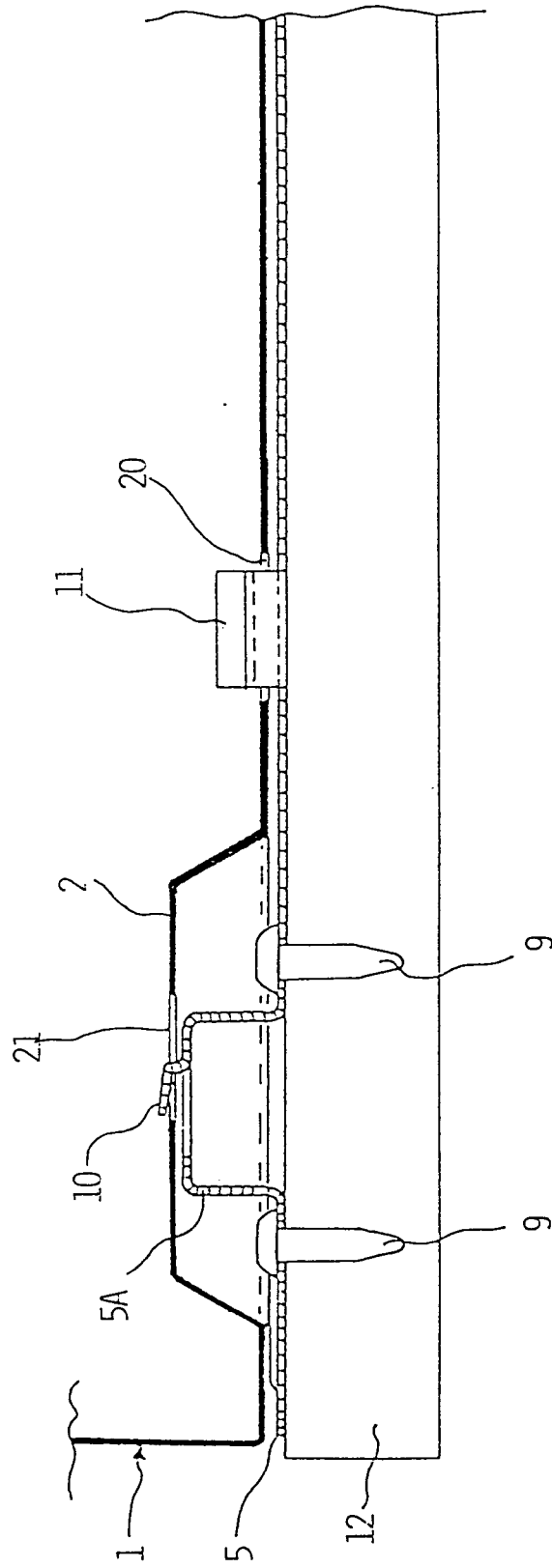


FIG. 7





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EUROPEAN SEARCH REPORT

Application Number
EP 94 10 6894

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	EP-A-0 261 083 (SMEG S.P.A.) * column 3, line 19 - column 5, line 51; claim 1; figures 3,5-7 *	1,2	D06F1/00 A47L15/42 D06F39/14
A	---	5,6,9,12	
A	EP-A-0 108 677 (THOMSON-BRANDT) * page 3, line 7 - page 4, line 14; claim 1; figure 2 *	1,5	
A	DE-A-40 00 284 (BAUKNECHT HAUSGERÄTE GMBH) -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			A47L D06F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 31 August 1994	Examiner Munzer, E
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