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(71) Applicant: **Coseley Insulation Products Limited**
Interdom House 10 Gough Square
London EC4A 3DE (GB)

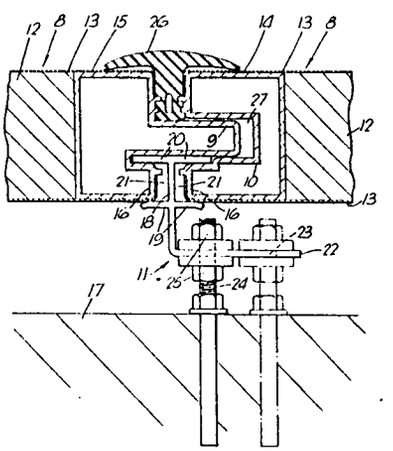
(72) Inventor: **Bruce, Anthony Roger**
93 Layston Park
Royston, Hertfordshire (GB)

(74) Representative: **Jackson, Peter Arthur et al**
GILL JENNINGS & EVERY 53-64 Chancery Lane
London WC2A 1HN (GB)

(54) Cladding system.

(57) A cladding system for a wall of a building has panels (8) which are interlocked with one another by having edges profiled to form complementary tongues (9) and grooves (10). The panels (8) are attached to the wall surface (17) by brackets (11), each of which has a pair of oppositely facing channels (21) into which are inserted flanges (16) formed adjacent to the rear faces of the panels (8). Preferably, the brackets (11) do not run the full length of the panel edges, and the profiling is provided by edge sections (14,15).

Fig.2.



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Description

CLADDING SYSTEM

Conventional cladding systems for the walls of new buildings, or for upgrading, particularly the external, walls of old buildings, conventionally involve securing a backing frame to the building wall or other supporting surface and then mounting an array of cladding panels edge to edge on the backing frame. The provision of the backing framework and its assembly is costly and time- and space-consuming and the object of the invention is to provide a cladding system which is cheaper and quicker to mount.

In accordance with a primary aspect of the present invention, a cladding system comprises a number of panels which are arranged to be mounted edge to edge to cover a supporting surface, the edges of the panels being profiled whereby adjacent edges of adjacent panels are provided with complementary tongues and grooves, and whereby each panel edge is provided with a longitudinal flange projecting parallel to the general plane of the panel adjacent to the rear face of the panel; and a number of brackets, each of which has a leg arranged to be secured to the supporting surface, and a pair of oppositely facing channels for receiving the longitudinal flanges on the adjacent edge profiles of a pair of adjacent panels.

With this arrangement an array of panels is mounted by successively adding and fixing a new panel to those already secured to the supporting surface. Typically, at any time, an exposed edge of an end panel in the partly completed array will present a tongue or groove, and will be secured relatively to the supporting surface by at least one of the brackets, one channel of which receives the flange at the exposed edge of that panel. A new panel is then offered up so that the groove or tongue along one edge slides into engagement with the tongue or groove at an edge of the already secured panel, and so that the flange at the edge of the new panel enters the other channel in the or each bracket. The new panel may cooperate in this way with adjacent edges of more than one panel, if the new panel is to be fitted into edge to edge relationship with two or more already secured panels. The exposed edges of the new panel are then secured to the supporting surface by offering up one or more of the brackets to each exposed edge of the new panel so that one channel of each bracket slides into engagement with the flange at the exposed edge of the new panel, and securing the leg of the bracket to the supporting surface. The procedure is then repeated for successive new panels. The resulting array is such that the adjacent edges of each adjacent pair of panels are secured to the supporting surface, and are, additionally, located relatively to one another by the complementary tongues and grooves, so that a comparatively ridged array of panels is provided without the need of any backing frame between the panels and the supporting surface.

Irregularites in the flatness of the supporting surface, or in the manner in which the bracket legs are secured to the supporting surface, can be accomodated by so arranging the bracket legs that they provide a degree of adjustment both perpendicular to the supporting surface and parallel to the supporting surface perpendicular to the panel edges.

The tongues and grooves preferably extend substantially along the full length of the panel edges. The bracket channels, however, are preferably short compared to the lengths of the panel edges, so that they may be accomodated at any convenient position along the panel edges. Each bracket may have a part of substantially I-section, providing the oppositely facing channels, the web of the I being extended to form a leg, which is then preferably connected to a laterally projecting portion to be secured to the supporting surface by an anchor bolt. The lateral offset of the anchor bolt from the web of the I enables the anchor bolt to be rendered more readily accessible beyond the edge of of a new panel being fitted to a partial array of secured panels. The bracket may be formed of one or more extruded parts, for example of an aluminium alloy, or of a comparatively hard plastics material.

The profiling at the edges of the panels may be formed by shaping the panel material, which may be, e.g., wood, metal, plastics material, GRC or GRP. Alternatively, the profiling may be provided by edge sections, for example of extruded aluminium alloy, steel or plastics material, which are assembled at the edge of the panel proper. For example, each panel may be of a sandwich construction, in which case the profiled sections may form an edge of the central core between the facing layers.

Complementary edge sectioning for fitting to the edges of panels, in combination with a number of brackets, all for use in a system according to the primary aspect of the invention, form an independent feature of the invention.

When the profiling is provided by an edge section, which is assembled at the edge of the panel proper, it is desirable for a common section to the usable with panels of different thicknesses. Furthermore, when the profiled section forms an edge of the central core, between facing layer of a panel of sandwich construction, difficulties may arise in bonding the facing layers to the forwardly and/or rearwardly facing surfaces of the edge sections. This is critical as a good bond betwen the facing layers to the sandwich core is very important at the edges of the panels where peeling of the facing layers might otherwise occur.

In accordance with the secondary independent aspect of the invention, a cladding system comprises a number of panels which are arranged to be mounted edge to edge to cover a supporting surface, the edges of the panels incorporating profiled sections whereby adjacent edges of adjacent panels are provided with complementary tongues and grooves, and each panel having on at least

one surface a facing layer which overlaps the profiled sections of the panel; and an insert member which extends along the front or rear face of at least one of the profiled sections which is overlapped by the facing layer whereby the facing layer contacts the insert, the insert being connected to the face of the profiled section by means of an undercut channel extending along the face of the profiled section and a complementary portion of the insert which is received within the channel.

The insert may be used as a spacer which spaces the facing layer from the adjacent face of the profiled section, whereby the optional use of spacers of different size enables common profiled sections to be used with panels of different thickness.

A further advantage of the insert is that, irrespective of whether it spaces the facing layer from the adjacent surface of the profiled section, or is merely exposed flush with the profiled section at the groove, is to provide a good bond with the facing layer. For that purpose the insert would be made of a material which is compatible, and readily bondable, with the facing layer, for example timber for a timber facing layer, metal for a metal facing layer, or a plastics material for a variety of different facing layers. The insert can therefore be used for its bonding properties, rather than necessarily for its structural properties, the essential structural strength being provided by the profiled sections.

The undercut channel may be provided by a pair of angular flanges which project from the edges of the face of the profiled section which is overlapped by the facing layer, and then towards one another. In this event the insert will have a pair of oppositely directed flanges which engage inside respective ones of the angular flanges, the insert having been fitted to the profiled section by sliding engagement from one end.

Complementary edge sectioning for fitting to the edges of panels, in combination with a number of inserts, all for use in a system according to a secondary aspect of the invention, form a further independent feature of the invention.

The invention will now be described by way of example with reference to the accompanying drawings in which:-

Figure I is a face view of three panels of an array;

Figure 2 is a section taken on the line II-II in Figure I;

Figure 2A shows a modification of the inter-panel seal of Figure 2;

Figure 3 is a section take in the same plane as that of Figure 2, but showing one part of an alternative bracket;

Figure 4 is a section taken in the same plane as Figure 3 and showing a second part of the bracket of Figure 3;

Figure 5 is an underneath plan of the part shown in Figure 4;

Figure 6 is a side elevation of the part shown in Figure 3;

Figure 7 is a side elevation of the part shown in Figure 4; and,

Figure 8 is a section similar to Figure 2, but illustrating the secondary aspect of the invention.

As shown in Figure I, three panels 8 each have a tongue 9 on two adjacent edges and a complementary groove I0 on the other two adjacent edges. The tongues and grooves locate adjacent edges of adjacent panels relatively to one another. The panels are additionally located relatively to one another and secured to a supporting surface by means of a number of brackets II.

As shown in Figure 2, each panel 8 is formed as a sandwich of a central core I2 of a insulating material between two plastics coated steel sheet layers I3. Each edge of the core I2 is provided by a hollow extruded profile section I4 or I5, of which the section I4 provides the groove I0 and the section I5 provides the complementary tongue 9. The sections I4 and I5 each have, adjacent to the rear face of the respective panel, a projecting flange I6.

The panels are secured to a supporting surface I7 by means of the brackets II. Each bracket has an I-section part formed by a web I8 and flanges I9 and 20, defining on each side of the web I8 a channel 2I. These channels receive the flanges I6. As shown in Figure 2, the inner side of the flange I6 of the profiled section I4 essentially runs into the groove I0, so that the flanges 20 abut the tongue 9 in the assembled position.

Each bracket II also has a transverse part 22 formed with a slot 23 which receives an anchor bolt 24 throughout a range of positions delimited by the full and chain dotted lines. This provides a degree of adjustment for the I-section part of the bracket in a direction parallel to the surface I7, relatively to the point at which the anchor bolt 24 is fixed to the supporting surface I7. The anchor bolt 24 carries a pair of nuts 25 which provide an analagous degree of adjustment perpendicular to the supporting surface I7.

During mounting of the panels, the left hand panel shown in Figure 2 is first secured, inter alia, by means of the brackets II. Subsequently the right hand panel is offered up so that the groove I0 receives the tongue 9 and the flange I6 of the right hand panel enters the corresponding open channel 2I in the bracket or brackets II. The two panels are then securely located relatively to one another and to the wall surface I7. Immediately thereafter one or more of the brackets II are coupled to the exposed edges of the right hand panel 8 and secured to the supporting surface I7.

After assembly a resilient gasket strip 26 is inserted in the gap between the profiled sections I4 and I5 at the exposed surface of the panels. In addition, a resilient sealing strip may be inserted, during assembly of the two panels together, in the gap 27 between the inner end of the groove I0 and the leading end of the tongue 9.

Instead of using a strip 26 which is inserted as the panels are mounted on the surface I7, each panel may be fitted during its manufacture with a resilient seal strip 26a, 26b (see Figure 2A) which is continuous around the edges of the panel and attached thereto by a rib gripped in an undercut recess I4a, I5a in the edge of the panel. In order to

improve the sealing effect between the abutting faces of the two seal strips 26a, 26b, the faces are provided with mutually aligned recesses into which an oversize locking bead 26c has been inserted.

The bracket shown in Figures 3 to 7 differs only from the bracket II in that it is formed in two parts, which are shown in Figures 3 and 4 respectively. The parts are connected adjustably together by means of a bolt which is passed through an elongate slot 28 in the Figure 3 part and a hole 29 in the Figure 4 part. This provides adjustment perpendicular to the supporting surface I7. Adjustment parallel to the surface I7 is provided by a slot 23 in the Figure 4 part, analagous to that in the Figure 2 bracket. Because of the two part construction of the bracket II, the anchor bolt 24 need not have the adjustment provided by the nuts 25.

Figure 8 shows a modification in which profiled sections I4a and I5a are used to provide the tongue and groove connection. An undercut channel is provided on the front and rear surface of each section I4a and I5a by angular flanges 30. An insert is shown retained in each channel by means of complementary flanges 3I which engage behind the flanges 30.

By way of example different inserts are illustrated. Thus an insert 32 is made of GRP and an insert 33 is made of metal. These are flush with the edges of the channel and are provided primarily to give a good bond to the respective facing layers I3. An insert 34 is a plastics extrusion and an insert 35 is a composite of a timber portion 36 and a metal portion 37, which is screwed to the timber portion. The inserts 34 and 35 act as spacers to space the respective facing layers I3 from the sections I4A and I5A. They may also be made of a material which is selected for good bonding with the facing layer I3.

Claims

I. A cladding system comprising a number of panels (8) which are arranged to be mounted edge to edge to cover a supporting surface (I7), the edges of the panels (8) being profiled whereby adjacent edges of adjacent panels are provided with complementary tongues (9) and grooves (I0), and whereby each panel edge is provided with a longitudinal flange (I6) projecting parallel to the general plane of the panel adjacent to the rear face of the panel; and a number of brackets (II), each of which has a leg arranged to be secured to the supporting surface (I7), and a pair of oppositely facing channels (2I) for receiving the longitudinal flanges (I6) on the adjacent edge profiles of a pair of adjacent panels.

2. A cladding system according to claim I, in which the bracket legs are arranged to provide a degree of adjustment both perpendicular to the supporting surface (I7) and parallel to the supporting surface perpendicular to the panel edges.

3. A cladding system according to claim I or claim 2, in which the tongues (9) and grooves (I0) extend substantially along the full length of the panel edges.

4. A cladding system according to any of the preceding claims, in which the bracket channels (2I) are short compared to the lengths of the panel edges.

5. A cladding system according to any of the preceding claims, in which each bracket (II) has a part of substantially I-section (I8,I9,20), providing the oppositely facing channels (2I), the web of the I being extended to form a leg.

6. A cladding system according to claim 5, in which the leg of each bracket (II) is connected to a laterally projecting portion to be secured to the supporting surface by an anchor bolt (24).

7. A cladding system according to any one of the preceding claims, in which the profiling at the edges of the panels (8) is provided by edge sections (I4,I5).

8. A cladding system according to claim 7, in which each panel (8) has on at least one surface a facing layer (I3) which overlaps the profiled edge sections (I4a,I5a) of the panel (8); and an insert member (32,33,34,35) which extends along the front or rear face of at least one of the profiled sections (I4a,I5a) which is overlapped by the facing layer (I3) whereby the facing layer (I3) contacts the insert (32,33,34,35), the insert (32,33,34,35) being connected to the face of the profiled section (I4a,I5a) by means of an undercut channel extending along the face of the profiled section (I4a,I5a) and a complementary portion (3I)of the insert (32,33,34,35) which is received within the undercut channel.

9. A cladding system according to claim 8, in which the undercut channel is provided by a pair of angular flanges (30) which project from the edges of the face of the profiled section (I4a,I5a) which is overlapped by the facing layer (I3), and then towards one another, and the insert (32,33,34,35) has a pair of oppositely directed flanges (3I) which engage inside respective ones of the angular flanges (30), the insert (32,33,34,35) having been fitted to the profiled section (I4a,I5a) by sliding engagement from one end.

I0. A cladding system comprising a number of panels (8) which are arranged to be mounted edge to edge to cover a supporting surface (I7), the edges of the panels (8) incorporating profiled sections (I4a,I5a) whereby adjacent edges of adjacent panels (8) are provided with complementary tongues (9) and grooves (I0), and each panel (8) having on at least one surface a facing layer (I3) which overlaps the profiled sections (I4a,I5a) of the panel (8); and an insert member (32,33,34,35) which extends along the front or rear face of at least one of the profiled sections (I4a,I5a) which is overlapped by the facing layer (I3) whereby the facing layer (I3) contacts the insert (32,33,34,35), the insert (32,33,34,35) being connected to the face of the profiled section (I4a,I5a) by means of an undercut channel extending along the face of

the profiled section (l4a,l5a) and a complementary portion (3l)of the insert (32,33,34,35) which is received within the channel.

Fig.1.

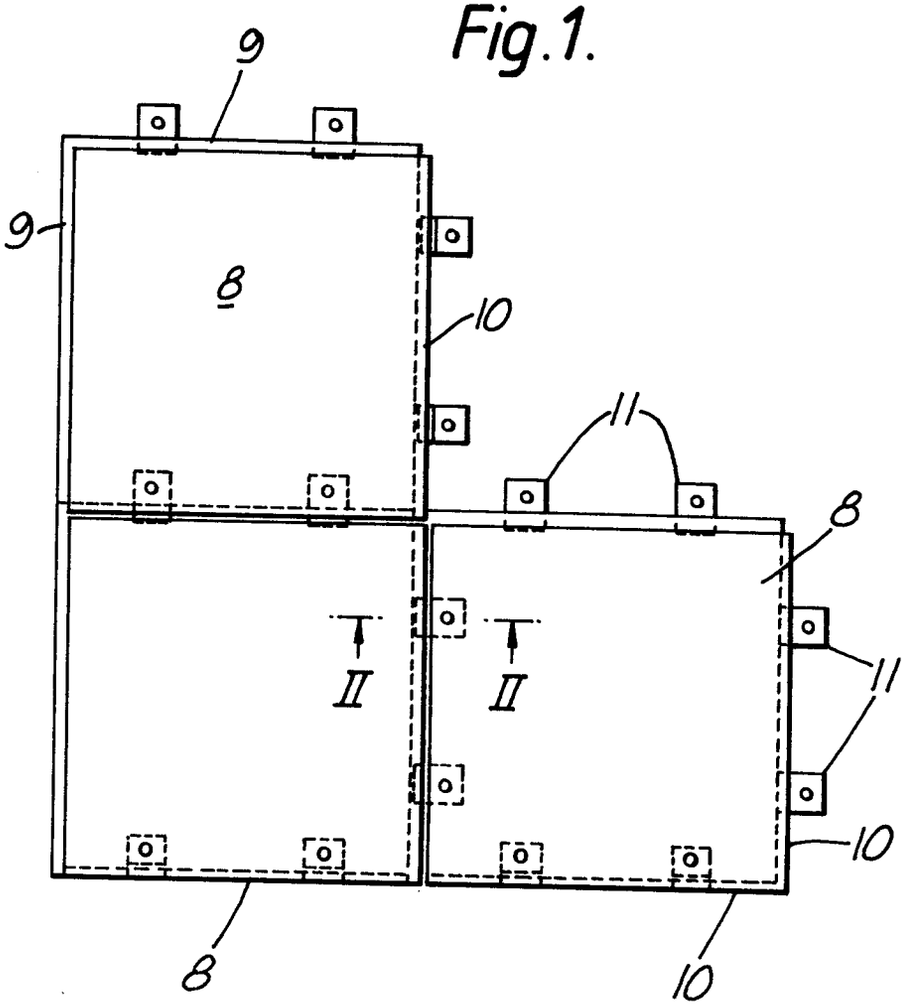


Fig. 2A.

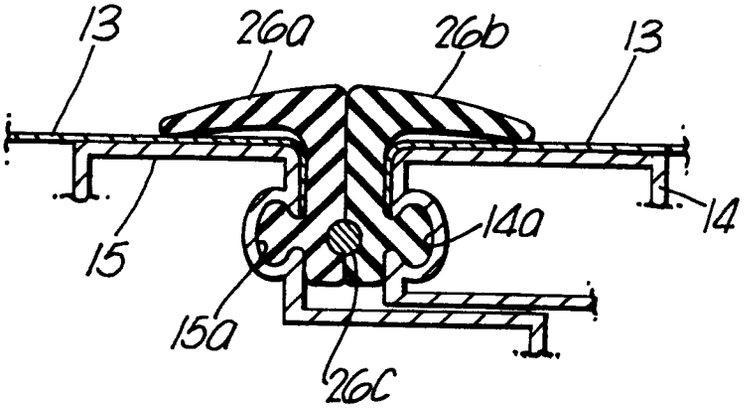


Fig.2.

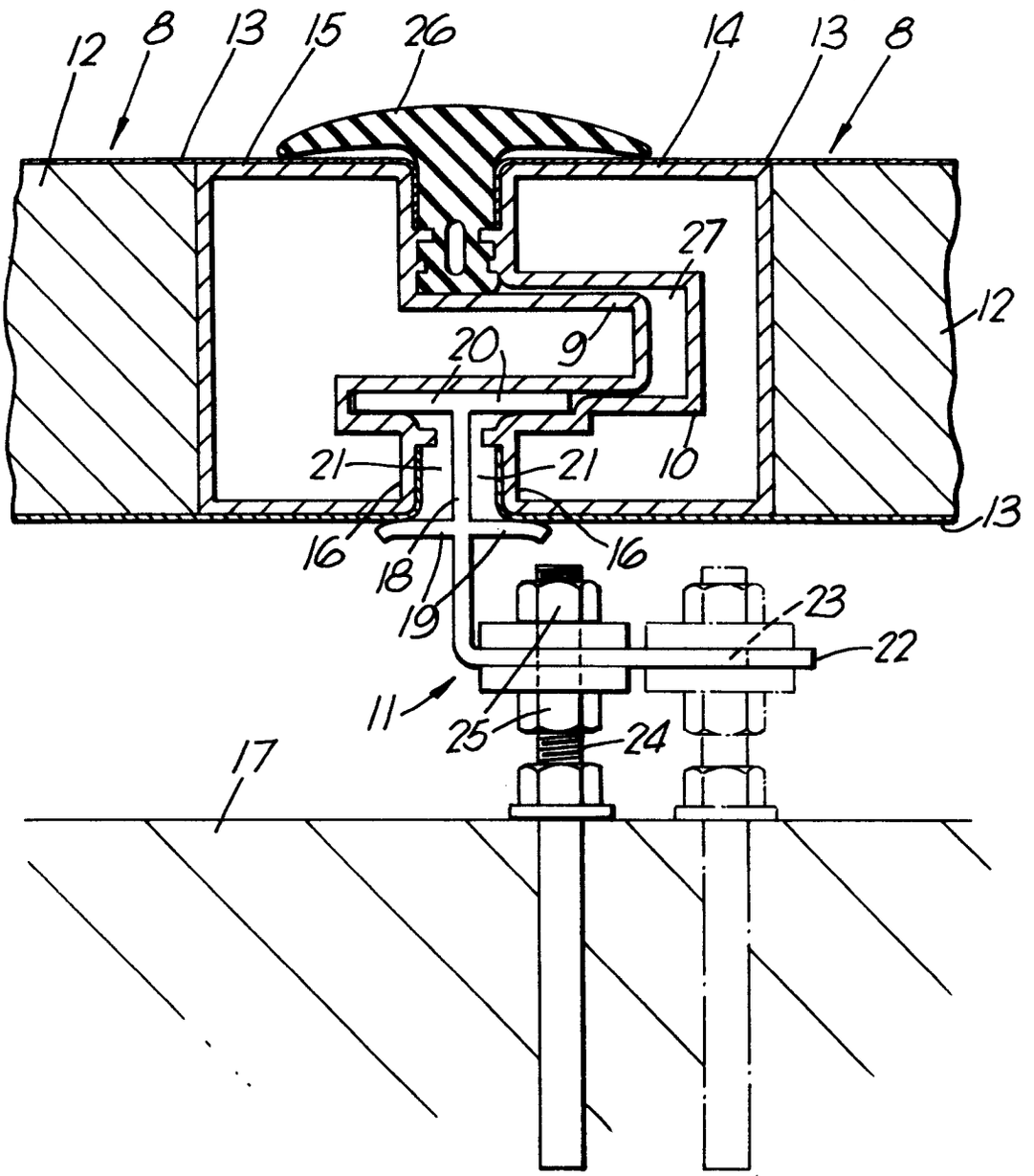


Fig.3.

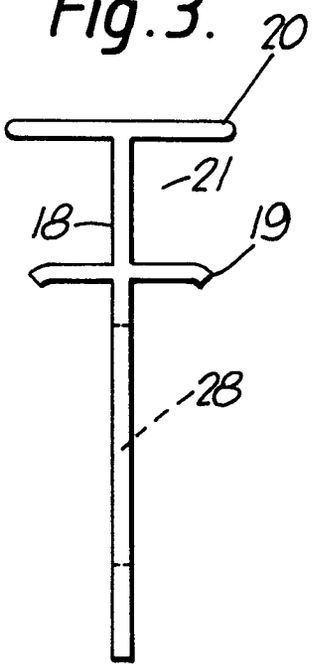


Fig.6.

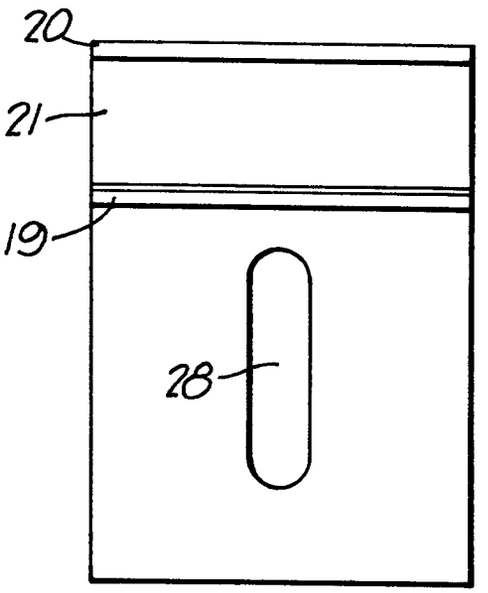


Fig.7.

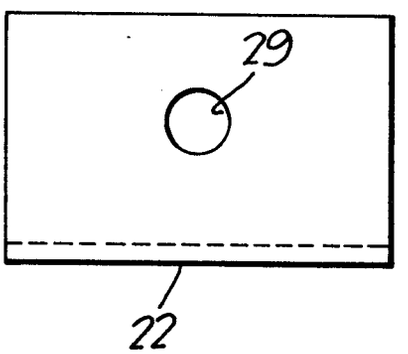
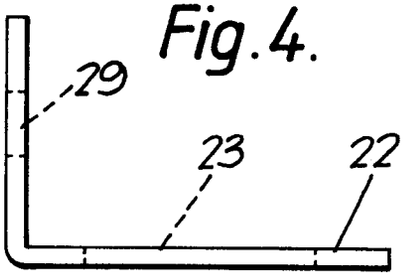


Fig.4.



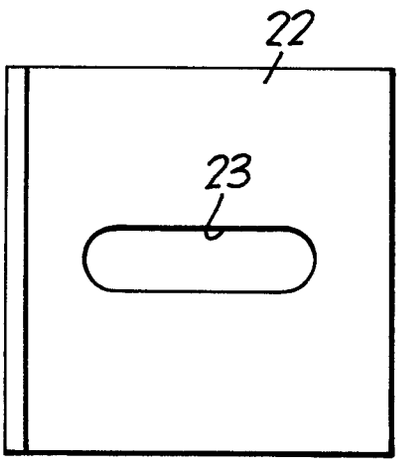


Fig.5.

Fig.8.