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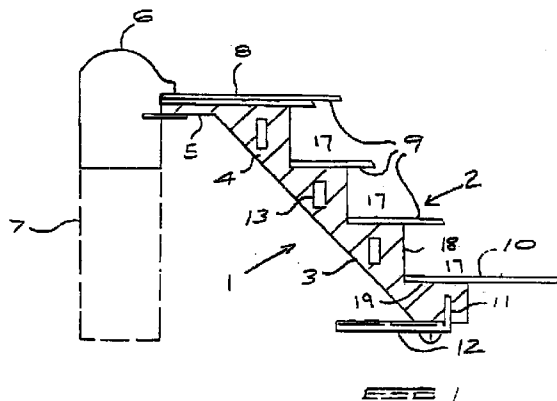
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### (54) Shadow box components

(57) The invention provides for a shadow box component in the form of an elongated profile (1) which may be cut to suitable lengths to substantially create a shadow box. The profile includes a front face (2) with at least one step (17) extending along its length. Alternatively the profile (1) may include at least one securing formation (5) projecting from an edge of the profile (1) parallel to and in a direction opposite to the step.



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## Description

[0001] This invention relates to shadow boxes or box frames which are used primarily in the framing of three dimensional objects behind glass, and more particularly to components for such shadow boxes.

[0002] Shadow boxes or box frames as they are commonly known in the United Kingdom and elsewhere, are becoming increasingly popular and are used for framing a wide variety of articles ranging from small three dimensional articles to large three dimensional articles as well as, to limited extent, flat art such as paintings and posters. The aesthetic effects which can be obtained from the Use of shadow boxes have proved widely acceptable and these can be varied, inter alia, by varying the depth of the box and/or its planer size relative to the size of the object being framed.

[0003] Generally shadow boxes are built up within outer frame mouldings using layers of foam board or other suitable material for spacing apart the matboards which provide the decorative border immediately surrounding the object framed. By progressively decreasing the sizes of the openings in successive matboards, as viewed from front to rear, a variety of pleasing visual-cum-depth effects can be achieved. The framing operation is generally one requiring skill and care and is also time consuming. The end product is one that desirably gives the appearance of having been crafted by a traditional skilled picture framing operator. To date the usual shadow box has largely been dependent on the depth of the other moulding which accommodates the matboards, spaced apart as required by foam board or other spacers. The manufacture of such conventional shadow boxes is both tedious and expensive.

[0004] Recent developments in shadow box framing include the securing of specially moulded boxes behind conventional outer frame mouldings, thereby, in a large percentage of cases, facilitating achievement of the required depth while at the same time appreciably reducing manufacturing time and cost. Such mouldings are described in the specification of US Patent Application No. 08/454,506. These moulded boxes can be made to have an inwardly stepped profile so that matboards can be attached down the series of steps and a backing board fitted to carry the object to be framed attached to any desired step. Such moulded boxes greatly facilitate shadow box framing operations but have limitations with regard to planar size and depth in that the overall sizes of frames achievable is governed by the limited range of moulded box sizes available. Furthermore, these stepped moulded boxes exclude flat art framing to a large degree.

[0005] It is an object of the present invention to provide at least one component which can be used in a number of shadow box framing systems which are not limited to surface size or shape and which can easily be used to provide different stepped depths to the frame while at the same time greatly reducing or eliminating

the need for foam board, spacers and the like in order to locate successive matboards at the desired spacings.

[0006] According to this invention there is provided a shadow box component comprising an elongated profile with a front face, the front face having at least one step therein extending along its length, and the step having a tread surface and a riser surface.

[0007] Further according to the invention the component includes at least one securing formation projecting from an edge of the profile parallel to and in a direction opposite to the step.

[0008] Still further according to the invention there is a groove extending rearwardly from the step into the riser surface and the groove is co-planer with the tread surface.

[0009] Still further features of the invention provide for there to be a rear face on the opposite side of the component to the front face and extending in a direction so as to be inclined down the steps of the front face, for there to be a passage within the profile along the length of at least one of the steps and for the profile to include a formation to provide for severity at the tread surface of the step.

[0010] The invention also provides for an optional hinge to be formed along the length of the step and for such hinge to be formed by a line of weakness formed in the profile at the riser surface of the step.

[0011] Still further features of this invention provide for the edge of the profile opposite that having the projecting formations to be slotted to receive a supporting bracket for a complete frame, and the projecting formation is in the form of a lip.

[0012] Still further features of this invention provide for the profile to comprise a number of complementary sub-profiles which are mutually engageable and which include co-operating grooves and tenons.

[0013] Still further according to the invention the component includes a plurality of steps.

[0014] Still further according to the invention the profile is an extrusion and preferably of plastics material.

[0015] Still further according to the invention there is an undercut first recess below the lower most step, the recess being adapted to accommodate a backing board and there is an undercut second recess in the inclined surface at the end of the rear face remote from the first recess.

[0016] These and other features of this invention will become apparent from the following descriptions of examples illustrated in the accompanying drawings in which:

Figs 1 and 2 illustrate in section two different kinds of basic profile fitted to a frame moulding;

Fig 3 illustrates a corner connector plug for the profiles of Figs 1 and 2;

Fig 4	is a section of a profile which can provide a series of hinges;
Fig 5	illustrates a corner connector plus for the profile of Fig 4;
Figs 6 and 7	illustrate a hinge of Fig 4 in use;
Figs 8 and 9	illustrate sets of complementary interlocking sub-profiles;
Fig 10	illustrates a further embodiment of the invention in cross-sectional elevation;
Fig 11	illustrates a further embodiment of the invention in cross-sectional elevation; and
Figs 12a & b	illustrate two uses of a further embodiment of the invention.
Figure 13	is an end elevation of a pair of co-operating shadow box profiles;
Figures 14 (A) & (B)	are end elevations of a further embodiment of a shadow box profile;
Figures 15 (A) & (B)	are end elevations of further embodiments of shadow box components in use; and
Figures 16	illustrates a further embodiment of the invention in cross sectional elevation.

#### **DETAILED DESCRIPTION OF THE INVENTION WITH REFERENCE TO THE DRAWINGS**

[0017] As shown in Fig 1 an elongated profile for use in constructing a shadow box is in the form of plastics extrusion (1) from any suitable plastics material having parallel front and rear faces (2) and (3). The front face (2) has a stepped profile and the rear face (3) is inclined in the same general direction as the steps of the profile (2).

[0018] Each step 17 has a riser surface (18) and a tread surface (19). One edge (4) of the profile has an outwardly projecting lip (5) extending from the inclined rear face (3) of the profile.

[0019] The extrusion (1) is shown as fitted into a frame moulding (6) which is shown as a standard depth ordinary moulding for a picture frame. In dotted lines (7) is indicated the moulding that would be required for a full depth shadow box moulding.

[0020] As illustrated the shadow box (or box frame)

would have a glass panel (8), three matboards (9) and a backing board (10) on which the object to be displayed would be mounted. (The number of matboards is optional and can be selected to suit the application at hand.)

[0021] A feature of the extrusion of this embodiment is a slot (11) into the bottom step formation to receive the end of a hanging device (12) conveniently in the form of a bell hanger. The incorporation of the hanger onto the extrusion leaves the surrounding outer frame moulding (6) free of carrying the weight of the complete frame and display object.

[0022] This in turn enables relatively thin sectioned and relatively weak outer frame mouldings (6) to be used in the framing of relatively large and heavy display objects.

[0023] Passages (13) are formed in the length of the extrusion (1) in the bulk of the material forming each step of the profile.

[0024] Extrusion (1) can be used for shadow boxes of any reasonable size simply by cutting each profile to length on the mitre at each end and securing the lengths together by means of connector plugs (14) as illustrated in Fig 3. These plugs (14) can be inserted in each passage (13) or only in some of them. The plugs impart rigidity to the assembled mitred lengths of extrusion. Adhesive may be used if desirable or necessary. Depending on the cross-section of the extrusion used and the amount of material available for the purpose, other well known methods of securing mitred ends together may be used, such as, for example, staples or right-angled corner fixing plates, suitably drilled and threaded and held firmly in position in accommodating slots by means of screws.

[0025] Figure 1 represents a shadow box (or box frame) suitable for three dimensional objects whereas the profile (15) illustrated in Figure 2 is more suited to the display of flat art (16) behind two matboards (9).

[0026] Quite clearly various designs of profile different to extrusion (1) can easily be provided and each such profile can be used for a large range of overall frame sizes.

[0027] Sometimes it is desirable that the object displayed be changed and this is usually done either by the tedious process of partially dismantling the shadow box, replacing the object displayed with another, and rebuilding the frame. Alternatively a completely new frame is used for the new object. Efforts have been made with the moulded boxes referred to above to enable the box to be hingedly connected to the frame so that the box can be simply opened, the object exchanged, and the box reclosed.

[0028] Figures 4, 6 and 7 illustrate extrusions (20) which can be used in shadow box framing to provide such a hinged assembly.

[0029] Slots (21) extend as shown at right angles to the freed surface (19) of each step formation. The posts (22) of the slots (21), parallel to the tread surface (19),

extend from the riser surface (18) to near the inclined face (24) of the profile.

**[0030]** Notches (25) of generally vee shape in section extend towards the ends of posts (22) of slots (21).

**[0031]** The extrusion is used in the same manner as described above to provide a box surround for a shadow box frame and the mitred lengths of extrusion are secured together by means of corner connector plugs (26) inserted into the slots (21) in the abutting mitred ends of the lengths of extrusion. These plugs can conveniently be of the form shown in Figure 5.

**[0032]** Figures (6) and (7) illustrate on an enlarged scale how the optional hinge operates. The box frame can be made to hinge at any particular slot (21) by cutting through the material of the extrusion between notch (25) and the end of the past (22) of slot (21) around the remaining three sides of the box. The box is then held together by the residual material between slot post (22) and notch (25) along the uncut side. This material is inherently sufficiently flexible to enable the box to be swung about this side to provide access into the box, thereby enabling objects displayed to be easily interchanged.

**[0033]** Preferably it will be the top of the frame which provides the hinge. In order to support the material at the hinge which must now carry the weight of the box and the object displayed, the end of the notch post (22) is enlarged to circular cross section as indicated at (27) in Figs 6 and 7. This enables hinge plugs (28) to be used. The extrusion (29) shown in dotted lines is not essential to the assembly but does provide increased support to the area around the part (27), thereby strengthening the hinge. The plugs (28) will of course have mitred ends to enable the three sides of the box to be swung away from the frame when access into the box is required.

**[0034]** It will be understood that the box frame above described can be varied in many ways without departing from the scope of the invention. The profile can be varied and in fact can be made so a certain number of step formations can relatively easily be severed from the remainder. This enables a single extrusion to provide different depths of profile.

**[0035]** The profile (1) need not be a single extrusion but may be made up of a plurality of interlocking elongated sub-profiles as shown in Figures 8 and 9. Thus the profile of Figure 8 can comprise a first sub-profile (30), which includes the lip (5), and three standard sub-profiles (31) each of which provides a step. The sub-profiles (30 and 31) are connected together by interlocking elongated mutually engageable formations (32) on the adjacent sub-profile surfaces. A hanger may be attached to the rearmost sub-profile using a formation (33) for engaging in the recess (34) of the formation (32).

**[0036]** Using this construction any reasonable depth of profile may be built up and cut to lengths to suit the length and breadth of shadow box required.

**[0037]** Figure 9 shows a construction similar to that of Figure 8 with a sub-profile (30) including the lip (5) and a single rear sub-profile (34) which includes a plurality of closely spaced steps (35). This configuration is more suitable for use in the framing of flat art.

**[0038]** The profile avoids or largely eliminates the necessity for foam boards or other spacer materials and by the choice of suitable material can provide desired resilience to support the glass panel in the frame moulding.

**[0039]** In the embodiment of Figure 10 a profile (40) includes a front face (41) which has two intermediate steps (42) and (43) of unequal height as shown, the lowermost step being of a greater height than the adjacent step.

**[0040]** A rear face (44) is provided which is inclined in the same general direction as these steps and which includes an elongated recessed notch (45) therein which is used to assist in locating the profile on a cutting jig.

**[0041]** In the embodiment of Figure 11 a profile (50) is made from a lightweight material such as expanded polystyrene for example.

**[0042]** The profile (50) includes a front face (51) with one or more steps (52) medially located therein.

**[0043]** Behind the front face (51) the profile has the configuration of a right angled section which provides bulk and strength to the profile which would otherwise be liable to break because of the relatively weak nature of the material.

**[0044]** In this instance the profile (50) is shown in use being glued to the periphery of a suitable backing board (53) and located by way of pins (54) in a suitable frame (55). A glass (56) is located under the inwardly directed lip (57) of the frame and three mountboards (58) are fixed to the steps.

**[0045]** In the embodiment shown by Figures 12a and 12b a profile (60) includes a front face (61) with several steps (62) therein. The "lower" or innermost step is undercut at (63) to accommodate a backing board (64) in one orientation as shown in Figure 12a. The rear face (65) is smooth.

**[0046]** The orientation of the profile (60) as shown in Figure 12a allows for the plurality of mountboards (66) as described in previous embodiments together with the glass (67) and a suitable moulding (68).

**[0047]** If the profile is reversed as shown in Figure 12b the smooth rear face (65) is innermost and provides a deep sloping surface which may be painted or covered with mountboard (69) or suitable fabric.

**[0048]** In Figure 13 an embodiment according to the invention comprises two co-operating profiles (71) and (72).

**[0049]** The first profile (71) has a front face (73) which has a stepped profile and the rear portion (74) thereof comprises two perpendicular side walls (75) and (76). Below the last of the steps (77) of the front faces (73) and in the side wall (76) is a rectangular undercut

recess (78). This recess (78) serves to accommodate either a backing board as described with reference to Figure 12(A) or alternatively serves to locate a projecting locating formation (79) of the second profile (72).

This second profile (72) is essentially rectangular in shape and has at one corner the locating projection (79) which is also rectangular in nature and on the adjacent corner is a rectangular recess (80) which is identical to recess (78) and which can be used to accommodate a projection (79) of a yet further additional profile.

**[0050]** Further or alternative locating or interlocking formations may be provided at the interface of the first and second profiles (71) and (72). An example in the form of a groove and tenon is shown in broken lines (70).

**[0051]** It will be appreciated that in this way depth may be provided to the shadow box.

**[0052]** The profile (81) shown in Figures 14(A) and 14(B) is similar to that of Figure 13 except that in addition to the stepped front face (82) it includes an inclined rear face (83) which enables the profile to be used in both orientations shown in the drawing and in a manner similar to the embodiment shown in Figures 12(A) and 12(B).

**[0053]** Additionally to the embodiments of Figures 12(A) and 12(B) the present embodiment not only includes the undercut or recess (63) but a further rectangular recess (84) which then may accommodate a backing board for example when the profile is used in the orientation shown in Figure 14(B) that is with the sloping face being utilised within the shadow box.

**[0054]** The profile (85) shown in Figures 15(A) and 15(B) once again includes a plurality of sub-profiles (86) which are stacked together in a similar manner to those of Figure 8, however instead of having positive interlocking means they include stepped formations (87) in their mating surfaces (88). These stepped formations (87) serve to positively locate the sub-profiles with respect to each other. The profiles are preferably glued together in this condition.

**[0055]** As shown in Figure 15(A) in the first orientation the profile (85) may be used with the stepped face (89) directed into the interior of the shadow box to provide support for matboards (90). The backing board indicated by numeral (91) and the glass and frame by numeral (92) and numeral (93) respectively. In the reversed condition as shown in Figure 15(B) the inclined rear surface of the profile (85) made of sub-profiles (86) is directed inwardly as the inclined surface provides a support for a cove mat (93) as previously described.

**[0056]** The profile (95) shown in Figure 16 includes a stepped front surface (96) with two steps (17).

**[0057]** Co-planar with each of the tread surfaces (19) of the steps (17) are grooves (97) of rectangular cross section which extend into the riser surface (18). There is a undercut rectangular recess (98) at the base (99) for accommodating a backing board (100).

**[0058]** The purpose of the grooves (97) is to accom-

modate either glass or matboards. In the present instance the groove (97) of the uppermost step (17) locates a frontal sheet of glass (101) and the other groove (97) locates a matboard (102). The object to be displayed (not shown) is then located adjacent the backing board (100).

**[0059]** By means of this construction one can alternatively do away with the need of an outer frame with the top edge (103) being satisfactorily decorated to provide this frame. It should of course be noted that a frame may be provided at this position in much the same way as the frames in the upper embodiments are provided. Such a frame is shown in dotted lines and is indicated by numeral 104.

**[0060]** The invention is simple to use, provides a wide variety of framing opportunities, and does not depart dramatically from conventional shadow box framing methods and aesthetic appearances.

## Claims

1. A shadow box component comprising an elongated profile with a front face, the front face having at least one step therein extending along its length, and the step having a tread surface and a riser surface.
2. A component as claimed in claim 1 characterised in that it includes at least one securing formation projecting from an edge of the profile parallel to and in a direction opposite to the step.
3. A component as claimed in either of claims 1 or 2 characterised in that there is a groove extending rearwardly from the step into the rise surface.
4. A component as claimed in claim 3 characterised in that the groove is co-planar with the tread surface.
5. A component as claimed in any of the preceding claims characterised in that there is a rear face on the opposite side of the component to the front face and extending in a direction so as to be inclined in the same general direction as the steps of the front face.
6. A component as claimed in any of the preceding claims characterised in that there is at least one passage within the profile along the length of at least one of the steps.
7. A component as claimed in any of the preceding claims characterised in that there is an elongated recessed notch in the rear face.
8. A component as claimed in any of the preceding claims characterised in that the profile includes a formation to provide for easy severability at the

tread surface of the step.

9. A component as claimed in any of the preceding claims characterised in that there is a hinge formed along the length of the step. 5
10. A component as claimed in claim 9 characterised in that the hinge is formed by a line of weakness formed in the profile at the riser surface of the step. 10
11. A component as claimed in any of the preceding claims characterised in that a face of the profile adapted to be at the rear of a shadowbox is slotted to receive a supporting bracket for a complete frame. 15
12. A component as claimed in claim 2 characterised in that the projecting formation is in the form of a lip.
13. A component as claimed in any of the preceding claims characterised in that the profile comprises a number of complementary sub-profiles which are mutually engageable. 20
14. A component as claimed in claim 13 characterised in that the sub profiles are mutually engageable by means of grooves and tenons. 25
15. A component as claimed in any of the preceding claims characterised in that it includes a plurality of steps. 30
16. A component as claimed in any of the preceding claims characterised in that the profile is an extrusion. 35
17. A component as claimed in any of claims 1 to 15 characterised in that the profile is made from wood.
18. A component as claimed in any of claims 1 to 15 characterised in that the profile comprises a plurality of complementary sub-profiles including locating formations. 40
19. A compound as claimed in claim 18 characterised in that the sub-profiles are glued together. 45
20. A component as claimed in any of the preceding claims characterised in that there is an undercut first recess below the lower most step, the recess being adapted to accommodate a backing board. 50
21. A component as claimed in claim 20 as appendant to claim 5 characterised in that there is an undercut second recess in the inclined surface at the end of the rear face remote from the first recess. 55

22. A shadow box comprising a frame, a glass panel, at

least one mat board, a backing board and a plurality of components as claimed in any preceding claim secured to said frame, the arrangement being such that the glass panel, at least one mat board and backing board are secured to said components.

23. A shadow box as claimed in claim 22, characterised in that the free ends of neighbouring components are secured to each other by means of connector plugs.

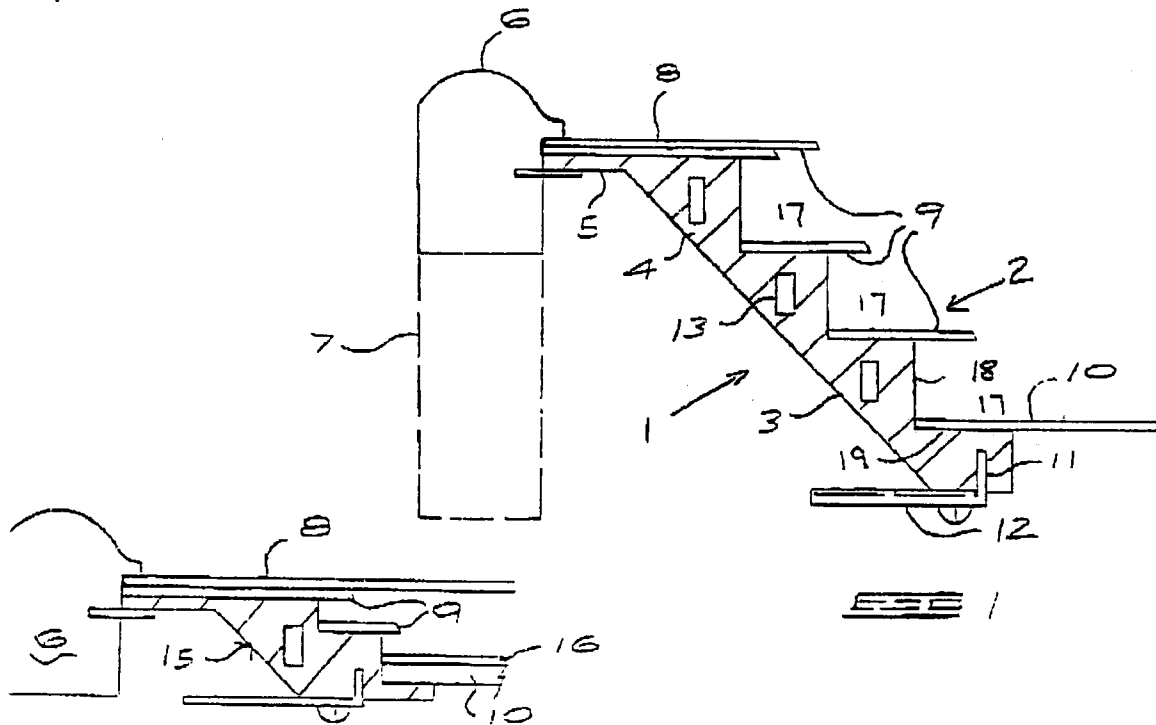


FIG. 2

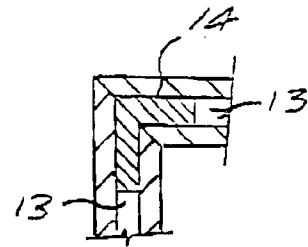


FIG. 3

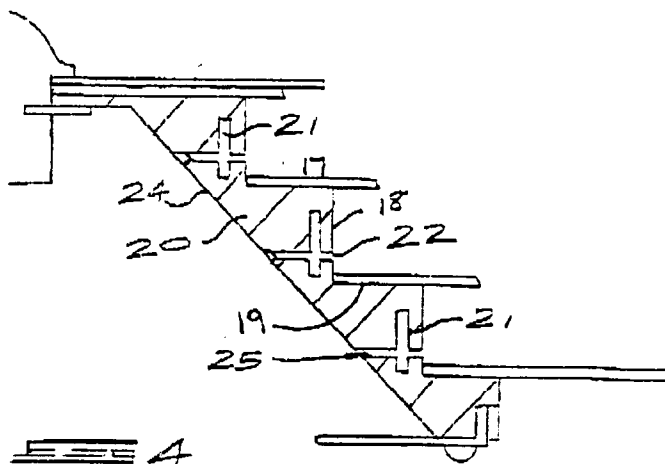


FIG. 4

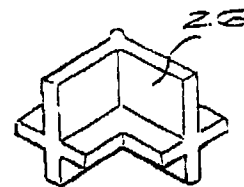
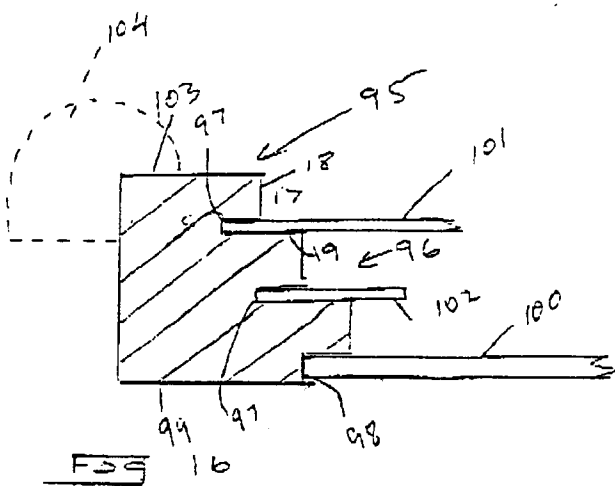
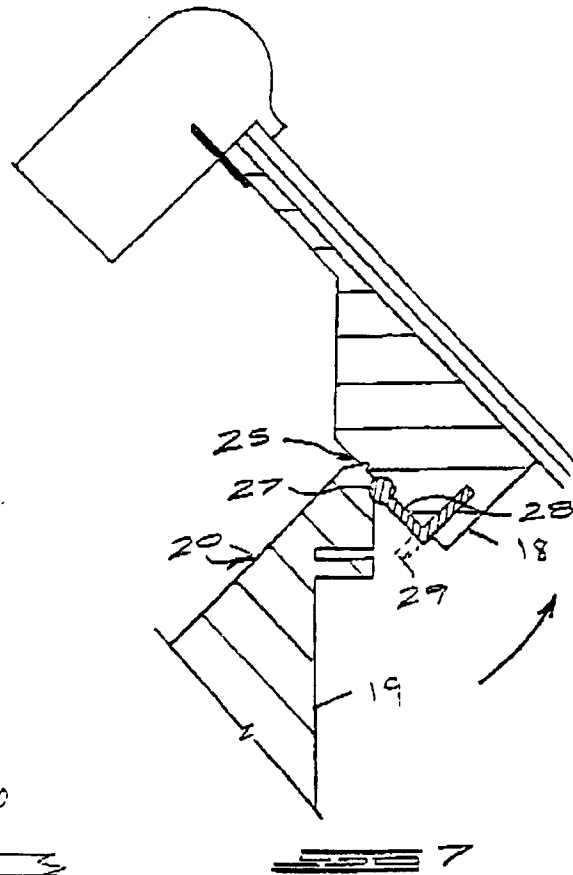
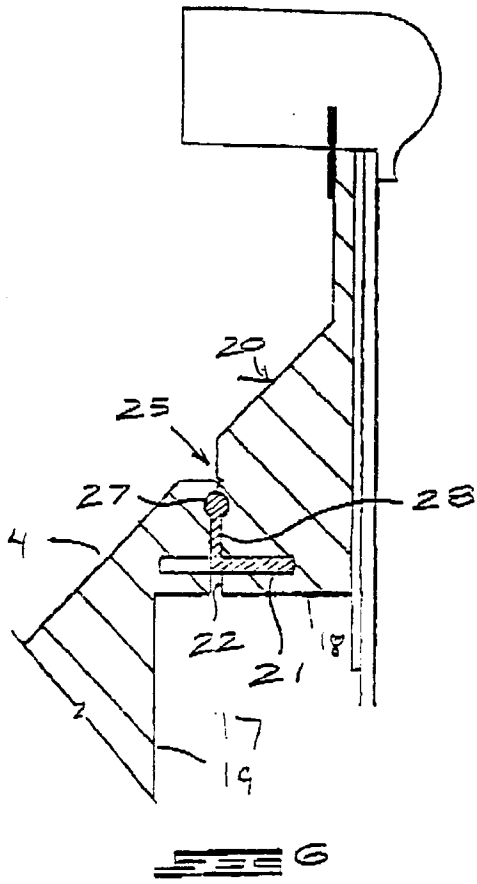
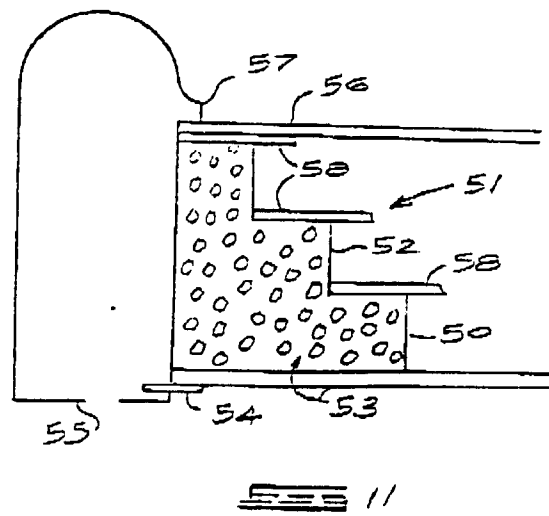
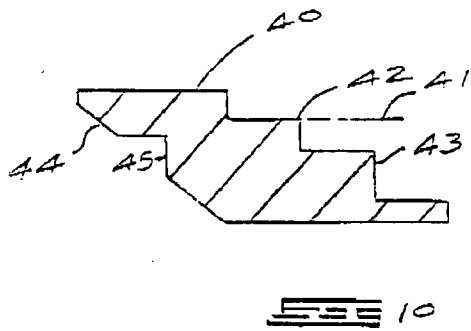
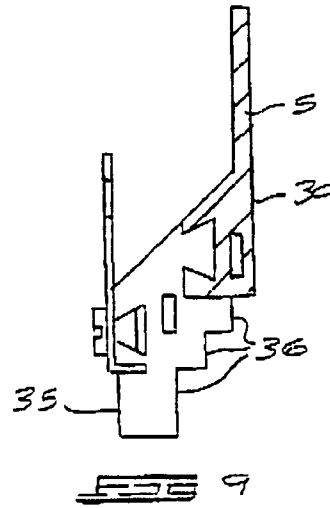
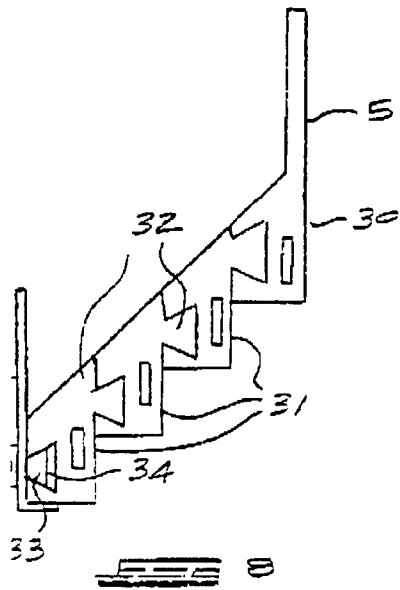


FIG. 5







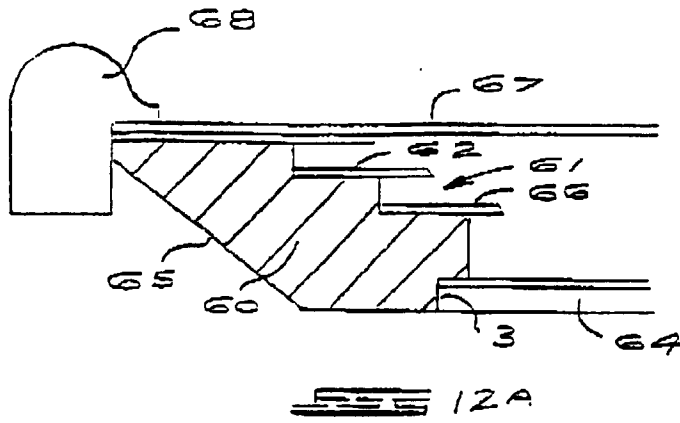


FIG 12A

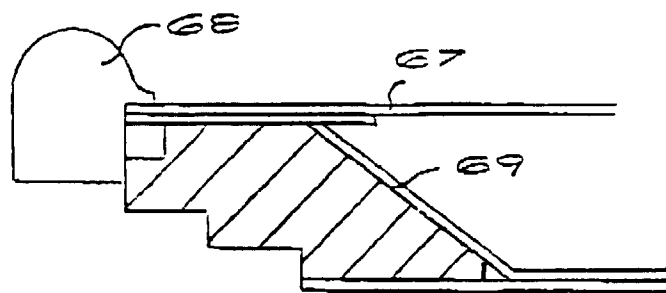
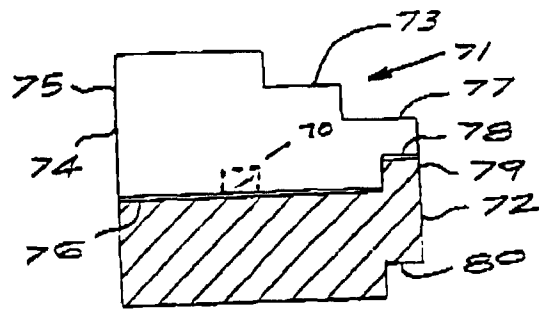
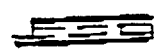
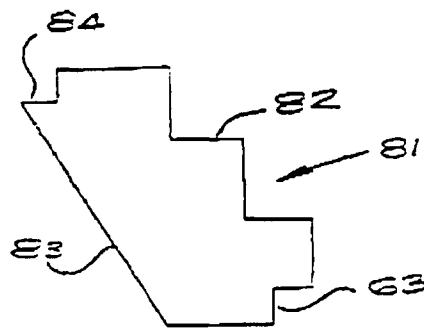


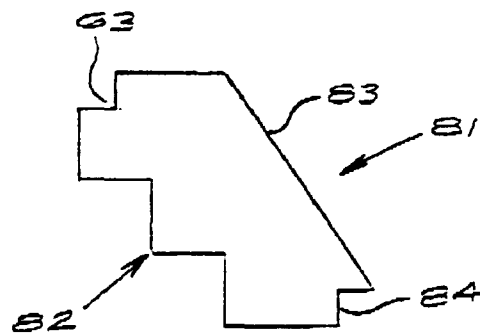
FIG 12B



 13



 14A



 14B

