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(54) Plastics channel systems

(57) A drainage system is constructed from plastics sections (2) having a uniform U-shaped cross section. A slotted grid (4) closes an open mouth of the channel. Adjacent channel sections (2) are joined by means of an external joining sleeve member (6) which engages with formations (26) at either side of the channel sections in the lower portion in both adjacent channel sections

(57) The channel sections are self-supporting and made of a closed cell structure PVC foam. An outlet sleeve (8) is provided which engages with formations (26) at either side of the channel sections in the lower portion of the channel section (2). The outlet sleeve (8) is provided so that the channel section (2) can be easily coupled to a downward drainpipe at any point along its length.

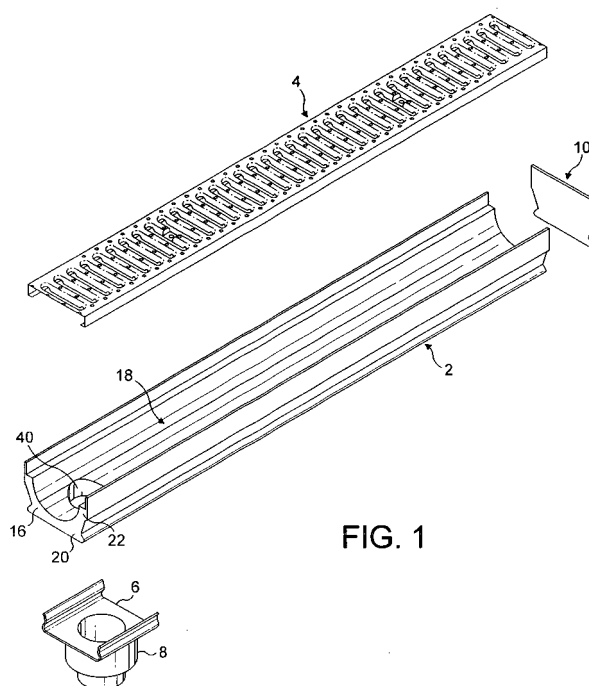


FIG. 1

## Description

### Background of the Invention

**[0001]** The present invention relates to plastics channel sections that can be used as enclosed ducting or in drainage systems made up of plastics drainage channel sections closed by slotted grids.

### Technical Background

**[0002]** The use of plastics material makes for a light-weight channel, which is particularly suitable for use in interior and in light-duty applications in situations where non-corrosive fluids are to be drained, for example, around swimming pools, patios and in domestic drive-ways.

**[0003]** As with many linear drainage systems, the channels are formed by placing U-shaped open mouth channel sections end-to-end in order to provide channels of the appropriate length. Typically special channel sections are provided with vertical outlet connections. These are inserted in the run of standard channel sections as required.

### Prior art

**[0004]** GB-A-2 351 992 describes such a plastics channel. This channel has been extruded with hollow section side walls. The same technique has been shown in US-A 5 181 793. These types of structure need additional lugs to be provided at one end face of the channel to plug into sockets formed in the other end face in order to connect channel sections together. These formations must be added to the channel section after extrusion. This makes for a more complex manufacturing process. Therefore, there is a need for a convenient system for joining channel sections so that they can be kept aligned during installation.

**[0005]** In the field of concrete drainage channels, it has been proposed in GB — A- 2184 896 to use various configurations of locking clips that can be pressed up or down onto joints between channel sections to hold the sections together. The clips have formations that engage in grooves in the channel.

**[0006]** The present invention also addresses the technical problem of eliminating the need for specially fabricated channel sections with outlet connectors. GB-A-2351992 shows but does not describe a drain pipe coupled to a plastics channel section.

### Solution of the invention

**[0007]** The present invention provides a plastics channel system comprising extruded plastics channel sections of uniform U shaped cross section having an external profile defining lateral projections at the base of the section, and respective sleeve components

shaped to slide onto said projections and surround a lower portion of the channel section for joining adjacent sections and for positioning an outlet pipe anywhere along the length of a section.

**[0008]** Preferably the sleeve component has a base and raised edges shaped to fit around said projections, the edges being radiused at at least one end face of the sleeve component to facilitate engagement with the projection. In one embodiment a single design of sleeve component may be used for joining adjacent sections and for positioning an outlet. Alternatively distinct sleeve components may be provided for each purpose and for additional purposes such as engaging an end plate. In each case the sleeve component can be easily slid into place.

**[0009]** If necessary, the sleeve component could be solvent welded to the lower portion of the channel section when in the desired position.

**[0010]** Use of sleeve components for connecting channel sections eliminates the need for any post extrusion end face modification to the channel section.

### Brief Description of the Drawings

**[0011]** In order that the invention may be well understood, some embodiments thereof will now be described, by way of example only, with reference to the accompanying diagrammatic drawings in which:

Figure 1 shows an exploded perspective view of the components of a drainage system;

Figure 2 is a perspective view of a short length of channel section;

Figure 3 is a front view of an end plate;

Figure 4 is a top view of the end plate of Figure 3;

Figure 5 shows a cross section through a joining sleeve component;

Figure 6 shows a partial cross section side view of an outlet sleeve component; and

Figure 7 shows a top view of the outlet sleeve component of Figure 6.

### Description of a Preferred Embodiment

**[0012]** The channel sections to be described can be used with a solid cover to provide a ducting system or with a slotted grid as part of a drainage system. The application of the channel sections in drainage systems will be exclusively described in more detail below but it will be appreciated that the channel sections may be put to other uses.

**[0013]** A drainage system can be assembled from a

small number of components as shown in Figure 1. These are a U shaped channel section 2, a slotted grid 4, a sleeve component 6 with an outlet connection 8 and an end plate 10. The embodiment shown in Figure 1 uses a single design of sleeve component 6 for joining sections 2 and positioning an outlet. The remaining figures show an embodiment in which a different design of sleeve component is used for each purpose.

**[0014]** The channel section 2 is made as an extrusion of foamed plastics material. In an alternative construction the section could be a solid plastics member. The channel section 2 has a uniform cross section, flat end faces 16 and an open mouth 18. The channel section 2 has a base 20 and two facing upstanding side walls 22. An internal surface of the section defines a curved U-shaped channel to provide good drainage flow characteristics. Externally the profile is substantially rectangular and the base 20 is flat so that the sections can be easily handled and seated. At either side of the base 20 in a lower portion of the channel section 2 lateral projections 24 are provided. The projections 24 merge with the side walls by means of sloping faces 26.

**[0015]** Each side wall 22 terminates in an edge 30. An internal recess 32 is formed adjacent the open mouth 18 of the channel section 2 just below the mouth. The recess 32 defines a ledge 34 that can support the slotted grid 4. Upstands 36 at either edge of the mouth effectively provide a protected edge for the grid 4 and aid line and level installation. These upstands 36 and the ledges 34 can be co-extruded with a harder more dense material to resist wear. An internal bead 38 is formed just beneath the upper edge of each upstand 36 in order to seat above the top of the grid 4.

**[0016]** The grid 4 may be a galvanised steel grating or a composite grating.

**[0017]** A circular opening 40 is shown in the base 20 of the channel section 2. Such an opening can be created on site using a serrated hole cutter at any position along the length of the channel section 2 in order to cooperate with an outlet connection 8.

**[0018]** The joining sleeve component 6 is used to join adjacent channel sections 2 together end-to-end. It is a plastics member so that it can be solvent welded to the channel sections 2.

**[0019]** The sleeve 6 is a laminar piece having a flat base 42 with raised edges 44 shaped to fit snugly around the projections 24 of the channel section 2. The edges 44 are intumed to seat against the walls 26 so that the sleeve 6 can slide along the channel section 2 using the projections 24 effectively as tracks. The sleeve enters the tracks by being engaged from one end face 16. The edges 44 are radiused at each end 46 so as to facilitate engagement with the channel sections.

**[0020]** In the embodiment illustrated in Figure 1 the sleeve component 6 also serves to provide a connection for an outlet connection 8. In this case, the base 42 will be provided with a circular witness 48 that can be knocked out when the multipurpose component is to be

used to couple to a drain. However, in a preferred embodiment separate sleeve components are provided for the purpose of joining the channel sections and for coupling to an outlet. The joining sleeve component is shown in Figure 5 and the outlet sleeve component shown in Figures 6 and 7. In addition, the end plate 10 is also adapted to be connected to the end face 16 of a channel section by means of its own sleeve component shown in Figures 3 and 4. Each sleeve component is constructed in the same way with a base and raised edges so that it can slide onto projections 24. The corresponding parts are given the same reference numerals.

**[0021]** The outlet sleeve component has a circular opening 50 in its flat base 42. A depending tubular wall 54 surrounds the opening 50 and projects in the opposite direction from the edges 44. The wall 54 provides a socket that serves as an outlet connection 8. A second, larger, tubular wall 56 surrounds the tubular wall 54 concentrically. Each wall 54, 56 acts as a socket for a respective standard diameter drainpipe. The inner wall 54 has a diameter of 75mm to cooperate with standard European drainpipes whereas the outer wall 56 has a diameter of 110mm to cooperate with the standard UK drainpipe. The lower edges of each wall 54, 56 are preferably chamfered to facilitate engagement with the end of the drainpipe. When an outlet sleeve component is used along a channel section the opening 50 must be aligned with an opening 40 created in the base 20 of the channel section 2 during assembly.

**[0022]** A perforated leaf guard (not shown) can be formed in the upper tubular part to prevent leaves and the like passing from the drainage channel into a drain pipe coupled to the outlet connection.

**[0023]** The channel sections 2 can be provided in various lengths such as 1 or 3 metres.

**[0024]** The end plate 10 as shown in Figure 3 is shaped to correspond to the outer profile of the cross section of the channel section 2. The thickness of the end plate 10 is reduced by means of v-shaped indents 60 on either face of the plate to outline areas 62 spaced over the surface of the end plate. This allows the outlined areas 62 of the end plate within these outlines to be knocked out during installation to leave apertures so that the drained water can flow into a soak away if desired.

**[0025]** Most required configurations of drainage arrangement for domestic application can easily be formed from the described components. However, for the block pavior installations, it may be necessary to provide 90° corner units. These are preferably assembled in a factory by mitring together two channel sections at 90° to each other and securing them together by solvent welding.

## 55 Manufacture

**[0026]** The channel sections 2 are preferably made of expanded PVC foam that has a closed cell structure.

The extrusion process will create a continuous smooth skin all on the exposed surfaces of the product. This skin will aid hydraulic flow and also improves the aesthetic appearance of the channel sections 2. The extrusion method is not novel of itself but it has not previously been used in the field of manufacture of drainage channel sections.

**[0027]** Reference may be made to the applicant's co pending application filed on the same date as this application claiming the use of foamed plastics for channel sections. 10

#### Installation

**[0028]** The channel sections 2 are positioned end to end to create channels of the required length. Each section is connected to the next by a joining sleeve component 6 which slides onto the projections 24 of the adjacent sections 2. Where an outlet connection is required a hole 40 is cut on site in the base 20 of the channel. An outlet sleeve component is slid into position under the hole 20 and a drainpipe fitted to the appropriate socket wall 54, 56 from below. 15 20

**[0029]** The components may be solvent welded together if necessary to provide greater watertightness and to prevent movement of the components while the surface adjacent to the channel is constructed. 25

**[0030]** The open mouths 18 of the channels 2 are closed by placing slotted grids 4 in the mouths of the channel. Edges of the grids 4 rest on the ledges 34 at either side of the channel. 30

**[0031]** The channels are placed in prepared trenches and connected to the drains via the outlet sleeves 8. The trench can then be backfilled with concrete to provide a permanent supporting haunch for the system. 35

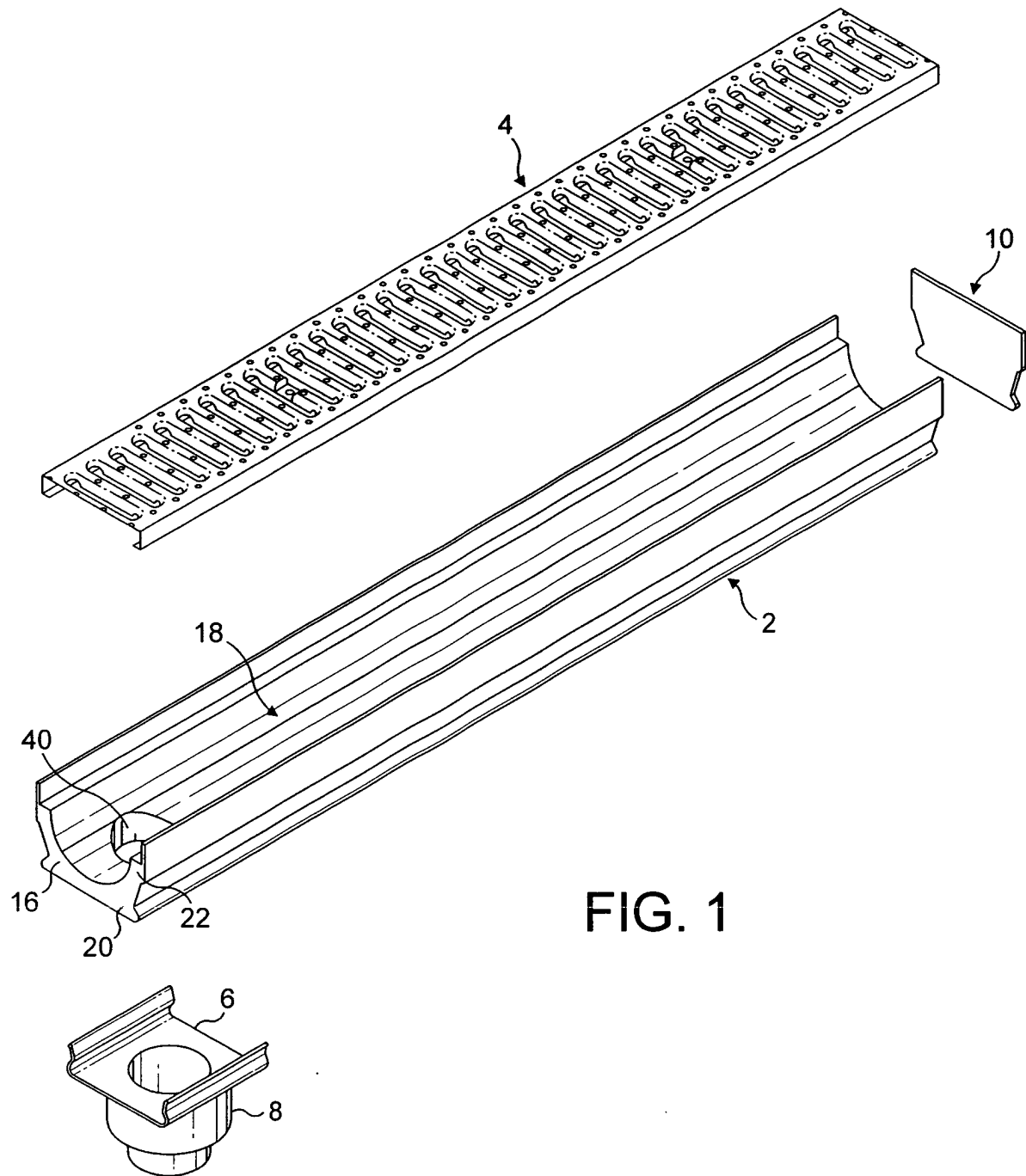
**[0032]** The system is lightweight and easy to install so that a kit suitable for draining a standard garage access could be sold on the DIY market. Such a kit would consist of 3 x 1 metre channel sections, grids, endplates, joining sleeve components and an outlet connection and leafguard. 40

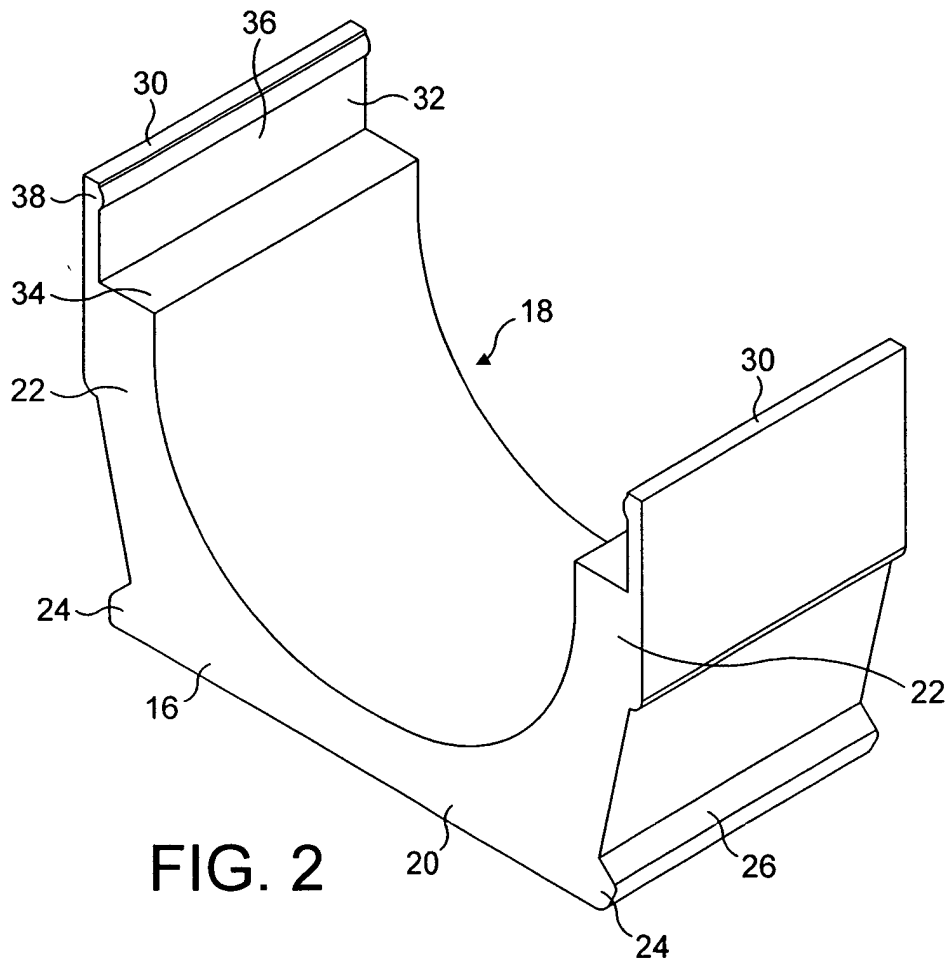
#### Claims

1. A plastics channel system comprising extruded plastics channel sections of uniform U-shaped cross section having an external profile defining lateral projections at the base of the section, and respective sleeve components shaped to slide onto said projections and surround a lower portion of the channel section for joining adjacent sections and for positioning an outlet pipe anywhere along the length of a section. 45 50 55
2. A system as claimed in claim 1, wherein the sleeve component has a base and raised edges shaped to fit around said projections, the edges being radi-

used at at least one end face of the sleeve component to facilitate engagement with the projection.

3. A system as claimed in claim 1, wherein the same sleeve component can function for joining channel sections and for positioning the outlet pipe.
4. A system as claimed in any one of preceding claims, wherein the sleeve component is solvent welded to the channel section.





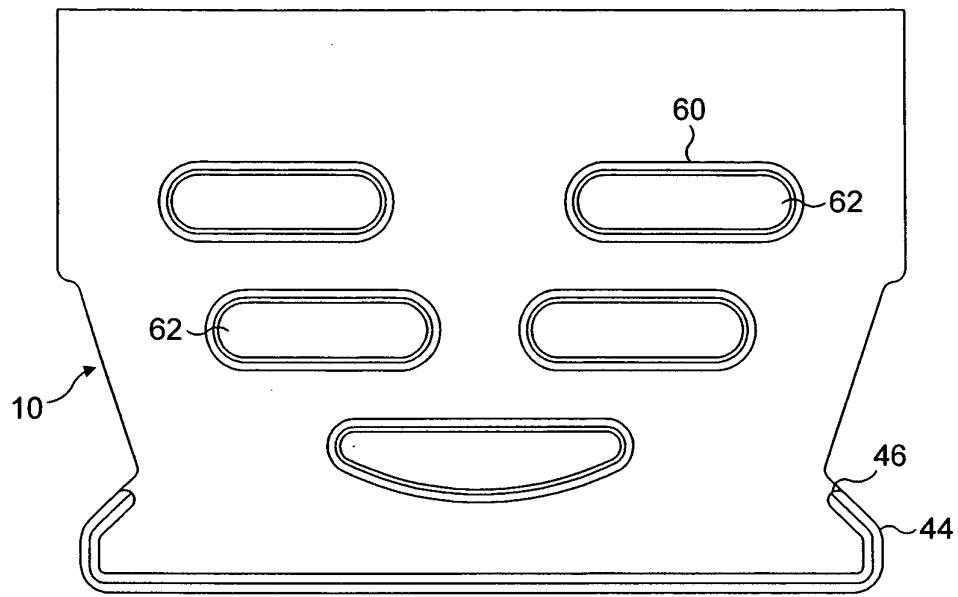


FIG. 3

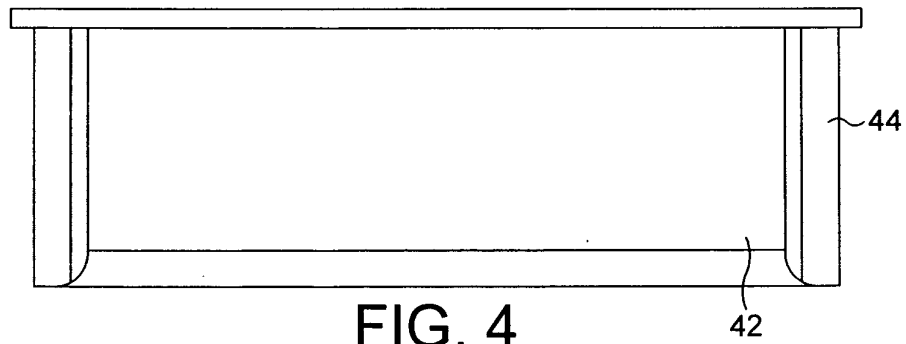


FIG. 4

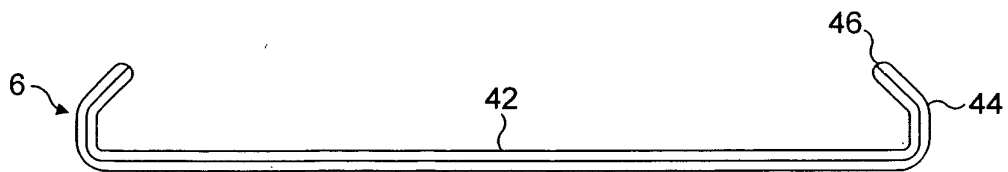


FIG. 5

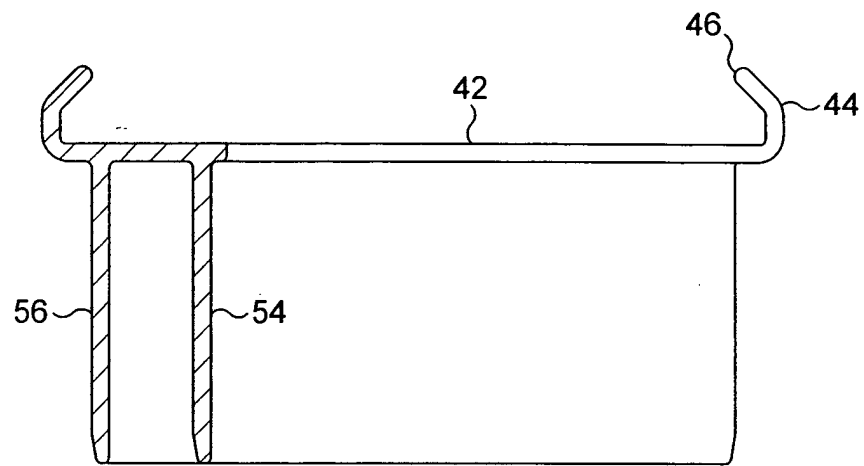


FIG. 6

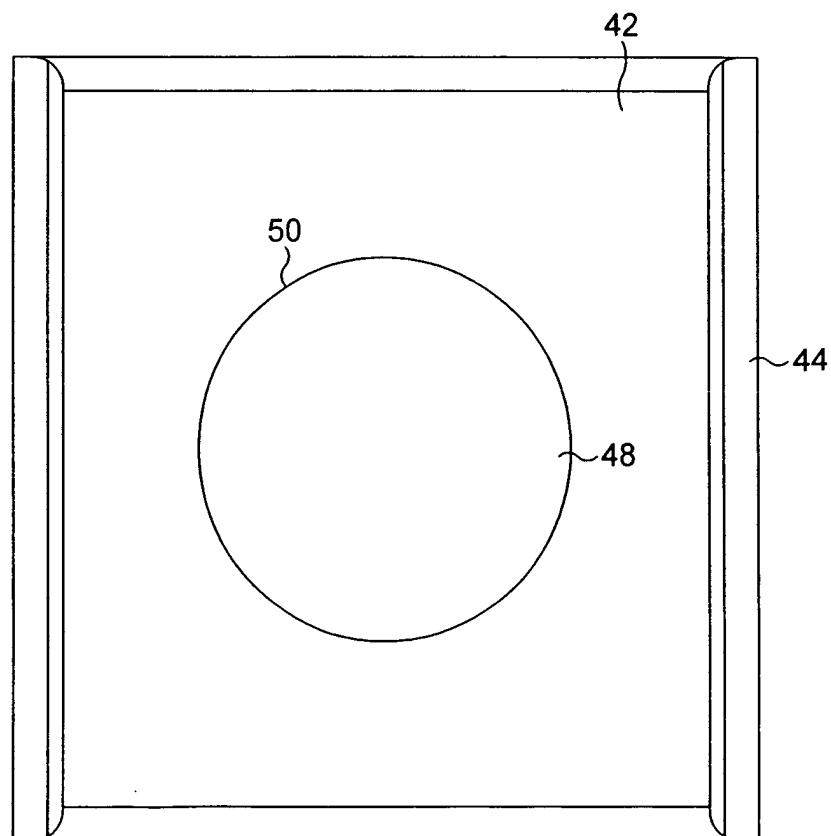


FIG. 7