

(12) INNOVATION PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. **AU 2015100632 A4**

(54) Title
Display Assembly Components

(51) International Patent Classification(s)
G09F 13/04 (2006.01) **A47G 1/06** (2006.01)

(21) Application No: **2015100632** (22) Date of Filing: **2015.05.12**

(45) Publication Date: **2015.06.11**

(45) Publication Journal Date: **2015.06.11**

(45) Granted Journal Date: **2015.06.11**

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Abstract

The invention concerns a frame member for a display assembly such as a light box, and an extrusion which can be used to mount the framed light box, either singly, in side-to-side
5 relationship or back to back.

The frame member has a side panel with an inside, an outside, a front edge and a rear edge. The frame member also has a channel on the inside of the side panel, located at the rear edge. The channel has an opening facing to the rear and can receive a magnet or ferrous
10 material attracted by a magnet.

The extrusion may be single-sided or double sided.

The single-sided extrusion has a side panel with an inside, an outside, a front edge and a
15 rear edge. On the inside of the side panel is a channel with a channel opening facing to the front. The channel can receive ferrous material attracted by a magnet, or a magnet.

The double-sided extrusion has a first side panel with an inside, an outside, a front edge and a rear edge. There is a first channel on the inside of the first panel with a channel
20 opening facing to the front. The first channel is adapted to receive ferrous material attracted by a magnet, or a magnet. There is a second side panel having an inside, an outside, a front edge and a rear edge. The second panel has a second channel on its inside, with a channel opening facing to the front. The channel is adapted to receive ferrous material attracted by a magnet, or a magnet. The first and second panels are aligned. The second channel is a
25 mirror image of the first channel.

Also disclosed is a new configuration of a magnet, suitable for use with the frame member and/or the extrusion.

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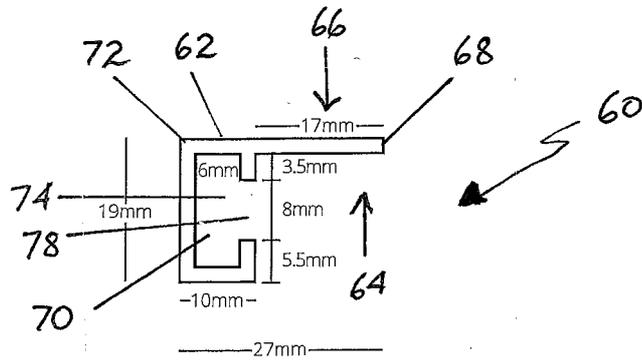


Fig. 3

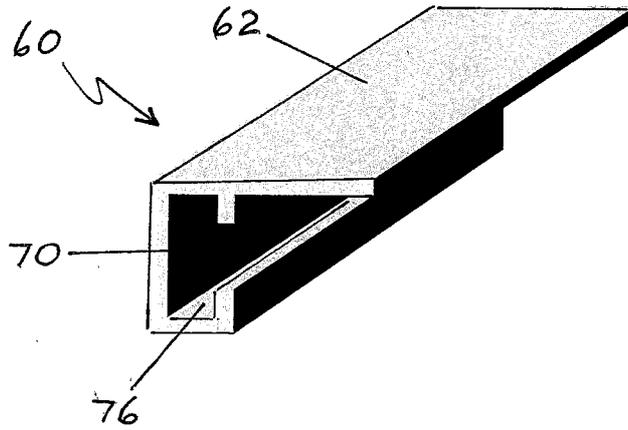


Fig. 4

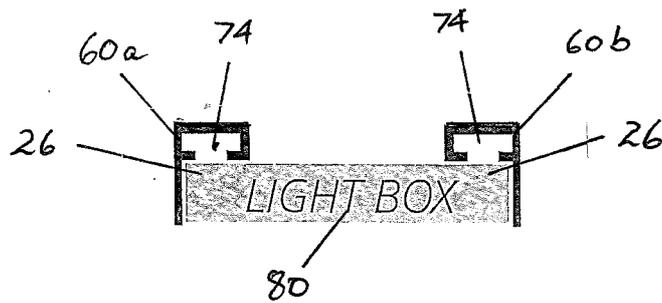


Fig. 5

Display Assembly Components

Field of the Invention

This invention relates to components for a display assembly. In particular, the invention concerns components for use in or with an assembly suitable for use as a light box, poster
5 box, sign cabinet, screen or advertising device, among other uses.

Background of the Invention

Illuminated signs are highly desirable, especially for advertising and location signs. For
10 many years, fluorescent or neon tubes were used to provide illumination in these types of signs. More recently, illuminated signs have used light emitting diodes (LEDs).

LEDs are well known. They have significant advantages over the traditional fluorescent or neon tubes, including low voltage, low running costs, increased life and flexibility of
15 design. Their use in light boxes and similar installations is also known.

An assembly such as a light box has a frame to contain the LEDs or on which the LEDs are mounted. The front of the box contains the poster or graphics. The rear of the box may have a panel or, if the light box is double-sided, may have a second poster or graphics.
20

It is desirable to produce light boxes with minimal frames, or so as to present a 'frameless' appearance and to maximize the poster or graphics display. In one prior art attempt to produce a 'frameless' light box, the graphics are printed on a fabric poster which is then stretched across the light box frame and secured to the front of the frame, inserting a
25 beading around the edge of the poster into a slot provided in the frame. The resulting light box can be effective, but it requires the beading to be sewn or adhered to the poster before installation. Further, it is necessary to provide the slot in the frame for receiving the beading.

It is an object of this invention, at least in some aspects, to provide a component being a frame member for an assembly such as a light box with an improved 'frameless' appearance.

5 For some display assemblies, it is desirable to present the display as two-sided, so that the poster or graphics can be seen from each side, such as in a concourse of a shopping mall. In other situations, it would be desirable to present two or more displays side by side in such a way as to minimize frames, to maximize 'flow' of the graphics.

10 It is an object of this invention, at least in some aspects, to provide one or more components, each being an extrusion for a framed display assembly such as a light box, which may be useful to present the displays as two-sided, and/or which may be useful to present two or more displays side by side.

For convenience below, the invention will be referred to generally in connection with a display assembly being a light box. However, it is to be understood that the invention is not
15 limited to this type of display assembly and has application in wider fields.

Summary of the Invention

Accordingly, in a first aspect, the present invention provides a frame member for a display assembly, the frame member including:

- 20 - a side panel having an inside, an outside, a front edge and a rear edge;
and
- a channel on the inside of the side panel, located at the rear edge and having a channel opening facing to the rear, the channel adapted to receive a magnet or ferrous material attracted by a magnet.

25

Preferably, the frame member includes a nib on the inside of the panel, located at the front edge;

The frame member may be made of any suitable material. Preferably, the frame member is
30 made of aluminium, for strength and lightness.

If present, the nib on the inside of the panel, located at the front edge, is preferably substantially at a right angle to the side panel and receivable in a slot formed in a front panel of the display assembly, in order to secure the front panel. A light box for use with the frame member of the invention preferably includes a front panel made of acrylic or
5 similar material, one or more LED strip lights mounted on the inside of the side panel of the frame member, a reflective acrylic film or similar which reflects light from the LED strip light/s forwardly through the front panel, and a backing for the reflective acrylic film. In use, a poster or other graphics may be adhered to the outer face of the front panel, to be illuminated by light reflected through the front panel.

10

The channel preferably has a base which can provide at least partial support for the backing. It is also preferred that the channel has walls with nibs or returns at the opening to the channel, to narrow it and assist in retaining the magnet or ferrous material.

15 It is preferred that multiple frame members are used to frame the light box. For example, where the light box is square or rectangular, two frame members may be provided, one each on opposite sides of the light box. Alternately, four frame members may be used, so that the channels continue around all four sides of the light box. In this embodiment, one or more magnets or ferrous material such as iron may be inserted in some or all of the
20 channels. The choice will depend at least partly on the size and weight of the light box and whether it is to be mounted using an extrusion according to the second aspect of the invention, below.

The magnet or ferrous material may be any suitable size or shape. In one preferred
25 embodiment, the magnet is in the shape of a parallelogram and has a central aperture for rotation in situ. The ferrous material may be of the same shape, but preferably it is provided in a strip form. If desired, the ferrous material may be fixed in place in the or each channel.

In a second aspect, the invention provides an extrusion for a framed display assembly, the
30 extrusion including:

- a side panel having an inside, an outside, a front edge and a rear edge; and

- a channel on the inside of the panel and having a channel opening facing to the front, the channel adapted to receive ferrous material attracted by a magnet, or a magnet.

5 The extrusion may be made of any suitable material. Preferably, the extrusion is made of aluminium, for strength and lightness

It is preferred that the channel of the extrusion has walls with nibs or returns at the opening to the channel, to narrow it and assist in retaining the ferrous material or magnet.

10

The extrusion of the invention may be used to present a display assembly. It may also be used to present two or more displays side by side. In both uses the presentation may have an extremely low profile, with very little of the extrusion visible around the poster or graphics.

15

In a side-by side display, a joiner is preferred between one display assembly and an adjacent display assembly, as will be explained in further detail in connection with the drawings.

20 The double-sided extrusion may be used to present framed displays in a back-to-back configuration,

In a variation of the second aspect, the extrusion may be made in a double-sided form in which a double sided extrusion includes:

- 25 - a first side panel having an inside, an outside, a front edge and a rear edge;
- a first channel on the inside of the first panel and having a channel opening facing to the front, the first channel adapted to receive ferrous material attracted by a magnet, or a magnet;
- a second side panel having an inside, an outside, a front edge and a rear edge; and
- 30 - a second channel on the inside of the second panel and having a channel opening facing to the front, the channel adapted to receive ferrous material attracted by a magnet, or a magnet;

the first and second panels being aligned and the second channel being a mirror image of the first channel.

The double-sided extrusion may be used to present framed displays in a back-to-back
5 configuration, with an extremely low profile and very little of the extrusion visible around the poster or graphics.

In another aspect, the invention provides the magnet which is of a parallelogram shape, having a first pair of parallel sides and a second pair of parallel sides, a parallel side of the
10 first pair being at an acute angle to a parallel side of the second pair, the magnet having a central portion of increased thickness and a central aperture.

Preferably, the magnet is used with one of the extrusions of the invention. It may also be used with the frame member of the invention or independently.

15

The invention in its various aspects will be described in connection with preferred embodiments in the drawings and detailed description below.

Brief Description of the Drawings

20 Possible and preferred features of the present invention will now be described with particular reference to the accompanying drawings. However, it is to be understood that the features illustrated in and described with reference to the drawings are not to be construed as limiting on the broad scope of the invention in its various aspects.

25 Dimensions shown in the drawings are by way of example and are not limiting on the scope of the invention.

In the drawings:

30 Fig. 1 depicts a preferred embodiment of the frame member of the invention, showing schematically components of a preferred light box;

- Fig. 2 shows a rear view of part of a light box on which two frame members of Fig. 1 are shown, assembled;
- Fig. 3 shows a profile of an embodiment of an extrusion of the invention;
- Fig. 4 shows the extrusion of Fig.3 in perspective view;
- 5 Fig. 5 is a plan schematic of the a light box mounted using two of the single-sided extrusions of Figs 3 and 4;
- Fig. 6 shows a profile of an embodiment of a joiner;
- Fig. 7 shows the joiner of Fig. 6 in perspective view;
- Fig. 8 shows a profile of an embodiment of a double-sided extrusion of the invention;
- 10 Fig. 9 shows the extrusion of Fig. 8 in perspective view;
- Fig. 10 shows the extrusion of Fig. 9, cut to 45 degrees;
- Fig 11 illustrates use of the double-sided extrusion of Figs 8 to 10 in use to mount two light boxes in back-to-back configuration;
- Fig. 12 is a plan schematic of the two light boxes mounted using two of the double-sided
- 15 extrusions of Figs 8 to 10;
- Fig. 13 shows a preferred magnet in plan view;
- Fig. 14 shows the magnet of Fig. 13 in side elevation;
- Fig. 15 shows the magnet of Figs 13 and 14 being rotated in situ in the double-sided extrusion of Figs 8 to 10;
- 20 Fig. 16 illustrates use of a magnet of a different configuration; and
- Fig. 17 demonstrates an example of a double-sided light box display in situ.

Detailed Description of the Preferred Embodiments

- 25 The frame member 10 in Fig 1 may be of any desired length. In this embodiment, it is made of aluminium. Frame member 10 has a side panel 12 with an inside indicated at 14 and an outside indicate by arrow 16. In this embodiment, at front edge 20 is located a return or nib 22. At rear edge 24 is located a channel 26, having side walls 28 and 30, base 32 and a pair of nibs or returns 34 and 36 designed to narrow channel mouth 38 (see Fig.2).
- 30 Channel 26 may receive a magnet or ferrous strip (not shown), either by insertion into an open end or by insertion through mouth 38 (Fig. 2).

Also shown in Fig. 1 are the components of a light box of which the frame member forms part. The components are not necessarily shown to scale.

Partly supported by the base 32 of channel 26 is a backing 42, in this embodiment made of aluminium. Backing 42 provides support for reflective acrylic film 44, which is positioned adjacent LED strip light 46, mounted on the inside of side panel 12. Any number or length of strip lights 46 may be mounted in this way to provide the desired level of illumination.

Front panel 48 is made of acrylic in this embodiment. Light from strip light 46 is reflected by reflective acrylic film 44 through front panel 48 and illuminates graphics or poster 50, which is adhered to front panel 48 by suitable adhesive 51. It is preferred that the adhesive used allows graphics 50 to be peeled away from front panel 48, leaving virtually no residue, so that graphics 50 may be easily replaced when desired.

In some applications, it may be sufficient to use one frame member 10 on one side of the light box and a second frame member 10 on the opposite side. If desired, conventional frame members may be used on other sides of the light box or one or more sides may be left unframed. However, it is preferred that the light box is fully framed, using the frame member of the invention.

20

Fig. 2 shows how this may be achieved. In Fig. 2, which shows only part of the light box from the rear, two frame members 10 have been adjoined at mitre 52. An L-shaped ferrous (iron) part 54 has been inserted into channel mouth 38 and screwed into position by screws 56 only one of which is labelled). Preferably, this construction is repeated at each corner of the light box.

25

The light box which includes one or more frame members of the invention may be used on its own. It is preferable, however, that the light box is mounted for display using one or more of the extrusions of the invention.

30

An embodiment of a 'single-sided' extrusion is shown in Figs 3 and 4. The extrusion may be made in any desired length and is preferably aluminium. In this embodiment, the extrusion 60 has a side panel 62 having an inside indicated by arrow 64 and an outside

indicated by arrow 66. Front edge 68 is intended to lie alongside a light box, as shown in Fig. 5. A channel 70 is located on inside 64 at rear edge 72. Channel 70 has a channel opening 74 facing to the front (facing the light box). Channel 74 can receive a magnet or ferrous strip (not shown), either by insertion into open end 76 (Fig. 4) or by insertion
5 through mouth 78.

Fig. 5 shows schematically the mounting of a light box 80 by a pair of extrusions 60a and 60b. Light box 80 has frame members 10 (not shown). Magnets or ferrous materials inserted into channels 26 of frame members 10 are attracted by ferrous material or magnets
10 inserted into channel 74 of extrusions 60a and 60b, in order to hold light box 80 in place.

It is within the scope of the invention that two or more light boxes may be mounted side by side to present an enlarged viewing area. As an example of side by side light boxes, referring to Fig 5, light box 80 would be annexed to a second light box (not shown) aligned
15 with light box 80. Extrusion 60b would be located further away from extrusion 60a, with two light boxes between them. To achieve a stable assembly, a joiner 82 would be used at the junction of the two light boxes. As can be seen in Figs 6 and 7, joiner 82 has two channels 84 and 86. Magnets or ferrous materials inserted in channels 84 and 86 would be attracted to ferrous material or magnets inserted into channels 26 of frame members 10, in
20 order to hold the two light boxes in place. Channel 84 would provide this facility for light box 80 and channel 86 would do the same for the second light box (not shown).

Turning now to the double-sided extrusion 90 in Figures 8 to 10, a first side panel 92 has an inside indicated by arrow 94 and an outside indicated by arrow 96. Front edge 98 is
25 intended to lie alongside a light box, as shown in Fig. 12. A first channel 100 is located on inside 94 at rear edge 102. First channel 100 has a channel opening 104 facing to the front (facing light box 80c in Fig 12). First channel 100 can receive a magnet or ferrous strip 110 (Fig. 10), either by insertion into end 106 or by insertion through mouth 108 – see Fig. 10.

30 As a mirror image of first panel 92 and first channel 100, second side panel 112 has an inside indicated by arrow 114 and an outside indicated by arrow 116. Front edge 118 is intended to lie alongside a light box, as shown in Fig. 12. A second channel 110 is located on inside 114 at rear edge 122. Second channel 110 has a channel opening 124 facing to

the front (facing light box 80d in Fig.12). Second channel 110 can receive a magnet or ferrous strip 110 (Fig. 10), either by insertion into end 126 (Fig. 9) or by insertion through mouth 128, in a similar way to that shown for the first panel and first channel in Fig. 10.

- 5 First panel 92 is aligned with second panel 112.

Magnets or ferrous materials inserted into channels 26 of frame members 10 are attracted by ferrous materials or magnets inserted into first channel 100 and second channel 110, in order to hold light boxes 80c and 80d in place.

10

Extrusion 90 in Figs 10 and 11, has been cut at an angle of 45 degrees, so that it may be joined at a mitre, in the same way as shown in Fig. 2 for frame member 10.

As shown in Figs 12 and 17, double-sided extrusion 90 can achieve an illuminated
15 assembly with light boxes on both sides. Because of the low profile - front edges 98 and 118 are only 2 mm wide in this embodiment - the graphics at the front of each light box are virtually frameless.

The magnet shown in Figures 13 to 15 is designed to be inserted in a channel of frame
20 member 10 or a channel of an extrusion and does not require access via an end of the extrusion. In the illustrated embodiment, magnet 130 is in the shape of a parallelogram, having parallel sides 132 and 134, and 136 and 138. Sides 132 and 134 are at an acute angle to sides 136 and 138. As may be seen in Fig. 14, central part 140 of magnet 130 is thicker to assist in retention in a channel. Magnet 130 may be inserted in the channel
25 mouth, being sized to fit between returns or nibs which narrow the channel opening. Once inserted, an allen key or similar tool may be inserted in central aperture 142 to rotate magnet 130 in situ, to the position indicated by the arrows in Fig. 15. In this position, parallel sides 132 and 134 are aligned with the channel sides and central part 140 wedges against the nibs or returns, to retain magnet 130 in the rotated position.

30

In Fig. 16, magnet 150 is in the form of a disc.

The same configuration may be used for the ferrous material if desired.

It will be appreciated by one skilled in the art that magnets may be used to facilitate mounting of a framed light box onto an extrusion, be it single or double sided. The number and type of magnets used may be dictated by the size and weight of the light box.

5

Ferrous material, including iron and steel, may be used in the frame member, with magnets being used in the extrusion. This can be reversed, with magnets being used in the frame member and ferrous material in the extrusion. In another embodiment, each of the frame member and the extrusion may have a mix of magnets and ferrous material, in each case
10 being arranged so that the desired attachment takes place.

Orientalional terms used in the specification and claims such as vertical, horizontal, top, bottom, upper and lower are to be interpreted as relational and are based on the premise that the component, item, article, apparatus, device or instrument will usually be
15 considered in a particular orientation.

It will be appreciated by those skilled in the art that many modifications and variations may be made to the methods of the invention described herein without departing from the spirit and scope of the invention.

Claims

1. A frame member for a display assembly, the frame member including:
- 5 - a side panel having an inside, an outside, a front edge and a rear edge;
and
- a channel on the inside of the side panel, located at the rear edge and having
a channel opening facing to the rear, the channel adapted to receive a
magnet or ferrous material attracted by a magnet.
- 10
2. The frame member of claim 1, which includes a nib on the inside of the panel,
located at the front edge.
3. An extrusion for a display assembly having a frame member as claimed in claim 1,
15 the extrusion including:
- a side panel having an inside, an outside, a front edge and a rear edge; and
- a channel on the inside of the panel and having a channel opening facing to
the front, the channel adapted to receive ferrous material attracted by a
magnet, or a magnet.
- 20
4. An extrusion for a display assembly having a frame member as claimed in claim 1,
the extrusion including:
- a first side panel having an inside, an outside, a front edge and a rear edge;
- a first channel on the inside of the first panel and having a channel opening
25 facing to the front, the first channel adapted to receive ferrous material
attracted by a magnet, or a magnet;
- a second side panel having an inside, an outside, a front edge and a rear
edge; and
- a second channel on the inside of the second panel and having a channel
30 opening facing to the front, the channel adapted to receive ferrous material
attracted by a magnet, or a magnet;
- the first and second panels being aligned and the second channel being a mirror
image of the first channel.

5. A light box installation, the light box having a frame member as claimed in claim 1 and an extrusion as claimed in any one of claims 2 to 4, wherein the magnet is a parallelogram shape, having a first pair of parallel sides and a second pair of parallel sides, a parallel side of the first pair being at an acute angle to a parallel side of the second pair, the magnet having a central portion of increased thickness and a central aperture.

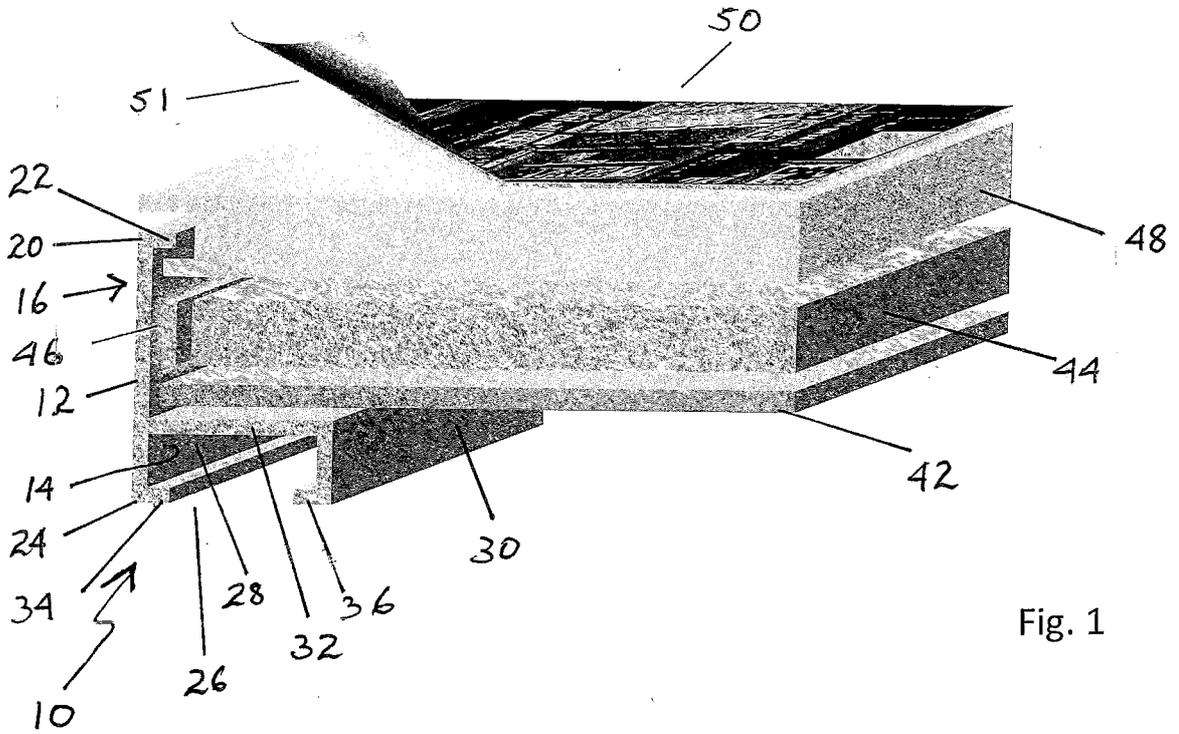


Fig. 1

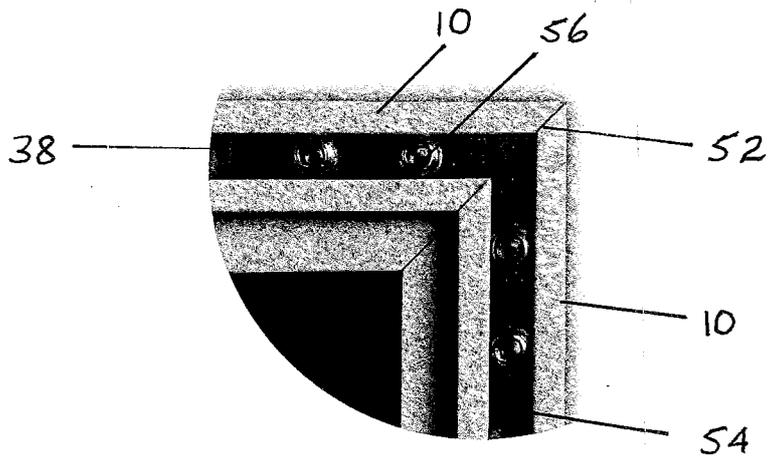


Fig. 2

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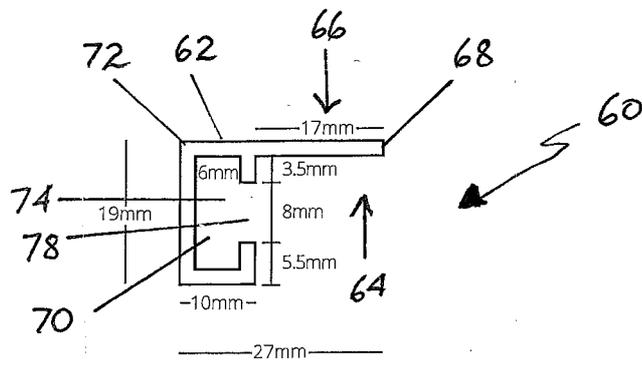


Fig. 3

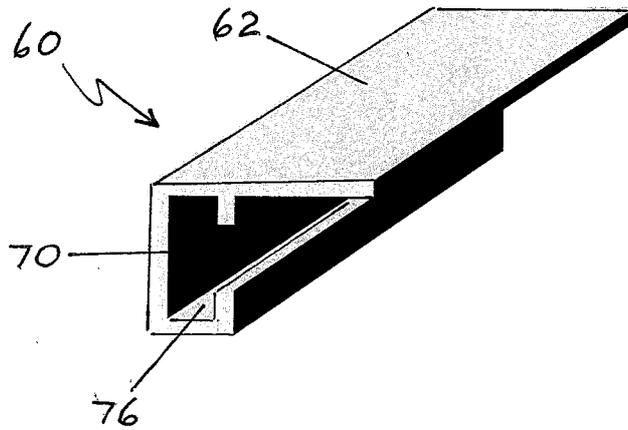


Fig. 4

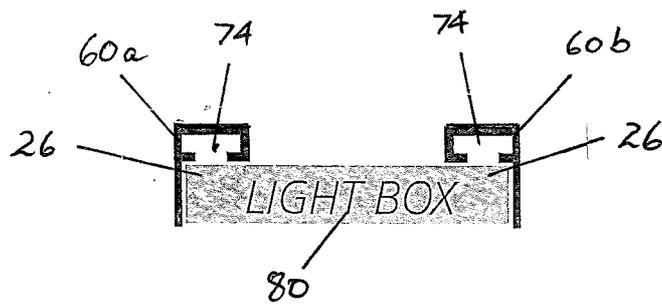


Fig. 5

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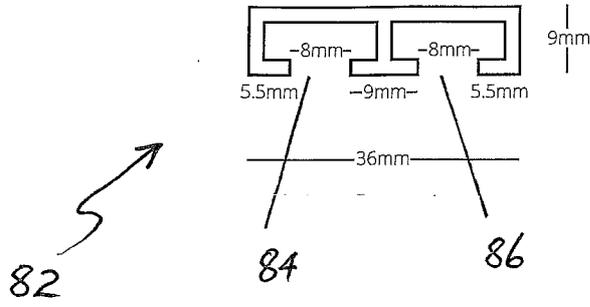


Fig. 6

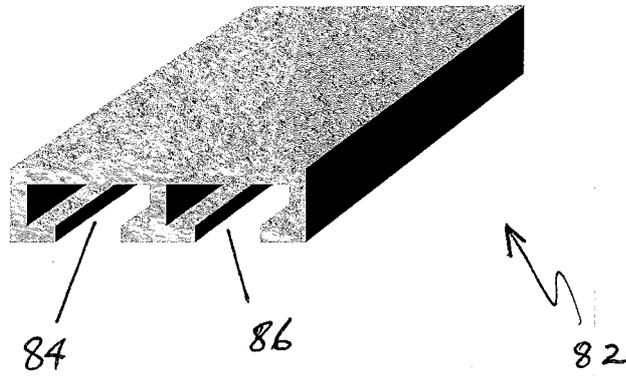


Fig. 7

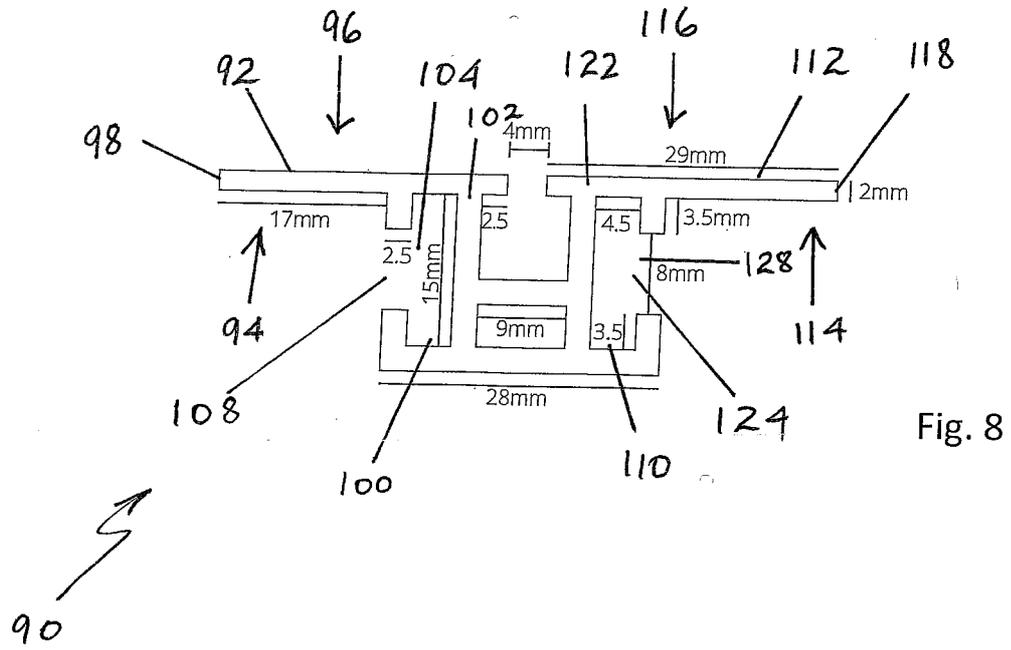


Fig. 8

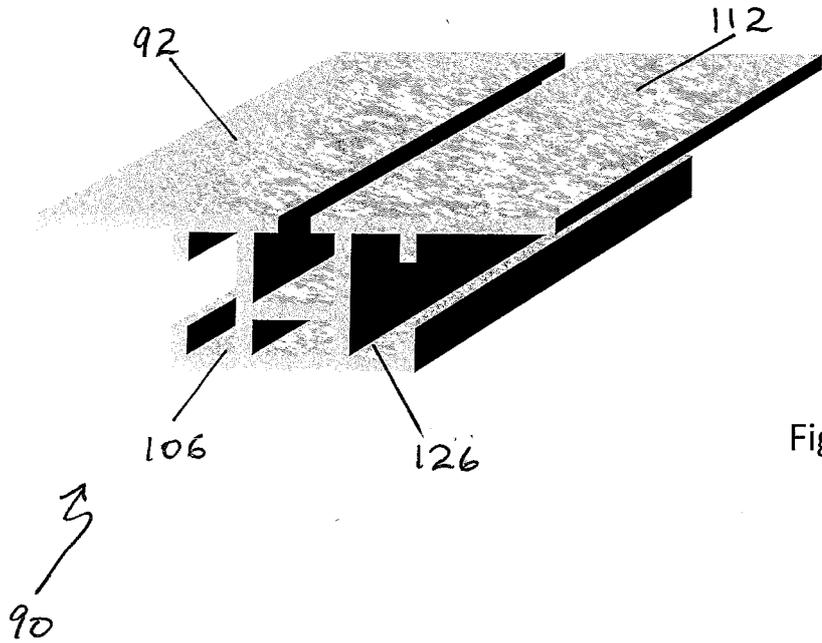


Fig. 9

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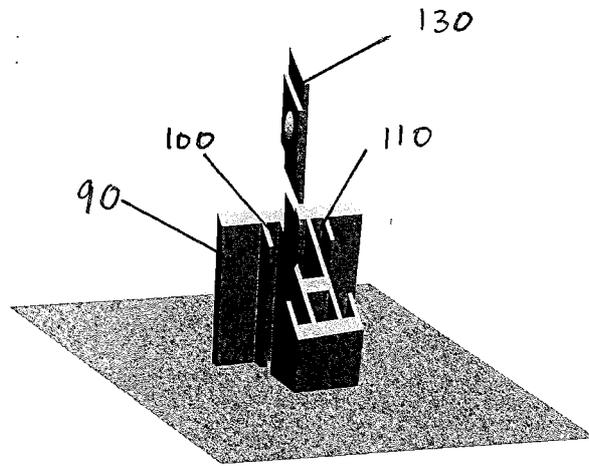


Fig. 10

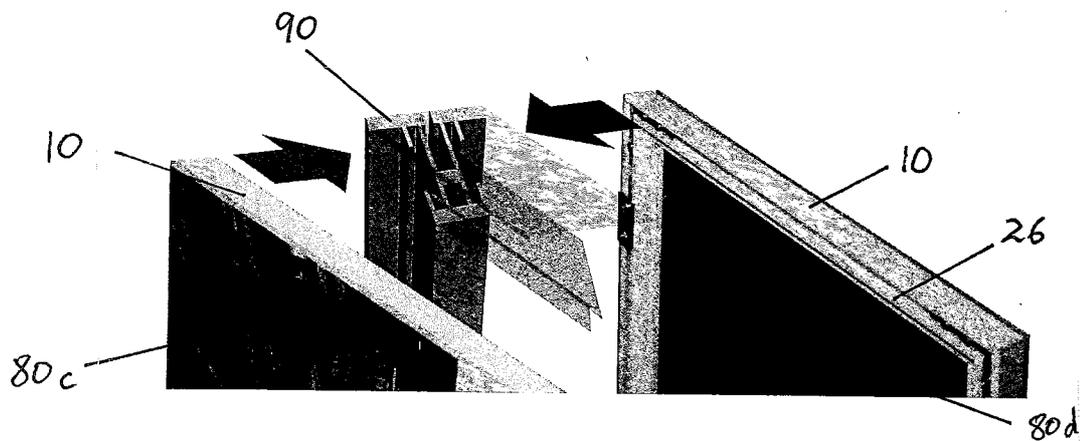


Fig. 11

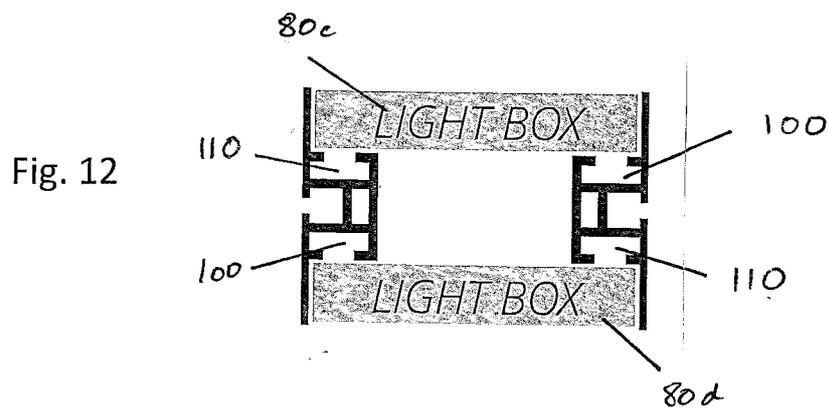


Fig. 12

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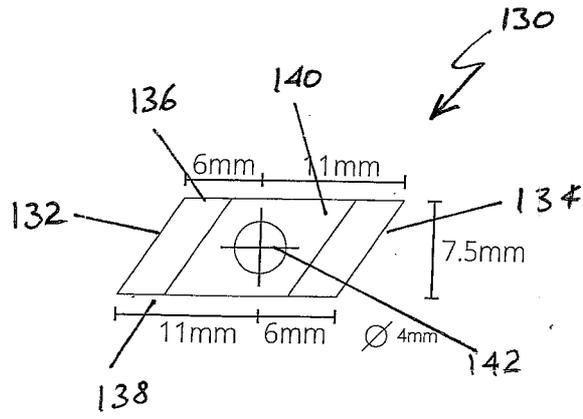


Fig. 13

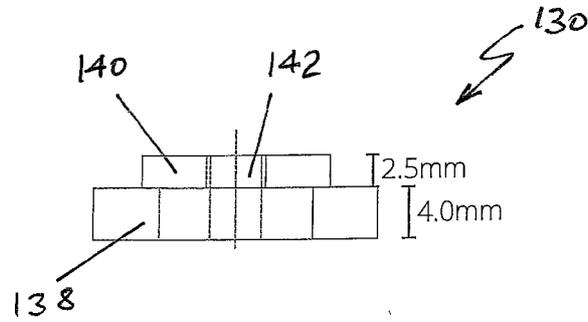


Fig. 14

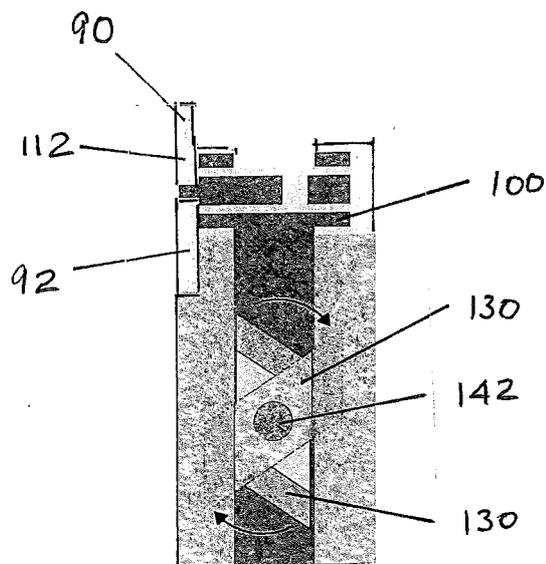


Fig. 15

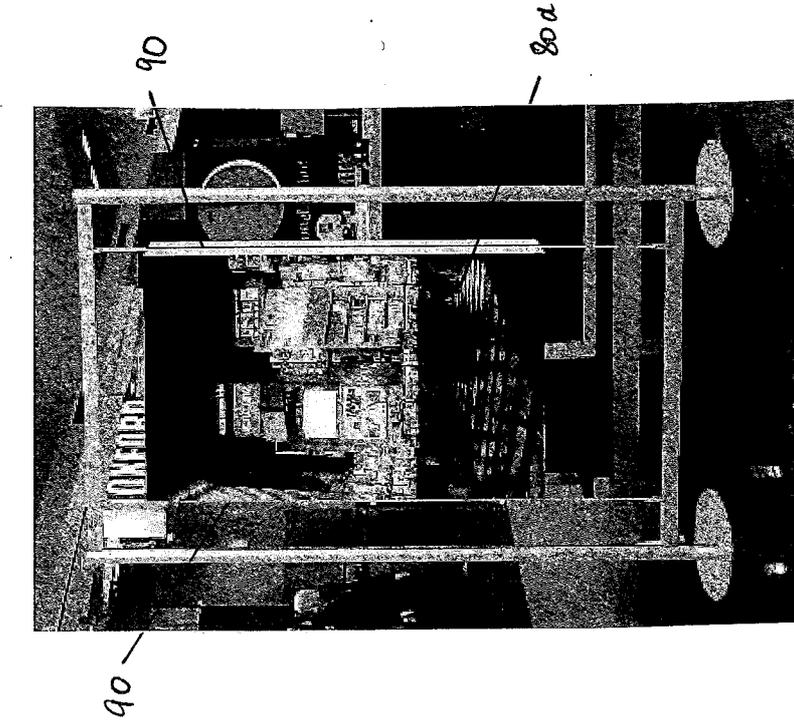


Fig. 16

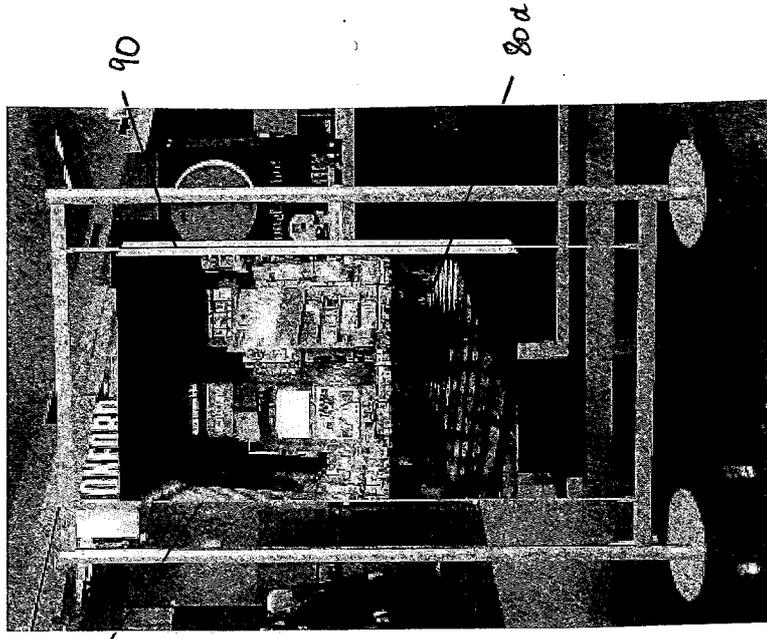


Fig. 17