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## Description

This invention relates to display apparatus.

More particularly, the invention relates to display apparatus of the kind comprising a frame around a rigid backing surface, which frame has a channel-shaped cross-section which serves to grip the outer margin of a semi-rigid sheet placed within the frame and positioned against said backing surface.

In this context, semi-rigid has the meaning that the sheet is relatively easy to flex in one plane but relatively very much harder to flex in two different planes at once. Examples of such semi-rigid sheets are laminated or encapsulated signs as are conventionally used for advertisements, e.g. in Underground stations.

Display apparatus of this kind is known, for example, in US—A—3060606 or US—A—4364192. The aim of the present invention is to improve upon such known display apparatus and the invention is characterised in that the channel-shaped cross-section of the frame is shaped so as to provide three bearing points with which to put a double bend in the outer margin of the sheet.

One of the significant advantages of the display apparatus according to the invention is that it allows for greater security than prior art apparatus of this kind. The rigid backing surface may be a panel to which the frame is attached or it may be the surface on which the frame is mounted.

The semi-rigid sheet may itself contain the display or it may simply be a transparent sheet for sandwiching an ordinary paper display against the rigid backing surface.

In the preferred embodiment, the frame comprises a plurality of assemblable frame members and means is provided for releasably assembling together the frame members, which means is inaccessible after assembly of the frame, and there is preferably also provided means for gaining access to the means for releasably assembling together the frame members to enable disassembly of the frame. Such means may be a special key and may require sacrificing the display sheet itself.

By way of example, embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 illustrates an example of display apparatus according to the invention,

Figure 2 is a detail showing an example of a locking mechanism,

Figure 3 shows an example of a frame section profile,

Figure 4 shows a modified form of the profile of Figure 3,

Figure 5 is a detail showing a corner of an assembled display,

Figures 6 to 9 show further examples of frame section profiles.

The example of display apparatus which can be seen in Figure 1 comprises a four-sided frame 10

to surround and retain a rectangular display 11. After the display 11 has been positioned within three pre-assembled sides 10a, 10b, 10c of the frame, the fourth side 10d of the frame is locked into position. The mechanism for locking the fourth side 10d of the frame into position may take many forms, and one example is seen in Figure 2. At the top left hand corner of the frame, a tongue 12 on the fourth side 10d is engageable with a catch 13 on the first side 10a. There is sufficient play in this connection to allow some relative pivotal movement of the fourth side 10d. This enables the fourth side 10d to be swung downwardly into engagement with the third side 10c. Upon this action, a tongue 14 on the fourth side 10d engages a latch 15 which is pivotally mounted by a pivot 16 to the third side 10c. The latch 15 is biased towards its engaged position by a spring 17. The engagement mechanism is housed within the confines of the frame members so that, once engaged, the frame cannot be released without the use of a special tool. The special tool is, for example, a key which has to be inserted through the display (which is therefore sacrificed) to disengage the latch 15.

An example of a frame section profile is seen in more detail in Figure 3. The frame member is of a basically channel-shaped cross-section, conveniently extruded aluminium, with an interior 20 defined between front and back walls, 21 and 22 respectively, and an end wall 23. The frame member here is attached to a rigid panel 24. The frame member may, however, be attached directly to some other rigid backing surface, e.g. a wall. A semi-rigid sheet 25 is supported against the panel 24, with its margin gripped within the interior 20 of the frame member. The sheet 25 is semi-rigid in the sense that the sheet is relatively easy to flex in one plane, but very much harder to flex in two different planes at once. Examples of semi-rigid sheets are conventional laminated or encapsulated signs which are used e.g. in advertisements in Underground stations. The margin of the sheet 25 is gripped by a three point bearing. As can be seen in Figure 3, the front wall 21 of the frame section has a turned over lip 26. The point of contact between this lip 26 and the sheet 25 forms the first bearing point 27. The back wall 22 of the frame section has a ridge 28, and the point of contact between this ridge 28 and the sheet 25 forms the second bearing point 29. The third bearing point 30 is the point where the outer edge of the sheet 25 contacts the interior face of the outer wall 21 of the frame section. It will be seen that the three point bearing from the frame section puts a double bend in the margin of the sheet. Referring now to Figure 5, it will be seen that in the region of a corner of the frame, as shown, there will be a compound flexure of the sheet, i.e., flexure in two planes at once. Since the sheet is semi-rigid, such compound flexure of the sheet will be effective to grip the sheet firmly. Thus, in use of the frame in a display, the sheet is gripped sufficiently to prevent its being distorted and hence removed from the frame.

In Figure 4 there is seen a modified form of the frame section profile of Figure 3. Here, the interior surface of the end wall 23' is radiused and the ridge 28' on the interior of the back wall 22' is somewhat smaller. The first and second bearing points 27' and 29' are as in Figure 3, but the third bearing point 30' is formed by the point of contact of the outer edge of the sheet 25 with the interior radiused surface of the end wall 23'.

There are seen in Figures 6 to 9 various alternative examples of frame section profile. In Figure 6, the lip 40 is provided as a separate item which is attached, e.g. with dowel pins, to the main frame section. Also seen in the frame section profile of Figure 6 is an additional channel opening 41. This provides useful space behind the display. The space can be used to house back-lighting for the display, for example. More sophisticated devices such as a removal alarm or selective lighting with touch control can also be incorporated in this space. The frame section seen in Figure 7 is extrusion-rolled and those of Figures 8 and 9 are rolled sections.

#### Claims

1. Display apparatus of the kind comprising a frame (10) around a rigid backing surface (24), which frame has a channel-shaped cross-section which serves to grip the outer margin of a semi-rigid sheet (25) placed within the frame and positioned against said backing surface, characterised in that the channel-shaped cross-section of the frame (10) is shaped so as to provide three bearing points with which to put a double bend in the outer margin of the sheet (25).

2. Apparatus as claimed in claim 1 wherein the frame (10) comprises a plurality of assemblable frame members (10a, 10b, 10c, 10d) and means is provided for releasably assembling together the frame members, which means is inaccessible after assembly of the frame.

3. Apparatus as claimed in claim 2 and comprising means for gaining access to the means for releasably assembling together the frame members (10a, 10b, 10c, 10d) to enable disassembly of the frame.

#### Patentansprüche

1. Schaustellungs-Vorrichtung der Art, die einen Rahmen (10) um eine starre Stützfläche

herum (24) aufweist, welcher Rahmen einen rinnenförmigen Querschnitt hat, der dazu dient, den äußeren Rand eines halbstarken Blattes (25) zu halten, das in dem Rahmen angeordnet ist und gegen die Stützfläche in Stellung gebracht ist, dadurch gekennzeichnet, daß der rinnenförmige Querschnitt des Rahmens (10) so geformt ist, daß er drei Lagerpunkte bildet, um damit in dem äußeren Rand des Blatts (25) eine Doppelbiegung zu bilden.

2. Vorrichtung nach Anspruch 1, bei der der Rahmen (10) eine Vielzahl von zusammengesetzten Rahmengliedern (10a, 10b, 10c, 10d) aufweist und Mittel vorgesehen sind, um die Rahmenglieder lösbar zusammenzusetzen, welche Mittel nach dem Zusammensetzen des Rahmens unzugänglich sind.

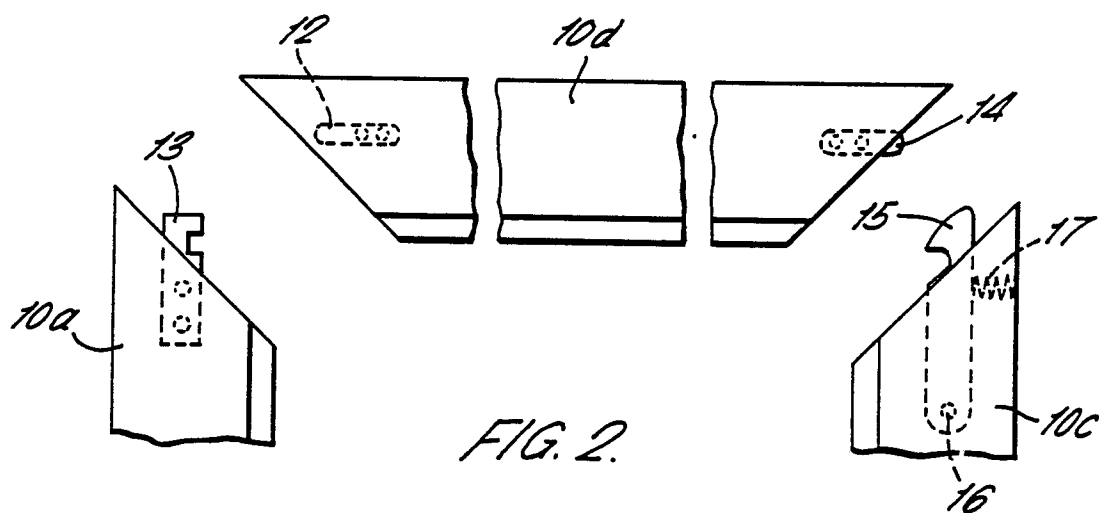
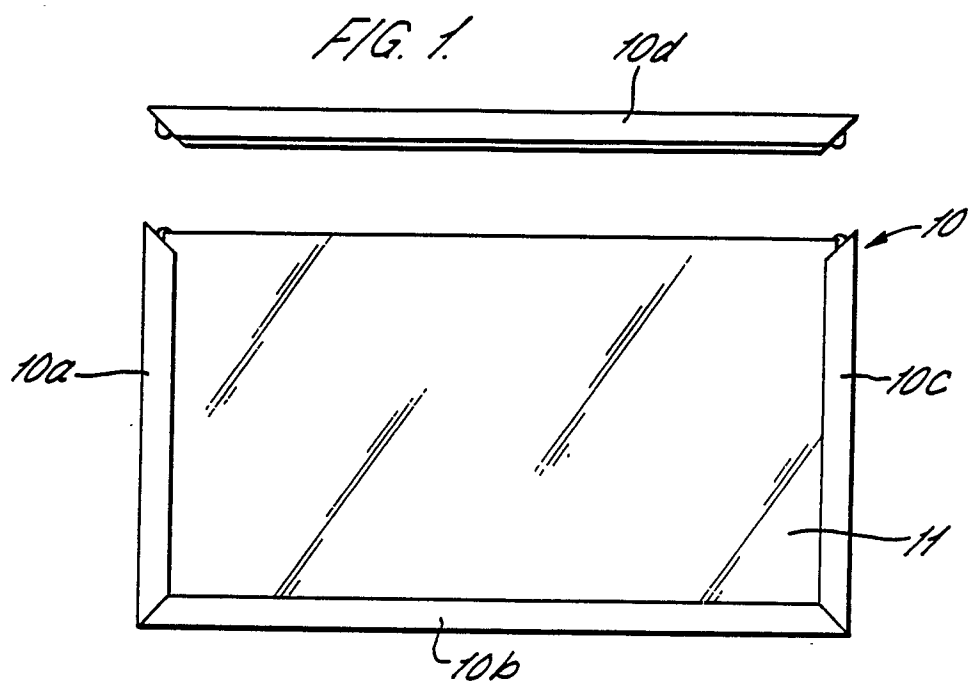
3. Vorrichtung nach Anspruch 2, die Mittel zum Gewinnen von Zugang zu den Mitteln zum lösbaren Zusammensetzen der Rahmenglieder (10a, 10b, 10c, 10d) aufweist, um das Auseinandernehmen des Rahmens zu ermöglichen.

#### Revendications

1. Appareil d'affichage de la sorte comprenant un cadre (10) autour d'une surface rigide qui renforce le dos (24), lequel cadre présente une section transversale en forme de canal qui sert à pincer la marge extérieure d'une feuille semi-rigide (25) placée à l'intérieur du cadre et disposée contre ladite surface qui renforce le dos, caractérisé en ce que la section transversale en forme de canal du cadre (10) est conformée de façon à procurer trois points d'appui par lesquels une double courbure est formée dans la marge extérieure de la feuille (25).

2. Appareil tel que revendiqué à la revendication 1 dans lequel le cadre (10) comprend une pluralité d'éléments de cadre pouvant être assemblés (10a, 10b, 10c, 10d) et un moyen est prévu pour assembler ensemble les éléments du cadre d'une manière telle qu'ils puissent être démontés, lequel moyen est inaccessible après l'assemblage du cadre.

3. Appareil tel que revendiqué à la revendication 2 et comprenant des moyens pour accéder au moyen servant à assembler ensemble les éléments du cadre (10a, 10b, 10c, 10d) d'une manière telle qu'ils puissent être démontés, pour permettre le démontage du cadre.



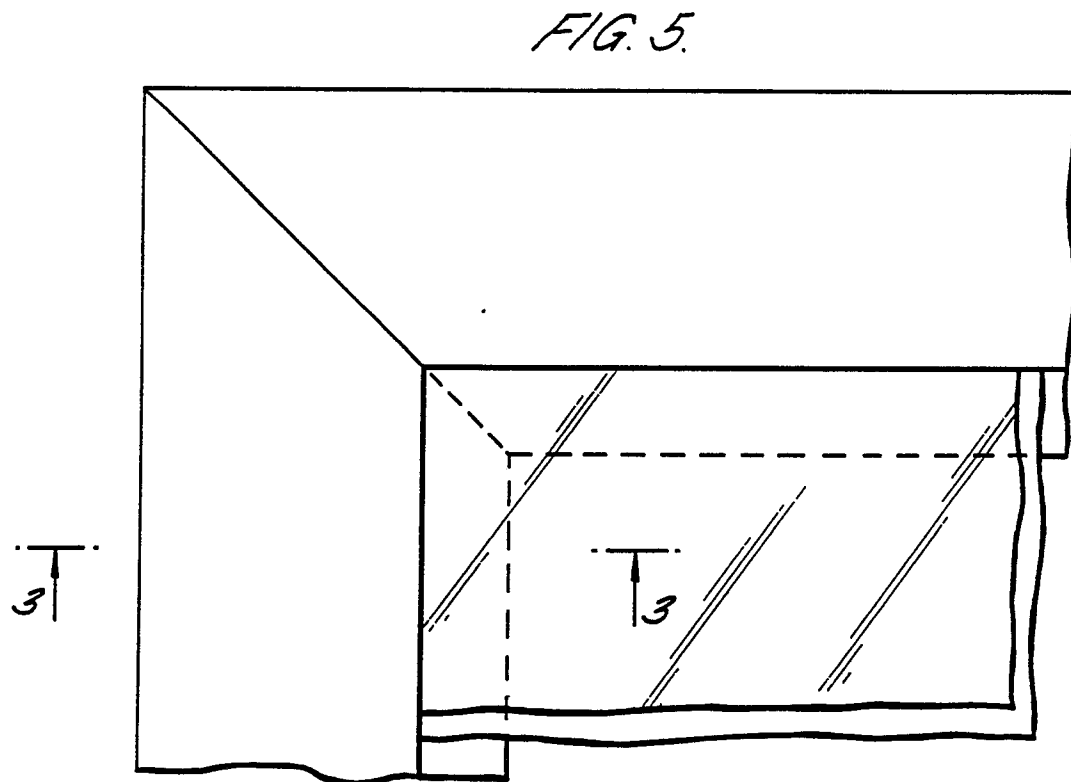
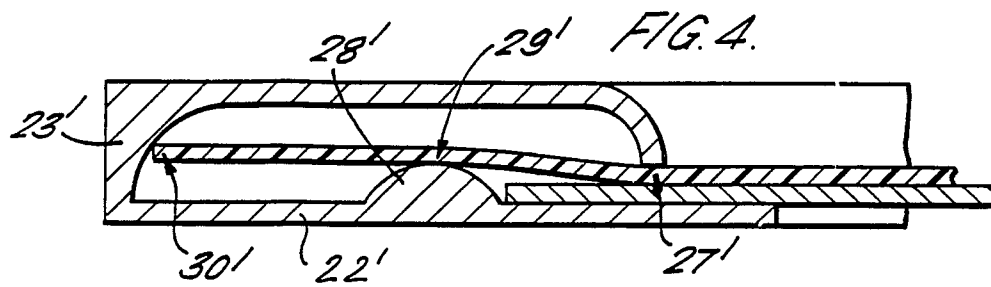
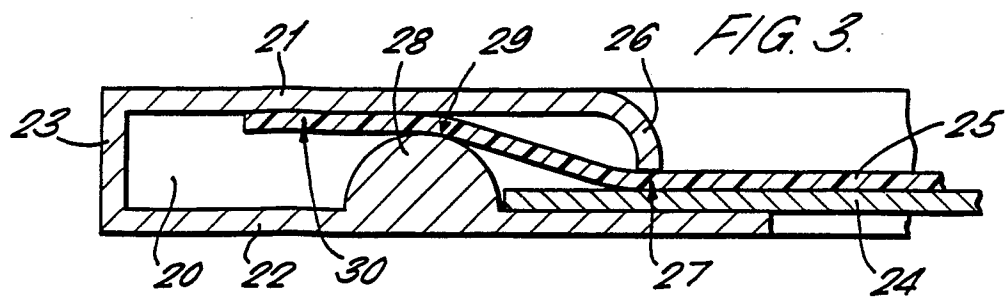


FIG. 6.

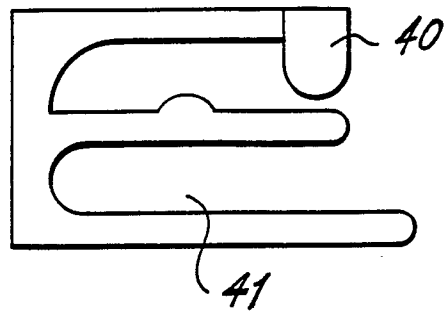


FIG. 7.



FIG. 8.

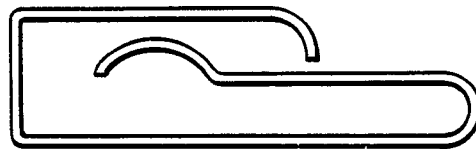


FIG. 9.

