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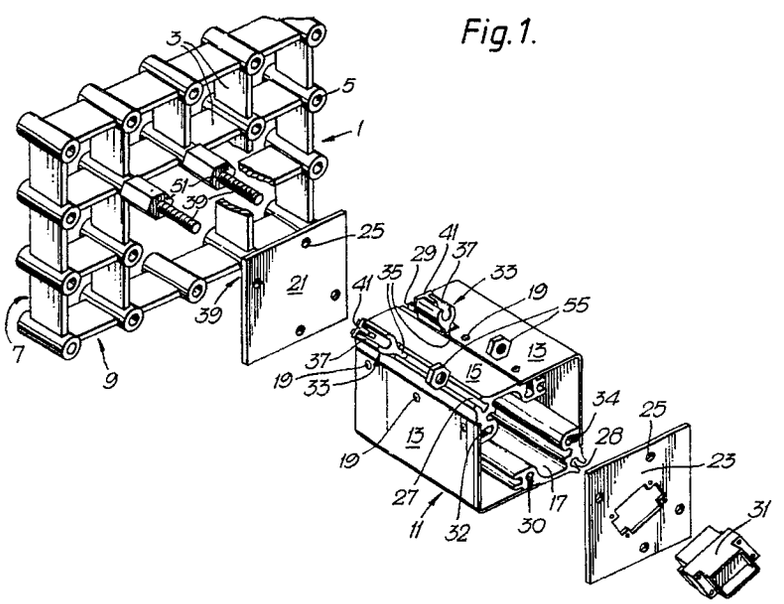
(54) Control and/or display panel arrangements.

(57) A control and/or display panel arrangement comprising: a planar frame structure (1) of grid form which supports on one side (7) thereof a mosaic arrangement of tiles which forms a display; and a plurality of modules (11) supported on the other side (9) of said frame structure (1) each of which provides a further part of said display on said one side (7) and/or a control function associated therewith. Each module (11) is supported on the frame structure (1) by way of at least one pair of first (15 or 17) and second (33, 39, or 33, 43, 39) complementary parts which are fixed one (15 or 17) to the module (11) and the other (33, 39 or 33, 43, 39) to the frame structure (1) and which slidingly engage, thereby to permit selection of the position of the module (11) with respect to the frame structure (1) in a direction perpendicular to the plane of the frame structure (1).

Fig.1.



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CONTROL AND/OR DISPLAY PANEL ARRANGEMENTS

This invention relates to control and/or display panel arrangements.

More particularly the invention relates to such arrangements comprising: a planar frame structure of grid form which supports on one side thereof a mosaic arrangement of tiles which forms a display; and a plurality of modules supported on the other side of said frame structure each of which provides a further part of said display on said one side and/or a control function associated therewith.

In one known arrangement of this kind each module is supported on the frame structure by way of a pair of spring clips fixed to respective sides of the module which bias against parts of the frame structure.

In another known arrangement of this kind each module is supported on the frame structure by way of a bolt carried by the module which clamps a part of the frame structure between it and a front face of the module.

Both of these known arrangements suffer from the disadvantage that the selection of more than one position for the module with respect to the frame structure and hence the mosaic tile display in a direction perpendicular to the plane of the frame structure is not straightforwardly possible.

It is an object of the present invention to provide a control and/or display panel arrangement wherein the above disadvantage is overcome.

According to the present invention there is provided a control and/or display panel arrangement comprising: a planar frame structure of grid form which supports on one side thereof a mosaic arrangement of tiles which forms a display; and a plurality of modules supported on the other side of said frame structure each of which provides a further part of said display on said one side and/or a control function associated therewith, characterised in that each module is supported on the frame structure by way of at least one pair of first and second complementary parts which are fixed one to the module and the other to the frame structure and which slidingly engage, thereby to permit selection of the position of the module with respect to the frame structure in a direction perpendicular to the plane of the frame structure.

One arrangement in accordance with the present invention will now be described, by way of example, with reference to the accompanying drawings in which:-

Figure 1 is an exploded isometric view illustrating the construction of a module of the arrangement and a first manner of supporting a module on a frame structure of the arrangement;

Figure 2 is an exploded isometric view illustrating an alternative manner of supporting a module on the frame structure; and

Figure 3 is an end view of several modules supported on the frame structure in the manner of Figure 2.

Referring to the drawings, the arrangement comprises a planar frame structure 1 of regular square grid form, only part of which is shown in each figure. The structure 1 comprises mutually perpendicular planar cross-pieces 3, perpendicular to the plane of the structure at the intersections of which are cylindrical bosses 5 through which threaded holes extend centrally. The frame structure 1 supports on one side 7 a mosaic arrangement of tiles (not shown) which are attached by clips (not shown) and which forms a display, e.g. a mimic diagram of an equipment, in known manner. On its other side 9 the structure 1 supports a plurality of modules 11, only one of which is shown in each of Figures 1 and 2 and several of which are shown in Figure 3. The modules 11 may provide a further part of the display on the side 7 and/or a control function associated therewith.

Referring to Figure 1, each module 11 has a housing of rectangular box form comprising two L-shaped sheet metal covers 13, which are secured at their edges to two L-shaped cross-section metal extrusions 15, 17 by means of screws 19, and two end plates 21, 23 fixed by screws (not shown) passing through holes 25 to the extrusions 15, 17.

Each of the extrusions 15, 17 is shaped to provide an outwardly facing channel 27, 28 which extends along the length of the module housing where two main faces of the box adjoin, and a second outwardly facing channel 29, 30 which extends centrally along a main face of the housing. Each channel 29, 30 is covered for two thirds of its length by the adjacent cover 13 and receives screws 19 along this part of its length. However, for the remainder of its length the channel 29, 30 is exposed, as are the channels 27, 28 along the whole of their length. Each extrusion 15, 17 also includes a further wholly covered channel 32, 34 for receiving screws 19.

Located in the end plate 23 is an electrical connector 31 for external electrical connection of the module 11. The end plate 21 provides a mounting for a further part of the mosaic tile display and/or a control member for a control function provided by the module 11.

A spigot 33 fits slidingly in each of channels 27, 28, 29, each spigot 33 comprising a projection 35 that slidingly engages the channel 27, 28 or 29 and a sleeve portion 37 housing a spring clip 41.

The sleeve portions co-operate with threaded

studs 39 secured in bosses 5 of the frame structure 1 and projecting therefrom.

The module 11 is supported on the frame structure 1 by slotting the sleeve portions 37 of the spigots 33 over the studs 39 on the frame structure 1 until the sleeve portions 37 abut against head portions 51 of the studs 39. In this position, the spring clips 41 engage the thread of the studs 30 so as to hold the module 11. Finally, nuts 55 are screwed onto the ends of the studs 39 to secure the module 11.

Referring now to Figure 2, in an alternative manner of supporting the modules 11 on the frame structure, the threaded studs 39, instead of slotting into sleeve portions 37 of spigots 33, slot into sleeve portions 45 of extension spigots 43, the extension spigots 43 each having two projections 47, 49 one of which fits slidingly into the sleeve portion 37 of the associated spigot 33. In this manner a module 11 may be positioned relative to the frame structure 1 in a direction parallel to the plane of the frame structure in a different manner to that obtained in the Figure 1 arrangement. It will be noted that in the Figure 2 arrangement one (not shown) of the spigots 33 engages a channel 30 in the extrusion 17 instead of the channel 28 in the extrusion 17. In the arrangement of Figure 2 the spring clips 41 are, of course, housed in the sleeve portions 45 of the extension spigots 43, and the extension spigots 43 are secured in the sleeve portions 37 of the associated spigots 33 by fitting tightly therein.

In both the support arrangements shown in Figures 1 and 2, the position of the module 11 relative to the frame structure 1 in a direction perpendicular to the plane of the structure is adjustable by virtue of the sliding arrangement between spigots 33 and channels 27, 28, 29 or 27, 29, 30. When the desired position has been selected for a module it is secured in position by grub screws (not shown) which screw into the relevant channel 27, 28, 29 or 30.

The provision of two projections 47, 49 on each extension spigot 43 allows choice of the position of the threaded stud 39 onto which the sleeve portion 45 of the spigot 43 fits. Similarly the angling of the projections 47, 49 with respect to one another and the sleeve portion 45 provides further flexibility in the use of the extension spigots, as illustrated in Figure 3.

Referring to Figure 3, considering the extension spigots 43A, B, it can be seen that each can be secured to either of two bosses 5A, B, C, D of the frame structure 1, by reversing the extension spigot 43A, B in a direction perpendicular to the plane of the frame structure 1. The same is true for any extension spigot 43 shown in Figure 3 that is secured to a channel 29, 30 which runs along the middle of a side of a module 11.

Considering the extension spigot 43C, it can be seen that this can be secured to any one of three bosses 5E, F, G of the frame structure 1. It can be secured to boss 5F by using branch 49 of the extension spigot 43C rather than branch 47 and to boss 5G by using branch 49 and reversing the extension spigot 43C in a direction perpendicular to the plane of the frame structure 1. The same is true for any extension spigot 43 shown in Figure 3 that is secured to a channel 27, 28 which runs along a length of the module housing where two main faces thereof adjoin.

It will be appreciated whilst in the arrangement described above by way of example the modules are secured to the frame structure by way of threaded studs projecting from the frame structure and sleeve members fixed to the modules, alternative methods may be used in other arrangements according to the invention. For example, such securing could be by way of bolts passing through spigots fixed to the modules and screwing into threaded holes at the bosses of the frame structure.

Claims

1. A control and/or display panel arrangement comprising: a planar frame structure (1) of grid form which supports on one side (7) thereof a mosaic arrangement of tiles which forms a display; and a plurality of modules (11) supported on the other side (9) of said frame structure (1) each of which provides a further part of said display on said one side (7) and/or a control function associated therewith, characterised in that each module (11) is supported on the frame structure (1) by way of at least one pair of first (15 or 17) and second (33, 39 or 33, 43, 39) complementary parts which are fixed one (15 or 17) to the module (11) and the other (33, 39 or 33, 43, 39) to the frame structure (1) and which slidingly engage, thereby to permit selection of the position of the module (11) with respect to the frame structure (1) in a direction perpendicular to the plane of the frame structure (1).

2. An arrangement according to Claim 1 wherein each said first complementary part (15 or 17) comprises an elongate member (15 or 17) having a channel (27 or 28 or 29 or 30) running along its length and each said second complementary part (33, 39 or 33, 43, 39) includes a projection (35) which slidingly engages a respective said channel (27 or 28 or 29 or 30).

3. An arrangement according to Claim 2 wherein each said second complementary part (33, 39 or 33, 43, 39) is fixed to the frame structure (1) at an intersection of crosspieces (3) of the frame struc-

ture (1) and each said first complementary part (15 or 17) is fixed to a module (11).

4. An arrangement according to Claim 3 wherein each said second complementary part (33, 39) further includes a sleeve portion (37) slotted over a threaded stud (39) projecting from an intersection of the frame structure (1) and secured thereto by means of a nut (55).

5. An arrangement according to Claim 4 wherein each said sleeve portion (37) incorporates a spring clip (41) for holding the module (11) up to the frame structure (1) prior to the securing of the sleeve portion (37) to the frame structure (1) by means of a said nut (55).

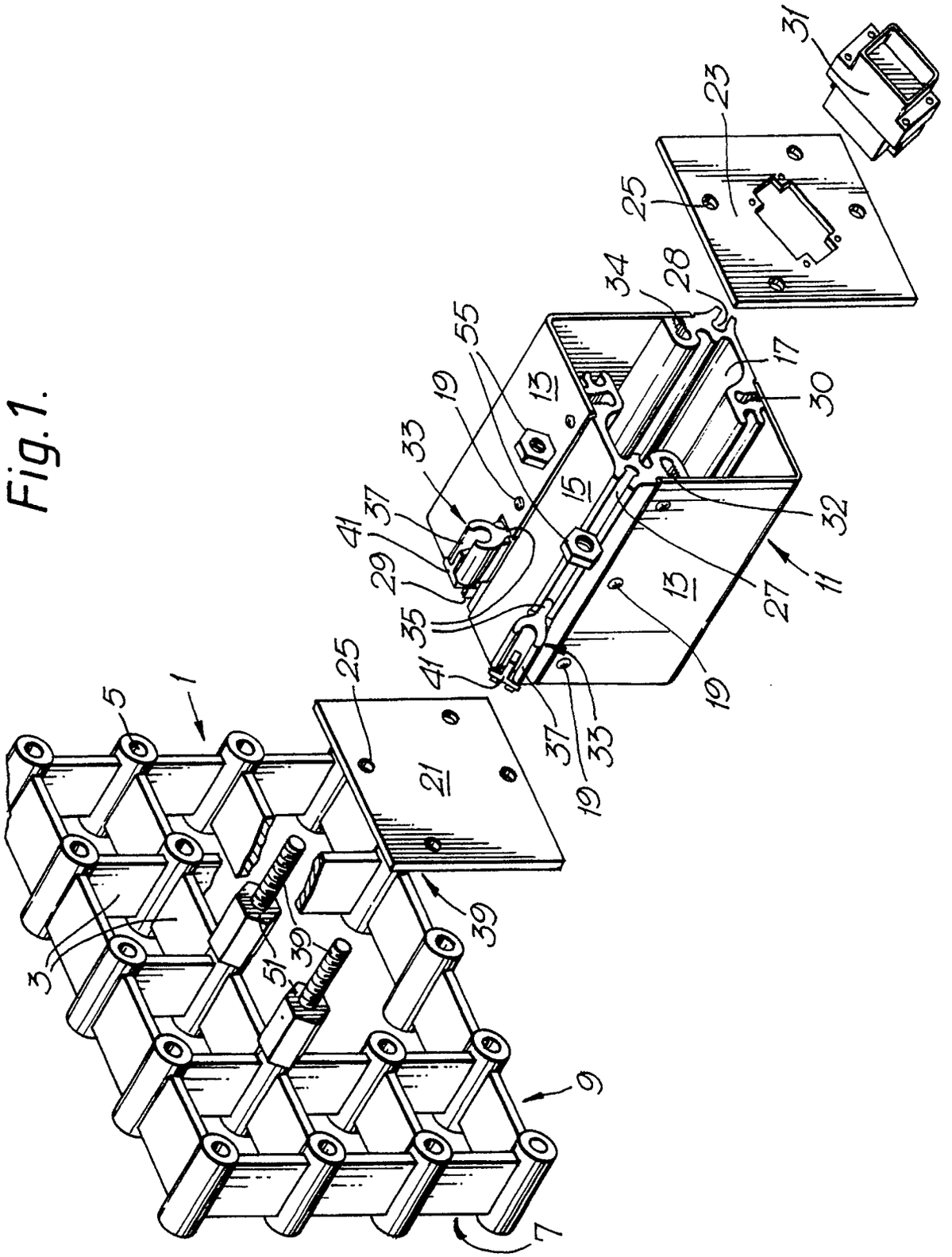
6. An arrangement according to Claim 3 wherein each said second complementary part (33, 43, 39) comprises a first element (33) which slidingly engages said first complementary part (15 or 17) and includes a sleeve portion (37) in which is secured a projection (47 or 49) of a second element (43), the second element (43) including a further sleeve portion (45) slotted over a threaded stud (39) projecting from an intersection of the frame structure (1) and secured thereto by means of a nut (55).

7. An arrangement according to Claim 6 wherein each said further sleeve portion (45) incorporates a spring clip (41) for holding the module (11) up to the frame structure (1) prior to the securing of the second sleeve portion (45) to the frame structure (1) by means of a said nut (55).

8. An arrangement according to any one of the preceding claims wherein each said module (11) has a housing (13, 15, 17) of rectangular box form and said complementary part (15 or 17) fixed to the module (11) forms part of said housing (13, 15,17).

9. An arrangement according to Claim 8 wherein said housing (13, 15, 17) comprises two L-shaped sheet members (13) and two further members (15, 17) which join parallel edges of the sheet members (13), said further members (15, 17) providing said complementary parts (15, 17) fixed to the module (11).

Fig. 1.



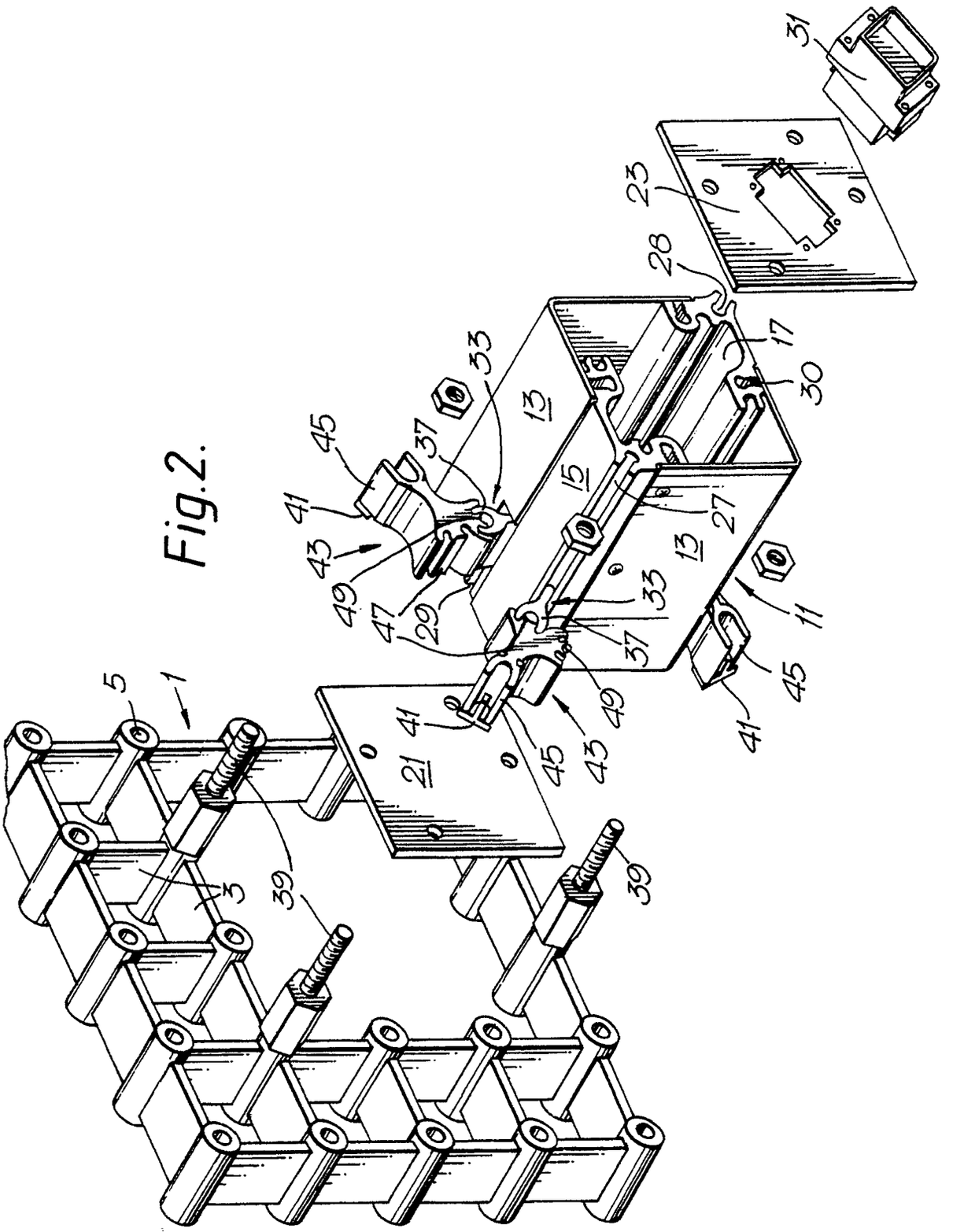


Fig.2.

Fig.3.