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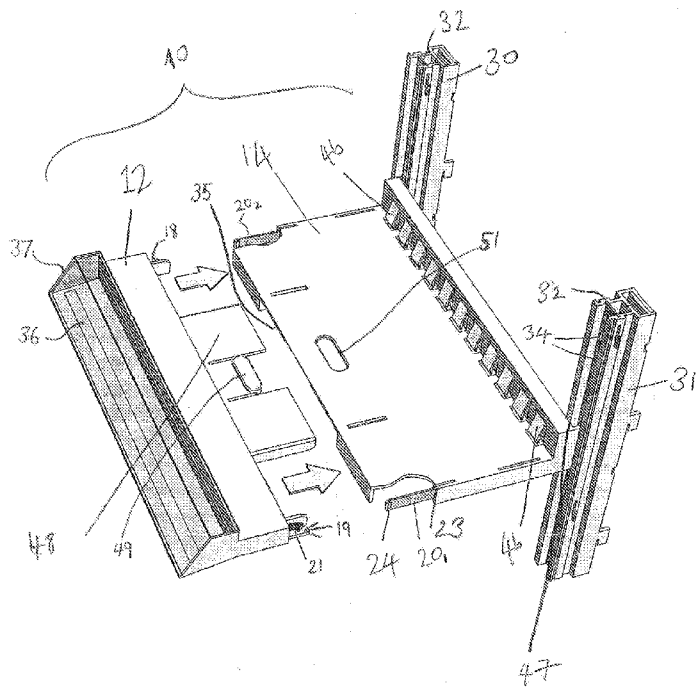


Fig. 1

(57) Abstract: A product display shelf, system and method are disclosed. The product display system includes a shelf unit having a back shelf portion and a front shelf portion. The back shelf portion includes a first connecting element for releasably attaching the back shelf portion to an electrically powered support member, and the front shelf portion includes a second connecting element for releasably attaching the front shelf portion to the back shelf portion. The front shelf portion can also include a body portion and a display panel connected to or integral with the body portion, suitable for displaying information to a user.



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PRODUCT DISPLAY SHELF, SYSTEM AND METHOD

There is disclosed a product display shelf, system and method for displaying products. In particular, but not exclusively, there is disclosed a convenient and safe means for providing a display for consumer goods to be sold in a retail establishment, for example.

BACKGROUND

Many different types of product display shelves are known. Typically these consist of shelving units in the form of product trays supported in some fashion and located at various positions in a shop or other retail establishment. Products are hung from the product trays or supported on an upper surface of a platform of the product trays and customers wishing to purchase the products can remove these from the display.

Displays are also known which include one or more light sources to illuminate parts, or all, of the display matrix. It is known that during an initial installation phase when the display is constructed, the provision of lighting can be an onerous task requiring a user to access parts of the display which may be difficult to reach.

This is very common in the health and beauty arena. In addition there is a situation where multiple brands within a store have to follow certain guidelines with the functionality and operation of display equipment in store. This can lead to a situation where there are common functions and features inherent in a display across multiple brands. To the consumer there is clear point of difference across the brands, achieved by specific design of the front of the shelves and/or features around the shoppable area. This also includes graphics and illumination.

WO2006/067396 discloses an apparatus and method for displaying retail products. The apparatus includes a number of product display trays connected to an upright spur. Each tray includes an electrical connection to electrically connect the tray to the spur.

In a world in which consumer products and branding are frequently being renewed, it would be useful to have a product display system that offers users a more convenient way of changing the visual appearance of the display shelf with minimum effort and cost.

BRIEF SUMMARY OF THE DISCLOSURE

According to a first aspect, there is disclosed a front shelf portion for releasable attachment to a back shelf portion to form a product display shelf, the front shelf portion comprising:

a body portion;

a connecting element for releasably attaching the body portion to a back shelf portion; and

a display panel connected to or integral with the body portion, suitable for displaying information to a user.

5 According to a second aspect, there is disclosed a front shelf portion for releasable attachment to a back shelf portion to form a product display shelf, the front shelf portion comprising:

a body portion;

10 a connecting element for releasably attaching the body portion to a back shelf portion; and

a display panel connected to or integral with the body portion, suitable for displaying information to a user.

According to a third aspect there is disclosed a computer readable medium having a computer executable instructions adapted to cause a 3-D printer to print a shelf unit
15 comprising a back shelf portion and a front shelf portion;

wherein the back shelf portion comprises a first connecting element for releasably attaching the back shelf portion to an electrically powered support member, and the front shelf portion comprises a second connecting element for releasably attaching the front shelf portion to the back shelf portion.

20 Certain embodiments of the present invention provide the advantage that a product display system is provided that enables a user to easily vary the appearance and/or overall design of the display system without needing to completely dismantle the whole product display system. For example, the front shelf portion (only) may be removed from a product display system, the front shelf portion updated in some way, such as a change in visual
25 appearance, and then the front shelf portion reconnected to the back shelf portion.

In addition, the function and/or capacity of the shelf may be varied. For example, the depth of the full shelf may be varied by having a number of interchangeable front shelf portions each having a different depth.

This user friendly system can reduce both expense and time in a retail environment
30 because it is simple to operate and easily changeable.

The product display system may reduce the cost of product display installation in a retail environment because the user need only change the shelf front in order to vary the appearance, function, capacity and/or overall design of the display system, allowing the user the functionality to keep abreast of the changing trends of retail displays.

Certain embodiments of the present invention provide the advantage that a front shelf portion is provided that can be releasably attached to a back shelf portion to form a product display shelf. This provides the potential to more easily vary the appearance and design of the display shelf.

5 BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention are further described hereinafter with reference to the accompanying drawings, in which:

Fig. 1 illustrates a perspective view of a product display system, with a front shelf portion detached from a back shelf portion;

10 Fig.s 2a, 2b and 2c illustrate the product display system in 3 positions;

 Fig. 3a illustrates a side view of a product display system in an unlocked position;

 Fig. 3b illustrates a cross-sectional view of the product display system in an unlocked position;

 Fig. 3c illustrates a side view of the product display system in a locked position;

15 Fig. 3d illustrates a cross-sectional view of the product display system in a locked position;

 Fig. 4a and 4b respectively illustrate a side view of a support bracket in an unlocked position and a locked position;

 Fig. 5 illustrates a number of front shelf portions of a product display system;

20 Fig. 6a illustrates a side view of a shelf holding a product cassette;

 Fig. 6b illustrates a perspective view of the shelf in Fig. 6a;

 Fig. 6c and 6d illustrate the front shelf portion being removed or reconnected to the shelf in Fig. 6a and 6b;

 Fig. 7 illustrates an example of a back shelf portion;

25 Fig. 8a illustrates an example of a front and back shelf portion;

 Fig. 8b illustrates a side view of the shelf portions in Fig. 8a after connection;

 Fig. 8c illustrates another example of a front and back shelf portion;

 Fig. 8d illustrates a side view of the shelf portions in Fig. 8c after connection;

30 Fig. 9a and 9c illustrate a shelf and product cassette in a disassembled and assembled state respectively;

Fig 9b and 9d illustrate another shelf and product cassette in a disassembled and assembled state respectively.

In the drawings like reference numerals refer to like parts.

5 DETAILED DESCRIPTION

Figure 1 shows a product display system having a shelf unit 10 in the form of a product tray (or platform). The shelf unit 10 includes a back shelf portion 14 and a front shelf portion 12. In this example both the front shelf portion and back shelf portion are formed mainly from fire retardant polycarbonate. However it will be appreciated that other materials may be used, e.g. polymers, plastics, composites, or other materials, or mixes thereof.

Together, the back shelf portion and front shelf portion form a shelf for supporting products to be displayed, for example retail items in a retail store. In use, the front shelf portion is brought towards the back shelf portion (as indicated by the arrows) until the shelf portions are connected to form a shelf.

It will be understood that a broad range of products may be supported by the shelves according to various embodiments. For example, retail products of the type purchased by shoppers in a supermarket or department store. The products may be supported on an upper surface of the shelf or may be hung below the shelf.

20

The back shelf portion 14 includes a connecting element, which in this example is conductive hooks 22 (see Fig. 2), for releasably attaching the back shelf portion 14 to elongate, electrically powered support rails 30, 31 (support members). In this example in which there are two support rails, the back shelf portion includes two conductive hooks 25 22₁, 22₂, located at the rear of the back shelf portion and approximately at the two side edges, so as to correspond with the spacing of the support rails. The hooks provide both mechanical attachment and electrical connectivity to the support rails 30, 31. The hooks are spaced to correspond with and slot into recesses 34 formed in the support rails 30, 31. The recesses provide access to an electric cable 32 within the rails 30, 31.

30 The support rails 30,31 are fixable to a wall, stand or other upright member. The electric cable 32 runs along the length of each support rail and is connected to a power source (not shown). The support rails have a number of recesses 34, such that there are numerous different height options for hooking the hooks 22 into.

Upon insertion of the hooks 22₁, 22₂ into the recesses 34, a rear surface 47 of the back shelf portion 14 abuts the support rails 30, 31. The rear surface and the hooks both provide mechanical stability of the back shelf portion 14 when hooked into the support rails 30, 31. The hooks 22 extend from a first end of a conductive bracket 20₁, 20₂. The brackets 20 each extend along a channel 23 in the back shelf portion 14. The channels 23 are provided along the two side edges of the back shelf portion. The brackets 20 are elongate members formed from plated mild steel in this case. This gives the brackets not only electrical conductivity but also mechanical strength. Of course other materials could be used, for example a metal plated with nickel, copper or zinc (which also provide anticorrosion properties).

Optionally the brackets 20 may form an interference fit in the channels 23.

Optionally the brackets 20 may include a clip 27 to prevent the back shelf portion being completely removed from the bracket, as shown in Fig. 7. The clip 27 is an extension of the back shelf portion 14 and may hook into the slot 24 (when the connector portion 18 is not hooked into the slot 24).

The front shelf portion 12 includes a connecting element for releasably attaching the front shelf portion 14 to the back shelf portion 12. The connecting element in this example is a protrusion 48 extending from the rear side of the front shelf portion towards the back shelf portion.

More specifically, the protrusion 48 includes two side portions and a central portion that is shorter than the side portions, and the central portion is resiliently biased such that a protruding button 49 can be inserted or released from a corresponding hole 51 in the back shelf portion 14. The ability to move the central portion, to be inserted or released from the hole 51, comes from the shape of the central portion as well as its material (in this case fire retardant polycarbonate).

The protrusion 48 functions so as to slot into a corresponding void area 35 in the underside of the back shelf portion when the front shelf portion is moved in the direction of the arrows, and thereby connect the front shelf portion with the back shelf portion. It will be appreciated that other designs of the protrusion are possible that will achieve this function.

The protrusion 48 in the front shelf portion 12 also acts as a cantilever to help the back shelf portion 14 support the weight of the front shelf portion 12 when they are connected.

As mentioned above, the back shelf portion 14 includes conductive brackets 20₁,20₂ each having a hook 22 at one end thereof. At the other end of the conductive brackets 20₁,20₂, there is a slot 24 for receiving a corresponding connection in the front shelf portion. This provides a further point of connection with the front shelf portion.

- 5 The front shelf portion 12 includes two connector portions 18, which are in some ways similar to the brackets 20. The connector portions 18 are also conductive, of phosphor bronze in this example, and each extend along a channel 19 in the front shelf portion. The channels 19 are provided along the two side edges of the front shelf portion.

10 An end of each connector portion 18 is folded so as to form a generally triangular shaped protrusion 21 facing laterally outwards (seen more clearly in Fig. 4a). The connector portions 18 are configured to engage with the slot 24 in the brackets 20 of the back shelf portion 14. The ends of the connector portions 18 are configured as a sprung element so that as the front shelf portion 12 is moved towards the back shelf portion 14, the protrusion 21 urges against the bracket 20 until the triangular protrusion 21 of the connector 18
15 locates the slot 24, and engages with the slot 24.

At the other end of the connector portions 18 is wiring (not shown), electrically connecting the connectors 18 with a strip of LED lights 36 in the front shelf portion so that the lights 36 can be powered.

- 20 The connector portions 18 provide an electrical connection point for electrically connecting the front shelf portion 12 to the support rails 30,31 via the back portion 14, because the bracket 20 is electrically conductive and is electrically connected to the cable 32 in the support rails 30,31.

- 25 To release the front shelf portion from the back shelf portion, a user can press down on the protruding button 49, so that the button 49 no longer lies within the hole 51, and pull the front portion away from the back shelf portion.

Also, when the user pulls the front shelf portion away from the back shelf portion, the connector portion 18 will release from the slot 24, because the triangular protrusion 21 of
30 the connector portion 18 will be forced out of the slot.

In this example the front shelf portion 12 includes a moveable flap member 37 located on the front face of the front shelf portion 12. The flap member 37 is attached to the front shelf portion at points along an upper surface 38 and pivots about the attachment points. This

allows a user to insert a sheet behind the flap member, the sheet having a chosen or predetermined logo or branding image on.

The flap member 37 in this example is transparent and so the logo or branding image can be seen by customers at the front of the shelf 10. Also, the flap member opens up to allow access to the LED light strip 36 in case access is required. The transparent flap member and sheet are located in close vicinity to, approximately adjacent to, the LED light strip 36. Therefore when the lights are turned on the lights will backlight the sheet, increasing the visual impact and intensity of the logo or branding image on the sheet to any customer.

10 In this example, the product display shelf 10 is used to hold product cassettes 70 (as shown in Fig. 6a to 6d. The cassettes are a convenient way to hold a number of products at once, and are releasably attached to the display shelf. The display shelf 10 has features to enable the cassettes to be attached to the shelf as described below.

The front shelf portion 12 has an elongate ridge 44 located along a front edge region of the front shelf portion (as shown in Fig. 4). A product cassette may be provided with a complementary recess to receive the ridge 44. A number of projecting resiliently sprung wedges 46 are provided along a rear edge region of the back shelf portion 14. Each projecting sprung wedge is formed from a partial cut-out of the back shelf portion 14. The cut-out is located in a plane perpendicular to the shelf's upper surface. The face of the wedge 46 is at an angle greater than 90 degrees to the plane of the shelf's upper surface.

With this arrangement a suitably sized product cassette may be inserted and held snugly between the ridge 44 of the front shelf portion 12 and the sprung wedge 46 of the back shelf portion 14. The ridge 44 and the projecting sprung wedge 46 cooperate to maintain the product cassette on the shelf unit 10.

25 The product cassette may have any suitable design to hold products that are to be displayed.

Alternatively, in other examples a product cassette may be sized so as to form a push-fit or an interference fit in the shelf unit 10 (optionally without the ridge 44 and/or wedges 46 being necessary).

30 In another example, either a ridge or valley may be formed in the shelf's upper surface of the back shelf portion 14, extending laterally along the width of the shelf surface and protruding upwards or downwards. A product cassette (or a plurality of cassettes) may then be provided that has either a corresponding recess to accommodate the ridge, or a ridge accommodated by the valley, extending laterally across a downward facing surface of the cassette. Each formation is shaped so that the product cassette can be push fitted

onto the product display shelf. For example, a valley 25 formed in the shelf's upper surface of the back shelf portion 14 is shown in Fig. 6a and 6b. The product cassette 70 has a corresponding ridge 26 to fit into the valley 25. As shown in Fig. 6a the valley 25 and ridge 26 have a particular angled edge to help locate the cassette 70 by resting the front portion of the cassette on the lip 45 and then lowering the rear portion of the cassette towards the wedges 46 (Fig. 6b).

A benefit of locating the ridge on the back shelf portion 14 is that the product cassettes are anchored to the back shelf portion 14 independently of the front shelf portion 12. Therefore, a user may be able to change the front shelf portion without having to remove all of the merchandise cassettes prior to changing the shelf front (as shown in Figs. 6c and 6d).

Figure 2a shows the product display shelf 10 unattached to the support rails 30, 31. Fig. 2b shows the product display shelf hooked into elongate support rails 30, 31, but not secured into the support rails 30, 31. Fig. 2c shows the product display shelf secured into the support rails. As described above, the brackets 20 have a first end having a hook 22 to slot into recesses in the support rails 30, 31.

Figs. 3a and 3b respectively show a side view and sectional view of the product display shelf 10 hooked into elongate support rails 30, 31, but not secured into the support rails 30, 31. In these figures there is also no power connection to the front shelf portion 12 because the connector portion 18 is not engaged with the bracket 20.

Figs. 3c and 3d respectively show a side view and sectional view of the product display shelf 10 secured into the support rails 30, 31. In these figures there is also a power connection to the front shelf portion 12 because the connector portion 18 is engaged with the bracket 20.

The back shelf portion 14 is provided with lugs 13. The lugs 13 contribute to a mechanical locking feature between the back shelf portion 14 of the shelf unit 10. In the secured or locked position (Fig. 2c, 3c and 3d), the lugs 13 are pushed into the recesses 34 of the support rails 30, 31 and therefore inhibit the removal of the hooks 22 of the brackets 20 from the support rails 30, 31. The lugs 13 consequently contribute to the mechanical locking feature because the hooks 24 of the brackets 20 are inhibited from vertical movement in the recesses 34 relative to the support rail because the recesses 34 are blocked by the lugs 13. Therefore, the hooks 24 cannot be moved vertically relative to the support rail because of the lugs 13.

During placement of the shelf unit 10 on the support rails 30, 31, the hooks 22 of the brackets 20 are inserted into the support rails 30, 31 by first locating the recesses 34 in the support rails and moving the hooks 22 relative to the recesses 34 to slot the brackets 20 into place as shown in Figs. 2a, 2b, 3a and 3b. In a first position or unlocked position
5 (Figs. 2b, 3a, 3b), the electrically conductive brackets 20 are electrically connected to a power cable 32 within the support rails 30, 31.

To lock the shelf unit 10, the back shelf portion 14 is pushed towards the support rails 30, 31 so that the back shelf portion 14 slides relative to the brackets 20 into a second position, or locked position (Fig. 2c, 3c, 3d). The back shelf portion 14 of the shelf unit 10
10 abuts the support rails 30, 31 with the back shelf portion 14 forming a mechanical lock by inhibiting vertical movement of the hooks 22 of the brackets 20 relative to the recesses 34 of the support rails 30, 31.

Conveniently, in use, when a user pushes the front shelf portion 12 towards the back shelf portion 14 to engage the protrusion 48 with the hole 35, and the protrusion 21 with the slot
15 24, this action also pushes the lugs 13 into the recesses 34. It will be appreciated though that these actions may be made separately or in other combinations.

In the unlocked position shown in Fig. 2b, 3a, 3b, the hooks 22 of the brackets 20 are engaged in recesses 34, thus forming electrical connectivity with the power rail 32. In the unlocked position, no electrical connectivity is provided to the front shelf portion 12.
20 There is electrical connectivity from the power rails 34 to the brackets 20 because the brackets are hooked into the support rails 30, 31 mechanically, and the hooks 22 make an electrical connection to the power rails 34 thus forming an electrical connection between the brackets 20 and the support rails 30, 31. In this arrangement, since there is no complete electrical circuit, electricity will not flow in the front shelf portion 12.

25 The shelf unit 10 is locked by pushing the front shelf portion 12 toward the support rails 30, 31. The bracket 20 electrically connects to the connector portion 18 of the front shelf portion 12 (Fig. 3c, 3d).

Locking the shelf unit 10 therefore provides dual functionality. Firstly, locking the shelf unit
30 10 mechanically inhibits the shelf unit 10 from removal from the support rails 30, 31. Secondly, locking the shelf unit 10 electrically connects the front shelf portion, to the back shelf portion 14, to the power rail 32.

The shelf unit 10 may be unlocked from the locked position by sliding the back shelf portion 14 relative to the brackets 20, such that the lugs 13 withdraw from the recesses 34.
35 The hooks 22 of the brackets 20 are then able to be moved in a vertical direction relative to

the support rails 30, 31 to disengage the bracket 20 from the recesses 34 in support rails 30, 31.

The lugs 13 are sized to substantially fill the recess 34 after the hook 22 has been inserted into the recess 34 of the support rail. The recess 34 is rectangular shaped in this example.
5 However, the person skilled will appreciate that the hook and recess must be adapted to complement each other and form both a stable mechanical connection, and an electrical connection between the brackets 20 and the support rails 30, 31.

The back shelf portion 14 extends across a suitable proportion of the shelf to ensure safe
10 carrying of the required merchandise on the shelf. This is engineered using an interrelationship of the weight of the product, the second moment of area for the configuration and the mechanical properties of the materials and the interlocking features on the shelf and on the uprights. In this example the bracket extends almost to the front of the back shelf portion.

15

Figure 4(a) and 4(b) show cut-out views of the back shelf portion 14, the releasably attachable front shelf portion 12, and the bracket 20 in unlocked and locked positions respectively.

Figure 4(a) shows the back shelf portion 14 in the unlocked position and thus the bracket
20 20 does not protrude sufficiently into the back shelf portion 14 to form an electrical connection to the back shelf portion 14.

The front shelf portion 12 is provided with a connector portion 18 to help releasably attach the front shelf portion 12 to the back shelf portion 13. In this example, the front shelf portion 12 has an open channel 19, adapted to slot into a corresponding recess 42 in the
25 back shelf portion 14.

Figure 4(b) shows the back shelf portion 14 connected to the front shelf portion 12. When the front and back shelf portions are connected, the protrusion 21 couples with the slot 24 of the bracket 20. This locked position thereby provides electrical connectivity between the front shelf portion and the back shelf portion 14.

30

With the above-described product display arrangement, a user can easily change the front shelf portion 12 to accommodate new branding and/or different shelf sizing. This may be achieved without having to move products from the back shelf portion 14 and/or without

having to remove the entire shelf system from the support rail. This may be achieved without having to rewire a lighting system, if provided.

As such, the visual appearance of a product display shelf can be easily changed.

Also, by using a back shelf portion that remains in place and variable front shelf portions of different depths, the depth of the full product display shelf may be easily changed, for occasions when different sized products are to be displayed or different sized product cartridges are to be added.

The ability to quickly and easily change the entire product display apparatus by varying the front shelf portion 12 enables the user to inexpensively recreate new styles of shelving systems at a minimal cost. The convenience of being able to leave product cassettes and other products on the back shelf portion 14 is convenient.

In the event that shelf branding must be changed, only the front shelf portion need be changed. Therefore, the product display shelf provides a convenient, cost-effective system for meeting business needs in a rapidly changing commercial environment.

With the above-described locking arrangement the user is provided with immediate feedback regarding whether the product display shelf 10 is mechanically locked into the support rails 30, 31 because power is delivered to the back shelf portion and a light for example would inform the user that the back shelf portion 10 was safely locked into place in the support rails 30, 31.

A positive 30 and a negative 31 support rail are provided in the example described above. Typically, the power rail is provided with an AC or DC power supply such as a 12 volt power supply. Other embodiments may include a support rail having positive and a negative power rails 34 within the same support rail.

By providing a shelf that has two positions, a simple and safe means of delivering power to the shelf is provided. Locking the shelf provides dual functionality in that it mechanically secures the shelf into the support rail and locking the shelf forms electrical connectivity. The arrangement provides a product display shelf that is simple, safe and quick to install.

A product display apparatus may be manufactured by injection moulding or 3-D printing of the plastic components, for example.

Various modifications to the detailed designs as described above are possible.

For example, the front shelf portion need not include a LED light strip. As a further variation, with or without lighting on the front shelf portion, the back shelf portion may include lighting.

5 Figs. 8a and 8b show an example where the back shelf portion 14 includes a LED light strip 28. The light strip 28 is located towards the front of the back shelf portion. In this way, a front shelf portion 12 may be connected to the back shelf portion and the light from the strip 28 will illuminate the display panel 33. The display panel 33 may include a front flap member under which imagery may be provided similar to that described previously, or may be another suitable panel (e.g. without a flap).

10 Figs. 8c and 8d show another example, where the back shelf portion 14 includes a LED light strip 28 and the front shelf portion 12 includes a further LED light strip 29.

If used, illuminations means may be provided in various forms including a plurality of lighting elements, a plurality of LEDs, LCDs, or the like.

15 Various specific male-female type connections have been described above in relation to the connections between various combinations of the front and back shelf portions, the rail and the product cassettes. It will be appreciated that any of these connections could be reversed without affecting the functionality of the shelf.

20 The back shelf portion 14 may be provided with alternative detachable shelf front portions 12, e.g. a charger 40 (shown in Fig. 5), to charge a mobile phone or other electrical device while the device is on display.

The back shelf portion may be provided with other marketing devices such as speakers, illuminated cassettes 50, graphic light boxes 60, large span graphic light boxes 62 or liquid crystal display means as shown in Fig. 5.

25 Printed graphics, touch screens and electroluminescent panels may optionally be incorporated into the front shelf portion.

The overall shelf size, in particular, the shelf depth, may be varied easily by changing the depth of the front shelf portion. This is illustrated by the comparative views of Figs. 9a to 9d. Figs. 9a and 9b show a side view of a back shelf portion 14. In Fig. 9a, a relatively larger product cassette 70₁ is to be added to the shelf. A corresponding relatively deeper front shelf portion 12₁ is selected to connect with the back shelf portion 14. Fig. 9c shows the shelf and cassette of Fig. 9a connected together. In Fig. 9b, a relatively smaller product cassette 70₂ is to be added to the shelf. A corresponding relatively shorter (less deep) front shelf portion 12₂ is selected to connect with the back shelf portion 14. Fig. 9d shows the shelf and cassette of Fig. 9b connected together. In this way the shelf size may be easily
35 varied to suit different products to be displayed.

In another embodiment, a single support bracket may be used to support the back shelf portion on a rail (support member). Various other ways to support the back shelf on a support member may be used. Rather than hooks, it is possible to use plugs or other fastening device, or even a permanent attachment, e.g. a weldment or other adhesive.

- 5 Although as described above the front shelf portion is joined with the back shelf portion with a protrusion 48, other attachment means are possible. For example, the brackets and connector portions described above, which also join the front and back portions, may be used alone as the connecting element. Other suitable mechanical connections may be used, e.g. plug and socket type connections, hooks, fasteners or the like.
- 10 In certain embodiments, a lighting element may be positioned within the back shelf portion to effectively backlight a portion of the back shelf portion. A display portion may be provided within the back shelf portion, and the illumination means may be positioned so that the display portion is illuminated.
- 15 It will be clear to a person skilled in the art that features described in relation to any of the embodiments described above can be applicable interchangeably between the different embodiments. The embodiments described above are examples to illustrate various features of the invention.

Throughout the description and claims of this specification, the words “comprise” and
20 “contain” and variations of them mean “including but not limited to”, and they are not intended to (and do not) exclude other moieties, additives, components, integers or steps. Throughout the description and claims of this specification, the singular encompasses the plural unless the context otherwise requires. In particular, where the indefinite article is used, the specification is to be understood as contemplating plurality as well as singularity,
25 unless the context requires otherwise.

Features, integers, characteristics, compounds, chemical moieties or groups described in conjunction with a particular aspect, embodiment or example of the invention are to be understood to be applicable to any other aspect, embodiment or example described herein unless incompatible therewith. All of the features disclosed in this specification (including
30 any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive. The invention is not restricted to the details of any foregoing embodiments. The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any

accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open
5 to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

CLAIMS

1. A product display system comprising:
a shelf unit comprising a back shelf portion and a front shelf portion;
wherein the back shelf portion comprises a first connecting element for releasably
attaching the back shelf portion to an electrically powered support member, and the
front shelf portion comprises a second connecting element for releasably attaching
the front shelf portion to the back shelf portion.
2. A product display system as claimed in claim 1, wherein, in use, the front shelf
portion is electrically connected to the electrically powered support member via the
back shelf portion.
3. A product display system as claimed in claim 1 or 2, further comprising the
electrically powered support member.
4. A product display system as claimed in any of claims 1 to 3 wherein the front shelf
portion includes an illumination element.
5. A product display system as claimed in claim 4 wherein the illumination element is
a light bulb, a light emitting diode, a liquid crystal display device, an electroluminescent
device, a light emitting cell, a light emitting electrochemical cell or an organic light emitting
diode.
6. A product display system as claimed in any preceding claim, wherein the first
connecting element is a hooked member, adapted to be inserted into a complementary
recess in the electrically powered support member.
7. A product display system as claimed in any preceding claim, wherein the second
connecting element is a protruding member, adapted to be insertable into a
complementary recess in the back shelf portion.
8. A product display system as claimed in any of claims 1 to 6 wherein the second
connecting element is a recess adapted for receiving a complementary protruding member
of the back shelf portion.
9. A product display system as claimed in any preceding claim wherein the front shelf
portion further comprises at least one conductive sprung contact member for resiliently
engaging with a corresponding conductive track in the back shelf portion.
10. A product display system as claimed in any of claims 1 to 6 wherein the second
connecting element is a conductive element for engaging with a corresponding conductive
track in the back shelf portion.

11. A front shelf portion for releasable attachment to a back shelf portion to form a product display shelf, the front shelf portion comprising:
- a body portion;
 - a connecting element for releasably attaching the body portion to a back shelf
 - 5 portion; and
 - a display panel connected to or integral with the body portion, suitable for displaying information to a user.
12. A front shelf portion as claimed in claim 11 further comprising an electrical connecting member for electrically connecting the body portion to a power supply
- 10 via the back shelf portion.
13. A front shelf portion as claimed in claim 11, further comprising an illumination element.
14. A front shelf portion as claimed in claim 12 wherein the illumination element is a light bulb, a light emitting diode, a liquid crystal display device, an electroluminescent
- 15 device, a light emitting cell, a light emitting electrochemical cell or an organic light emitting diode.
15. A front shelf portion as claimed in claims 13 or 14 wherein the illumination element is provided as part of the display panel or is provided adjacent to the display panel for illuminating at least a portion of the display panel.
- 20 16. A front shelf portion as claimed in any of claims 11 to 15 wherein the connecting element is a protruding member adapted to be insertable into a complementary recess in the back shelf portion.
17. A front shelf portion as claimed in claim 16 wherein the protruding member is resiliently biased.
- 25 18. A front shelf portion as claimed in any of claims 11 to 15 wherein the connecting element is a recess adapted to receiving a complementary protruding member of the back shelf portion.
19. A front shelf portion as claimed in any of claims 11 to 18 further comprising at least one conductive sprung contact member for resiliently engaging with a corresponding
- 30 conductive track in the back shelf portion.
20. A computer readable medium having a computer executable instructions adapted to cause a 3-D printer to print a shelf unit comprising a back shelf portion and a front shelf portion;

wherein the back shelf portion comprises a first connecting element for releasably attaching the back shelf portion to an electrically powered support member, and the front shelf portion comprises a second connecting element for releasably attaching the front shelf portion to the back shelf portion.

- 5 21. A product display system substantially as hereinbefore described with reference to the accompanying drawings.
22. A front shelf portion substantially as hereinbefore described with reference to the accompanying drawings.

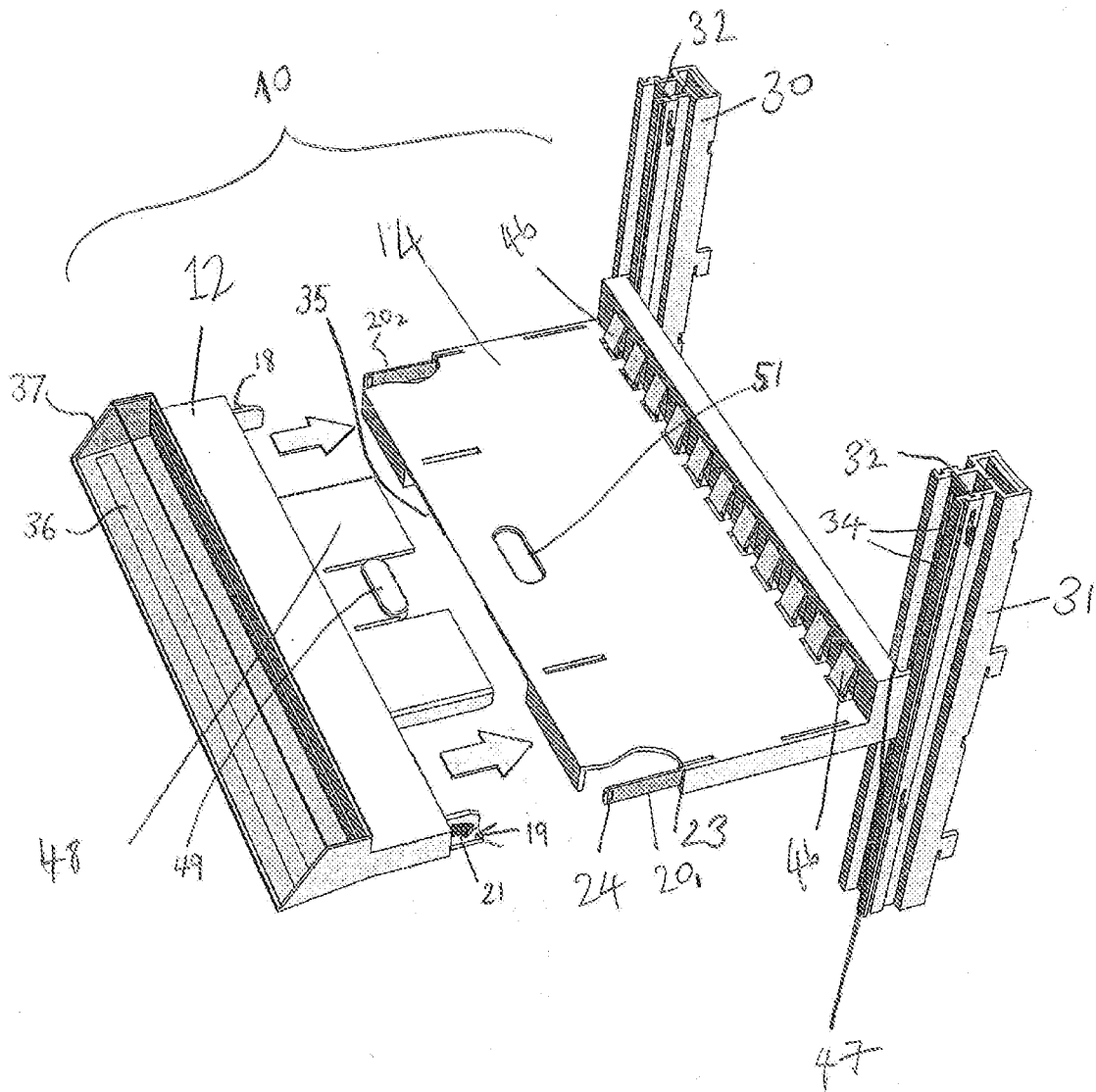
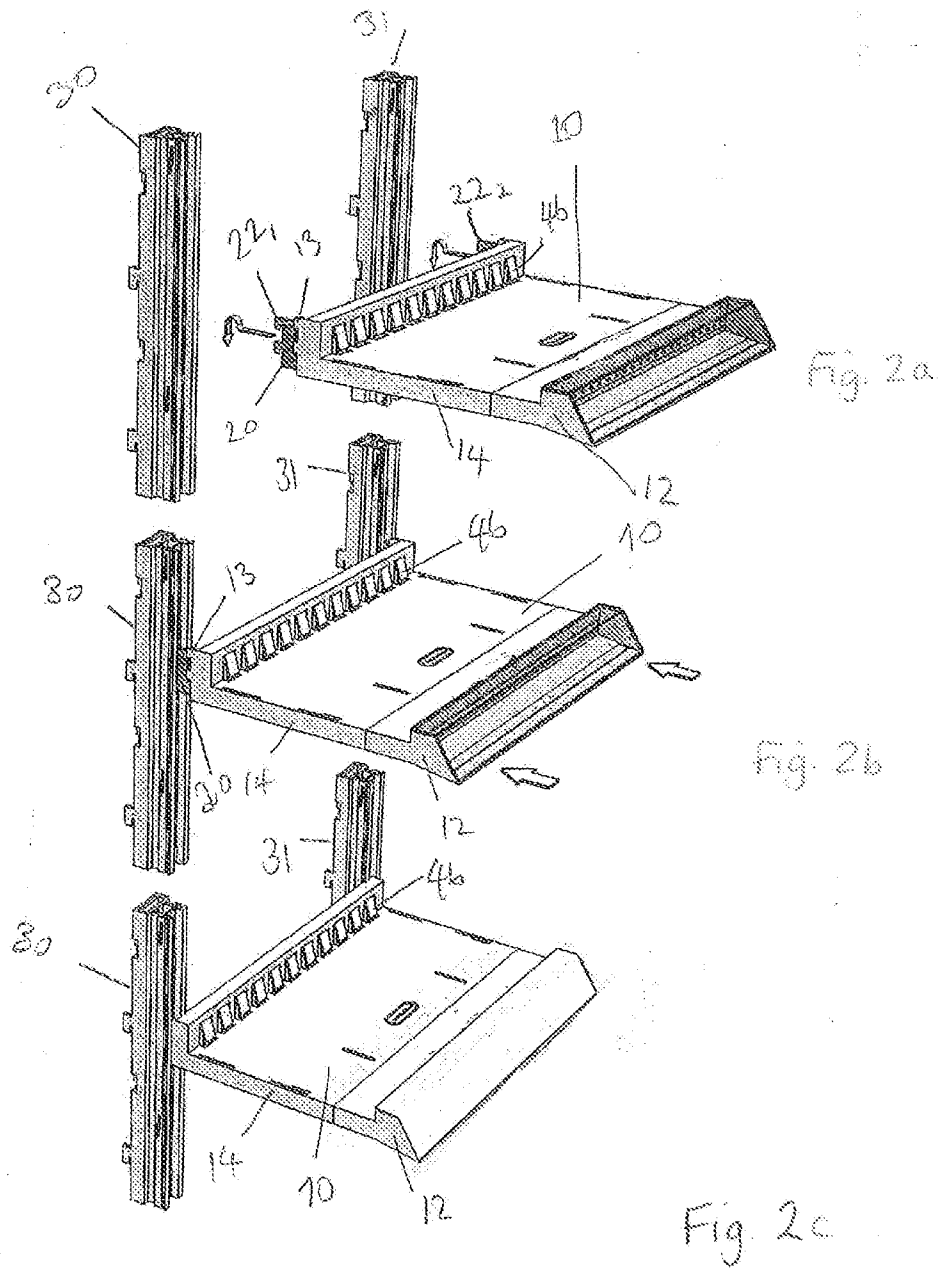
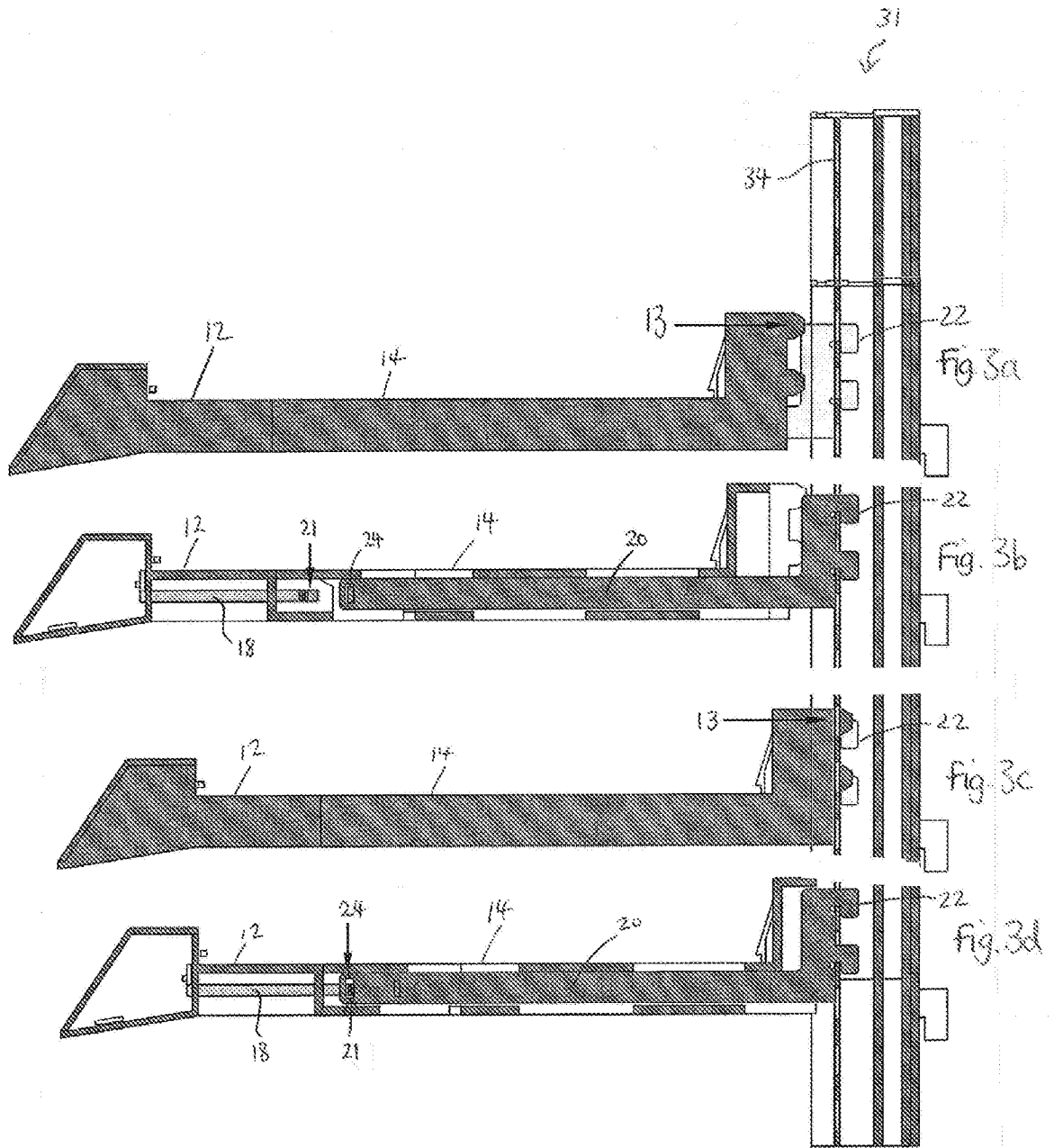
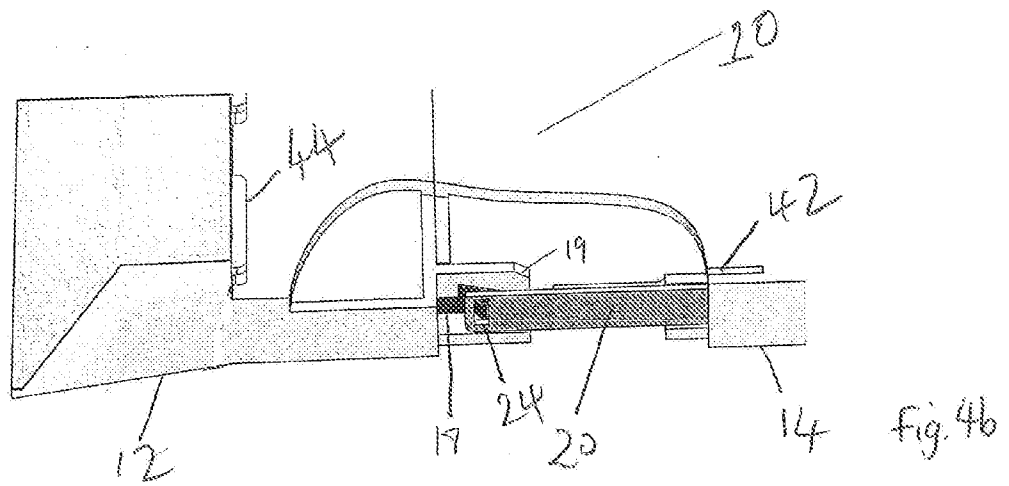
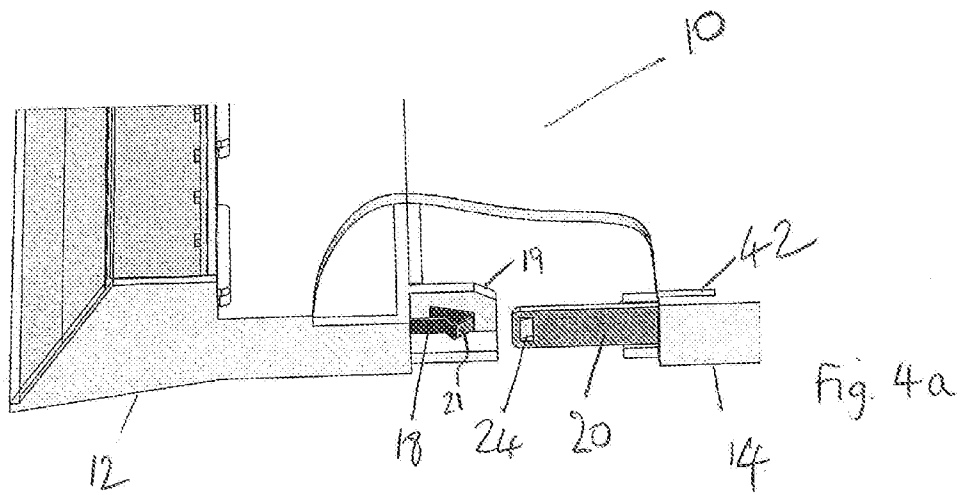


Fig. 1







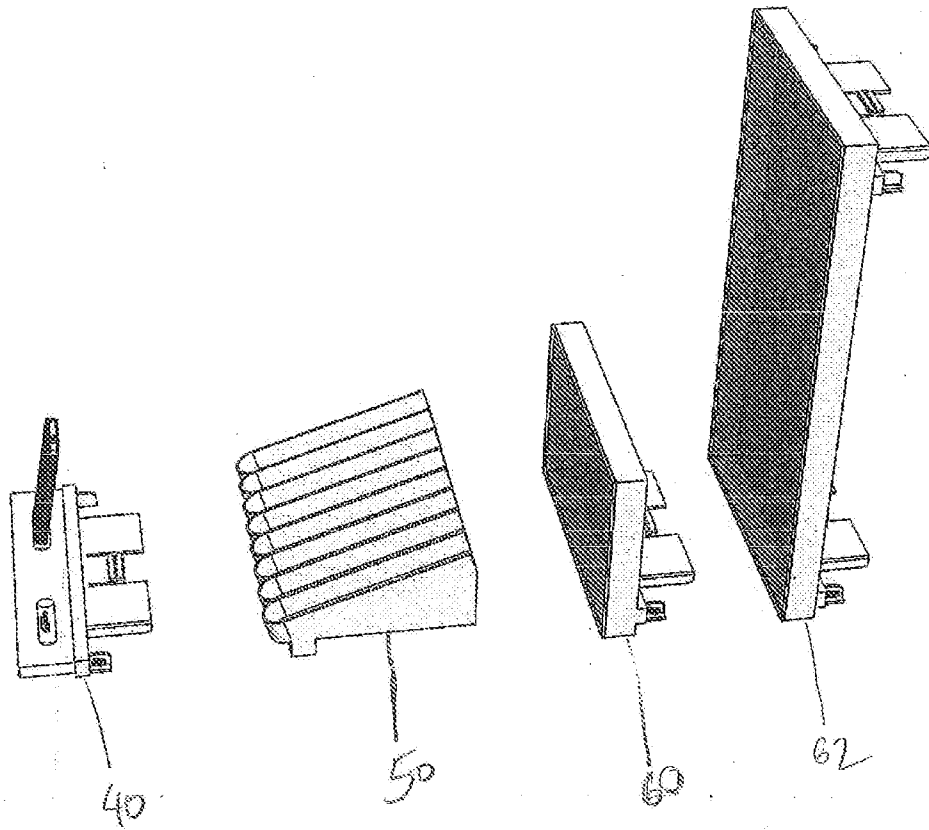
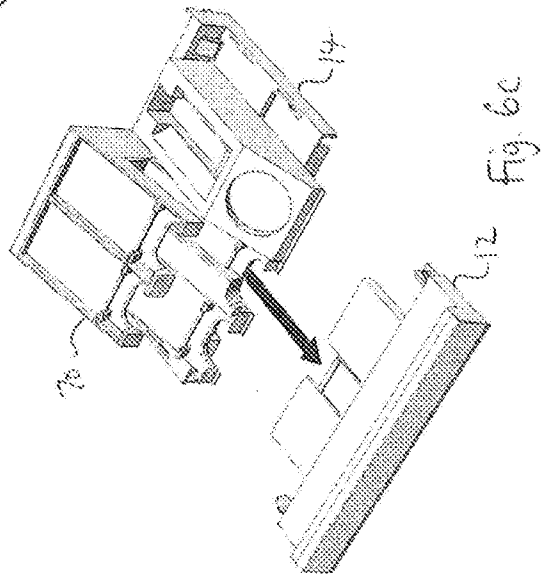
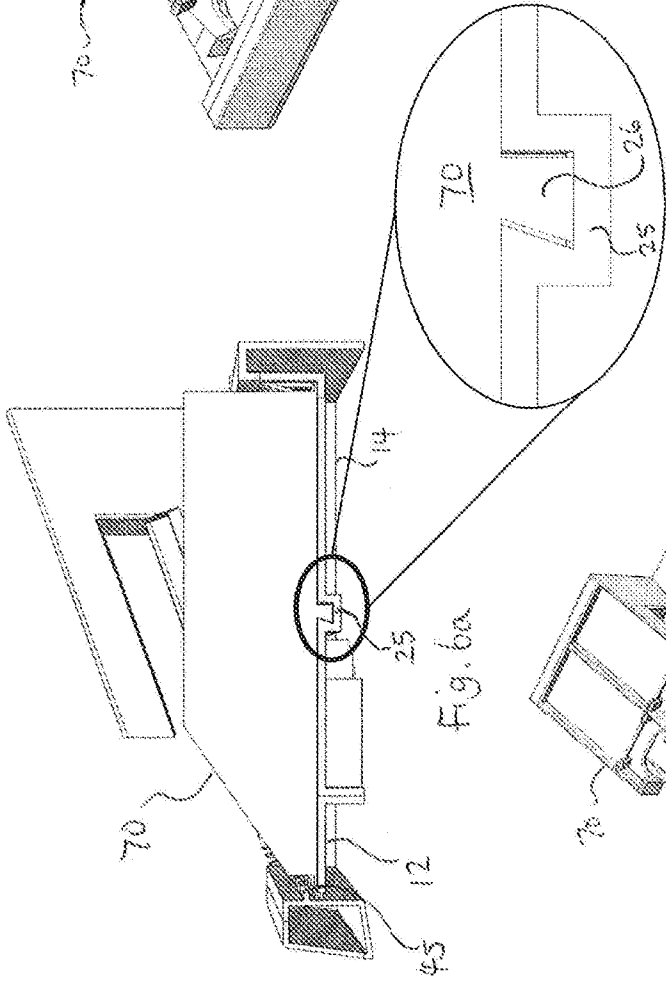
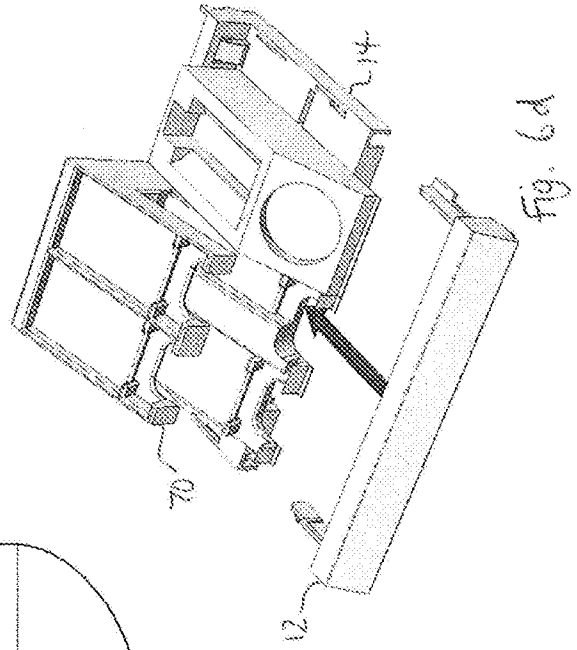
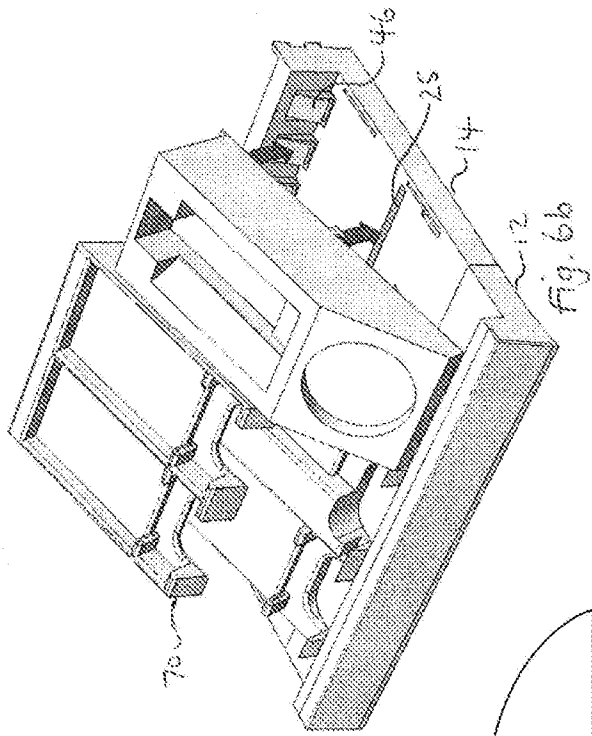
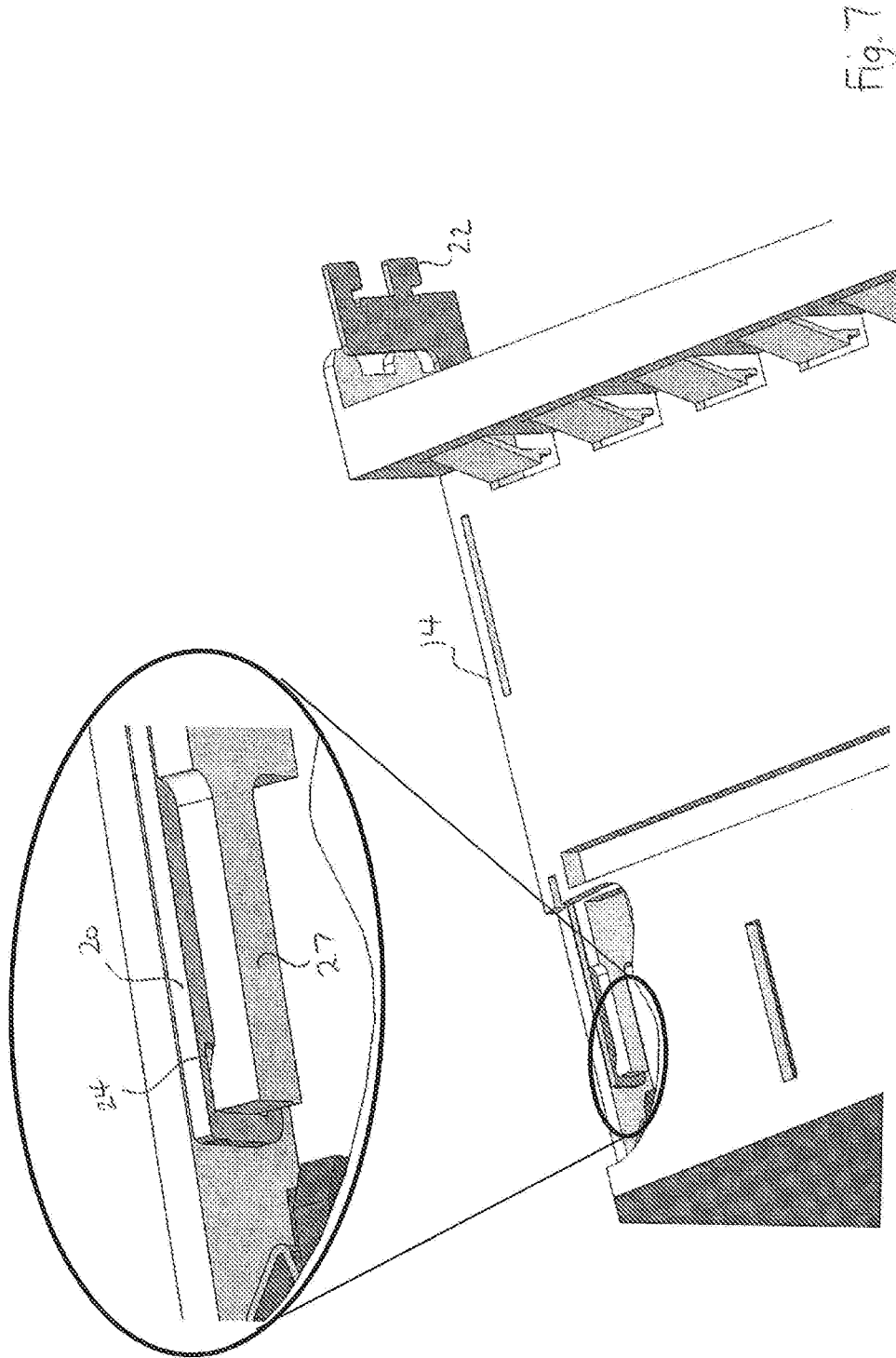


Fig. 5





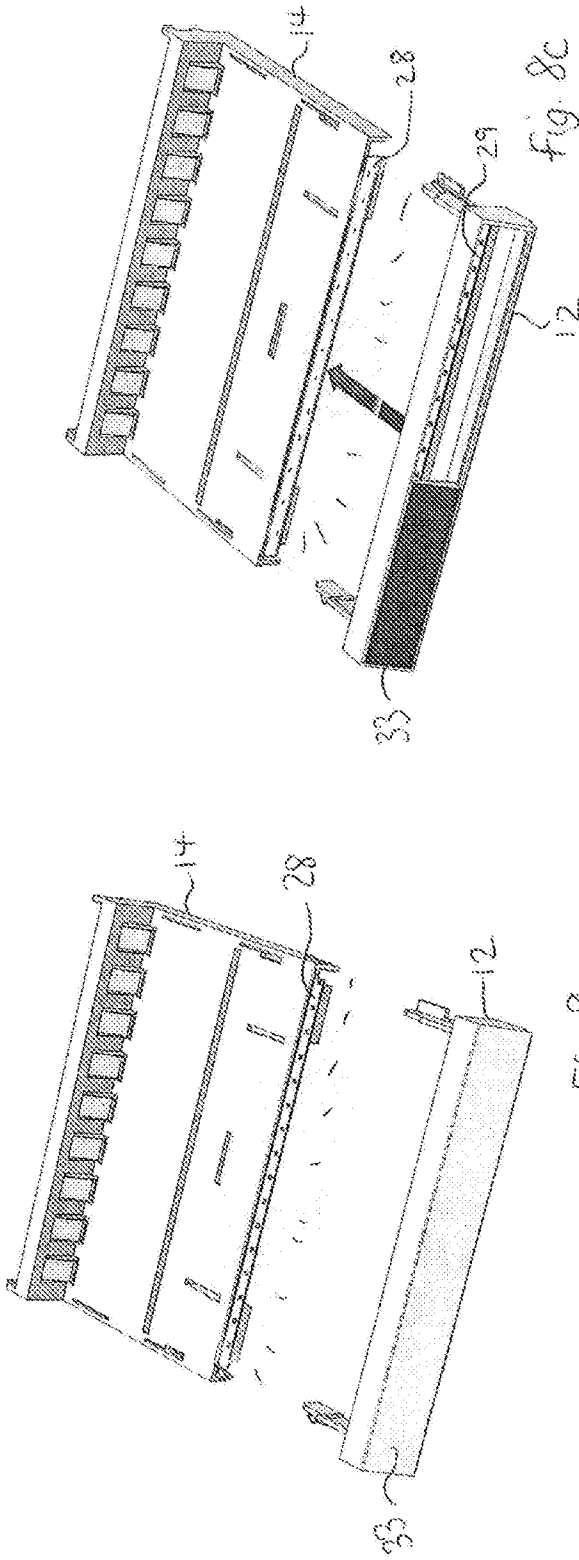


Fig. 8a

Fig. 8c

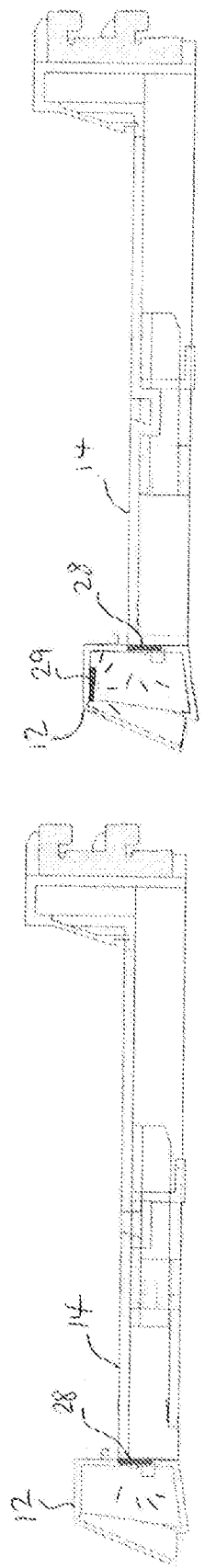


Fig. 8b

Fig. 8d

