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(54) **Modular display shelving system**

(57) The invention relates to a modular display shelving (10) comprising a support element in the form of a panel (11) that extends from a base (12) in a vertical direction (V) generally perpendicular thereto, said panel (11) comprising a plurality of grooves (13) parallel to each other and stretching out in a horizontal direction (H), perpendicular to said vertical direction (V), from one end to the opposite end of the panel (11) ending out at its side edges, said shelving (10) further comprising a plurality of profiled elements (20) mounted in grooves (13) of the panel (11), and a pair of electrical conductors (14, 15) arranged on a rear surface of the panel (11) and respectively connected to the terminals of a transformer (16), a plurality of strips (17; 170) made of a conductive material being respectively connected to one or the other electrical conductor (14, 15) and mounted on the profiled elements (20), the shelving (10) further comprising a plurality of shelves (30) configured to be mounted on said profiled elements (20) of the panel (11), said shelves (30) being provided with one or more lamps (40) and with an electric circuit having a pair of electrical terminals (41, 42) intended to contact said strips (17; 170) upon assembly of a shelf (30) on the profiled elements (20).

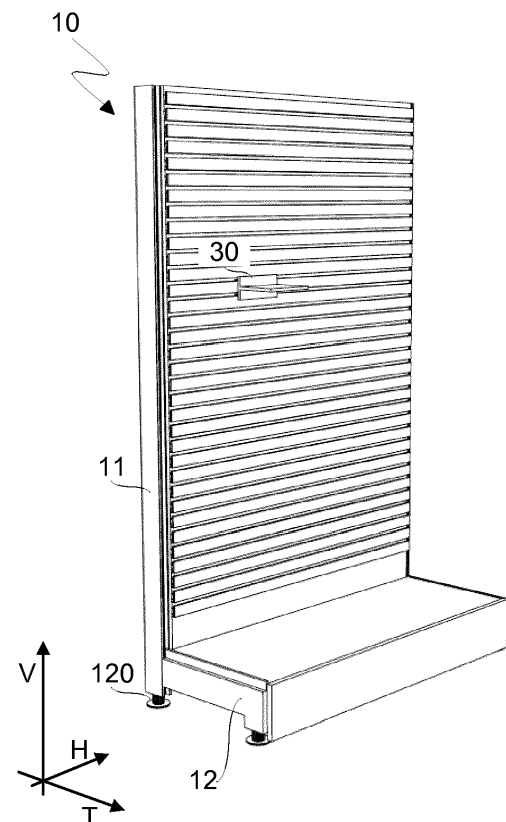


Fig. 1

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Description

[0001] The present invention generally relates to modular shelving systems and in particular to a modular shelving for the display of products, whose shelves may be illuminated.

[0002] In the field of modular shelving systems there are known systems comprising a plurality of supports in the form of uprights and/or panels, as well as one or more shelves mounted on the supports by way of suitable connecting means.

[0003] There are also known electrified modular shelving systems configured so as to allow illumination of the shelves. To this aim, the supports intended to receive the shelves are provided with a pair of electrical conductors that may be fed from the mains through a low-voltage transformer. Each shelf is provided with one or more lamps connected to an electric circuit, whose terminals are arranged at the connecting means of the shelf to the respective support. By mounting a shelf on a support, the electrical terminals respectively contact the electrical conductors present on the support, thus making with them a closed electrical circuit that may be fed from the mains.

[0004] An example of such a modular shelving system is disclosed in the British patent publication GB 2255820 A. In one embodiment of the modular system, the supports are rectangular panels wherein a plurality of parallel grooves are formed and wherein the grooves stretch out in a horizontal direction parallel to the ground. Each groove has a T-shaped cross section and accommodates a hollow channel made of a plastic material. The shape of the hollow channel matches the shape of the groove and the hollow channel protrudes outwards perpendicular to the panel plane thus defining an access for the mounting of a shelf.

[0005] Inside each channel a pair of parallel conductive strips are arranged and respectively connected to a pair of electrical conductors, in turn connected to a positive terminal and a negative terminal of a low-voltage transformer that may be fed from the mains. The conductive strips are fixed on opposite faces of the channel cavity, in particular on opposite faces of the head of its T-shaped cross section, so that one of the conductive strips is visible from outside of the channel, whereas the other one is not visible because of the undercut location with respect to the aperture of the channel towards the outside of the panel, which is defined by the shank of T-shaped cross section.

[0006] Each shelf is provided with one or more lamps mounted along one of its edges and includes means for the connection to the panel in correspondence of which electrical terminals of the wires allowing to power the lamp or lamps are arranged. The connecting means are configured so as to engage consecutive cavities of the panel in a vertical direction, thereby making a mechanical connection between a shelf and the panel. The connection means are also configured in an asymmetrical man-

ner so that the terminals of the electric wires of the lamps respectively contact a metal strip of a channel housed in a first cavity, connected to the positive terminal of the transformer, and a metal strip of the channel of the consecutive cavity, which is connected to the negative terminal of the transformer.

[0007] The configuration of the means allowing connection of the shelves to a support panel may be improved in particular from the point of view of the mounting maneuvers a user has to do, which is an object of the present invention. Due to the T-shape of the cavities and the respective channels in fact a partial rotation of a shelf with respect to the panel plane is required so as to allow to fit it in the undercut of its connecting means, as well as a consecutive rotation in the opposite direction so as to bring the shelf in the working position, i.e. perpendicular to the panel plane.

[0008] It is also an object of the present invention to simplify the electrical configuration of the power circuit associated with the support panel. In the modular shelving described in the publication GB 2255820 A, for example, each channel accommodates both a metal strip connected to the positive terminal of the transformer and a metal strip connected to its negative terminal.

[0009] This object is achieved with a modular display shelving whose main features are specified in the first claim, while other features are specified in the remaining claims.

[0010] An idea of the solution underlying the invention is to realize a modular shelving comprising a support panel having a plurality of parallel horizontal grooves similar to panel of the above-mentioned British publication GB 2255820 A, and to fit into said grooves H-shaped profiled elements that are configured to engage the grooves in correspondence of a head of the H-shaped cross section, and to support the shelves not inside but outside of the groove cavities by exploiting the opposite head of the H-shaped cross section as well as the intermediate portion connecting the two heads.

[0011] The connection means of the shelves have a hook-shaped cross section and the two gripping portions have the same geometry. This configuration provides the advantage of simplifying the assembly operation of a shelf on the panel, which no longer requires any rotation relative to the latter, but a first translation movement perpendicular to the panel plane so as to fit the connection means between consecutive profiled elements and a second translation movement parallel to the panel plane so as to lock the shelf on the heads of the profiled elements.

[0012] The support panel of the shelving is provided with a pair of electrical conductors that stretch out in a vertical direction close to its opposite edges and are respectively connected to the positive terminal and the negative terminal of a low-voltage transformer that may be fed from the mains.

[0013] Individual strips made of a conductive material are accommodated in the portions of the H-shaped pro-

filed elements protruding from the panel there. The strips are connected to one of the electrical conductors in turn connected to the positive terminal or to the negative terminal of the low-voltage transformer. The arrangement of the conductive strips is such that a conductive strip connected to the positive terminal of the transformer and a conductive strip connected to the negative terminal are alternately accommodated in consecutive profiled elements in the vertical direction. Consequently, the electrical configuration of the power circuit associated with the support panel is highly simplified compared to those known in the field, because each profiled element is connected to a single conductive strip.

[0014] The lamps used for lighting shelves are non-polarized lamps, for example neon lamps, incandescent or non-polarized LEDs, thus not restraining the position of the shelves to the alternate arrangement of the conductive strips, which are connected to alternately connected to the positive terminal and the negative terminal of the transformer.

[0015] A further advantage offered by the invention is that the surface of the head of the profiled elements protruding from the support panel may be used for the application of textures, i.e. decorative elements, such as to create surface finish effects that allow to customize the design of the display shelving in an extremely simple and cheap manner according to the needs of the end user.

[0016] Further advantages and features of the modular shelving according to the present invention will become clear to those skilled in the art from the following detailed and non-limiting description of an embodiment thereof with reference to the accompanying drawings wherein:

- Figure 1 is a perspective view showing a modular display shelving according to the present invention;
- Figure 2 is an exploded perspective view showing in detail the assembly method of a profiled element and of a strip made of a conductive material onto the supporting panel of the modular display shelving of Figure 1;
- Figures 3 and 4 are a rear view and a side view, respectively, of the modular display shelving of Figure 1;
- Figure 5 is a partial cross-sectional view of the modular display shelving taken along a plane passing through the line V-V of Figure 3;
- Figure 6 is a cross-sectional view showing a shelf of the modular display shelving;
- Figure 7 is an exploded perspective view similar to that of Figure 2, which shows in detail the assembly method of a profiled element and of a variant of the strip made of a conductive material onto the supporting panel of the modular display shelving;
- Figure 8 is a partial cross-sectional view similar to that of Figure 5, which shows an operating arrangement of the variant of the conductive material strip.

[0017] Referring to Figure 1, a modular display shelv-

ing according to the present invention is generally indicated by reference number 10.

[0018] The modular display shelving 10 comprises a support element in the form of a panel 11 that extends from a base 12 along a direction V generally perpendicular thereto, hence a substantially vertical direction with reference to an operating configuration of the display shelving.

[0019] In the illustrated embodiment, the base 12 is for example provided with a plurality of support feet 120 that are configured so as to allow fine adjustments of the position of the panel 11 with respect to a support surface such as a floor.

[0020] As shown in more detail in Figure 2, a plurality of parallel grooves 13 are formed in the panel 11, each groove stretching out in a horizontal direction H, perpendicular to the vertical direction V, from one end of the panel 11 to the other ending up in its side edges.

[0021] The modular shelving 10 also comprises a plurality of profiled elements 20 mounted on the panel element 11, every one of which extends in the horizontal direction H along at least a portion of the related groove 13, preferably from one end to the opposite end of the panel 11 along the horizontal direction H. The profiled elements 20 are preferably blocked in the respective grooves 13 in the horizontal direction by way of screws or equivalent fastening means.

[0022] The modular shelving 10 also comprises in a known manner a plurality of shelves 30 which are assembled to the panel 11 on the profiled elements 20, as it will be described in greater detail hereinafter.

[0023] According to the invention, each profiled element 20 has an H-shaped cross-section wherein a first head portion 21 has a shape matching the shape of the grooves 13, thus allowing its assembly substantially without play in each groove.

[0024] The profiled element 20 also comprises a second head portion 22 spaced from the first head portion 21 and an intermediate or core portion 23 arranged between them and connected to both of them.

[0025] In the illustrated embodiment, the H-shaped profiled element 20 is for example an extruded beam made of a plastic material, which, due to manufacturing needs, comprises a plurality of inner cavities formed in both the first and second head portions 21, 22, as well as in the intermediate portion 23. These are not limiting features of the invention.

[0026] In an assembled configuration of the display shelving 10, the first head portion 21 of a profiled element 20 is fitted in one of the grooves 13 of the panel 11, the intermediate portion 23 protrudes from the latter in a transverse direction T, perpendicular to the vertical and horizontal directions V and H, and the second head portion 22 is arranged parallel to the panel 11. Thanks to this arrangement, the second head portion 22 and the intermediate portion 23 define a channel suitable for the assembly of a shelf 30.

[0027] Correspondingly, each shelf 30 is provided with

connection means whose shape matches the shape of the channels defined by the profiled element 20. In particular, the connection means of each shelf 30 comprise a pair of elements 31, 32 having hook-shape in cross-section and configured so as to engage the channels of two profiled elements 20 consecutively arranged in the vertical direction V of the display shelving 10. This configuration allows to mount a shelf 30 onto the panel 11 in a stable and safe manner.

[0028] The hook-shaped elements 31, 32 are restrained to a same panel 33 to which a flat element 34 intended to constitute a supporting surface of the shelf 30 is also restrained. The hook-shaped elements 31, 32, the panel 33 and the flat element 34 are shown in Figures 5 and 6, which will be described in greater detail below.

[0029] Now referring now to Figure 3, the display shelving 10 is configured so as to allow illumination of the shelves 30 mounted thereon.

[0030] To this aim, the shelving 10 comprises in a known manner a pair of electrical conductors 14, 15 arranged on a rear surface of the panel 11, opposite to the surface on which the grooves 13 for the mounting of the profiled elements 20 are formed. The electrical conductors 14, 15 are preferably protected by a suitable cover (not shown) of the shelving, fixed to the rear surface of the panel 11, and stretch out along the latter in the vertical direction V, for example close to its side edges.

[0031] As shown in Figure 3, the electrical conductors 14, 15 are respectively connected to the terminals of a transformer 16, which transforms the mains voltage e.g. from 220 V to 24 V.

[0032] With reference to Figures 4 and 5, the shelving 10 also comprises a plurality of strips 17 made of a conductive material, for example having the form of a slats, arranged in each profiled element 20. The configuration of the shelving 10 is such that each profiled element 20 is associated with a single conductive strip 17 and that conductive strips 17 mounted on profiled elements that are arranged consecutively in the vertical direction V of the shelving 10 are alternately connected to the positive terminal or the negative terminal of the transformer 16.

[0033] The conductive strips 17 are arranged in the channels defined by the head portions 22 and the intermediate portions 23, and are preferably fixed to the intermediate portions 23, as shown in the cross section of Figure 5.

[0034] The conductive strips 17 stretch out along the respective channels at least along a portion of them, and preferably from one end to the opposite end of the panel 11 in the horizontal direction H, thus allowing electrical connection of the shelves 30 in any position along the horizontal direction H.

[0035] As it may clearly be seen in Figure 5, the conductive strips 17 are located outside of the panel 11, which allows to access them more easily than in the case of known display shelvings with illuminable shelves, and thus to simplify connection of the electrical terminals of the circuits installed on the shelves 30 in order to power

the lamps mounted therein.

[0036] With particular reference to Figure 6, each shelf 30 is provided in a known manner with one or more lamps 40 that may be supplied through an appropriate electric circuit (not shown) mounted in the structure of the shelf 30 and comprising a pair of electrical terminals 41, 42 arranged in correspondence to the connection means 31, 32 allowing to mount the shelf to the panel 11.

[0037] The electrical terminals 41, 42 of the electric circuit of the lamps 40 are respectively arranged in correspondence with the hook-shaped elements 31, 32 and protrude therefrom outwards so as to allow electrical connection with the conductive strips 17 accommodated in the profiled elements 20.

[0038] Advantageously, each electrical terminal 41, 42 includes biasing means, for example in the form of a spring 43, 44, configured so as to urge contact elements of the terminals 41, 42 outwards and compensate for any alignment and contact problem with the conductive strips 17, e.g. due to machining tolerances.

[0039] By mounting a shelf 30 on the panel 11 as shown in Figure 5, the hook-shaped elements 31, 32 respectively engage the channels defined by two profiled elements 20 arranged consecutively in the vertical direction V and the electrical terminals 41, 42 contact the conductive strips 17, thus closing the electric circuit of the lamps 40 pressed by respective springs 43, 44.

[0040] The lamps 40 used for the illumination of the shelves 30 are of a non-polar type, such as neon lamps, incandescent lamps or non-polarized LEDs, thus not restraining the position of the shelves 30 to the alternate arrangement of the conductive strips 17 connected to either the positive terminal or to negative terminal of the transformer 16.

[0041] The flat elements 34 of the shelves 30 are preferably made of a transparent material and, as shown in Figure 5, the lamps 40 are for example arranged along an edge thereof extending in the horizontal direction H, thus allowing to exploit the flat elements 34 as light-guides. In the illustrated embodiment, the lamps 40 of each shelf 30 are e.g. arranged in a cavity formed in the panel 33 to which the flat element 34 is fixed.

[0042] The faces of the flat elements 34 of the shelves 30 may be advantageously machined so as to create particular diffusion effects of the light, for example satin or buffed, or machined in order to obtain reflective surfaces suitable to direct light rays emitted by the lamps 40 e.g. upwards or downwards in the vertical direction V so as to illuminate the items arranged on the shelves more effectively.

[0043] As described above, the conductive strips may be slats suitable to be fitted into the channels defined by the second head portion 22 and the intermediate portion 23 of the profiled elements 20. However, this is not their only possible configuration.

[0044] According to a variant of the invention, the conductive strips may be shaped as profiled elements configured so as to engage not only the channels defined by

the second head portion 22 and the intermediate portion 23 of each profiled element 20, but also the first head portion 21.

[0045] With reference to figures 7 and 8, the conductive strip 170 comprises a first portion 171 configured to be fitted in the channel defined by the second head portion 22 and the intermediate portion 23 of a profiled element 20, as well as a second portion 172, contiguous to the first portion 171, whose shape matches the shape of the first head portion 21 of the profiled element 20.

[0046] This configuration provides a more stable anchoring of the conductive strips 170 to the respective profiled elements 20 of the modular shelving 10, because they are substantially wound around the second portion 172 on the profiled elements 20 at the portion intended to be fixed into the panel 11. This configuration also simplifies electric connection of the conductive strips, which can be achieved by using the screws 140, 150 employed to connect the electrical conductors 14, 15 to the rear surface of the panel 11 of the shelving 10. As shown in Figures 5 and 8, these screws also serve to mechanically block the profiled elements 20 inside the grooves 13 of the panel 11 along the horizontal direction H.

[0047] As shown in the cross section of Figure 8, in fact, the screws 140, 150 of either electrical conductors 14, 15 protrude beyond the panel 11 and are alternately fitted into the second portions 172 of the conductive strips 170, which are thus electrically connected to either the positive terminal or the negative terminal of the transformer 16.

[0048] According to a further aspect of the invention, the surface of the head 22 of the profiled elements 20 projecting from the panel 11 may be advantageously used for the application of decorative elements so as to create surface finishing effects allowing to customize the design of the display shelving in an extremely simple and cheap manner depending on the needs of the end user.

[0049] Profiled elements 20 made of plastic materials may for example be co-molded with decorative elements by way of the widely known and diffused *in-mold decoration* techniques, also known under the acronym IMD.

[0050] The invention has been hitherto described with reference to preferred embodiments thereof. It is understood that there may be other embodiments relating to the same inventive idea, as defined by the scope of protection of the claims set forth below.

Claims

1. A modular shelving (10) for displaying products, said shelving comprising a support element in the form of a panel (11) that extends from a base (12) in a vertical direction (V) generally perpendicular thereto, said panel (11) comprising a plurality of grooves (13) parallel to each other and stretching out in a horizontal direction (H), perpendicular to said vertical direction (V), from one end of the panel (11) to its opposite

end ending out at its side edges, said shelving (10) further comprising a plurality of profiled elements (20) mounted in grooves (13) of the panel (11), and a pair of electrical conductors (14, 15) arranged on a rear surface of the panel (11) and respectively connected to the terminals of a transformer (16), a plurality of strips (17; 170) made of a conductive material being respectively connected to one or the other electrical conductor (14, 15) and mounted on the profiled elements (20), the shelving (10) further comprising a plurality of shelves (30) configured to be mounted on the profiled elements (20) of the panel (11), said shelves (30) being provided with one or more lamps (40) and with an electric circuit having a pair of electrical terminals (41, 42) intended to contact said strips (17; 170) upon assembly of a shelf (30) on the profiled elements (20),

characterized in that each profiled element (20) has a H-shaped cross-section comprising a first head portion (21) whose shape matches the shape of the grooves (13) formed in the panel (11), a second head portion (22) spaced from the first head portion (21) and an intermediate or core portion (23) arranged between them and connected to both of them, said first head portion (21) being housed in a groove (13) and said second head portion (22) and intermediate portion (23) projecting from the panel (11) in a transverse direction (T) perpendicular to the vertical direction (V) and the horizontal direction (H) and defining a channel for the assembly of a shelf (30), and **in that** the strips (17; 170) are fitted in the channels defined by the second head portion (22) and the intermediate portion (23) of each profiled element (20) and are arranged in the vertical direction (V) alternately connected to either the positive terminal or the negative terminal of the transformer (16) through the electrical conductors (14, 15).

2. A modular display shelving (10) according to claim 1, wherein the conductive strips (17) have the form of a slat and are fixed on the intermediate portions (23) of the profiled elements (20).
3. A modular display shelving (10) according to claim 1 or 2, wherein the conductive strips (17) stretch out along the channels formed by the profiled elements (20) along at least a portion thereof.
4. A modular display shelving (10) according to claim 3, wherein the conductive strips (17) stretch out from one end to the opposite end of the panel (11) in the horizontal direction (H).
5. A modular display shelving (10) according to claim 1, wherein the conductive strips (170) comprise a first portion (171) configured to be fitted in the channel defined by the second head portion (22) and the intermediate portion (23) of each profiled element

- (20), as well as a second portion (172) whose shape matches the shape of the first head portion (21) of the profiled element (20).
6. A modular display shelving (10) according to any one of claims 1 to 5, wherein each shelf (30) comprises connection means configured so as to allow its assembly on the channels defined by profiled elements (20) connected to the panel (11). 5
7. A modular display shelving (10) according to claim 6, wherein said connecting means comprise a pair of elements (31, 32) having hook-shaped in cross-section and configured so as to engage the channels of two profiled elements (20) arranged consecutively in the vertical direction (V), and wherein the electrical terminals (41, 42) of the lamp circuits (40) mounted on the shelves (30) are arranged in correspondence to said hook-shaped elements (31, 32) and protrude outwards therefrom. 10 15 20
8. A modular display shelving (10) according to claim 7, wherein said hook-shaped elements (31, 32) are restrained to a panel (33) to which a flat element (34) intended to be the supporting surface of a shelf (30) is restrained. 25
9. A modular display shelving (10) according to claim 8, wherein the flat elements (34) of the shelves (30) are made of a transparent material and wherein the lamps (40) are arranged along an edge of the respective shelves extending in the horizontal direction (H), the flat elements (34) thus serving as the light-guiding means. 30 35
10. A modular display shelving (10) according to any one of claims 1 to 9, wherein which the lamps (40) used for the illumination of the shelves (30) are non-polarized lamps. 40
11. A shelf (30) for a modular display shelving (10) according to any one of claims 1 to 10, said shelf (30) comprising connection means configured to allow it to be assembled on the channels defined by profiled elements (20) connected to a panel (11) of said modular display shelving (10), said connecting means comprising a pair of elements (31, 32) having a hook-shape in cross-section and configured to engage the channels of two profiled elements (20) arranged consecutively in the vertical direction (V), said shelf (30) also comprising one or more lamps (40) and an electric circuit provided with a pair of electrical terminals (41, 42) intended to contact conductive strips (17; 170) of said modular display shelving (10), wherein said electrical terminals (41, 42) are arranged in correspondence with said hook-shaped elements (31, 32) and protrude outwards therefrom. 45 50 55
12. A shelf (30) according to claim 11, further comprising a panel (33) and a flat element (34) mounted on a face of said panel (33) and intended to be a supporting surface of the shelf (30), and wherein said hook-shaped elements (31, 32) are secured to the panel (33) on the face opposite to the face to which said flat element (34) is restrained.
13. A shelf (30) according to claim 12, wherein the flat element (34) is made of a transparent material and wherein the lamps (40) are arranged along an edge thereof stretching out in the horizontal direction (H), the flat element (34) thus serving as a light-guide means.
14. A shelf (30) according to any one of claims 11 to 13, wherein the lamps (40) are non-polarized lamps.

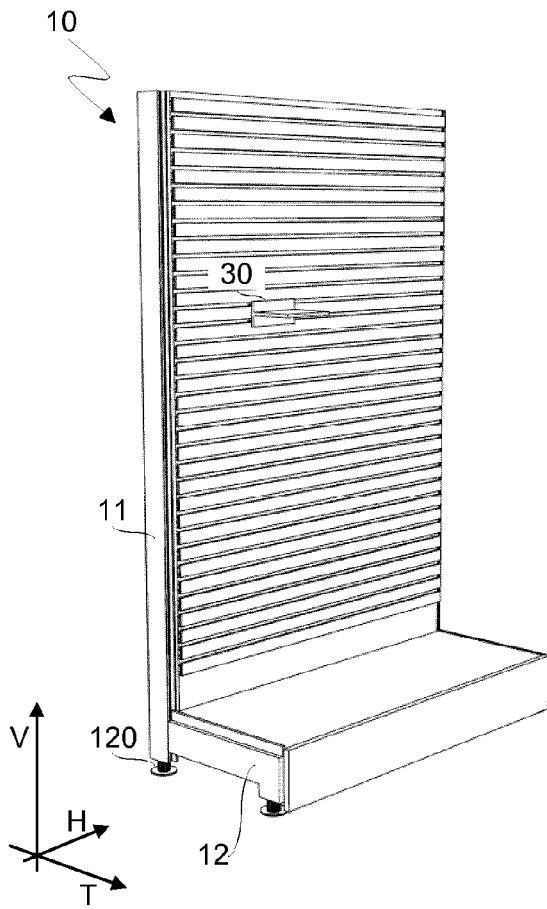


Fig.1

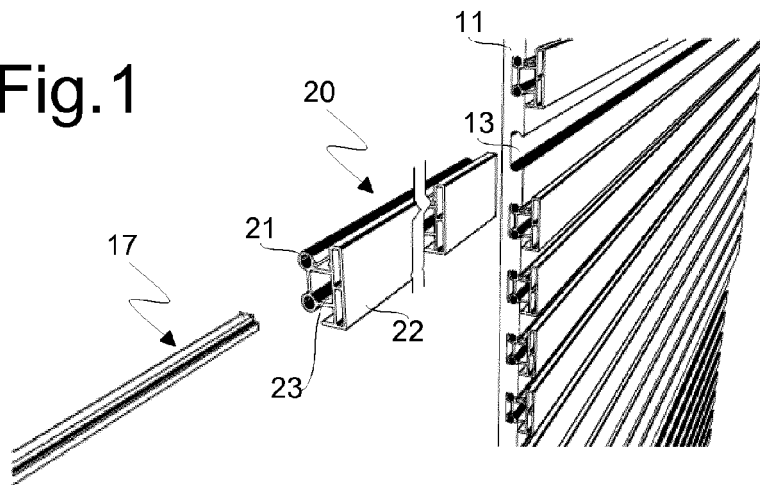


Fig.2

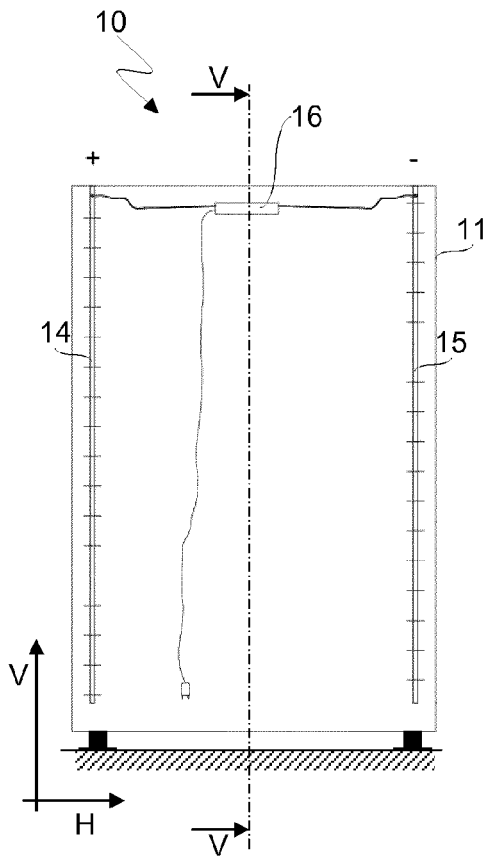


Fig.3

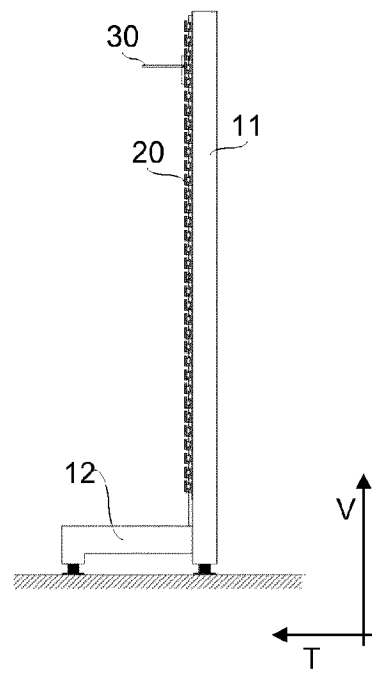


Fig.4

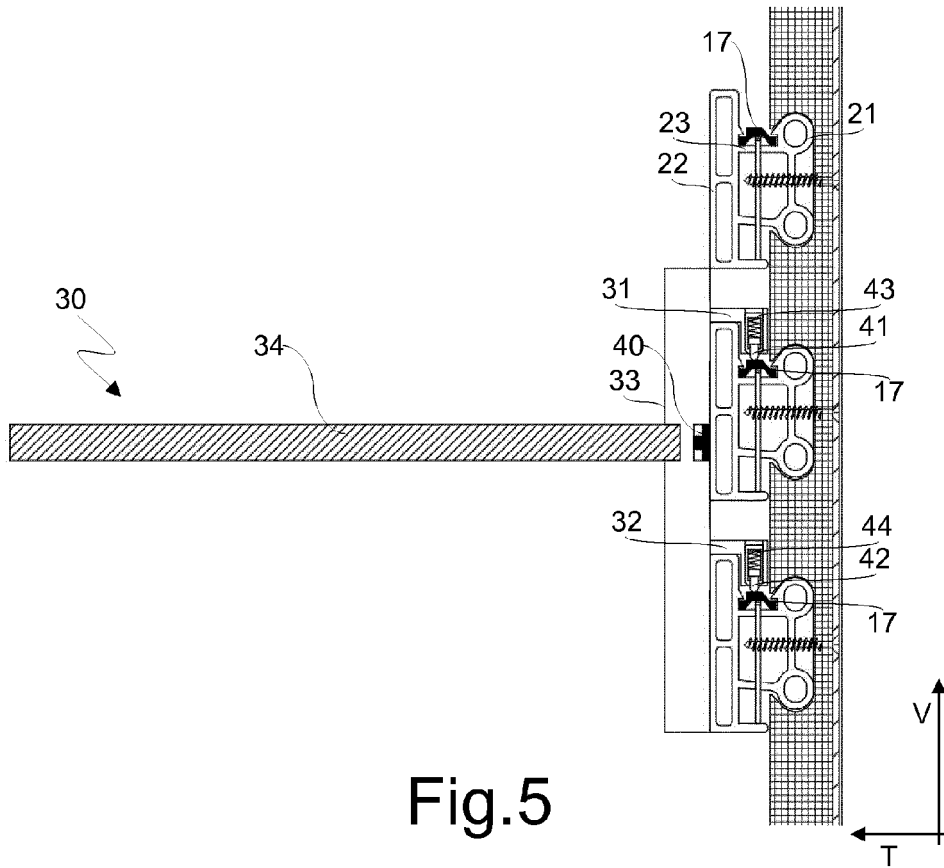


Fig.5

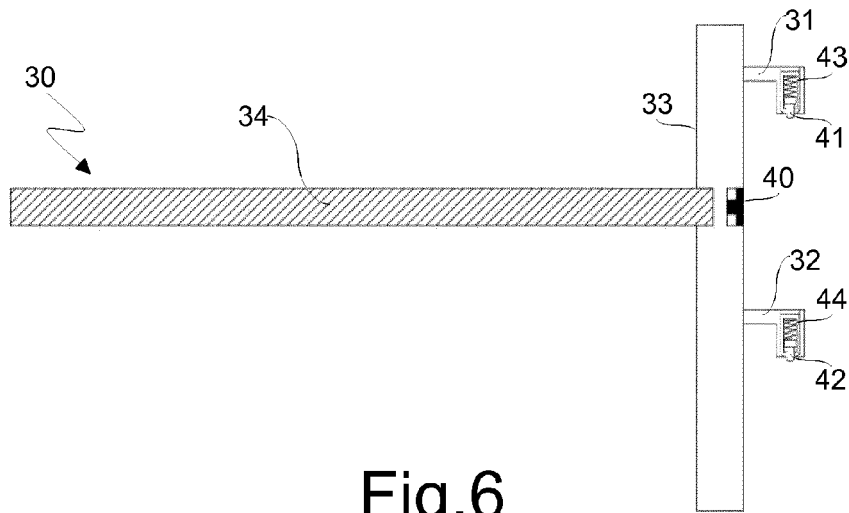


Fig.6

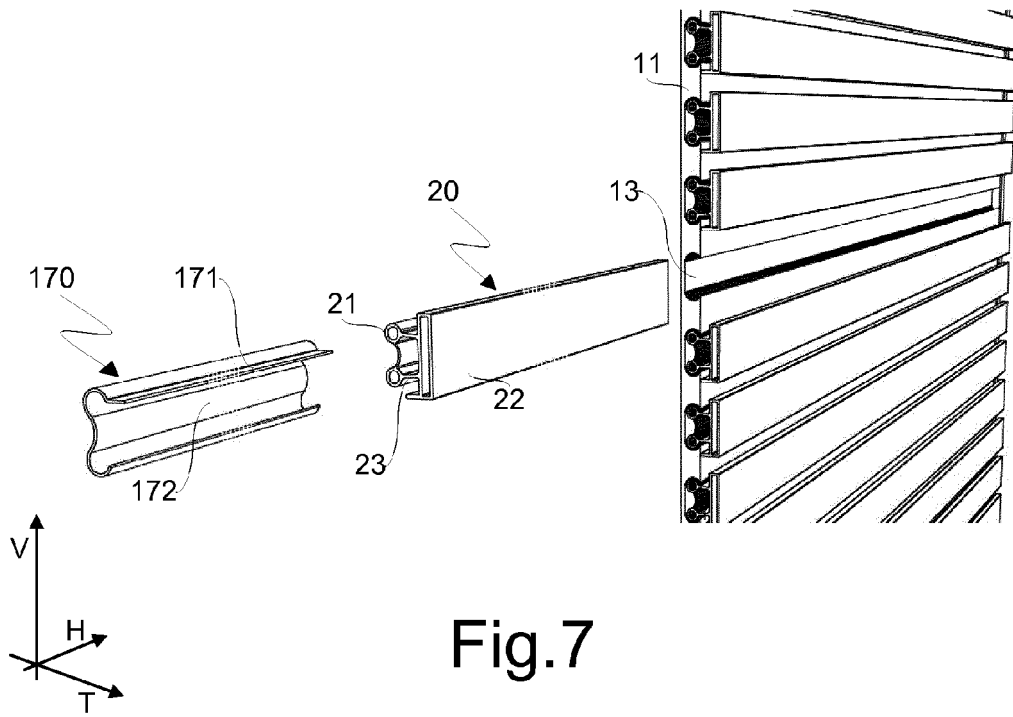


Fig.7

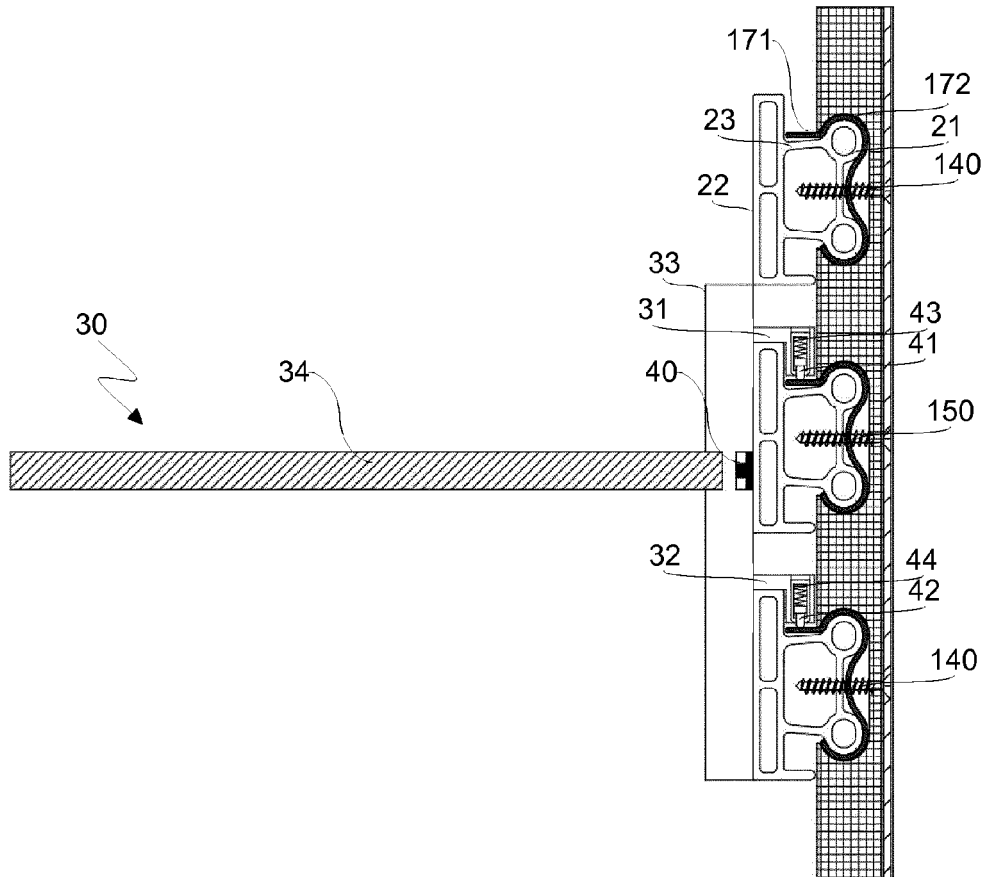


Fig.8



EUROPEAN SEARCH REPORT

Application Number
EP 15 15 3580

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| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
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| X,D | GB 2 255 820 A (A M S RETAIL INTERIORS LIMITED [GB]) 18 November 1992 (1992-11-18) | 11-14 | INV. A47F5/08 |
| A | * page 7, line 5 - page 9, line 4; claims 1,5-8; figures 7-9 * | 1-10 | |
| A | ----- FR 2 793 667 A1 (TIPSY CREATION [FR]) 24 November 2000 (2000-11-24) * page 5, line 21 - page 9, line 25; figures 1-7 * ----- | 1-10 | |
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| The present search report has been drawn up for all claims | | | |
| Place of search | | Date of completion of the search | Examiner |
| The Hague | | 12 June 2015 | Kohler, Pierre |
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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