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(71) Applicant: **ITW Limited**
Windsor
Berkshire SL4 3BL (GB)

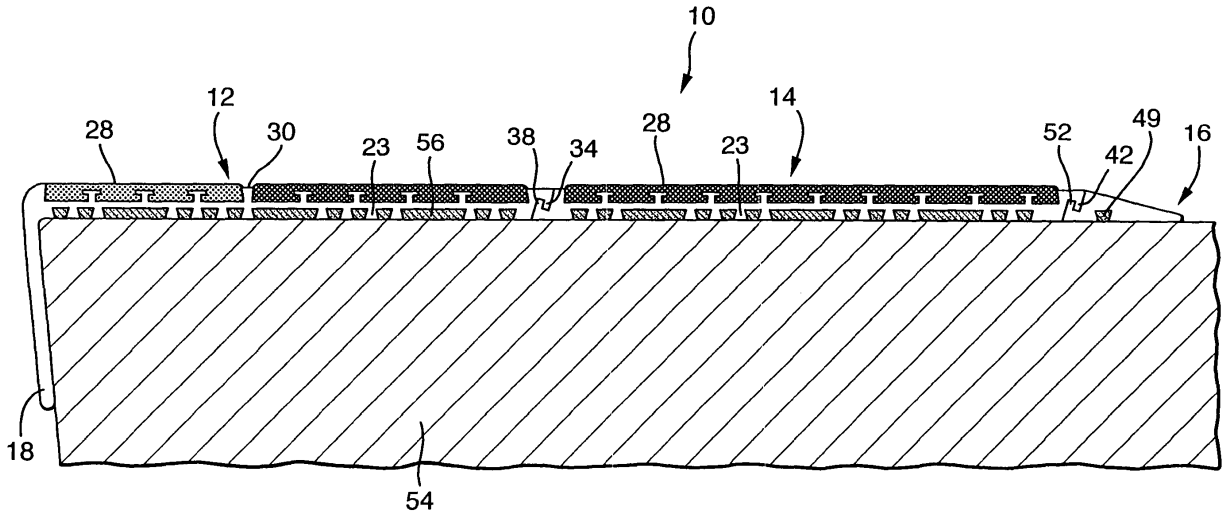
(72) Inventors:
- **Tuzinkiewicz, Chris c/o Rocol Site Safety Systems**
  Huntingdon, Cambs PE29 7DN (GB)
- **Lister, Dave c/o Rocol Site Safety Systems**
  Swillington,
  Leeds LS26 8 BS (GB)

(74) Representative: **Weston, Robert Dale et al**
PHILLIPS & LEIGH
5 Pemberton Row
London EC4A 3BA (GB)

(54) Floor panels

(57) A modular floor panel system comprises panel components (12, 14, 16) each having a joint part (34, 42) extending along at least one panel edge (32, 40), the joint part being shaped to interlock with a complimentary joint part (38, 52) extending along the meeting edge (36, 50) of an adjacent panel component, and the complimentary joint parts further being shaped to interconnect by relative panel component movement generally out of the plane of panel components; whereby, in use, the interlocked and interconnected joint parts resist relative, planar separation of joined panel components: in a preferred embodiment, a modular stair tread and riser system has stair nosings (12), tread plates (14) and chamfer plates (16) interconnected and interlocked by angled hook joints (34,38, 42,52).

Fig.4.



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Description

[0001] This invention relates to floor panels and it particularly relates to modular floor panel systems, for example stair treads and nosings.

Prior Art.

[0002] It is known to provide panel systems to cover floors, stairs and the like structures; either as an original surface or to repair worn surfaces. The panel components for such systems are often provided with a non-slip upper surface and recent legislation in the United Kingdom can require non-slip surfaces in given circumstances. One application of such panels is as replacement stair treads and nosings, see for example our "PRO-TREAD™" panels, described at our website:- http://www.rocol.com/sitesafety/english/slipprevention/panels.php. These panels are custom-made for particular applications and can be quite large and cumbersome to fit.

[0003] A known modular stair tread is the ALISPAR™ stair tread and nosing marketed by Magma Safety Products Limited , described at their website:- http://www.magmasafety.co.uk/alispar/alispar.htm. As shown, this stair tread and nosing comprises the following components:-

an extruded aluminium nosing having a non-slip upper surface, a grooved undersurface and a dovetail mortise along the rear edge;
an extruded aluminium tread having a non-slip upper surface, a grooved undersurface, a dovetail tenon along the front edge and a dovetail mortise along the rear edge;
and,
an extruded aluminium chamfer having a tapering upper surface, a grooved lower surface and a dovetail tenon along the front edge. The nosing, tread and chafer are jointed one to the other to form a complete stair tread system, which is then fixed to a stair. The dovetail joint provides a strong connection between the components but has the disadvantage that the components have to be assembled by sliding dovetail tenons lengthwise into dovetail mortises and this has to be done prior to installation and fixing to a stair; because there is no room to manoeuvre each component laterally with respect to another component in the confined space of a stairwell.

[0004] Documents EP-A2-0273517 [FERODO] for "Flooring Edge Finisher" , US-A-4840824 [DAVIS] for "Stairtread Facings and a Co-Extrusion Method for their Manufacture" and GB-A-1578528 [FERODO] for "Improvements in or relating to Step of Stairwell Fitments" all disclose a snap-fit connection between parts, which connection requires some relative, planar movement of parts towards one another.

[0005] Document EP-A-1024234 [UNILIN] for "Floor covering, consisting of hard floor panels and method of manufacturing such floor panels" wherein nose 9 of panel part 5 has to be introduced into groove 10 of panel part 42 by a rotary movement of part 5 relative to part 42 and/or by relative planar movement of part 5 towards part 42 for the parts to snap-fit one with the other [see para. 0097 and Figs 24 and 25].

[0006] The problem with these prior art floor panels and stairtread facings is that the relative planar movement between parts to achieve for snap fit engagement limits installation of such panels and facings in confined spaces.

Object of the Invention

[0007] It is an object of the present invention to provide a modular floor panel system wherein the component parts can be installed one-by-one in confined spaces.

Statement of Invention

[0008] According to the present invention, a modular floor panel system comprises panel components each having:-

i) a joint part extending along at least one panel edge;
ii) the joint part shaped to interlock with a complimentary joint part extending along the meeting edge of an adjacent panel component; and,
iii) the complimentary joint parts shaped to interconnect essentially by relative movement out of the common plane of the panel components.

[0009] By "out of the common plane of" is meant any relative movement between panel components to interconnect joint parts in the plane of a floor on which the components are to be mounted, the "common plane", which relative movement does not consist of one panel meeting edge either being moved towards or along the meeting edge of an adjacent panel in the common plane.

[0010] We have realised that, as modular floor panel components are generally fitted, such as by screwing and/or bonding, to a floor surface, the function of the joint need only be to locate one component part relative to another until some or all of the panel components have been fitted to a floor. This means that joints which can interconnect by relative non-planar movement, i.e. generally vertical and/or rotational, but which still resist relative planar movement of adjacent components away from one another can be used; for example a hook joint. This means that floor panel components of the present invention can be fitted in a stair well or other confined space, such a narrow hallway, component-by-component. Dovetail joints, such as that disclosed by the ALISPAR™ stair nosing and tread, do not meet this definition as they require one panel meeting edge to be moved along the meeting edge of an adjacent panel generally

in the plane of the two components. Snap-fit joints require at least some relative planar movement towards one another.

[0011] According to a preferred embodiment of the present invention, the joint parts are complementary, down-turned and up-turned hooks. The hooks may each have an included angle of between 0° and 45° to the perpendicular to the plane of the component; with a preferred angle of approximately 15°.

[0012] According to a preferred application of the present invention, the system is for a modular stair tread and riser system which may comprises a stair nosing component, a tread plate component and/or a chamfer plate component.

Introduction to the Drawings

[0013] The above and further features of the present invention are illustrated, by way of example, in the Drawings, wherein:-

Fig. 1 is a side elevation of a stair nose component in accordance with a stair tread and nosing system in accordance with the present invention;

Fig. 2 is a similar view of a tread plate component for the system of Fig. 1;

Fig. 3 is a similar view of a chamfer plate component for the system of Fig. 1;

Fig. 4 is a side elevation of a stair tread and nosing system assembled from the components of Figs 1 to 3;
and,

Fig. 5 is a perspective view of the stair tread and nosing system of Fig. 4.

Detailed Description

[0014] As shown by the figures a modular stair tread and nosing system 10 comprises a series of extruded aluminium components, in the example, a stair nosing 12, a tread plate 14 and a chamfer plate 16.

[0015] Fig. 1 shows a stair nosing 12 that is generally L-shaped with a down-turned front piece 18 and an upper panel 20. A series of laterally-extending, integral, generally T-shaped ribs 22 protrude from upper panel surface 24; the T-shaping enabling ribs 22 to mechanically key with a non-slip infill 28 bonded to the upper panel surface, see Figs, 4 and 5. One rib 30 may be higher and generally rectilinear so as to provide a visible break in the infill. A series of laterally-extending generally dovetail-shaped ribs 23 protrude from lower panel surface 26. The upper panel terminates in rear edge 32 with an integral, down-turned hook 34 extending there along. The axis I-I of this hook is inclined at an angle α of approximately 15° to one side of the perpendicular to the plane of the upper panel.

[0016] Fig. 2 shows a tread plate 14 that is generally similar to nosing upper panel 20 and like parts have the same references. However, front edge 36 of tread plate 14 has a width-wise extending, integral, upturned hook 38, complimentary to nosing hook 34; the axis II-II of this hook has an angle β of approximately 15° to the other side of the perpendicular to the plane of the tread plate. The rear edge 40 of tread plate 14 has an integral, down-turned hook 42; the axis I-I of this hook is inclined at an angle α of approximately 15° to the one side of the perpendicular to the plane of the tread plate.

[0017] Fig. 3 shows a chamfer plate 16 that has an inclined, planar, upper surface 44 terminating in a rear edge 46. The under surface 48 is generally flat with a laterally-extending, dovetail-shaped groove 49. Upper surface may have transverse, slip-resistant ribbing (not shown). The front edge 50 of chamfer plate 16 has an integral, upturned hook 52, complimentary to nosing rear hook 34 or tread rear hook 42; the axis II-II of chamfer hook 52 has an angle β of approximately 15° to the other side of the perpendicular to the plane of the chamfer plate.

[0018] In use, a nosing plate 12 is fitted to a stair nose 54, a tread plate 14 is then fitted to nosing plate 12 by locating tread front hook 38 under nosing rear hook 34 and then rotating tread plate 14 clockwise to lift the rear of tread plate 14 sufficiently to enable the tread front hook 38 to engage under nosing rear hook 34, as shown in Fig. 4. Chamfer front hook 52 is similarly engaged under tread rear hook 42. This mode of interengagement is out of the common plane of the stair tread and enables the components to be fitted one-at-a-time in the confined space of a stair well as no planar movement of a component towards another component is needed.

[0019] The components can be fixed to the stair 54 by a bonding agent (cement) 56, the dovetail-shaped lower surface ribs 23 and dovetail-shaped groove 49 providing a mechanical key and/or by fixings (such as nails or screws) through the components into the stair; only the rear of any component needs to be fixed, as it traps the front of the adjacent component. Components can be fixed to the stair one-at-a-time or as an assembled whole.

[0020] The interconnected, complimentary angled hooks resist vertical movement between joined components as well as planar movements, such that all components do not need to be fixed to a surface; for example tread 14 could be left free, depending upon fixed nosing 12 and chamfer 16. The angle of the hooks improves the mechanical interlock between adjacent, interconnected, essentially rigid components without reliance on additional snap-fit features.

[0021] Stair nosings and tread plates of differing lengths can be provided to enable a range of stair treads to be fitted using standardised component plates. Some applications may not require a chamfer plate, in which circumstance it will be noted that tread plate 14 will finish with a down turned hook 34; presenting a pleasing appearance and not forming a dirt trap.

[0022] Non-inclined, hooks of the same orientation would function to keep component parts together as they

are being assembled, but would not function to hold parts together vertically once they have been assembled. All component parts would need to be fixed to a floor. Whilst an included angle of 15° has been described, this could be any angle in the range 0° to 45°. The vertical/rotational engaging movement of a hook joint, enables components to be engaged close to a vertical surface, for example the riser of the next stair, as no relative planar movement between components is required.

[0023] Alternative joints could be used provided that complimentary joint parts can be inter-engaged by non-planar relative movement between panel components to interconnect complimentary joint parts. Although the present invention has been described in terms of stair panels, the invention is applicable to any floor panels to be assembled and fitted in a confined space; for example a narrow hallway.

Claims

1. A modular floor panel system comprising panel components (12, 14, 16) each having:-

i) a joint part (34, 42) extending along at least one panel edge (32, 36, 40, 50);
ii) the joint part shaped to interlock with a complimentary joint part (38, 52) extending along the meeting edge (36, 50) of an adjacent panel component;
characterised in that:
iii) the complimentary joint parts (34, 42, 38, 52) are shaped to interconnect essentially by relative panel component movement out of the common plane of panel components (12, 14, 16).

2. A system as claimed in claim 1, wherein the joint parts are complementary, down-turned (34, 42) and up-turned (42, 52) hooks.

3. A system as claimed in claim 2, wherein complementary hooks (34, 42, 38, 52) are interengageable on an axis (I-I, II-II) having an included angle (α, β) of between 0° and 45° to the perpendicular to the plane of the component (12, 14, 16).

4. A system as claimed in claim 3, wherein the included angle (α, β) is approximately 15°.

5. A system as claimed in any of claims 1 to 4, which is a modular stair tread and riser system.

6. A modular stair tread and riser system as claimed in claim 5 and comprising stair nosing (12), tread plate (14) and/or chamfer plate (16) panel components.

7. A system as claimed in claim 6, wherein:-

i) the rear edge (32) of the stair nosing (12) has a hook (34);
ii) the front edge (36) of the tread plate (14) has a complimentary hook (38);
iii) the rear edge (40) of the tread plate has a hook (42); and,
iv) the front edge (50) of the chamfer plate (16) has a complimentary hook (52).

8. A system as claimed in claim 7, wherein:-

i) the hooks (34, 42) at the rear edges (32, 40) of stair nosings (12) and tread plates (14) are down-turned;
and,
ii) the hooks (38, 52) at the front edges (36, 50) of tread plates and chamfer plates (16) are up-turned.

9. A system as claimed in any of claims 6 to 8 wherein upper surfaces (24) of the stair nosing (12) and the tread plate (14) have a non-slip infill (28).

Fig.1.

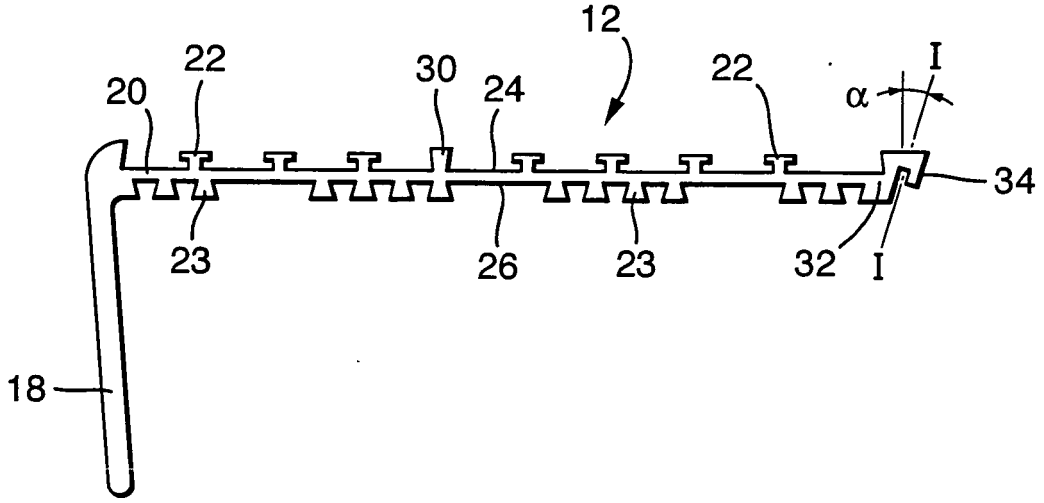


Fig.2.

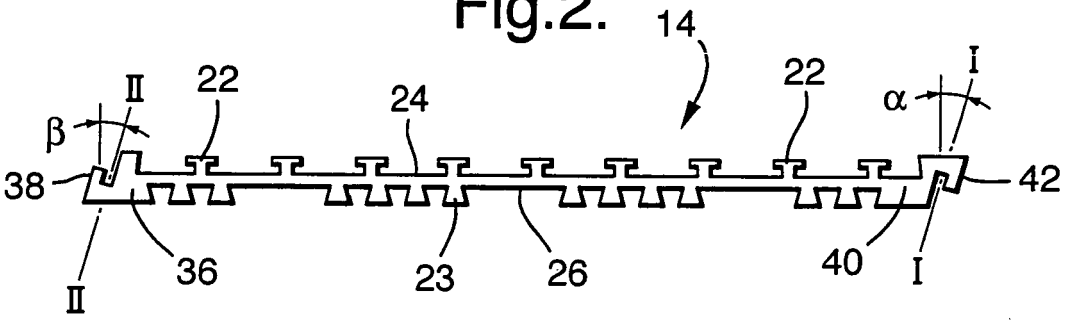


Fig.3.

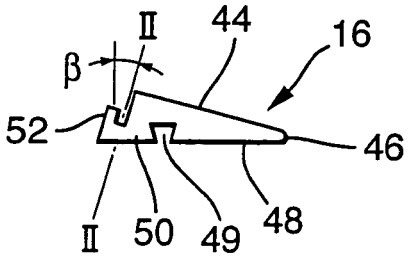


Fig.4.

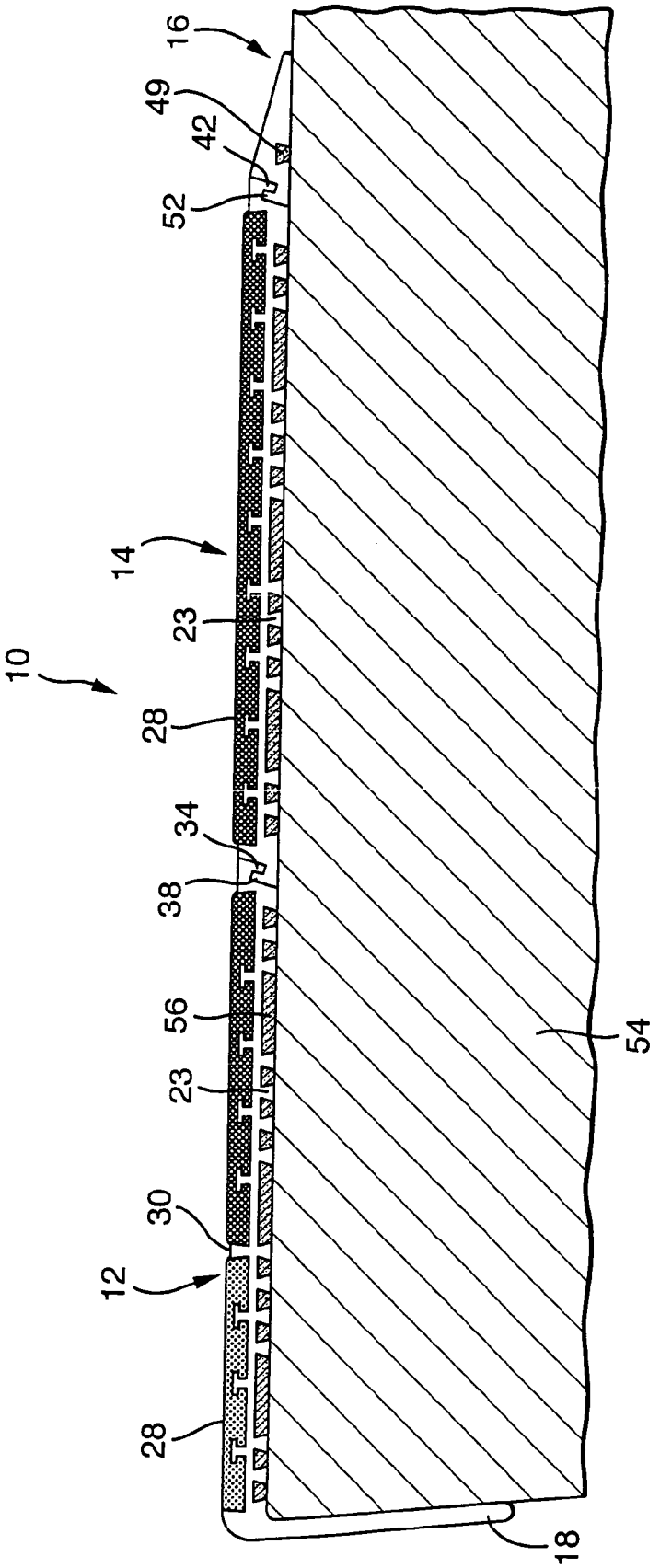
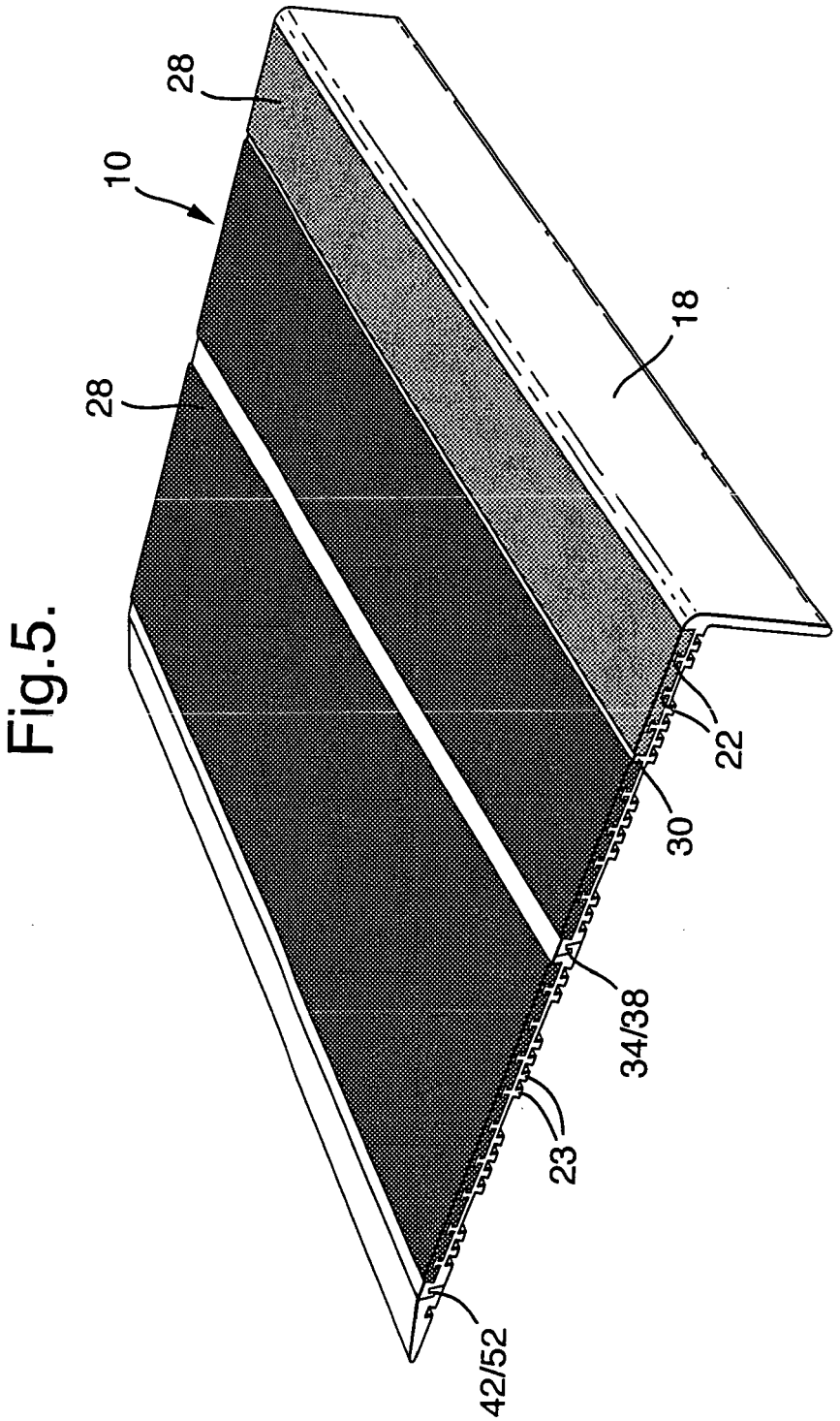


Fig.5.



REFERENCES CITED IN THE DESCRIPTION

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