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71 Applicant: **STEELDEN (MANUFACTURING) LIMITED**
Steelden House Harwood Street
Blackburn, BB1 3BD (GB)

72 Inventor: **Salter, Brian Vaughan**
113 Griffin Street, Witton
Blackburn BB2 2NZ (GB)

74 Representative: **Mock, Hans et al**
MARKS & CLERK Suite 301 Sunlight House Quay Street
Manchester M3 3JY (GB)

54 **Improvements in or relating to access floor structures.**

57 An access floor structure has support means for supporting the panels above a solid floor. Each panel has a laminar panel element fitted in said pan member and resting on protrusions from the floor thereof, and a cover panel fixed to said laminar panel element, the floor protrusions being so arranged as to increase the strength of the panel on two mutually perpendicular axes thereof.

Description

IMPROVEMENTS IN OR RELATING TO ACCESS FLOOR STRUCTURES

This invention relates to access floor structures and to a floor panel for such a structure.

An access floor structure provides a floor surface spaced above a solid, e.g. reinforced concrete, floor of a building to provide a cavity in which electrical cables and other services can extend concealed from view. Such structures are particularly useful in computer rooms where the underfloor plenum may also be used for air conditioning purposes. Conventionally, the floor structure comprises pedestals with feet resting on the solid floor and upper ends supporting the floor panels either directly or indirectly by way of a grid of support beams or stringers.

The floor panels require good structural and sound and thermal insulation properties. Originally such panels were made for example of chipboard covered with carpet but although such composite wood materials perform well under compressive loads they soon fail under tensile or sheer stresses. Steel panels, on the other hand, although having good structural properties as well as wear and fire resistance, do not provide adequate sound and thermal insulation. One improved embodiment of steel panel has a lower skin with circular depressions on its upper surface spot welded to a planar upper panel with the enclosed space filled with a cementitious material.

Another design called the "Guardian" manufactured by Propaflor Limited has a structural steel pan which locates a core of insulating material which may be provided with an additional steel sheet cladding. The pan has an edge corrugation formed by a downwardly extending double thickness fold of which the outer skin projects upwardly to create the side walls of the pan. Additionally, a rib is provided at the base of each side wall. In a later design described in European Patent Appln. No. 168247 each floor panel comprises a plane rectangular laminar panel member formed of a wood composite material. A sheet of metal is mounted in touching contact with the lower surface of the panel member and has channels formed therein extending across the full width thereof. Metal support beams are mounted on opposite sides of the panel and are connected to and extend transversely of the channels in the sheet of metal so that the load on the panel is carried by the channels and the support beams to the pedestal units at the corners of the panel. This known floor panel is expensive to manufacture because it consists of numerous components requiring separate fabrication and subsequent manual assembly.

It is an object of the present invention to provide an improved floor panel and access floor structure incorporating same.

According to a first aspect of the present invention there is provided an access floor structure comprising one or more panels according to the second aspect of the invention and support means, for example pedestal units, for supporting the panel(s) either directly (and preferably at the corners

thereof) or indirectly via a framework of stringers.

According to a second aspect of the present invention there is provided a floor panel for an access floor structure, comprising a structural pan member having a floor and side walls, a laminar panel element (preferably of wood composite material) fitted in said pan member and resting on protrusions from the floor thereof, and a cover panel fixed (as by adhesive bonding) to said laminar panel element (and preferably to the side walls of said pan member), the floor protrusions being so arranged as to increase the strength of the panel on two mutually perpendicular axes thereof.

The invention will now be further described by way of example only with reference to the accompanying drawings, in which :-

Fig. 1 is an exploded isometric view of one embodiment of floor panel in accordance with the invention, and

Fig. 2 is an underneath isometric view of the same panel.

Referring now to the drawings, the access floor structure comprises one or more structural floor panels raised above a solid, e.g. reinforced concrete, floor of a building by pedestal units (not shown) arranged either to support each rectangular panel at the four corners thereof or, alternatively, to support a grid of stringers on which the floor panels are located. Such access floor structures are well known and require no further description.

The floor panel illustrated in the drawings comprises a plane rectangular laminar panel member 1 made of a wood composite material, preferably chipboard. The panel 1 fits snugly into a galvanised steel pan 2 with a planar floor 3 interrupted by generally triangular lands 4 arranged symmetrically around a central circular land 5 to produce the appearance of a wheel hub and spokes in the underneath view shown in Fig. 2. The triangular lands 4 have grooves 6 parallel to the adjacent pan edge. Circular lands 4a are provided at the corners of the pan 2.

The underside of the panel 1 is bonded by adhesive (e.g. a structural epoxy adhesive) to the lands 4, 4a. The side walls 7 of the metal pan are stepped outwardly and have at their upper edges out-turned lips 8 which are overlapped by a top skin 9 of galvanised steel bonded by adhesive (e.g. a laminating adhesive) to the panel 1 and welded to the lips 8 to complete the structure.

The steel pan 2 may be fabricated in a single pressing operation and in a modified embodiment the top skin 9 is formed integrally with and alongside the pan 2 and then cut off before being laminated to the chipboard panel 1 which is then inserted into the pan 2 which has previously been treated on the lands 4 with the structural adhesive (which may alternatively or additionally be applied to the free surface of the panel 1).

It will be appreciated that numerous other modifications may be made without departing from the

scope of the invention. For example, the lands of the metal pan may be arranged differently; also, the chipboard may be replaced by another material (although a wood composite is preferred).

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Claims

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1. A floor panel for an access floor structure, comprising a structural pan member having a floor and side walls, a laminar panel element fitted in said pan member and resting on protrusions from the floor thereof, and a cover panel fixed to said laminar panel element, the floor protrusions being so arranged as to increase the strength of the panel on two mutually perpendicular axes thereof.

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2. A floor panel as claimed in claim 1, wherein the laminar panel element is made of wood composite material.

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3. A floor panel as claimed in claim 1 or 2, wherein the cover panel is adhesively bonded to the laminar panel element and to the side walls of the pan member.

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4. A floor panel as claimed in any one of the preceding claims, wherein the cover panel is formed integrally with and alongside the pan member.

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5. A floor panel for an access floor structure, substantially as herein described with reference to the accompanying drawings.

6. An access floor structure comprising one or more panels according to any one of the preceding claims, and support means for supporting the panels above a solid floor.

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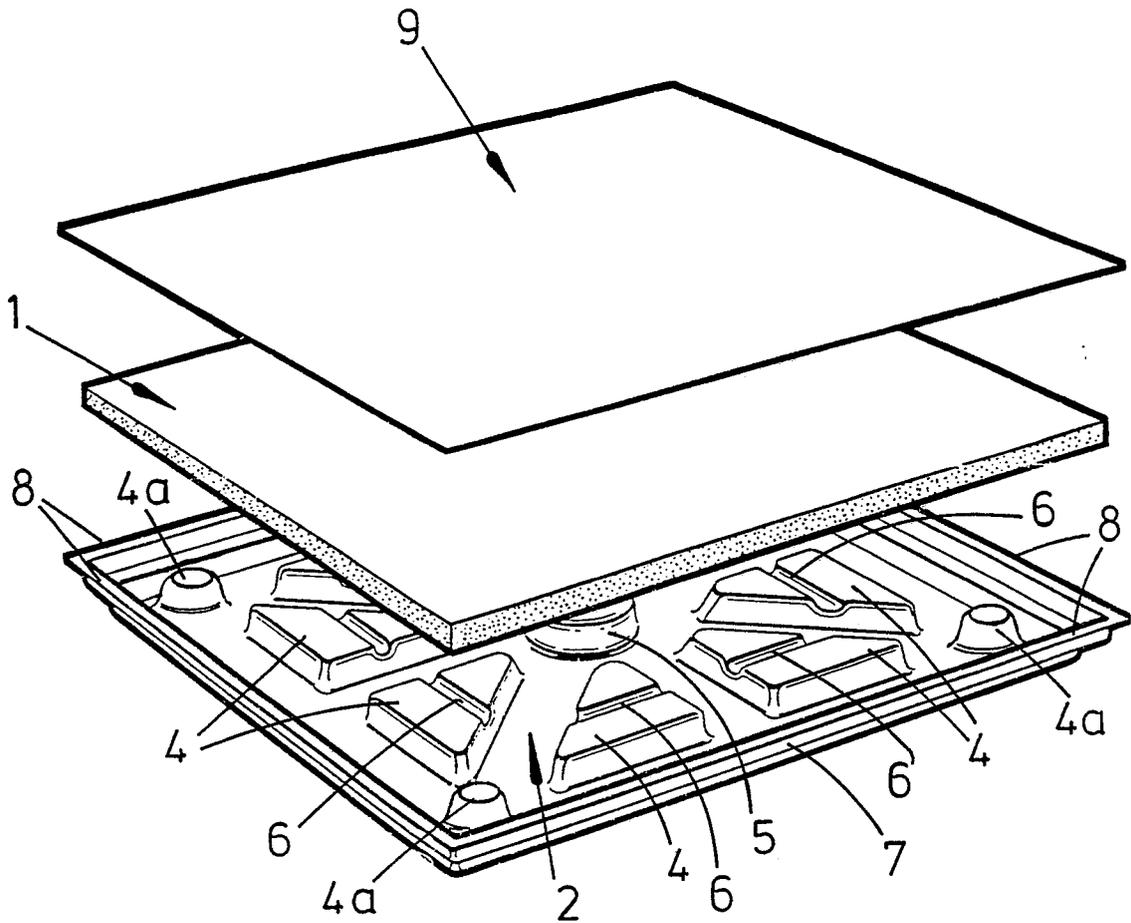


FIG. 1

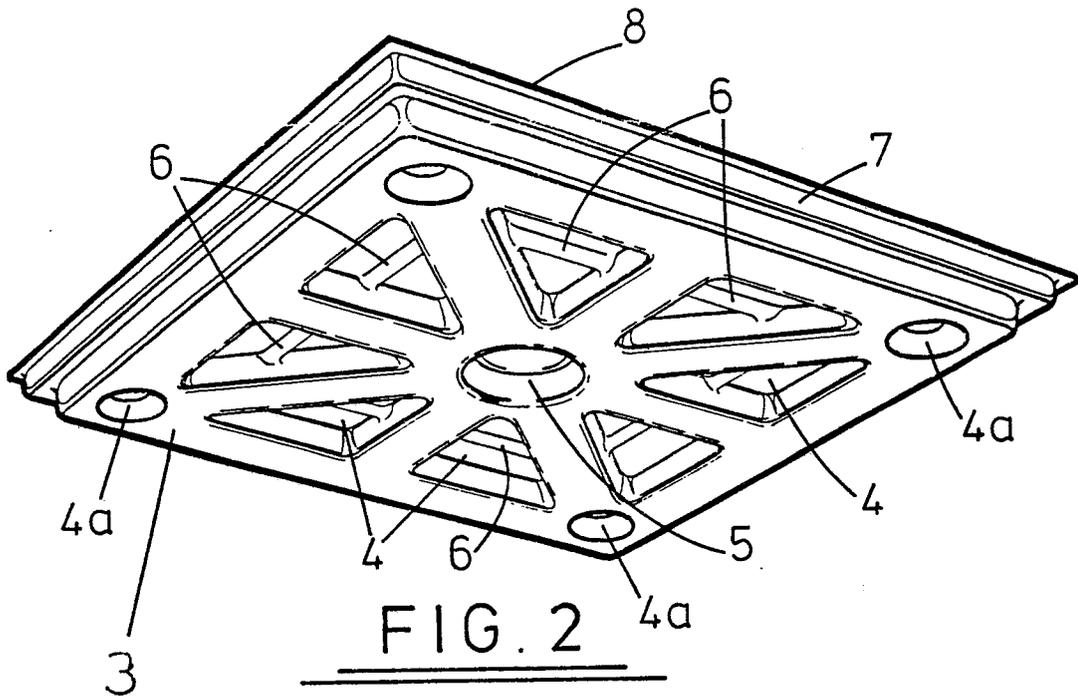


FIG. 2