(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 113 619 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
04.11.2009 Bulletin 2009/45

(51) Int Cl.:
E04F 15/22 *(2006.01)* ***E04F 15/024*** *(2006.01)*

(21) Application number: **09251041.1**

(22) Date of filing: **02.04.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR

(30) Priority: **02.04.2008 GB 0805976**

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(54) **Flooring system**

(57) A flooring pedestal and acoustic flooring system including the pedestal is described which comprises a planar vibration absorbing panel supporting a substantially planar pedestal base plate having a threaded support pillar extending upwards from the base plate with a thread substantially along its full length and a substantially planar support plate having a centrally located threaded aperture, the support plate being threadably engaged onto the support pillar of the pedestal base so that it may travel substantially the full length of the support pillar. The pedestal may include a locking member. This arrangement enables low profile acoustic flooring to be laid with minimum preparation of the sub-flooring and disruption to the fabric of the building accommodating the acoustic flooring.

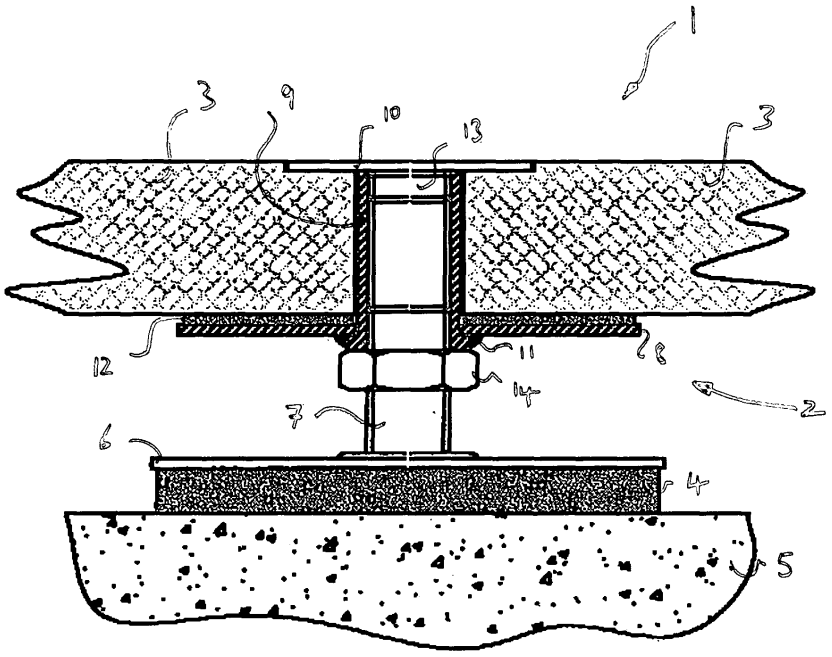

FIGURE 2

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Description

FIELD OF INVENTION

[0001] The present invention relates to flooring and more particularly to methods of mounting a flooring structure such as an acoustic flooring structure and pedestal for use in such flooring.

BACKGROUND ART

[0002] In the art there are various floor constructions, which consist of flooring panels raised and secured above a host flooring substrate, such as for example concrete flooring. These arrangements are achieved either through the use of pedestals or pillars, in the case of what is known as access flooring, or typically by means of wooden battens with batten supports, as often used in what is referred to as acoustic flooring. In a number of arrangements in the art pedestals for access flooring and access flooring systems may incorporate materials or arrangements to improve the acoustic or vibration properties of the floor. Whilst there are various arrangements available for acoustic flooring and access flooring there is a need for flooring systems and especially acoustic flooring systems, which may easily accommodate uneven host flooring conditions whilst at the same time providing a low profile floor structure requiring the minimum of remedial works on the building to incorporate the floor. Typically the floor tolerance limitation for conventional systems is $\pm$ 3 mm. There is also a need for a flooring system, which may accommodate any desired thickness of flooring panel and panel material. A further challenge is to provide flooring systems, which conform to the various standards for Uniformly Distributed Loading (UDL) specifications and concentrated loading specifications for both domestic and commercial/public buildings and in particular common circulation areas where the loading specifications are more demanding.

[0003] Published European patent application EP1584771 describes a low profile acoustic flooring system, which uses an isolator substantially recessed and welded to steel sections within the acoustic flooring.

[0004] GB2305947, GB2219105, GB2372515, GB2420796 and GB2214537 all illustrate a typical batten and cradle arrangements for sound attenuating flooring.

DISCLOSURE OF THE INVENTION

[0005] The present invention is directed to a flooring pedestal which comprises a substantially planar pedestal base plate having a threaded support pillar extending upwards from the base plate with a thread substantially along its full length and a substantially planar support plate having a centrally located threaded aperture, the support plate being threadably engaged onto the support pillar of the pedestal base so that it may travel substantially the full length of the support pillar.

[0006] In a further embodiment the flooring pedestal further comprises a planar vibration absorbing panel supporting the substantially planar pedestal base plate.

[0007] In a further embodiment the support plate has a centrally located and internally threaded tubular section co-axial with the aperture and extending from the top surface of the support plate, the support plate being threadably engaged on the support pillar of the pedestal base so that its tubular section is remote from the base plate.

[0008] In a further embodiment the flooring pedestal further comprises securing means associated with the support plate for securing floor panels to the flooring pedestal. In a preferred embodiment the securing means comprises a locking member, which may be secured to the tubular section of the support plate. In a more preferred embodiment the locking member comprises a threaded pillar extending from its lower surface, which may be threadably engaged with the hollow tubular section of the support plate. In an alternative arrangement the exterior of the hollow tube may also be threaded and the locking member comprises a threaded tube in place of the threaded pillar, which may then threadably engage with the exterior of the hollow tube of the support plate.

[0009] In a further embodiment the flooring pedestal may further comprise a planar panel of vibration absorbing material located on the top surface of the support plate, the panel having an orifice through which the threaded hollow tubular section may be located. The use of this panel of vibration absorbing material assists in creating a compressive fitting between the floor panel and the support plate thus aiding in restricting the relative movement of the support plate to the floor panel.

[0010] In a further embodiment the flooring pedestal may further comprise a tubular piece of vibration absorbing material located around the external surface of the tubular section of the support plate.

[0011] In a further embodiment there is provided a flooring system comprising a plurality of flooring pedestals according to the present invention and a plurality of flooring panels.

[0012] The planar vibration absorbing panel at the base of the pedestal, which is in contact with the subflooring provides sound attenuating properties to the flooring through the base of the pedestal and the sound attenuation may be further enhanced by the use of a further panel of sound attenuating material located at the top surface of the support plate. The pedestal base, support plate and when present locking means may be made of any suitable materials such as steel and high strength composite materials or engineering plastics.

[0013] The planar vibration absorbing panel at the base of the pedestal in plan view may be of any desirable shape and is preferably either square or circular in shape and most preferably is circular in shape. The vibration absorbing panel at the base of the pedestal may be of any suitable thickness depending on the choice of acoustic attenuating material and the desired level of acoustic

attenuation required. This panel is preferably attached to the bottom of the base plate, preferably it is adhesively bonded to the bottom of the base plate.

[0014] The components of the pedestal are sized to match the thickness of the floor panel to be used. Thus the pedestal system of the present invention may be adapted to accommodate many standard floor panels e.g. chipboard panels of 18 mm and 22 mm thickness, other standard sizes include 23 mm, 30 mm, 38 mm and 42 mm. In one embodiment the threaded support pillar is a T16 (16 mm) stud or preferably for higher load bearing floors is a 20 or 22 mm stud.

[0015] In use the flooring panels, usually four, meet at the location of a pedestal, with a corner of each panel sitting on a quadrant of the support plate. In one embodiment the plates merely sit on the support plate and may be secured to each other e.g. by means of a tongue and groove arrangement. In a further embodiment each panel may be separately secured to it's quadrant of the support plate by any suitable means. In one embodiment a hole preferably threaded may pass through the corner of the floor panel at the location of the support quadrant, which has a corresponding hole, preferably threaded; this enables the use of a threaded bolt to secure the floor panel to the support plate. In one embodiment the threaded bolt may be secured to the quadrant section and pass through a corresponding hole in the floor panel to be secured with a nut or similar arrangement. In a further embodiment the support plate on its top surface may have protrusions, which correspond with and co-operate with indentations on the underside of the floor panel. In a further embodiment when the hollow tube is present on the support plate the flooring panels are fabricated or machined such that when they meet on the support plate they can accommodate and in one embodiment totally conceal the hollow tube; this is especially advantageous for the pedestals which are located at the floor perimeter and proximate to e.g. walls. In a further embodiment they are fabricated or machined to expose the hollow tube so that the locking member may be secured to the top of the hollow tube and preferably flush with the flooring surface. Any of the foregoing arrangements for securing the flooring panel to the pedestal may be used alone or in any combination.

[0016] Preferably the base, the support plate and the locking member in plan view are circular. In an alternative arrangement the base and support plate when viewed in plan may be square.

[0017] When a locking member is used the height of the hollow tube on the support plate is such that the required flooring panel can be accommodated. In this instance the distance between the locking member and the top surface of the support plate is dictated by the thickness of the flooring panel to be accommodated.

[0018] In the arrangement of the present invention the substantially planar arrangement of the components including when present the vibration absorbing panel, the base plate and the support plate coupled with the support pillar being threaded substantially throughout its length are an important combination. This combination enables flooring especially acoustic flooring to be accommodated on relatively uneven sub-flooring e.g. with tolerances greater than $\pm$ 3 mm, with minimal preparation and without significantly adding to the height of the floor in relation to other building features such as door thresholds, steps etc. The arrangement of the present invention is both accommodating and relatively simple, easy and cost effective to install.

[0019] In a further aspect the present invention provides a flooring system, which comprises a plurality of flooring panels supported on a plurality of flooring pedestals according to the present invention.

[0020] In a preferred embodiment the flooring system is a flooring system, which meets the Class "O" requirements of BS 476 and the flooring panels are fire resistant to this specification. A preferred flooring panel is a calcium sulphate based or containing flooring panel.

[0021] In a further aspect the present invention provides a flooring system, which comprises a plurality of flooring panels supported on a plurality of flooring pedestals according to the present invention, wherein one or more of the flooring panels has thermal conductivity characteristics to prevent heat loss/transfer between adjacent rooms.

[0022] In a further preferred embodiment the flooring system is a flooring system which has a Uniform Distributed Load (UDL) greater than 2.0 kN/m^2, preferably greater than 2.5 kN/m^2, preferably greater than 3.0 kN/m^2, preferably greater than 3.5 kN/m^2, more preferably greater than 4.0 kN/m^2, more preferably greater than 4.5 kN/m^2, more preferably greater than 5.0 kN/m^2, more preferably greater than 5.0 kN/m^2, more preferably greater than 5.5 kN/m^2, and most preferably greater than 6.0 kN/m^2. It is preferred that the concentration load is greater than 1.2 kN/m^2, more preferably greater than 1.5 kN/m^2, more preferably greater than 2.0 kN/m^2 and most preferably greater than 2.5 kN/m^2.

[0023] As the flooring system, especially acoustic flooring system, of the present invention is capable of meeting the stringent Class "O" requirements of BS 476 it enables improved building methods to be used when for example constructing apartments or the like within a preformed reinforced concrete or similar building shell. Normally due to the limitations of conventional acoustic flooring systems it is necessary to partition each floor of the building into the required compartments for each dwelling and communal access areas before the acoustic flooring is laid separately for each for these areas. In addition given the limitations of some flooring systems, as to their load capacities, more than one flooring specification may be required for each building floor e.g. a different usually higher specification acoustic floor may be required for the communal areas. This conventional approach is time consuming and wasteful as it requires a significant amount of floor panel cutting and shaping to fit each partitioned room. With the flooring pedestal

and flooring system of the present invention it is possible to lay a complete acoustic floor on each building floor with ideally a single specification flooring panel and then to partition the building floor on top of the acoustic floor. This is a much more cost-effective building method, which is possible with the flooring pedestal and flooring system of the present invention. Its is preferred that the flooring panels are of a tongue and groove arrangement and are preferably a calcium sulphate based or containing flooring panels which meet the Class "O" requirements of BS 476.

[0024] This in a further aspect the present invention provides a method for constructing a partitioned building, which method comprises in a first step the laying of a flooring system according to the present invention and in a subsequent step the construction of partitions on top of the flooring system.

[0025] In a further embodiment the method comprises insertion of a thermal insulation barrier under the floor within the floor void. In a preferred embodiment this thermal insulation barrier is selectively located under the floor along the lines of the proposed partitioning. In a preferred embodiment the thermal insulation barrier is selected to have thermal insulation properties which match those of the corresponding partition.

[0026] One of the benefits of the flooring system of the present invention is that all the components are resistant to the ingress of moisture. Water ingress with conventional acoustic flooring systems based on wooden components suffer from this problem which may lead to squeaking floors etc, which should be avoided in this application of the flooring system.

DESCRIPTION OF THE DRAWINGS

[0027] For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to various specific embodiments of the invention as shown in the accompanying diagrammatic drawings, in which:

FIG. 1 shows a side view of a pedestal according to the present invention accommodating flooring panels at its lowest setting,

FIG. 2 shows a side view of a pedestal according to the present invention accommodating flooring panels at its highest setting,

FIG. 3 shows a sectional view of a pedestal according to the present invention without flooring panels at its highest setting,

FIG. 4, shows a sectional view of a pedestal according to the present invention with its component parts separated from each other,

FIG. 5 shows a part sectional view of a pedestal according to the present invention in combination with a panel and a closed cell foam perimeter flanking strip at a perimeter wall abutment, and

FIG.6 shows a part sectional view of a pedestal according to the present invention in combination with a oversized panel and closed cell foam perimeter flanking strip at a perimeter wall abutment in instances where the perimeter panel width is less than the width of the pedestal component.

DETAILED DESCRIPTION OF THE INVENTION

[0028] Referring to Figure 1 there is shown an acoustic flooring system (1) according to the present invention at its lowest height setting comprising a flooring pedestal (2) supporting a number of flooring panels (3). The flooring pedestal (2) comprises a planar vibration-absorbing panel (4) in contact with the sub-flooring (5). The vibration-absorbing panel (4) is secured to the bottom of a planar pedestal base plate (6) having a threaded support pillar (7) extending upwards from the base plate (6) with a thread substantially along its full length. Engaged upon this support pillar (7) is a support plate (8) having a centrally located threaded aperture and threaded hollow tube (9). Attached to the top of the hollow tube is a locking member (10), with a threaded pillar (13). In this illustration a small weld section (11) is present, which may preferably be machined to be planar with the support plate (8) so that this plate may be located closer to the base plate (6). Also illustrated is a planar vibration-absorbing panel (12) located on top of the support plate (8) and around the exterior of the hollow tube (9).

[0029] Referring to Figure 2 the system of Figure 1 is illustrated with the pedestal at its highest height setting. The figure also illustrates the presence of an optional locking nut (14) on the support pillar (7).

[0030] Referring to Figures 3 and 4 the key components of the support pedestal are the illustrated without the flooring.

[0031] Referring to Figure 5 there is shown an acoustic flooring system (1) according to the present invention at a perimeter wall (13) abutment comprising a flooring pedestal (2) in partial section supporting a flooring panel (3) shown in section. The flooring pedestal (2) comprises a planar vibration-absorbing panel (4) not shown in section in contact with the sub-flooring (5) shown in section. The vibration-absorbing panel (4) is secured to the bottom of a planar pedestal base plate (6) not shown in section having a threaded support pillar (7) not shown in section extending upwards from the base plate (6) with a thread substantially along its full length. Engaged upon this support pillar (7) is a support plate (8) shown in section having a centrally located threaded aperture and threaded hollow tube (9) shown in section. In this illustration a small weld section (11) is present shown in section, which may preferably be machined to be planar with the support plate (8) so that this plate may be located closer to the

base plate (6). Also illustrated is a planar vibration-absorbing panel (12) shown in section located on top of the support plate (8) and around the exterior of the hollow tube (9). The figure also illustrates the presence of an optional locking nut (14) shown in section. The figure also illustrates the presence of a perimeter flanking strip (17) between the wall abutment (13) and the system components, in contact with the flooring panel (3). It is preferred that the perimeter flanking strip is a closed cell foam material. Preferably it is "L" shaped in cross-section with the longest part of the "L" cross-section being located between the wall (13) and the flooring panel end (3) and the short arm of the "L" cross-section sitting flush with the top of the flooring panel (3). In a preferred embodiment the perimeter flanking strip is between 4 and 20 mm in cross-section, more preferably 4 and 15 mm in cross-section, more preferably between 4 and 10 mm in cross-section and most preferably between 4 and 8 mm in cross-section.

[0032] The arrangement in Figure 5 illustrates one possible arrangement for accommodating the flooring pedestal (2) of the present invention at the perimeter abutment of the flooring system. In this particular arrangement the flooring pedestal is located beneath a flooring panel edge and not necessarily at the junction of two panels. In this embodiment the underside (15) of the flooring panel (3) has a hole (16), which is capable of accommodating the threaded hollow tube (9) of the support plate (8). In this embodiment the hollow tube (9) is truncated compared to that illustrated in Figures 1 to 4. There may be one or more of these flooring pedestals for each panel edge at the perimeter wall abutment.

[0033] The arrangement in Figure 6 illustrates another possible arrangement for accommodating the flooring pedestal (2) of the present invention at the perimeter abutment of the flooring system where the final normal panel width falls short of reaching the perimeter abutment. The remaining gap to be bridged to the perimeter abutment is less than the width of a normal size panel. In this particular arrangement the flooring pedestal closest to the perimeter abutment is located beneath an oversized flooring panel and towards the edge of that panel proximate to the perimeter abutment and not necessarily at the junction of two panels. In this embodiment the underside (15) of the oversize flooring panel (3) has a hole (16), which is capable of accommodating the threaded hollow tube (9) of the support plate (8). In this embodiment the hollow tube (9) is truncated compared to that illustrated in Figures 1 to 4. There may be one or more of these flooring pedestals for each panel edge at the perimeter wall abutment to conform to the specified loading requirements.

[0034] The invention is not restricted to the details of the foregoing embodiment(s). 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.

Claims

1. A flooring pedestal which comprises a substantially planar pedestal base plate having a threaded support pillar extending upwards from the base plate with a thread substantially along its full length and a substantially planar support plate having a centrally located threaded aperture, the support plate being threadably engaged onto the support pillar of the pedestal base so that it may travel substantially the full length of the support pillar.

2. A flooring pedestal as claimed in claim 1 comprising a planar vibration absorbing panel supporting the substantially planar pedestal base plate.

3. A flooring pedestal as claimed in claim 1 or claim 2 wherein the support plate has a centrally located and internally threaded tubular section co-axial with the aperture and extending from the top surface of the support plate, the support plate being threadably engaged on the support pillar of the pedestal base so that its tubular section is remote from the base plate.

4. A flooring pedestal as claimed in any one of claims 1 to 3 further comprising securing means associated with the support plate for securing floor panels to the flooring pedestal.

5. A flooring pedestal as claimed in claim 4 wherein the securing means comprises a locking member, which may be secured to the tubular section of the support plate.

6. A flooring pedestal as claimed in claim 5 wherein the locking member comprises a threaded pillar extending from its lower surface, which may be threadably engaged with the hollow tubular section of the support plate.

7. A flooring pedestal as claimed in claim 5 wherein the locking member comprises a threaded tube extending from its lower surface, which may be threadably engaged with the exterior of the hollow tubular section of the support plate.

8. A flooring pedestal as claimed in any one of the preceding claims further comprising a planar panel of vibration absorbing material located on the top surface of the support plate, the panel having an orifice through which the threaded hollow tubular section may be located if present.

9. A flooring pedestal as claimed in any one of the preceding claims further comprising a tubular piece of

vibration absorbing material located around the external surface of the tubular section of the support plate.

10. A flooring system comprising a combination of a plurality of flooring pedestals according to any one of the preceding claims and a plurality of flooring panels.

11. A flooring system according to claim 10, wherein the flooring system is an acoustic flooring system.

12. A flooring system according to claim 10 or claim 11, wherein the flooring system, meets the Class "O" requirements of BS 476.

13. A flooring system according to claim 10 or 11, wherein the flooring panels are fire resistant flooring panels.

14. A flooring system according to claim 13 wherein the flooring panels are calcium sulphate based or containing flooring panels.

15. A flooring system as claimed in any one of claims 10 to 13 having a Uniform Distributed Load (UDL) greater than 2.0 kN/m^2, preferably greater than 2.5 kN/m^2, preferably greater than 3.0 kN/m^2, preferably greater than 3.5 kN/m^2, more preferably greater than 4.0 kN/m^2, more preferably greater than 4.5 kN/m^2, more preferably greater than 5.0 kN/m^2, more preferably greater than 5.0 kN/m^2, more preferably greater than 5.5 kN/m^2, and most preferably greater than 6.0 kN/m^2.

16. A flooring system as claimed in any one of claims 10 to 13 having a concentration load greater than 1.2 kN/m^2, more preferably greater than 1.5 kN/m^2, more preferably greater than 2.0 kN/m^2 and most preferably greater than 2.5 kN/m^2.

17. A flooring system as claimed in any one of claims 10 to 16, wherein one or more of the flooring panels has thermal conductivity characteristics to prevent heat loss/transfer between adjacent rooms.

18. A flooring system as claimed in any one of claims 10 to 17, wherein one or more oversized flooring panels are utilized for perimeter abutment.

19. A method of constructing a partitioned building, which method comprises in a first step the laying of a flooring system according to any one of claims 10 to 18 and in a subsequent step the construction of partitions on top of the flooring system.

20. A method as claimed in claim 19, wherein the flooring system, meets the Class "O" requirements of BS 476.

21. The method according claims 19 or 20 which further comprises insertion of a thermal insulation barrier under the floor within the floor void.

22. The method according claims 21, wherein the thermal insulation barrier is selectively located under the floor along the lines of the proposed partitioning.

23. The method according to claim 21 or claim 22 wherein the thermal insulation barrier is selected to have thermal insulation properties which match those of the corresponding partition.

24. A partitioned building comprising a flooring pedestal according to any one of claims 1 to 9 or a flooring system according to any one of claims 10 to 18 or constructed according to the method of claims 19 to 23.

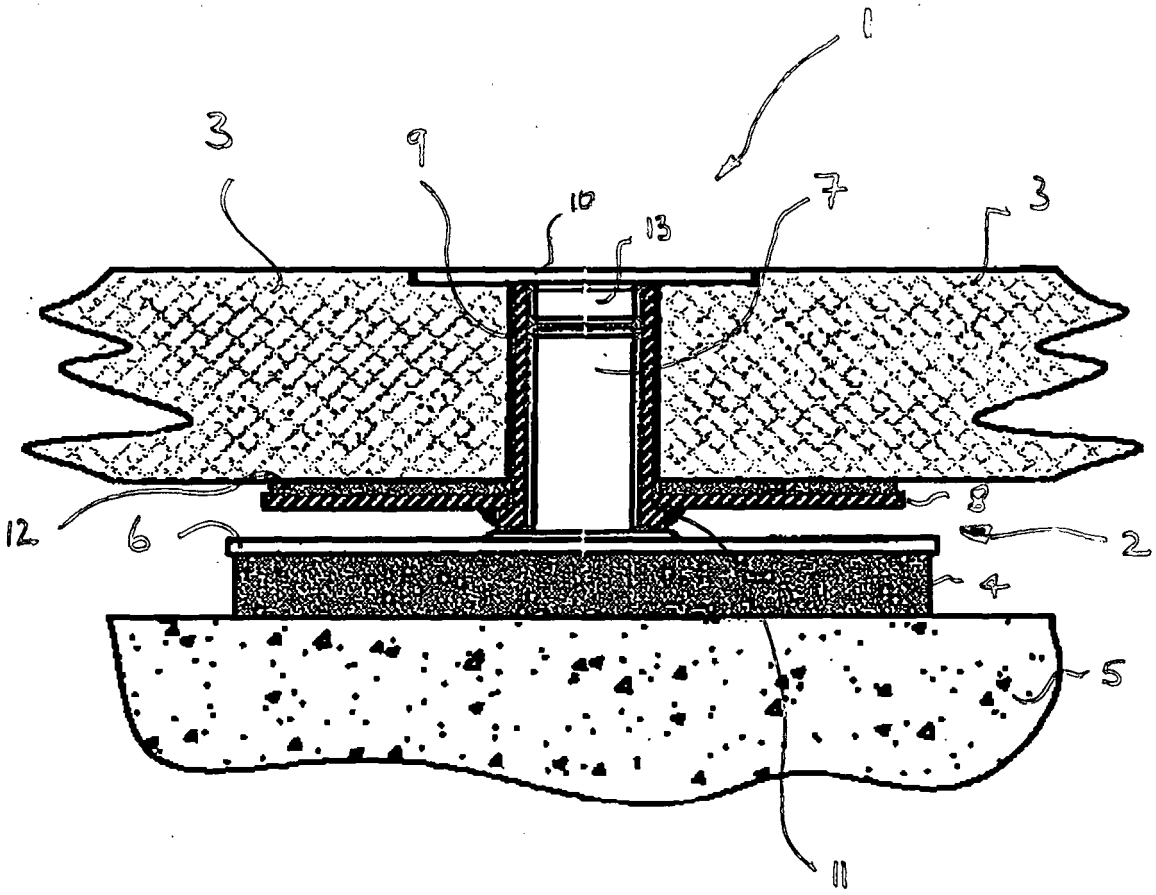

FIGURE 1

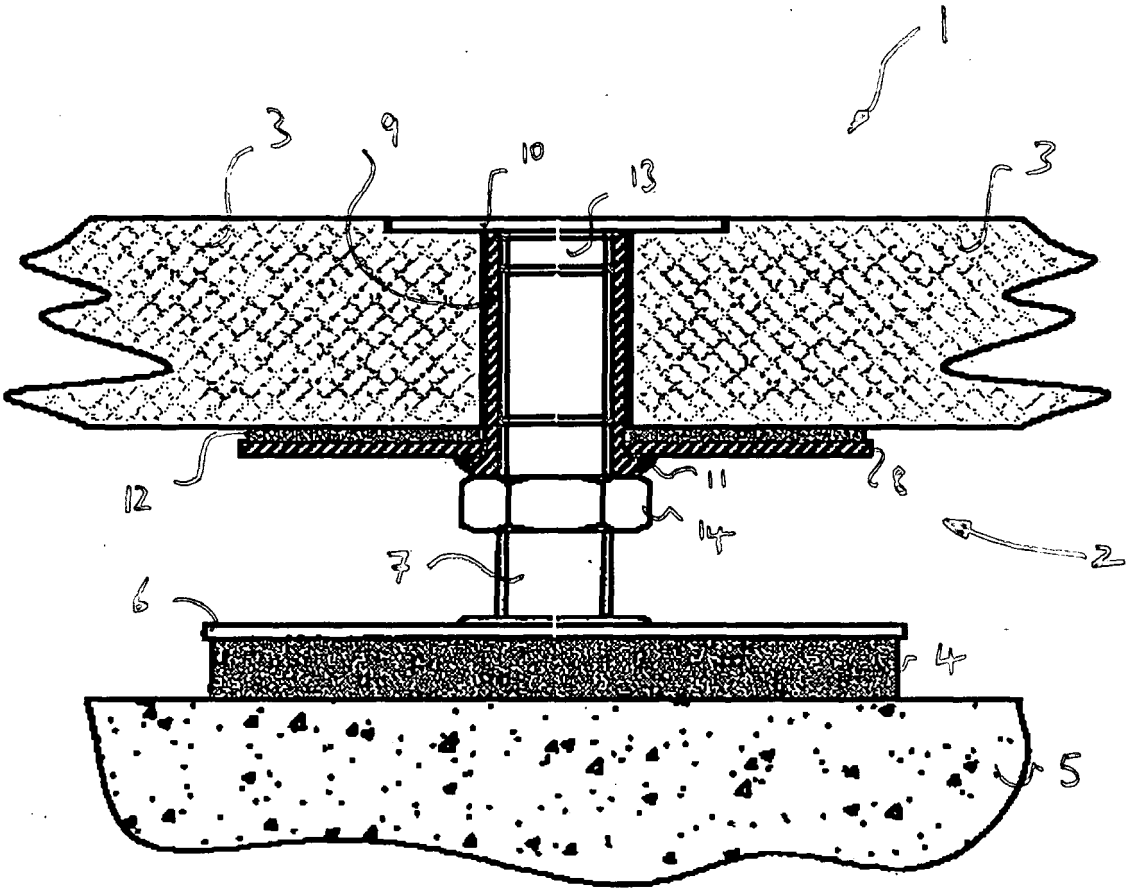

FIGURE 2

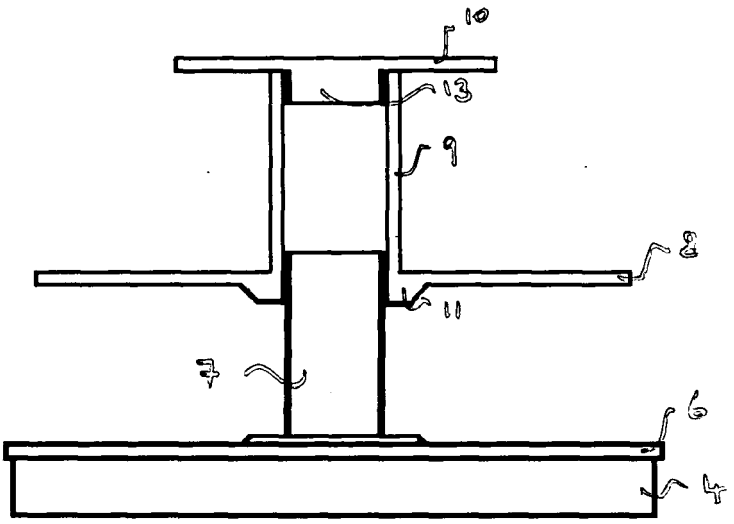

Figure 3

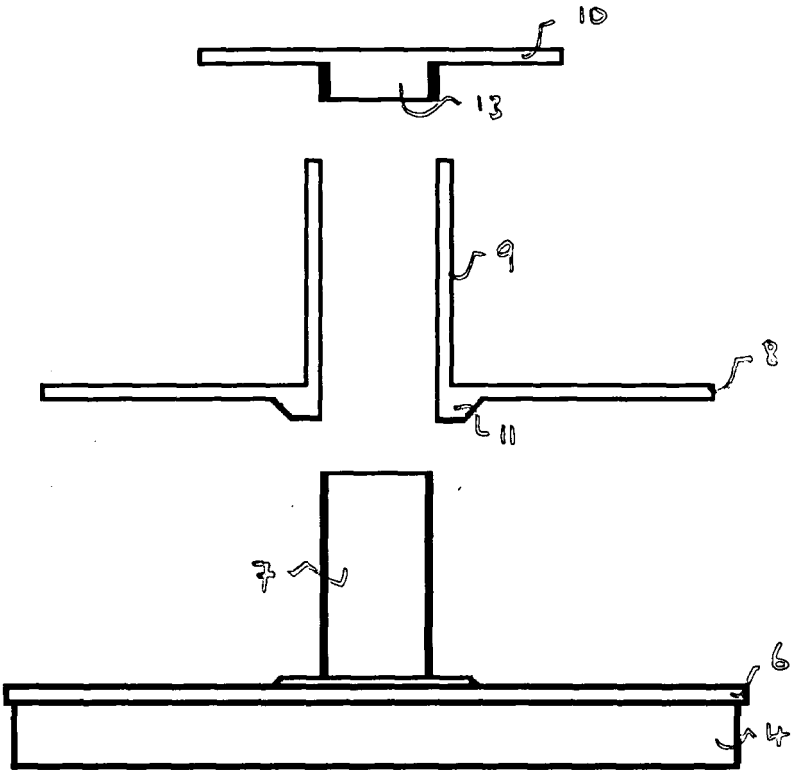

Figure 4

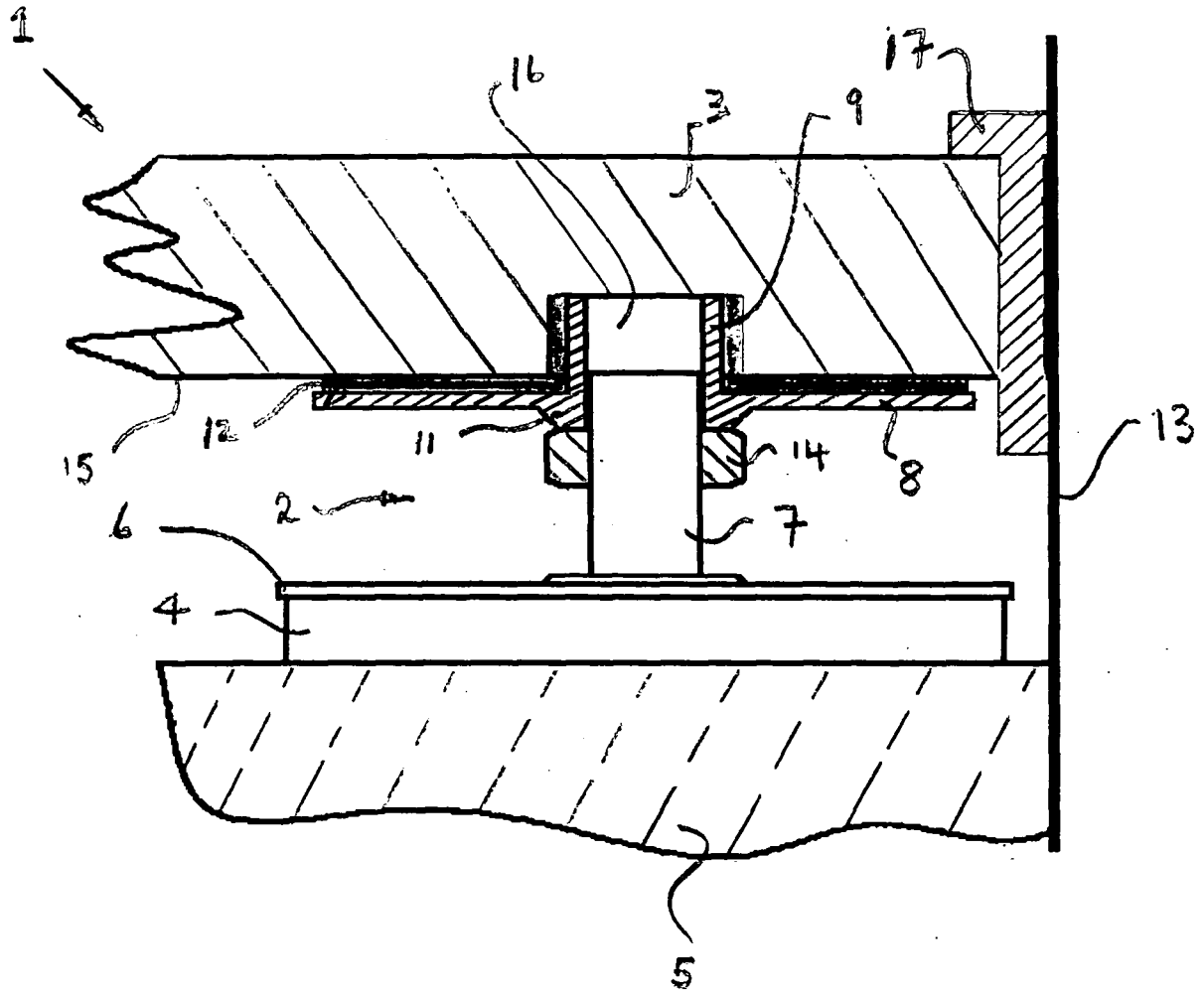

Figure 5

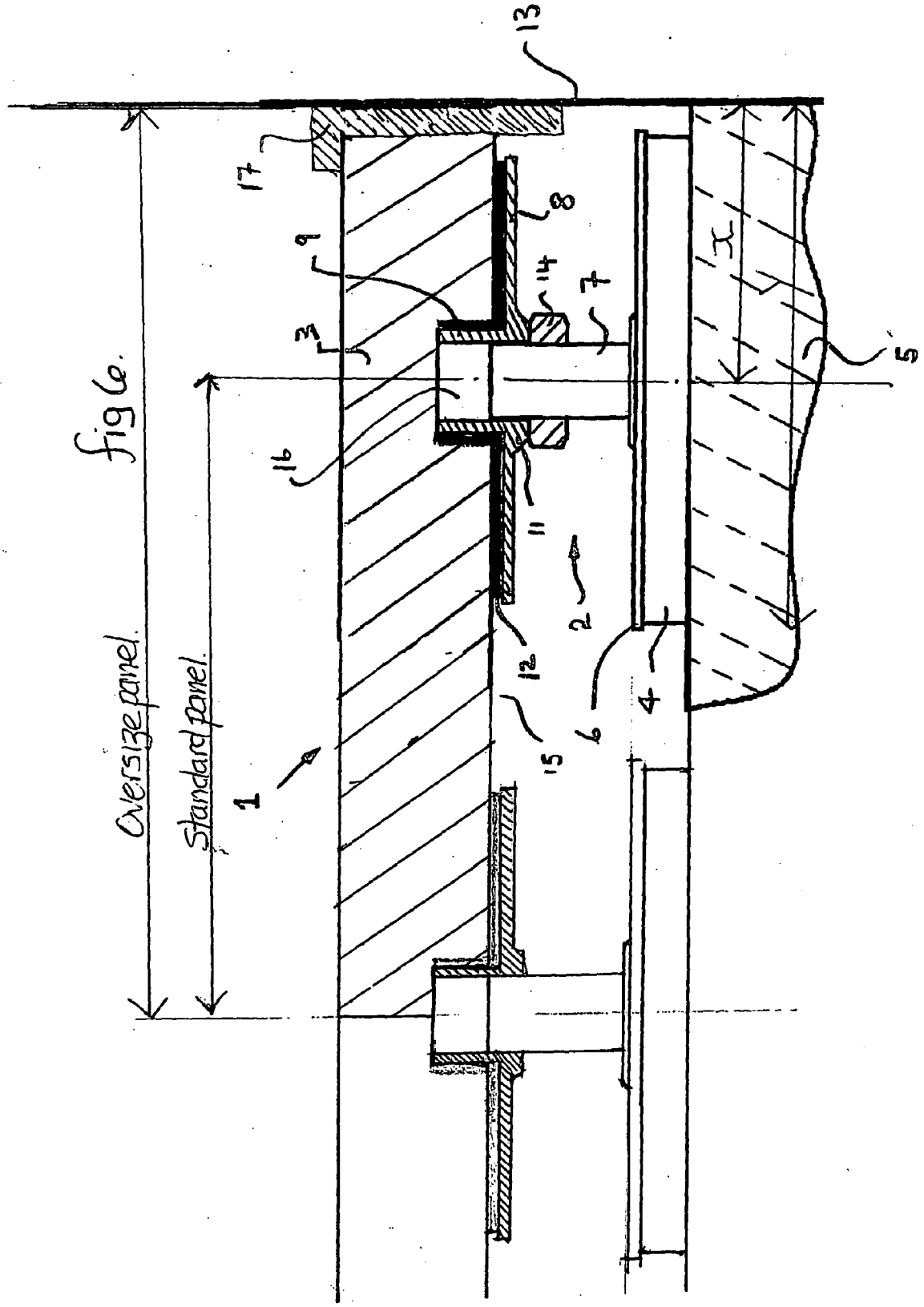
13
17
8
9
14
7
3
5
X
16
11
2
12
4
6
15
1
Oversize panel.
Standard panel.

fig 6.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- GB 2305947 A **[0004]**
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