(19) DANMARK

(10) DK/EP 2434071 T3

Patent- og Varemærkestyrelsen

(12) Oversættelse af europæisk patentskrift

(51) Int.Cl.: *E 04 H 15/56 (2006.01)* *E 04 D 11/00 (2006.01)* *E 04 F 15/024 (2006.01)*

(45) Oversættelsen bekendtgjort den: **2015-10-19**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2015-07-15**

(86) Europæisk ansøgning nr.: **11182487.6**

(86) Europæisk indleveringsdag: **2011-09-23**

(87) Den europæiske ansøgnings publiceringsdag: **2012-03-28**

(30) Prioritet: **2010-09-28 GB 201016248**

(84) Designerede stater: **AL 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 RS SE SI SK SM TR**

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(54) Benævnelse: **Højdeindstillelig gulvstøtte**

(56) Fremdragne publikationer:
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DESCRIPTION

[0001] This invention relates to a height-adjustable floor support, for example for use with temporary structures.

[0002] Temporary floor structures are commonly used in combination with marquees. At present, in order to elevate the floor of a marquee a rudimentary technique is employed which involves placing undedicated pieces of wood beneath the floor to adjust the height thereof. Such a technique is time-consuming and unreliable. A modern marquee is far removed from the traditional image of a tent held by fixing pegs; today a marquee is a self-supporting structure which can have all the facilities of a conventional building, including heating and running water. There is, therefore, a demand for a modern floor support to match the other features of such marquees.

[0003] DE2325202 discloses a kit for a baseboard for tents and which includes adjustable support feet, according to the preamble of claim 1.

[0004] US2008/105172 discloses a deck system and pedestal for use in forming an elevated surface.

[0005] US2006/162262 discloses a panel assembly for providing underdeck water drainage and for other applications such as wall panels and skirting for exposed areas under building. The panel assembly includes a plurality of joist brackets that are mounted transversely to and under the joists of a deck, a plurality of drainage panels, a plurality of drainage panel brackets, and a plurality of joist bracket spacers.

[0006] US2009/293378 discloses a modular free standing structure and an adjustable footing configured to support the modular free standing structure. The structural footing comprises a support member having a support surface configured to provide vertical support to one or more modular platform structures, a base member, and an adjustable levelling mechanism disposed between the support member and the base member, and configured to level adjoining modular platform structures by adjusting a height of the support member relative to the base member about a vertical axis of the structural footing.

[0007] DE19631880 discloses a floor build-up unit in which floor sections are mounted on supports including a spherical cup which allows alignment of the support face. A bolt is provided which can be screwed into the cup so as to adjust the height of the support.

[0008] US6106186 discloses a modular portable stage and floor system which uses a small number of standardised modular components to construct a temporary or permanent platform that is easily adaptable to a wide variety of platform designs.

[0009] It is an object of the present invention to provide a height-adjustable floor support which overcomes, or at least ameliorates, the disadvantages of known supports.

[0010] According to the present invention there is provided a height-adjustable floor support comprising: a baseplate assembly including a plurality of first interlocking members; an adapter plate for engaging with a flooring component and including a plurality of second interlocking members; and at least one riser, the riser including a peripheral wall mounted between a bottom plate and a top plate; the bottom plate having a plurality of second interlocking members formed therein, and the top plate having a plurality of first interlocking members formed therein, the number of first interlocking members corresponding to the number of second interlocking members or a multiple thereof, the first and second interlocking members being axially spaced from each other and each interlocking member of the first and second interlocking members being equally spaced around a circle, and the second interlocking members of the bottom plate releasably interlocking with the first interlocking members of the baseplate assembly and the first interlocking members of the bottom plate releasably interlocking with the second interlocking members of the adapter plate.

[0011] The floor support may include a plurality of the risers. At least some of the risers may have different axial lengths.

[0012] The baseplate assembly may be provided with apertures for use in securing the baseplate assembly to a ground surface.

[0013] The first interlocking members of the baseplate assembly may be mounted to be positioned at a range of angles relative to the baseplate.

[0014] The first interlocking members of the baseplate assembly may be provided in a plate spaced from a baseplate of the assembly.

[0015] The first and second interlocking members may be engaged and disengaged by rotating one set of interlocking members about the axial direction relative to the other set of interlocking members.

[0016] One of the first and second sets of interlocking members may include a bayonet assembly. Alternatively, the first and second interlocking members may be interlocked by means of a screw thread. As a further alternative, the first interlocking members may be diametrically opposed.

[0017] The first interlocking members may comprise a tab which may extend in the axial direction of the riser and which is formed with a neck portion, for example adjacent to the bottom plate. The tab may extend in at least one of a radially inner and a radially outer direction. The or each free end of the tab may be mitred or rounded to facilitate insertion.

[0018] The end plate including the first interlocking members may be provided with an axially extending peripheral flange which may extend at least the axial extent of the tabs.

[0019] The peripheral wall may include apertures which may extend from one end plate to the other end plate. The peripheral wall may be arcuate, for example, cylindrical, or may be polygonal. The polygonal regions may be arranged such that two planar regions of the peripheral wall are diametrically opposed.

[0020] The second interlocking members may be in the form of apertures formed in one of the end plates, the apertures being configured with a portion of relatively large dimensions to allow the tab of the first interlocking members to pass through in an axial direction, and a further, preferably arcuate, portion which extends in a circumferential direction and which is dimensioned to allow the neck portion of the tab to pass along the circumferentially-extending portion but which does not allow the tab to pass through in an axial direction.

[0021] The circumferentially-extending portion of the second interlocking members may be formed at that end thereof remote from the relatively large portion with an intermediate circumferentially-extending projection to limit circumferential movement of the first interlocking member relative to the second interlocking member.

[0022] The aperture may be formed with a tab which is bent out of the plane of the aperture to inhibit rotation relative to an adjacent riser.

[0023] Two or four second interlocking members may be provided equally spaced around a circle.

[0024] The adapter plate may comprise a channel member which includes upright flanges provided with apertures to allow the adapter plate to be secured to a flooring component of a temporary floor structure.

[0025] The adapter plate may include an axially extending flange extending around the second interlocking members provided thereon.

[0026] The adapter plate may be mounted by way of a threaded elevating mechanism.

[0027] For a better understanding of the present invention and to show more clearly how it may be carried into effect reference will now be made, by way of example, to the accompanying drawings in which:

[0028] Figure 1 is a perspective view of one embodiment of a height-adjustable floor support according to the present invention;

[0029] Figure 2 is an exploded view of the floor support shown in Figure 1;

[0030] Figure 3 is a perspective view of a baseplate assembly forming part of the floor support shown in Figure 1;

[0031] Figures 4, 5 and 6 are perspective views of a range of risers forming part of the height-adjustable floor support according to the present invention;

[0032] Figure 7 is a perspective view of a bottom plate forming part of the risers shown in Figures 4 to 6;

[0033] Figure 8 is a perspective view of a top plate forming part of the risers shown in Figures 4 to 6;

[0034] Figure 9 is a perspective view from above of an adapter plate forming part of the floor support shown in Figure 1;

[0035] Figure 10 is a perspective view from below of the adapter plate of Figure 9;

[0036] Figure 11 is a perspective view of an alternative form of top plate;

[0037] Figure 12 is a perspective view of an alternative form of bottom plate for use with the top plate of Figure 11;

[0038] Figure 13 shows a threaded elevating mechanism; and

[0039] Figures 14 and 15 show how a baseplate may be modified to operate at a range of different angles.

[0040] The height-adjustable floor support shown in Figures 1 to 10 comprises a baseplate assembly 1 which comprises a baseplate 3 provided with apertures 5 for use in securing the baseplate assembly to a ground surface, for example by means of stakes (not shown), and a retaining mechanism 7 for receiving and retaining a riser as will be explained in more detail hereinafter. A riser 9 is mounted on the baseplate 1 and secured in position by the retaining mechanism 7, the riser 9 including a peripheral wall 11 mounted between a bottom plate 13 and a top plate 15. The riser will be described in more detail hereinafter. An adapter plate 17 is mounted on the top of the, or the upper, riser, again as will be explained in more detail hereinafter. The floor supports allow a temporary floor to be elevated above ground level, allowing for a basement-type configuration.

[0041] Each riser 9 comprises a peripheral wall 11 which may be incomplete, for example including apertures 19 which may extend from an upper end to a lower end (as shown in the drawings) of the wall. Additionally, the wall is not necessarily arcuate, but may be polygonal in plan view as shown in the figures. The apertures and polygonal regions may be arranged such that two planar regions 21 of the peripheral wall are preferably diametrically opposed. The apertures and the planar regions allow the riser to be gripped, either manually or by means of a tool, in order to rotate the riser. The peripheral wall 11 may be of different axial lengths as shown in Figures 4, 5 and 6 to provide different heights. If desired, however, the peripheral wall may simply be in the form of a hollow cylinder.

[0042] The bottom plate 13 of each riser 9 is designed with a pair of diametrically opposed interlocking members 23 which engage with a complementary interlocking member formed in the top plate of each riser and in the retaining mechanism of the baseplate assembly 1. The bottom plate additionally includes a central aperture 25. The interlocking members 23 comprise a tab 27 which may extend substantially at right angles to the plane of the bottom plate (or in the axial direction of the peripheral wall) and which is formed with a neck portion 29, for example adjacent to the bottom plate. The free ends of the tab 27 may be mitred or rounded to facilitate insertion. The bottom plate 13 is also provided with an axially extending peripheral flange 31 (or skirt) which extends at least the axial extent of the tabs 27 to protect the same. Of course, a greater number of interlocking members may be provided if desired.

[0043] The top plate 15 of each riser 9 is designed with four interlocking members 33 equally spaced around a circle, although in practice the number of interlocking members 33 will correspond to the number of interlocking members 23 of the bottom plate 13 or a multiple thereof. The top plate additionally includes a central aperture 41. The interlocking members 33 are in the form of apertures formed in the top plate, the apertures having a keyhole configuration with a portion 35 of relatively large dimensions to allow the tab 27 of the bottom plate to pass through in an axial direction, and an arcuate portion 37 which extends in a circumferential direction and which is dimensioned to allow the neck portion 29 of the tab 27 to pass along the arcuate portion but which does not allow the tab to pass through in an axial direction. Thus, the top plate 15 of one riser 9 can be securely mounted to a bottom plate of an adjoining riser. The arcuate portion of the interlocking members 33 is formed at that end thereof remote from the portion 35 with an intermediate circumferentially extending projection 39 which limits circumferential movement of the interlocking member 23 relative to the interlocking member 33 and reduces the likelihood of the interlocking member 23 becoming jammed in the interlocking member 33.

[0044] The retaining mechanism 7 of the baseplate assembly 1 comprises a sheet 43 spaced from the baseplate 3 and formed with a central aperture 45 and with interlocking members 47 which correspond to the interlocking members 33 of the top plate 15 of the risers so as to allow a riser 9 to be securely mounted on the baseplate assembly 1 in the same manner as the riser would be mounted on a further riser.

[0045] The adapter plate 17 comprises a channel member 49 which includes upright flanges 51 provided with apertures 53 to allow users to secure the floor support to a floor component (not shown) of a temporary floor structure. A retaining mechanism 55 is secured to the underside of the channel member 49 and is essentially the same as the bottom plate 13 of a riser. The retaining

mechanism 55 includes diametrically opposed interlocking members 57, equal in number and location to the interlocking members 23 of the bottom plate of a riser, and which engage with a complementary interlocking member 33 formed in the top plate of each riser 9 or in the retaining mechanism of the baseplate assembly 1. The interlocking members 55 of the adapter plate are of substantially the same configuration as the interlocking members of the riser bottom plate 13 and will not be described further. The retaining mechanism 55 also includes an axially extending flange 59 (or skirt) which extends at least the axial extent of the tabs 27 to protect the same. The configuration of the channel member 49 may be modified, if desired, to accommodate alternative temporary floor structures.

[0046] The components may be made of any suitable material, such as coated mild steel or stainless steel, suitable for an outdoor environment. However, the floor support may also be used indoors.

[0047] The floor support according to the present invention is employed by mounting a baseplate assembly 1 to a ground surface and securely mounting a riser 9 of selected axial extent to the baseplate assembly by engaging the interlocking members 23, 47 and rotating the riser a few degrees relative to the baseplate assembly. One or more further risers may be securely mounted one by one on the riser beneath, again by engaging the interlocking members 33, 23 and rotating the riser 9 a few degrees relative to the riser below. When the required elevation has been achieved an adapter plate 17 is securely mounted on the assembly beneath by engaging the interlocking members 55, 47 or 55, 33 and rotating the locking plate a few degrees relative to the assembly beneath. Disassembly of the floor support is the reverse of the assembly method.

[0048] It should be noted that alternative interlocking members may be employed to those described above. For example, interlocking members incorporating a bayonet mechanism in which a centrally located tab on one component engages with a suitable aperture provided in an adjacent component, or a screw thread in which one component is threaded onto an adjacent component by means rotating one component a few degrees relative to the other component in the manner of a lid of a glass jar.

[0049] The height-adjustable floor support may be modified in a number of ways. As shown in Figure 11, the interlocking members 33 of the top plate 15 may be provided with a tab 61 within the aperture of the interlocking member, the tab 61 being bent out of the plane of the aperture to act as an anti-rotational feature when the bottom plate 13 of an adjoining riser 9 engages with the top plate 15. That is, the tab 61 inhibits rotation in a direction towards the tab.

[0050] Correspondingly, as shown in Figure 12, the interlocking members 23 of the bottom plate 13 of a riser may be formed with a tab 63 which, unlike the tabs 27 which extend both radially inwardly and radially outwardly, extends only in a single radial direction, that is, radially outwardly as shown in Figure 12. It should be noted that the keyhole configuration for the apertures in the top plate is not essential, provided a portion of a radially inner or radially outer side wall (radially outer as shown in Figure 11) is configured so as to allow the tab 63 (or tab 27) to engage beneath the top plate. As illustrated in Figure 11, the radially outer wall has a shorter circumferential extent than the radially inner wall and also a shorter circumferential extent than a radially intermediate portion of the aperture such that the tab 63 can engage beneath the top plate. In contrast, in Figures 3 to 6 and 8, both the radially outer and radially inner walls of the aperture are reduced in circumferential extent compared with a radially intermediate portion of the aperture so as to give rise to the keyhole configuration.

[0051] As shown in Figure 13, the retaining mechanism 55 may be separated from the adapter plate 17 by way of a threaded elevating mechanism 65 which comprises a threaded member 67 with a rotatable member 69 mounted thereon and rotatable so as to cause the retaining mechanism to move towards and away from the adapter plate 17 in an axial direction of the threaded member as a result of rotation of the rotatable member 69 in an appropriate direction.

[0052] As shown in Figures 14 and 15, the baseplate 3 may be modified to operate at a range of different angles. As shown, the retaining mechanism 7 is mounted on an intermediate plate 71 which has angled side walls that are pivotably mounted on correspondingly angled side walls of the baseplate 3. Both sets of side walls are formed with a row of apertures 73 which are positioned to allow the intermediate plate 71 to be positioned at different angles with a locking bar 75 passing through the chosen apertures.

REFERENCES CITED IN THE DESCRIPTION

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PATENTKRAV

1. Højdeindstillelig gulvstøtte omfattende: en grundpladesamling (1), der omfatter en flerhed af første sammenlåste elementer (47); en adaptorplade (17) til at gå i indgreb med en gulvkomponent og omfattende en flerhed af andre sammenlåste elementer (57); og mindst ét afstandsstykke (9), kendetegnet ved, at afstandsstykket (9) omfatter en perifer væg (11), som er monteret mellem en bundplade (13) og en topplade (15); idet bundpladen har en flerhed af andre sammenlåste elementer (23) dannet deri, og toppladen har en flerhed af første sammenlåste elementer (33) dannet deri, hvor antallet af de første sammenlåste elementer (33) på toppladen svarer til antallet af de andre sammenlåste elementer på bundpladen (13) eller et multiplum deraf, idet de første (33) og andre (23) sammenlåste elementer er i en aksial afstand fra hinanden, og hvert sammenlåste element af de første og andre sammenlåste elementer (33, 23) er i en lige stor afstand omkring en cirkel, og de andre sammenlåste elementer (23) på bundpladen (13) er aftageligt sammenlåst med de første sammenlåste elementer (47) af grundpladesamlingen (1), og de første sammenlåste elementer (33) på toppladen (15) er aftageligt sammenlåst med de andre sammenlåste elementer (57) på adaptorpladen (17).

2. Gulvstøtte ifølge krav 1 og omfattende en flerhed af afstandsstykker (9).

3. Gulvstøtte ifølge krav 2, hvor i det mindste nogle af afstandsstykkerne (9) har forskellige aksiale længder.

4. Gulvstøtte ifølge et hvilket som helst af de foregående krav, hvor de første sammenlåste elementer (47) på grundpladesamlingen (1) er monteret således, at de er anbragt i en række vinkler i forhold til grundpladesamlingen (1).

5. Gulvstøtte ifølge et hvilket som helst af de foregående krav, hvor de første sammenlåste elementer (47) på grundpladesamlingen (1) er tilvejebragt i en plade (7) i en afstand fra en grundplade (3) af samlingen (1).

6. Gulvstøtte ifølge et hvilket som helst af de foregående krav, hvor de første og de andre sammenlåste elementer (23, 33, 47, 57) tilkobles og frakobles ved at dreje ét

sæt sammenlåste elementer omkring den aksiale retning i forhold til det andet sæt sammenlåste elementer.

7. Gulvstøtte ifølge et hvilket som helst af de foregående krav, hvor de første sammenlåste elementer (23, 47) omfatter en flap (27, 63), som strækker sig i den aksiale retning af afstandsstykket (9), og som er udformet med en halsdel (29).

8. Gulvstøtte ifølge krav 7, hvor flappen (27, 63) strækker sig i mindst én af en radialt indre og en radialt ydre retning.

9. Gulvstøtte ifølge krav 7 eller 8, hvor den endeplade (13), der omfatter de første sammenlåste elementer (23), er forsynet med en aksialt forløbende perifer flange (31), som i det mindste strækker sig over den aksiale udstrækning af flapperne (27, 63).

10. Gulvstøtte ifølge et hvilket som helst af de foregående krav, hvor den perifere væg (11) omfatter åbninger, som strækker sig fra én endeplade (13) til den anden endeplade (15).

11. Gulvstøtte ifølge et hvilket som helst af de foregående krav, hvor de andre sammenlåste elementer (33) er i form af åbninger, som er udformet i én af endepladerne, idet åbningerne er konfigureret med en portion (35) med relativt store dimensioner for at gøre det muligt for flappen (24, 63) på de første sammenlåste elementer (23) at passere igennem i en aksial retning og en yderligere, fortrinsvis bueformet, portion (37), som strækker sig i en periferisk retning, og som er dimensioneret til at gøre det muligt for halsdelen (29) af flappen (27, 63) at passere langs med den periferisk forløbende portion, men som ikke gør det muligt for flappen at passere igennem i en aksial retning.

12. Gulvstøtte ifølge krav 11, hvor den periferisk forløbende portion (37) af de andre sammenlåste elementer (33) er udformet ved den ende deraf, som er fjernt fra den relativt store portion (35) med et mellemliggende periferisk forløbende fremspring (39) til at begrænse periferisk bevægelse af det første sammenlåste element (23) i forhold til det andet sammenlåste element (33).

13. Gulvstøtte ifølge krav 11 eller 12, hvor åbningen er udformet med en flap (61), som er bøjet ud af åbningens plan for at forhindre rotation i forhold til et tilgrænsende afstandsstykke (9).

14. Gulvstøtte ifølge et hvilket som helst af de foregående krav, hvor adaptorpladen (17) omfatter en aksialt forløbende flange (59), som strækker sig omkring de andre sammenlåste elementer (57), der er tilvejebragt derpå.

15. Gulvstøtte ifølge et hvilket som helst af de foregående krav, hvor adaptorpladen (17) er monteret ved hjælp af en løftemekanisme (65) med gevind.

DRAWINGS

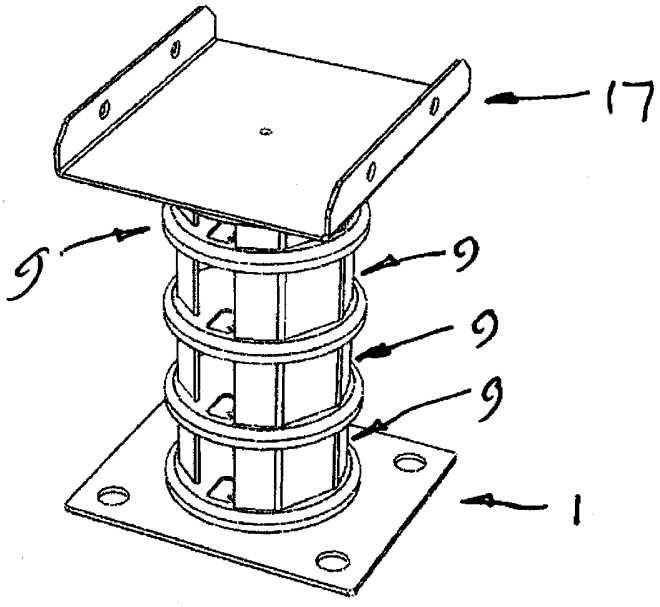

Fig. 1

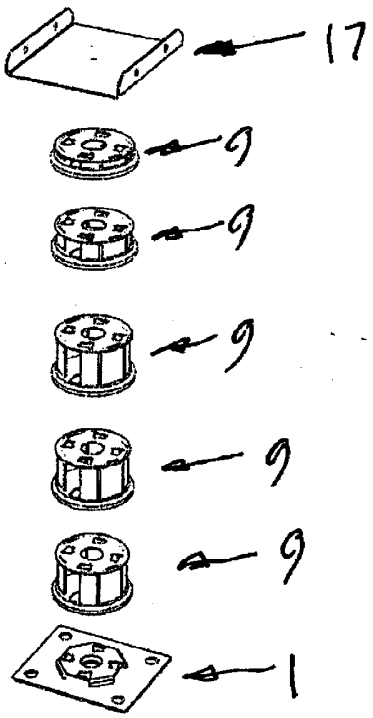

Fig. 2

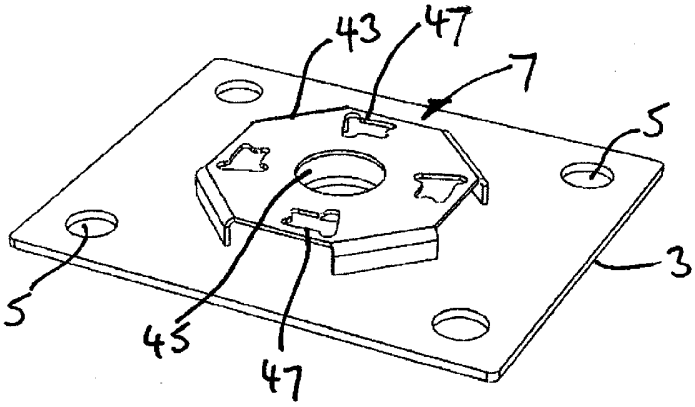

Fig. 3

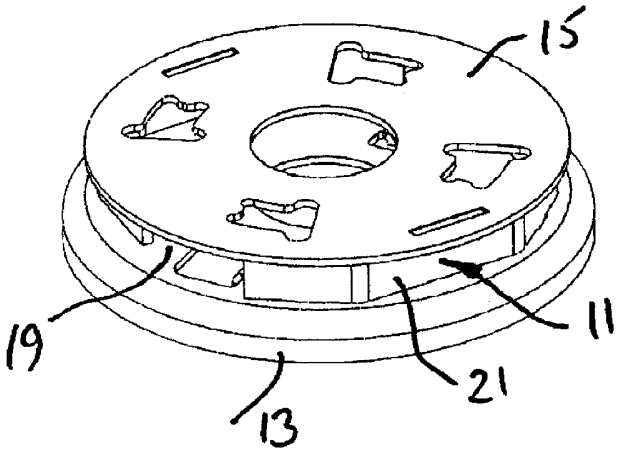

Fig. 4

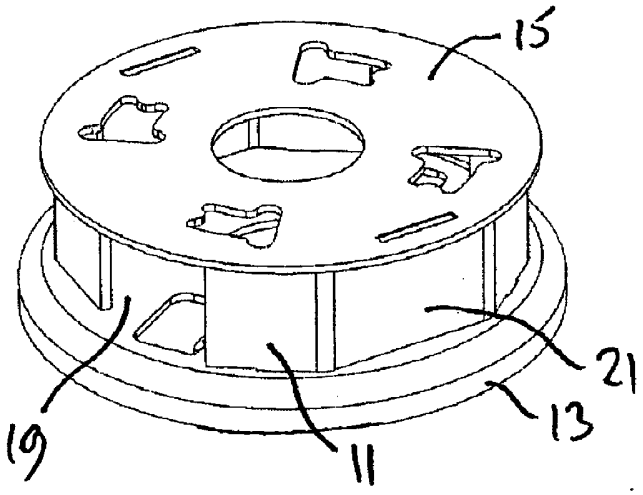

Fig. 5

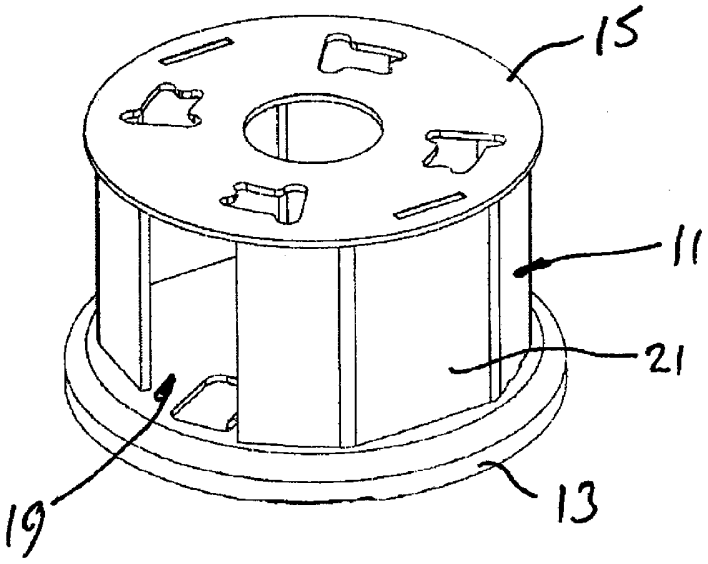

Fig. 6

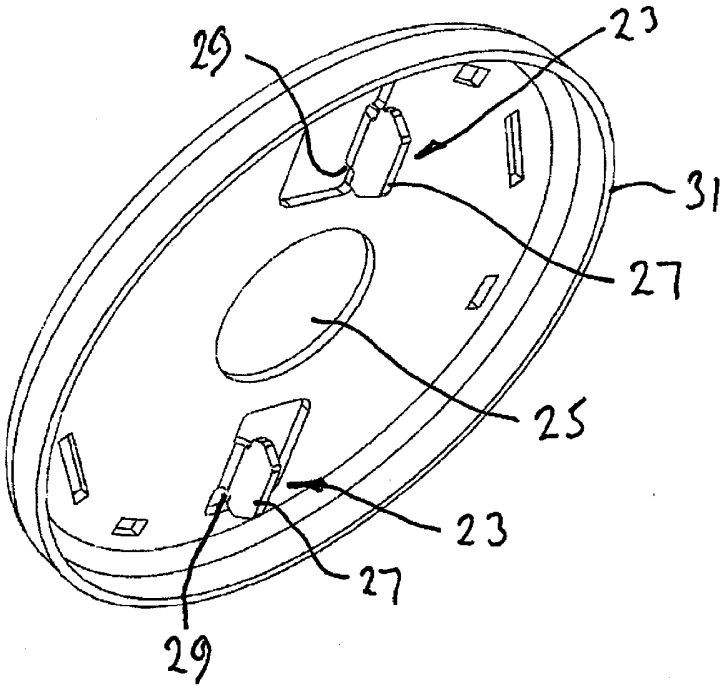

Fig. 7

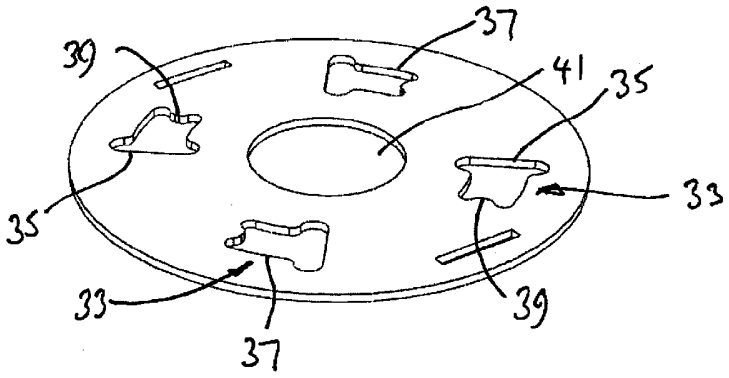

Fig. 8

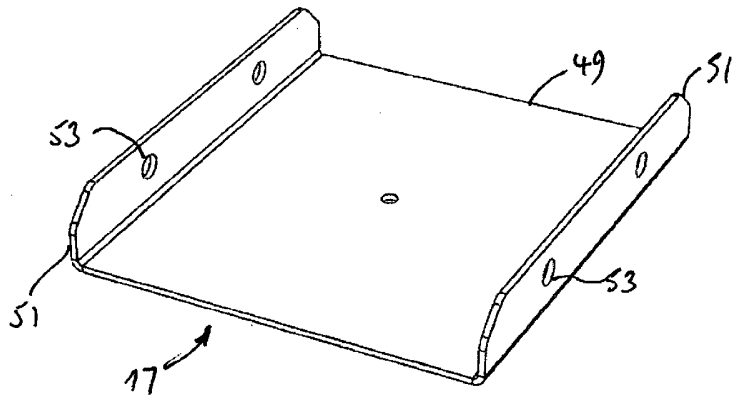

Fig. 9

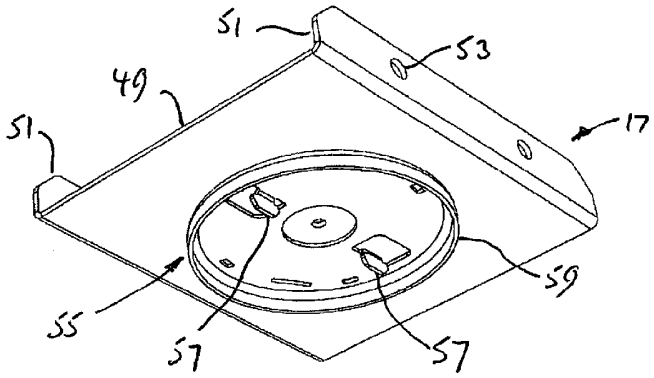

Fig. 10

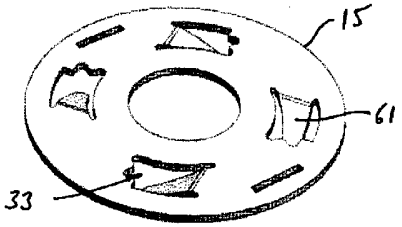

Fig. 11

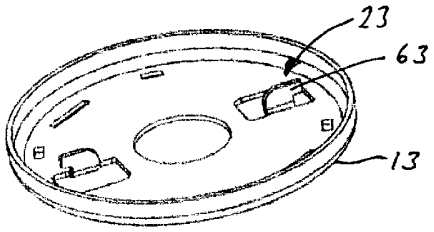

Fig. 12

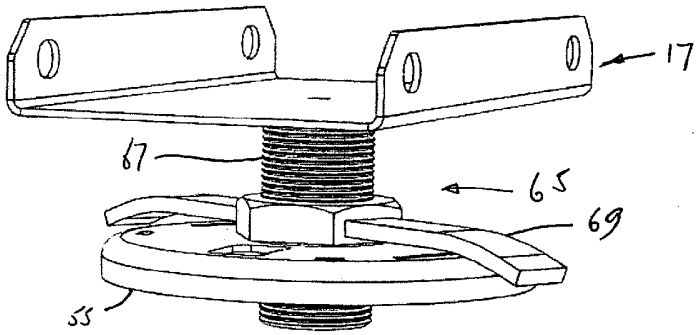

Fig. 13

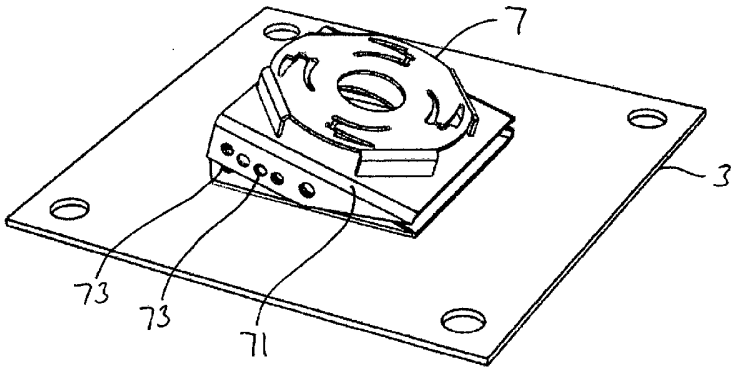

Fig. 14

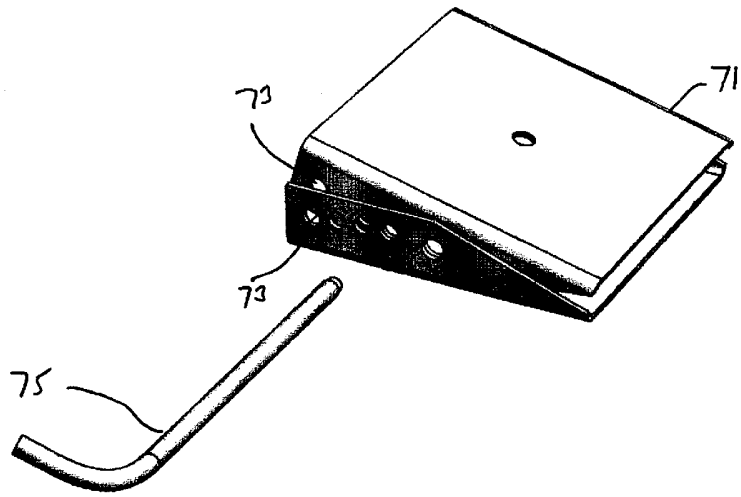

Fig. 15