

(21) Application No: 0512858.2
(22) Date of Filing: 23.06.2005

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(51) INT CL:
E04F 15/024 (2006.01)
(52) UK CL (Edition X):
E1D DF172 DLEKH2 D2026 D2106 D401 D402
(56) Documents Cited:
US 6442906 B1 **US 5333423 A**
(58) Field of Search:
UK CL (Edition X) **E1D**
INT CL⁷ **E04F**
Other: **WPI & EPODOC**

(54) Abstract Title: **Pedestal structure for raised access floors**

(57) A pedestal comprises a support 20 having a screw bolt 21, its upper end having an adjusting hole 23, its lower end having an H-shape and being connected to a base 22, the base having a protruding portion 27 with a central pivot hole 271. Also provided is a fixing seat 30 having an interiorly threaded through hole 31, connected by screwing with the upper end of the screw bolt. The fixing seat supports a plurality of raised access floor panels. A socket set screw 40 is screwed into the through hole of the fixing seat, it has a vertical (in use) though hole having a diameter larger than that of the adjusting hole 23 of the screw bolt. In use, an adjusting tool extends through the through hole in the socket set screw to engage with the adjusting hole of the screw bolt, rotation of the screw bolt permits vertical displacement of the supporting seat relative to the fixing seat. The socket set screw is rotated into abutment with the screw bolt in order to prevent movement of the screw bolt.

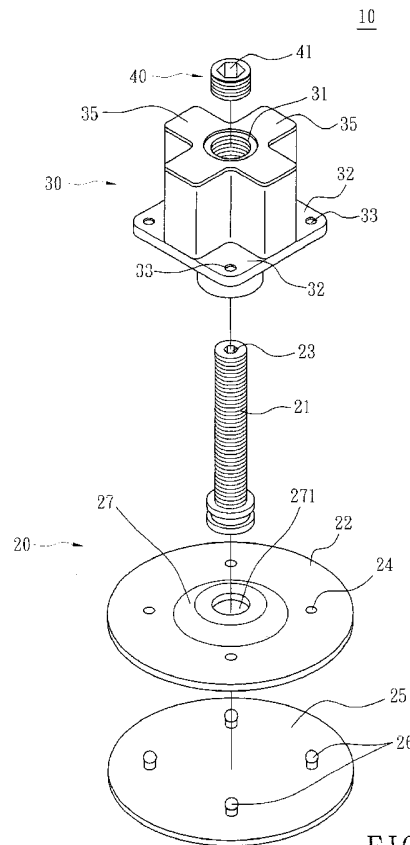


FIG. 2

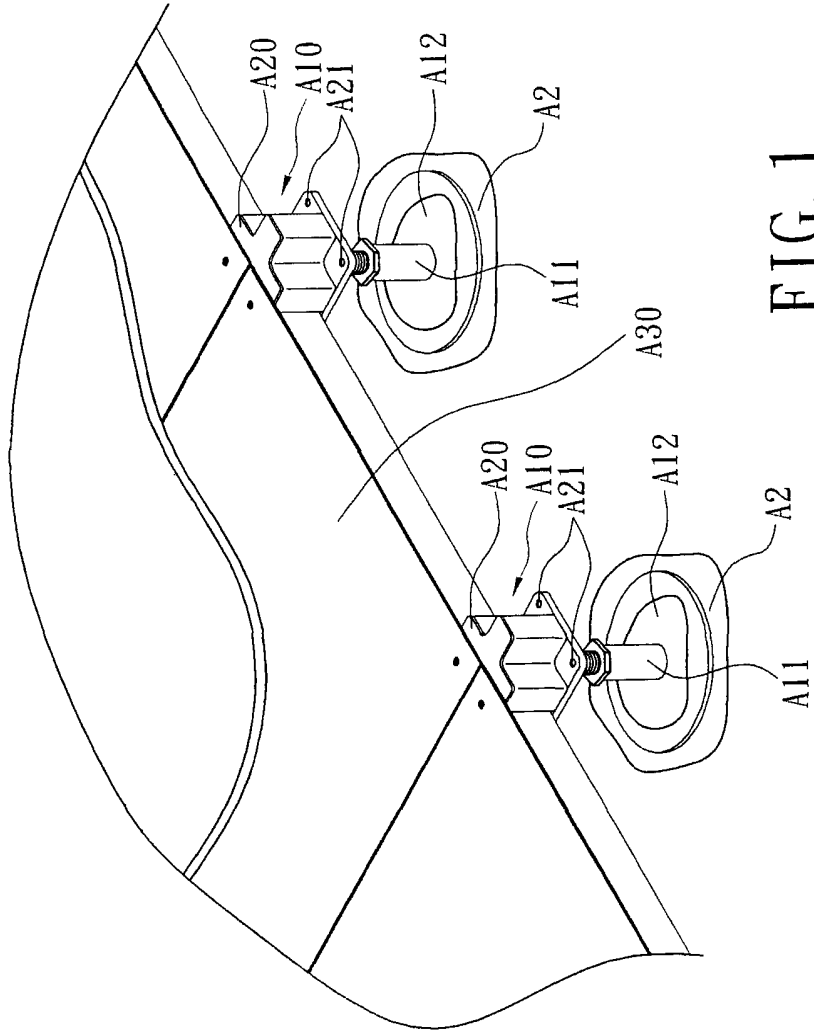


FIG. 1
PRIOR ART

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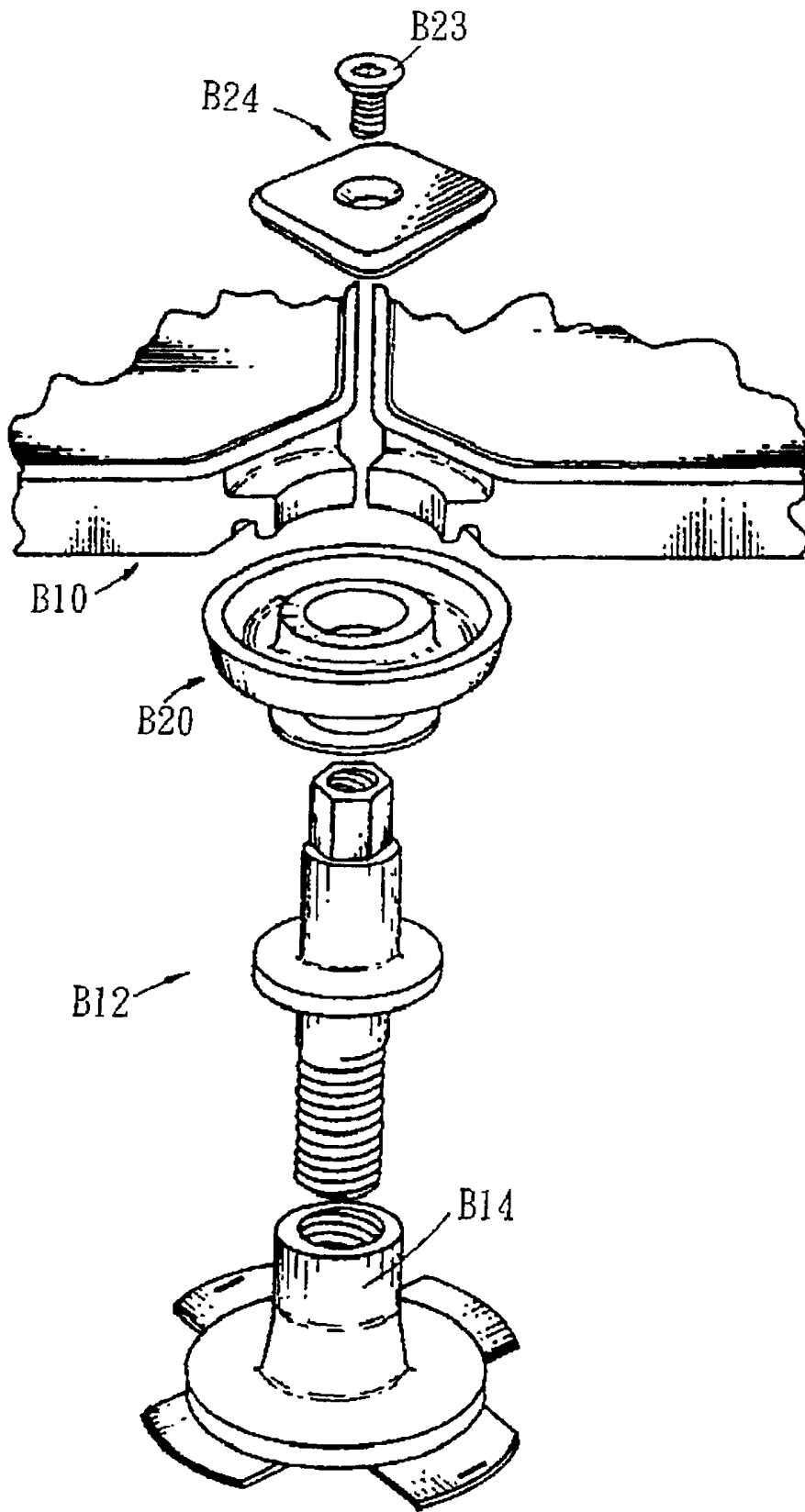


FIG. 1B
PRIOR ART

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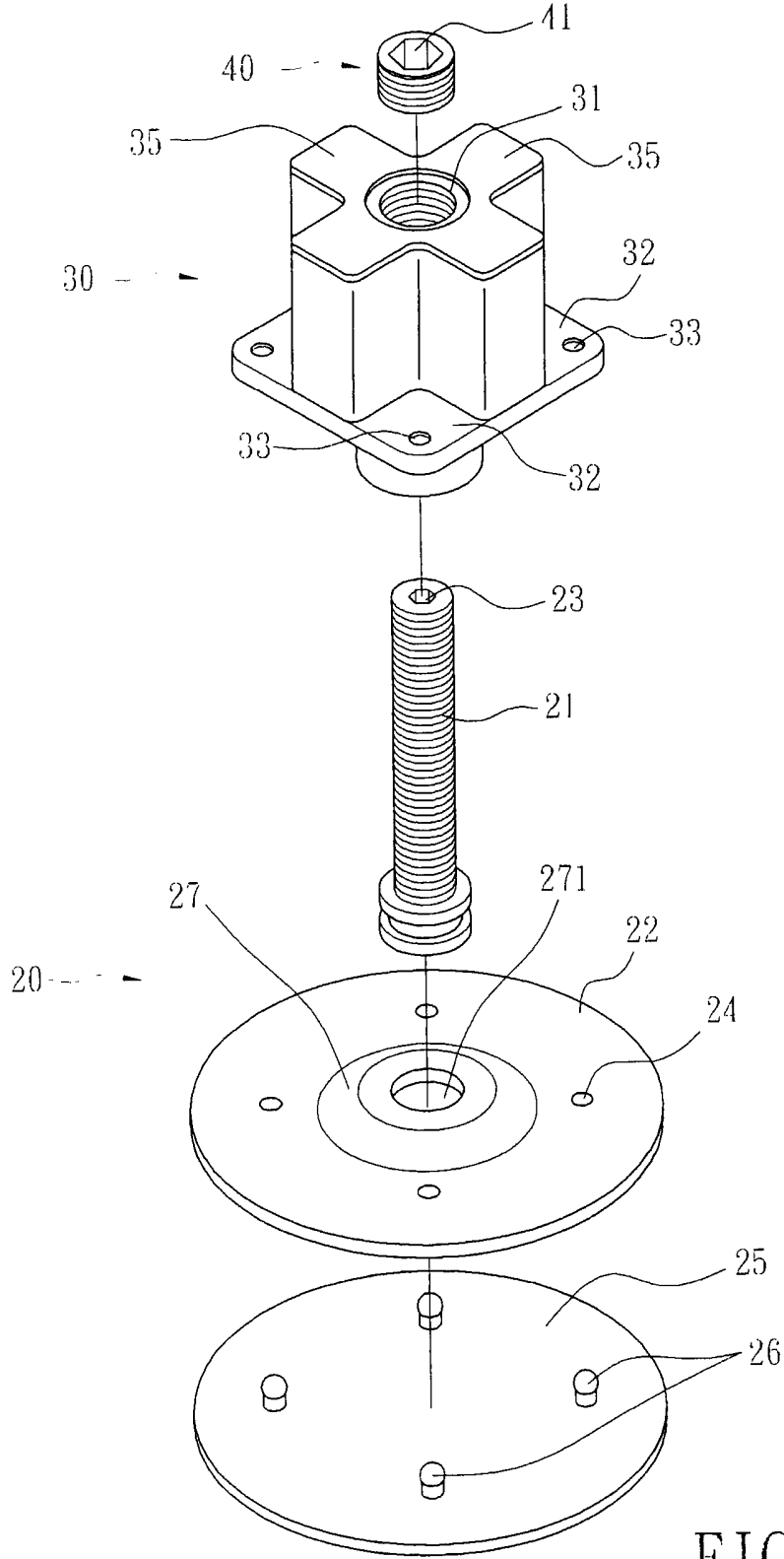


FIG. 2

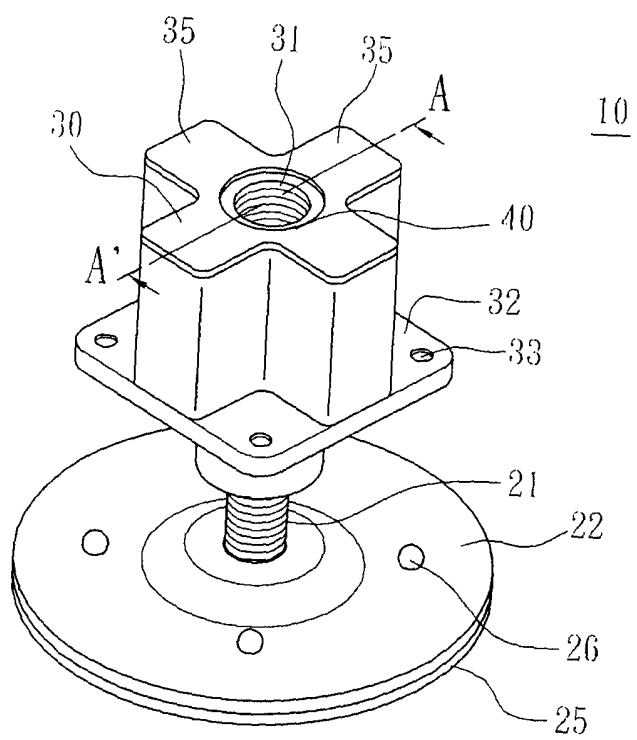


FIG. 3

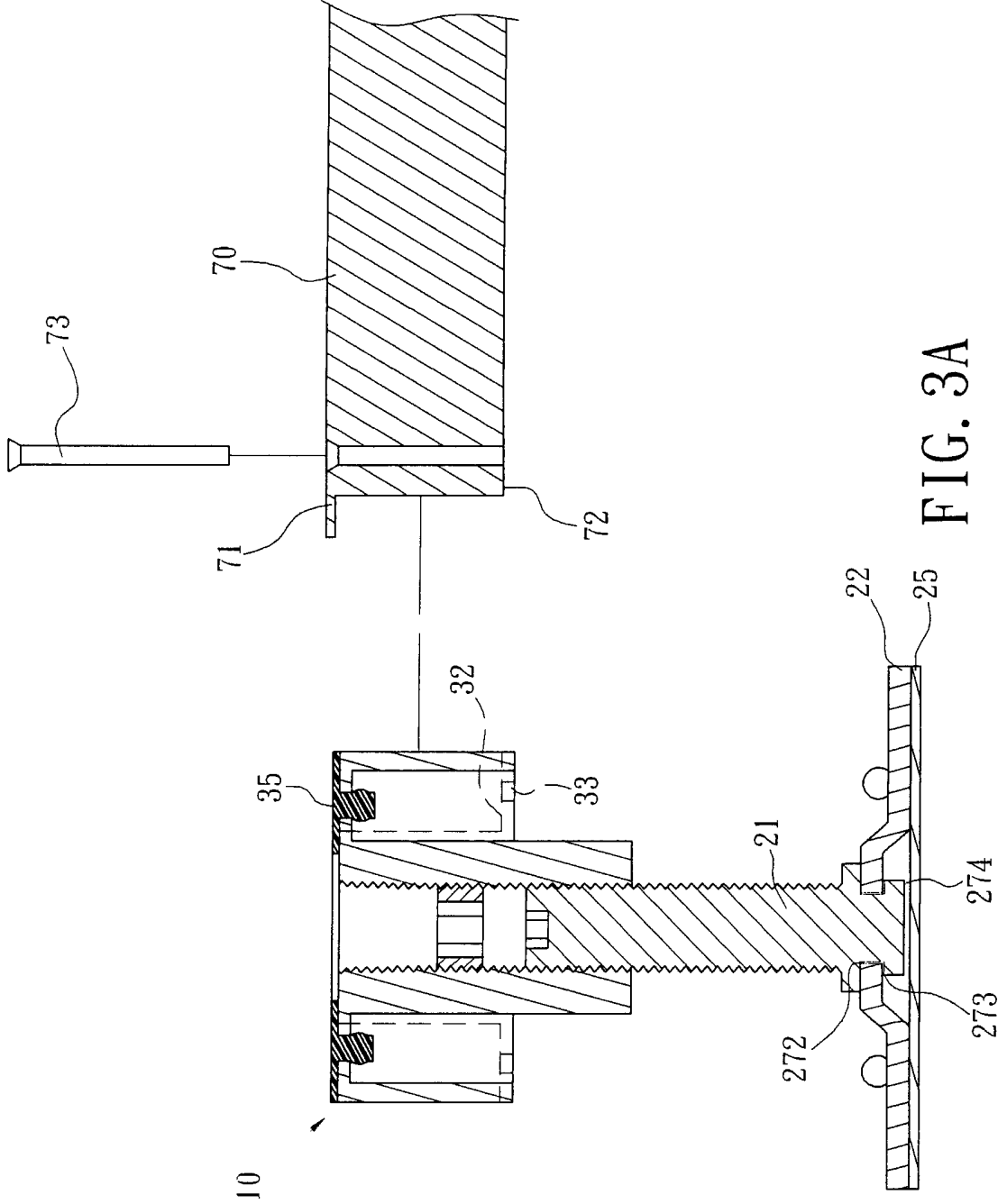


FIG. 3A

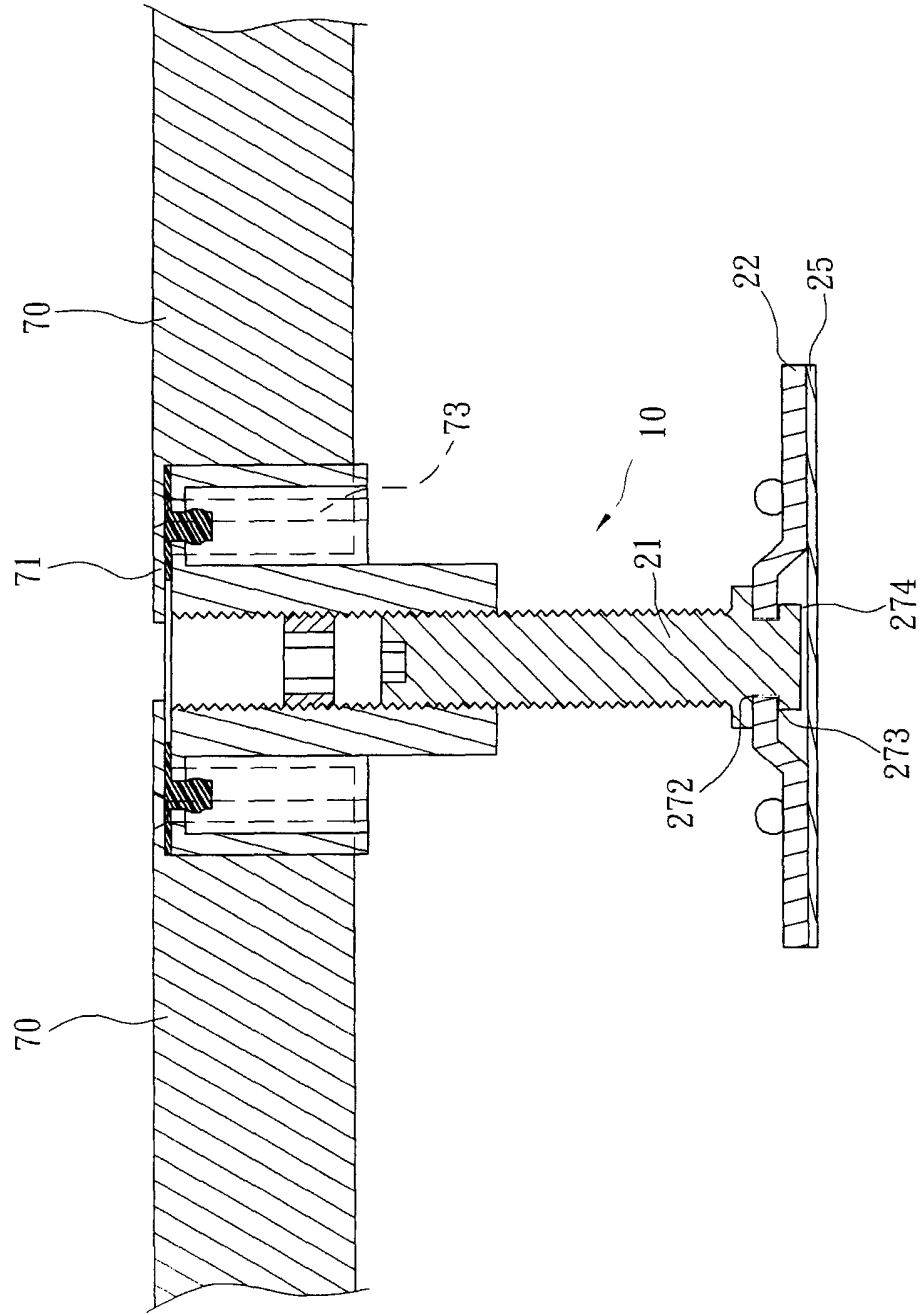
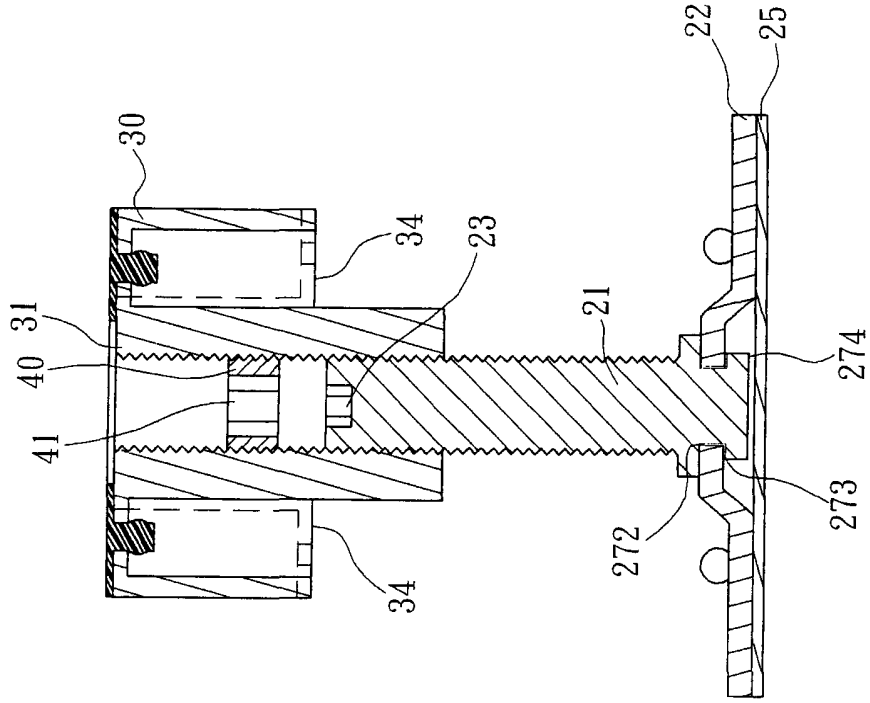


FIG. 3B



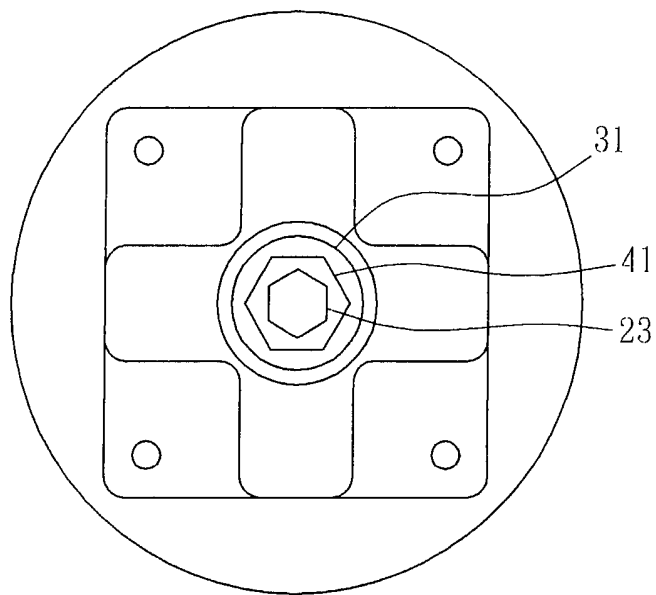


FIG. 5

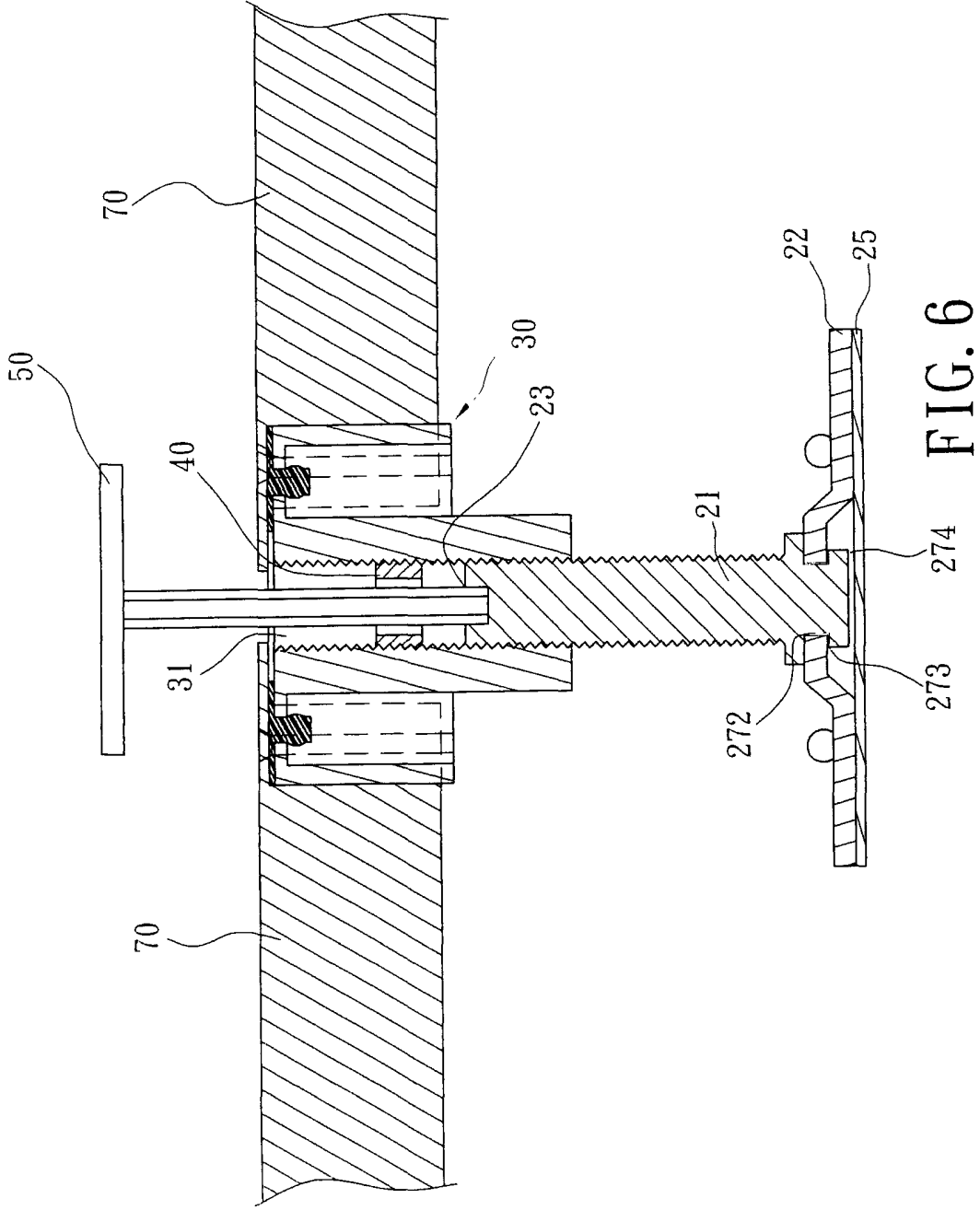


FIG. 6

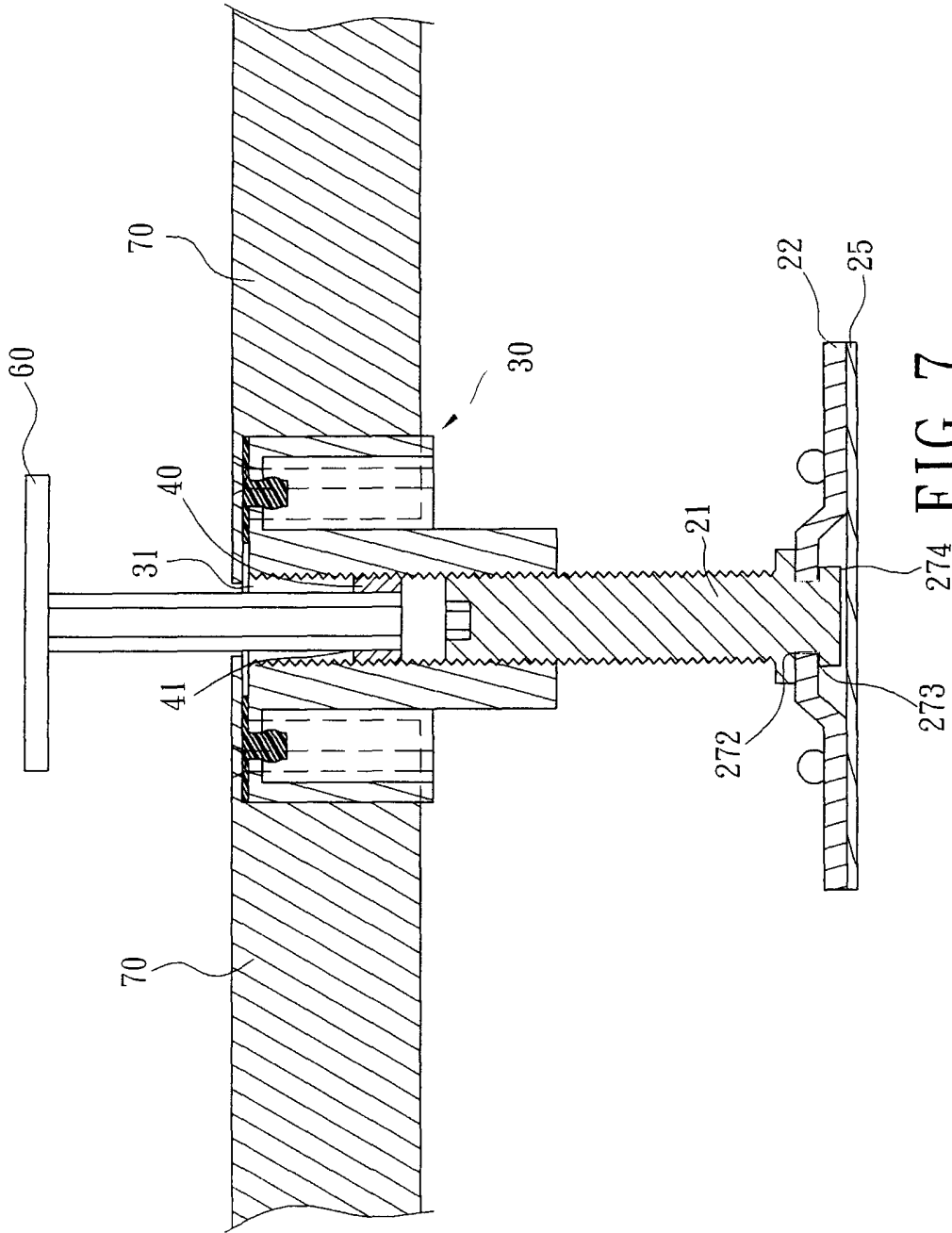


FIG. 7

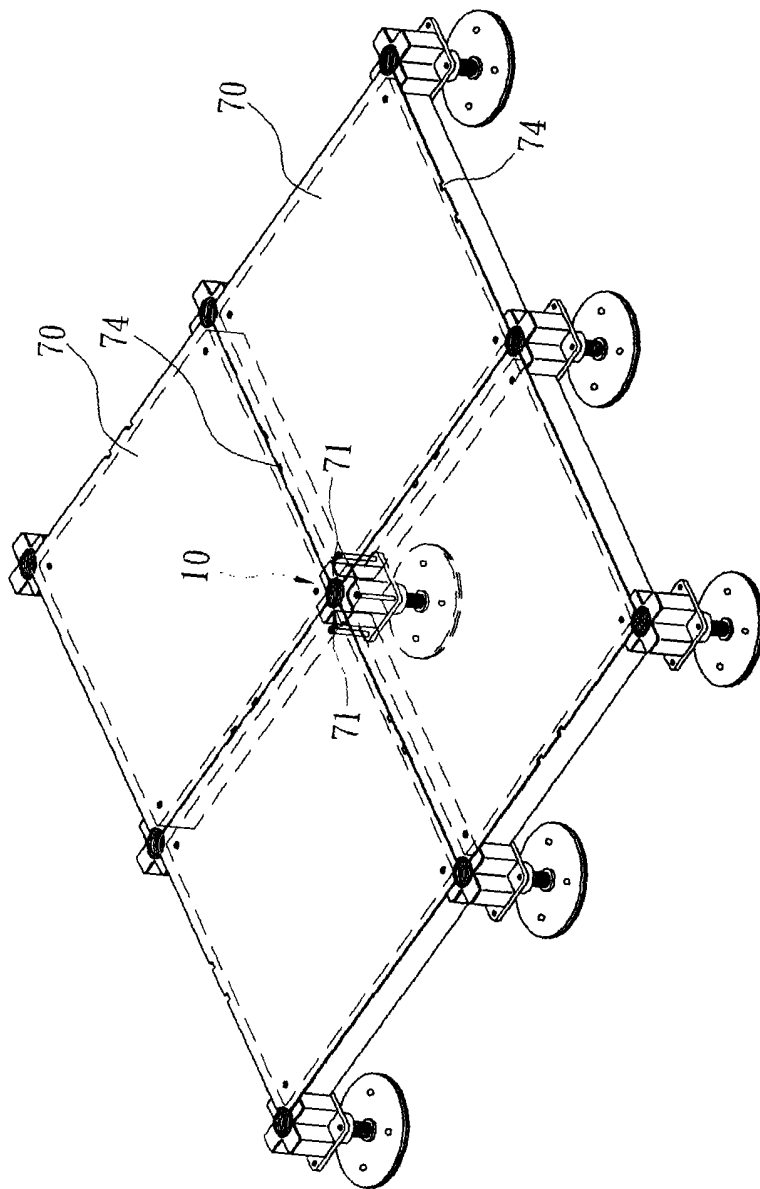


FIG. 7A

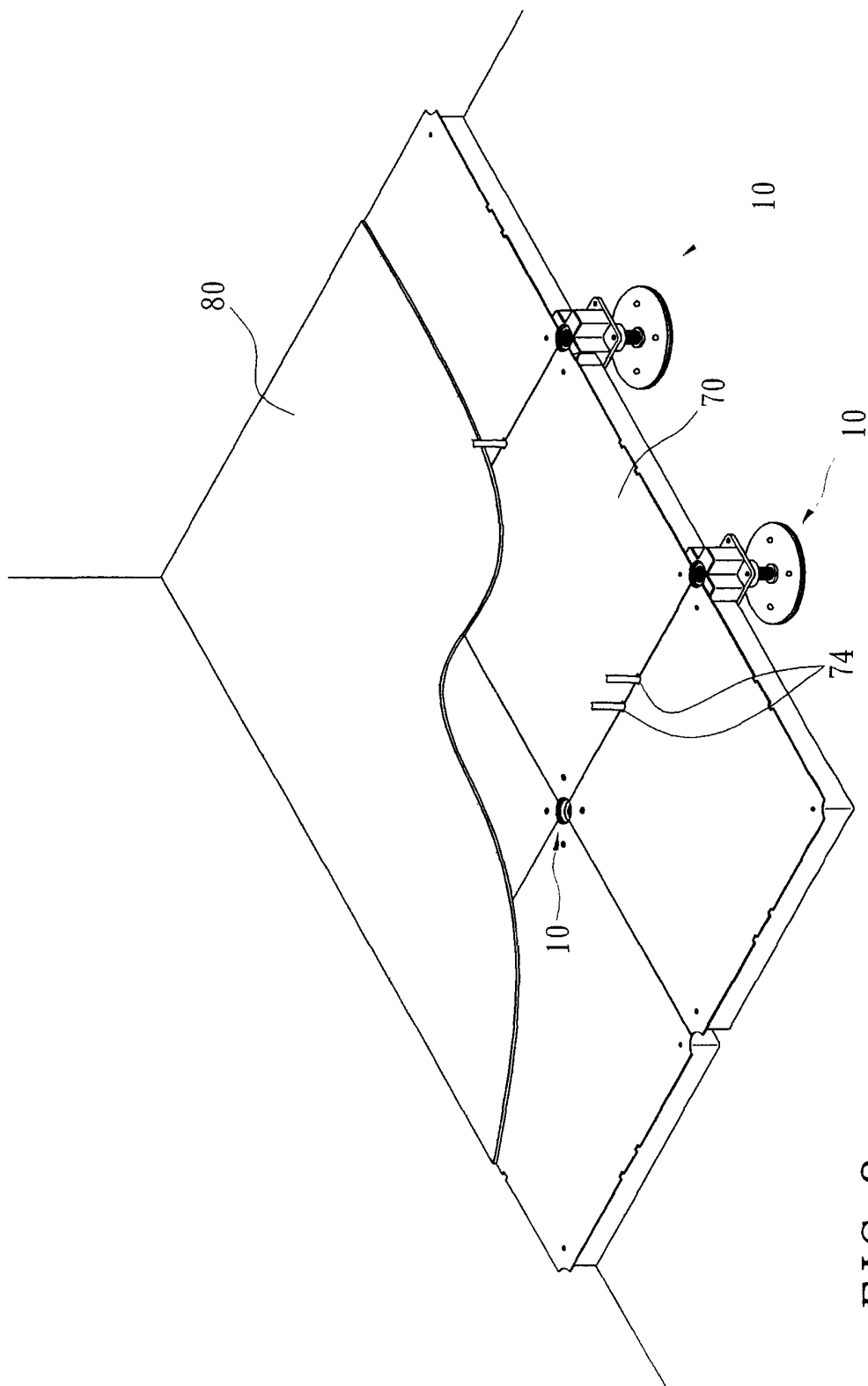


FIG. 8

TITLE: PEDESTAL STRUCTURE FOR RAISED ACCESS FLOORS

BACKGROUND OF THE INVENTION

1. Field of the invention

The present invention relates to a pedestal structure for raised
5 access floors, and more particularly to a pedestal structure non-sticking
to the ground and able to adjust its height immediately before or after
assembling, the structure can largely reduce working hours in
construction, and increase flexibility of changing wires, changing
arrangement and moving of the raised access floors, it is applicable to
10 use for a network-line or pipeline laying out for raised access floors in a
house, a building, a school or an short-term exhibition field etc.

2. Description of the Prior Art

For those working places widely using computers, distribution and
laying-out of networks and other kind of lines are very important and
15 necessary. Because each computer can only be connected or electrically
connected with other computers through a network, intertwining of lines
becomes more and more complicated when amount of equipment gets
larger and larger. If in an office lines are exposed outside, they not
only look ugly, but also affect walking of workers.

20 A floor for networks because of being able to be elevated for
assembling, it leaves at its bottom a space for threading and distribution
of lines. Thereby for informationalization of a modern office, it has
been a main trend to flexibly decide the amount of floors laid out in
pursuance of the size of the space in an office.

25 At present, there are many kinds of raised access floor products for

networks in the market. Referring to Fig. 1A showing schematically conventional raised access floors for networks being raised by pedestals A10, wherein AB adhesive or super glue A2 generally is used to stick the bottoms A12 of supporting seats A11 of the pedestals A10 onto the ground one by one. Then fixing seats A20 are connected by screwing onto the supporting seats A11, and the fixing seats A20 are adjusted for the distance of them from the bottoms A12 to decide the heights of the pedestals A10. Lastly, the raised access floors straddle for connection over recessed portions A21 of the fixing seats A20. The above stated structure can get the suitable heights of the pedestals A10 by adjustment by rotating the fixing seats A20 to adapt to heights of the ground; however, it still has the following disadvantages:

1. The bottoms A12 of the pedestals A10 have to be stuck to the ground one by one by using the AB adhesive or super glue A2 for the convenience of locking by constructors. However, detachment of the pedestals A10 afterwards may still leave traces of glue when in moving to another working field, changing assembling or being necessary to change the electric lines in the floors, the surfaces of the floors have been damaged and are hard to be recovered. This really is a problem for the business of field rent-service or for offices users nowadays. And more, the bottoms A12 of the pedestals A10 after detachment will have residual traces of glue to make the pedestals A10 no more being usable, thus wastes of resources as well as cost can be induced.

2. When the fixing seats A20 are connected by screwing onto the supporting seats A11, a problem of the orientations of the fixing seats A20 must be under consideration. In other words, to make all the corners of the raised access floors to be placed in the recessed portions A21 of the fixing seats A20, the diagonal projection direction of each fixing seat A20 must be same as those of the other fixing seats A20. But by the fact that the ground is often uneven, if it is desired that the diagonal projection directions of all the pedestals A10 are same, it is unable to make the heights of all the pedestals A10 same, thereby the heights of all the pedestals A10 are slightly different. Thus the floors after laying out is not be truly horizontal but look uneven.
3. Before assembling, each pedestal A10 shall be adjusted to be horizontal, locked, and then floors A30 are placed on one by one. After assembling, if a pedestal A10 is to be once more adjusted in height, the floors 30 around the pedestal A10 must be removed to rotate and adjust the corresponding fixing seat A20 up and down to get the desired level, and after adjustment, the pedestal A10 removed are again placed back. The process of work induces over working time, and inconvenience of working.

Further, referring to Fig. 1B, a US Patent No. 5,333,423 discloses an adjusting structure for raised access floors; wherein an adjuster B12 is locked with its bottom on a supporting seat B14, and has a top for

slipping thereover of a sleeve B20. Thereby, when a floor B10 is placed on the sleeve B20, an adjustment tool can be used to adjust the vertical distance between the adjuster B12 and the supporting seat B14, lastly, a square cover B24 covers and seals, thereafter a screw B23 is
5 screwed in for locking.

However, although the technique is designed to get the object of adjusting the level of the floor B10, when in assembling and using practically, by the fact that the adjustment can only be performed after detachment of the screw B23 and removing the square cover B24, the
10 supporting seat B14 likewise needs to be fixed on the ground in favor of rotating and adjustment, this is inconvenient and still has room for improvement as to the whole designing and using.

In view of these, the inventor of the present invention developed a pedestal structure for raised access floors based on his professional
15 experience of years on raised access floors to solve the above stated problems.

SUMMARY OF THE INVENTION

A primary objective of the present invention is to provide a pedestal structure for raised access floors, the pedestal structure needs
20 not to be stuck on the ground and thereby will not damage the existing ground structure, and can be recovered for reusing.

Another objective of the present invention is to provide a pedestal structure for raised access floors. After assembling, the heights of pedestals can be directly adjusted on the floors without lifting the floors,
25 this can largely increase the accuracy of leveling of the floors.

To achieve the above stated objectives, the pedestal structure for raised access floors of the present invention comprises: a supporting seat, a fixing seat and a socket set screw. Wherein the supporting seat has on the top thereof a screw bolt which is connected on its bottom with a bottom seat. The bottom seat has a protruding portion having centrally a pivot hole, the bottom of the screw bolt is in a shape of "H" for the purpose of connecting into the pivot hole. While the fixing seat has a through hole for connecting by screwing with the screw bolt to raise the fixing seat; the screw bolt has on the top thereof a hexagonal adjusting hole for engaging therein a hexagonal wrench to adjust the height of the fixing seat relative to the supporting seat. The fixing seat is provided with a plurality of recessed portions for placing a raised access floor on and fixedly connecting with them. The socket set screw is connected by screwing into the through hole of the fixing seat; thereby the heights after screw connecting of the fixing seat and the supporting seat can be fixed.

The present invention will be apparent in its content and function after reading the detailed description of the preferred embodiment thereof in reference to the accompanying drawings.

20 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1A is a schematic perspective view showing the appearance of conventional pedestals in raising a raised access floor;

Fig. 1B is an exploded perspective view of a floor adjuster of another conventional raised access floor;

25 Fig. 2 is an exploded perspective view of an embodiment of a

pedestal of the present invention;

Fig. 3 is a perspective view showing the appearance of the embodiment of the pedestal of the present invention after assembling;

Fig. 3A is a schematic sectional view of the embodiment of the pedestal of the present invention before assembling with a floor;

Fig. 3B is a schematic sectional view of the embodiment of the pedestal of the present invention after assembling with a floor;

Fig. 4 is a sectional view taken from a section line AA' in Fig. 3 showing a through hole which is longer and is protruded downwards over the bottom of a fixing seat;

Fig. 5 is a bottom view of the embodiment of the pedestal of the present invention, showing the size relationship among the through hole, an adjusting hole and a hole in a socket set screw;

Fig. 6 is a schematic sectional view of the embodiment of the pedestal of the present invention, showing a smaller hexagonal wrench is used to adjust the adjusting hole;

Fig. 7 is a schematic sectional view of the embodiment of the pedestal of the present invention, showing a larger hexagonal wrench is used to adjust a hexagonal hole of the socket set screw;

Fig. 7A is a schematic perspective view of the embodiment of a pedestal of the present invention, showing the four corners of the pedestal are placed respectively with floors;

Fig. 8 is a schematic perspective view showing assembling of the embodiment of the present invention with raised access floors.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring firstly to Figs. 2-3B showing perspective views and schematic sectional views of a preferred embodiment of a pedestal 10 of the present invention, the pedestal 10 comprises: a supporting seat 20, a fixing seat 30 and a socket set screw 40.

5 Wherein the supporting seat 20 has on the top thereof a screw bolt 21 which is connected on its bottom with a bottom seat 22; the supporting seat 20 basically is metallic and has sufficient strength. The screw bolt 21 has on the top thereof a hexagonal adjusting hole 23; the bottom of the screw bolt 21 is in a shape of "H". The bottom seat 22
10 has a protruding portion 27 with a pivot hole 271 to have the bottom of the screw bolt 21 can be pivotally connected with the pivot hole 271. The pivot hole 271 has a slightly larger diameter, in order that small gaps 272, 273 are formed between the "H" shaped bottom of the screw bolt 21 and the pivot hole 27. The bottom seat 22 has thereon a
15 plurality of openings 24, further has on its bottom a pad 25 that is made of plastic or rubber having thereon a plurality of protrusions 26. The protrusions 26 are in shapes for reverse hooking after smoothly slipping in the openings 24, thus the pad 25 can be firmly attached to the bottom of the bottom seat 22. The setting of pad 25 not only can make soft
20 contact of the bottom seat 22 with the ground, but also the chance of oxidation of the supporting seat 20 due to the humidity of the ground can be reduced.

The fixing seat 30 generally is rectangular, it is provided centrally with a threaded through hole 31 to connect by screwing with the above
25 stated screw bolt 21. A plurality of recessed portions 32 are provided at

four corners of the fixing seat 30 having thereon screw holes 33. When a raised access floor 70 is placed on the pedestal 10, such as are shown in Figs. 3A and 3B, a corner 71 of the raised access floor 70 straddles a top surface 35 of the pedestal 10, while a bottom surface 72 of the raised access floor 70 is abutted against and held by the recessed portions 32, then screws 73 are extended through the raised access floor 70 and the screw holes 33, so that the raised access floor 70 can be firmly fixed on recessed portions 32.

As shown in Fig. 4, the interiorly threaded through hole 31 of the above stated fixing seat 30 is longer and is protruded downwards over a bottom 34 of the fixing seat 30, this can increase the length of adjusting of the screw bolt 21 of the supporting seat 20 in the through hole 31 of the fixing seat 30.

The socket set screw 40 is provided on the top of the screw bolt 21 to be connected by screwing into the through hole 31 of the fixing seat 30. The socket set screw 40 has thereon a top-to-bottom extending hexagonal hole 41 of which the diameter is larger than that of the adjusting hole 23. The external contact circle of the hexagonal adjusting hole 23 is precisely smaller than the internal tangent circle of the hexagonal hole 41 of the socket set screw 40 (as shown in Fig. 5), in order to allow a hexagonal wrench 50 matching with the adjusting hole 23 to extend smoothly through the hexagonal hole 41 of the socket set screw 40 and engage in the hexagonal adjusting hole 23 for adjusting the distance between the bottom seat 22 of the supporting seat 20 and the fixing seat 30 (as shown in Fig. 6). Then a hexagonal wrench 60

matching with the hexagonal hole 41 of the socket set screw 40 adjusts downwardly the socket set screw 40 (as shown in Fig. 7) to tightly abut against the top surface of the screw bolt 21 to make the screw bolt 21 unable to rotate in the interiorly threaded through hole 31, thus the supporting seat 20 and the fixing seat 30 are firmly connected with each other.

When the present invention is connected with raised access floors, the steps are: (1) a first raised access floor 70 is put and raised on the ground by using four pedestals 10, and screws 73 are used to firmly fix in the screw holes 33 of the recessed portions 32 on the pedestals 10 (such as are stated above and shown in Figs. 3A and 3B); (2) if the ground is uneven, smaller hexagonal wrenches 50 are used to extend into the through holes 31 of the fixing seats 30 on the pedestals 10, and are engaged in hexagonal adjusting holes 23 on the tops of screw bolts 21, thus supporting seats 20 are micro-adjusted in height (as shown in Fig. 6), at this time, the screw bolts 21 of the supporting seats 20 are rotated to adjust the heights of the supporting seats 20, while the fixing seats 30 are stay non-rotated relative to the supporting seats 20; (3) the above steps (1) and (2) are repeated to complete a large scale engineering of raising the raised access floors; as shown in Fig. 7A, the four corners of a pedestal 10 are respectively straddled by four corners 71 each belongs to one of four raised access floors 70; (4) after assembling of these raised access floors 70 (line outlets 74 of the raised access floors 70 can be alternatively arranged in a cross way or a mutual opposite way in pursuance of requirement, and their heights are

corrected with laser level-correction); then larger hexagonal wrenches
60 are used (or electric drivers are used in a fast mode all around) to
connect by screwing socket set screws 40 into each through hole 31 of
the fixing seats 30 (as shown in Fig. 7), thereby the socket set screws 40
5 are tightly abutted against the tops of the screw bolts 21, so that the
screw bolts 21 are unable to rotate in the interiorly threaded through
holes 31; (5) lastly, according to practical requirement, a carpet or
mattress 80 can be placed on the raised access floors 70 (as shown in
Fig. 8 for an example, line outlets 74 of the raised access floors 70 are
10 arranged in a mutual opposite way).

Moreover, protruding portions 27 are used to slightly raise the
screw bolts 21 in order to leave gaps 274 between each bottom surface
of the screw bolts 21 and each pad 25, the gaps 274 can be used for
absorbing unevenness of the ground.

15 If sometime afterwards a pedestal 10 is to be adjusted in height, it
needs only to lift the abovementioned carpet 80, and to rotate to loosen
a corresponding socket set screw 40 to be separated from the top surface
of a corresponding screw bolt 21, and then a hexagonal wrench 50 is
used to extend into a corresponding hexagonal adjusting hole 23 to
20 adjust the screw bolt 21, at this time, the corresponding supporting seat
20 will entirely be rotated following the adjusting of the hexagonal
adjusting hole 23, and the function of raising or lowering the pedestal
10 can be achieved. This can save the trouble of removing the raised
access floors 70 around a corresponding fixing seat 30 as is the cases of
25 conventional techniques.

According to the above stated, the present invention has the following advantages:

1. When the pedestals of the present invention are in construction, their bottoms no more need to be stuck to the ground by using adhesive for fixing on the ground, hence the ground will not be damaged. This is very convenient for fast construction, moving and changing arrangement for short-term exhibition or the business of field rent-service.
2. When the pedestals are not in use, they can be collected hundred percent for reuse. This not only is environment friendly, but also can promote marketing of rent service of raised access floors and pedestals.
3. The diameters of the pivot holes of the present invention are slightly larger in order that gaps are formed between the "H" shaped bottoms of the screw bolts and the pivot holes. Thereby if sometime afterwards a pedestal is to be adjusted in height, by providing the gap correspondingly between the bottom of the screw bolt and the pivot hole of the pedestal, when a hexagonal wrench is used to extend into a corresponding hexagonal adjusting hole to adjust the screw bolt, only the screw bolt rotates and the corresponding bottom seat is not moved. The screw bolt is easier for adjusting to achieve the function of raising or lowering the pedestal.
4. The pedestal structure for raised access floors of the present invention has a bottom seat on the bottom of the supporting seat, the bottom seat is added on its bottom with a plastic pad. This not only

make the bottom seat to avoid oxidation to generate rust because of wet floor, but also make the bottom seat to avoid direct contact and rubbing the ground to scrape the ground.

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5. When in assembling, a floor can be placed on after adjustment of pedestals, and after level correction, the pedestals and the ground can be locked together, such construction work is very convenient; while after assembling, if it is desired to further adjust the heights of the pedestals, it needs not to lift the floors, but needs only to use a hexagonal wrench above the floors to extend deeply into the adjusting holes to adjust the heights of the pedestals. This can reduce working time and steps.
 6. The designing of the present invention makes four corners of the fixing seat of a pedestal to be locked onto the ground, so that in adjusting the pedestal, a supporting seat rather than the fixing seat rotates; this can avoid the situation of rotating the fixing seat on one hand, and thinking of the orientation the fixing seat to afford placing thereon a floor on the other hand; thereby, the present invention can get a high accuracy of the entire level after placing the floor.

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The embodiment given is only for illustrating the present invention, and not for giving any limitation to the scope of the present invention. It will be apparent to those skilled in this art that various modifications or changes without departing from the spirit of this invention shall also fall within the scope of the appended claims.

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In conclusion, the present invention can get the expected objects thereof to provide a pedestal structure for raised access floors, it is

extremely practicable.

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CLAIMS:

1. A pedestal structure for raised access floors comprising:

a supporting seat having on its top a screw bolt with a hexagonal adjusting hole on the top thereof, said screw bolt is connected on its
5 bottom with a bottom seat; said bottom seat has a protruding portion having a central pivot hole, said bottom of said screw bolt is in a shape of "H" and is pivotally connected into said pivot hole;

a fixing seat provided for placing thereon and connected with a plurality of raised access floors and provided centrally with an
10 interiorly threaded through hole, said fixing seat is connected by screwing with said screw bolt of said supporting seat; and

a socket set screw provided on said top of said screw bolt to be connected by screwing into said through hole of said fixing seat; said socket set screw has thereon a top-to-bottom extending hole of which
15 the diameter is larger than that of said adjusting hole, in order to allow an adjusting tool to extend through said top-to-bottom extending hole to engage in said hexagonal adjusting hole for adjusting up and down displacement of said supporting seat relative to said fixing seat; by rotating said socket set screw, said screw bolt of said supporting seat is
20 tightly abutted against said threaded through hole of said fixing seat.

2. The pedestal structure for raised access floors as in claim 1, wherein said fixing seat is rectangular, and is provided centrally with said threaded through hole; a plurality of recessed portions are provided at four corners of said fixing seat and have thereon screw holes for
25 placing and connecting of said raised access floors.

3. The pedestal structure for raised access floors as in claim 1, wherein said bottom seat has on its bottom a pad to prevent direct contact of said bottom seat with the ground, and to reduce degree of oxidation of said bottom seat.

5 4. The pedestal structure for raised access floors as in claim 3 wherein said bottom seat has thereon a plurality of openings, said pad has thereon a plurality of protrusions, said protrusions are connected with said openings to make said pad to be firmly attached to said bottom of said bottom seat.

10 5. The pedestal structure for raised access floors as in claim 1, wherein said through hole of said fixing seat is protruded downwards over said bottom of said fixing seat to increase length of adjusting of said screw bolt of said supporting seat relative to said through hole of said fixing seat to adapt to heights of the ground being more uneven.

15 6. The pedestal structure for raised access floors as in claim 1, wherein said adjusting hole on said screw bolt and said top-to-bottom extending hole of said socket set screw are both hexagonal for engaging therein a hexagonal wrench for screwing tight or screwing loose.

20 7. The pedestal structure for raised access floors as in claim 1, wherein said pivot hole has a slightly larger diameter than that of said screw bolt, in order that gaps are formed between said bottom of said screw bolt and said pivot hole; thus only said screw bolt rotates, said bottom seat is not moved, and said screw bolt is easier for adjusting to achieve a function of raising or lowering said pedestal.

25 8. The pedestal structure for raised access floors substantially as

described herein with reference to the drawings except Figs. 1A and 1B.

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Amendments to the claims have been filed as follows

1. A pedestal structure for raised access floors comprising:

5 a supporting seat having on its top a screw bolt with a hexagonal adjusting hole on the top thereof, said screw bolt being connected at its bottom with a bottom seat; said bottom seat having a protruding portion having a central hole, said bottom of said screw bolt having the shape of an "H" and being located in said central hole;

10 a fixing seat provided for placing thereon and adapted to be connected with a plurality of raised access floors and provided centrally with an interiorly threaded through hole, said fixing seat being connected by screwing with said screw bolt of said supporting seat; and

15 a socket set screw provided on said top of said screw bolt to be connected by screwing into said through hole of said fixing seat; said socket set screw having a through hole of which the diameter is larger than that of said adjusting hole, in order to allow an adjusting tool to extend through said hole in the socket set screw to engage in said
20 hexagonal adjusting hole for adjusting the distance of said supporting seat from said fixing seat; by rotating said socket set screw, said screw bolt of said supporting seat being able to be tightly abutted against said fixing seat.

2. A pedestal structure for raised access floors according to claim 1, wherein said fixing seat is rectangular and is provided centrally with said threaded through hole and a
25 plurality of recessed portions are provided at four corners of said fixing seat and have thereon screw holes for placing and connecting of said raised access floors.

3. A pedestal structure for raised access floor according to claim 1 or claim 2, wherein said bottom seat has on its bottom a pad to prevent direct contact of said bottom seat with
30 the ground.

4. A pedestal structure for raised access floors according to claim 3, wherein said bottom seat has a plurality of openings, said pad having a plurality of protrusions, said protrusions being connected with said openings to firmly attach said pad to said bottom of said bottom seat.

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5. A pedestal structure for raised access floors according to any one of the preceding claims, wherein said through hole of said fixing seat extends beyond the bottom of said fixing seat to increase the length of adjustment of said screw bolt of said supporting seat relative to said through hole of said fixing seat to adapt to heights of the ground being more

10 uneven.

6. A pedestal structure for raised access floors according to any one of the preceding claims, wherein said adjusting hole in said screw bolt and said through hole of said socket set screw are both hexagonal for engaging therein a respective hexagonal wrench for screwing

15 tight or screwing loose.

7. A pedestal structure for raised access floors according to any one of the preceding claims, wherein the hole in the protruding portion of the bottom seat has a slightly larger diameter than that of said screw bolt, in order that gaps are formed between said bottom of

20 said screw bolt and said hole whereby said screw bolt can rotate with respect to said bottom seat.

8. A pedestal structure for raised access floors substantially as described herein with reference to Figs. 2 to 8 of the drawings.

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INVESTOR IN PEOPLE

Application No: GB0512858.2

Examiner: Dr Hazel Oliver

Claims searched: 1-8

Date of search: 13 September 2005

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A	-	US 5333423 A (PROPST)
A	-	US 6442906 B1 (HWANG)

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

E1D

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

E04F

The following online and other databases have been used in the preparation of this search report

WPI & EPODOC