

ADJUSTABLE SUPPORT COLUMN FOR FLOOR PANELS**BACKGROUND OF THE INVENTION****(Field of the Invention)**

The present invention generally relates to adjustable support columns and, more particularly, to the adjustable support columns for supporting panels a controllable distance above a base surface such as, for example, a building floor to permit the panels to form a secondary surface, that is, a secondary floor.

(Description of the Prior Art)

A system of making a secondary floor above a building floor, commercially known as a free-access floor system, is currently offered in the market. The free-access floor system makes use of, inter alia, a plurality of adjustable support columns which serve concurrently as a spacer and as a support leg. The free-access floor system provides people with a free access to and fro within a building without being disturbed and/or annoyed by a jungle of obstructions such as electric wiring and/or plumbing lying on a building floor. The free-access floor system can also be used to conceal the electric wiring and/or plumbing that are laid on a building floor substantial years after completion of the building.

The adjustable support column of a type comprising a base plate adapted to be installed on the base surface, an externally helically threaded pole fixed at a lower end to a center portion of the base plate, and a support pedestal adjustably mounted on the threaded pole and having a top surface for support thereon of the panels, has been well known and is shown in Fig. 17, and the manner of use thereof is shown in Figs. 10 to 13, reference to which will now be made for discussion of the prior art.

Referring first to Fig. 17, the adjustable support column indicated generally by A comprises a base plate 1 of, for example, a generally square configuration adapted to be installed on a support surface, for example, a building floor, an externally threaded pole 4 fixed at a lower end to a center portion of the base plate 1, and a support pedestal 3 adjustably mounted on the externally threaded pole 4 for support of floor panels 2 (Figs. 18 to 21).

The support pedestal 3 includes a generally square mounting plate 3a threadingly mounted on the threaded pole 4, and a support block 3b formed integrally with, or otherwise secured to, the mounting plate 3a. The support block 3b is so cross-shaped, when viewed from top, as to leave four voids 7 that open upwardly and laterally at a location corresponding to four corner regions of the mounting plate 3a. A cushioning sheet 6 of a shape similar to the cross-shape of the support block 3b is laid on a top surface thereof.

The support column A of the above described construction is installed on the building floor at a location aligned with a corner butt joint of, for example, four floor panels 2 at which respective corners of the four floor panels 2 are joined in a common plane, so that respective corner regions of those floor panels 2 can be supported from below by the support column A. Specifically, each of the floor panels 2 includes a surfacing plate 2b and a reinforcement skeleton structure 2a secured to, or otherwise formed integrally, with an under-surface of the surfacing plate 2b. At least four corners of the reinforcement skeleton structure 2a are inwardly depleted in a generally L-shaped pattern to allow the corresponding corners of the surfacing plate 2b to have a generally L-shaped corner fringe 9 protruding outwardly from and relative to the inwardly depleted corners of the reinforcement skeleton structure 2a.

When a secondary floor is desired to be formed a distance, for example, 10 cm, above the building floor to define a space in which electric wiring and/or plumbing can be accommodated between the building floor and the secondary floor, or to conceal the electric wiring and/or plumbing then laid on the building floor, the panels 2 are laid above the building floor with the support columns A supporting the panels 2 from below at respective locations aligned with the corner butt joints each defined by respective one corners of the four panels 2. The panels 2 so laid and supported above the building floor serve as the secondary floor.

The detail of how each support column A supports the panels 2 will be discussed with particular reference to Figs. 18 to 20. Assuming that the support column A is fixedly installed on the building floor, the panel 2 has to be lowered from above, or displaced sidewise, until the inwardly depleted corner of the reinforcement skeleton structure 2a is snugly received within the associated void 7 with the L-shaped corner fringe 9 resting on the support block 3b of the support pedestal 3 through the cushioning sheet 6 as shown in Figs. 18 and 19. A similar procedure is repeated with respect to the remaining three panels 2 to complete the secondary floor substantially as shown in Fig. 19 with side edges of one surfacing plate 2b held in abutment with mating side edge of the next adjoining surfacing plate or plates 2b.

Thus, with the free-access floor system, the secondary floor can be formed a distance above the building floor so that people in an office building can freely walk on the secondary floor without being disturbed and/or annoyed by the presence of obstructions such as electric wiring and/or plumbing lying on the building floor.

However, the free-access floor system utilizing the prior art support columns discussed above has been found having a problem. More specifically, as a result of clumsy installation and/or shocks transmitted from people walking on the secondary floor, one or some of the support columns may be displaced from the initial position of installation to such an extent that as shown in Fig. 21, the corner fringe 9 at one corner of the panel 2 rides over the corner fringe 9 at the adjacent corner of the neighboring panel 2. Once this happens, the secondary floor as a whole would have a surface step which would constitute an obstruction to people's safe walking.

In addition, considering that the all four side edges of the neighboring panels 2 are held in abutment with each other, the adjoining corner fringes 9 are subjected to rubbing under the influence of vibrations or shocks transmitted from

the people walking on the secondary floor with the consequence that obnoxious sounds are generated.

Other adjustable support columns of a type similar to that shown in Figs. 17 to 21 are disclosed in, for example, the Japanese Patent Publication No. 6-23491 published March 30, 1994, the Japanese Design Registration No. 903596 published July 21, 1994, and the Japanese Laid-open Patent Publication No. 7-48920 published February 21, 1995. All of those published materials disclose the adjustable support column having an internally threaded lock member mounted adjustably on the externally threaded pole for locking the support pedestal in position relative to the externally threaded pole once the level of the secondary floor has been fixed. However, the lock member disclosed in the first two published materials is in the form of a lock nut, whereas the lock member disclosed in the last mentioned published material is in the form of a generally flat lock lever having one end perforated to define an internal thread and the opposite end extending transverse to the threaded pole so as to be accessible to hands of a worker engaged in installation.

Even the adjustable support columns disclosed in those published materials are ineffective to eliminate the problems discussed in connection with the prior art adjustable support column shown in Figs. 17 to 21.

SUMMARY OF THE INVENTION

Accordingly, the present invention has been devised with a view to substantially eliminating the problems brought about in the free-access floor system by the use of the prior art support columns and is intended to provide an improved support column effective to avoid formation of surface obstructions on the secondary floor and also to minimize generation of obnoxious sounds which would otherwise be generated as a result of rubbing between the neighboring floor panels.

In order to accomplish the foregoing object, the adjustable support column according to the present invention is characterized in that a plurality of

banks are disposed on the top surface of the pedestal for avoiding a direct contact between corners of the panels which are supported from below by the pedestal.

According to the present invention, because of the employment of the banks on the support pedestal, it is possible to avoid a direct contact among corners of the floor panels which are supported from below by the support pedestal to thereby minimize the possibility of the corner of one floor panel riding over the corner fringe of the next adjacent floor panel and also to avoid generation of obnoxious sounds which would otherwise take place when the direct contact takes place.

Preferably, the banks are integrally formed with the pedestal and are arranged in a shape similar to the cross shape. According to this feature, not only can the need to use separate component parts to form the banks be dispensed with, but also the area of surface of the banks which contact the associated corner of the floor panel is advantageously increased to thereby minimize the possibility of one or more of the floor panels being laterally displaced.

A cushioning sheet may be disposed between the banks and the top surface of the pedestal, to further minimize the possibility of the obnoxious sounds being generated as a result of rubbing between each floor pane and the support pedestal. Instead of the banks integrally formed with the support pedestal, the banks may be formed integrally with the cushioning sheet where the latter is employed in the adjustable support column.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become readily understood from the following description of preferred embodiments thereof made with reference to the accompanying drawings, in which like parts are designated by like reference numeral and in which:

Fig. 1 is a perspective view of an adjustable support column according to a first preferred embodiment of the present invention;

Figs. 2 and 3 are fragmentary perspective views showing how the adjustable support column is used to support floor panels;

Fig. 4 is a side view showing how the adjustable support column of the present invention supports the neighboring floor panels;

Fig. 5 is a fragmentary side sectional view, on an enlarged scale, of the lock lever used in the adjustable support column of the present invention;

Fig. 6 is a fragmentary side view, showing how the lock lever is threadingly mounted on an externally threaded pole of the adjustable support column;

Fig. 7 is a top plan view, on an enlarged scale, showing one of floor panels which are used in the practice of the present invention;

Fig. 8 is a side view, with one of halves being shown in cross-section, of the floor panel shown in Fig. 7;

Fig. 9 is a top plan view, with a surfacing plate removed, of the floor panel shown in Fig. 7;

Figs. 10 to 12 are fragmentary side views of a support pedestal, showing the sequence of installation of the floor panel onto the adjustable support column of the present invention;

Fig. 13 is a schematic perspective view of the adjustable support column according to a second preferred embodiment of the present invention;

Figs. 14 and 15 are views similar to Fig. 13 showing the adjustable support column according to third and fourth preferred embodiments of the present invention, respectively;

Fig. 16 is a schematic perspective view, on an enlarged scale, showing the manner in which a cushioning sheet formed with banks is placed atop a support pedestal forming a part of the adjustable support column according to the fourth embodiment of the present invention;

Fig. 17 is a schematic perspective view showing the prior art adjustable support column;

Figs. 18 and 19 are fragmentary perspective views showing how the prior art adjustable support column is used to support the floor panels;

Fig. 21 is a schematic side view showing how the prior art adjustable support column supports the neighboring floor panels; and

Fig. 22 is a schematic side view showing the manner in which one of the neighboring floor panels is undesirably displaced.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Referring now to Fig. 1, an adjustable support column shown therein by B comprises a base plate 10 of, for example, a generally square configuration adapted to be installed on a support surface, for example, a building floor, an externally helically threaded pole 40 fixed at a lower end to a center portion of the base plate 10, and a support pedestal 30 adjustably mounted on the externally threaded pole 40 for support of floor panels 2 (Figs. 2 to 4).

The support pedestal 30 includes a generally square mounting plate 30a threadingly mounted on the threaded pole 40, and a support block 30b formed integrally with, or otherwise secured to, the mounting plate 30a. The support block 30b is so cross-shaped, when viewed from top, having four arms 31a, 31b, 31c and 31d. The arms 31a to 31d protrude outwardly from a common core and are spaced 90° circumferentially from each other with respect to the common core so as to leave four voids 70 that open upwardly and laterally at respective locations corresponding to four corner regions of the mounting plate 30a.

Each of the arms 31a to 31d of the support block 30b has a top face formed integrally with an elongated bank 50a, 50b, 50c or 50d positioned intermediate of the width of the respective arm 31a, 31b, 31c or 31d. The elongated banks 50a to 50d on the respective top faces of the arms 31a to 31d altogether form a parting element with which as will become clear from the subsequent description, adjoining corners of the respective floor panels 2 can be separated from each other to avoid a direct contact among them. The elongated bank 50a to 50d on each of the arms 31a to 31d extends, in the embodiment shown in Figs. 1 to

4, a distance inwardly towards the common core 2 from a plane substantially flush with an outer end face of the respective arm 31a, 31b, 31c or 31d so that extensions of those elongated banks 50a to 50d may cross with each other at a point aligned with the longitudinal axis of the threaded pole 40. Each bank 50a to 50d has its opposite side faces lying at right angles to the top face of the corresponding arm 31a to 31d.

A cushioning sheet 60 of a shape similar to the cross-shape of the support block 30b and having four slots defined at 60a is laid on a top surface of the support pedestal 30 with the elongated banks 50a to 50d received in and protruding upwardly outwardly from the respective slots 60a in the cushioning sheet 60. Each elongated bank 50a to 50d has a height, as measured upwardly from the top face of the corresponding arm 31a, 31b, 31c or 31d, which is equal to or slightly smaller than the thickness of the surfacing plate 2b of each floor panel 2 plus the thickness of the cushioning sheet 60.

While the cross-shaped cushioning sheet 60 may be laid within a correspondingly shaped recess (not shown in Figs. 1 to 4, but fragmentarily shown by 33 in Fig. 8) formed in the top surface of the support pedestal 30, a top surface of the cross-shaped cushioning sheet 6 should in such case be situated a slight distance upwardly from the top surface of the support pedestal 30 so that the corner fringe 9 of the surfacing plate 2b of each floor panel 2 can rest on the cushioning sheet 60. Hence, in such case, each elongated bank 50a to 50d should have a height sufficient to allow it to protrude upwardly from a top surface of the cushioning sheet 60.

The support pedestal 30 including the mounting plate 30a and the support block 30b may be of one-piece construction made of metal such as, for example, aluminum, or hard synthetic resin by the use of any known metal or plastics die casting technique. However, where the adjustable support column of the present invention is used for heavy-duty purpose, the use of metallic material is recommended. Alternatively, the mounting plate 30a and the support

block 30b may be members separate from each other, but fixed together by means of, for example, welding or screw fastening.

In any event, a specific material for the entire support column or specific materials for the various component parts of the support column may be suitably chosen in consideration of a particular application of the support column, particularly the amount of load which would be imposed on the support column.

As best shown in Figs. 4 to 6, a lock lever 100 having one end perforated to define an internal thread represented by a helical lip region 101 of the perforation is adjustably mounted on the threaded pole 40 with the internal thread engaged with the external helical thread on the pole 40. The lock lever 100 so mounted on the threaded pole 40 extends transversely outwardly from the threaded pole 40 and terminated at the opposite end accessible to hands of a worker engaged in installation of the free-access floor system. This lock lever 100 is used to lock the support pedestal 30 in position relative to the externally threaded pole 40 once the position of the support pedestal 30 relative to the externally threaded pole 40 has been fixed to thereby fix the level of the eventually formed secondary floor. As a matter of course, the helix of the helical lip region 101 confronting the perforation in the lock lever 100 corresponds to the helix of the external helical thread on the externally threaded pole 40. In any event, this lock lever 100 may be substantially identical with that disclosed in the Japanese Laid-open Patent Publication No. 7-48920 referred to hereinbefore.

In the structure described above, portions of each arm 31a, 31b, 31c or 31d of the support block 30b on respective sides of the corresponding elongated bank 50a to 50d, indicated by 32a and 32b, respectively, are used to support the L-shaped corner fringe 9 of the associated floor panel 2 from below as will subsequently be described.

Each floor panel 2 may be identical in structure with that discussed in connection with the prior art support column. Specifically, as best shown in Figs. 7 to 9, each floor panel 2 includes, in addition to the surfacing plate 2b, a

reinforcement skeleton structure 2a secured to an undersurface of the surfacing plate 2b with peripheral side edges of said surfacing plate 2b crimped inwardly so as to embrace the corresponding peripheral side edges of the reinforcement skeleton structure 2a, except for four corners regions of the floor panel 2. At the four corner regions of the floor panel 2, the reinforcement skeleton structure 2a is spot-welded to the corresponding corners of the surfacing plate 2b and are, at the same time, inwardly depleted or set backward at 2c in a generally L-shaped pattern to allow the corresponding corners of the surfacing plate 2b to have a generally L-shaped corner fringe 9 that protrudes outwardly from and relative to the inwardly depleted corners 2c of the reinforcement skeleton structure 2a.

The reinforcement skeleton structure 2a has a generally grid pattern of generally semi-spherical recesses 2d so that when the reinforcement skeleton structure 2a is assembled together with the surfacing plate 2b to complete the respective floor panel 2, the floor panel 2 can have a correspondingly shaped pattern of semi-spherical voids into which a filler material such as, for example, concrete is poured as shown by 2e in a right half of Fig. 8 through one or more inject ports 2f defined in side walls of the reinforcement skeleton structure 2a as shown in Fig. 9. Because of the filler material injected into each floor panel 2, it can readily be understood that the load bearing capacity of the floor panel 2 is high.

Alternatively, each floor panel 2 may be of a design wherein the reinforcement skeleton structure 2a of a shape similar to the shape of the surfacing plate 2b is so undersized relative to the surfacing plate 2b as to permit the outer periphery of the reinforcement skeleton structure 2a to be inwardly set back to define a peripheral fringe.

Hereinafter, the manner of installation of the floor panels on one adjustable support column B will be described with particular reference to Figs. 2 to 4.

When a secondary floor is desired to be formed a distance, for example, 10 cm, above the building floor to define a space in which electric wiring and/or plumbing can be accommodated between the building floor and the secondary floor, or to conceal the electric wiring and/or plumbing then laid on the building floor, the panels 2 are laid above the building floor with the support columns B supporting the panels 2 from below at respective locations aligned with the corner butt joints each defined by respective one corners of the four panels 2.

More specifically, assuming that the support column B is fixedly installed on the building floor, the panel 2 has to be lowered from above, or displaced sidewise, until the inwardly depleted corner 2c of the reinforcement skeleton structure 2a is snugly received within the associated void 70 with the L-shaped corner fringe 9 resting on the support block 30b of the support pedestal 30 through the cushioning sheet 60 as shown in Fig. 10. As described hereinbefore, when the first laid floor panel 2 has been laid down above the support column B, the corner fringe 9 rests in part on the portion 32a of one arm 31a and in part on the portion 32b of the next neighboring arm 31d.

A similar procedure is repeated with respect to the second floor panel 2. When the second floor panel 2 is laid as shown in Fig. 2, the corner fringe 9 in the second laid floor panel 2 rests in part on the opposite portion 32b of the arm 31a and in part on the portion 31a of the arm 31b opposite to the arm 31d. Similarly, when the third laid floor panel 2 is laid as shown in Fig. 3, the corner fringe 9 in the second laid floor panel 2 rests in part on the portion 32b of the arm 31b and in part on the portion 32a of the next neighboring arm 31c opposite to the arm 31a. Again likewise, when the last laid floor panel 2 is laid, the corner fringe 9 in the last laid floor panel 2 rest in part on the portion 32b of the arm 31c and in part on the portion 32a of the arm 31d substantially as shown in Fig. 3, thereby completing installation of all four floor panels 2.

Because of the presence of the elongated banks 50a to 50d, the secondary floor completed by the floor panels 2 laid above the building floor has a grid pattern of gaps 11 each formed between the neighboring floor panels 2, each gap 11 having a width substantially equal to the width of the respective elongated bank 50a to 50d. Each gap 11 serves to avoid a direct contact not only between the corner fringes 9 of the neighboring surfacing plates 2b, but also between the side edges of the neighboring floor panels 2. In addition, the elongated banks 50a to 50d are effective to avoid any possible lateral displacement of any of the neighboring floor panels 2 and also to minimize the possibility of the corner fringe 9 of one floor panel 2 riding over the corner fringe 9 of the next adjacent floor panel 2.

Moreover, the exact position of the corner fringe 9 of the surfacing plate 2b of each panel 2 is advantageously defined by the neighboring elongated banks 50a to 50d with which the corresponding corner of the floor panel 2 is brought into engagement as clearly shown in Fig. 4. Considering that the elongated banks 50a to 50d are so positioned and so arranged that their extensions of those elongated banks 50a to 50d may cross with each other at a point aligned with the longitudinal axis of the threaded pole 40 which is in turn aligned with the center of the support pedestal 30, and also considering the capability of those elongated banks to position the corner fringes 9 in the respective floor panels 2 relative to each other at a location above the adjustable support column B, the floor panels 2 can advantageously be laid substantially accurately above the building floor to complete the secondary floor that can be laid out or modified in any desired way should the necessity occur.

Furthermore, if desired, the cushioning sheet 60 may be dispensed with. However, the use of the cushioning sheet 60 is particularly advantageous in that a direct contact between each floor panel 2, particularly the corner fringe 9, and the corresponding arm 31a, 31b, 31c or 31d can be avoided to thereby minimize generation of obnoxious rubbing sounds.

When installing each floor panel 2, it may occur that the corner fringe 9 may ride over the associated elongated banks 50a to 50d, and this is particularly true when the floor panel 2 is lowered from above during installation. To avoid the possibility of the corner fringe 9 riding on one or both of the associated elongated bank 50a to 50d, opposite vertical side edges of each of the arms 31a to 31d which stand upwardly above the mounting plate 30a are formed with respective guide ribs 32. Accordingly, assuming that during installation of the floor panels 2 one floor panel 2 is lowered from above as shown in Fig. 10, the set-back corner 2c of the reinforcement skeleton structure 2a is first brought in contact with and then guided downwardly along the guide ribs 32, as shown in Fig. 11, to thereby facilitate the corner fringe 9 in the floor panel 2 to rest in part on the portion 32a of one arm and in part on the portion 32b of the next adjacent arm as hereinbefore described and as shown in Fig. 12.

More specifically, each of the guide ribs 32 is so positioned and so configured that during as shown in Fig. 10 installation of one floor panel 2 by lowering the latter from above in a downward direction shown by the arrow D in Fig. 11, the set-back corner 2c of the reinforcement skeleton structure 2a of the floor panel 2 is received in the corresponding void 70 while held in sliding contact with the neighboring guide ribs 32 as shown in Fig. 11 wherefore the floor panel 2 being lowered can be laterally displaced in a direction shown by the arrow L in Fig. 11 to allow the associated corner fringe 9 to eventually rest in part on the portion 32a of one arm and in part on the portion 32b of the next adjacent arm as hereinbefore described without the fringe 9 riding over the elongated banks 50d and 50c as shown in Fig. 12.

In the foregoing embodiment, the parting element has been shown as including the four separate elongated banks 50a to 50d. However, according to a second preferred embodiment of the present invention shown in Fig. 13, the parting element comprises a single bank member 51 having four elongated banks 51a, 51b, 51c and 51d that are integrated together to represent a cross shape.

Each elongated bank 51a, 51b, 51c or 51d is positioned intermediate of the width of the associated arm 31a, 31b, 31c or 31d while the elongated banks 51a and 51c are in line with each other and the elongated banks 51b and 51d are in line with each other and perpendicular to the elongated banks 51a and 51c.

The bank member 51 may be a member separate from the support block 30b, but formation of the bank member 51 integrally with the support block 30b is particularly advantageous in that the need to employ separate component parts can be eliminated.

According to the second embodiment shown in Fig. 13, since the bank member 51 is of a cross-shape extending from end to end in two directions perpendicular to each other, the area of surface of the elongated banks 51a to 51d which contact the associated fringes 9 in the floor panel 2 is advantageously increased as compared with that in the previously described embodiment. The greater the area of surface of the elongated banks 51a to 51d which contact the associated fringes 9 in the floor panels 2, the less the possibility of one or more of the floor panels being laterally displaced.

Fig. 14 illustrates a third preferred embodiment of the present invention which is substantially similar to that shown in and described with reference to Fig. 13. However, the third embodiment shown in Fig. 14 differs from that shown in Fig. 13 in that in the embodiment of Fig. 14, each elongated banks 52a to 52d forming a single bank member 52 has a length so smaller than that shown in Fig. 13 that a free end of each elongated bank 52a to 52d is set back from an outer end face of the respective arm 31a to 31d. Thus, according to the embodiment shown in Fig. 14, the single bank member 52 is formed only in an area occupied by the common core from which the arms 31a and 31d protrude generally radially.

The embodiment shown in Fig. 14 is particularly advantageous where the possibility of the obnoxious sounds being generated as a result of rubbing between the fringes in the floor panels and the elongated banks is desired to be

minimized. This is because each elongated bank 52a to 52d of the bank member 52 is of a length smaller than that in any one of the foregoing embodiments of the present invention and therefore has a smaller area of surface of the elongated banks which contact the associated fringes 9 in the floor panels 2.

Referring now to Figs. 15 and 16 showing a fourth preferred embodiment of the present invention. In this embodiment, the parting element which is similar to, for example, that shown in Fig. 4, is integrally formed with the cushioning sheet 60.

Specifically, the cushioning sheet 60 similar in shape to the shape of the top surface of the support block 30b having four cushioning arms 60a, 60b, 60c and 60d protruding outwardly from a common core where they are joined together. The parting element with which the adjoining corners of the respective floor panels 2 can be separated from each other to avoid a direct contact among them includes four elongated elastic banks 61a, 61b, 61c and 61d formed integrally with the cushioning sheet 60 in a pattern similar to the cross shape. Each of those elongated elastic banks 61a to 61d has its opposite side faces lying at right angles to the associated cushioning arm 60a to 60d and is positioned intermediate of the width of the associated cushioning arm 60a to 60d.

The cushioning sheet 60 with the parting element is received within the cross-shaped recess 33 defined in the top surface of the support block 30b as fragmentarily shown in Fig. 8.

According to the embodiment shown in Figs. 15 and 16, since the cushioning sheet 60 having the parting element is made of an elastic material such as, for example, synthetic or natural rubber material, the possibility generation of the obnoxious sounds from the resultant secondary floor can be more minimized.

Although the present invention has been described in connection with the preferred embodiments thereof, it should be noted that various changes and modifications are apparent to those skilled in the art. For example, although

the guide ribs 32 have been shown as employed in the embodiment of Figs. 1 to 4, they can be equally employed in any one of the subsequently described embodiments of the present invention. Similarly, although the lock lever 100 has been shown as employed in the embodiment of Figs. 1 to 4, it can be equally employed in any one of the subsequently described embodiments of the present invention.

Also, the parting element employed in the embodiment shown in Figs. 15 and 16 may include separate elongated banks such as shown in Figs. 1 to 4 or a cross-shaped single bank member such as shown in Fig. 13.

Furthermore, each of the elongated banks employed in any one of the embodiments of the present invention may not be always limited to a single elongated segment such as shown, but may be comprised of a plurality of discrete bank segments aligned with each other.

Accordingly, such changes and modifications so far as encompassed by the appended claims are to be understood as included within the scope of the present invention.



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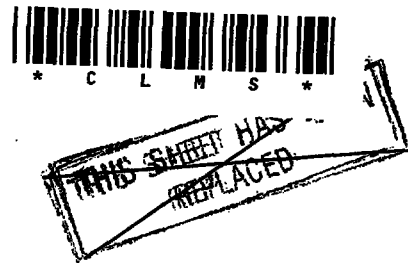
WHAT IS CLAIMED IS:

1. An adjustable support column for supporting panels a controllable distance above a base surface to permit the panels to form a panelled surface, which column comprises a base plate adapted to be installed on the base surface, an externally helically threaded pole fixed at a lower end to a center portion of the base plate, and a support pedestal adjustably mounted on the threaded pole and having a top surface for support thereon of the panels, characterized in that a plurality of banks are disposed on the top surface of the pedestal for avoiding a direct contact between corners of the panels which are supported from below by the pedestal.
2. The adjustable support column as claimed in Claim 1, characterized in that a cushioning sheet is disposed on the top surface of the pedestal.
3. The adjustable support column as claimed in Claim 1 or 2, characterized in that the banks are integrally formed with the pedestal and are arranged in a shape similar to the cross shape.
4. The adjustable support column as claimed in Claim 2, characterized in that the banks are integrally formed with the cushioning sheet.
5. The adjustable support column as claimed in any one of the preceding claims, characterized in that the support pedestal is of a generally cross-shaped configuration, when viewed from top, having four arms, each arm having an outer vertical end face and opposite vertical side faces generally perpendicular to the outer vertical end face, and in that each of a joint between the outer vertical end face and one of the opposite vertical side faces in each of the arms is formed with a guide rib for guiding the associated corner of each panel during installation of the



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panels.

6. The adjustable support column as claimed in any one of the preceding claims, characterized in that there is provided a lock lever for locking the support pedestal in position relative to the externally threaded pole once the level of the panelled surface has been fixed, said local lever having one end perforated to define an internal thread represented by a helical lip region of the perforation, said lock lever being adjustably mounted on the threaded pole with said pole threadingly extending through the perforation.

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ADJUSTABLE SUPPORT COLUMN FOR FLOOR PANELS

ABSTRACT OF THE DISCLOSURE

An adjustable support column for supporting panels a controllable distance above a base surface to permit the panels to form a panelled surface, is disclosed which comprises a base plate (10) adapted to be installed on the base surface, an externally helically threaded pole (40) fixed at a lower end to a center portion of the base plate (10), and a support pedestal (30) adjustably mounted on the threaded pole (40) and having a top surface for support thereon of the panels (2). A plurality of banks (50a to 50d, 51a to 51d, 52a to 52d, 61a to 61d) are disposed on the top surface of the pedestal (30) for avoiding a direct contact between corners of the panels (2) which are supported from below by the pedestal (30).

Fig. 1

Fig. 1

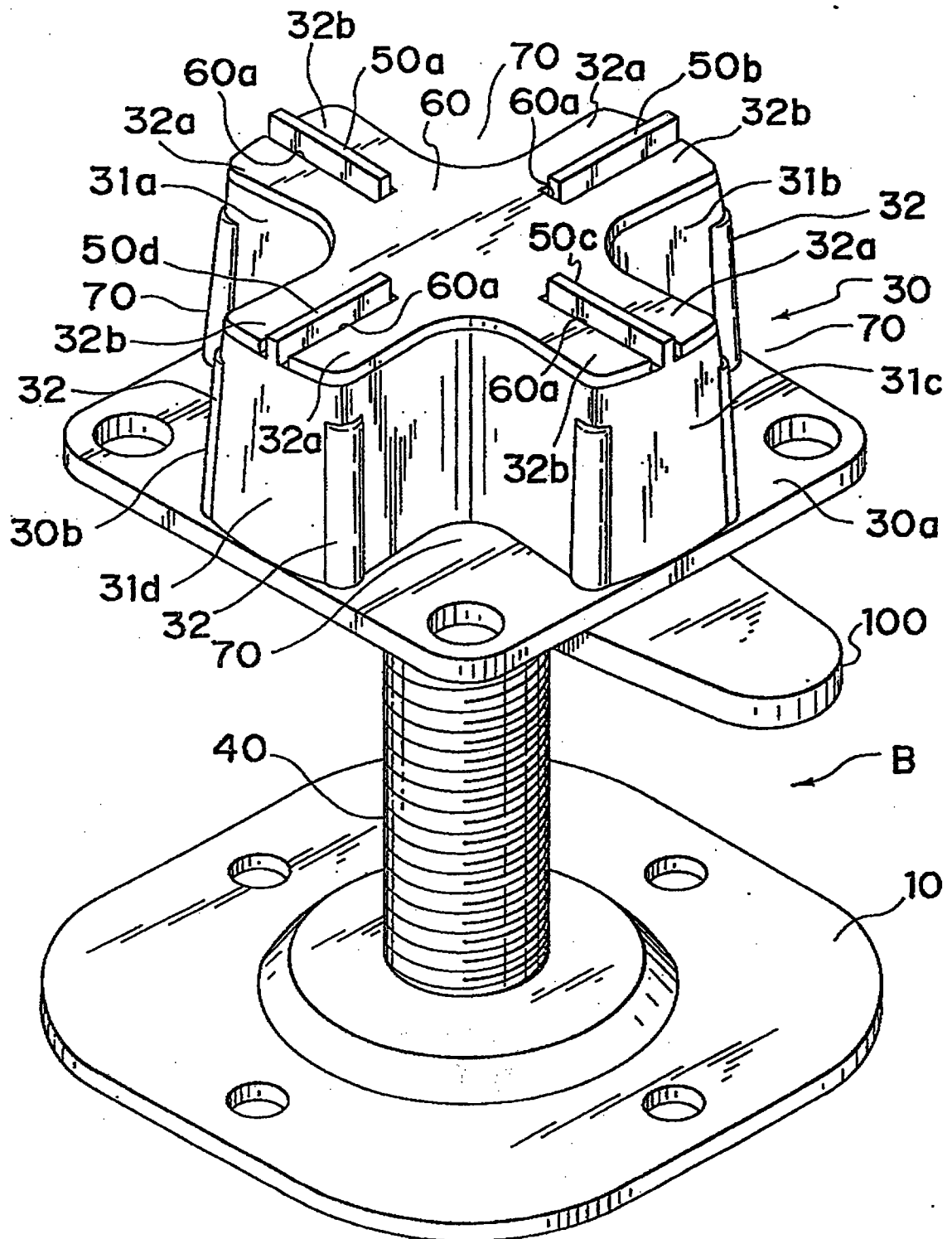


Fig.2

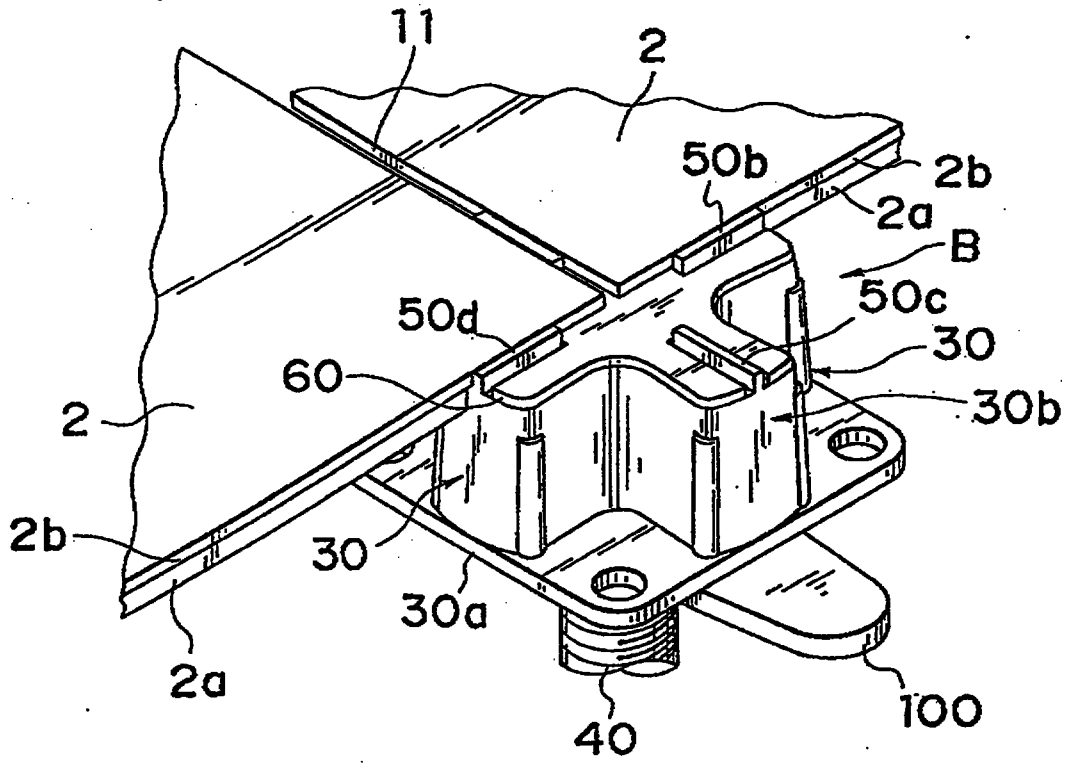


Fig.3

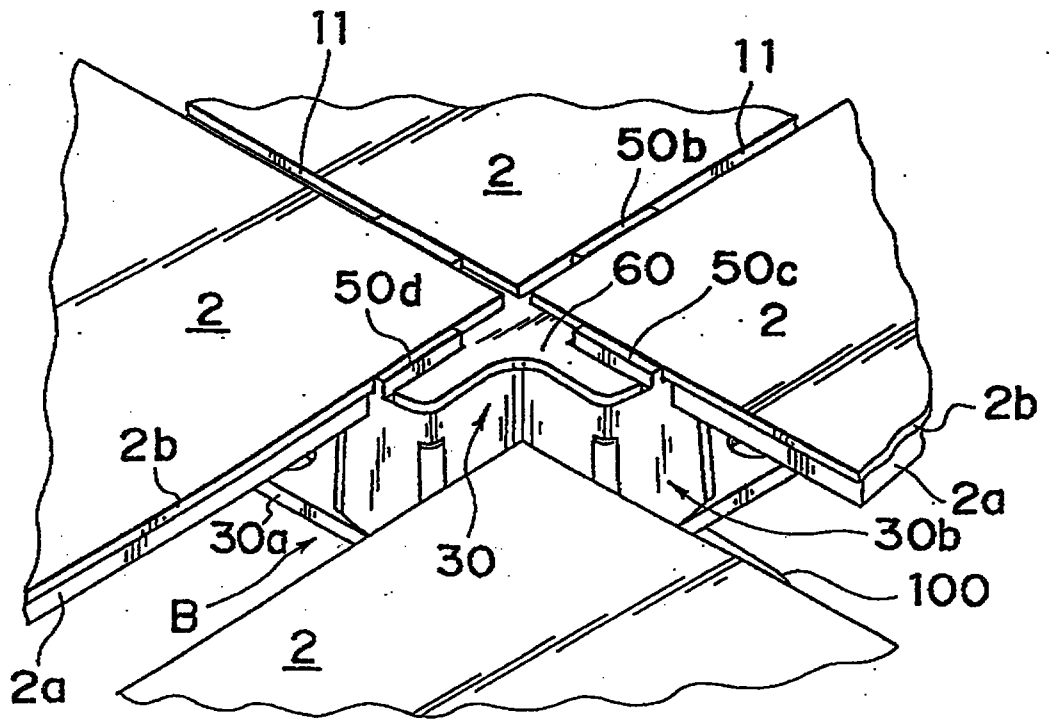


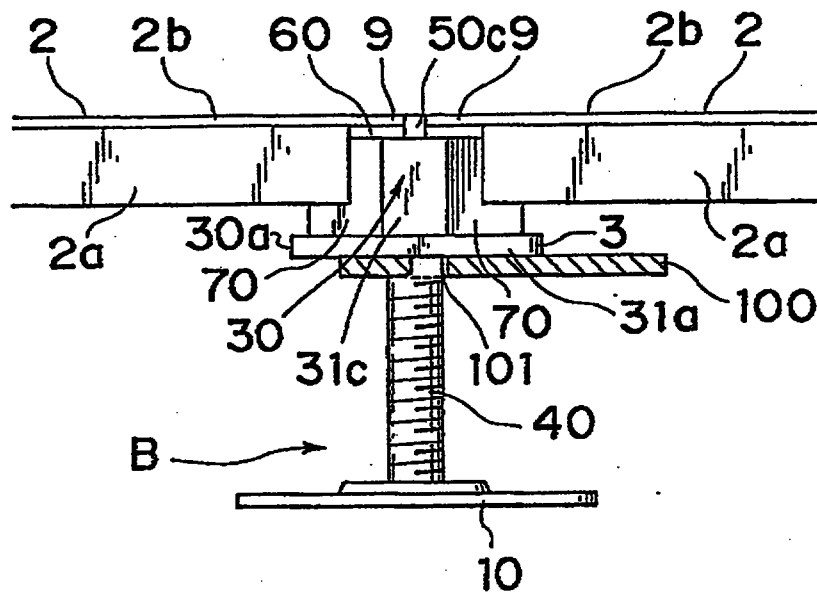
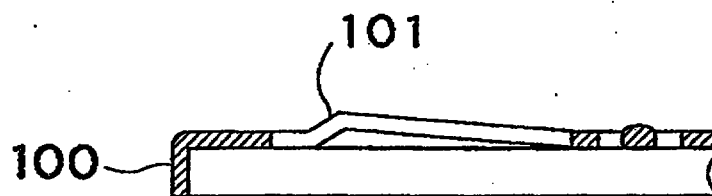
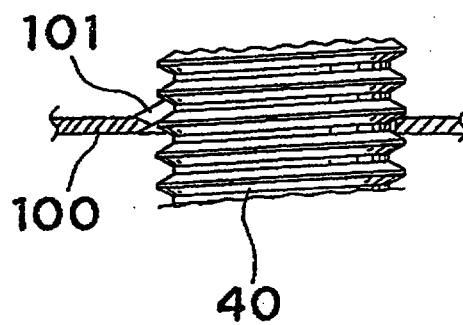
Fig.4*Fig.5**Fig.6*

Fig.7

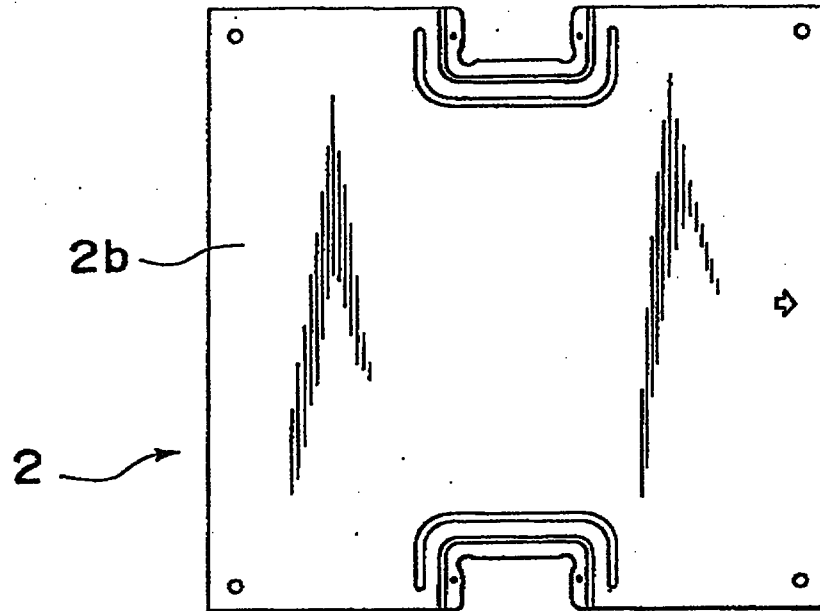


Fig.8

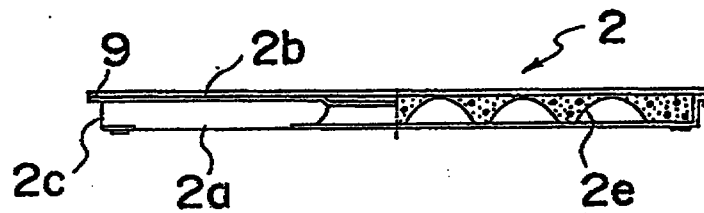


Fig.9

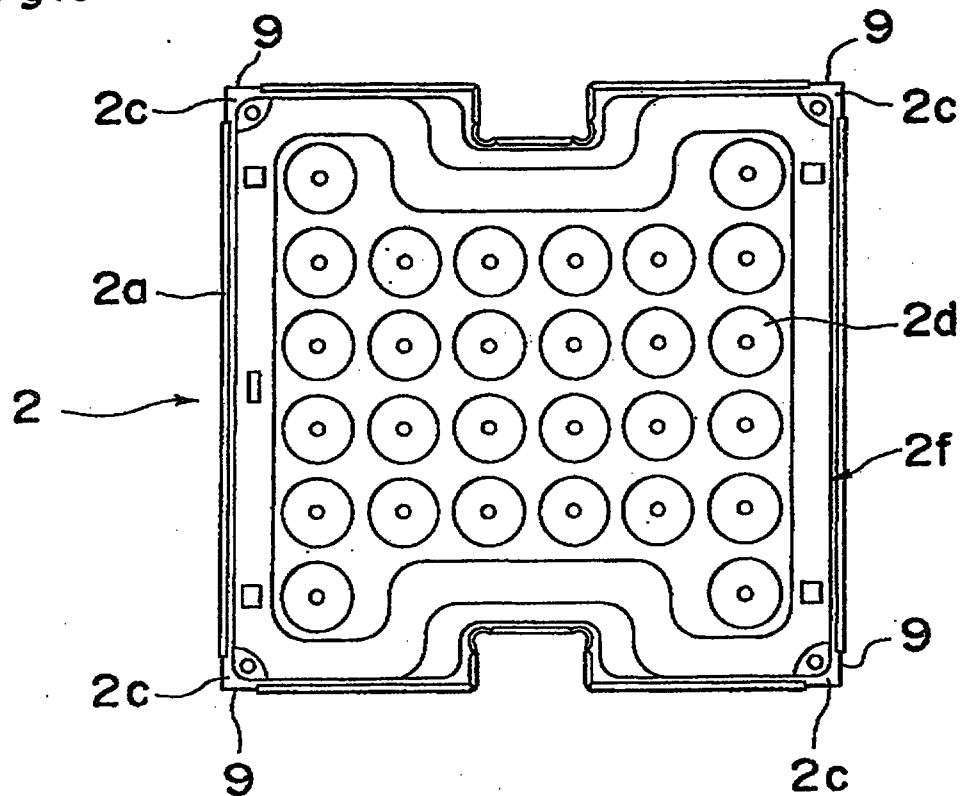
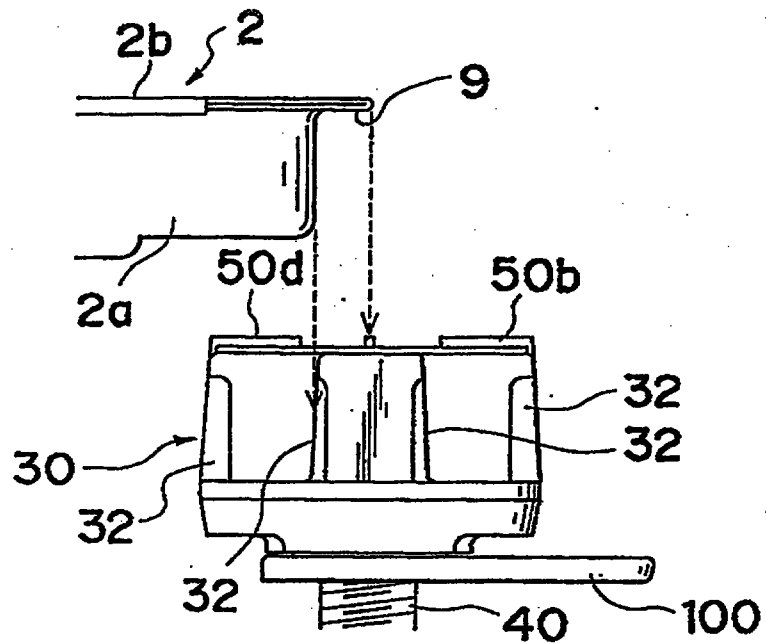
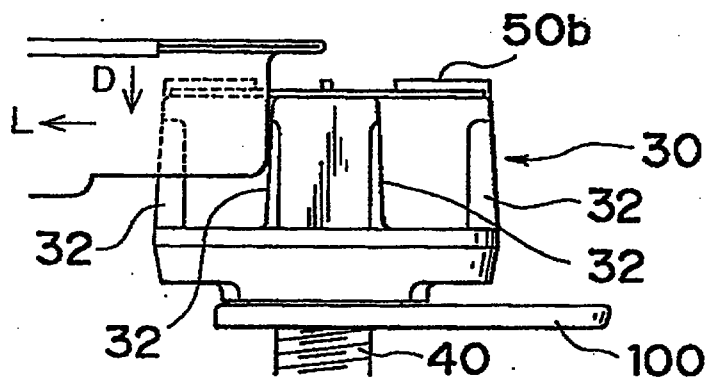
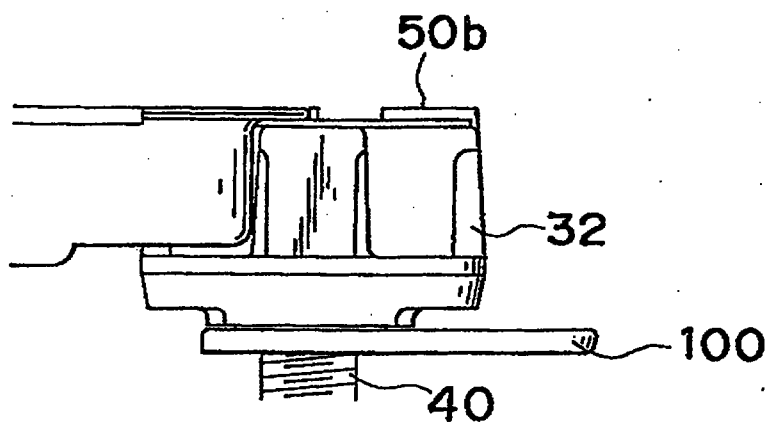


Fig.10*Fig.11**Fig.12*

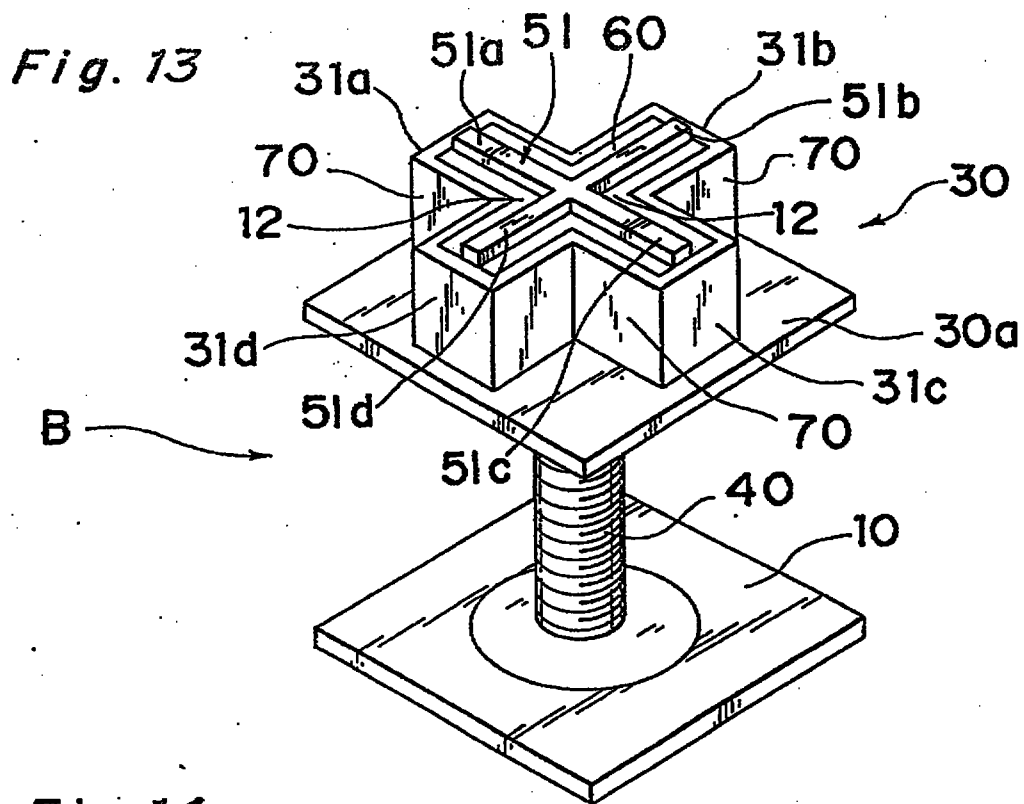


Fig. 14

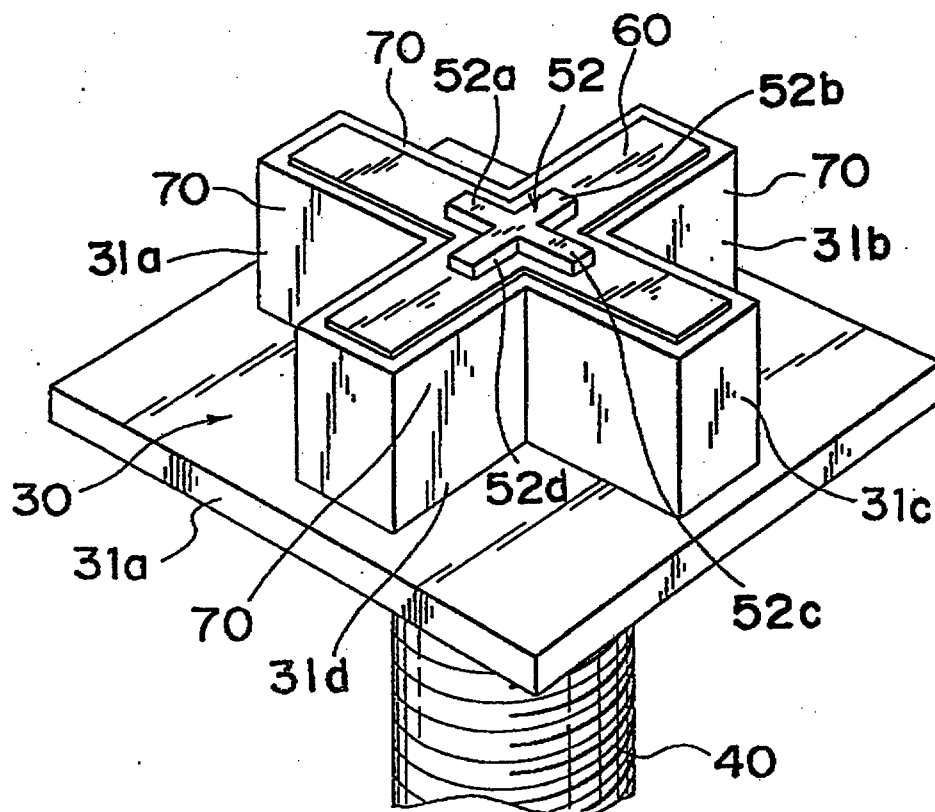


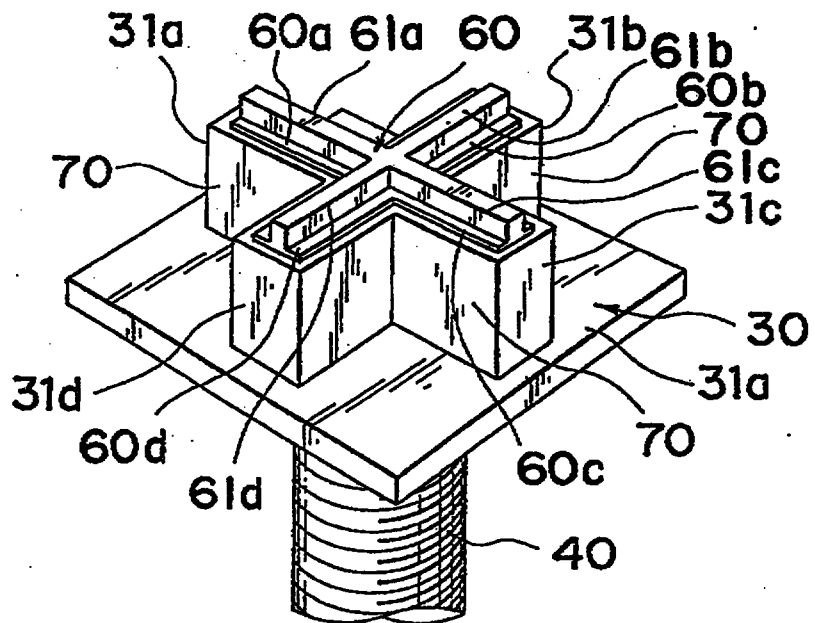
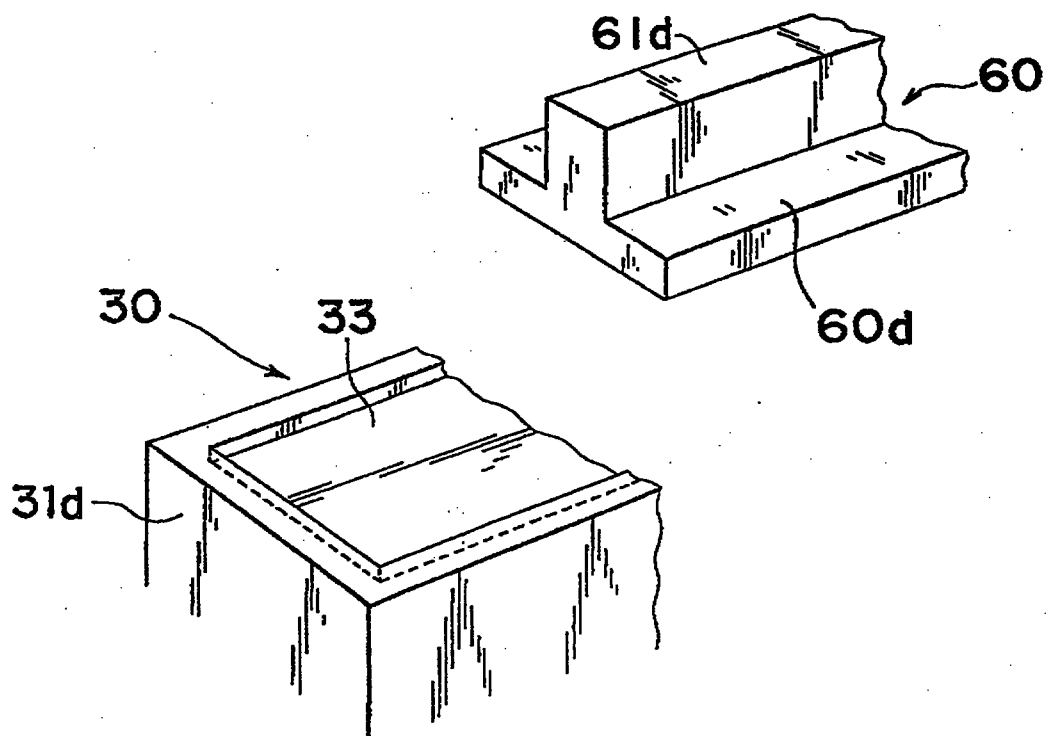
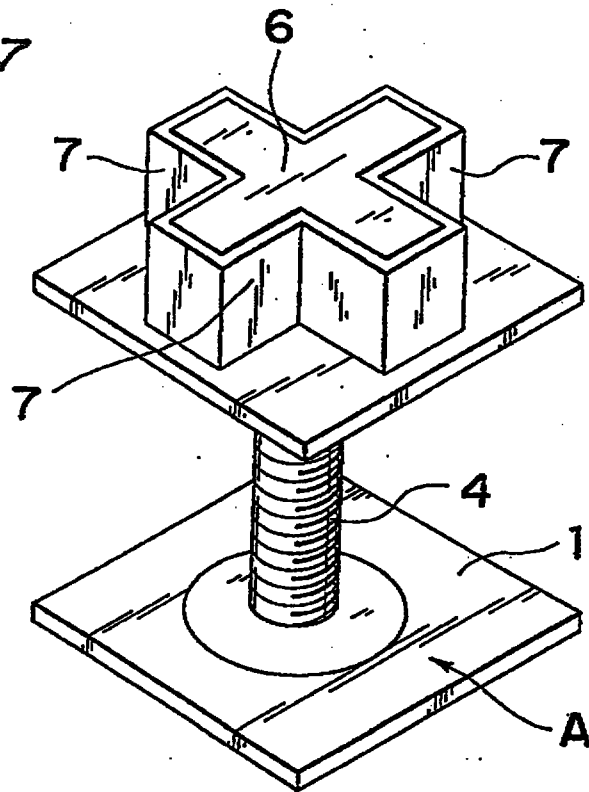
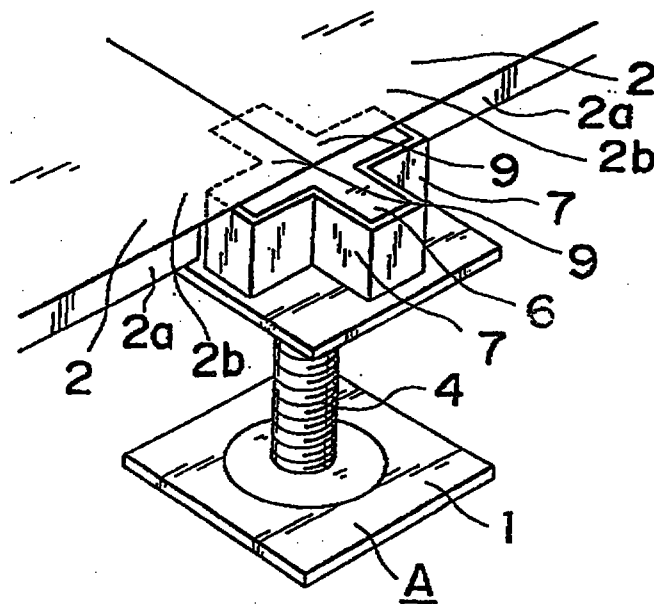
Fig. 15*Fig. 16*

Fig.17*Fig.18*

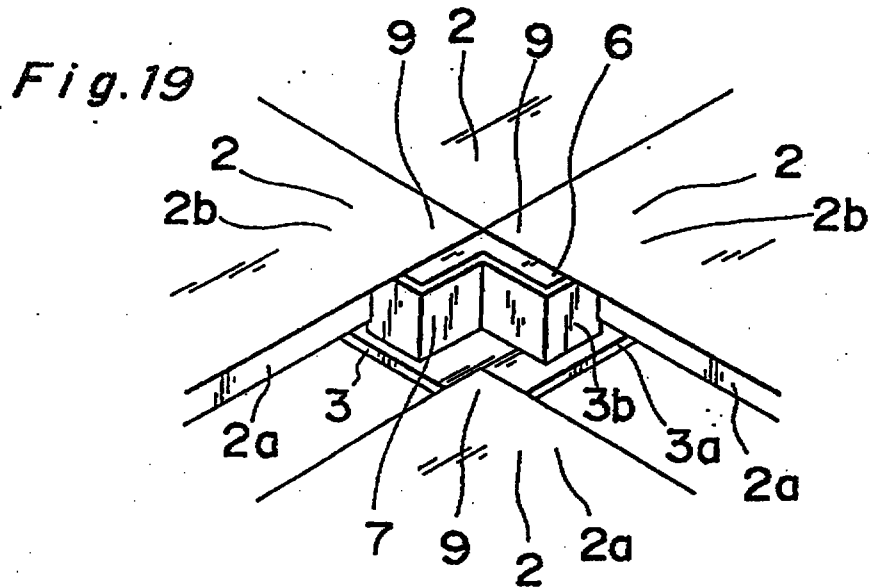


Fig. 20

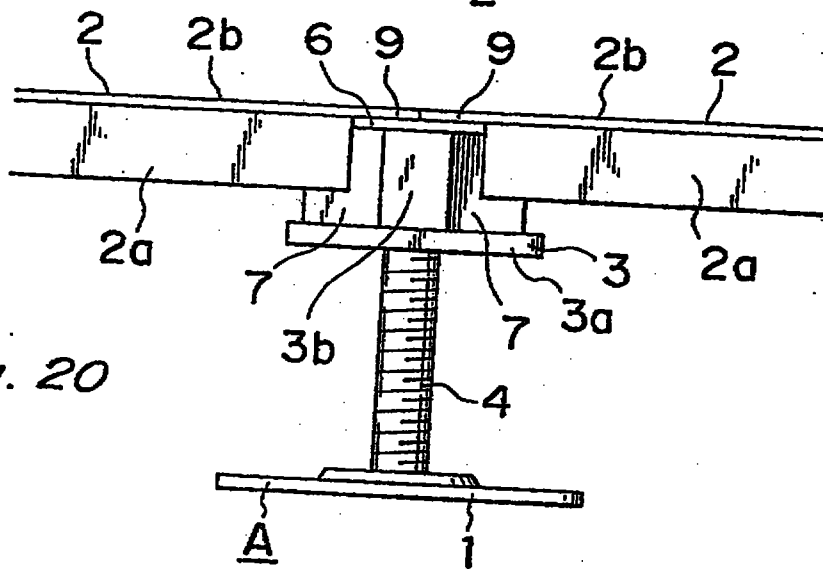
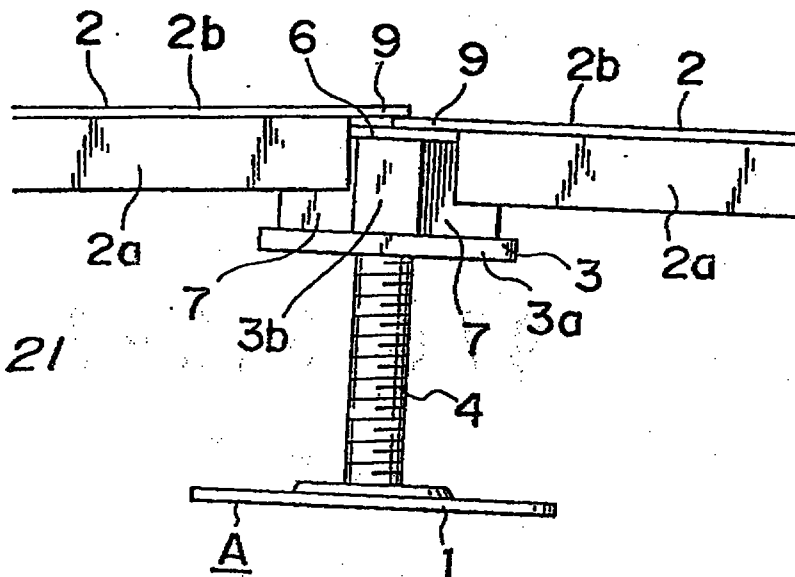


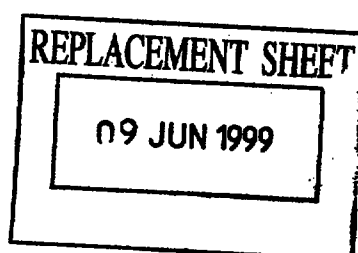
Fig. 21





WHAT IS CLAIMED IS:

1. An adjustable support column for supporting panels a controllable distance above a base surface to permit the panels to form a panelled surface, which column comprises a base plate adapted to be installed on the base surface, an externally helically threaded pole fixed at a lower end to a center portion of the base plate, and a support pedestal adjustably mounted on the threaded pole and having a top surface for support thereon of the panels, characterized in that a plurality of banks are disposed on the top surface of the pedestal for avoiding a direct contact between corners of the panels which are supported from below by the pedestal, wherein the support pedestal is of a generally cross-shaped configuration, when viewed from top, having four arms, each arm having an outer vertical end face and opposite vertical side faces generally perpendicular to the outer vertical end face, and in that each of a joint between the outer vertical end face and one of the opposite vertical side faces in each of the arms is formed with a guide rib for guiding the associated corner of each panel during installation of the panels.
2. The adjustable support column as claimed in Claim 1, characterized in that a cushioning sheet is disposed on the top surface of the pedestal.
3. The adjustable support column as claimed in Claim 1 or 2, characterized in that the banks are integrally formed with the pedestal and are arranged in a shape similar to the cross shape.
4. The adjustable support column as claimed in Claim 2, characterized in that the banks are integrally formed with the cushioning sheet.



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5. The adjustable support column as claimed in any one of the preceding claims, characterized in that there is provided a lock lever for locking the support pedestal in position relative to the externally threaded pole once the level of the panelled surface has been fixed, said local lever having one end perforated to define an internal thread represented by a helical lip region of the perforation, said lock lever being adjustably mounted on the threaded pole with said pole threading extending through the perforation.
6. The adjustable support column as claimed in any one of the preceding claims wherein the guide ribs are slanted.

