

**FLOOR PANEL****BACKGROUND OF THE INVENTION****FIELD OF THE INVENTION**

This invention is categorized in floor panel for raised access floors which is constructed by attaching the edges of top plate and bottom pan.

DESCRIPTION OF THE RELATED ART

The article: sanctioned release #6-113433 may be cited as an example of patented floor panel, which enables cables pass through to the floor void between top and bottom panels.

Following is the description of the above example. Outlets are already formed on floor panel, and cable screening cover, built in to the wiring outlet, is installed in two ways: on the level when no electrical connection is required or with an inclination for connection to the building ground so that cables can pass downward along with the inclined surface on the cable screening cover through to the floor void.

The above mentioned article offers two options for installation of cable screening cover: on the level or with an inclination, and the installation structure is complicated because there are individual parts used for each method. This incurs extra cost. As cable screening cover is built in to all wiring outlets even when no electrical connection is required, the intensity of this part tends to be fragile. In addition, there are several potential troubles considered: necessary installation of cable screening cover may be

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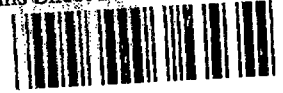
missed; cable screening cover may come off floor panel during construction, etc. Furthermore, wrong installation of cable screening cover onto floor panel could occur as there are two kinds of installation methods provided.

As in former manner, Floor Panel 3 is constructed of Top Plate 1 and Bottom Pan 2 of which the rims are attached together, and is encased with Mortar 40a. When encased with Mortar 40a as Core 40, Bottom Pan 2 is held the bottom side up as shown in Fig. 30. This causes an incomplete filing of Mortar 40a, and an unnecessary space S will be created between Mortar 40a and the base of Bottom Pan 2. If concentrated loads are applied over, cracks will be generated, especially in the center unsatisfactorily encased with Mortar 40a, due to the space S.

As in former manner, the corners of Floor Panel 3 as the back bottom of Bottom Pan 2 are placed on Head 22 of the upper Pedestal 20 as shown in Fig. 23(b). If the head width W is constant and the length from Pedestal 20 to the surface of Head 22 is L_1 longer, the moment of force against Head 22 increases, then the intensity of Head 22 is spoiled.

Total formation of the former Floor Panel 3, constructed of Top Plate 1 and Bottom Pan 2 of which the rims are attached together, is affected by metallic Bottom Pan 2.

The invented article answers the above mentioned problems. Achieving no extra installation of cable screening cover when no electrical connection is required or simple wiring construction only with cutoff for connection to the building ground, the structure and the installation method are simplified. Cutting Sections are treated effortlessly and accurately. Since



the width necessary for wiring can be minimized, the intensity of floor panel is kept for electrical connection, therefore, this invention may be used as floor panel to support weighty loads. Its reasonable structure realizes better intensity of floor panel itself. Even when mortar is encased incompletely, the center of floor panel generates no space between mortar and the base of Bottom Pan so that no cracks will be made when concentrated loads are applied over the center. Floor Panel is placed securely on Head 22, which is the top of pedestal. Cutting Sections may be treated in advance when needed so that electrical connection can be completed without cutoff process at job site. Overall, it is the assignment of the invention to provide prevention of deformation on bottom pan and reinforcement of intensity in floor panel.

SUMMARY OF THE INVENTION

The invented floor panel is constructed of Top Plate 1 and Bottom Pan 2 of which the rims are attached together. Connective Piece 5 is attached to project out of the level from the upper brim of Body 4, thin-box figured in plain view with an opening on the top. Sunken Part 7 for wires is formed by denting the surface inward from the upper end to the bottom of each Wall Piece 6 of Body 4. The opening of Bottom Pan 2 is closed with Top Plate 1, and Conjugation Piece 8, provided to the outer edge of Top Plate 1, and Connective Piece 5, provided to the top outer edge of Bottom Pan 2, are attached together so that the top of Sunken part 7 is closed. The closed top of Sunken Part 7, as stretches upward, is reserved as Cutting Section 9 for formation of wiring outlets to pass cables through to the floor void. When no electrical connection is required, Cutting Section 9 is not treated, and general method is applied to floor-panel construction. On the other hand, when connection to the building ground is needed, Cutting



Section 9 is trimmed to open the upper end of Sunken Part 7 to make an wiring outlet through which cables pass to the floor void.

It is preferable to provide dotted lines or fine grooves as Cutoff Guidance 9a onto both or either Conjugation Piece 8 and/or Connective Piece 5, which are closing the upper rim of upward stretching Sunken Part 7. This is because the upper rim of Sunken Part 7 can be opened, without mistake, by treating Cutting Section 9 along with dotted lines or fine grooves as Cutoff Guidance 9a.

It is preferable that Cutting Section 9 is provided in all sides of Floor Panel 3 so that Cutting Section 9s faces each other when Floor Panel 3 is arranged side by side. The length of Cutting Section 9, measured in the same direction as Sunken Part 7, becomes around $\frac{1}{2}$ diameter of standard Flexible Cable Tube 13. This is because the wiring outlet between adjoined Floor Panel 3 can be equal to standard Flexible Cable Tube 13 in diameter. The length of Cutting Section 9, measured in the same direction as Sunken Part 7, may be minimized so that the intensity of Floor Panel 3 is not spoiled.

It is preferable to provide several Projection 14 upward on the base of thin-box figured Body 4 as Bottom Pan 2; joint Top Plate 1 and the tips of the Projection 14, and to provide several Joint 15 in a radial pattern from center on the surface of Top Plate 1 so that the number of Joint 15, which is located on diagonal linking the corners of Top Plate 1, is counted more than on other diagonals. Therefore, Top Plate 1 and Bottom Pan 2 are jointed more securely by longest diagonal, in plain view, on Floor Panel 3.

It is preferable to provide Central Anti-space Projection 50, an upward dent in the center of Bottom Pan 2, for Motor 40a to set firmly in the center



after encased. This is because even when Bottom Pan 2 is held the bottom side up while Mortar 40a is encased and an incomplete filling of Mortar 40a generates an unnecessary space S between Mortar 40a and the base of Bottom Pan 2, Mortar 40a contact Central Anti-space Projection 50 on the base of Bottom Pan 2 so that the inner part of Floor Panel 3, which has been unsatisfactorily encased with mortar 40a, will be supported by Central Anti-space Projection 50 and will not generate cracks.

It is preferable to provide Corner Inflated Part 51, that is the four corners of Body 4, thin-box figured in plain view with an opening on the top, inflated over the level of lines which create a square. This is because, if the width W of Head 22 is constant and the length from pedestal 20 to the surface of Head 22 is L_2 shorter, as Corner Inflated part 51 of Bottom Pan 2 are placed on Head 22 of the upper Pedestal 20, the moment of force against Head 22 decreases as well as the intensity of Head 22 is not spoiled.

It is preferable to trim some, not all, Cutting Sections 9 avoiding Cap Support 52 to create wiring outlets to pass cables through to the floor void, and to cover the wiring outlets with Cap 53. This is for the convenience of wiring construction. Cutting Sections 9 may be prepared before installation so that no cutting task is needed at job site. When extra electrical connection is assigned, untreated Cutting Sections 9 can be trimmed to create wiring outlets.

It is preferable to provide Bottom Pan 2 with Support 54 figured in slender sunken and projecting parts parallel to the four sides of the base. This is because the deformation on Bottom Pan 2 is prevented by Supports 54 described as the above, and the intensity of Floor Panel 3 is reinforced.



BRIEF DESCRIPTION ON THE DRAWINGS

Fig. 1 is a sidelong view to show mainly sunken part of floor panel as the invented article.

Fig. 2 is a sectioned drawing to show mainly sunken part of floor panel as the invented article.

Fig. 3 is a sidelong view to show mainly wiring outlet after trimming cutting section on floor panel as the invented article.

Fig. 4 is a sectioned drawing to show mainly wiring outlet after trimming cutting section on floor panel as the invented article.

Fig. 5 is a sidelong view to show a construction of floor panel as the invented article.

Fig. 6 is a bottom pan used for the invented article. (a) is shown in bottom view, (b) in front view, (c) in side view, and (d) in view of (a) sectioned with X to X line.

Fig. 7 is a top plate used for the invented article. (a) is shown in bottom view, (b) in front view, (c) in side view, and (d) in view of (a) sectioned with Y to Y line.



Fig. 8 (a) and (b) are description drawings to show the examples of the joint of connective element and connective receiver element used for the invented article.

Fig. 9 (a) and (b) are description drawings to show the examples of the joint of connective element and connective receiver element used for the invented article.

Fig. 10 (a) is a sectioned drawing of piling inlaying and piling inlayed parts, which are formed the upper surface and the back of floor panel. (b) is a sectioned drawing of bent projection part of floor panel. (c) is a sectioned drawing of the joint part of connective element and connective receiver element.

Fig. 11 is a drawing to show floor panel as the invented article when placed on pedestal. (a) is shown in sidelong view, (b) in plain view, (c) in section, and (d) in sectioned view of adjoined floor panels away from pedestal.

Fig. 12 is a sidelong view of floor panel as the invented article before cable screening cover is installed (a) and after the installation of cable screening cover and wiring (b).

Fig. 13 (a), (b) and (c) are description drawings to indicate the order of a process from trimming of cutting section on the invented article to create wiring outlet to installation of pushing to wiring outlet.

Fig. 14 is a sidelong view of wiring with pushing installed, as the invented article.

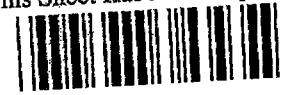


Fig. 15 is an example of providing cutoff guidance on the invented article. (a) is shown in bottom view, and (b) in plain view.

Fig. 16 is other example of providing cutoff guidance on the invented article. (a) is shown in bottom view, and (b) in plain view.

Fig. 17 is a plain view of flexible cable tube to pass through wiring outlet which is created on cutting section of the invented article.

Fig. 18 is other drawings of the actual practice of the invented article. (a) is shown in base view, (b) in front view, and (c) in side view.

Fig. 19 is a bottom view of wiring outlet which is created by trimming some, not all, cutting section avoiding cap support area. The wiring outlet is closed with a cap.

Fig. 20 is a sectioned view of the invented article before encased with mortar.

Fig. 21 (a) is an outline drawing when a space is generated between mortar and the base of bottom plate after mortar is encased. (b) is a sample description when concentrated loads are applied over the center of floor panel.

Fig. 22 is a bottom view of corner inflated parts of the invented article.

Fig. 23 (a) is an outline drawing when corner inflated parts are placed on the base of pedestal, and (b) is when corners without inflating process are placed on the base of pedestal.



Fig. 24 is a sidelong view of wiring outlet, which is created by trimming cutting section, and of a cap, which covers the wiring outlet.

Fig. 25 is a sidelong view of wiring outlet, as the invented article, which is covered with a cap.

Fig. 26. is a drawing of wiring outlet which is trimmed avoiding cap support area. (a) is shown in plain view, (b) in bottom view, and (c) in side view.

Fig. 27 is an example front view of sunken part which is created on surface in order to create a projection part on the upper surface of floor panel, as the invented article.

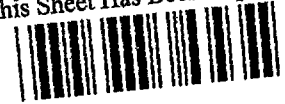
Fig. 28 is an outline drawing of floor panel, as the invented article, when piled up and below for processing of mortar.

Fig. 29 is other sectioned view of piling inlaying and piling inlayed parts which are formed in both the upper surface and the back of floor panel as the invented article.

Fig. 30 is an outline drawing when a small space is generated between mortar and the base of bottom plate after mortar is encased in the method formerly known.

Description of Numbered Items

1. Top Plate



2. Bottom pan
3. Floor Panel
4. Body
5. Connective part
6. Wall Piece
7. Sunken Part
8. Conjugation part
9. Cutting Section
- 9a. Cutoff Guidance
10. Wiring Outlet
13. Flexible Cable Tube
14. Projection
15. Joint
20. Pedestal
22. Head
- 40a Mortar
50. Central Anti-Space Projection
51. Corner Inflated Part
52. Cap Support
53. Cap
54. Support

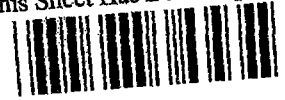
DETAILED DESCRIPTION OF THE INVENTION

The following description is based on the actual practice of this invention along with the attached drawings. Floor Panel 3 is made of Top Plate 1 and Bottom Pan 2, both materials are metallic like iron, and the insides of both plates are encased with lightweight mortar, expanded synthetic resins, etc. as Core 40.



Bottom Pan 2, as shown in Fig. 6, is a substance with flange attached outward to the upper brim of Body 4, thin-box figured in plain view with an opening on the top. The above mentioned flange is called as Connective Piece 5. Sunken part 7 for wires, which stretches upward and is formed by denting the surface inward from the upper end to the bottom of each Wall Piece 6, a side of thin-box figured Body 4. The upper rim of Sunken Part 7 is covered with Connective Piece 5, the above mentioned flange. Sunken Part 7 is provided in one or more of Wall Piece 6, a side of thin-box figured Body 4. There are Projection 14, formed upward to Head 16 of Bottom Pan 2, and Connected Element 15a, provided on the upper surface of Projection 14. Connected Element 15a is provided in several places from the center of Bottom Pan 2 diagonally, as shown in Fig. 6(a), so that the number of Connected Element 15a located on diagonal on Bottom Pan 2 is counted more than on other diagonals. The upper surface of Projection 14 and the top of Body 4 are kept in the same level although Hollow Part 17, which is shorter than projection 14, is attached upward on the base of Bottom Pan 2. As the above mentioned structure, the intensity of thin-box figured Body 4 is reinforced by Projection 14 and Hollow Part 17. Additionally, Piling Inlayed Part 45, which is projected upward or downward, and Mortar Filler Opening 47 are provided in the base of Bottom Pan 2.

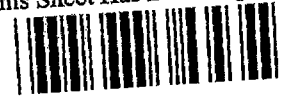
Top Plate 1, as shown in Fig. 7, is a square plate in plain view, and its edges are Connective Piece 5. There are several Connecting Element 15b provided on Top Plate 1. Connecting Element 15b are provided from the center of Top Plate 1 diagonally in plain view, as shown in Fig. 7(a), so that the number of Connecting Element 15b, located on diagonal on Top Plate 1, is counted more than on other diagonals. Additionally, Piling Inlaying



Part 46, which is projected upward or downward, is provided on Top Plate 1.

Top Plate 1 covers the upper opening of thin-box figured Body 4 as Bottom Pan 2. Then, Conjugation Piece 8 as the rim of Top Plate 1 is attached to Connective Piece 5 as the rim of Bottom Pan 2. Conjugation Piece 8 and Connective Piece 5 are securely adhered by inserting the edge of Conjugation Piece 8 to the back of Connective Piece 5 (cf. Fig. 1, 2). Connecting Element 15b of Top Plate 1 and Connected Element 15a of Bottom Pan 2 are also joined. As shown in Fig. 8 (a), Connecting Element 15b of Top Plate 1 and Connected Element 15a of Bottom Pan 2 may be formed in cylindrical figure with base of no holes to fit into and attach each other in caulking. On the other hand, Connecting Element 15b of Top Plate 1 may be formed in cylindrical figure with base of no holes, and Connected Element 15a of Bottom Pan 2 may be formed in peg. Then, Connecting Element 15b as cylinder figure with base of no holes is to fit into and attach each other in caulking as shown in Fig. 9 (c).

Joint 15, which is a joint of Connecting Element 15b and Connected Element 15a, is provided in several places diagonally from the center of Top Plate 1 in plain view, so that the number of Connecting Element 15b located on diagonal on Top Plate 1 is counted more than on other diagonals. Since Floor Panel 3 is constructed to figure in square in plain view, the diagonals, linking the corners, are longest in plain view. By keeping a number of Joint 15 on longest line, Top Plate 1 and Bottom Pan 2 are attached firmly on longest diagonal, in plain view. This is because the number of Connecting Element 15b, located on diagonal on Top Plate 1 is counted more than on other diagonals.



The construction of Floor Panel 3 is mentioned so far. Conjugation Piece 8 as the rim of Top Plate 1 is attached to Connective Piece 5 as the rim of Bottom Pan 2, and Conjugation Piece 8 and Connective Piece 5 are securely adhered by inserting the edge of conjugation Piece 8 to the back of Connective Piece 5. Sunken Part 7 for wires, which stretches upward and is formed by denting the surface inward from the upper end to the bottom of each Wall Piece 6, a side of thin-box figured Body 4, is closed by the layer of Connective Piece 5 and Conjugation Piece 8 as shown in Fig. 1, 2. The upper closing of upward stretching Sunken Part 7 is Cutting Section 9 to create a wiring outlet by cutoff.

The layer of Connective Piece 5 and Conjugation Piece 8, located in the corners of Floor Panel 3, is trimmed off as shown in Fig. 11, and the part is indicated as Trimmed Part 18.

Floor Panel 3, with the above mentioned structure, can be piled for storage or conveyed without misalignment by fitting Piling Inlaying Part 46 into Piling Inlayed Part 45 which are formed onto the upper surface and back bottom of Floor Panel 3. Fig. 5 and 11 show the construction of Floor Panel 3 at work site. Floor Panel 3 is placed on the head of Pedestal 20, which is provided on Floor foundation 19 like mortar slab, to construct Floor 21 over Space 20 on the upper surface of Floor foundation 19. There is Head 22 provided on the top of Pedestal 20, and the center of the upper surface of Head 22 has cross-figured Base 23. On Base 23 is Spacer Projection 24 provided. The corners of four Floor Panels 3 are jointed on the head of Pedestal 20. As shown in Fig. 11, when the back bottom of Bottom Pan 2, where there are the corners of Floor Panel 3, is jointed onto Head 22, and the layer of Connective Piece 5 and Conjugation Part 8 located in the corners of Floor Panel 3 is fit into Base 23. At this time,



Trimmed Part 18 is inserted into Spacer Projection 24 to be fixed in position so that there will be Space 25, measured in 1mm maximum, created between adjoined Floor Panels 3. Space 25, provided by positioning Spacer Projection 24, prevents Floor Panel 3 from its misalignment and sticking too hard to be removed during work.

When Floor Panel 3 is installed where no electrical connection is required, there is no need of treating Cutting Section 9, which covers the top of Sunken Part 7, while the top of Sunken Part 7 is closed with the layer of Connective Piece 5 and Conjugation Piece 8, as shown in Fig. 1, 2. For connection to the building ground, Cutting Section 9, which covers the top of Sunken Part 7, is trimmed to create Wiring Outlet 10 so that the top of Sunken Part 7 opens upward, as shown in Fig. 3 and Fig. 4. Then, Cable 26, connected over Floor foundation 19, is led to Sunken Part 7, which is formed on the side of Floor Panel 3, and comes out upward from Wiring Outlet 10, formed in the top of Sunken Part 7.

Fig. 5 shows the example of that Main Cable 26' is connected through Terminal Joint 27a to the inside of Cable Tray 27, placed onto Floor foundation 19, and Cable 26, wired through Terminal Joint 27a is connected through Sunken Part 7, which is formed on the side of Floor Panel 3, and is led out of upper Wiring Outlet 10, formed in the top of Sunken Part 7. As Plug 28 is attached to the tip of Cable 26, standard Flexible Cable Tube 13 which is located on Floor foundation 9, may be led out of upper Wiring Outlet 10, formed in the top of Sunken Part 7. Fig. 27b shows the cover to close the opening of Cable Tray 27.

As for the method of trimming Cutting Section 9, which covers the top of Sunken Part 7, to create Wiring Outlet 10, Cutting Section 9 may be cut in



U shape with cutoff jig to create Wiring Outlet 10 as shown in Fig. 12 (a), or the both ends of Cutting Section 9 may be cut off, as shown in Fig. 13 (a) → (b), and be bent downward in the arrow direction as shown in Fig. 13(b) along with the line which is led to the end of cutoff guidance to create Wiring Outlet 10.

With U-shaped dotted lines or fine grooves, as shown in Fig. 16, provided as Cutoff guidance 9a along with the upper sides and the inner part of Sunken Part 7 or, as shown in Fig. 15, along with the both upper sides of Sunken Part 7, Cutting Section 9 is treated in U shape accurately following the dotted lines or fine grooves as Cutoff guidance 9a to create Wiring Outlet 10 which is located in the opposite of Sunken Part 7, or both ends of Cutting Section 9 may be treated to face the both ends of Sunken Part 7 so that Cutting Section 9 is bent downward along with the end of cutoff guidance to create Wiring Outlet 10.

Cutoff Guidance 9a, which is dotted line, fine groove, or etc. on Cutting Section 9, may be provided on both or either Connective Piece 5 and/or Conjugation Piece 8. Cutoff process is simple in either way. Additionally, when provided on either of Connective Piece 5 or Conjugation Piece 8, cutoff process is done only to sides, not whole, and the intensity of Cutting Section 9, if untrimmed, is maintained.

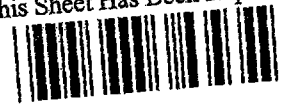
When Wiring Outlet 10 is created by trimming Cutting Section 9, Cable Screening Cover 12 may be installed as shown in Fig. 12. There are two U-shaped, in plain view, Knockouts 11 provided on Cable Screening Cover 12 and a grooved Fixing Part 12a provided in the edge of Cable Screening Cover 12. Fixing Part 12a of Cable Screening Cover 12 is inserted to the edge of Wiring Outlet 10, and any one of two Knockouts 11 is cut off with



Jig 30 like a pair of pliers as shown in Fig. 12 (a) to create Cutoff part 31 so that Cable 26, passing through Sunken Part 7 as shown in Fig. 12 (b), is led out of the upper Cutoff Part 31. Each of two Knockouts 11 is knocked in for individual purpose: one for electrical cable and the other for communication line. If Cable 26 is electric, Knockout 11 for electrical cable is knocked in, and if Cable 26 is for communication use, Knockout 11 for communication line is knocked in. Cable Screening Cover 12 prevents damage to the edge of Wiring Outlet 10 which is created by trimming Cutting Section 9, caused by knocking of Cable 26, etc.

U-shaped Pushing 32, made from pliable materials such as rubber, pliable synthetic resins, etc., may be inserted to the edge of Wiring Outlet 10 which is created by trimming Cutting Section 9 as shown in Fig. 13 (a) → (b) so that Cable 26 is connected through Wiring Outlet 10 as shown in Fig. 13 (c). By inserting Pushing 32, of which a grooved Fixing part 32a is formed in the end, to the edge (section) of Wiring Outlet 10 which is created by trimming Cutting Section 9, damage is prevented to the edge (section) of Wiring Outlet 10, caused by knocking of Cable 26, etc.

Cutting Section 9, as a part of this invention, is provided in all sides of Floor Panel 3 so that Cutting Section 9 faces each other when Floor Panel 3 is arranged side by side. Therefore, when Cutting Section 9 on an adjoining side of Floor Panel 3 is trimmed, removed, or bent to create Wiring Outlet 10, the pair of U-shaped Wiring Outlet 10 is connected each other to create Opening 33, shaped in square in plain view. Since the length of Cutting Section 9, measured in the same direction as Sunken Part 7, becomes around $\frac{1}{2}$ diameter of standard Flexible Cable Tube 13, the width of Opening 33, created by the pair of Openings 10, in U shape in plain view is enough for standard Flexible Cable Tube 13 to pass through.



Since the length of Cutting Section 9, measure in the same direction as Sunken Part 7, is kept around $\frac{1}{2}$ diameter of standard Flexible Cable Tube 13, the length can be minimized when standard Flexible Cable Tube 13 passes through. Therefore, the intensity of Floor Panel 3 is not spoiled. The actual practice in the attached figure shows that the length along with the upper rim of Floor Panel 3 on Cutting Section 9 (that is, the length along with the sides of Top Plate 1) is around 2 times longer than the diameter of standard Flexible Cable Tube 13 so that two of standard Flexible Cable Tubes 13 can pass through: one for electrical cable, and the other for communication lines. The actual practice in Fig. 17 shows that since the edge of Wiring Outlet 10 is reserved by inserting pushing 32 onto Wiring Outlet 10, the length of Cutting Section 9, measure in the same direction as Sunken Part 7, is some wider than $\frac{1}{2}$ diameter of standard Flexible Cable Tube 13, and the length along with the upper rim of Floor Panel 3 on Cutting Section 9 is 2 times wider than the diameter of standard Flexible Cable Tube 13. As the diameter of standard Flexible Cable Tube 13 is 25m, the length of Cutting Section 9, measures in the same direction as Sunken Part 7, is 15 mm, and the length along with the upper rim of Floor Panel 3 on Cutting Section 9 is 60 mm. It is not necessary to follow the measurement in this actual practice.

Fig. 18 to Fig. 29 show the other actual practices of this invention. As the basic structure of these states in the same as the above mentioned, the duplicated descriptions will be omitted from now on. In this actual practice, the center of Bottom Pan 2 is dented inward to form Central Anti-Space Projection 50. While Floor Panel 3, which is constructed of Top Plate 1 and Bottom Pan 2, is encased with Mortar 40a as Core 40 internally from Mortar Filler Opening 47, Bottom Pan 2 is held the bottom



side up as shown in Fig. 21 (a). It may happen that Space S is generated between Mortar 40a and the base of Bottom Pan due to incomplete encasing of Mortar 40a. In the actual practice of this invention, however, Mortar 40a contact and is supported by Central Anti-Space Projection 50 in the central base of Bottom Pan 2, and no cracks will be generated even when concentrated loads are applied over surface, as shown in Fig. 21 (b). The depth of the dent on Central Anti-Space Projection 50 is around 3mm.

Fig. 18 shows that Mortar Filler Opening 47 is provided to one of four corners of the base of Bottom Pan 2. There is Air Release Hole 55 provided to other corner diagonal to the corner with Mortar Filler Opening 47 to release air during mortar filling. Mortar Filler Opening 47 and Air Release Hole 47 are provided in the corners on diagonal line. It is advisable not to provide them directly on diagonal line for fear of deterioration of intensity. Since Mortar Filler Opening 47 is provided in the base of Bottom Pan 2, the diameter of opening may be measured up to 50mm. This saves time for mortar filling as well as reduces the chance of blockage when in filling. (The diameter of opening, however, may not exceed 20mm if Mortar Filler Opening 47 is provided in the side of Bottom Pan 2). The diameter of Air Release Hole 55 should be the same as that of Mortar Filler Opening 47 or less. Placed in the base of Bottom Pan 2, Air Release Hole 55 discharges Mortar 40a encased from Mortar Filler Opening 47. This gives workers the indication that Mortar 40a is encased sufficiently.

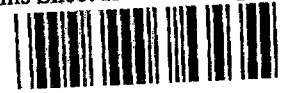
In this actual practice, Corner Inflated Part 51, that is the four corners of Body 4, thin-box figured in plain view with an opening on the top, inflated over the level of lines which create a square, is formed (cf. Fig. 18, Fig. 22). Corner Inflated Part 51 of Bottom Pan 2, which is located in the corner of Floor Panel 3, is placed on Head 22 of the upper Pedestal 20 as shown in



Fig. 23 (a), or the layer of connective and conjugation pieces in the corner of Floor Panel 3 is placed on Base 22 of the Pedestal 20. Therefore, by placing Corner Inflated Part 51 provided in the corner of Bottom Pan 2 onto Head 22 of Pedestal 20, if the width W of Head 22 is constant, the length from Pedestal 20 to the edge of Head 22 may be L_2 shorter: that is, shorter than the length L_1 , which is from Pedestal 20 to the surface of Head 22, compared with former article as shown in fig. 23 (b). As the result, the moment of force against Head 22 decreases, and the intensity of Head 22 is not spoiled.

Fig. 18 shows that several Cutting Sections 9 are provided to create Wiring Outlet 10. Some, not all, cutting Section 9 is trimmed avoiding Cap Supports 52 area, to create Wiring Outlet 10 in advance. Wiring Outlet 10 may be covered with Cap 53 so that Cap Support 52 can uphold Cap 53. Although Fig. 18 shows four Cutting Section 9, two Cutting Section 9: one each in left and right, may be treated, as shown in Fig. 19, in advance at factory to create Wiring Outlet 10, which will be covered with Cap 53, while the other cutting Section 9 are left untouched at this time.

When Cutting Section 9 is prepared by pressing process at factory, Cap Support 52, which is formed of inward projection form the center of the edges of Wiring Outlet 10, should be left as shown in Fig. 26. Cap 53 is placed onto Cap Support 52 to uphold as shown in Fig. 24 (Fig. 25 shows the installation of Cap 53). Elastic and V-shaped Fixing Leg 53a, provided in Cap 53, is inserted into the gap between the projected Cap Support 52 and the inner edge of Wiring Outlet 10 to fasten elastically Fixing leg 53a onto the side edge of Wiring Outlet 10. There is Hole 53b provided in Cap 53 for inserting jigs such as screwdriver so that Cap 53 can be removed by unfastening screws with jigs inserted from Hole 53b.



Wiring Outlet 10 is created by trimming some, not all, Cutting Section 9 avoiding Cap Support 52 area, and prepared Wiring Outlet 10 is covered with Cap 53. This requires no cutoff at job site for connection to the building ground. If more electrical connection is assigned, the untouched Cutting Section 9 is trimmed to create Wiring Outlet 10.

In this actual practice, there is Support 54, figured in slender sunken or projecting parts, provided parallel to four sides of the back bottom of Bottom Pan 2 as shown in Fig. 18 and Fig. 20. Therefore, deformation of Bottom Pan 2 can be prevented by Support 54 as well as Floor Panel 3 can be formed accurately. The intensity of Floor Panel 3 is also reinforced. Slender sunken or projecting Support 54 is pushed inward from the upper rim of Floor Panel 3 so that Mortar 40a is easily encased from the sides of Floor Panel 3.

Fig. 27 shows that the upper surface of Floor Panel 3 has a projected part in the center surrounded by the edge. (The difference of the height H between the edge and the projected surface is measured in 0.5mm in Fig. 27.) Therefore, the seams between arranged Floor Panel 3 are hidden when Floor Panel 3 is carpeted. Because a pile of Floor Panel 3, with a projected part in the center surrounded by the outer edge, is unsteady, the back bottom of Floor Panel 3, that is, the base, excluding the outer edge, of Bottom Pan 2, is dented. When the above mentioned H is measured in 0.5mm, Center 2b, which is surrounded by Outer Edge 2a, is dented by 1mm as shown in Fig. 20 for Bottom Pan 2. By this process, balance is secured even when many Floor Panel 3 are piled up.



When Floor Panel 3 is piled for processing after encased with mortar, a 5mm height of projected part cannot be formed on the upper surface of Floor Panel 3 as long as the back bottom of Floor Panel 3 is flat. By denting center 2b, which is surrounded by Outer Edge 2a, by 1mm as the above mentioned, there will be a room over the upper surface when Floor Panel 3 is piled to keep projected part in shape. Center 2b is dented by 1mm, and the measurement of projected part does not exceed 1mm. Therefore, even if a projected part is risen by the behavior of mortar, the quality in terms of flatness is secured.

Fig. 29 shows the structure of Piling Inlayed Part 45, which is formed in the back bottom of Floor Panel 3, that of Piling Inlaying Part 46, which is formed in the upper surface of Floor Panel 3, and others. In the actual practice, Dent 45a is formed by denting upward the back bottom of Floor Panel 3, and Piling Inlayed Part 45 is provided by projecting downward the center of Dent 45a. Therefore, when Floor Panel 3 is piled up and below, Piling Inlaying Part 46 is fitted into Piling Inlayed Part 45 so that misalignment to sides will not caused. A nonskid rubber may be adhered on the base of Dent 45a, if necessary, to prevent sliding.

Following is the effect of the invented article described on Claim 1: To assemble a bottom pan, connective pieces are attached to project out of the level from the upper rim of a body, thin-box figured in plain view with an opening on the top. The sunken part for wires, which stretches upward, is formed by denting the surface inward from the upper end to the bottom of each wall piece of the thing-box figured body. The opening of the bottom pan is closed with a top plate, and connective pieces, provided to the outer rim of the top plate, and conjugation pieces, provided to the top outer rim of the bottom pan, are attached together so that the top of the



sunken part is closed. The closed top of the upward-stretching sunken part is reserved as a cutting section for formation of wiring outlet to pass cables through to the floor void. Unlike former article, the uncomplicated structure simplifies the construction: no extra installation of cable screening cover when no electrical connection is needed, no missing installation of cable screening cover, no cable screening cover's falling off floor panel during construction, etc. In addition, the intensity is not spoiled unnecessarily. When electrical connection is required, Cutting Section, which covers the top of upward stretching Sunken Part, is treated to create Wiring Outlet through which cables come out from the floor void. This structure achieves simplified wiring construction.

Following is the effect of the invented article described on Claim 2 in addition to the above description on Claim 1: there are dotted lines or fine grooves provided as cutoff guidance onto both or either connective pieces and/or conjugation pieces, which are closing the upper rim of the upward-stretching sunken part. By trimming a cutting section along with the dotted lines or fine grooves as cutoff guidance, opening the top of the sunken part can be effortlessly and accurately done.

Following is the effect of the invented article described on Claim 3 in addition to the descriptions on Claims 1 and 2: cutting sections are provided around the sides of the floor panel where face others when mounted so that the length of cutting section, measured in the same direction as the sunken part, becomes around $\frac{1}{2}$ diameter of standard flexible cable. Since the width necessary for wiring can be minimized, the intensity of floor panel is kept for electrical connection, and this invention may be used as floor panel to support weighty loads.



Following is the effect of the invention articles described on Claim 4 in addition to the description on Claim 1: several projections, provided upward from the bottom of the thin-box figured body of a bottom pan, are jointed to a top plate. The joints are provided in a radial pattern from the center of the top plate surface so that the joints, located on a diagonal line on top plate, are numbered more than on other diagonals. Therefore, the intensification of the part on longest diagonal in plain view achieves reasonable structure and reinforces the intensity of floor panel.

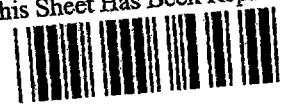
Following is the effect of the invested article described on Claim 5 in addition to the description on Claim 1: the central anti-space projection, an upward dent in to the center of bottom pan, is provided for mortar to set firmly in the center after encased. When mortar is encased incompletely because Bottom Pan 2 is held the bottom side up, the center of floor panel generates space between mortar and the base of the bottom pan. Mortar, however, contacts and is supported by the central anti-space projection in the center base on the bottom pan so that no crack will be generated when concentrated loads are applied over the center. Therefore, the quality in terms of flatness is secured.

Following is the effect of the invented article described on Claim 6 in addition to the description on Claim 1: the four corners of body, thin-box figured in plain view with an opening on the top, are inflated over the level of lines which create a square. Therefore, the corner inflated parts of the bottom pan are placed on the head of the upper pedestal, and if the width W of the head is constant, the length from pedestal to the edge of the head can be shorter. The moment of force against the head decreases, and the quality in terms of stability is secured.



Following is the effect of the invented article described on Claim 7 in addition to the description on Claim 1: some, not all, cutting sections are trimmed avoiding cap support area to create wiring outlet, which is covered with a cap. Therefore, cutting sections may be prepared before installation so that no cutting task is needed at job site. When extra electrical connection is assigned, untreated cutting sections can be trimmed to create wiring outlets.

Following is the effect of the invented article described on Claim 8 in addition to the description on Claim 1: there is support, figured in slender sunken and projecting parts parallel to the four sides of the base of bottom pan. Therefore, deformation of bottom pan can be prevented by the above mentioned support as well as the floor panel can be formed accurately. As the result, the quality in terms of intensity and formation is secured.



WHAT IS CLAIMED:

1. Following is a feature of the invented floor panel. The floor panel is constructed of top plate and bottom pan of which the rims are attached together. For bottom pan, connective pieces are attached to project out of the level from the upper brim of a body, thin-box figured in plain view with an opening on the top. Sunken Parts for wires are formed by denting the surface inward from the upper end to the bottom of each wall piece of the body. The opening of the bottom pan is closed with a top plate, and connective pieces, provided to the outer rim of the top plate, and conjugation pieces, provided to the top outer rim of the bottom pan, are attached together so that the top of the sunken parts is closed. The closed top of the sunken parts, as stretch upward, is reserved as Cutting Section sections for formation of wiring outlets to pass cables through to the floor void.
2. Following is an additional feature of the invented floor panel described in Claim 1. Dotted lines or fine grooves are provided as cutoff guidance onto both or either connective pieces and/or Conjugation Pieces, which are closing the upper rim of upward-stretching sunken parts.
3. Following is an additional feature of the invented floor panel described in Claim 1 and Claim 2. Cutting sections are provided around the sides the floor panel so that the length of cutting section, measured in the same direction as sunken parts, become around $\frac{1}{2}$ diameter of a standard flexible cable.





4. Following is an additional feature of the invented floor panel described in Claim 1. Several projections, provided upward from the bottom of the thin-box figured body of bottom pan, are jointed to top plate. The joints are provided in radial pattern from the center of the top plate surface so that the joints, located on diagonal on top plate, are numbered more than on other diagonals.
5. Following is an additional feature of the invented floor panel described in Claim 1. A central anti-space projection, an upward dent in the center of bottom pan, is provided for mortar to set firmly in the center after encased.
6. Following is an additional feature of the invented floor panel described in Claim 1. The four corners of the body, thin-box figured in plain view with an opening on the top, are inflated over the level of lines which form a square.
7. Following is an additional feature of the invented floor panel described in Claim 1. Some, not all, cutting sections are trimmed avoiding cap support area to create wiring outlets to pass cables through to the floor void. These wiring outlets are covered with cap.
8. Following is an additional feature of the invented floor panel described in Claim 1. Bottom Pan is provided with supports figured in slender sunken and projecting parts parallel to the four sides of the base.

