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WIRING SYSTEM AND APPARATUS PRESET UNDER FLOOR

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

This invention is categorized in under-floor pre-wiring system and device.

DESCRIPTION OF THE RELATED ART

For the construction of a raised access floor, the installation on slab-like floor material of cables such as electrical wires and data wires is prior to laying floor panels which assemble a raised access floor.

Following is the description of the above method of the cable installation. Connected to polarization-current disk, Cable 6, an electric wire, is directly distributed on slab floor as shown in Fig. 23, and then, floor panels are laid over the wires. There are the problems caused by this installation method: cables become fragile; are easy to catch a fire; are flammable when ignited; tend to be disorganized and to be wrongly cut off; and there is a possibility that cables are bit off by mice.

Following is the description of the above method of the cable installation. Wires are installed in ducts laid on slab floor. Wiring in this installation method tends to become fixed and to lose flexibility, and relocation of wiring or increase/decrease of wires is difficult. In addition, cable pull-out position cannot be modified easily.



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The invented article is devised to solve the above mentioned problems, and does not damage to the previously installed cables; prevents cables bit by mice; is durable to fire; makes cable arrangement easy; provides flexible wiring and relocation; and enables easy modification of cable pull-out position. This is the assignment of the invention of the under-floor pre-wiring system and device.

The invented article answers the above mentioned problems. To assemble the invented under-floor wiring system, Wiring tray 3, on which Junction box 2 with a built-in Connector 1 is appropriately attached, is installed underneath the floor. Wiring tray 3 is equipped in Junction box 2 with Electric wire 6a, which end is connected to Polarization-current disk 4 and Data disk 5, and Cable 6 as Data wire 6b etc. One end of built-in Connector 1 of Junction box 2 has Plug 7 and the other end has Socket 8. The both ends are connected with Cable 9 to assemble Wiring instrument 10. When desks or tables are positioned, Plug 7 of Wiring instrument 10 is inserted to built-in Connector 1 of Junction box 2. This construction method, in which Cable 6 as electric wire, data wire, etc. which end is connected to Polarization-current disk 4 and Data disk 5 in Wiring tray 3, protects the previously installed Cable 6, especially in case of fire, with Wiring tray 3, and prevents spreading flames if cables get ignited. In addition, cables are wired in Wiring tray 3 for easy arrangement. Cable 6 is wired in Wiring tray 3, and Connector 1, built in any Junction box 2 which is located on Wiring tray 3 in an appropriate width, is equipped with Plug 7 of Wiring instrument 10. This provides easy relocation of wiring, flexible wiring and easy modification of connecting position of Plug 7 of Wiring instrument 10.

Wiring tray 3 is used as Electric wiring tray 3a and Data wiring tray 3b. It is preferable that Junction box 2 on Electric wiring tray 3a is equipped with connector for electric wire, and on Data wiring tray 3b with connector for data wire. This construction locate Electric wire 6a and Data wire 6b respectively to Electric wiring tray 3a and Data wiring tray 3b.

It is preferable that Wiring tray 3 is installed in Mount 13 which is located between Pedestal 12 to support floor panel. This construction ensures to support Cable 6 with Electric tube 14.

At the same time, it is preferable that a part of Wiring tray 3 is combined with Electric tube 14. This construction ensures to protect Cable 6 with Electric tube 14.

SUMMARY OF THE INVENTION

Following is the details of the structure of the invented under-floor pre-wiring device. A lower part of Junction box 2 is installed into the upper opening part of Wiring tray 3, which is U-shaped in section, and there is Wiring space 15 formed between the inner bottom of Wiring tray 3 and the lower bottom of Junction box 2. The part of Junction box 2, which is installed into Wiring tray 3, carries Cable connection part 16 to connect Cable 6, which is passed through Wiring tray 3, to built-in Connector 1 of Junction box 2, and the part of Junction box 2, which is exposed upward from Wiring tray 3, carries Open 17 for Cable 9 to wire to Connector 1. This construction protects Cable 6 with Wiring tray 3 as Cable 6 is wired in Wiring tray 3, and connects Cable 6 directly to Connector 1 of Junction box 2 without pulling out upward from Wiring tray 3 as Cable 6 passes through Cable connection part 16 to reach Connector 1 if connected to

built-in Connector 1 of Junction box 2, which is located in the upper opening of Wiring tray 3, and allows Cable 9 through Open 17 which is furnished the exposed part of upper Wiring tray 3 of Junction box 2 if pulled out from Connector 1 through floor surface. If many a Junction box 2 is furnished on the upper opening of Wiring tray 3, and any of these Junction box 2 does not pull in Cable 6, cables are installed effortlessly inside Wiring tray 3 through Wiring space 15, which is located between the inner bottom of Wiring tray 3 and the lower bottom of Junction box 2, without interrupting Junction box 2.

The edges of the upper opening part of Wiring tray 3, which is U-shaped in section, are projected outward, and this is Projection 18 as shown in (c) and (d) of Fig. 9. It is preferable that Projection 18 is furnished with Tray support 19 allowing height adjustment. This construction keeps stability of the adjusted height even if Base floor 22, a slab floor, is uneven.

At the same time, it is preferable that Junction box 2 is furnished with Support 21, which upholds Projection 18 on Wiring tray 3, onto the side of Box 20 which has a rectangular figure with upper opening and which width is slightly smaller than the inner width of Wiring tray 3; with Cable connection part 16 in the lower part of both longer sides of Box 20; with Open 17 for cables in the upper part of both longer sides of Box 20; and with Connector 1 in the inner Box 20. This construction enables provides the installation of Junction box 2 using Support 21 even when a lower part of Junction box 2 is dropped inside Wiring tray 3. After installation, as Cable connection part 16, which is furnished in the lower part of both longer sides of Junction box 2, internally faces longer sides of Wiring tray 3, Cable 6 which is installed in Wiring tray 3 passes through cable

connection part 16 to reach Connector 1 which is located in the center of Junction box 2.

For the invented under-floor pre-wiring device, it is preferable to provide the following parts: Fixing pedestal 41 to the lower part of Box 20, which is rectangular figured with the upper opening; Cable connection 16 to the lower part of both longer sides of Box 20 so that the end of Electric tube 14 is fit into, and Cable 6 passes through; Open 17 for Cable 9 to the upper edges of both longer sides of Box 20, and built-in Connector 1 in the inner Box 20. This construction supports Junction box 2 where Electric tube is attached, with Fixing pedestal 41, allows Cable 6 pass through Electric tube 14 which is fixed into Cable connection part 16, located in the lower part of the longer sides of Box 20, so that Cable 6 reaches built-in Connector 1. In addition, Cable 9 is pulled out from Open 17, furnished in the upper part.

BRIEF DESCRIPTION ON THE DRAWINGS

Fig. 1 is a simple wiring map of the invented article.

Fig. 2 is a sidelong view, without details, to show a construction of the invented article.

Fig. 3 is a sidelong view to show a partial disassembly when junction box is installed to wiring tray as the invented article.

Fig. 4 is a sidelong view to show a partial disassembly when cables are connected to junction box as the invented article.

Fig. 4a is a sidelong view to show a partial disassemble when other practices are applied to junction box as the invented article.

Fig. 5 is a sectioned view to show when junction box is installed to wiring tray as the invented article.

Fig. 5a is a sectioned view to show when junction box is installed, in other practices, to wiring tray as the invented article.

Fig. 6 is a sidelong view to show a partial disassemble of junction box used for the invented article.

Fig. 7a is a sidelong view to show the part of wiring tray connected with corner connector.

Fig. 7b is a sidelong view of a corner connector used for the above practice.

Fig. 8a is a sidelong view to show the part of wiring tray connected by section joiner.

Fig. 8b is a sidelong view of a section joiner used for the above practice, and (c) is a sidelong view to show a partial disassembly of section joiner.

Fig. 9a is a sidelong view.

Fig. 9b is a front view to show when wiring tray is supported by tray support.

Fig. 9c is a sidelong view of the actual practice when (a) is not provided with support.

Fig. 9d is a front view of the above.

Fig. 10a is a sidelong view of a partial disassembly to show when wiring tray is upheld by mount.

Fig. 10b is a sidelong view of the length adjustment part of mount.

Fig. 11a is a sidelong view of the part connecting wiring tray by line joiner.

Fig. 11b is a sidelong view of a line joiner.

Fig. 12a is a sidelong view to show when end piece is attached to the end of wiring tray.

Fig. 12b is a sidelong view of an end piece used for the above.

Fig. 13a is a sidelong view to show an example of connector used for the invented article.

Fig. 13b is a circuit map for the above practice.

Fig. 14 is a sidelong view to show an example of wiring instrument used for the invented article.

Fig. 15 is a sidelong view of plug which is provided in an end of wiring instrument used for the invented article.

Fig. 16 is a sidelong view to show other examples of wiring instrument used for the invented article.

Fig. 17 is a sidelong view of a partial disassembly to show other actual practices of junction box used for the invented article.

Fig. 18 is an outline drawing to show wiring condition of cables used for the invented article.

Fig. 19 is a simple wiring map for other actual practices as the invented article.

Fig. 20 is a sidelong view of a partial disassembly to show when electric tube is connected to junction box as the invented article.

Fig. 21a is a sidelong view to show a partial disassembly of junction box as the invented article.

Fig. 21b is a front view of the above practice.

Fig. 22 is a sidelong view to show a partial disassembly of other actual practices of junction box.

Fig. 23 is a simple wiring map of a previous article.

Description of Numbered Items

- 1 Connector
- 2 Junction box
- 3 Wiring tray

- 3a Electric wiring tray
- 3b Data wiring tray
- 4 Polarization-current disk
- 5 Data disk
- 6 Cable
- 6a Electric wire
- 6b Data wire
- 7 Plug
- 8 Socket
- 9 Cable
- 10 Wiring instrument
- 11 Floor panel
- 12 Pedestal
- 13 Mount
- 14 Electric tube
- 15 Wiring space
- 16 Cable connection part
- 17 Open
- 18 Projection
- 19 Tray support
- 20 Box
- 21 Support
- 21a Stepped part
- 41 Fixing pedestal

DETAILED DESCRIPTION OF THE INVENTION

The following description is based on the actual practice of this invention along with the attached drawings. Fig. 1 shows the outline of wiring map

of the invented article. In Fig. 1, the indication, "A" sections to wall side, and "B" to floor side. Fig. 2 shows the administered construction, omitting the details, in sidelong view.

A raised access floor is constructed on Base floor 22, a slab floor, and the invented article installs Cable 6 before Floor panel 11, which constructs into a raised access floor.

Wiring tray 3 is installed onto Base floor 22, a slab floor, prior to the construction of Floor panel 11, and is furnished with Junction box 2, which has built-in Connector 1, in an appropriate width. There are Cable 6 such as Data wire 6b and Electric wire 6a connected to Polarization-current disk 4 and Data disk 5, which are furnished along with an edge of Wall 24, passed through the inner Wiring tray 3 so that Cable 6 reaches the built-in Connector 1 of Junction box 2.

Wiring tray 3 is figured in U-shape and in rectangular with Projection 18 provided outward in the both upper openings, and made from metallic materials.

The corners where Wall 24 and Base floor 22 face each other are provided with Corner connector 44 as shown in Fig. 7 (b). Each end is connected to Polarization-current disk 4 or Data disk 5, and the lower end of Wiring tray 3, which is furnished along with Wall 24, and another Wiring tray 3, which is furnished on Base floor 22 are attached as shown in Fig. 7 (a). To classify many a Wiring tray 3 installed on Base floor 22 as shown in Fig. 1, each tray is named as 3X located the most close to Polarization-current disk 4 or Data disk 5, 3Y at the second close, 3Z at the third close, etc.

Section joiner 25 as shown in (b) and (c) of Fig. 8 is used to connect the wiring branches when they are spread; 3X as main wiring branch out to 3Y as second branch; out to 3Y and 3Z as third branch or 3Y out to 3Z. Side opening 25b is provided to the all sides or any 3 sides of Joiner body 25a so that the end of Wiring tray 3 is attached to Side opening 25b for connection. There is a hole on the upper surface of the projected part of Joiner body 25a for Joiner cover 25c to be fixed on with a screw.

To connect Wiring tray 3 in a straight line, Line joiner 26 as shown in Fig. 11 (b) is used, and is fixed with a screw as shown in Fig. 11 (a). Line joiner 26 may be provided with Jut 26a and 26b as shown in Fig. 11 (c).

End piece 27, as shown in Fig. 12 (b), is attached to the end of the connection of Wiring tray 3.

The typical figure of Wiring tray 3 is shown in (c) and (d) of Fig. 9. Projection 18 of the Wiring tray 3, however, may be provided with Tray support 19, as shown in (a) and (b) of Fig. 9, to allow the height adjustment. Tray support 19 at the time of actual practice is assembled of Height adjustment bolt 19a and Nut 19b: Height adjustment bolt 19a, which bottom is placed onto Base floor 22, passes through a hole on Projection 18, and many a Nut 19b on Height adjustment bolt 19a holds Projection 18 from upper and lower surfaces. Therefore, the height of Wiring tray 3 may be adjusted by repositioning Nut 19b.

Wiring tray 3 is placed between Pedestal 12, not on Pedestal 12 to support Floor panel 11 when installed on Base floor 22, a slab floor, before Floor panel 11 is laid. Pedestal 12 may be installed on Base floor 22 before installing Wiring tray 3 between Pedestal 12, or Wiring tray 3 may be

installed on Base floor 22 before installing Pedestal 12 on Base floor 22. (In this case, mark with black ink on Base floor 22 so that Wiring tray 3 is installed not on Pedestal 12 which is provided in later time). Mount 13 is furnished underneath Wiring tray 3 between Pedestal 12, as shown in Fig. 10 (a), with screws, and Support 13a, the ends of Mount 13, is fixed into Pedestal 12 so that Wiring tray 3 is not allowed to move side by side.

As shown in Fig. 10 (b), Mount 13 may be divided into several parts to make Sliding mount 13b. Slide mount 13b are placed over another Slide mount 13b on the end, and are fixed, through Oval hole 13c which is provided on Slide mount 13b to screw hole which is provided on another Slide mount 13b (not shown), loosely with Screw 13d to give a flexible movement of expansion and contraction. This construction adjusts the length of Mount 13 which depends on the distance between Pedestal 12, and provides an installation method in which Support 13a of contracted Mount 13 is placed between Pedestal 12 when Pedestal 12 is fit into Support 13a, the ends of Mount 13, and Screw 13d is tightened.

Junction box 2, which is furnished on Wiring tray 3, is assembled of Box 20 which is rectangular-figured with the upper opening, and which width is slightly smaller than the inner width of Wiring tray 3. Box 20 is provided with Holder 21 in the horizontal center of its longer sides, with holes in the lower and upper ends, with Cable connection part 16 and Open 17 both of which are constructed of knockout parts to create knockout holes, with Connector 1 in the center of Box 20. The upper opening of Box 20 is covered with Cover 28, which movement is flexible by screws.

The above Junction box 2 is installed on the longer sides of the upper opening of Wiring tray 3 in an appropriate width. The lower part of Box 20 is fit into the upper part of the inner Wiring tray 3, inserted from the upper opening of Wiring tray 3, and Support 21 of Box 20 is fixed with screws to settle on Projection 18 which is provided in the edges of the upper opening of Wiring tray 3. Cable connection part 16, which is provided in the lower edges of longer sides of Junction box 2, and the longer sides of Wiring tray 3 should cross each other inside Wiring tray 3. Open 17, which is provided in the upper edges of longer sides of Junction box 2 is positioned higher than Wiring tray 3. Fig. 4a shows other example of Junction box 2. Instead of providing Support 21 with Box 20, the bottom width of Box 20 (ℓ_0) is shorter than the elevated part (ℓ_1) to create Stepped part 21a so that Stepped part 21a is fixed with screws to settle on Projection 18 which is provided in the edges of the upper opening of Wiring tray 3.

Wiring tray 3 is used as Electric wiring tray 3a and Data wiring tray 3b at the time of actual practice as shown in attached diagrams. Cable 6, including Electric wire 6a, Data wire 6b, etc. which ends are connected to Polarization-current disk 4 and Data disk 5, is wired in Wiring tray 3 as described in the above. Electric wire 6a, Cable 6 which end is connected to Polarization-current disk 4, is connected to Electric wiring tray 3a, and Data wire 6b, Cable 6 which end is connected to Data disk 5, is connected to Data wiring tray 3b so that Electric wire 6a and Data wire 6b are properly organized in the same Wiring tray 3.

Cable 6 which is connected to Wiring tray 3 is installed to Connector 1 of Junction box 2, which is located in the longer sides of Wiring tray. Cable 6 is connected through the hole, which is provided in the lower edge of longer sides of Junction box 2, and Cable connection part 16, which is

constructed of knockout parts to create knockout holes. (Knockout holes should be created for knockout parts.)

When connection to Connector 1 is complete, other parts than the upper opening of Wiring tray 3 where Junction box 2 is attached are screened with Cover 40, which is detachable.

The examples of Connector 1 for electric wires, which are installed to Junction box 2, are shown in Fig. 4, 4a, 6, 6a, and 13. Connector 1 used here is assembled of Connector 30, used for main cables when the above Cable 6 or Distribution cable 6' is connected, and Connector 31, used for open when an end of Cable 9 of Wiring instrument 10 is connected. The actual practices shown in Fig. 4, 4a, 6, 6a and 13 are the examples of connector for 4 intersections.

Cable 30 for main cables, which figure is not shown, is assembled of rapid connection terminals, and an end of Cable 6, which is connected in Wiring tray 3, passes through Cable connection part 16 which is provided in a lower end of Junction box to reach Connector 30 for main cables which are assembled of rapid connection terminals of Connector 1 in Junction box 2. For Distribution wiring as shown in Fig. 18, an end of Distribution cable 6' may be connected to Connector 30 for main cables which is located in the other end of Connector 1 in Junction box 2 so that Distribution cable 6' passes through the Cable connection part 16 which is provided in the other lower end of Junction box 2 to reach Wiring tray 3 and passes through other Cable connection part 16 which needs distribution wiring to reach Connector 30 for main cables which is assembled of rapid connection terminals of Connector 1 in Junction box 2. This method provides distribution wiring. When there are several Junction box 2

installed on Wiring tray 3, and some Cable 6 does not need pass through all of them, Cable 6 may pass through Wiring space 15 which is located between the bottom of Junction box 2 and the inner bottom of Wiring tray to reach a specific Junction box.

Wiring instrument 10 is assembled of Plug 7, which is connected to built-in Connector 1 of Junction box 2, in an end of Cable 9 and of Socket 7 in the other end of Cable 9. Plug 7, at the time of actual practice, is a harness plug, and Connector 31 for open, which is provided in Junction box 2 is assembled of a harness connector by which Plug 7 is mechanically and electrically flexible to connection. When harness plug is connected to harness connector, the connection of the lock in harness plug is maintained by Stopper 32, provided in harness connector. To unlock the connection, Operational part 33 in harness plug releases Stopper 32, and disconnection is complete.

Cable 9 of the above Wiring instrument 10 is pulled out of Open 17, which is provided in the upper end of longer sides of Junction box 2. (Knockout holes need to be created when knockout parts are provided in Open 17 or Cover 28, which faces Open 17.) Socket 8, which is furnished to an end of the pulled out Cable 9 is placed on the upper surface of Floor panel 11 or to cutoff parts or holes on Floor panel 11.

Wiring instrument 10 in Fig. 14 and 16 is used for electric wiring, and Wiring 9 is assembled of electric wires. Fig. 14 shows that Socket 8 is installed on the surface of Floor panel 11, which is laid after the installation of wiring. Wiring instrument 10 in Fig. 16 shows that Socket 8 is installed to cutoff parts and holes of Floor panel 11, which is laid after the installation of wiring (in other words, the figure shows an example of

inner socket). Socket 8 as inner socket is provided with open/close flexible Lid 35, and when installed, the lid is leveled to the surface of Finishing material 34, which is constructed over Floor panel 11.

Connector 1a for electric wires is installed to Junction box 2, which is attached on Electric wiring tray 3a as Wiring tray 3 as the above description. An end of Electric wire 6a is attached to an end of Connector 1a for electric wires, and Cable 9 for electric wires to the other end of Connector 1a as described in the above. Fig. 17 shows the example of Connector 1b for data wire which is installed to Junction box 2, attached to Data wiring tray 3b as Wiring tray 3. In this example, Data wire 6b used as Wiring 6 and data wires as Cable 9 are connected to Connector 30 for main cables of Connector 1b for data wires or Connector 31 for open.

To connect Wiring instrument 10 to Connector 1 which is provided in Junction box 2, Plug 7 of Wiring instrument 10 is connected to built-in Connector 1 in the nearest Junction box 2 when desks and tables are positioned.

After the installation, Floor panel 11 is laid and supported by Pedestal 12 as shown in Fig. 2, and Finishing material 34 is laid over the floor panels. Desks and tables are positioned after this construction.

Fig. 19 to 22 shows the other actual practice of the invented article. The actual practice regards a part of Wiring tray 3 as Electric tube 14. In Fig. 19, Electric tube 14 is used instead of third wiring tray 3Z as a part of Wiring tray 3, and an end of Electric tube 14 is connected to second wiring tray 3Y to distribute wiring. Junction box 2, which connects Electric tube 14, is provided with Fixing pedestal 41, as shown in Fig. 20 and 21, in the

bottom of its Body 20, which is rectangular-figured with an upper opening. Fixing pedestal 41 is fixed on Base floor 22 by fixing instruments so that Box 20 is settled on the floor. The ends of Electric tube 14 are fit into the lower ends of longer sides of Box 20, and Cable connection part 14 is provided for Cable 6 to pass through. Cable connection part 16 is a hole or knockout hole which is created by knockout parts. There is Open 17 for Cable 9 provided in the upper ends of longer sides of Box 20, and Open 17 is also a hole or knockout hole which is created by knockout parts. Connector 1 is built in the center of Box 20, and the upper opening of Box 20 is covered with Cover 28, which is detachable by screws.

The ends of Electric tube 14 is fit into Cable connection part 16, and Cable 6, which passes from Wiring tray 3 through Electric tube 14, is administered from Cable connection part 16 through the inner Box 20 to reach Connector 1 as described in the above. Passed through Connector 1 to connect to Cable 6' if necessary, Cable 6 may be distributed to Electric tube 14 which is fit into Cable connection 16, provided in the end of Box 20. When Cable 9 of Wiring instrument 10 is connected to Connector 1, Cable 9 comes out of Open 17 which is provided in the upper ends of longer sides of Junction box 2. Socket 8, which is provided in an end of the pulled out Cable 9, may be positioned on the surface of Floor panel 11, installed after the wiring construction or may be attached to cutoff parts or holes provided on Floor panel 11.

Fig. 21 shows an example of Connector 1 for 4 intersections inside Junction box 2, and Fig. 22 shows an example of Connector 1 for 2 intersections.

Since Wiring tray 3 is combined with Electric tube 14, protection of Cable 6 is ensured. The use of Electric tube 14 instead of third wiring tray 3Z, a part of Wiring tray 3, is the end of the connection, and wiring to Electric tube 14 is easy because there is no need to distribute wiring from Electric tube 14.

For the effect of the invented article described in Claim 1, wiring tray, on which junction box with a built-in connector is appropriately attached, is installed underneath the floor. Wiring tray is equipped in junction box with electric wire, which end is connected to polarization-current disk and data disk, and cable as data wire etc. One end of built-in connector of junction box has plug and the other end has socket. The both ends are connected with cable to assemble wiring instrument. When desks or tables are positioned, plug of wiring instrument is inserted to built-in connector of junction box. The invented article does not damage to the previously installed cables; prevents cables bit by mice; is durable to fire; makes cable arrangement easier compared to direct wiring on base floor; provides flexible wiring and relocation as cables are connected to wiring tray instead of to inner duct; and enables easy modification of cable pull-out position.

For the effect of the invented article described in Claim 2 in addition to the above, wiring tray is used as electric wiring tray and data wiring tray: junction box on electric wiring tray is equipped with connector for electric wire, and on data wiring tray with connector for data wire. Therefore, electric wire and data wire may be arranged respectively on electric wiring tray and data wiring tray.

For the effect of the invented article described in Claim 3 in addition to the above, wiring tray is installed in mount which is located between pedestals to support floor panel, and the support of wiring tray is ensured between pedestals which uphold floor panels.

For the invented article described in Claim 4 in addition to the above effect, a part of wiring tray is combined with electrical tube, and the protection of cables is ensured by electric tube.

For the effect of the invented article described in Claim 5 in addition to the above, a lower part of junction box is installed into the upper opening part of wiring tray, which is U-shaped in section, and there is wiring space formed between the inner bottom of wiring tray and the lower bottom of junction box. The part of junction box, which is installed into wiring tray, carries cable connection part to connect cable, which is passed through wiring tray, to built-in connector of junction box, and which is exposed upward from wiring tray, carries open for cable to wire to connector. Therefore, when cables wired to wiring tray are connected to connector, pulling into junction box, cables are connected to connector without pulling out upward the wiring tray. When taken out of connector to the floor surface, cables may pass through open, which is exposed upward from wiring tray of junction box. When there are several junction boxes installed on wiring tray, and some cables do not need pass through all of them, cables may pass through wiring space which is located between the bottom of junction box and the inner bottom of wiring tray to reach a specific junction box. The invented article provides easier structure of wiring and simple arrangement of wires under floor panels.

For the effect of the invented article described in Claim 5 in addition to the above, projection is provided outward on edges of the upper opening of wiring tray to create a U-shaped in section. The projection is furnished with tray support for height adjustment. This construction keeps stability of the adjusted height even if base floor, a slab floor, is uneven.

For the effect of the invented article described in Claim 7 in addition to the above, junction box is assembled of rectangular box with upper opening, and which width is smaller than the inner width of wiring tray. Support is provided on the sides of box to be supported by projection of wiring tray, and Cable connection part is provided in the lower ends of long sides of box. In addition, open for cables is located in the upper ends of longer sides of box. Junction box may be installed, using support, as a bottom of junction box is fit into the inner wiring tray. Cable connection part, which is provided in the lower ends of longer sides of junction box, faces longer sides of inner wiring tray, and cables which is wired in wiring tray is connected to connector which is located in the center of junction box. This simple structure provides easy connection of cables which are wired in wiring tray.

For the effect of the invented article described in Claim 8, junction box is assembled of rectangular box with upper opening, and fixing pedestal is provided in the bottom of box. Cable connection part, through which electric tube is fit into the lower ends of longer sides of box for cables to pass, is provided. Open for cables is furnished in the upper ends of longer sides of box, and connector is built in inside box. Therefore, junction box which can be connected to electric tube is supported by fixing pedestals, and cables are connected to the internal connector through cables pulled out of electric tube which fit into cable connection part provided in the

lower longer sides of box. In addition, cables are pulled out from open which is provided in the upper part.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A wiring system, which is adapted to be pre-installed under a raised floor, the wiring system including:
 - a wiring tray to be placed under the raised floor and having a plurality of junction boxes placed at predetermined intervals along the wiring tray, each junction box having a built-in electrical connector inside the junction box, and the wiring tray being for the carrying of at least one distribution cable that is connectable at one end to a distribution panel and/or a data panel, and at the other end to the built-in connectors of the junction boxes,
 - the junction box having at least one distribution cable opening and at least one equipment cable opening, the at least one distribution cable opening being within the wiring tray and the at least one equipment cable opening being above the wiring tray;
 - at least one equipment cable having, at one end, a plug that is to be plugged in and electrically connected with the built-in connector, and, at another end, a plug socket;
 - whereby, when a layout of equipment has been substantially determined, the plug of the equipment cable can be plugged into one of the built-in connectors in a nearby said junction box to thereby electrically connect the equipment cable with the distribution panel and/or data panel.
2. A wiring system which is pre-installed under a raised floor, according to claim 1, characterised in that there are a plurality of said wiring trays and these trays include a power cable wiring tray and a data cable wiring tray and connectors for power cables are installed in junction boxes for the power cable tray while connectors for data cables are installed in junction boxes for the data cable tray.

3. A wiring system which is pre-installed under a raised floor, according to claim 1 or 2, characterised in that the wiring tray is maintained on a fixing pedestal arranged between pillars supporting a floor panel.
4. A wiring system which is pre-installed under a raised floor, according to claim 1, characterised in that one portion of the wiring tray is formed as an electric cable tube.
5. A wiring system which is pre-installed under a raised floor, according to any one of claims 1 to 3, characterised in that:

the wiring tray has in cross-section a generally recessed profile with an upper opening, and the junction box is attached to the upper opening of the wiring tray with a portion of a lower side of the junction box being located inside the wiring tray in a recessed manner so that a wiring space is formed between an inner bottom surface of the wiring tray and a lower surface of the junction box.

6. The wiring system which is pre-installed under a raised floor, according to claim 5, characterised in that protruding flange portions are formed on both edges of the opening of the wiring tray and a tray supporting member having a height-adjusting means is installed on said flange portions.
7. The wiring system which is pre-installed under a raised floor, according to claim 6, characterised in that:

support portions, which are to be supported by the flange portions of the wiring tray, are formed on side faces of a box main body of the junction box, the box main body having a rectangular open-topped box shape and a width slightly smaller than the width of the inside of the wiring tray; and

cable passages are formed in lower portions of both of the longitudinal ends of the box main body, and leader passages for cables are formed in upper portions of both longitudinal ends of the box main body, and a connector is built inside the box main body.

8. A wiring system, which is pre-installed under a raised floor, according to claim 6 or 7, characterised in that:

a securing leg portion is formed on a lower portion of a box main body of the junction box, the box main body having a rectangular open-topped box shape, and cable passages to which ends of a cable tube are fitted so as to pass a cable through them are formed in lower portions of both of the ends of the box main body in the length direction, and leader passages for cables are formed in upper portions of both of the ends of the box main body in the length direction.

9. A wiring system which is pre-installed under a raised floor, according to claim 7, characterised in that:

the junction box has a rectangular open-topped box shape, and the junction box has a lower portion having a width slightly smaller than the width of the inside of the wiring tray, and an upper portion having a width larger than the width of the inside of the wiring tray, so as to form a step portion on longitudinal side faces of the junction box, the flange portions of the wiring tray supporting the junction box by the step portion.

10. A wiring system which is pre-installed under a raised floor, according to any one of claims 1 to 9, characterised in that said one or more cables is a plurality of cables.