

CORD HOLE CAPPING DEVICE

The present invention relates to a cord hole capping device. Particularly, the present invention relates to a cord hole capping device preferably employable for an office automation equipment or the like mounted on a desk, a partition panel or the like.

A conventional cord hole capping device of the foregoing type is constructed such that a cap (or a cover) is detachably secured to a cord protective frame fitted into an opening portion formed through a plate member of a desk, a panel or the like, and when cord(s) are electrically connected to an office automation equipment or the like, the cap is disconnected from the cord protective frame.

With the conventional cord hole capping device constructed in the above-described manner, since the cord protective frame is prepared separately from the cap, a user should take care of the cap after it is disconnected from the cord protective frame. Thus, there arises a problem that the cap is lost for an unidentified reason while it is inoperatively maintained in an office for a long time. Other problem is that when a certain foreign article collides against the cap, there arises an occasion that the cap is unexpectedly disconnected from the desk. Another problem is that since many cords or a bundle of cords each having a different diameter are practically used, a plurality of caps each having different dimensions should always be prepared in an office, and moreover, attachment and detachment of each cap are achieved only with a well-trained technique.

The present invention has been made in consideration of the aforementioned problems.

An object of the present invention is to provide a cord hole capping device which assures that there does not arise a malfunction that a cap is lost during practical use of the

device in an office for some reason.

Another object of the present invention is to provide a cord hole capping device which assures that cord opening portion(s) for allowing cords to be inserted therethrough can
5 arbitrarily be opened or closed depending on the number of cords, the kind of cords, a size of bundle of cords or the like.

Further object of the present invention is to provide a cord hole capping device which assures that each cap can
10 stably be held after cord(s) are inserted through the cord opening portion(s).

According to the present invention, there is provided a cord hole capping arrangement for a cord hole formed through a plate member constituted by a desk or the like,
15 said arrangement comprising: a rectangular cord protective frame fitted into said cord hole; a cap pivotally held about one edge thereof in said cord protective frame to effect closure of an opening portion of said cord protective frame; fastening means located centrally of the free edge of said cap opposite the pivoting edge thereof;
20 complementary means provided on the cord protective frame for engagement with said fastening means when the cap is closed, and removable portions arranged adjacent the opposing lateral edges of said cap so as to enable a cord or cords to be inserted through said plate member through
25 an opening portion formed after at least one removable portion is removed from said cap by performing a cutting operation along a cutout line defining each of said removable portions.

Usually, the removable portions are located at the
30 corners of the cap opposite the edge about which it is pivoted.

Alternatively, the removable portions are located in the centres of the opposing lateral edges of the cap adjacent the edge about which it is pivoted.

Specifically, the fastening means and the complementary means may comprise a protuberance provided or a tongue piece disposed on one of said cap and said cord protective frame, the protuberance being adapted for engagement with a hole provided in a projection on the other of said cap and said cord protective frame. It is desirable that at least one of the tongue piece and the projection is formed of a resilient material.

When the cap is turnably received in the cord protective frame to assume a closed position, the outer surface of the cap is flush with the outer surface of the plate member. At this time, the cap is turnably held in the cord protective frame to turn inside of the plate member.

As desired, the projection piece extending inside of the cap may serve as a handle adapted to be actuated with user's fingers when the cap is opened or closed from the inside of the plate member.

At least one removable portion is arranged on the cap so as to enable cord(s) to be inserted inside of the plate member through an opening portion formed after the removable portion is removed from the cap by performing a cutting operation along a cutout line defining the removable portion.

Usually, the removable portions are located at the opposite corners of the cap on the upper side of the latter. Alternatively, the removable portions may be located on the opposite sides of the cap at the central part of the latter as seen in the vertical direction.

Also in this aspect of the present invention, the plate member is a rear plate of a desk.

With this construction, when the other end part of the cap of which one end is turnably supported on the cord protective frame is squeezed in the inward direction or pulled inside of the plate member with user's fingers, the cap can be

opened. At least one of the removable portions is removed from the cap depending on the number of cords, the kind of cords, a size of bundle of cords or the like by performing a cutting operation along the cutout line defining each

5 removable portion. This enables cord(s) to be inserted inside of the plate member through an opening portion formed after removal of the removable portion. Subsequently, the cap is closed again with the result that the cap is stably held with the aid of the holding means.

10 Other objects, features and advantages of the present invention will become apparent from reading of the following description which has been made in conjunction with the accompanying drawings.

Fig. 1 is a front view of a desk as seen from the rear
15 side wherein a cord hole capping device constructed according to an embodiment of the present invention is mounted on a rear plate of the desk.

Fig. 2 is an enlarged front view of a section A represented by a circular line in Fig. 1.

20 Fig. 3 is an enlarged sectional view of the cord hole capping device taken along line B - B in Fig. 2.

Fig. 4 is an enlarged front view of a cord hole capping device constructed according to another embodiment of the present invention.

25 The present invention will now be described in detail hereinafter with reference to the accompanying drawings which illustrate preferred embodiments thereof.

First, a cord hole capping device constructed according to an embodiment of the present invention will be described
30 below with reference to Fig. 1 to Fig. 3.

Fig. 1 is a front view of a desk 1 as seen from the rear side. A cutout portion 4 is formed through a ceiling plate 2 of the desk 1 serving as a work table of the latter at one corner on the rear side of the desk 1 so that various kinds of

cords 3 such as a power supply cord, a connection cord or the like each illustrated by phantom lines in the drawing are inserted through the cutout portion 4 in the downward direction for an office automation equipment (not shown) mounted on the ceiling plate 2.

To assure that the cords 3 passing through the cutout portion 4 are taken in the interior of the desk 1, a rectangular cord hole 6 is formed through a rear plate 5 of the desk 1 at a predetermined position on the rear plate 5 so that the cords 3 are received in the desk 1 through the cord hole 6.

To prevent each cord 3 from being injured or scratched by sharp edges of the rectangular hole 6, a cord protective frame 7 molded of a synthetic resin to exhibit a rectangular picture frame-shaped configuration is fitted into the cord hole 6.

The cord protective frame 7 is designed in the rectangular frame configuration and includes a flange portion 7a coming in contact with the outer surface of the rear plate 5, a plurality of inward extending pieces 7b fitted into the cord hole 6 while extending forward from the flange portion 7a and a plurality of triangular flexible engagement pieces 7c. The engagement pieces 7c molded integral with the inward extending pieces 7b are located not only at the central part of each of the opposite side inward extending pieces 7b but also at the opposite ends of the upper and lower inward extending pieces 7b. When the cord protective frame 7 is fitted into the cord hole 6 from the rear side, the respective engagement pieces 7c are elastically deformed and engaged with the inner surface of the rear plate 5 so as to prevent the cord protective frame 7 from being disconnected from the rear plate 5 of the desk 1.

In Fig. 1, reference numeral 8 designates a rectangular cap molded of a synthetic resin. An opening portion 7d of the cord protective frame 7 is closed with the cap 8. As shown in Fig. 3, the cap 8 includes a pair of projection pieces 9 at the lower end thereof, and a shaft 10 is bridged between the

projection pieces 9 while extending through bearing holes 11 formed through the projection pieces 9. The closed state that the opening portion 7d of the cord protective frame 7 is closed with the cap 8 is represented by solid lines in Fig. 3, while the opened state that the opening portion 7d of the cord protective frame 7 is opened by downward turning movement of the cap 8 about the shaft 10 in the arrow-marked direction is represented by phantom lines in the drawing. In other words, when the opening portion 7d of the cord protective frame 7 is opened, the cap 8 is downwardly turned inside of the rear plate 5 of the desk 1.

As is best seen in Fig. 3, the cap 8 includes holding means 12 for holding the cap 8 in the closed state.

In the shown embodiment, the holding means 12 is composed of a downward orienting triangular protuberance 14 at the foremost end of a flexible tongue piece 13 that is a part of the inward extending piece 7b and an engagement hole 16 formed through the intermediate part of a projection piece 15 projecting forward of the upper end of the cap 8 so as to receive the protuberance 14 therein when the cap 8 is closed.

The foremost end part of the projection piece 15 is rounded to serve as a handle adapted to be actuated with user's fingers when the cap 8 is opened or closed from the front side of the desk 1.

L-shaped cutout lines 17 are formed on the opposite upper corners of the cap 8, and when substantially square removable portions 8a are removed from the cap 8 along the L-shaped cutout lines 17 to form opening portions after removable of the removable portions 8a from the cap 8, the cords 3 can be inserted into the interior of the desk 1 through the opening portions formed corresponding to the removable portions 8a.

In this embodiment, the cap 8 is opened by squeezing it in the forward direction from the rear side or by pulling the projection piece 15 seized with user's fingers. In the case that a bundle of cords 3 has a small diameter, one or both of the removable portions 8a are removed from the cap 8 by

performing a cutting operation along the L-shaped cutout lines 17. Subsequently, the cords 3 are inserted through the opening portion formed after removal of the removable portion 8a from the cap 8, and thereafter, the cap 8 is closed again.

5 Consequently, the cords 4 are inserted through the rear plate 6 while exhibiting good appearance

On the contrary, in the case that a bundle of cords 3 has a large diameter, it is inserted into the interior of the desk 1 through the cord protective frame 7 while the cap 8 is kept
10 opened.

In any case, the cap 8 is always firmly secured to the cord protective frame 7 without any possibility that it is disconnected therefrom. Thus, there does not arise a malfunction that the cap 8 is lost in an office for some
15 reason.

As described above, the cord hole capping device is constructed such that the cap 8 is turnably held in the cord protective frame 7 to turn about the shaft 10 disposed at the lower end thereof, the holding means 12 is disposed between
20 the central part of the upper end part of the cap 8 and the central part of the upper end part of the cord protective frame 7, and the removable portions 8a are located on the opposite sides of the holding means 12. With this construction, the cap 8 can stably be held in the cord
25 protective frame 7 when it is kept closed, and moreover, each of the removable portions 8a can be designed to assume a wide area.

In this embodiment, the tongue piece 13 is molded of an elastic synthetic resin having excellent flexibility.
30 However, the present invention should not be limited only to this. Alternatively, modification may be made such that the projection piece 15 is molded of an elastic synthetic resin having excellent flexibility but the tongue piece 13 is made of a rigid material. Otherwise, both of the tongue piece 13
35 and the projection piece 15 may be molded of an elastic synthetic resin having excellent flexibility.

In addition, another modification may be made such that an engagement hole is formed through the tongue piece 13 extending forward of the cord protective frame 7 and a protuberance is formed at the fore end part of the projection piece 15. Also in this case, the protuberance is engaged with the engagement hole to constitute holding means in cooperation with each other.

Next, a cord hole capping device constructed according to another embodiment of the present invention will be described below with reference to Fig. 4.

In this embodiment, a pair of removable portions 28a each defined by a U-shaped cutout line 27 are arranged on the opposite sides of a cap 28 at the central part of the latter as seen in the vertical direction. Since other components rather than the foregoing ones are same to those in the preceding embodiment, repeated description on these components will not be required.

As described above, according to the present invention, since the cord hole capping device is constructed such that one end of the cap is turnably on the cord protective frame, the central part of other end of the cap is firmly held by the holding means, and the removable portions are arranged on the opposite sides of the holding means, the following advantageous effects are obtainable with the cord hole capping device.

(a) Since the cap is always turnably secured to the cord protective frame without any possibility that it is disconnected from the cord protective frame, there does not arise a malfunction that the cap is lost during practical use of the cord hole capping device in an office for some reason.

(b) A cord opening portion for allowing cords to be inserted therethrough inside of the rear plate of the desk can adequately be closed depending on the number of cords, the kind of cords, a size of bundle of cords. Specifically, in the case that a bundle of cords has a small diameter, only one

of the removable portions is removed from the cap. In the case that two kinds of cords, e.g., a power source cord and a connector cord are separately inserted through cord opening portions, both the removable portions are removed from the cap so as to enable the different two cords to be separately inserted through the opening portions formed after removal of the removable portions from the cord. In the case that a size of bundle of cords has a large diameter, cords can be inserted through the cord protective frame as the cap is kept opened.

(c) Since one end part of the cap is turnably received in the cord protective frame and the central part of other end part of the cap is held by the holding means, the cap can stably be supported while any cord opening portion is kept closed.

(d) Since the holding means is located at the central part of the other end part of the cap, wide removable portions can be arranged on the opposite sides of the holding means.

Especially, since the removable portions can be located at corners on the opposite sides of the cap, they can easily be removed from the cap merely by performing a cutting operation along two cutout lines defining each removable portion while opening portions formed after removal of the removable portions from the cap are located on the cap in the well-balanced state.

While the present invention has been described above only with respect to two preferred embodiments thereof, it should of course be understood that the present invention should not be limited only to these embodiments but various change or modification may be made without any departure from the scope of the present invention as defined by the appended claims.

CLAIMS

1. A cord hole capping arrangement for a cord hole formed through a plate member constituted by a desk or the like, said arrangement comprising: a rectangular cord protective frame fitted into said cord hole; a cap pivotally held about one edge thereof in said cord protective frame to effect closure of an opening portion of said cord protective frame; fastening means located centrally of the free edge of said cap opposite the pivoting edge thereof; complementary means provided on the cord protective frame for engagement with said fastening means when the cap is closed, and removable portions arranged adjacent the opposing lateral edges of said cap so as to enable a cord or cords to be inserted through said plate member through an opening portion formed after at least one removable portion is removed from said cap by performing a cutting operation along a cutout line defining each of said removable portions.
2. A cord hole capping arrangement as claimed in claim 1, wherein said removable portions are located at the corners of said cap opposite the edge about which it is pivoted.
3. A cord hole capping arrangement as claimed in claim 1, wherein said removable portions are located in the centres of the opposing lateral edges of said cap adjacent the edge about which it is pivoted.
4. A cord hole capping arrangement as claimed in any one of claims 1 to 3, wherein said fastening means and said complementary means comprise a protuberance provided on a tongue piece disposed on one of said cap and said cord protective frame adapted for engagement with a hole provided in a projection on the other of said cap and said cord protective frame, at least one of said tongue piece and said projection being formed of a resilient material.



5. A cord hole capping arrangement as claimed in any preceding claim wherein said plate member is a rear panel of a desk.

6. A cord hole capping arrangement substantially as described herein with reference to the drawings.

