United States Patent

Mann et al.

[15] **3,659,248**

[45] **Apr. 25, 1972**

[54] COMBINED SOCKET COVER AND PLUG RETAINER

[72] Inventors: **Friedrich H. Mann; Henry A. Schaefer,** both of Lynchburg, Va.

[73] Assignee: **General Electric Company**

[22] Filed: **May 4, 1970**

[21] Appl. No.: **34,108**

[52] **U.S. Cl.** ..... **339/44 R,** 339/91 R

[51] **Int. Cl.** **H01r 13/54**

[58] **Field of Search** ..... 339/36–44, 91 R

[56] **References Cited**

UNITED STATES PATENTS

3,387,252	6/1968	Rothweiler	339/44 R
3,239,791	3/1966	Fyrk	339/44 M
2,932,811	4/1960	Abraham et al.	339/44 R X
2,878,456	3/1959	Cormier	339/44 R
3,178,674	4/1965	Scheller	339/91 R X

FOREIGN PATENTS OR APPLICATIONS

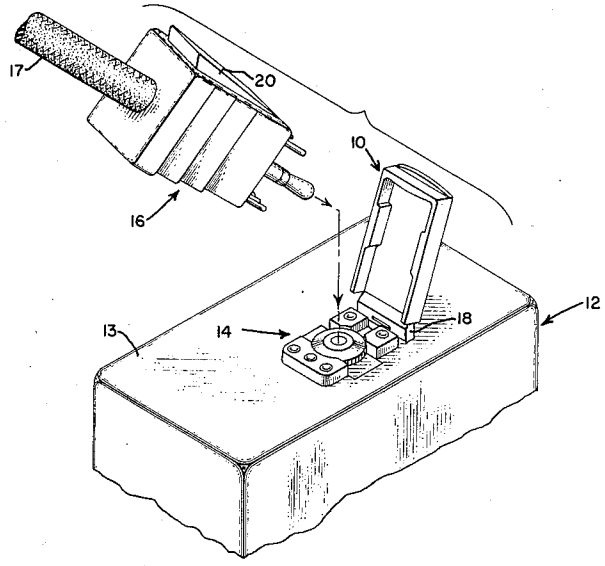
445,820	2/1949	Italy	339/39

Primary Examiner—Marvin A. Champion
Assistant Examiner—Terrell P. Lewis
Attorney—James J. Williams, Frank L. Neuhauser, Oscar B. Waddell and Joseph B. Forman

[57] **ABSTRACT**

A plastic member is provided with a hinge that is attached to a supporting wall next to an electrical socket. The plastic member is provided with a retaining flange spaced from the hinge. When the socket is empty, the member can be pivoted on its hinge down over the socket, and can be held by the retaining flange so as to serve as a cover for the socket. When a plug is to be inserted in the socket, the member can be pivoted on its hinge so that the retaining flange can engage the plug so as to serve as a plug retainer.

1 Claims, 3 Drawing Figures



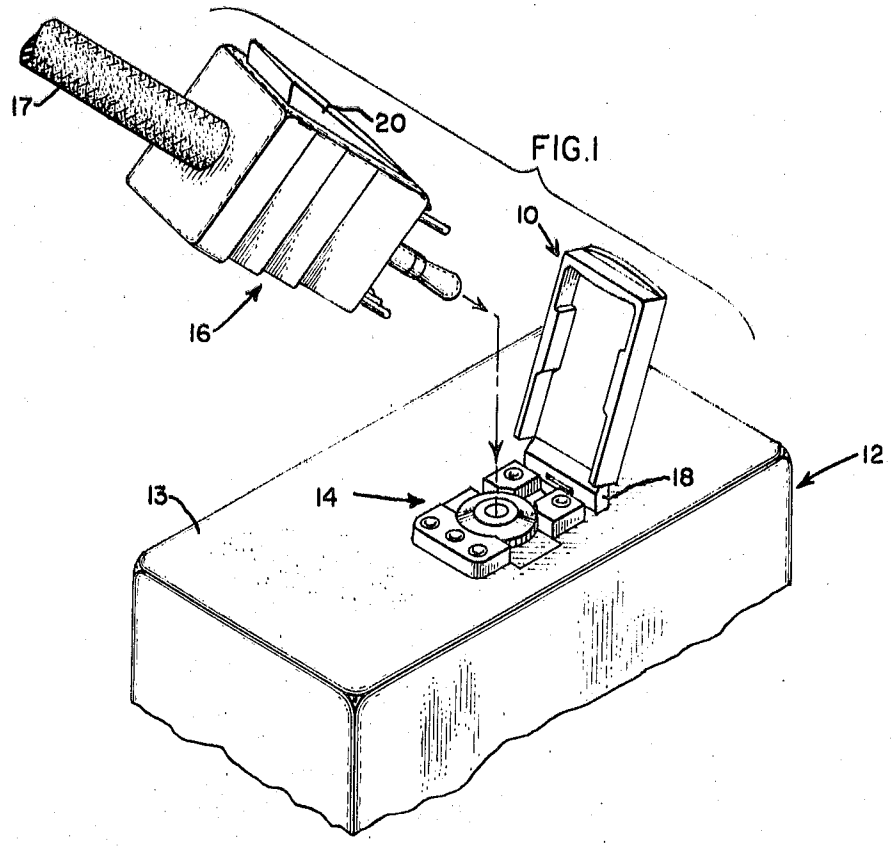


FIG.1

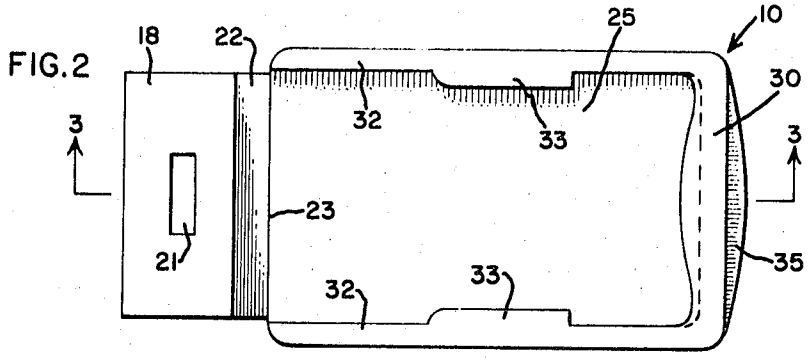


FIG.2

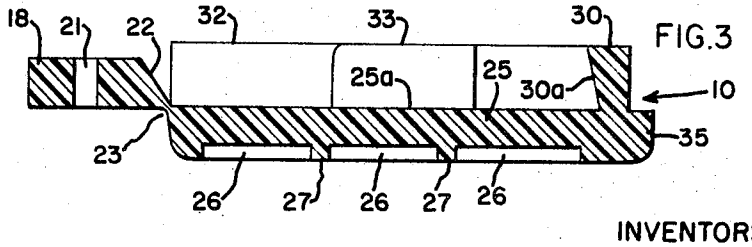


FIG.3

INVENTORS:
FRIEDRICH H. MANN,
HENRY A. SCHAEFER,
BY James J. Williams
THEIR ATTORNEY.

COMBINED SOCKET COVER AND PLUG RETAINER

BACKGROUND OF THE INVENTION

Our invention relates to a combined cover and retainer, and particularly to a combined cover for an electrical socket and a retainer for an electrical plug.

Electrical sockets are frequently provided on apparatus to permit an external electrical connection to be made with some part or circuit within the apparatus. For example, a radio transmitter may require an electrical connection between the radio transmitter and an external device such as a microphone and a push-to-talk switch. In such a situation, an electrical socket is provided on one of the external surfaces of the case that houses the radio transmitter with appropriate connections between the socket and the associated internal transmitter circuit. An external microphone with a push-to-talk switch is attached to a plug which can be inserted into the socket when desired. While such arrangements facilitate making a connection to an internal circuit, the arrangements have permitted dust and dirt to get into the socket and possibly into the apparatus, so that a faulty connection or failure of the apparatus may result. In addition, the plug may be inadvertently pulled out of the socket, breaking the connection and, in some instances, damaging the plug, the socket, or the apparatus.

Accordingly, an object of our invention is to provide a new and improved combined socket cover and plug retainer for electrical apparatus.

Another object of our invention is to provide a novel device which can be attached to electrical apparatus, the device being arranged to pivot and cover an electrical socket on the apparatus, or to pivot so that a plug can be inserted in the socket and retained by the cover.

SUMMARY OF THE INVENTION

Briefly, these and other objects are achieved in accordance with our invention by an elongated, flexible or plastic cover that has a hinge adapted to be attached to a housing wall adjacent to an electrical socket. The cover is shaped so as to cover the socket, and is provided with a retaining flange at the end remote from its hinge. This retaining flange is formed by a wall extending from the cover and having a surface that forms an acute angle with the cover surface. The retaining flange permits the cover to frictionally engage the socket, or to mechanically engage an appropriate projection on a plug when the plug is inserted in the socket. Thus, the cover serves the combined function of a socket cover and a plug retainer.

BRIEF DESCRIPTION OF THE DRAWING

The subject matter which we regard as our invention is particularly pointed out and distinctly claimed in the claims. The structure and operation of our invention, together with further objects and advantages, may be better understood from the following description given in connection with the accompanying drawing, in which:

FIG. 1 shows a perspective view of radio apparatus having an electrical socket, a cover in accordance with our invention, and a plug positioned to be inserted into the socket;

FIG. 2 shows a plan view of our cover, this plan view showing the inner surface or side of our cover; and

FIG. 3 shows a cross-sectional view of our cover taken along the line 3—3 in FIG. 2.

In FIG. 1, we have shown a cover **10** in accordance with our invention used, by way of example only, with a radio receiver **12**. The receiver **12** is contained in a suitable housing (only part of which is shown) having a supporting wall **13** on which is mounted an electrical socket **14**. The socket **14** has sides which extend upward from the wall **13** and which are engaged by our cover **10** in the closed position. The socket **14** may include one or more connectors in order to make connections to parts of the radio receiver circuit, such as the antenna input, the power input, or the audio output. These connections are made through an electrical plug **16** which has one or more connectors that mate and connect with corresponding connectors in the socket **14**. The connectors on the plug **16** are connected to appropriate wires or leads housed in a cable **17** that extends to a desired location and equipment (not shown). Our cover **10** is attached to the wall **13** by a hinge portion **18** which, in turn, may be attached by the same hardware used to fasten the socket **14**. As will be described in greater detail in connection with FIGS. **2** and **3**, our cover **10** pivots downward about its hinge portion **18** and covers the electrical socket **14** to keep out dust and dirt, and pivots upward so that the plug **16** can be inserted into the socket **14** as indicated by the arrows. When the plug **16** is inserted in the socket **14**, our cover **10** can engage an appropriately shaped projection or wedge **20** on the plug **16** to firmly hold the plug **16** in its inserted position in the socket **14**. We have found that our cover **10** is securely attached to the socket **16** when used as a cover, and also firmly retains the plug **16** in the socket **14** against pull and strain on the cable **17**.

Our cover **10** is shown in greater detail in FIGS. **2** and **3**. FIG. **2** is a plan view of our cover **10**, showing the surface or side that faces or engages the socket **14** when the cover **10** covers the socket **14**. FIG. **3** is a cross-sectional view of our cover **10** taken along the line 3—3 in FIG. **2**. Our cover **10** is preferably made of a very strong and flexible thermoplastic material such as polypropylene, and is preferably made as an integral unit in a single molding operation. The cover **10** comprises the hinge portion or member **18** which is to be fastened to a plate or member, such as the wall **13** of the receiver **12**. The hinge portion **18** is provided with a suitable hole or opening **21** which permits our cover **10** to be attached. This attachment may be made by inserting the hinge portion **18** through a suitable hole or opening in a wall, and inserting a retaining member (which may be part of the hardware for holding the socket **14**) through the hole **21** to hold the cover **10** in position. The hinge portion **18** is provided with a beveled surface **22** to reduce the thickness of the hinge portion **18** to a relatively small neck **23**. The neck **23** must provide sufficient strength and flexibility to permit the cover **10** to be easily pivoted or moved about the hinge portion **18**, and still not fatigue and break. The cover **10** comprises an elongated top **25** which has the same general size and shape as the socket which the cover **10** is to protect. The surface of the top **25** which faces away from the socket **14** may be provided with recesses **26** and ribs **27** for strengthening the cover **10**. These recesses **26** may be used for application of metal foil nameplates for code numbers or instructions if desired. The surface **25***a* of the top **25** that faces toward or is adjacent the socket **14** is generally flat and plane. This surface **25***a* is provided with a retaining flange **30** at the end remote from the hinge portion **18**. The retaining flange **30** is spaced a distance such that when the cover **10** is pivoted down over an electrical socket, such as the socket **14** of FIG. **1**, the inner face **30***a* of the retaining flange **30** frictionally engages a vertical side or edge of the socket **14** and holds the cover **10** in position with its plane surface **25***a* against or adjacent to the upper surface of the socket. As seen in FIG. **3**, this retention is provided by making the inner or engaging surface **30***a* of the retaining flange **30** form an acute angle with the plane surface **25***a* of the top **25**. In one embodiment of a cover constructed in accordance with our invention, this acute angle was approximately 78°. While not essential or necessary, we also prefer that the top **25** be provided with longitudinal side flanges **32** which are positioned and spaced to engage the vertical sides of a socket such as the socket **14**. The side flanges **32** are also provided with retaining projections **33** which provide additional frictional engagement with the vertical sides of a socket. While also not necessary, our cover **10** may be provided with a projection or tab **35** to facilitate operation of the cover **10**. The projection **35** is particularly helpful or useful in removing the cover **10** from its frictional engagement with a socket such as the socket **14**, or with a plug, such as the plug **16**. The surface **25***a* may also be provided with a tapered boss or plug positioned so that it can engage with a large contact opening in the socket **14**. In this case, the large contact opening could

be made virtually waterproof when the cover **10** is closed over the socket **14**.

When our cover **10** is in position on a supporting or enclosing wall, such as the wall **13**, it will be seen that the cover **10** may be pivoted down and held in tight frictional engagement with the sides of an appropriately shaped socket, such as the socket **14**, and thereby exclude dust and dirt from the connectors in the socket **14**. When a plug, such as the plug **16**, is to be inserted in the socket, the cover **10** may be pivoted up and out of the way by placing a finger under the projection **35** and disengaging the cover **10** and pivoting it about the neck **23** to the position shown in FIG. **1**. The plug **16** may then be inserted in the socket **14**, after which the cover **10** is pressed against the plug **16** so that the retaining flange **30** snaps over and mechanically engages the shoulder **20***a* on the wedge **20**. We have found that with proper design, particularly making the acute angle between the surface **30***a* and the surface **25***a* correspond to the angle of the shoulder **20***a* on the wedge **20**, the plug **16** is securely held in the socket **14** and can resist a substantial strain or pull. Thus, a plug is firmly held in the socket by our cover, and our cover also protects the socket from dust and dirt when a plug is not inserted in a socket.

While we have shown only one preferred embodiment of our invention, persons skilled in the art will appreciate that a cover having all of the advantages of our invention may be provided in different forms. For example, various acute angles between the surfaces **25***a*, **30***a* may be utilized, depending upon design preference and choice. While we prefer the side flanges **32**, they may be omitted if desired. Similarly, the recesses **26** and ribs **27** may be omitted. Various devices or methods may be used to attach the hinge portion **18**, although we prefer a device which also holds the socket. And various dimensions for the neck **23** on the hinge portion **18** may be provided, depending upon the strength and flexibility of the material used in the cover **10**. Therefore, while our invention has been described with reference to a particular embodiment, it is to be understood that modifications may be made without departing from the spirit of the invention or from the scope of the claims.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A device for covering an electrical socket mounted on a supporting wall and alternatively for retaining an electrical plug in an inserted position in said socket, said device comprising:

a. an elongated top formed of a strong and flexible plastic material;

b. a hinge portion formed of a strong and flexible plastic material and attached to one end of said top, said hinge portion being adapted to be fastened to a supporting wall and being movable at its point of attachment so that said top may be moved relative to said supporting wall;

c. a retaining flange formed of a strong and flexible plastic material and attached to one surface of said top at the other end from said hinge portion, said retaining flange extending from said one surface of said top and having a surface facing said hinge portion that forms an acute angle with respect to said one surface of said top, that frictionally engages a portion of an electrical socket when said top covers said electrical socket, and that mechanically engages a portion of an electrical plug when said top is in an open position and said electrical plug is inserted in said electrical socket, thereby providing a cover for said electrical socket and retaining an electrical plug inserted in said socket;

d. side flanges attached to said one surface of said top and extending from said retaining flange along both sides of said top toward said one end of said top;

e. and an operating tab extending from said top beyond said retaining flange;

f. said top, said hinge portion, said retaining flange, said side flanges, and said operating tab being integrally formed of a strong and flexible plastic material.

* * * * *