United States Patent [19]

Tokizaki

[11] **3,798,389**

[45] **Mar. 19, 1974**

[54] **EARPHONE WITH REEL**

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[22] Filed: **Sept. 8, 1972**

[21] Appl. No.: **287,261**

[52] **U.S. Cl.** **179/101,** 179/155

[51] **Int. Cl.** **H04m 1/15**

[58] **Field of Search** 179/155, 95, 101

[56] **References Cited**

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Primary Examiner—William C. Cooper

Attorney, Agent, or Firm—Burns, Doane, Swecker & Mathis

[57] **ABSTRACT**

A headphone having a reel for the internal storage of the cord.

3 Claims, 7 Drawing Figures

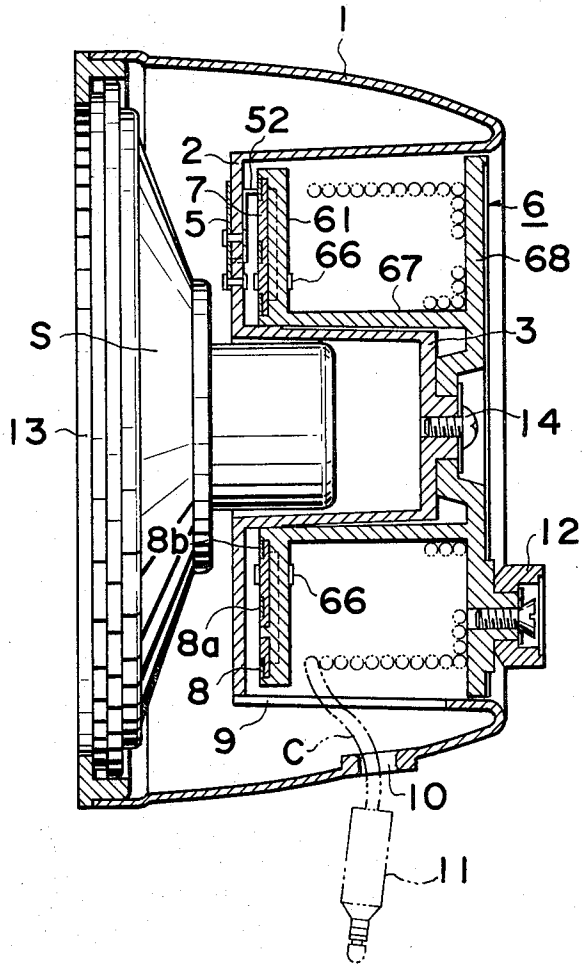


FIG. 1

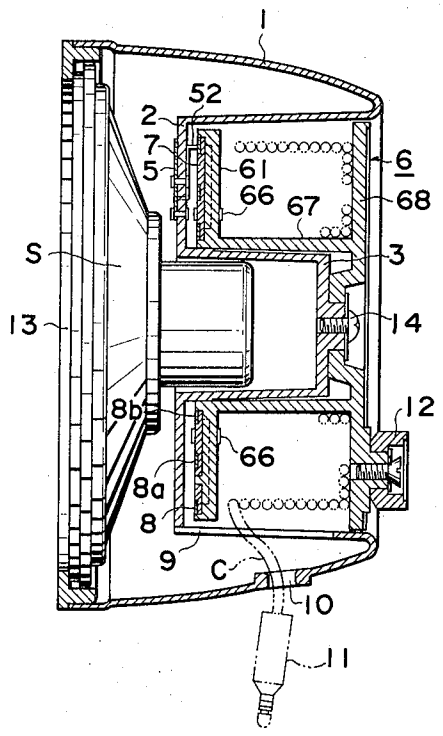


FIG. 2

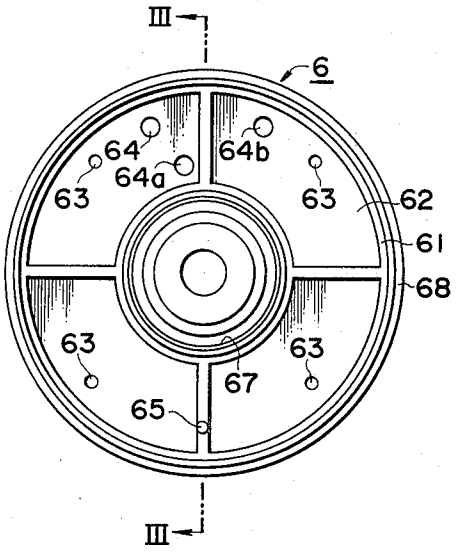


FIG. 3

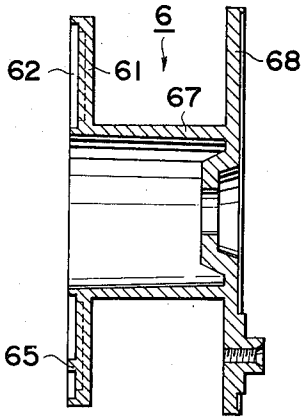


FIG. 4

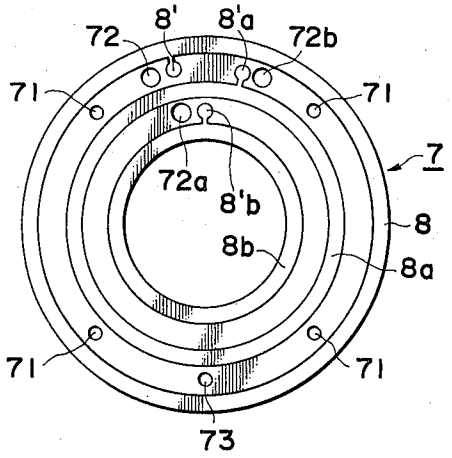


FIG. 5

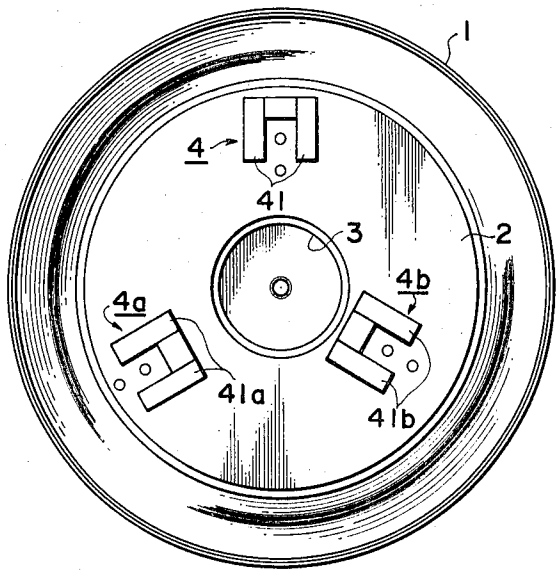


FIG. 6

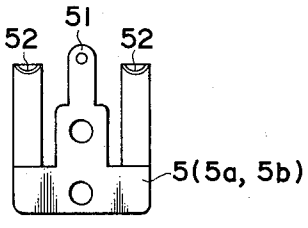
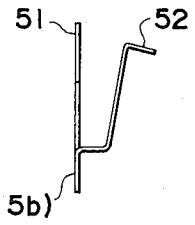


FIG. 7



EARPHONE WITH REEL

BACKGROUND OF THE INVENTION

The present invention is concerned with a headphone which internally contains the cord by which it is connected to the sound source.

A headphone is usually secured to a long cord which has the jack, plug or other electric connector on the other end thereof. While the headphone is not in use, the cord is generally wound around the headphone or folded up. Not only is this inconvenient, but the cord may be broken if folded up too many times.

It is accordingly an object of the present invention to provide a novel headphone having a cord which can be contained in the case of the headphone while not in use.

These and many other objects and advantages of the present invention will be apparent to one skilled in the art to which the invention pertains from the claims and from a perusal of the following detailed description when read in conjunction with the appended drawings.

The preferred embodiment of the present invention features a case containing the speaker system at one end and having on both the inside and outside of the other end an electrically conducting plate in an annular recess in which a freely rotatable reel for the cord is mounted. One end of the cord is affixed to the reel and the other end of the cord is taken out of the case and may be affixed to the jack and other electric connector. The plate on the reel to which the cord is attached is constantly in contact with the other electrically conducting plate on the inside of the case by means of a flexible electric connector connected to the speaker system in the case.

THE DRAWINGS

FIG. 1 is a lateral view in elevation and in partial section of one embodiment of the invention;

FIG. 2 is the front view in elevation of the main body of the reel of FIG. 1;

FIG. 3 is a section taken through lines III—III of FIG. 2;

FIG. 4 is a front view in elevation of the electric conductivity plate of FIG. 1;

FIG. 5 is the front view in elevation of the case of FIG. 1 with the speaker system removed;

FIG. 6 is a front view in elevation of the contactor of FIG. 1; and,

FIG. 7 is a lateral view in elevation of the contactor of FIG. 6.

THE DETAILED DESCRIPTION

With reference to the Figures, a case 1 contains the speaker system S on one side thereof. On the other side of the case 1 is an end wall configured to form a hub 3 to receive the speaker coil and to form an annular recess for a reel 6 extending toward the speaker system S about the hub 3. Connector attachment parts 4, 4*a*, and 4*b* are affixed to the end wall 2. The leader attachment piece and connectors 5, 5*a*, and 5*b* of electric conductive and flexible material with two contacting pieces 51 are inserted in holes 41, 41*a*, and 41*b* with the resilient contacting pieces 52 protruding therefrom.

The reel 6 is freely rotatable about the hub 3 and affixed thereto by the bolt 14. A plate 7 with circular printed conductors 8, 8*a*, and 8*b* is immovably affixed in a annular recess 62 which is cut on the forward surface 61 of the reel 6 and provides four penetrating holes 63 on the inner plate of the reel 6, cord inserting holes 64, 64*a*, and 64*b* and a hole for a protrusion 65 on the body of the reel. Also on the plate 7 are penetrating holes 71, 73.

The penetrating hole 73 is affixed to the protrusion 65; at the same time inserting and connecting penetrating holes 71 match with the holes 63. Simultaneously, the cord inserting holes 72, 72*a*, and 72*b* matched with the holes 64, 64*a*, and 64*b* and secured with an eyelet 66.

To connect the device, divide one end of the cord C into three parts and insert each part through one of the holes 64 and 72. Then connect the end of each of the parts of the cord C to one of the ends of the printed conductors 8, 8*a*, and 8*b* by soldering. When the reel 6 is thus attached, the printed conductors 8, 8*a*, and 8*b* are so made as to be in contact with the resilient contactor 52 of the contactors 5, 5*a*, and 5*b*. The cord 8 is to be wound around the body 67 of the reel 6 and one end thereof taken out through the cord leading holes 9 and 10 to be attached with a plug 11.

An attachment 12 may be attached at the outer surface of the outer plate 68 of the reel 6 to facilitate rotating the reel 6. A sound plate 13 may be arranged in front of the speaker system S. The leads between the contactors 5, 5*a*, and 5*b* and the speaker system S are not illustrated but they are to be attached.

For a headphone comprised as above, wind up the cord C on the reel 6 when not in use and, to use it, pull the cord C out and connect it with an amplifier by means of the plug 11. When its use is ended, detach the plug 11 from the amplifier and wind in the cord C on the reel 6 turning the reel 6 by holding the attachment 12.

The present invention, as above described, has on the inner surface of the side away from the speaker system a plate. The reel for the cord is in contact with this plate and has one end of the cord attached thereto. The cord may be wound or rewound by leading out the other end of the cord from the case so the cord may be wound on the reel when not in use. The headphone will not only be uncumbersome, but there won't be the hazard of damaging the electrical lead because of flexing.

The present invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The presently disclosed embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed is:

1. A headphone comprising:

a generally annular case having a radial aperture, said case being open at one end and closed at the other end thereof, said closed end being configured to form an annular recess extending inwardly toward the open end thereof;

a cylindrical hub integrally formed in said case concentric with the annular recess and extending axially outwardly from the closed end of the case;

a speaker system attached to said case in the open end thereof;

a first electrical connector means internally carried by the closed end of said case and electrically connected to said speaker system;

a reel supported by said cylindrical hub for rotation within said annular recess about said cylindrical hub;

a second electrical connector means carried by said reel, one of said first and second connector means being resiliently biased into electrical contact with the other of said first and second connector means;

a plug; and

a flexible cord secured at one end thereof to said second connector and passing through the aperture in said case, the other end of said cord being electrically connected to said plug.

2. The headphone of claim **1** wherein said reel includes means extending from said reel in a direction generally parallel to said cylindrical hub whereby said reel may be rotated about said cylindrical hub to wind said cord about said reel.

3. A headphone comprising:

a generally annular case having a radial aperture therethrough, said case being open at one end and closed at the other end thereof, said closed end being configured to form an annular recess extending inwardly toward the open end thereof;

an integral cylindrical hub concentric with said annular recess and extending outwardly from the closed end of said case;

a speaker system attached to said case in the open end thereof, a portion of said speaker system being

received within said integral cylindrical hub;

a first electrical connector means internally carried by the closed end of said case and electrically connected to said speaker system;

said first electrical connector including a plurality of identical contacts said contacts being equiangularly disposed about the closed end of said case and providing electrical communication between the closed end of said case and the speaker system mounted in the open end of said case;

a reel supported by said cylindrical hub and rotatably mounted within said annular recess about said cylindrical hub said reel having an externally-directed radial face and an internally-directed radial face;

said internally-directed radial face of said reel being provided with an annular recess;

a second electrical connector means carried by said recess in said internally-directed radial face of said reel;

said second electrical connector means comprising a plate with a plurality of concentrically-spaced conducting rings thereon, one conducting ring for each of the plurality of identical contacts of said first connector means and said plate provided with holes to secure and position said disc in said annular recess of said internally-directed radial face of said reel;

a plug; and

a flexible cord secured at one end thereof to said second connector means and passing through the radial aperture in said case, the other end of said cord being electrically connected to said plug.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,798,389 Dated March 19, 1974

Inventor(s) Teru Tokizaki

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the title page, after "[21] Appl. No.: 287,261" insert

--Foreign Application Priority Data

July 18, 1972 Japan 47/83998--

Signed and sealed this 13th day of August 1974.

(SEAL)
Attest:

McCOY M. GIBSON, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

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