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[72] Inventor **Donald L. Kliever**
Minneapolis, Minn.
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[73] Assignee **The Telex Corporation**
Tulsa, Okla.

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Primary Examiner—William C. Cooper
Attorney—Carlsen, Carlsen, Strum & Wicks

[54] **MICROPHONE BOOM**
5 Claims, 6 Drawing Figs.

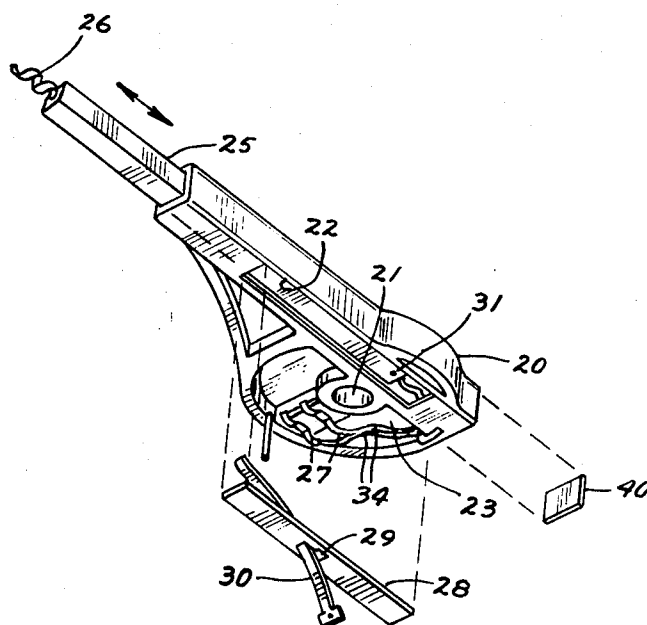
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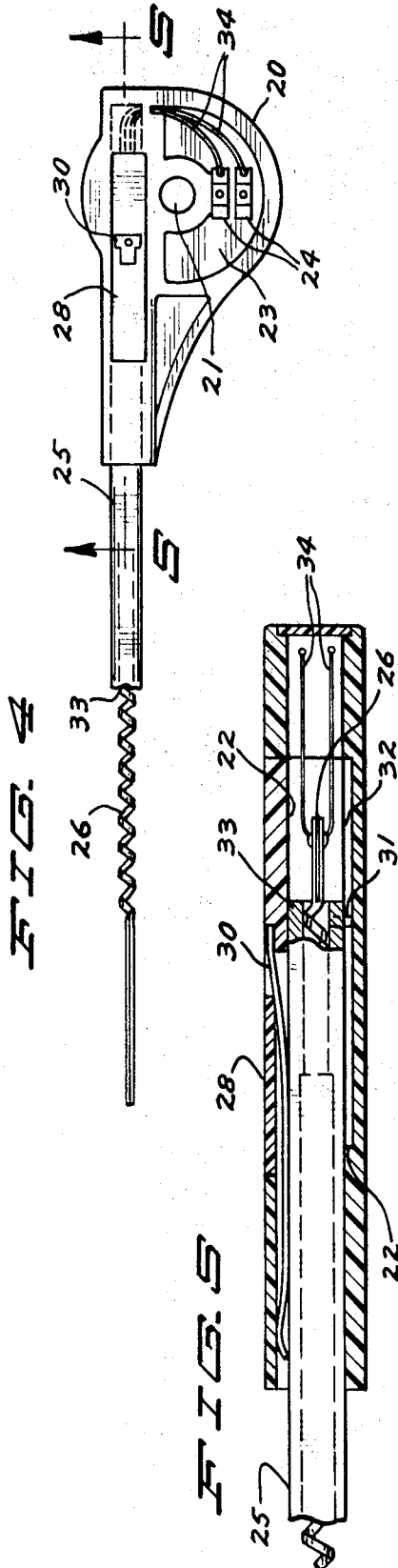
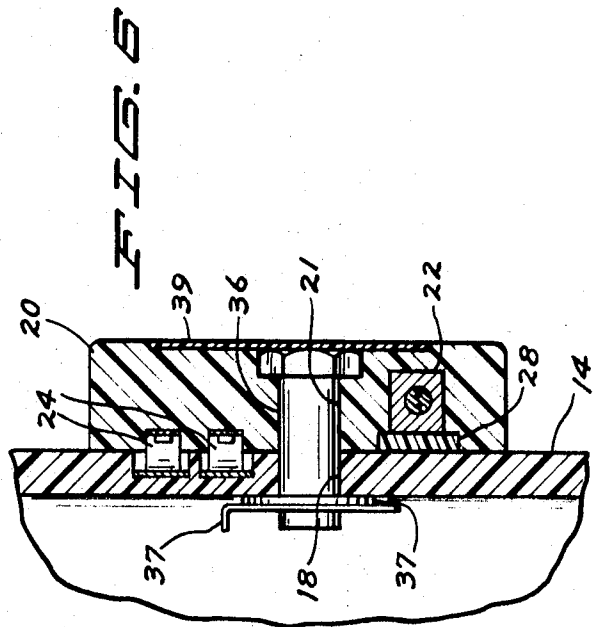
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ABSTRACT: A boom for adjustably mounting a microphone in proximity to the mouth of an operator. A housing is rotatably disposed on a headphone and includes internally disposed commutators which are operable to provide a switching and slidable contacting function. A boom member is slidably disposed in a laterally extending aperture in the housing and includes an internally disposed extendable conductor that is conductively connected to the commutators and to a microphone that is rotatably mounted on the remote end of the boom.





INVENTOR.
DONALD L. KLIEWER
BY
Carlson Carlson Sturm & Wicks
ATTORNEYS

MICROPHONE BOOM

This application relates generally to energy translating apparatus and is more particularly directed to compressional wave energy translating apparatus of the class wherein a microphone is to be adjustably disposed in proximity to the mouth of a user. Specifically, a boom member is adjustably disposed on a means for carrying the same in general proximity to the mouth of the user (such as an earcup) and a microphone is mounted on the end of the boom that is in the general proximity of the mouth of the user. The microphone is conductively connected internally of the apparatus to conductors that may ultimately be connected to an output utilization means, such as an amplifier.

In the prior art with which my invention is concerned, there are generally two classes of apparatus which have been utilized to adjustably mount a microphone in proximity to the mouth of a user. A first class comprises apparatus in which the boom itself is made of flexible material to the extent that it may be deformed and will retain such deformation so that the user may physically bend the boom to place the microphone in a comfortable and efficient operating position. The second class is comprised of apparatus in which a rigid boom is adjustably disposed on mounting apparatus and which has heretofore included an outwardly depending exposed end opposite to that of the microphone from which energy carrying conductors emerge.

In my invention, it will be seen that improved operation is attained to avoid the deficiencies of the prior art while at the same time, additional improvements are found which result in improved efficiency of operation, wearability, manufacture and cooperative relationship of the elements of which the apparatus is comprised.

It is therefore an object of my invention to provide an improved holder for a microphone.

Another object of my invention is to provide an improved microphone boom which is adjustable with respect to a mounting therefor to efficiently dispose a microphone in proximity to the mouth of the user.

Another object of my invention is to provide an improved microphone boom having a high degree of efficiency of operation and including a means for controlling the operation of the microphone attached thereto.

These and other objects of my invention will become apparent from a consideration of the appended specification, claims and drawing, in which:

FIG. 1 is a side elevation view of a headset incorporating the microphone boom;

FIG. 2 is a perspective exploded view of the apparatus shown in FIG. 1;

FIG. 3 is an enlarged exploded perspective view of a portion of FIG. 2;

FIG. 4 is a partially skeletonized side elevation view looking up toward the apparatus of FIG. 3;

FIG. 5 is an enlarged sectional view taken along section line 5—5 on FIG. 4; and

FIG. 6 is an enlarged fragmentary sectional view taken along section line 6—6 on FIG. 1 of the drawings.

Referring to the several figures of the drawing, my apparatus is shown mounted upon and carried by an earcup 13 that is part of the headset assembly 10. Headset assembly 10 includes a headband assembly 11 which may extend over the head of the user to support a further earcup or may be adapted to merely engage the head of the user and operatively support earcup 13 over the ear of a user. Earcup 13 is shown adjustably supported by headband assembly 10 through a yoke member 12.

Earcup 13 is provided with an outer portion 14 which includes a recess 15 in which is disposed a pair of arcuate conductive portions 16 which are separated at one peripheral end by corresponding portions of nonconductive material 17 which may, for convenience, be the material of the earcup itself, provided it is comprised of an insulating material. A hole or aperture 18 is shown extending inwardly through the outer face of outer portion 14 and is adapted to rotatably receive a

pin member to be described below. The microphone boom assembly includes a flat housing 20 and is adapted to be rotatably disposed over the aperture 18 and recess 15 on the outer portion 14 of earcup 13, and microphone boom 25 that is slidably disposed for movement laterally above the axis of rotation of housing 20.

For the purposes of discussion, flat housing 20 may be considered to have an outer flat major surface corresponding to what is seen in the view of FIG. 1 or the top portion of FIG. 2 and an inner surface which includes a recess 23 that is adapted to receive a pair of contacts 24. Recess 23 is in communication with a further laterally elongated recess or aperture 22 that is adapted to slidably receive a hollow elongated microphone boom 25 which is configured so as to be straight for at least the portion which is slidably disposed in elongated aperture 22 opening through a minor sidewall extending intermediate the major surfaces of flat housing 20. The inner side of elongated lateral aperture 22 has an opening which is adapted to receive a cover plate 28 having a slot 29 that operatively engages one end of an elongated friction spring member 30 that is adapted to be disposed upon and in contact with the portion of boom 25 that is slidably disposed in aperture 22. The other end of aperture 22 is covered by a suitable plate, shown as end cover plate 40.

A generally flat conductor assembly 26, is shown connected at one end through a further pair of conductors, 34, to contacts 24 and is adapted to be operatively connected to microphone 27 disposed on the other end of boom 25 by suitable means, now shown. Conductor assembly 26 is preferably formed as a helix so that it may be free to extend and contract within the hollow interior of boom 25 as it is withdrawn from or retracted into aperture 22. Aperture 22 further includes a recess 32 at the top portion thereof which is adapted to slidably receive a pin member 31 which is disposed in a hole 33 at the inner end of boom 25 so as to allow limited slidable movement intermediate the ends of slot 32.

Flat housing 20 is then suitably rotatably disposed upon the outer portion 14 of earcup 13 and held in place by a pin member 36 which extends through holes 21 and 18 into the interior of earcup 13 whereat a washer 37 and clip retainer member 38 are removably disposed to rotatably hold flat housing 20 in operative disposition so that earcup 13 may then serve as a mounting for the microphone boom assembly. A suitable cover plate 39 is then preferably permanently disposed on the top surface of housing 20 to complete the assembly.

It may be noted that contacts 24 disposed in recess 23 on housing 20 are radially spaced apart a distance equal to the spacing of the arcuate recesses formed in outer portion 14 of earcup 13 whereby the contacts may engage with the conductive portions 16 or may be disposed in the nonconductive portions 17 so that operative coaction may be obtained whereby rotational freedom for housing 20 is obtained with respect to earcup 13 except for the portion of rotation in which the terminals 24 are out of contact with the arcuate conductive portions 16. This switching feature has been found to be very desirable in the overall operation of a headset.

In operation, it may be assumed that the apparatus shown in FIG. 1 is in a first, off position, in which the microphone boom is pointed generally upwardly toward the top of the drawing at which position, the microphone would normally be "off" and not connected to any signal utilization device. It should further be assumed that the headset assembly is connected to a suitable source of signal and signal utilization means through appropriate conductors, the specific configuration of which, are believed to be adequately known to one skilled in the art to which this invention pertains, and therefore these have not been shown except to the extent that a cable is shown on FIG. 1 of the drawings as extending from the headband assembly down into the interior of earcup 13 and this cable would include conductors connected to a suitable transducer disposed interiorly of earcup 13 and further conductors suitably and conductively connected to the conductive portions 16 on outer portion 14 of earcup 13.

When it is desired to use the apparatus, the headset assembly is disposed on the head of the user in the normal position with headband assembly 11 either on the top of the head or extending underneath the chin. The end of the microphone boom assembly is then rotated into a position adjacent the mouth of the wearer and boom 25 is then retracted or extended so as to dispose microphone 27 in a comfortable and desirable position with respect to the mouth of the user. It might further be noted that the generalized showing of microphone 27 on the outer end of microphone boom 25 may include a mounting which provides for limited rotation of the microphone with respect to the outer end of the boom 25 so as to effect a further adjustment.

Having now therefore fully illustrated and described my invention, what I claim to be new and desire to protect by Letters Patent is:

1. In apparatus of the class above described, a rotatable, extensible microphone boom comprising in combination; a generally flat housing, said housing having an axis of rotation about an axis extending normal to the flat surfaces thereof and an interior chamber having an aperture extending outwardly through a minor sidewall of said housing and conductive terminal means adopted to slidably conductively engage stationary conductive means, adapted to be connected to a source of electrical signal, as said housing is rotated about said axis of rotation; an elongated hollow boom member slidably disposed

in said aperture for limited lateral movement with respect to said axis of rotation; and conductor means having one end extending outwardly through said boom and a second end connected to said terminal means in the chamber in said flat housing.

2. The apparatus of claim 1 in which the flat housing is rotatably mounted upon an earcup of a headset and the headset includes arcuate conductive means and the terminal means on said flat housing and the arcuate conductive means and the terminal means on said flat housing and the arcuate conductive means are disposed concentrically of the axis of rotation of said flat housing on said earcup whereby conductive engagement of the arcuate conductive means by the terminal means is effected.

3. The apparatus of claim 2 in which at least one of the arcuate conductive means extends over an arc of less than 360°.

4. The apparatus of claim 2 in which the conductor means are comprised of a plurality of parallel insulated conductors formed in a longitudinally elongated helix through at least a portion of the inside of the hollow boom.

5. The apparatus of claim 3 in which the conductor means are comprised of a plurality of parallel insulated conductors formed in a longitudinally elongated helix through at least a portion of the inside of the hollow boom.

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