

ERGONOMIC EAR MOUNTED HEADSET

BACKGROUND OF THE INVENTION

The invention relates to an ergonomic headset which may include either or both of a microphone and earphone. In particular, the invention relates to an ergonomic ear mounted headset which may be custom fit to the user by means of a flexible selectively deformable ear loop.

Relatively lightweight headsets are well known. Some devices employ a resilient headpiece which carries a boom mounted microphone or an earphone or both. Users complain that such devices are uncomfortable. Also, the headpiece may also upset the user's hair style.

Some lightweight headsets employ an ear mounted support which resiliently engages the ear of the user. Pressure exerted by the support on the ear maintains the device in position. Such arrangements essentially employ a one size fits all approach. The ear is essentially squeezed to fit within the confines of the ear support. Further, while, in some cases, a variety of sizes may be provided, such sizes are not custom fit to the user.

Conventional devices oftentimes employ two pressure points to hold or secure the ear piece in position. After a while this can be quite uncomfortable. This is especially true if the earpiece

is sufficiently strong to support the combined weight of the microphone and earpiece with reduced slippage. If the earpiece is not sufficiently tight, the device will fall off. If the earpiece is tight, the device is
5 uncomfortable.

Some devices wrap all the way around the ear. These too can be quite uncomfortable. Other devices rely on the spring action of a thin wire to secure the earpiece to the head.

10 Some designs employ an ear loop which allows adjustment of the boom. However, the ear loop parts do not adjust. Some designs have a molded part which retains its general shape, and is thus not a custom fit. Also, some designs have an intrusive earpiece
15 which is necessary for stability.

SUMMARY OF THE INVENTION

The present invention is based upon the discovery that an ergonomic headset for carrying an earphone, a
20 microphone or both is provided with a flexible ear loop which is selectively adjustable to custom fit the ear of the user. In one embodiment, the ear loop carries a boom mounted microphone or a swivel mounted earphone or both in a device which is self supporting,
25 comfortable and not subject to slippage or detachment from or about the ear. The selectively adjustable ear

loop is made of a material which is sufficiently strong to support the entire headset. The flexible material has relatively no spring action and has enough strength to put the ear into minor compression allowing the ear
5 and the flexible ear loop material to engage in a comfortable fit. The user may adjust the tension as desired. The design is stable, simple and comfortable.

In a particular embodiment, the invention comprises a lightweight, ergonomic headset. The device
10 includes an ear loop for conformably engaging the ear of the user formed of a length of relatively strong, selectively deformable, flexible material having opposite ends and being mountable behind the ear of the user so as to result in a custom fit of the ear loop in
15 opposition to the natural resiliency of the ear. The ear loop is adapted to support at least one transducer device at either end. In a particular embodiment, the ear loop supports a boom mounted microphone from an end of the loop extending below the ear and towards the
20 mouth of the user. In another embodiment, the ear loop supports a swivel mounted earphone coupled to an end of the ear loop extending over the ear of the user.

BRIEF DESCRIPTION OF THE DRAWINGS

Figs. 1A and 1B are respective side and rear perspective views of one embodiment of the invention in use mounted on the ear of a user;

5 Fig. 2 is a plan view of the device of Fig. 1 showing its various components;

Fig. 3 is a perspective view of the invention with the ear of the user shown in phantom;

10 Figs. 4A and 4B are respective side and rear perspective views of another embodiment of the invention in use mounted on the ear of the user;

Fig. 5 is a plan view of the device of Fig. 4 showing its various components; and

15 Fig. 6 is a perspective of the invention with the ear in phantom;

DESCRIPTION OF THE INVENTION

20 The invention is directed to a lightweight, ergonomic headset 10 for mounting on the ear of the user. In Figs. 1A-3, a simplified embodiment of the invention is illustrated. The headset 10 comprises an ear loop 12 adapted to be conformably secured about the ear 13 of the user, a junction box 14 mounted at one end of the ear loop 12, a boom microphone 16 supported
25 by the junction box 14 adapted to extend towards the

mouth of the user, and an output wire 18 extending from the junction box 14 coupled to the boom microphone 16.

In accordance with a feature of the invention, the ear loop 12 is formed of a length of relatively lightweight, strong selectively deformable flexible material which is conformable about the ear 13 of the user. The ear loop 12 is adapted to extend from the upper portion 15 of the ear 13 around the posterior 17 thereof to below the ear lobe 19 and may be deformed in such a way so as to engage or oppose the natural resiliency of the ear 13. In this way, the ear loop may be custom fit for any user without special molds or the like which may be required for each individual.

Fig. 2 illustrates the invention in greater detail. The ear loop 12 of the headset 10 may comprise a hollow flex tube 30 having a distal end 32 and a proximal end 34. In the arrangement illustrated, the flex tube 30 may be formed of a continuous band or ribbon of relatively strong (e.g., stainless steel) material wound in a spiral and having an interior chamber 36. A strong, selectively deformable, flexible wire 38 may be disposed within the central chamber 36 as a stiffener. A resilient cover 31 may be provided over the flex tube 30 to enhance user comfort. The cover 31 may be an organic coating or a foam sleeve.

When the ear loop 12 is deformed, the flexible wire 38 maintains the flex tube 30 in the position or shape which it has been deformed. Accordingly, the user may deform the ear loop 12, as shown in Fig. 3, so that the distal end 32 is located at the upper portion 15 of the ear and extends below the ear lobe 19 and towards the proximal end 34. The ear loop 12 may be selectively adjusted to conform with the ear of the user.

10 The boom microphone 16 may be formed of a relatively stiff, thin wall, hollow tube 40. The tube 40 has a distal end 42 which extends towards the mouth 21 of the user (Figs. 1A-1B) and a proximal end 44 which is attached to the junction box 14. An
15 intermediate portion 43 is curved so as to conform in spaced relation with the cheek 23 of the user (Fig. 1B). A microphone 46 may be attached to the distal end 42 of the tube 40.

20 The lightweight, miniature microphone 46 includes a housing 48 and a microphone element 50 having an acoustic cover or screen 52. In the exemplary form illustrated, the cover 52 comprises a foam cap. The microphone element 50 includes fine lead wires 54 which extend through the hollow tube 40 to the junction box
25 14. The output wires 18 may then be connected to the lead wires 54 in the junction box 14 and to the

microphone element 50, as illustrated. The output wire 18 has a connector element 56 which may be coupled to a suitable input device such a stereo preamplifier, not shown. The output wire 18 may be secured to the flex tube 30 by means of a suitable fastener such as an elastomeric O-ring 58. The O-ring 58 allows the user to position the output wire 18 with respect to the ear loop 12 so as to reduce pulling of the wire 18 on the headset 10 while in use. For example, it is desirable to position the O-ring 58 close to the ear lobe 19 so as to align the wire 18 for low stress movement with the head movements of the user.

In another embodiment of the invention illustrated in Fig. 4A-6, wherein similar elements from the above described illustrations have the same reference numerals, the headset 100 employs an earphone 110 which is secured to the distal end 32 of the flexible ear loop 12. The earphone 110 comprises a miniature speaker portion 112 having an earphone axis 114 adapted to be positioned within the inlet to the ear canal 115 of the user. A radial swivel support 116 may be provided for connection to the distal end 32 of the ear loop 12. The support 116 has an interior opening 117 which receives the distal end 32 of the ear loop therein. The support 116 allows the speaker 112 to rotate about a terminal axis 118 of the distal end 32

of the ear loop 12. Thus, the ear loop 12 and the support 114 permit the user to position the miniature microphone 112 at any angle with respect to the ear canal 115 for maximum comfort. The speaker 112 has a
5 resilient pad cover 119 to further enhance user comfort.

An input wire 120 is coupled to the microphone 112 via the support 116, as illustrated. The input wire 120 and the microphone output wire 18 may be secured
10 together by means of a suitable wire sleeve 122, as illustrated. By securing the wires 18 and 120, as shown, there is less pull stress on the headset 100 so that it is less likely that the device will be pulled from the head of the user.

15 The invention allows a relatively high comfort level for the user because the ear loop 12 may be selectively adjusted about the ear of the user with an appropriate opposing force commensurate with the sensory threshold of the particular user. Likewise,
20 the microphone 16 may be selectively adjusted as may be the earphone 110. The supporting forces may also be more readily distributed about or on the ear of the user as opposed to conventional devices which exert a higher or more concentrated forces on the ear at
25 several (typically two) engagement points. The present invention spreads the force out so that over a

prolonged period of use of several hours, the user has little or no uncomfortable sensation.

Another advantage of the invention is that a vocal performer may use the device with reduced concern for dropping or losing the device during a performance. This is because the device is lightweight, for example, weighing less than perhaps 1 oz. overall and with most of the weight concentrated or centered on the ear loop 12 and with the boom microphone 16 being less than about 1/3 of the total overall weight. In this way, the center of mass of the device is near the ear so that rapid head movement is less likely to cause the device to sling off or fall off the ear during a performance.

It should be understood that the device may include only the ear loop 12 with the attached earphone 110 and without the junction box 14 and boom microphone 16. Alternatively, the device may include the ear piece 10 and the junction box 14 and boom microphone 16 only.

While there have been described what are at present considered to be the preferred embodiments of the present invention, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and it is intended in the appended

claims to cover such changes and modifications as fall within the spirit and scope of the invention.

WHAT IS CLAIMED IS:

1 1. A lightweight ergonomic headset for mounting
2 on the ear of a user comprising: an ear loop for
3 engaging the ear of the user being formed of a length
4 of relatively strong, selectively deformable, flexible
5 material conformable behind the ear of the user in
6 opposition to the natural resiliency thereof so as to
7 result in a snug, non-irritating, custom-fit of the ear
8 loop for such user; and at least one transducer mounted
9 on the ear loop for operatively engaging one of the ear
10 and the mouth of the user.

1 2. A lightweight ergonomic headset for mounting
2 on the ear of a user comprising:
3 an ear loop for engaging the ear of the user being
4 formed of length of relatively strong, selectively
5 deformable, flexible material having opposite ends and
6 being selectively conformable behind the ear of the
7 user so as to result in a custom fit of the ear loop on
8 the ear of such user in opposition to the natural
9 resiliency of the ear; and
10 at least one transducer adapted to be supported at
11 either end of the ear loop.

1 3. The headset of claim 1 wherein the transducer
2 comprises an earphone.



1 4. The headset of claim 3 wherein the earphone is
2 mounted for rotation about a terminal axis of the ear
3 loop.

1 5. The headset of claim 2 wherein the transducer
2 comprises a microphone.

1 6. The headset of claim 2 wherein the transducer
2 comprises a boom microphone and the headset further
3 comprises a junction box secured to an end of the ear
4 loop for connecting the boom microphone thereto.

1 7. The headset of claim 6 wherein the junction
2 box has an interior portion and the boom microphone
3 comprises a microphone element supported on a free end
4 of the boom and wiring means coupled to the microphone
5 having terminal portions within the junction box.

1 8. The headset of claim 7 further comprising
2 cable means coupled to the terminal ends of the
3 microphone within the junction box.

1 9. The headset of claim 2 wherein the transducer
2 comprises a microphone and a swivel support for
3 engaging the end of the ear loop, said ear loop having



4 a terminal axis aligned with the swivel support so as
5 to allow the headphone to rotate thereabout thereby
6 allowing adjustment thereof with respect to the ear of
7 the user, said terminal axis being adjustable by the
8 user.

1 10. The headset of claim 9 wherein the microphone
2 has a microphone axis adjustable for alignment with the
3 ear of the user.

1 11. The headset of claim 2 wherein the ear loop
2 comprises a flex tube and a selectively deformable
3 flexible wire disposed therein.

1 12. The headset of claim 2 wherein the ear loop
2 includes a resilient cover.

1 13. The headset of claim 12 wherein the cover
2 comprises a foam sleeve.

1 14. The headset of claim 2 wherein the ear loop
2 comprises a ductile wire.

1 15. The headset of claim 14 wherein the ear loop
2 includes a resilient cover.



1 16. The headset of claim 15 wherein the cover
2 comprises a foam sleeve.

1 17. The headset of claim 3 further including a
2 resilient pad disposed over the earphone.

1 18. The headset of claim 17 wherein the pad
2 comprises a foam cap.

1 19. The headset of claim 4 wherein the microphone
2 further includes a screen cover.

1 20. The headset of claim 19 wherein the screen
2 cover comprises a foam cap.

1 21. The headset of claim 5 wherein the microphone
2 includes a boom portion secured to the earpiece and a
3 microphone element attached to the boom portion remote
4 from the earpiece for positionment near the mouth of
5 the user.

1 22. The headset of claim 21 wherein the boom
2 portion comprises a thin wall tube.