United States Patent [19]

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[11] **3,837,681**

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[54] **STETHOSCOPE**

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[52] **U.S. Cl.** **181/24**
[51] **Int. Cl.** **A61b 7/02**
[58] **Field of Search** 181/24, 23

[56] **References Cited**

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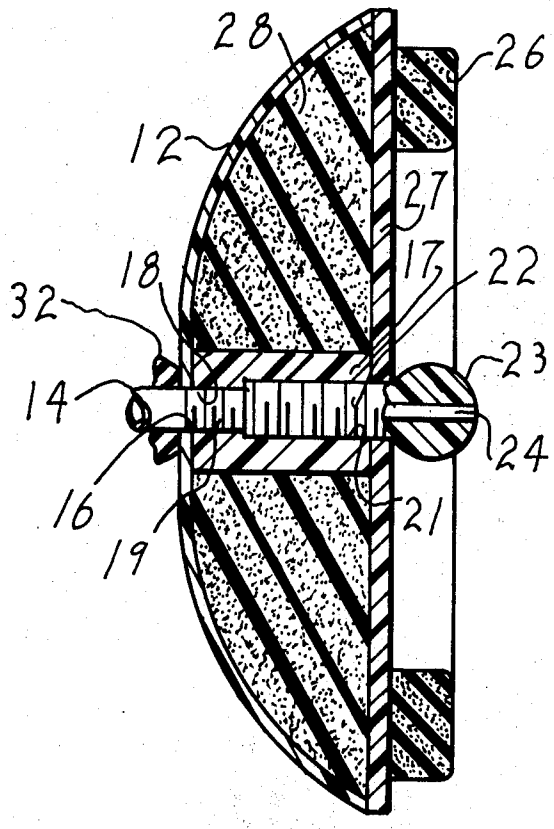
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Primary Examiner—Stephen J. Tomsky
Attorney, Agent, or Firm—Jennings, Carter & Thompson

[57] **ABSTRACT**

A rigid cup-like member has an opening therethrough for receiving an end of a sound delivery tube of a stethoscope. A deformable member extends around the cup-like member adjacent the periphery thereof and is adapted to engage and conform to the shape of the head surrounding the ear of a user so that the cup-like member together with the deformable member encases the ear of a user. The ear piece is adjustable relative to the sound delivery tube and a sound absorbing material is positioned between the cup-like member and the ear piece.

2 Claims, 4 Drawing Figures



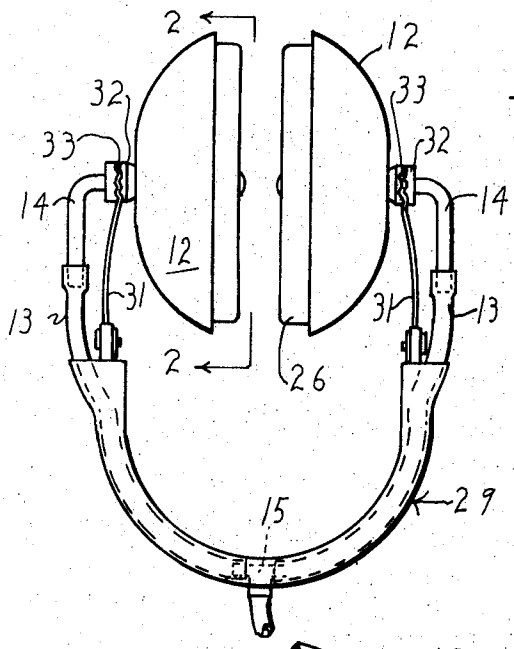


Fig. 1

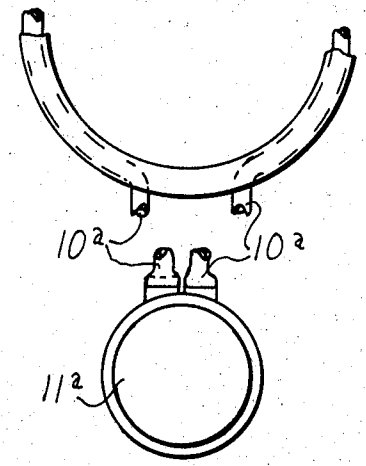


Fig. 4

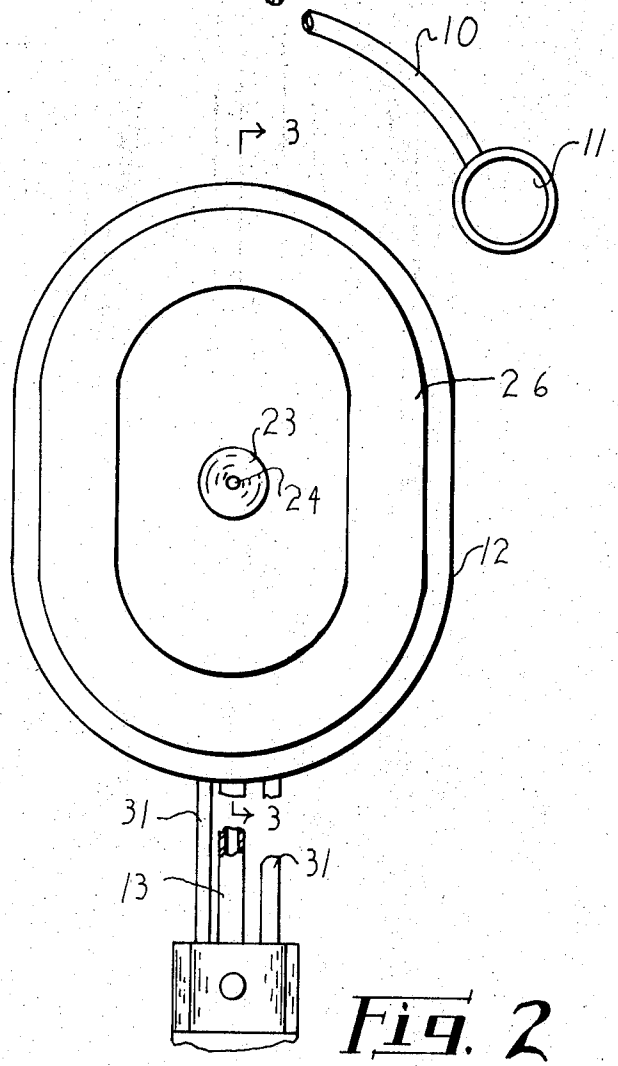


Fig. 2

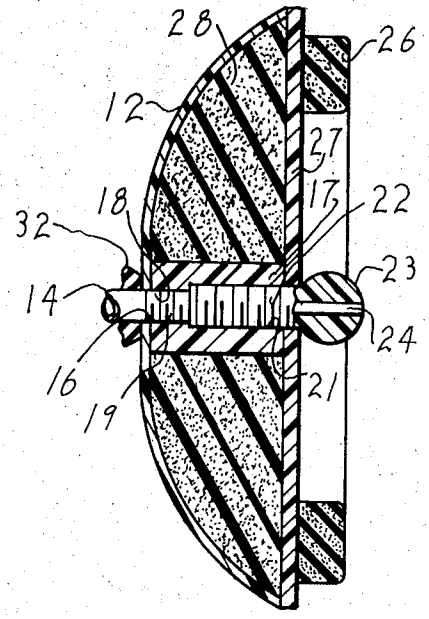


Fig. 3

STETHOSCOPE

BACKGROUND OF THE INVENTION

This invention relates to a stethoscope and more particularly to a stethoscope which is not affected by extraneous noises.

As is well known in the art to which my invention relates, faint heart sounds are not always clearly discernible to doctors using conventional stethoscopes due to the presence of extraneous noises, such as noises which are transferred through the ear as well as noises which are transferred through bone structure.

BRIEF SUMMARY OF THE INVENTION

In accordance with my present invention, I provide a stethoscope in which the delivery end of a sound delivery tube extends through a rigid cup-like member and carries an ear piece inwardly of the cup-like member. A deformable member extends around the periphery of the cup-like member and is adapted to engage and conform to the shape of the head surrounding the ear of a user to provide a composite structure which completely encases the ear. A sound absorbing material is positioned between the cup-like member and the ear piece and the ear piece is adjustable whereby it may be moved to selected positions relative to the ear of a user.

DESCRIPTION OF THE DRAWING

Apparatus embodying features of my invention is illustrated in the accompanying drawing, forming a part of this application, in which:

FIG. **1** is a front elevational view, partly broken away showing one form of my invention;

FIG. **2** is an enlarged, fragmental view taken generally along the line **2—2** of FIG. **1**;

FIG. **3** is a sectional view taken along the line **3—3** of FIG. **2**; and,

FIG. **4** is a fragmental view, partly broken away, showing a modified form of stethoscope in which the chest piece is connected to a pair of sound delivery tubes.

Referring now to the drawing for a better understanding of my invention, I show in FIG. **1** a stethoscope having a sound delivery tube **10** which is connected at one end to a chest piece **11.** The other end of the sound delivery tube **10** is connected to a pair of cup-like members **12** by branch tubes **13.** That is, the branch tubes **13** are connected to the main sound delivery tube **10** by a T-fitting **15.** The ends of the branch tubes **13** are connected to rigid, L-shaped tubes **14** which are formed of a suitable material, such as metal.

As shown in FIG. **3,** the end of each rigid tube **14** extends through a centrally disposed opening **16** provided in the cup-like member **12.** Each cup-like member **12** is formed of a rigid material, such as plastic or the like. A sleeve-like hub member **17** is secured to the inner surface of the cup-like member **12** adjacent the center thereof and is provided with a threaded opening **18** for receiving a threaded end portion **19** on the rigid tube **14.** The other end of the sleeve-like member **17** is provided with a threaded opening **21** for receiving an elongated threaded portion **22** of an ear piece **23.** The ear piece **23** is provided with a rounded inner end and is provided with a passageway **24** therethrough for transmitting sound to the ear. By providing the threaded

connection between the ear piece **23** and the sleeve-like member **17,** the ear piece is adapted for axial movement relative to the tube **14** and the sleeve-like member **17** whereby it may be moved toward and away from the ear of a user.

A deformable member **26** extends all the way around the cup-like member **12** adjacent the periphery thereof, as shown. The deformable member **26** is adapted to engage and conform to the shape of the head surrounding the ear of a user whereby the deformable member and the cup-like member together encase the ear with the ear piece **23** extending inwardly of the ear. The deformable member **26** may be formed of any suitable material, such as foam rubber.

As shown in FIG. **3,** a plate-like member **27** extends across the open end of the cup-like member **12** between the ear piece and the cup-like member and defines a cavity therebetween for receiving a sound absorbing material **28** which may be in the form of sponge rubber or the like.

As shown in FIG. **1,** the branch tubes **13** are carried by a generally U-shaped supporting structure **29** which is connected by upstanding support members **31** to a resilient support **32** which surrounds the horizontal portion of each L-shaped tube **14.** Suitable recesses **33** are provided in the members **32** for receiving the support members **31.**

Referring now to FIG. **4** of the drawing, I show a slightly modified form of my invention in which a chest piece **11***a* is connected to a pair of sound delivery tubes **10***a*. The other end of each sound delivery tube **10***a* is connected to a rigid, L-shaped tube **14,** as described hereinabove, which is connected to the cup-like member **12** and the ear piece **23.** Accordingly, the stethoscope shown in FIG. **4** operates in the identical manner to the stethoscope shown in FIGS. **1** through **3,** the only difference being that two separate sound delivery tubes **10***a* are employed rather than employing a single sound delivery tube **10** which in turn is connected to the branch tubes **13** in the embodiment shown in FIGS. **1** through **3.** In view of the fact that there are many types of such chest pieces and sound delivery tubes which may be employed in association with my invention, no further description of the chest piece or the sound delivery tube is deemed necessary.

From the foregoing description, the operation of my improved stethoscope will be readily understood. The cup-like members **12** are positioned over the ears of the user whereby the deformable members **26** encircle the ear to thus encase the ear with the ear piece **23** extending inwardly of the ear. The ear piece **23** is adjusted to the desired position relative to the ear of a user by merely rotating the ear piece. The threaded connection **21–22** thus holds the ear piece **23** in any selected position.

From the foregoing, it will be seen that I have devised an improved stethoscope which eliminates extraneous noises. By providing a cup-like member which, together with the deformable member **26,** completely encases the ear, I not only eliminate the transfer of extraneous noises through the ear but also eliminate the transfer of such noises through the bone structure adjacent the ear. Also, by providing means for adjusting the position of the ear piece **23** relative to the ear of the user, the ear piece may be moved to any desired position to form an effective seal between the ear piece and the ear. Furthermore, by providing the sound absorbing

material **28** between the ear piece **23** and the cup-like member, together with the sound absorbing material in the peripheral member **26,** I further reduce the transfer of noises to the ear and the area adajcent thereto.

While I have shown my invention in but two forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof.

What I claim is:

1. In a stethoscope having a chest piece connected to one end of at least one sound delivery tube with at least one ear piece for the other end of said sound delivery tube,

a a rigid cup-like member for each ear piece;

b there being an opening through each cup-like member for receiving said other end of said sound delivery tube,

c a sleeve-like member connected at one end to said other end of said sound delivery tube and threadedly connected at its other end to said ear piece so that said ear piece is adapted for axial movement relative to said sleeve-like member to selected positions relative to the ear of a user, and

d. a deformable member extending around said cup-like member adjacent the periphery thereof and adapted to engage and conform to the shape of the head surrounding the ear of a user so that said deformable member and said cup-like member together encase said ear with said ear piece engaging said ear.

2. A stethoscope as defined in claim **1** in which a sound absorbing material is positioned between the inner surface of said cup-like member and said ear piece and a plate-like member extends between said ear piece and said cup-like member and forms a cavity for said sound absorbing material.

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