United States Patent [19]

Denhart

[11] **3,890,475**

[45] **June 17, 1975**

[54] **SELF-CONTAINED VOICE AMPLIFICATION HEADGEAR**

[76] Inventor: **Robert R. Denhart,** Route 2, Box 741, Rosenberg, Tex. 77471

[22] Filed: **Jan. 30, 1974**

[21] Appl. No.: **437,990**

[52] **U.S. Cl.** ..... **179/156 A;** 179/1 MG

[51] **Int. Cl.** **H04m 1/05**

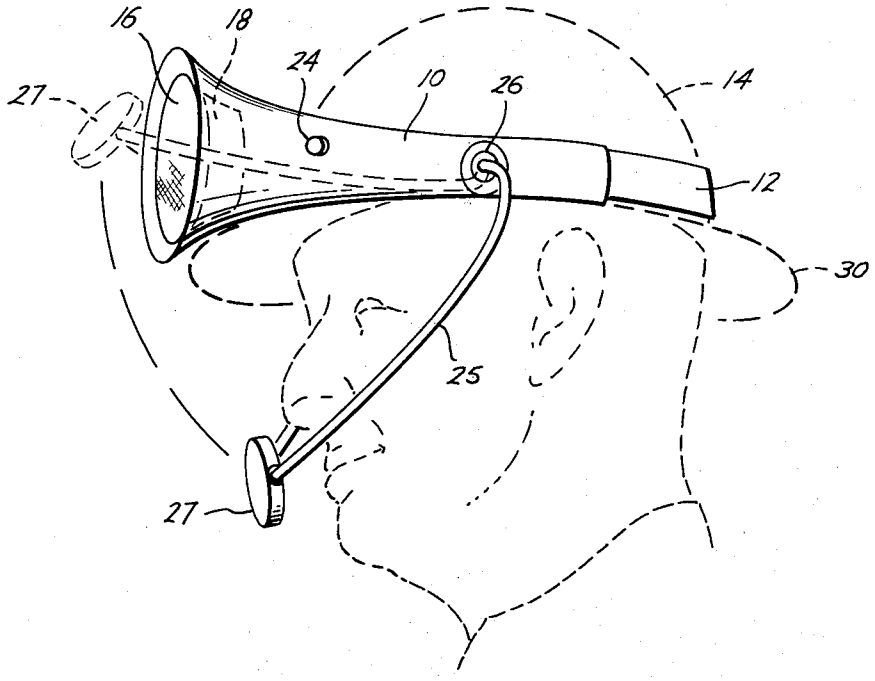
[58] **Field of Search** ..... 179/156 R, 156 A

Primary Examiner—William C. Cooper
Attorney, Agent, or Firm—James F. Weiler; William A. Stout; Dudley R. Dobie, Jr.

[57] **ABSTRACT**

A self-contained voice amplification headgear is disclosed which includes a housing arranged to be secured around the head, hat or helmet of the user and around and on objects by an adjustable headband, or molded, adhered to or otherwise externally secured to the hat or helmet without their modification, a speaker is carried by the housing and a microphone arm carrying a microphone is pivotally connected to the housing and operable to swing the microphone to a downward position in front of the mouth of the user, and up away from the mouth of the user to an out-of-the-way position. Preferably, the speaker is facing in the same direction as the user is facing. An on-off switch is provided and is operable to connect an electrical power source to an amplifier circuit carried by the housing when the microphone arm is in the downward position and to disconnect them when in the out-of-the-way position. An auxiliary on-off switch, volume control and connection for a recharger may be provided and carried by the housing.

6 Claims, 5 Drawing Figures



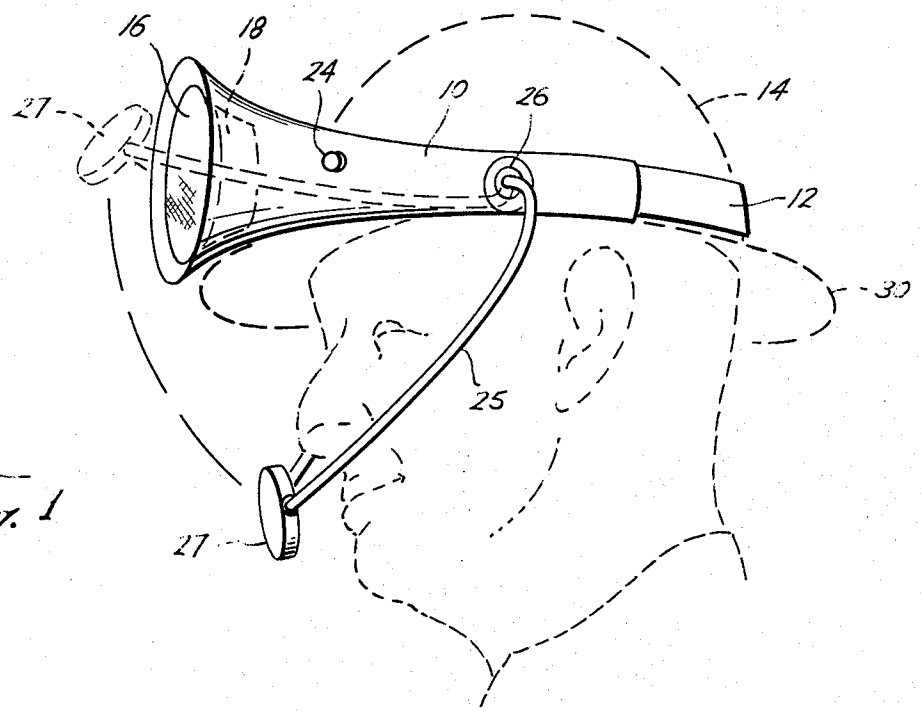


Fig. 1

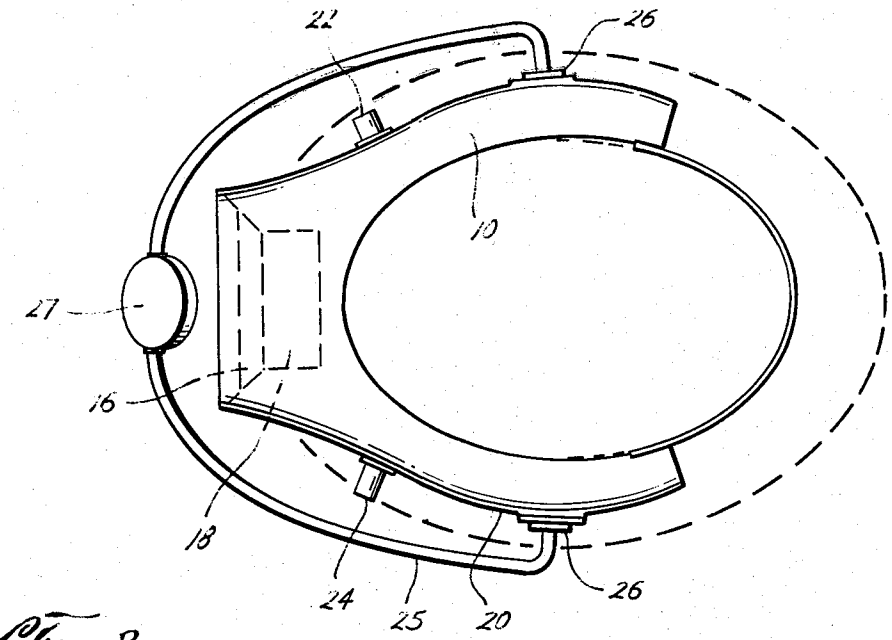


Fig. 2

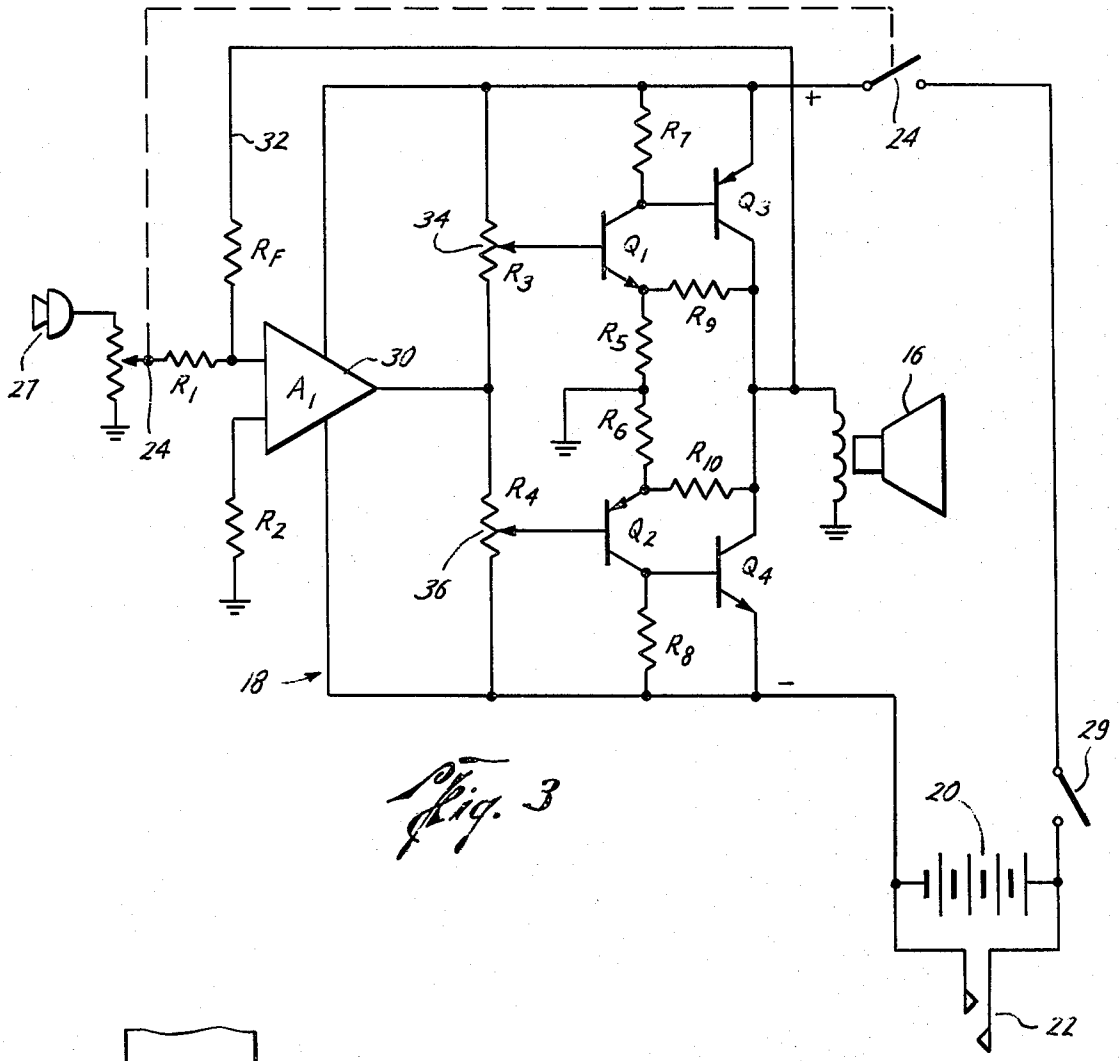


Fig. 3

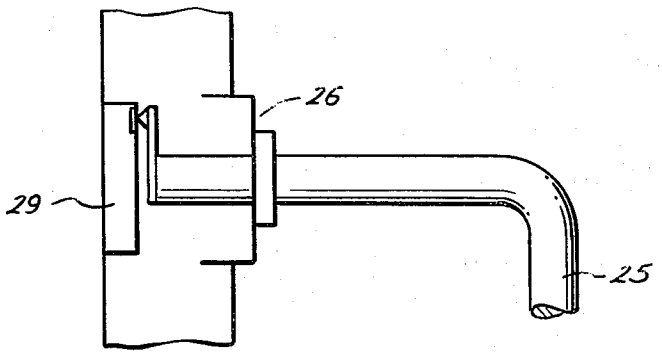


Fig. 4

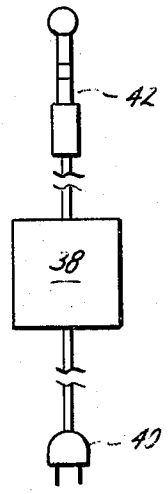


Fig. 5

SELF-CONTAINED VOICE AMPLIFICATION HEADGEAR

BACKGROUND OF THE INVENTION

Labor costs are an ever-increasing and major component in every product or service. Accordingly, it is highly desirable, if not necessary, to obtain as much utilization of labor as reasonably possible. Much labor time, and hence money, is lost because of poor communication systems between foremen, group chiefs or leaders, superintendents, engineers, architects, and management prople and labor. This is particularly true in the construction industry, and primarily with safety hard-hat type people in that the directions and instructions are given orally without amplification and in view of the distances or noise or both, it is necessary or desirable for the person or persons giving the directions and instructions to go to the workers or each group of workers to give them such instructions. This requires a considerable amount of time which, in effect, is lost time and creates production stoppages when these persons must move about to convey necessary instructions and communications. Also, much time is lost in workers stopping and getting started again, which is very costly, caused by waiting on instructions and directions.

The magnitude of the cost involved in labor loss of time due to poor communications may be gleaned from the fact that at the present time it is estimated there are approximately 30,000,000 blue-collar workers in the United States of America, of that number about 12,000,000 to perform their job function must by law wear a safety hat, and approximately 6,000,000 are of a supervisory nature.

It has been established that better communications, through the many uses of microwave, telephonic, and acoustical systems, have a direct bearing on productivity of personnel, quality of product in service, and personnel relationships. While a number of speaker systems for headpieces, helmets and hats have been proposed in the past, for example, systems such as disclosed in U.S. Pat. Nos. 2,497,871; 3,258,534; 3,347,229; 3,422,224; 3,549,831; and 3,629,552, most of these speaker systems require modification to or special headgear or helmets, are bulky and do not permit the user to be unencumbered and do not include an on-off switch which connects the power source to the amplifier circuit when the microphone arm is swung downwardly to position the microphone in front of the mouth of the user, and disconnects the power source from the amplifier circuit when the microphone arm is moved upwardly to position the microphone away from the mouth and face of the user into an out-of-the-way position. In addition, some of these have internal mountings and parts between the crown and head, which is unsafe and do not qualify under present OSHSA laws for safety hats. In any event, none of these amplification systems are presently marketed or in use in the construction of hard-hat industry in the United States of America.

SUMMARY

The present invention is directed to self-contained voice amplification headgear which overcomes the disadvantages and obj ctions of prior art hat, helmet or headgear amplification systems, by providing a housing and an adjustable headband by which it can be secured directly around the head of the user or externally to hard hats, helmets and other headgear without modification and to other objects, and which includes an on-off switch incorporated into a microphone arm pivotally carried by the housing and arranged so that when the arm is swung to a downward position to bring the microphone before the mouth of the user, an electrical power source is connected to an amplification system, both carried by the housing, and when the microphone arm is raised to raise the microphone from before the mouth and face of the user to an out-of-the-way position, the electrical power source is disconnected from the amplifier circuit.

Accordingly, it is an object of the present invention to provide a self-contained voice amplification headgear which can be strapped around the head of the user or to the user's hard hat, helmet or other headgear or otherwise externally secured to them without any modification in them.

A further object of the present invention is the provision of such a self-contained voice amplification headgear which includes an on-off switch operable by a microphone arm pivotally carried by the housing portion of the adjustable headband, which arm is arranged to swing down to bring the microphone before the mouth of the user and which switch connects the electrical power source with the amplifier circuit, and operable to disconnect them when the microphone arm is raised to raise the microphone from before the mouth and face of the user to an out-of-the-way position.

A further object of the present invention is the provision of such a self-contained voice amplification headgear which may be utilized to provide necessary or desirable instructions where distance presents a problem to efficient and fast communication, and where noise, machinery or environment, presents an obstacle to efficient and fast communication.

Still a further object of the present invention is the provision of such a self-contained voice amplification system which leaves the user completely unencumbered so as not to interfere with the performance of his job function.

A further object of the present invention is the provision of a self-contained voice amplification headgear which is relatively inexpensive, may readily and easily be attached or secured to the head of the user, or to hard hats, helmets and the like without any modification or change to them, and which can be turned on simply by bringing the microphone arm to a downward position to bring the microphone in front of the mouth of the user and turned off by moving the arm and the microphone to an out-of-the-way position.

Other and further objects, features and advantages of the invention will be apparent from the following description of a preferred embodiment thereof, the abstract of the disclosure, the background of the invention, this summary, the drawing and the appended claims.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a self-contained voice amplification headgear according to the invention shown attached to a hard hat worn by the user,

FIG. 2 is a plan view of the same,

FIG. 3 is a circuit diagram illustrating the amplifier circuit,

FIG. 4 is a detail view of the pivot, and

FIG. 5 is a schematic view illustrating a recharger for the electrical power source.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, a self-contained voice amplification headgear is illustrated which includes a body portion generally in the shape of a headband comprised of an enlarged forward position which serves as the housing **10** for the voice amplification headgear to which is attached the headband straps **12** which are adjustable to fit about the head or hard hat **14** shown here, as well as other typical hats, helmets and objects, not shown. Preferably, the housing **10** is made of a lightweight waterproof material, such as a plastic, and the headband straps **12** are preferably made of a lightweight material, such as plastic as used in safety hats in the construction industry. If desired, the housing **10** may be molded, adhered to by an adhesive or otherwise externally secured to the hat without modifying the hat, and without use of the headband straps **12,** if desired, so that the housing is carried by the hat.

A speaker **16** is disposed at the enlarged forward portion of the housing **10** which also carries the amplifier **18,** the electrical power source, here shown as the batteries **20,** to power the system, a battery recharger jack **22,** and the combined volume control and secondary on-off switch **24.** Preferably, the speaker **16** faces in the direction of the user, as does the microphone **27,** to provide best results in communicating instructions, directions, and the like.

A microphone arm **25** is pivotally secured to the housing **10** by the pivot connections **26,** which microphone arm **25** adjustably carries at its end the microphone **27.** The arm **25** is shown as supporting the microphone **27** from both sides. If desired, the arm **25** may pivotally extend from one side of the housing **10** to the microphone **27** and the other side of the arm and its pivot connection **26** omitted. Advantageously, the pivot connection **26** includes an on-off switch **29** (see FIG. 2) so that when the microphone arm **25** is in an upward and out-of-the-way position, the electrical power source **20** is disconnected from the amplifier **18,** and when the microphone arm **25** is swung to a downward position so that the microphone **27** is in front of the mouth of the user, the electrical power source **20** is connected to the amplifier **22.** Advantageously, this permits connecting and disconnecting the electrical power source **20** to and from the amplifier **22** automatically by moving the microphone arm **25** to the downward position for use and by moving the microphone arm **25** to the out-of-the-way position for non-use, leaving the user completely unencumbered insofar as the voice amplification headgear is concerned.

The microphone arm **25** is outwardly bowed, as illustrated, so that it clears the brim **30** of the hard hat **14** and can be swung into the downward position for use and into the out-of-the-way position when not in use.

Referring now to FIG. 2, which generally depicts the amplifier **18** and shows its interconnection to the electrical power source **20,** it is to be noted that the circuitry includes two on-and-off switches, **24** and **29,** in series. The combined volume control potentiometer and on-and-off switch **24** is mounted on the housing **10** in such a manner that it may be readily reached for manipulation by the user. The other on-and-off switch **29** is arranged in the pivot connection **26** such that the switch is on when the microphone arm **25** is pivoted downwardly, as previously noted. If desired, the electrical power source **20** may consist of rechargeable batteries, and if this is done, then a recharger jack **22** is provided, also mounted in the housing **10.** The amplifier **18** generally consists of a preamplifier stage **30** whose input comes from the volume control **24** and microphone **27.** The output of the preamplifier stage **30** may advantageously be fed to the conventional power amplifier stages in a push-pull arrangement which includes transistors **Q1, Q2, Q3** and **Q4.** The output of a transistor amplifier circuitry is fed to the speaker **16.** If desired, a feedback control circuit **32** may be included, as well as balancing potentiometers **34** and **36.** Other conventional amplifier circuitry may be substituted for that shown as the amplifier **18.**

Referring now to FIG. 3, the recharger **38** is generally depicted and this includes a power plug **40** along with an output plug **42** which is designed to interconnect with the recharger jack **22.** The recharger is conventional and includes elements to convert line current to the required lowered voltage direct current. If desired, and assuming that the user does not require great mobility, for example, when hung or strapped around an object, the recharger may be connected to the amplifier even when the present invention is in use so that the amplifier **18** operates off of the usual line current instead of the batteries.

The self-contained voice amplification headgear can be powered to amplify the voice up to most desired distances, such as 50, 100 or more yards.

Since the self-contained voice amplification headgear is adjustable as to size, it may readily be fitted over any hat, helmet or other headgear, may be worn around the head without a hat, molded to or adhered to a hat by a suitable adhesive or otherwise secured externally to the hat. Also, if desired, the headgear amplifier may be strapped around or hung on posts and other objects and used in that manner when not being worn by the user when using straps, such as indicated by the reference numeral **12.**

Accordingly, the self-contained voice amplification headgear of the present invention is well adapted and suited to attain the objects and ends and has the advantages mentioned as well as others inherent therein.

While a presently-preferred embodiment of the invention has been given for the purpose of disclosure, changes may be made which are within the spirit of the invention as defined by the scope of the appended claims.

What is claimed is:

1. A self-contained voice amplification headgear comprising,

a housing arranged to be carried externally by the head, hat or helmet of the user,

a speaker carried by the housing,

an amplifier electrically connected to the speaker carried by the housing,

an electrical power source carried by the housing,

a microphone arm pivotally connected to the housing,

a microphone electrically connected to the amplifier and carried by the microphone arm,

the microphone arm operable to swing the microphone to a downward position in front of the mouth of the user and upwardly and away from the

mouth and face of the user into an out-of-the-way position, and

an on-off switch operable to connect the electrical power source to the amplifier when the microphone arm is in the downward position and operable to disconnect the electrical power source from the amplifier when the microphone arm is in the out-of-the-way position.

2. The self-contained voice amplification headgear of claim **1**, including,

an adjustable headband arranged to extend around the head, hat or helmet of the user,

the housing forming part of the headband.

3. The self-contained voice amplification headgear of claim **1** where,

the electrical power source is a rechargeable power source, and

includes a connection carried by the housing for an electrical recharger.

4. The self-contained voice amplification headgear of claim **3**, including,

a volume control carried by the housing operable to control the volume of the speaker.

5. The self-contained voice amplification headgear of claim **1**, including,

an auxiliary on-and-off switch carried by the housing operable to connect and to disconnect the electrical power source to and from the amplifier circuit.

6. The self-contained voice amplification headgear of claim **1** where,

the electrical power source is a rechargeable power source, and includes

a connection carried by the housing for an electrical recharger of the electrical power source, and

an auxiliary on-and-off switch carried by the housing connecting and disconnecting the electrical power source to and from the amplifier circuit.

* * * * *