June 28, 1966 F. C. GOLDSWORTHY 3,258,534

SAFETY HEADPIECE LOUDSPEAKER

Filed Feb. 25, 1963

FIG_1

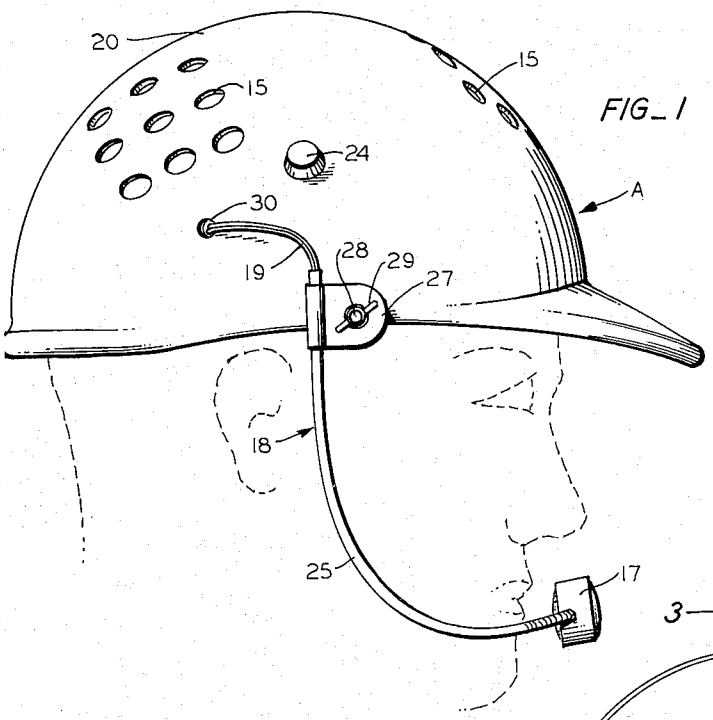


FIG_2

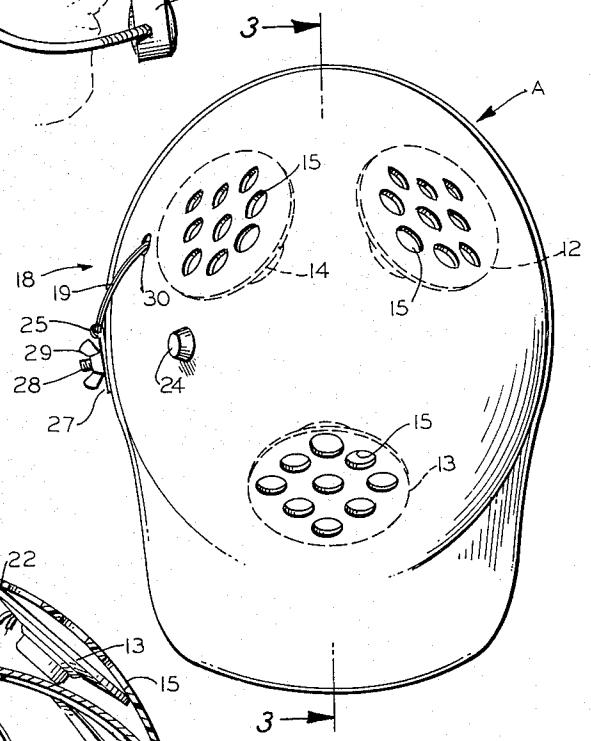
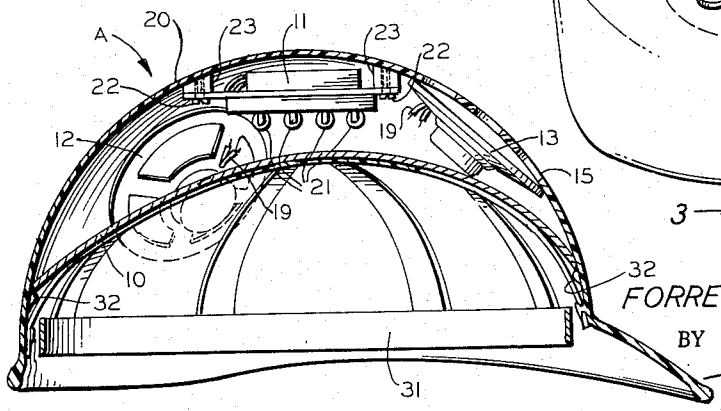


FIG_3



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SAFETY HEADPIECE LOUDSPEAKER

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The present invention relates to a loudspeaker headpiece, and pertains more particularly to a safety head covering having a loudspeaker mechanism incorporated therein.

In many industries, and on many occasions, it is necessary or desirable for people to communicate with others under conditions which make hearing extremely difficult, and frequently at such times it is necessary for the speaker to have his hands free, and to protect his head by means of a safety headpiece such as a hat, cap or helmet.

The present invention provides a safety head covering having a loudspeaker system incorporated therein, so that not only the speaker's head, but also the transmitting mechanism is protected, while the wearer's hands are completely free for such use as he may need or wish to make of them.

An object of the invention is to provide an improved, simple, compact and protected loudspeaker headpiece.

A further object of the invention is to provide a loudspeaker mechanism wherein portions of the mechanism except the microphone are embodied within the crown portion of a safety head piece or helmet, and the microphone is adjustably mounted on the head piece for positioning in front of a wearer's mouth.

These, and other objects and advantages of the invention, will be apparent from the following description and the accompanying drawings, wherein:

FIG. 1 is a side elevational view of an illustrative embodiment of the invention as it appears when worn.

FIG. 2 is a top elevational view of the mechanism shown in FIG. 1.

FIG. 3 is a sectional view taken along line 3—3 of FIG. 2.

Briefly, the invention comprises a headpiece, such as a safety cap A, having an arched or domed partition **10** therein spaced downwardly from the crown of the cap, and having a small amplifier unit **11** mounted in a compartment **10***a* formed by the partition **10** between the latter and the crown. A plurality of loudspeakers **12**, **13** and **14** are mounted within the compartment **10***a*, one in register with each of three groups of holes **15** provided in the crown of the cap A. A microphone **17** is mounted on a swivel support **18** on the cap A, and communicates with the loudspeaker mechanism in the crown through conductors **19**.

Referring to the drawings in greater detail, the cap A is, except for the three sets of holes **15** therein, of a type commonly worn by factory and construction workers, and others exposed to head-hazardous conditions. The specific type of hat, cap or helmet employed is not material to the invention, except that it should be of rigid material and of a type having a fairly high crown.

The three similar pluralities or sets of holes **15** are in symmetrically spaced relation, and open into the compartment **10***a* above the partition **10**. The three loudspeakers **12**, **13** and **14** are of a small, flat, light weight type, and are secured one over the inner side of each set of the holes **15**.

The amplifier unit **11** may be of a conventional and well known type, preferably employing all transistors instead of tubes in the amplifying circuit. The all transistor type of amplifier unit is preferred for two reasons; one, that it is instantly ready to transmit as soon as it is turned on; and, two, that it exerts considerably less drain than would tubes on the batteries **21** with which the transmitter

is powered. These batteries may be of the small flashlight or pen-light type of dry cells, although any small, light weight type of battery of suitable voltage may be employed. The amplifier unit **11** is secured to the crown **20** by screws **22** screwed into blocks **23** formed on the inner side of the crown **20**. A conventional switch button **24** is provided on the side of the helmet for turning the loudspeaker mechanism off and on.

The microphone **17** is of a small, light weight type, and is mounted on the support **18** comprising an arm **25**, which may be of fairly rigid, strong, plastic tubing. The arm **25** is clamped in a swivel clamp **27** mounted on a side of the helmet by means of a screw **28** and wing nut **29**. Conductors **19** from the microphone pass through the tubular arm **25** and enter the crown compartment **10***a* through a hole **30** provided therefor in the side of the crown. A usual head harness **31** of a type conventionally employed in safety headwear is mounted on the partition **10** to support the device on a wearer's head.

The partition **10** is of suitable material, such as fairly rigid plastic sheet material. It is concave on its under side, and is of a size to fit into the helmet A. It preferably is retained therein by a plurality of embossments **32**, which project inwardly from the side of the helmet. The partition **10** is a closé, press fit within the helmet, so that when sprung slightly to force it up over the embossments **32**, it springs out into fitted position and thus securely retains itself in the helmet. When it is desired to remove the partition for replacing the batteries with which the loudspeaker mechanism is powered, or for repair or service of the mechanism, the partition **10**, with the head harness **31** mounted thereon, may be withdrawn from the helmet by springing an edge portion of the partition radially inwardly to clear one or more of the embossments **32**, after which the partition can be withdrawn from the helmet.

In using the illustrative embodiment of the invention, the cap A is worn in a conventional manner as shown in FIG. 1. The microphone **17** may be swung upwardly or downwardly as desired to position it a required distance from a wearer's mouth, and may be frictionally held in such position by tightening the wing nut **29**. The loudspeaker mechanism may be turned on by means of the switch button **24**, whereupon the device is ready for use by a wearer talking into the microphone. The three loudspeakers **12**, **13** and **14** amplify and project the sound with substantial volume in all directions.

Some proposed uses of the invention include use by a foreman directing a crew working under noisy conditions; a guide conducting a group of visitors through a noisy factory; and on many other occasions where it is necessary to project one's voice at substantial volume or to a substantial distance.

The invention provides a readily useable, compact and convenient loudspeaker mechanism, which also provides substantial protection for the head of a user.

While I have illustrated and described a preferred embodiment of the present invention, it will be understood, however, that various changes and modifications may be made in the details thereof without departing from the scope of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to protect by Letters Patent is defined in the following claims:

1. A loudspeaker helmet comprising:

(a) a safety helmet of rigid material having a high crown,

(b) a partition within the helmet separating an upper portion of the crown of the helmet from the lower portion thereof to thereby form a compartment in the crown above the partition,

(c) a plurality of loudspeakers mounted interiorly of the compartment formed in the crown by the partition, each loudspeaker being fastened in outwardly facing relation to the crown and communicating exteriorly of the helmet through an opening provided in the crown over each loudspeaker,
(d) electronic audio amplifying means mounted in the compartment formed in the crown by the partition,
(e) a microphone adjustably mounted on the helmet for positioning in front of the mouth of a wearer,
(f) electric battery means mounted on the helmet, and
(g) conductors operatively connecting the microphone to the loudspeakers through the amplifying means and the batteries.

2. A loudspeaker helmet comprising:
(a) a safety helmet of rigid material having a high crown,
(b) a removable partition separating an upper portion of the crown of the helmet from the lower portion thereof to thereby form a compartment in the crown above the partition,
(c) a head harness in the lower portion of the crown below the partition for fitted relation with the head of a wearer,
(d) a plurality of loudspeakers mounted interiorly of the compartment formed in the crown by the partition and facing in different directions, each loudspeaker communicating exteriorly of the headpiece thorugh an opening provided in the crown over each loudspeaker,
(e) electronic audio amplifying means mounted in the compartment formed in the crown by the partition,
(f) a microphone adjustably mounted on the headpiece for positioning in front of the mouth of a wearer,
(g) electric battery means mounted on the headpiece,
(h) switch means for controlling operation of the loudspeakers, and
(i) conductors operatively connecting the microphone to the loudspeakers through the switch means and the amplifying means and the batteries.

3. A loudspeaker helmet comprising:
(a) a safety helmet of rigid material having a high crown of a height to provide an instrument mounting zone interiorly of the helmet above the top of the head of a person wearing the helmet,
(b) a loudspeaker mounted in such mounting zone interiorly of the crown of the helmet and communicating exteriorly of the helmet through an opening provided in the crown over the loudspeaker,

(c) electronic audio amplifying means mounted in such mounting zone interiorly of the crown,
(d) closure means separating the audio amplifying means from the portion of the interior of the crown therebeneath,
(e) a microphone adjustably mounted on the helmet for positioning in front of the mouth of a wearer of the helmet,
(f) electric battery means mounted in such mounting zone interiorly of the crown of the helmet, and
(g) conductors operatively connecting the microphone to the loudspeaker through the amplifying means and the batteries.

4. A loudspeaker helmet comprising:
(a) a helmet of rigid material having a high crown,
(b) a head harness mounted in the lower portion of the crown of the helmet with the top portion of the harness in downwardly spaced relation to the top of the crown of the helmet,
(c) a loudspeaker mounted interiorly of the upper portion of the crown of the helmet above the head harness and communicating exteriorly of the helmet through one or more laterally directed openings provided in the crown for the loudspeaker,
(d) electronic audio amplifying means mounted interiorly of the crown above the head harness,
(e) closure means separating the audio amplifying means from the portion of the interior of the crown therebeneath,
(f) a microphone adjustably mounted on the helmet for positioning in front of the mouth of a wearer of the helmet,
(g) electric battery means mounted interiorly of the crown of the helmet above the head harness, and
(h) conductors operatively connecting the microphone to the loudspeaker through the amplifying means and the batteries.

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