

[54] **ADJUSTABLE EARMUFFS**

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[51] Int. Cl. **A42b 3/00**

[58] Field of Search **2/6, 209; 179/156**

[56] **References Cited**

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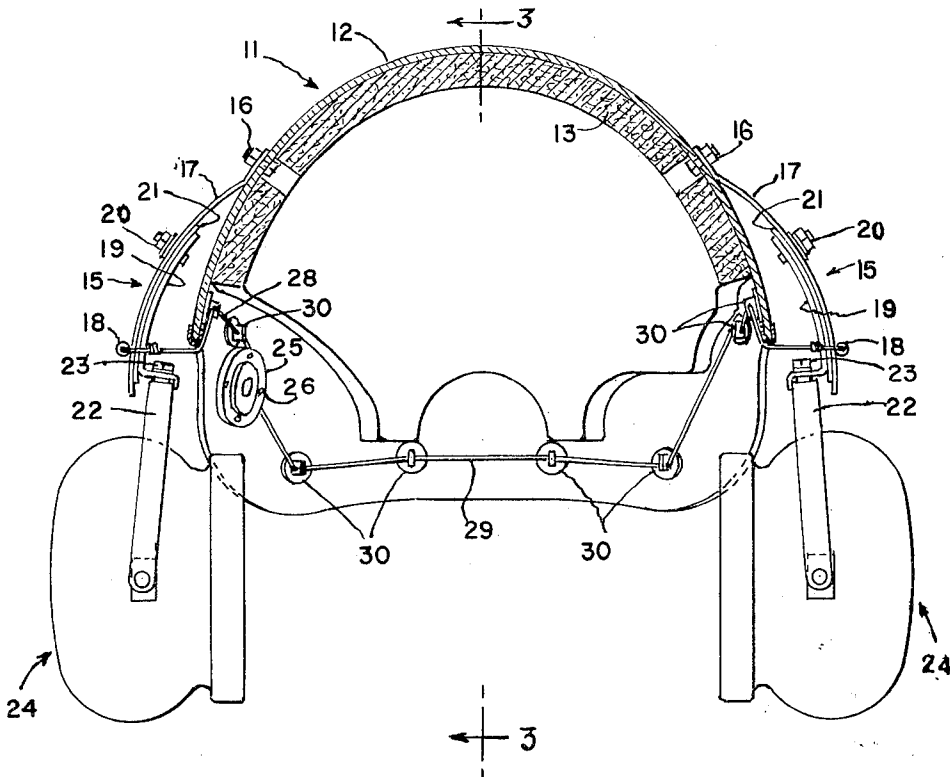
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[57] **ABSTRACT**

An ear protecting headgear having means for adjusting the pressure of an earmuff seal against the head of a wearer useful in high noise environments. In a headgear such as a helmet the apparatus includes a pair of cords connected at their respective one ends to a pair of resilient supports containing earmuffs, and at their other ends to a single take-up device mounted on the helmet. Manual manipulation of the take-up device selectively and simultaneously shortens the extensible length of both cords moving both earmuffs inwardly toward a wearer's ears, adjusting the earmuff seal pressure against the wearer's head and effectuating varying degrees of ambient sound attenuation.

2 Claims, 5 Drawing Figures



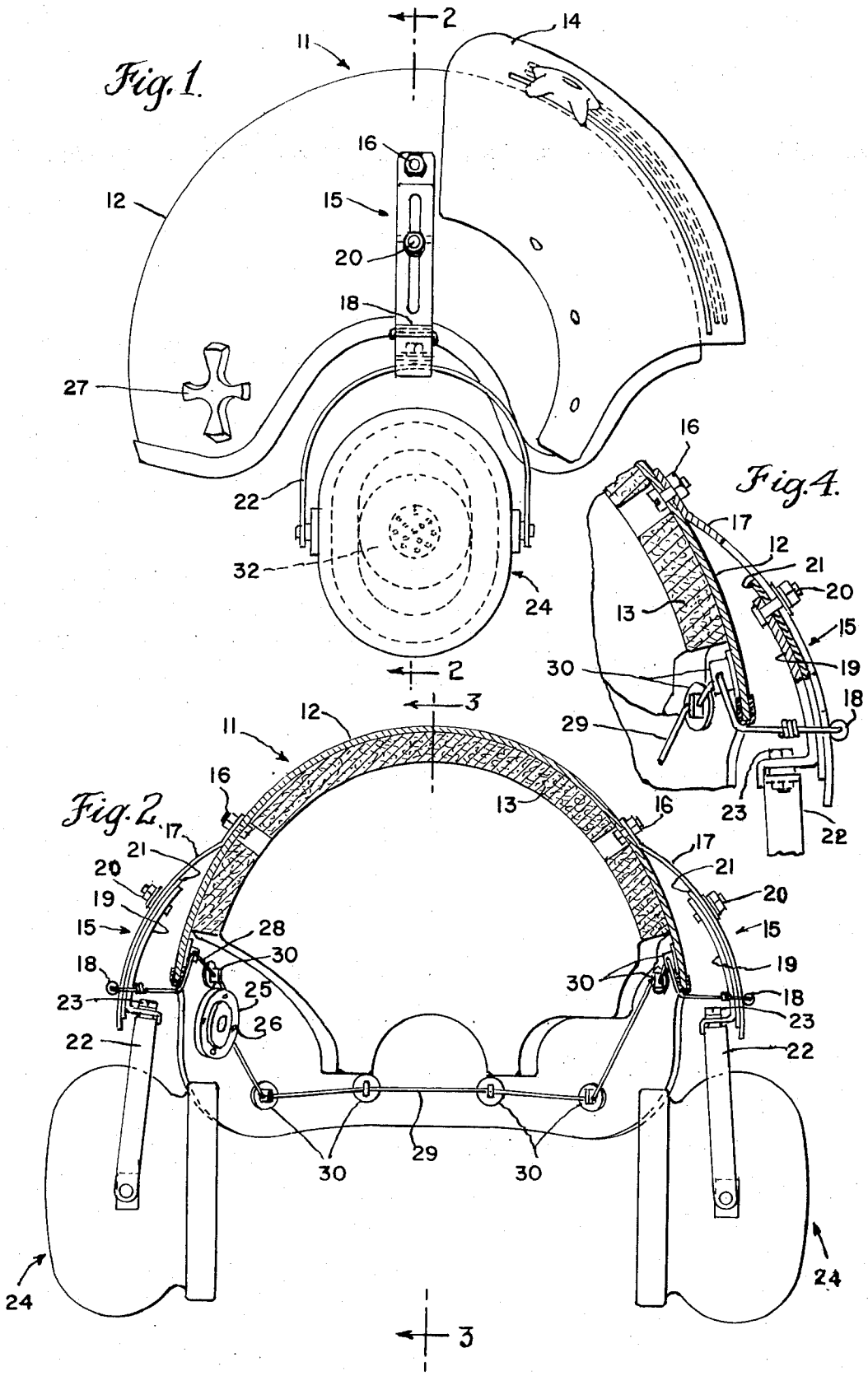


Fig. 3.

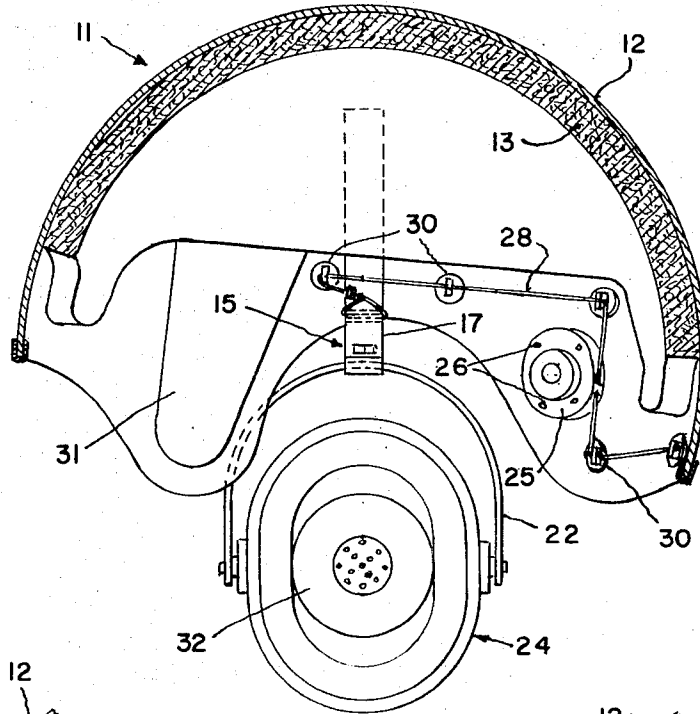
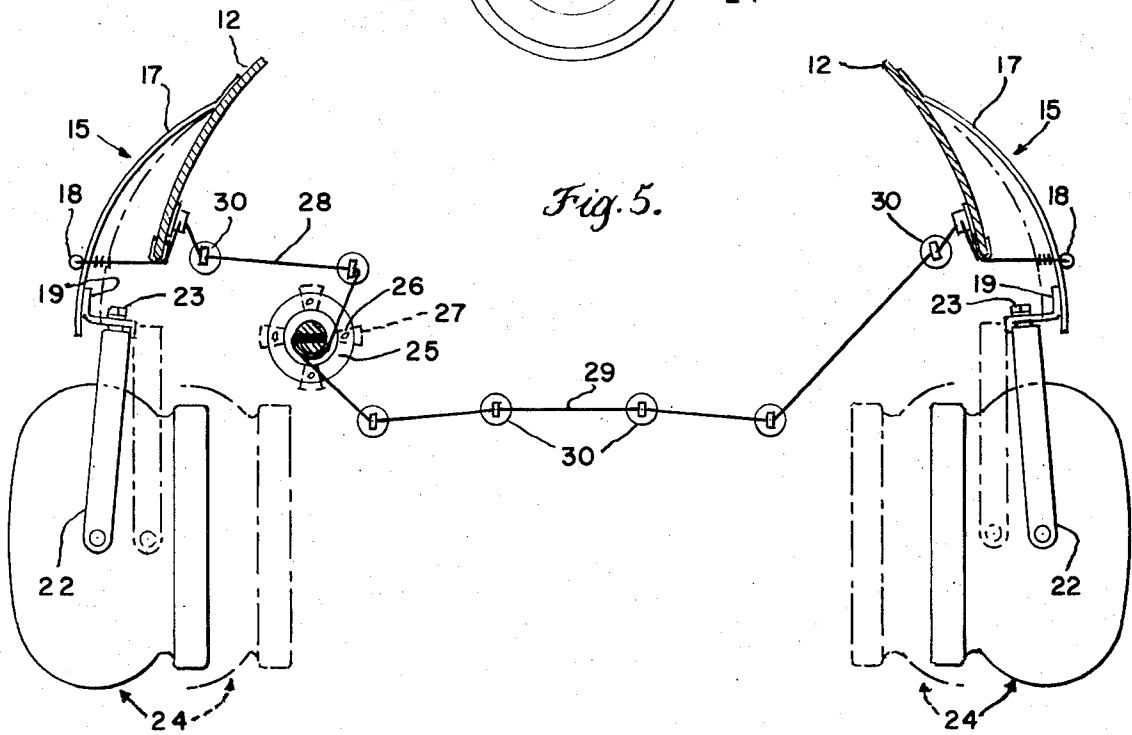


Fig. 5.



ADJUSTABLE EARMUFFS

STATEMENT OF GOVERNMENT INTEREST

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

BACKGROUND OF THE INVENTION

This invention relates generally to the field of headgear and more particularly to improved head coverings containing earmuff pressure adjustment apparatus.

Personnel working in high ambient noise environments, such as in military aircraft, must be protected from possible damage to their ears. They must also generally maintain sound communication with each other and with a remote radio communicator. Typical devices found in the prior art provide some form of adjustable sound attenuation, including removable earmuff attachments for safety helmets and enclosed sound attenuators for various types of aviators's headgear. Among the problems encountered in the various prior art devices is the inability to simply and quickly adjust earmuff seal pressure against the side of the wearer's head by a single quick manipulation. Selective adjustment of earmuff seal pressure is generally accomplished by individual adjustment at each earmuff.

SUMMARY OF THE INVENTION

Accordingly, it is a general purpose and object of the present invention to provide simple, inexpensive, lightweight, efficient, fast, simultaneous selective means for adjusting earmuff seal pressure against a wearer's head.

These and other objects are accomplished according to the present invention by a cord adjustment system mounted in a helmet connected to a take-up reel adjustable from outside of the helmet by the rotation of a single member. Two individual cords attached at their one ends to the take-up reel and at their other ends to respective earmuff mounting supports containing the individual earmuffs are shortened by rotating the outside reel adjustment member producing an inward force and urging the cantilevered spring supports in a laterally inwardly direction toward the wearer's ears effecting a tight seal against the side of the head. The reel maintains the selected tension on the respective cords, thus maintaining constant pressure of the earmuffs against the wearer's head. Disengagement of the earmuffs is accomplished by rotating the reel adjustment member in the opposite direction lengthening the respective cords and removing the inward force on the supports which are biased outwardly away from the wearer's ears by the spring supports.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation view of a safety helmet with ear protecting muffs and supporting structure according to the invention;

FIG. 2 is a cross-sectional view taken on the line 2—2 of FIG. 1 with the earmuffs and supporting structure shown in front elevation;

FIG. 3 is a cross-sectional view taken on the line 3—3 of FIG. 2;

FIG. 4 is an enlarged fragmentary sectional view of the earmuff supporting structure of FIG. 2; and

FIG. 5 is a diagrammatic developed view of an earmuff adjusting cord system constructed according to

the invention showing two positions of the earmuff and supporting structure.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1-5, inclusive, a safety helmet 11 is shown comprising a hard protective outer shell 12, such as constructed of hard plastic or a similar material, and an insert 13 epoxied thereto to provide the wearer safety from sudden shock or impact forces. Insert 13 can be made of any impact absorbing material such as rubber, foam, composition material or the like. A pair of foam rubber inserts 31 are epoxied to shell 12 to protect the wearer's temples. Attached to helmet 11 is a visor guard 14 containing slidably eye protective visors not shown. A pair of earmuff support structures 15 are each similarly attached to opposite sides of shell 12 by an appropriate fastener 16, such as a self-locking nut and bolt arrangement. As shown more clearly in FIG. 4, support structure 15 comprises a first arcuate cantilever spring bracket 17 having a hollow, cylindrical ferrule 18 attached transverse to the longitudinal axis of bracket 17 near its distal end. A second arcuate bracket 19 is fastened to bracket 17 by a fastener 20, such as a self-locking nut and bolt, with an arcuate spacer 21 of a nonconducting material sandwiched between brackets 17 and 19 for providing complete electrical isolation therebetween. A gimbal 22 is attached to bracket 19 by a fastener 23, such as a self-locking nut and bolt, and depends therefrom pivotally containing an earmuff 24. Mounted within earmuff 24 is a speaker 32 for providing the wearer with sound communication from a remote source, such as by radio communication. A take-up reel 25, utilizing internal friction to maintain a rotational position is mounted on the inside of shell 12 by appropriate fasteners such as screws 26. A reel adjustment member 27 disposed on the outside of helmet 11 is connected by a common shaft to reel 25, and can be easily rotated by the wearer to wind a pair of cords 28 and 29 around a drum within reel 25 not shown. Cords 28 and 29 may alternatively be comprised of cable, string, wire or the like and should be capable of some degree of stretch. Cord 28 is routed through a plurality of guide rings 30 to the right earmuff support structure, and cord 29 is similarly routed through guide rings 30 to the left earmuff support structure, as is more clearly shown in FIG. 5. Cords 28 and 29 are routed around respective brackets 17 through ferrules 18 and are secured in any convenient manner to form a fixed loop therearound.

In operation the wearer can select the desired amount of earmuff seal pressure against the side of his head by rotating adjustment member 27 on the outside of his helmet until a comfortable fit is achieved. Rotation of member 27 in either direction from a neutral position causes internal rotation of a shaft in reel 25 (not shown) having the one ends of cords 28 and 29 secured thereto and resulting in a shortening of their extensible lengths. Shortening of cords 28 and 29 causes them to exert an inward force on respective brackets 17, pulling them inwardly against the natural outward cantilever spring force of brackets 17 from a neutral position and causing earmuffs 24 to move inwardly as depicted in FIG. 5. In this manner, earmuff pressure can be selectively adjusted by the wearer to provide that degree of comfort and sound attenuation necessary in any noise environment encountered. Rotating

adjustment member 27 in the opposite direction causes the shaft in reel 25 (not shown) to rotate in the opposite direction unwinding cords 28 and 29 and increasing their extensible length. Increasing the cord length removes the inward force on respective brackets 17 allowing their natural outward spring force to return them to the neutral position and moving earmuffs 24 away from the wearer's head. By the simple manipulation of adjustment member 27 the wearer can intermittently select that amount of pressure which is most comfortable and provides the desired amount of sound attenuation. It should be pointed out that reel 25 used in the present embodiment of the invention is but a single means for increasing or decreasing the lengths of cords 28 and 29. Any suitable take-up device could be substituted for reel 25 without departing from the scope and spirit of the present invention.

It should be noted that the sound attenuation system described herein need not be mounted to a hard helmet as shown in the accompanying drawings. The system as described herein can be constructed independent of a helmet hard shell by suspending the earmuffs from a mounting device such as an appropriate strap fitting over the head on which reel 25, reel adjustment member 27 and guide rings 30 are also mounted. Operation of the system would take place in the same manner as described hereinbefore.

Some of the many advantages of the present invention should now be readily apparent. The wearer can vary the amount of sound attenuation to obtain a greater degree of earmuff effectiveness at such critical times as communicating in an aircraft during landing, takeoff, combat and emergency procedures. Earmuffs can be flown loose when not in use and easily tightened

by a single manipulation of the accessible adjustment member when needed. Additional benefits of the present invention include its light weight, relatively low cost to make, high efficiency and simple earmuff seal design for most applications.

Obviously many modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. Headgear comprising, in combination; a helmet; a pair of ear covers formed to encompass the ears; a pair of resilient support means mounted on said helmet each containing one of said ear covers for juxtapositioning said ear covers adjacent to respective ones of the ears; and adjustment means for simultaneously pulling said ear covers toward the ears including take-up means operatively mounted on said helmet, guide means fixed to the inside of said helmet between said take-up means and said support means, and a pair of cords threaded through said guide means fixed at their respective one ends to said take-up means and extending laterally outward from said helmet, fixedly terminating at their respective other ends at respective ones of said support means.

2. Headgear as set forth in claim 1, further comprising: said take-up means being disposed on the inside of said helmet and having a member disposed on the outside of said helmet communicating therewith for winding said cord on said take-up means.

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