

Jan. 28, 1969

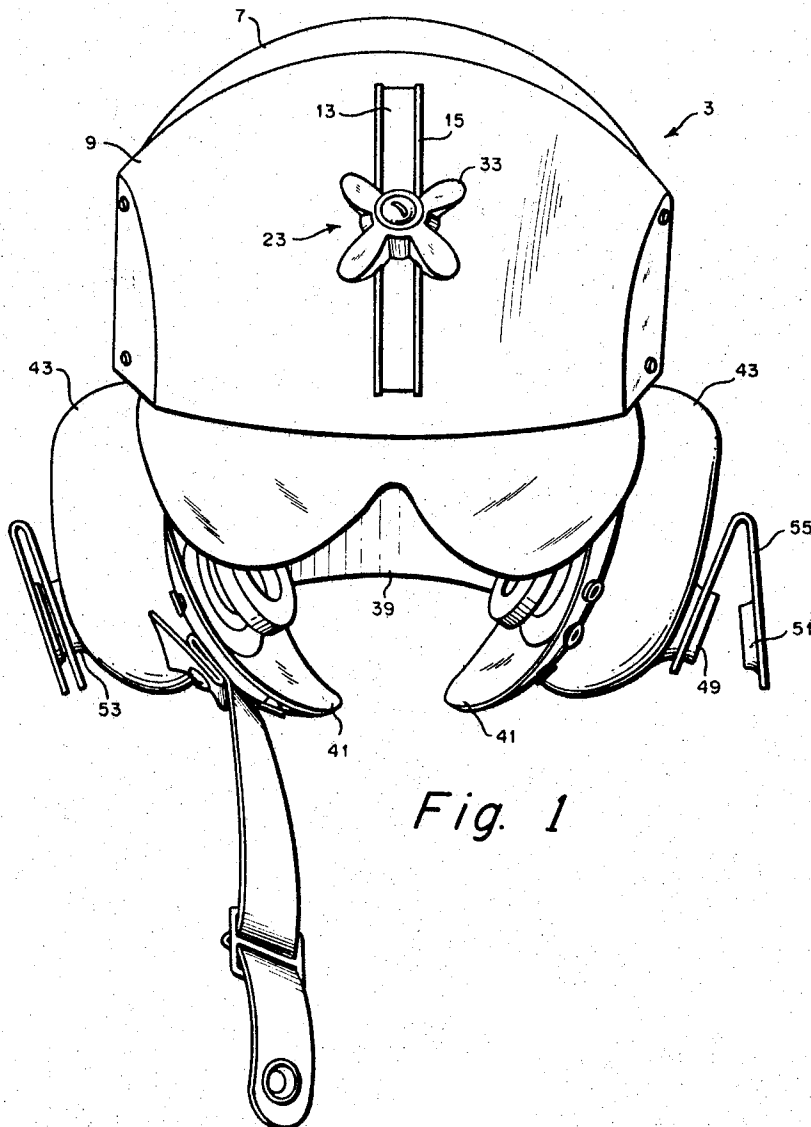
F. A. CATROPPA ETAL

3,423,759

PROTECTIVE AND SOUND ATTENUATION HELMET

Filed Nov. 25, 1966

Sheet 1 of 2



INVENTORS
FRANK A. CATROPPA
SIDNEY HIRSCH
BY
Arthur L. Balline
ATTORNEY

Jan. 28, 1969

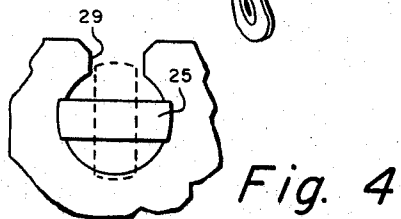
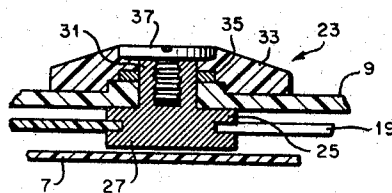
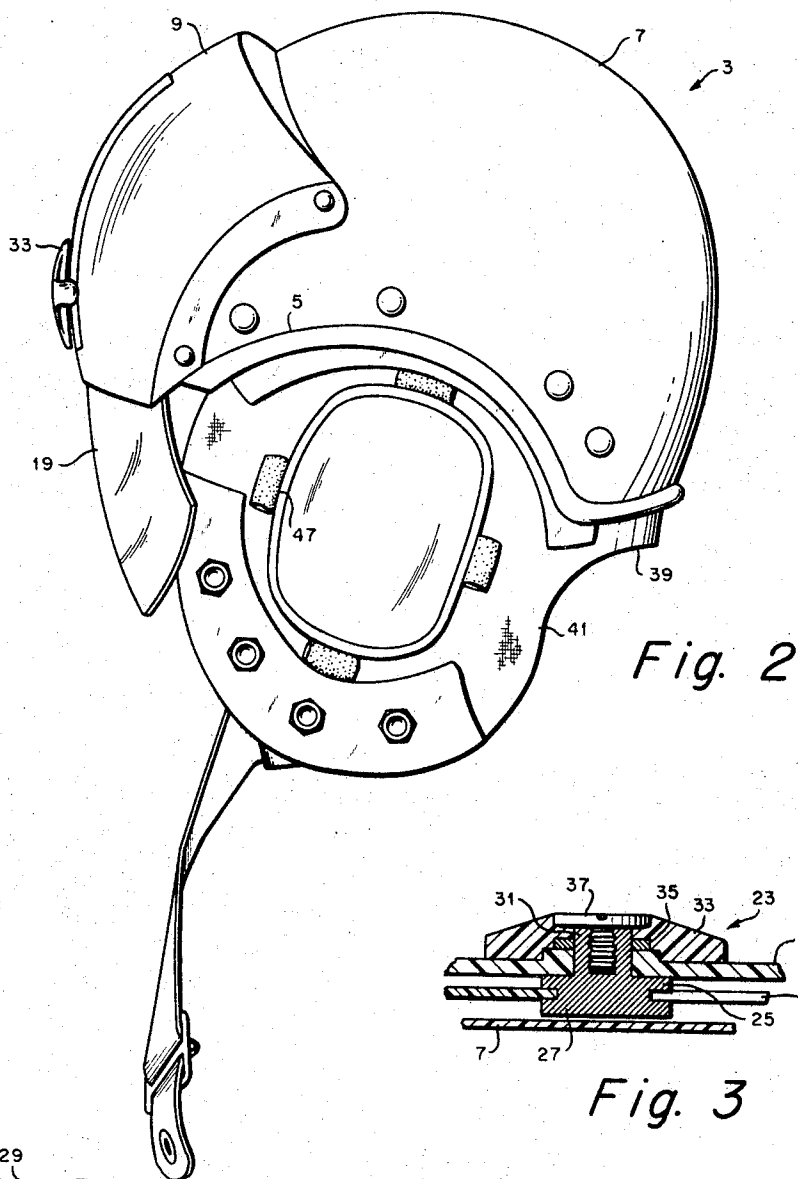
F. A. CATROPPA ETAL

3,423,759

PROTECTIVE AND SOUND ATTENUATION HELMET

Filed Nov. 25, 1966

Sheet 2 of 2



INVENTORS
FRANK A. CATROPPA
SIDNEY HIRSCH

BY

Arthur L. Bolline
ATTORNEY

1

3,423,759

PROTECTIVE AND SOUND ATTENUATION HELMET

Frank A. Catroppa, Philadelphia, and Sidney Hirsch,
Elkins Park, Pa., assignors to the United States of
America as represented by the Secretary of the
Navy

Filed Nov. 25, 1966 Ser. No. 597,138

U.S. Cl. 2—6

Int. Cl. A42b 3/02, 1/06

1 Claim

ABSTRACT OF THE DISCLOSURE

The present invention relates to a novel and improved protective helmet that can be readily and effectively adapted to selectively exclude external environmental noise. The improved helmet includes a hard outer shell of Fiberglas or other suitable material, an inner energy absorbent shell, a headband liner which is secured to the inner surface of the energy absorbing shell and which includes annular portions that extend downwardly about the ear area of the wearer, and ear cups which are removably secured in the aperture of each annular ear portion of the liner and which include a relief port that is selectively opened or closed to the exterior environment.

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 therein or therefor.

Prolonged exposure to high levels of background and environmental noise often become highly distracting and unbearable in the performance of complicated, technical and exacting tasks. This is particularly the case for pilots of helicopters and other types of aircraft. Although various types of protective helmets have been devised in the past, considerable difficulty has been experienced heretofore in providing a noise attenuating protective helmet which is relatively simple in design and yet highly reliable and effective in operation.

It is therefore a principal object of the present invention to provide a novel and improved helmet which incorporates the important protective features of presently used helmets and at the same time provides selective sound attenuation control.

It is a further object of the invention to provide a novel and improved protective aircraft helmet having noise attenuating earcups that can readily be detached from the helmet assembly when environmental noise levels are not objectionable.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawing wherein:

FIG. 1 is a frontal perspective view of a preferred embodiment of the present invention.

FIG. 2 is a side perspective view of the embodiment of the invention shown in FIG. 1 with the visor in its lowered eye shielding position and with one earflap and earcup removed;

FIG. 3 is a cross-sectional view of the visor control knob shown in FIGS. 1 and 2; and

FIG. 4 is a view which illustrates the manner in which the control knob of FIGS. 1 and 2 is removably secured to the eye shielding visor.

Referring now to the various figures of the drawing, it will be noted that the improved protective helmet 3 of the present invention is generally hemispherical in shape

2

with portions cut away as at 5 on its opposite sides about the ears of the pilot or person wearing the helmet. The outer protective shell 7 of the helmet is preferably constructed of a hard fiberglass reinforced plastic or resinous substance or any other suitable material. An inner shell which is preferably constructed of a styrofoam energy adsorbent material is secured to the inner peripheral surface of the outer shell 7 in any suitable conventional manner. The nylon injection molded visor cover 9 is mounted on the exterior surface of the shell 7 and spaced therefrom by visor track members which are secured to and extend along the outer surface of shell 7 generally upwardly and rearwardly from opposite sides of the temple protection area of the helmet. The upper edge of the visor cover 9 is preferably curved inwardly so as to engage the outer surface of the helmet shell 7 and thereby form a narrow enclosure between the shell 7 and the visor cover 9. The slot 13 in the visor cover 9 extends upwardly and rearwardly from a centrally located point above the lower edge of the cover. The thickness of the visor cover about the edge of the slot 13 is preferably increased as shown at 15. As will be more apparent hereinafter, this increased thickness of the visor cover 9 about slot 13 minimizes damage to the cover as the visor slide 23 is operated back and forth therein. Opposite flanged edges of the transparent visor 19 are slidably disposed in grooves 21 in the track members such that the visor is movable between a fully retracted position within the enclosure between the shell 7 and the visor cover 9 and a position in which it extends downwardly from the enclosure in front of the eyes of the pilot.

The visor locking mechanism and slide 23 is removably secured to the visor 19 between its oblong lower extremity 25 and its juxtaposed flange portion 27 in a keyhole shaped notch 29 that extends downwardly from the upper edge of the visor 19. Thus, the slide 23 is securely attached to the visor 19 when its oblong extremity is oriented at right angles to the axis of keyhole notch 29 and is readily detached from the visor when the oblong extremity is aligned with the axis of notch 29. The stem 31 which extends upwardly from the oblong extremity 25 through slot 13 in visor cover 9 is preferably rectangular in cross-section so as to engage opposite sides of the embossed slot 13 as it moves up and down therealong. The upper end of stem 31 is externally threaded to receive the complementary threads of the slide locking button or knob 33. The lower surface of knob 33 is preferably generally concave in contour so as to readily engage the outer surface of the visor cover 9 when knob 33 is screwed downwardly on stem 31. The nylon washer or the like 35 is preferably positioned on stem 31 between the embossed slot 13 in cover 9 and knob 33. The upper end of stem 31 is also internally threaded to receive the locking screw or the like 37 which normally prevents removal of knob 33 from stem 31.

The conventional adjustable headband 39 is secured to the inner surface of shell 7 of the helmet 3 in any suitable manner and includes the annular downwardly extending earflap portions 41. The earcups 43 are removably positioned in the openings 45 in the earflap portions 41 preferably by the hook and pile fastening devices 47. Sound absorbing foam material or the like is secured to and lines the inner peripheral surface of each earcup. The sound attenuation relief port 49, which is formed in each earcup 43, is opened or closed at the discretion of the pilot by placement or removal of the plastic cap or the like 51 on or off the earcup projection 53 that defines the port. The elongated flexible extension 55 on each cap 51 is adapted as shown to be secured about the relief port projection 53 in order to minimize the possibility of misplacing or losing the cap.

3

In the operation and use of the helmet 3, the visor 19 is moved upwardly and downwardly in the grooves of track members that space the visor cover 9 from the helmet shell 7 between its fully retracted position within the protective enclosure 9 and its eye shielding position in front of the eyes of the pilot. In so doing, the rectangularly contoured stem of slide 31 readily rides up and down in the embossed slot 13 without injury or damage to the visor cover 9. The slide 23 and the attached visor 19 are locked in any selected position along the slot 13 by tightening the button or knob 33 down on stem 31 and thereby clamping the visor cover 9 between the flanged portion of slide 23 and the concave lower surface of knob 33. When the pilot desires to exclude or attenuate environmental noise, he inserts and fastens the earcups 43 in the earflaps of the helmet by means of the hook and pile fastener devices 47. Removal or placement of the caps 51 over the earcup relief ports 49 permits ready partial restoration of ear contact with the external environment.

Obviously, many modifications and variations of the present invention are possible in the 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. A protective helmet for an aircraft pilot comprising:
 - (a) a hard Fiberglas shell that is contoured to fit over the pilot's head;
 - (b) a layer of energy absorbent material secured to the inner surface of the Fiberglas shell;

4

- (c) a headband liner secured to the inner surface of the layer of energy absorbent material, said headband liner including generally annular portions that extend downwardly about the ears of the pilot;
- (d) an ear cup removably secured within each annular portion of the headband liner by means of a plurality of hook and pile fastening devices, each said ear cup having a sound relief port therein;
- (e) a sound absorbing foam liner secured to the inner peripheral surface of each ear cup;
- (f) and a removable cap which normally closes the sound relief port in each ear cup and which includes a projecting tab that is secured to the ear cup about the sound relief port therein.

References Cited

UNITED STATES PATENTS

1,354,524	10/1920	Timmons	2—6
2,286,843	6/1942	Catalane et al.	2—3
2,902,692	9/1959	Christy et al.	2—3
3,005,203	10/1961	Aileo	2—3
3,262,125	7/1966	Bowen	2—6
3,335,720	8/1967	Aileo	2—6 XR

FOREIGN PATENTS

1,259,571	3/1961	France.
-----------	--------	---------

JAMES R. BOLER, *Primary Examiner.*

U.S. Cl. X.R.

2—209