

April 10, 1962

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3,028,602

HELMET HEAD POSITIONER

Filed Dec. 19, 1960

3 Sheets-Sheet 1

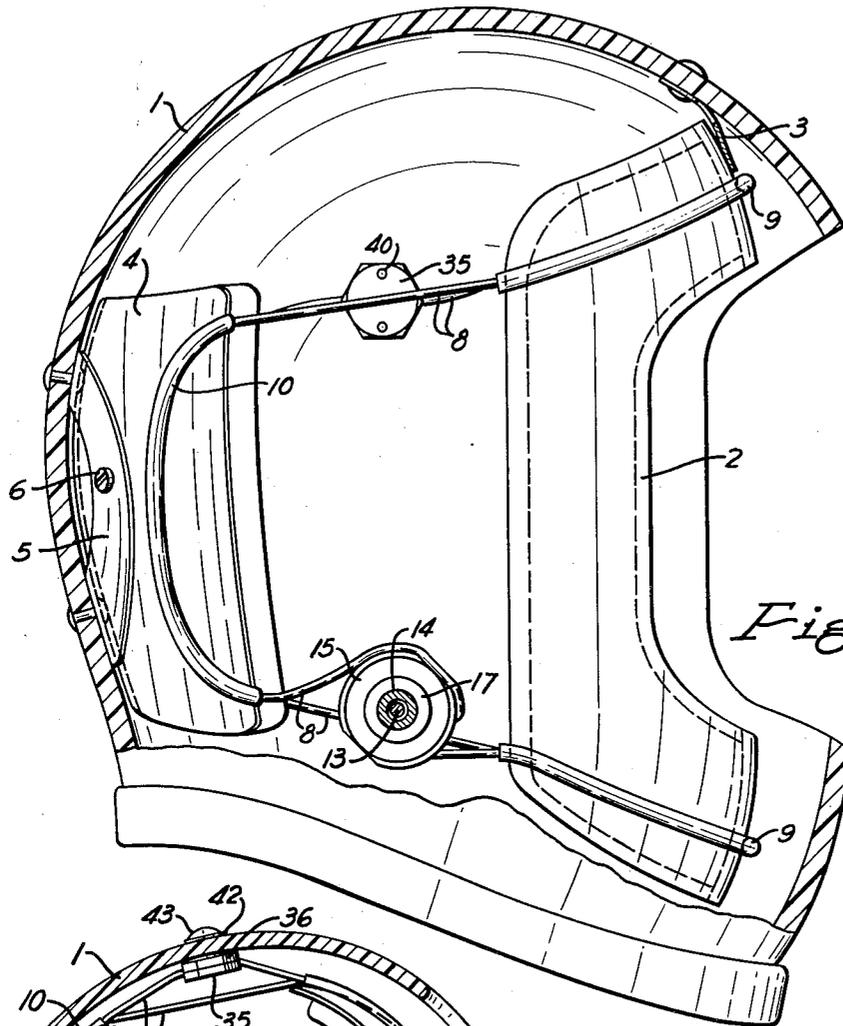


Fig. 1

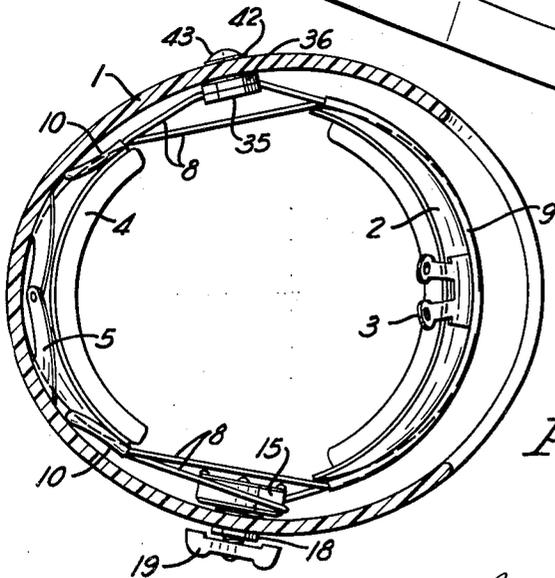


Fig. 2

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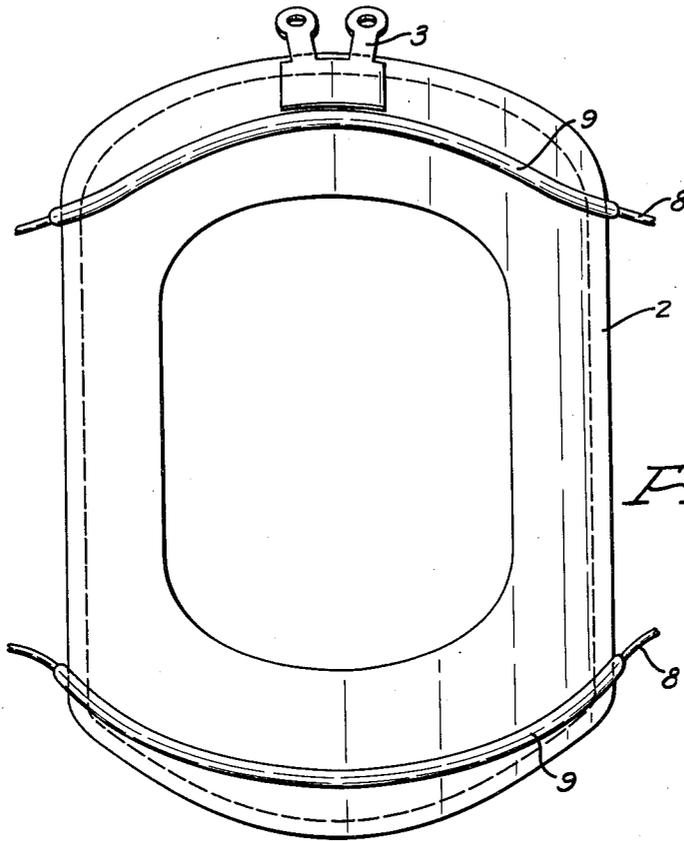
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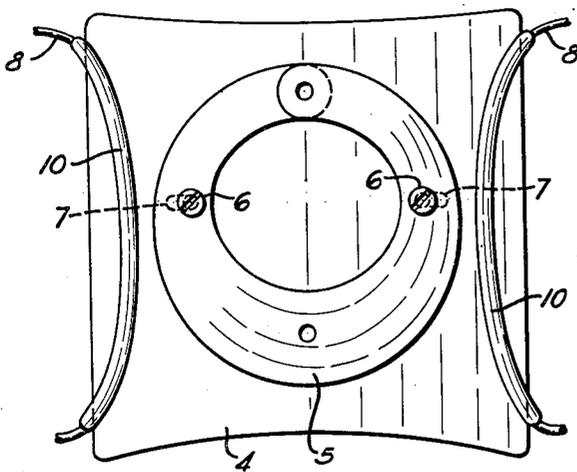
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3 Sheets-Sheet 2



*Fig. 3*



*Fig. 4*

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3 Sheets-Sheet 3

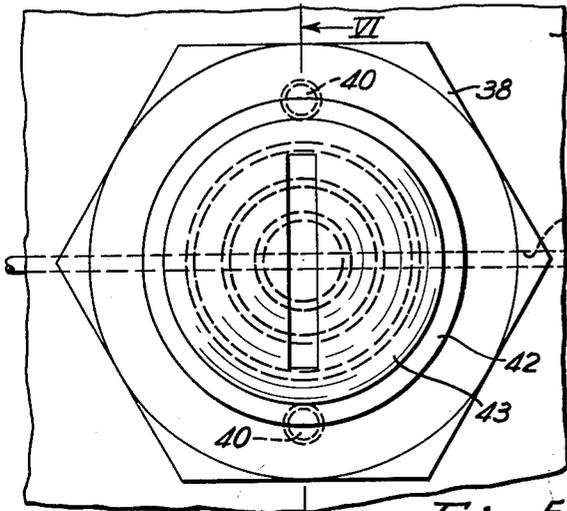


Fig. 5

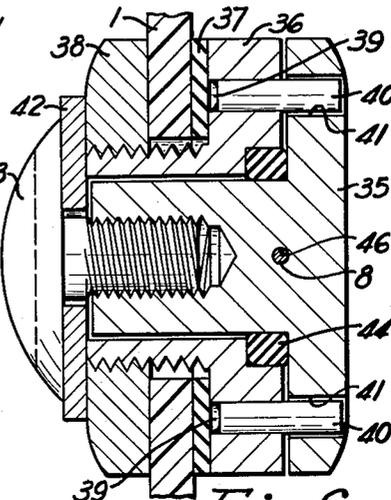


Fig. 6

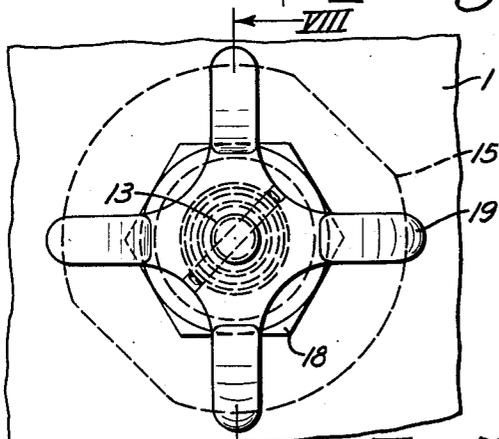


Fig. 7

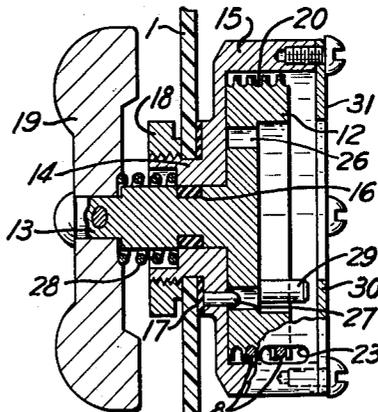


Fig. 8

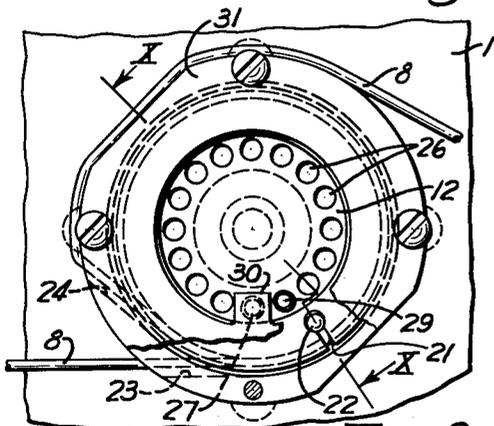


Fig. 9

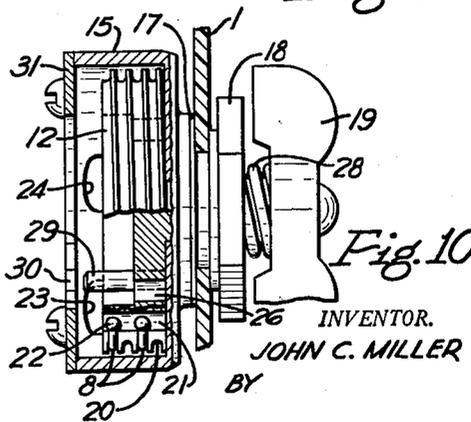


Fig. 10

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1

3,028,602

**HELMET HEAD POSITIONER**

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 Filed Dec. 19, 1960, Ser. No. 76,804  
 3 Claims. (Cl. 2—6)

This invention relates to helmets for aviators and the like, and more particularly to means for positioning the head in such a helmet.

In a pressure helmet for aviators or for other similar uses, minimum size is desirable. Also, the head should be maintained as comfortably as possible in a substantially fixed position relative to the helmet in order to provide minimum slack when head movements are required to move the helmet relative to the pressure suit, and to reduce likelihood of impingement of the helmet against the face or transmission of impacts to the head. It has been found most practical to position a head in a helmet of this nature by use of pads bearing on the top, back and sides of the head and by a padded frame surrounding the face. In order to introduce the head into such a helmet it is necessary to make the face frame and the back pad movable so that they can be spread farther apart while the helmet is being applied to or removed from the head. After application, the pads are tightened against the head, but heretofore the head could move the pads too much relative to the helmet.

It is among the objects of this invention to provide a helmet, in which face pad and back of the head pad can be adjusted toward and away from each other, and in which after adjustment against the head the pads can be held in substantially fixed position relative to the surrounding helmet.

In accordance with this invention a padded face-fitting frame and a head-fitting pad are flexibly mounted in the front and back of a helmet, respectively. Slidably connected to spaced edges of the frame and pad is a cord that has vertically spaced portions between those two members at each side of the helmet. One of those portions includes the opposite ends of the cord. Attached to those ends is a take-up drum that is journaled in the adjacent side of the helmet where it can be turned from the outside in order to tighten the cord and thereby pull the frame and pad toward each other. A locking member is mounted in the opposite side of the helmet and slidably receives an adjacent portion of the cord. After the cord has been tightened by the drum, the locking member is clamped to the cord by means operable from outside of the helmet. The cord is thus anchored by the locking member and the take-up drum to both sides of the helmet, so that movement between the head and helmet will be restrained.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which

FIG. 1 is a side view, partly broken away, of a helmet containing head positioning means;

FIG. 2 is a reduced horizontal section through the helmet showing the positioning means in place;

FIG. 3 is a front view of the face frame;

FIG. 4 is a rear view of the head pad;

FIG. 5 is an enlarged outer end view of the cord-locking member;

FIG. 6 is a vertical section taken on the line VI—VI of FIG. 5;

FIG. 7 is an enlarged outer end view of the cord take-up device;

FIG. 8 is a vertical section taken on the line VIII—VIII of FIG. 7;

FIG. 9 is a view of the inner end of the take-up device; and

2

FIG. 10 is a transverse section taken on the line X—X of FIG. 9.

Referring to FIGS. 1 to 4 of the drawings, a bare helmet shell 1, without the lens and usual top and side pads, is shown provided with head-positioning means according to this invention. The positioning means include a front pad in the form of a frame 2 designed to fit around the face. The frame is flexibly connected to the helmet by means of a resilient sheet metal bracket 3 secured to the upper part of the frame and riveted to the top of the helmet. At the back of the helmet there is a generally rectangular pad 4 intended to fit against the back of the head. This pad is secured to a circular sheet metal spring 5 by means of fasteners 6 slidably mounted in horizontal slots 7 in the rigid back of the pad. The top and bottom of the spring are riveted to the back of the helmet. The face frame and head pad have spaced edges provided with passages or tunnels for a cable or cord 8. Preferably, the tunnels 9 for the frame extend across the front of its upper and lower portions, and the tunnels 10 for the back pad extend up and down along its opposite sides. The cord starts between the two pads, most conveniently near their bottoms at the right-hand side of the helmet. From there it extends forward through the lower front tunnel 9, back to the lower end of the left-hand back tunnel 10 and up through it, then forward and through the upper front tunnel, back to the upper end of the right-hand rear tunnel and down through it and forward. Therefore, there are vertically spaced portions of the cord at each side of the helmet between the two pads, and one of these portions includes the two opposite ends of the cord.

The ends of the cord are connected to a take-up drum so that the wearer can shorten the cord in order to draw the two pads against his head. As shown in FIGS. 7 to 10, the take-up drum 12 is provided with a central outwardly extending shaft 13 that is rotatably mounted in a hub 14 projecting through the side of the helmet from a cup-like housing 15 that encircles the drum. A sealing ring 16 encircles the shaft inside the hub. The housing is clamped against the helmet and a sealing gasket 17 by a nut 18 screwed onto the outer end of the hub. A knob 19 is rigidly mounted on the outer end of the drum shaft for turning it. The periphery of the drum is provided with a helical groove 20 and with a cross slot 21 (FIGS. 9 and 10) that has a restricted side that opens into the inside of the groove. Enlarged ends 22 on the cord are inserted in the slot, and the cord is led forward away from the slot through laterally spaced areas of the groove and through slots 23 and 24 (FIG. 9) in the side wall of the housing. It will be seen that by turning the knob clockwise, FIG. 7, the end portions of the cord can be wound around the drum in groove 20.

To lock the drum in any desired position, it is provided with a plurality of circumferentially spaced holes 26 parallel to its axis adapted to receive a pin 27 mounted in the adjoining side of housing 15. The drum and pin normally are held together by a coil spring 28 encircling shaft 13 and compressed between the knob and the housing hub. When it is desired to turn the drum, the knob is pushed inward to disengage the drum from the pin, whereupon the drum can be rotated. When the knob is released, the spring will move one of the drum holes 26 out around the pin and thereby prevent the drum from turning back. As shown in FIG. 10, the drum is provided with an inwardly projecting pin 29 that will strike the side of a radial tab 30 on an annular cover 31 for the housing in case the knob is pushed in and an attempt is made to turn it the wrong way from its unwound position.

In fitting the helmet to a head, the take-up drum 12

is turned clockwise to wind the cord on it in order to pull the face frame and the head pad toward each other and tightly against the head. The cord can slip in the tunnels 9 and 10 of the frame and pad during this adjustment so that the pads will not be pulled sideways out of position relative to each other. However, if the cord were connected to the helmet only at the drum, the head could move the pads considerably without moving the helmet, which would be objectionable.

It therefore is a feature of this invention that after the cord has been tightened by the take-up drum, a portion of the cord at the opposite side of the helmet can be secured to the helmet so that the head cannot move the pads appreciably without the helmet moving with them. For this purpose, a locking member is provided which preferably is located at the elevation of the upper portion of the cord at said opposite side of the helmet. As shown in FIGS. 5 and 6, the locking member 35 is slidably mounted in a tubular fitting that is rigidly mounted in the side of the helmet. The tubular fitting includes a hollow bolt 36 that extends outward through a hole in the helmet, with the head of the bolt clamped against a sealing gasket 37 by means of a nut 38 on the outer end of the bolt. The head of the bolt is provided with a pair of diametrically spaced holes 39, in which inwardly projecting pins 40 are rigidly mounted. The pins extend loosely into holes 41 through the head of the locking member overlapping the head of the bolt. The pins prevent the locking member from rotating in the bolt. A washer 42 bears against nut 38, and a screw 43 extends through the washer and is threaded into the locking member. By tightening the screw, the locking member can be pulled outwardly in the hollow bolt. The latter is provided with an annular recess at its inner end containing a gasket 44 which engages the head of the locking member to seal the space between them.

Extending transversely through locking member 35 close to its head is a passage 46, through which the adjoining portion of cord 8 extends. While the adjusting screw 43 is loose the cord can slide through the locking member as the take-up drum is turned to shorten the cord. After that, the screw is tightened to clamp the cord against the fitting. Preferably, gasket 44 projects from the hollow bolt so that the cord will be clamped between the head of the locking member and the gasket and therefore will not be in any danger of being cut by sharp edges of any of the metal members. After the locking member has clamped the cord tightly in place, it is not necessary to touch the locking member again unless it is desired to change the adjustment of the head positioner. To remove the helmet, it is only necessary to release the take-up drum so that the frame and pad can move away from each other as the helmet is lifted off the head.

I claim:

1. The combination with a helmet, of a face-fitting frame in the front of the helmet, a head-fitting pad in the back of the helmet, means flexibly connecting said frame and pad to the helmet, a cord slidably connected to spaced edges of the frame and pad and having vertically spaced portions between the frame and pad at both sides of the helmet, one of said portions including the opposite ends of the cord, a take-up drum attached to

said opposite ends and journaled in the adjacent side of the helmet, means outside the helmet for turning the drum to tighten the cord and thereby pull the frame and pad toward each other, a locking member mounted in the opposite side of the helmet and slidably receiving one of said portions of the cord, and means outside the helmet for clamping said member to the cord after the cord has been tightened by the drum, whereby the cord will be anchored to both sides of the helmet.

2. The combination with a helmet, of a face-fitting frame in the front of the helmet, a head-fitting pad in the back of the helmet, means flexibly connecting said frame and pad to the helmet, a cord slidably connected to spaced edges of the frame and pad and having vertically spaced portions between the frame and pad at both sides of the helmet, one of said portions including the opposite ends of the cord, a take-up drum attached to said opposite ends and journaled in the adjacent side of the helmet, means outside the helmet for turning the drum to tighten the cord and thereby pull the frame and pad toward each other, a tubular fitting mounted in the opposite side of the helmet beside one of said portions of the cord, a locking member slidably mounted in said fitting and having a portion inside the helmet provided with a transverse passage adjacent the inner end of the fitting slidably receiving an adjacent portion of the cord, the locking member being provided with a head overlapping the inner end of the fitting, and means outside the helmet for pulling the locking member outward to clamp said adjacent portion of the cord against the fitting after the cord has been tightened by the drum, whereby the cord will be anchored to both sides of the helmet.

3. The combination with a helmet, of a face-fitting frame in the front of the helmet, a head-fitting pad in the back of the helmet, means flexibly connecting said frame and pad to the helmet, a cord slidably connected to spaced edges of the frame and pad and having vertically spaced portions between the frame and pad at both sides of the helmet, one of said portions including the opposite ends of the cord, a take-up drum attached to said opposite ends and journaled in the adjacent side of the helmet, means outside the helmet for turning the drum to tighten the cord and thereby pull the frame and pad toward each other, a tubular member rigidly mounted in the opposite side of the helmet beside one of said portions of the cord, the inner end of said member being provided with an annular groove, a gasket disposed in said groove, a locking member slidably mounted in said fitting and having a portion inside the helmet provided with a transverse passage adjacent said gasket slidably receiving an adjacent portion of the cord, the locking member having a head overlapping the gasket, and means outside the helmet for pulling the locking member outward to clamp said adjacent portion of the cord against the gasket after the cord has been tightened by the drum, whereby the cord will be anchored to both sides of the helmet.

#### References Cited in the file of this patent

#### UNITED STATES PATENTS

2,270,238	Clarke et al. -----	Jan. 20, 1942
2,573,250	Le Grand Daly -----	Oct. 30, 1951
2,739,310	Frieder et al. -----	Mar. 27, 1956