United States Patent

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[54] **HANGING QUICK DONNING MASK SUSPENSION**
7 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **128/146.7**
[51] **Int. Cl.** **A62b 9/04**
[50] **Field of Search** 128/146.7

[56] **References Cited**

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ABSTRACT: A device for one hand donning of a head harness suspending an oxygen breathing mask wherein lateral supports are arcuate in shape to extend well over the ears of the user, even though the user may be wearing earphones, and wherein there is a transverse support or neck piece attached to the rear ends of the lateral support by hinges, the pivot axes of which are disposed at such an angle that the lateral supports can fold toward each other in a flat package and which when opened will assume positions adapted to readily fit over the head. The suspension is adjustable to size by a crown strap attached to midportions of the lateral supports and a rear strap which extends from the crown strap to a point of attachment with the transverse support. The front ends of the lateral support are pivotally connected to the mask so that when collapsed the mask will assume a tilted position improving the compactness of the package but capable of tilting to a proper operating position when the mask is donned.

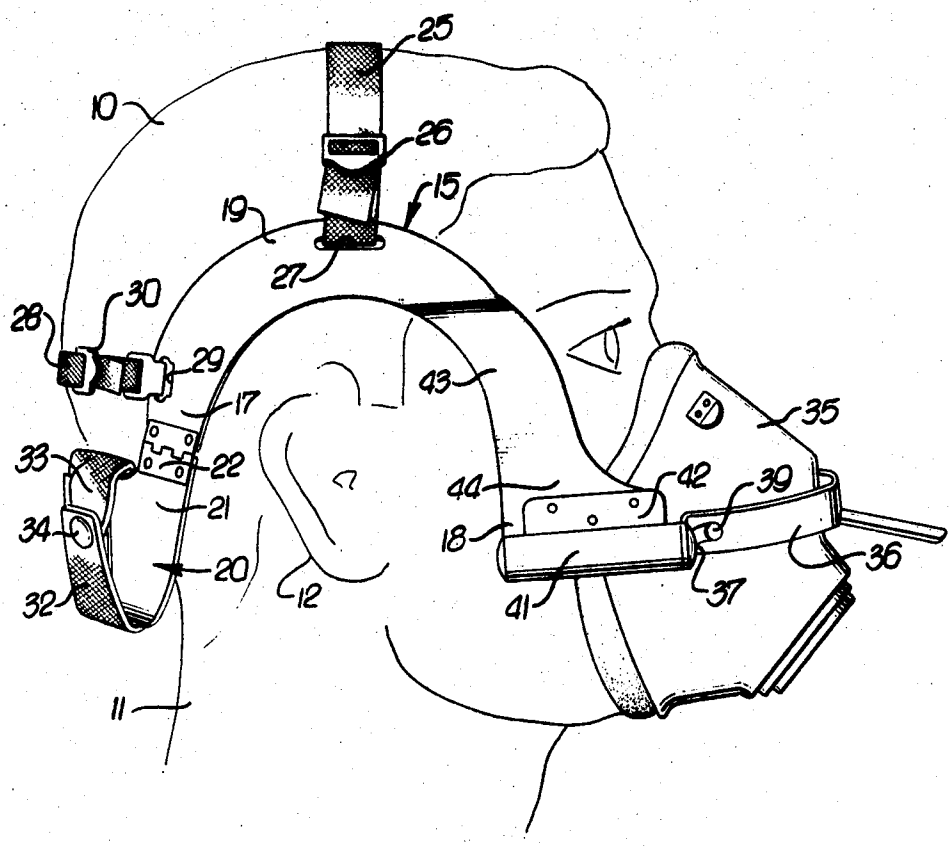


FIG. 1.

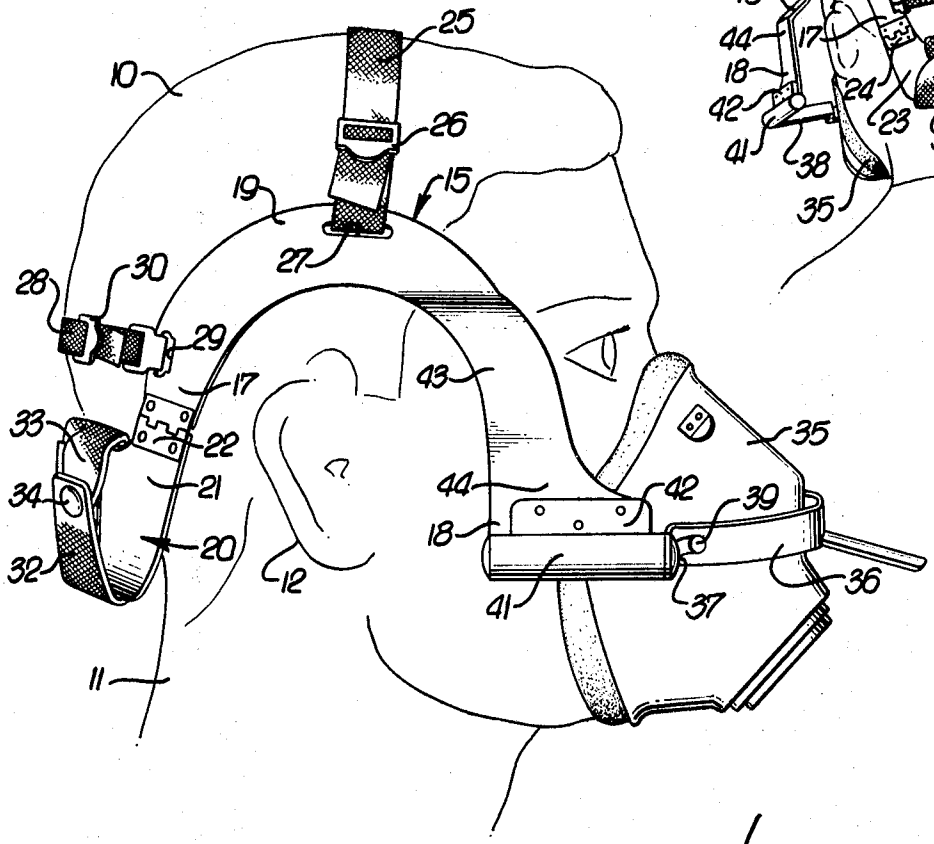


FIG. 2.

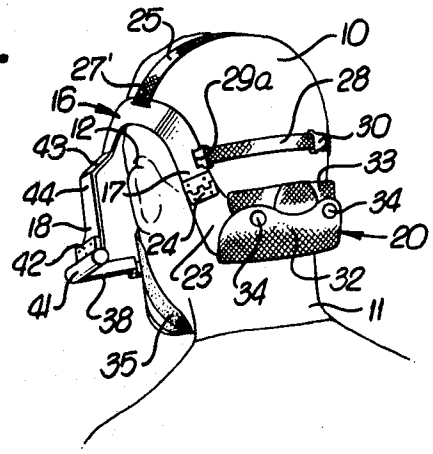


FIG. 3.

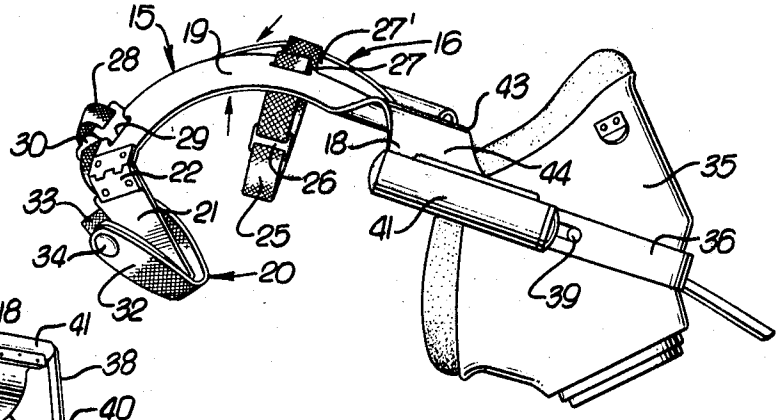
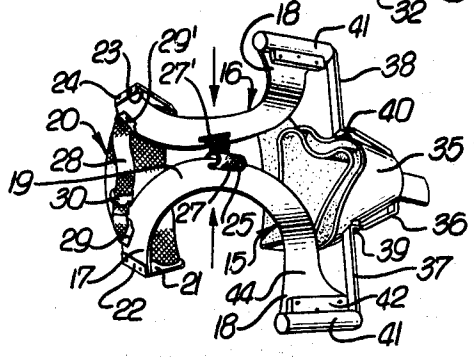


FIG. 4.



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HANGING QUICK DONNING MASK SUSPENSION

The common practice for pilot and crew of an airplane is to operate without a breathing mask because the cabins and cockpits are customarily pressurized to compensate for high altitude flight. There is of course always the prospect of an emergency situation arising wherein it may be necessary for the user to quickly don an oxygen breathing mask. Consequently, each user is provided with a mask designed to fit his head and face and which must be kept handy and within reach so that it can be quickly donned when needed. However necessary it may be to have a mask ready to meet an emergency situation, it cannot be such that when stowed it interferes with the user's freedom in the cockpit of an airplane where space is at a premium and which is crowded with equipment. Mask suspensions which are not collapsible in any way take up entirely too much room when stowed. Even mask suspensions which are partially collapsible tend to take up more room than can properly be sacrificed to them, especially where when collapsed they still occupy appreciable space. Though the mask suspension itself may be capable of being compactly collapsed, when there is a mask attached to the suspension, the mask itself occupies appreciable space and, when it is mounted on the suspension in a position capable of being immediately applied to the face for use, the combination of mask and attached suspension makes an assembly which is particularly difficult to collapse into one small bundle.

It is therefore among the objects of the invention to provide a new and improved quick donning mask and foldable suspension which when folded or collapsed makes a particularly flat package which is easy to stow and unobtrusive, and which is so constructed that as promptly as removed from stowed position, the parts will fall automatically in a donning relationship so that the combination can be quickly applied over the user's head with a single hand operation.

Another object of the invention is to provide a new and improved quick donning mask and foldable suspension assembly which is of such construction that when the assembly is unfolded from a flat compact position to a usable condition, it can be easily donned over the user's head even though the user may be wearing a pair of cumbersome earphones which cannot be removed.

Still another object of the invention is to provide a new and improved quick donning mask and foldable suspension which is constructed of a substantially minimum number of simple parts readily adjustable to fit each individual wearer, few in number so as to make possible a simple inexpensive and well ordered assembly and which are joined together in such fashion that they will fall open automatically to a quick donning position, thereby minimizing the time needed for withdrawing the device from a compactly stowed location and placing it on the user in usable condition.

With these and other objects in view, the invention consists in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claims and illustrated in the accompanying drawings.

In the drawing:

FIG. 1 is a side elevational view of the mask and suspension in extended condition on a user's head with the mask ready for use.

FIG. 2 is a rear elevational view showing the suspension in place.

FIG. 3 is a side elevational view showing the mask and foldable suspension removed from the user's head and folded into a stowing condition.

FIG. 4 is a plan view of the device in the folded condition of FIG. 3.

In an embodiment of the invention chosen for the purpose of illustration there is shown for illustrative purposes the head 10 of a user supported by his neck 11 wherein ears 12 are visible, not covered by earphones but which would normally have earphones in place under conditions wherein the quick donning mask and foldable suspension would be worn.

The foldable suspension consists of right and left lateral supports 15 and 16 which are of the same general shape, form and configuration except for the fact that the lateral support 15 is bent to fit the right side of the head and the lateral support 16 is bent to fit the left side of the head.

Except for the left- and right-hand configuration each lateral support has a rear end 17, a front end 18 and a widely arcuate midportion 19. The midportion 19 arcs widely so as to clear the ear 12, for example, by an ample extent so that even though the ears may be covered by a conventional earphone set, the midportion will have a large enough space intermediate front and rear ends to adequately clear any earphones which might be in place.

A transverse support or neckpiece 20 is of appreciable length and adapted to extend across the upper end or nape of the neck somewhat below the curve of the skull at the rear. The transverse support is relatively rigid so as to substantially hold its form under all circumstances. At the right-hand end 21 there is a hinge 22 attached on one side to the transverse support 20 and on the other side to the rear end 17 of the lateral support. The pivot axis of the hinge 22 extends obliquely rearwardly in its general relationship to the head 10 of the user, the configuration on the relatively flat rear end 17 and its shape with respect to the head 10 together with the shape and configuration of the immediately adjacent portion of the right-hand end 21 being such as to make the preferred direction of the pivot axis possible. The same attachment is provided also on the left side wherein a left-hand end 23 of the transverse support 20 is attached by means of a hinge 24 to the rear end 17 of the left lateral support.

Extending between midportions of the right and left lateral supports is a transverse crown strap 25 which is provided with an adjusting buckle 26, the strap extending through respective openings 27 and 27' in the lateral supports. A rear strap 28 engages respective openings 29 and 29' in the lateral supports just forward of the respective hinges 22 and 24, and an adjusting buckle 30 is connected to the rear strap 28.

The transverse support 20 is of relatively ample dimensions in the interest of comfort and may, if desired, be provided with folding portions 32 and 33 adapted to be folded upon each other and secured by snap fasteners 34.

A breathing mask 35 of substantially conventional form is provided with a bracket 36 on which is a right-hand extension 37 and a left-hand extension 38. A pivot pin 39 pivotally mounts the right side of the bracket 36 to the right side of the mask 35 and a similar pivot pin 40 pivotally mounts the left side of the bracket 36 to the left side of the mask 35.

On the front end 18 of each lateral support there is a telescoping mechanism 41 of substantially conventional construction which enables the mask 35 to be pulled yieldably forward away from the face against spring tension for manipulation and adjustment after which it is pulled automatically back into snug position, as shown in FIG. 1. The right-hand and left-hand extensions 37 and 38 are secured at their respective outer ends to forward ends of the telescoping mechanism in each case. The telescoping mechanism in turn is fixed in position by means of a tab 42 which is attached to an enlargement at the front end 18.

It is also significant to note, as readily observable in FIG. 2, that there is an outward bow at the location 43 in each lateral support so that a portion 44 immediately adjacent the front end 18 stands well clear of the face of the user, thereby to further ease and facilitate both donning and wearing.

The combination quick donning mask and foldable suspension when in use has the parts extended as shown in FIGS. 1 and 2 with the arcuate midportions 19 amply clearing the ears, the transverse support being snugly in place against the nape of the neck and the mask comfortably in place over the nose and mouth of the user. The buckles 26 and 30 can be used to adjust the straps to a satisfactory fit.

When the suspension is removed, the lateral supports fold toward each other in the direction of the arrows shown in FIGS. 3 and 4. The length of the transverse support and the spread of the extensions 37 and 38 are such that the lateral

supports do not exactly overlap but move toward each other so that the midportions are in close proximity. Since the straps **25** and **28** are flexible, they fold down into a compact position. In this folded relationship, the pivot pins **39** and **40** permit the mask **35** to tilt so that it can be moved into the most compact relationship permitted by its size. The folded lateral supports and transverse supports make a relatively flat package by reason of the angular relationship of the axes of the hinges **22** and **24** being such as to permit a compact folding. In this collapsed relationship the assembly may be stowed in a bag or stowed on an appropriate shelf.

When the device is to be used, it is removed from the shelf and the usual donning maneuver causes it to assume its intended shape, the lateral supports **15** and **16** will fall outwardly into natural position for donning, limited by the adjusted length of the crown strap **25** and positioned by the proper angular relationship of the hinges **22** and **24** to each other and to the apparatus as a whole. In this automatically sized open position the device can be quickly applied over the head **10** of the user with a single hand operation.

While the invention has herein been shown and described in what is conceived to be a practical and effective embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices.

Having described the invention, what I claim as new in support of Letters Patent Is:

1. A quick donning mask and foldable suspension for mounting said mask on the head of user comprising right and left lateral supports having each a substantially arcuate shape wherein an arcuate midportion is adapted to extend above the ears of the user and respective front and rear ends are adapted to extend respectively forward and rearward of the ears, said lateral supports being continuous and substantially rigid throughout the length between front and rear ends, a separate rearwardly located substantially rigid transverse support adapted to extend across the upper parts of the user's neck, respective lateral ends of said transverse support having a hinged attachment to respective rear ends of said lateral supports, the axis of movement of said hinged attachment being in the plane of said lateral supports and when worn being substantially parallel to the adjacent surface of the user's head, a transverse crown strap having ends connected to respective lateral supports, lateral extensions on respective right and left sides of said mask and a pivotal connection between an outer end of each said extensions and the font end of the respective lateral support, said lateral supports when removed from the user's head having folded positions extending toward each other and overlying said transverse support and the inner end of said mask.

2. A quick donning mask and foldable suspension as in claim **1** including a rear strap extending between rear portions of said lateral supports, a length adjustment between the ends of said transverse crown strap and between the ends of said rear strap.

3. A quick donning mask and foldable suspension as in claim **1** wherein the front ends of said lateral supports have each an outwardly extending end portion terminating at a location clear of the user's cheeks and attached to the end of the respective lateral extension.

4. A quick donning mask and foldable suspension as in claim **3** wherein the pivot connection between the respective lateral support and lateral extension is in fore and aft alignment with a hinged connection.

5. A quick donning mask and foldable suspension as in claim **4** wherein the axes of said hinged connections are disposed in an angular relationship one with respect to the other.

6. A quick donning mask and foldable suspension as in claim **2** wherein the rear strap and crown strap are flexible bands.

7. A quick donning mask and foldable suspension as in claim **1** wherein there is a pivotal connection between the inner ends of said respective lateral extensions and said mask.