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HEAD HARNESS FOR MASKS
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FIG. 8.

FIG. 9.

FIG. 10.

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My invention relates to a head harness for masks and has for its object to provide a form of head harness for holding the mask securely mounted on the face of an aviator or other wearer, which will at the same time be adapted for any adjustment to fit the head of the wearer whether worn over or under a helmet, and which will be comfortable and satisfactory in operation.

Various types of harness have been supplied which have been not too satisfactory because insufficient contact is made with supporting parts of the head. There is no provision for sufficient adjustment to fit various sizes and shapes of head, and in many cases the harness can only be made effective for holding the mask by causing undue pressure on certain parts of the head or face which produces discomfort to the wearer. Furthermore, types of mask harness as heretofore used have been of such a nature that they can be held on the head only when the mask is attached. This is a serious inconvenience since application of the harness with the mask attached is much more difficult than if the harness can be properly adjusted to the head first and then the mask applied by merely snapping hooks on the mask into eyes on the harness.

It is a principal object of my invention, therefore, to provide a harness structure which will grip parts of the head and neck of the wearer so as to give firm and balanced support to the mask itself and which will not produce uncomfortable pressure areas on the parts of the head, face or neck which are contacted.

It is a further object of my invention to provide in combination with various strapping means a face-contacting supporting member for guiding and holding the strapping members out of contact with the ears of the wearer and which aids in securing the straps properly in position and which renders the wearing of the harness satisfactory and comfortable.

It is a further object of my invention to form said support of a substantially arcuate or semicrescent outline and encircled opening for receiving the ear and with guides for straps on either side of the ear to be fastened to crossing straps to be secured to the mask body.

It is a further object of my invention to have the straps running from the crossing straps of the mask pass over the top of the head and the nape of the neck respectively and to have these straps pass through the series of slits in the face contacting supporting member providing keepers for slidably uniting the straps and supporting member.

It is a further object of my invention to provide said straps, in combination with the face-contacting supporting members with means for adjusting the length of the straps to bring them into firm adjusted contact with the parts of the head of a wearer.

It is a further object of my invention to provide an elastic head strap adapted to pass over the forehead of the wearer and to be connected with the face-contacting supports.

It is a further object of my invention to carry the head strap either attached to the face-contacting supporting member or slidably connected therewith back to form a strap member encircling the coronal portion of the head.

It is a further object of my invention to make this coronal head band adjustable as to length so that it will fit the head of any individual wearer and thus hold the harness in position on the head, whether or not the mask is attached to it.

The full objects and advantages of my invention will appear in connection with the detailed description thereof, and the novel features by means of which the aforesaid advantageous results are secured will be particularly pointed out in the claims.

In the drawings illustrating some forms of my invention—

Fig. 1 is a side elevation view indicating the position of the harness and the mask as worn.

Fig. 2 is a similar side elevation view of a somewhat modified form of the harness structure of Fig. 1.

Fig. 3 is a sectional view taken on line 3–3 of Figs. 1 and 2.

Fig. 4 is a flat plan view of the harness of Fig. 1 disassembled.

Fig. 5 is a view specifically of the mask of Fig. 2 shown in the position of Fig. 2 with the head part eliminated and it applies also substantially to the showing of Fig. 1.

Fig. 6 is a side elevation view showing the parts as worn of the modified form of construction in which the head contacting piece is shown as positioned at the side of the head above the ear and not surrounding the ear, as is true of the head-contacting piece of Figs. 1 and 2.

Fig. 7 is a view similar to Fig. 6 showing the parts in position apart from the mask and the head of the wearer.

Fig. 8 is a modified form of the invention wherein the head-contacting portions across the top of the head and at the neck are directly sewed to an aviator's helmet.

Fig. 9 is a plan view of the head-contacting part removed from the helmet; and

Fig. 10 is a plan view of the head-contacting part removed from the helmet.

As shown, and referring first to Figs. 1, 3 and 4, a pair of face-contacting members 11 and 12 are formed having a broadly arcuate top outer edge 13 and an inner edge 14 forming an elongated side opening 15, substantially vertical as the
harness is worn adapted to receive the ears of the wearer and leave them exposed and free. As clearly shown in Fig. 3, the face-contacting members 11 and 12 are formed of two layers, 16 and 17. The bottom layer 16 is of semi-soft material such as chamois, or similar material adapted to contact with the face of the wearer. The top layer 17 is formed of strong very pliable leather with a smooth outer finish, preferably some form of kid skin. The entire construction is, therefore, very pliable, being adapted to be held comfortably against the face of a wearer.

The lower portion (as worn) of the face-contacting members 11 and 12 has a projecting ear 18 which normally will come down on the neck below the ear, as indicated in Figs. 1 and 2. Extending transversely across the central part of this ear is a series of slits 19 and 20 forming keepers 21 and 22, Figs. 1 to 5, which are adapted to come above a pair of strap members 23 and 24. The strap members 23 and 24 are therefore mounted in sliding arrangement upon the projecting ears 18. Each of these strap members is provided with a hook 25 adapted to engage in an eye 26 on a strap 27 secured by buttons 28 to the mask body 29. On the inner end of strap 23 is a buckle 30 and on the inner end of strap 24 are a series of holes 31. By these means the straps 23 and 24 are adapted to be fastened to the face-contacting member 11 as indicated in Fig. 1, so as to fit the individual wearing the harness, and the lower part of the face-contacting portions 11 and 12 including the ears 18 are adapted to slide along the strap portions 23 and 24 so as to permit adjustment of the face-contacting portions 11 and 12 to the side of the neck and about the ear of the wearer.

The upper parts of the face-contacting members 11 and 12 are provided (as worn) with downward-projecting ears 32. Above the ears 33 are pairs of slits 34 and 35 in the outer or top layer 17 of the face-contacting members. These slits, as clearly shown in Figs. 1 and 4, extend substantially along the coronal plane of the head as the mask is worn and form between the pairs of slits respectively keepers 36 and 37. Slightly above the keepers 36 and 37 of face-contacting member 11 a strap 38 terminating in its outer end in a buckle 39. Similarly under the other set of keepers 36 and 37 on face-contacting member 12, as clearly shown in Fig. 4, is a strap 40 provided with a multiplicity of holes 41. Strap 38 has at its inner end a hook 42 and strap 40 has at its inner end a hook 43. The hooks 42 and 43 are adapted to engage an eye-member 44 on a strap 45 held on the mask body 20 by buttons 46 and extending at an angle across strap member 27. With this arrangement the straps 38 and 40 may be carried over the top of the head as shown in Fig. 1 and may be secured together in a manner to hold the harness and the face-contacting portions 11 and 12 thereof in proper position on the side of the face and about the ear of the wearer and when the hooks 42 and 43 are engaged with the eye-piece 44 it will hold the mask body 27 firmly in position on the face of the wearer.

As shown in Fig. 1, secured to the face-contacting members 11 and 12 is a front band 47, preferably formed of elastic, being held between the two respective face-contacting members 11 and 12 at the front thereof as worn, preferably by sewing or by the use of eyelets or of both, as shown at 48 in Fig. 1. Similarly extending to the rear substantially in the plane of band 47 and of slits 34 and 35 is a strap member 49 secured to the upper part of face-contacting member 11 and having on its outer end a buckle 50. Also secured to face-contacting member 12 and extending in the same plane as strap 49 and tape 47 is a second strap 51 provided with a multiplicity of holes 52, all as clearly shown in Fig. 4. When these strap members 49 and 51 are united there is a substantially continuous strap arrangement going about the coronal part of the head, and, in combination with the other strapping means, holds the entire harness securely to the head even when the mask body 20 is not held to the face of the wearer by hooks 25 and 42 in eye-pieces 26 and 44.

The parts above described in detail as to Figs. 1, 3 and 4 are the same in the modifications of Figs. 2 and 5 except for the following features: The coronal headband 53 comprises a single continuous member formed throughout its length of elastic tape. As clearly shown in Figs. 2 and 5, slits 54 and 55 cut out keepers 56 and 57 in the top layer 17 of the face-contacting members 11 and 12. The band 53 goes under the keepers 56 and 57 and over wide keepers 57' overlying the straps 38 and 40 so that both the straps 38 and 40 and the band 53 are slidable connected with the upper portion (as worn) of face-contacting members 11 and 12. The band 53 is made adjustable as to length by carrying a loop portion 58 through an eye-piece 59 and maintaining the parts in locked position by an eye-buckle 60, as best shown in Fig. 5. By extending or shortening the loop portion 58 the band 53 may be set to encircle the coronal part of the head with a sufficiently tight grip to hold the harness in position.

In the modications of Figs. 2 and 5 the strap portions 23 and 24 are formed of elastic material and are secured at their ends by loop portions 61 running through an eye-piece 62 and held by an eye-buckle 63. Similarly in the modification of Figs. 2 and 5 top strap pieces 64 and 40 are formed of elastic tape and are adjustable secured together by a loop portion 64 extending through an eye-piece 65 and secured by an eye-buckle 66.

The form of my invention illustrated in Figs. 6 and 7 has face-contacting members 67 and 68 of the form shown in these members contact the face only above the ears of the wearer, as shown. The coronal headband 63 is identical with the headband 53 of Figs. 2 and 5 and is slidable mounted on the face-contacting pieces in a similar way. As best shown in Fig. 7, keepers 60 and 78 are formed on the outer face of face-contacting piece 67 and the headband 63 is thus slidable held on face-contacting member 67. Keepers 71 and 72 are formed on face-contacting member 67 and receive a strap member 78 which is united at 74 with an eye-piece 76 adapted to take over a hook 78 directly secured as indicated at 77 to the mask body 8. A second strap 78 is slidable held to face-contacting member 68 in the same manner as strap 78 is held to face-contacting member 67. The strap 78 is secured to a second eye-piece 80 which has the part 80 thereof corresponding to the similar part of eye-piece 76 adapted to engage a hook similar to the hook 78 hereinbefore referred to. Strap 78 has a loop 81 which runs through an eye-piece 82 and through an eye-buckle 83. In this form of the invention the strap members 78 and 78 may be of elastic material. Similarly a strap member 84 is attached at 85 to eye-piece 87. A similar strap portion 86 is attached to eye-piece 78.
at the angles to straps 73 and 78 indicated in Figs. 6 and 7. The strap 84 has a loop portion 91 which extends through an eye-piece 85 and is secured by an eye-buckle 89.

In the construction shown in Figs. 8, 9 and 10, a helmet 90 is the base of the harness and takes the place of the face-contacting members and of the coronal band 53 of Figs. 2 and 5. Upon the helmet 90 is sewed a piece 91 shown in detail in plan of Fig. 9. The piece 91 is formed in the same manner as the face-contacting member 17 with an outer and inner layer. On the outer layer of piece 91 is formed keepers 92, 93, 94 and 95, the latter being shown in dotted lines because of the overlapping of a strap portion. Slidably held within keepers 92 and 93 is the strap portion 96 which overlies keeper 95. The strap portion 96 is provided with a multiplicity of holes 97. Slidably mounted upon a piece 91 under keepers 94 and 95 is a second strap portion 98 which is provided at its outer end with a buckle 99. To the strap portion 98 is secured by means of a staple 100 a hook member 101, and to the strap member 98 is secured by means of a staple 102 a hook member 103. These hook members engage eye-member 44 on strap 45 secured to the mask body 29 in the same manner as in the form of Figs. 1 and 4.

Similarly, a piece 104 may be sewed to the back of the helmet, as indicated at 105 in Fig. 9. This piece, as clearly shown, is roughly crescent-shaped and is composed of inner and outer layers as are pieces 11 and 12 as heretofore described. This piece is provided with a center section 105 which carries at its ends a pair of buckles 106 and 107 disposed at a suitable angle so that when the piece 104 is laid around the back of the neck the ends 108, 109 thereof may take positions in parallel relation on opposite sides of the neck.

Piece 108 has a keeper 110 through which is slidably mounted a strap 111 provided with a suitable number of holes 112 and the strap is thus slidably mounted on the piece 104 and may be secured in any adjusted position thereon by buckle 109. Similarly a keeper 113 has holes in sliding relation upon the end 109 of piece 104. A strap 114 is provided with holes 115 by which it is adapted to be held in adjusted position by means of buckle 107. The hook device 116 is on the end of strap 111 and a hook device 117 is on the end of strap 114. These hook devices engage eyes 26 on strap 27 fast on mask body 29 in the same manner as is shown in Figs. 1 and 2. It follows that the harness device of Figs. 8, 9 and 10 gives an adjusted 4-point suspension of the mask body 29 in the same manner as the earlier described harness structure.

The advantages of my invention have largely been made clear in the foregoing description. A fundamental advantage resides in the fact that the mask body is held firmly in position by a 4-point suspension arrangement comprising suspended straps or slidably mounted upon a face-contacting member, which provides both anchorage for these straps or tapes and supporting means permitting ready adjust-

ment so that the harness may be adapted to adjust itself in perfectly fitting arrangement upon any type of head and face, while the face-contacting members protect the face from irritation by rubbing of the movable holding parts. A further advantage present in all forms of the invention is that means is provided to hold the harness in position upon the head of the wearer when the mask is separated therefrom.

I claim:

1. In combination with supporting means on a mask body, a harness for holding the mask in position comprising a face-contacting member on each side of the head, said members having upper and lower portions and an intervening open portion for receiving the ear of a wearer, trapping means adapted to go over the head of the wearer slidably connected with the upper part of the face-contacting member, other strapping means adapted to pass around the neck of the wearer slidably connected with the lower part of the face-contacting member, and means for connecting the two sets of strapping means to the supporting means on the mask body.

2. In combination with supporting means on a mask body, a harness for holding the mask in position comprising a face-contacting member on each side of the head, said members having upper and lower portions and an intervening open portion for receiving the ear of a wearer, a strap slidably mounted on the upper part of both face-contacting members for going directly over the head of the wearer, a second strap slidably mounted on the lower part of both face-contacting members adapted to pass around the nape of the neck, eyes on the supporting means on the mask body, and hooks on the ends of the mask for engaging in said eyes, whereby the mask will be secured upon the face of the wearer by a 4-point suspension.

3. In combination with a mask and a pair of straps thereon, said straps secured to the sides and extending over the top of the mask in angularly disposed relation and each of said straps terminating in ends extending out on each side of the mask body, a harness for holding the mask in position, comprising a face-contacting member on each side of the head formed with portions adapted to hold a pair of supporting straps in alignment with the respective straps on the mask body, a strap slidably mounted on both face-contacting members and adapted when worn to be in alignment with the projecting portions of one of said mask straps and to pass directly over the top of the head of the wearer, a second strap slidably mounted on both face-contacting members and adapted when worn to come into alignment with the other strap ends on the mask and to pass around the nape of the neck, and complementary hooks and eyes on the respective ends of said straps, whereby the mask may be quickly and easily secured upon the face of the wearer by a four-point suspension and quickly and easily removed therefrom.

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