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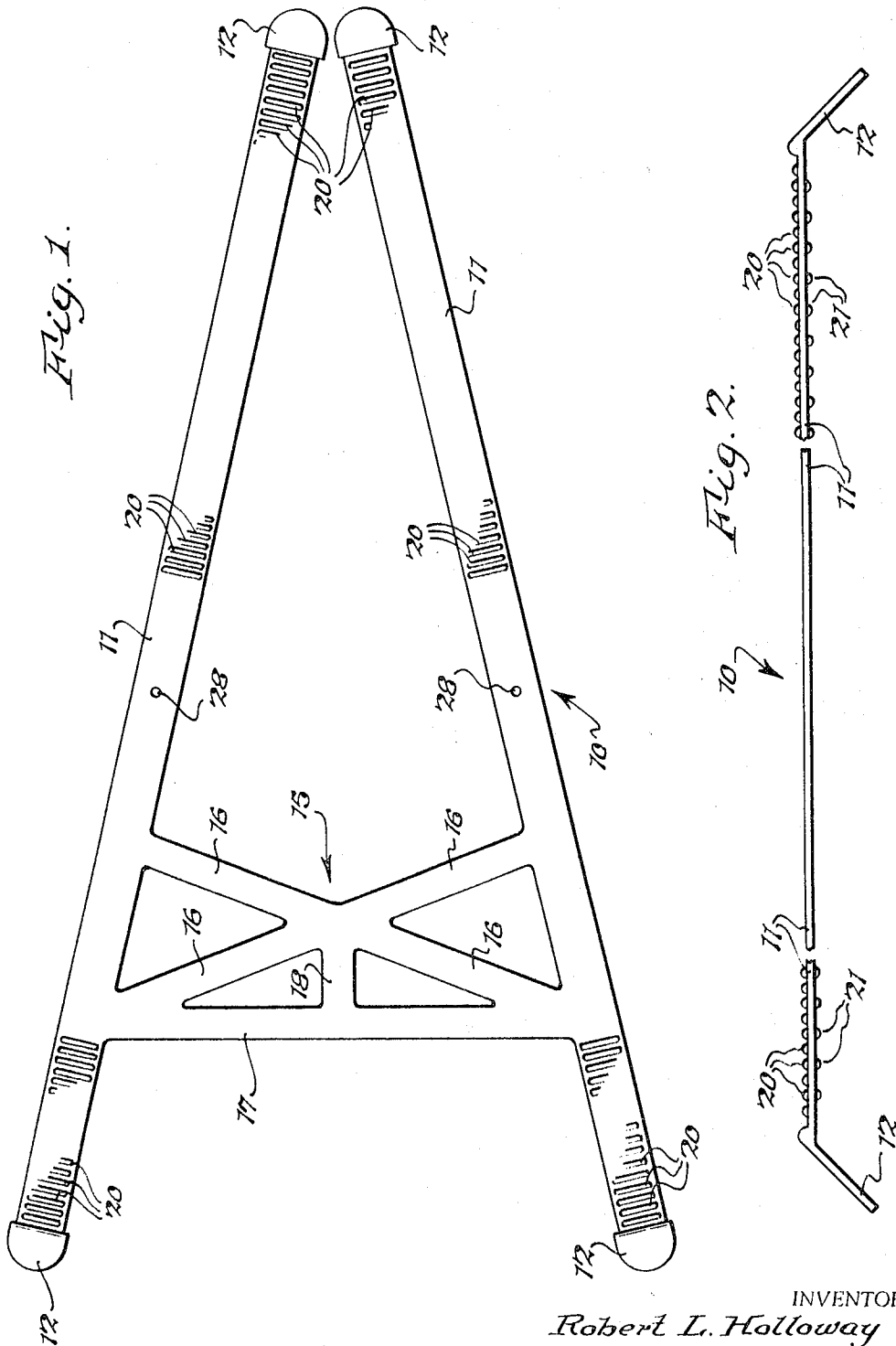
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3,457,564

HEAD HARNESS

Filed July 21, 1967

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3.

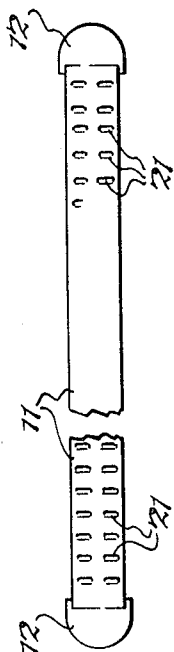


Fig. 5.

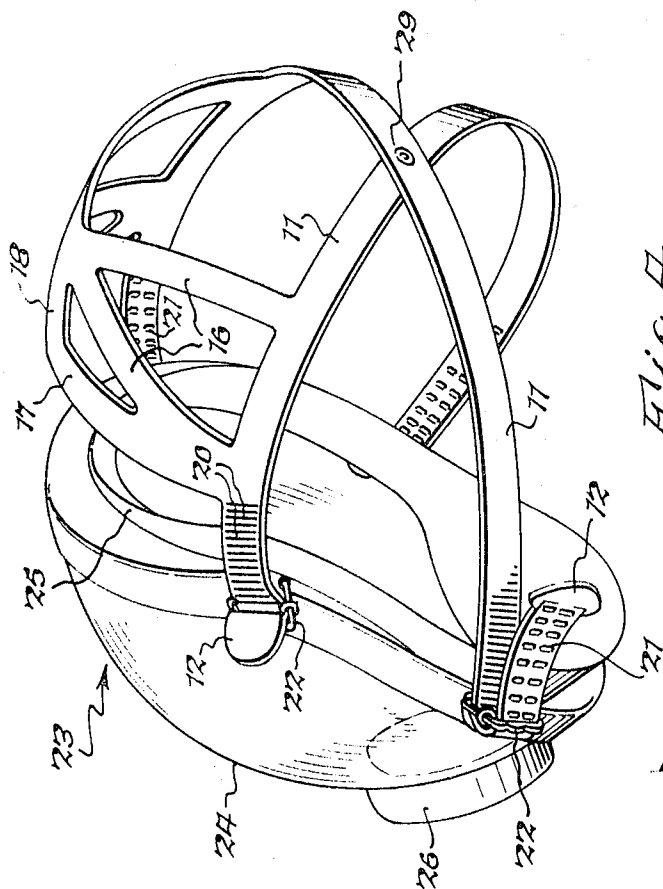
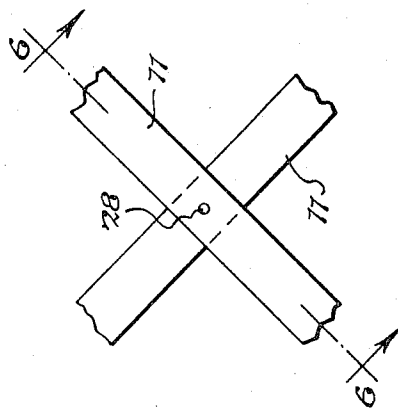
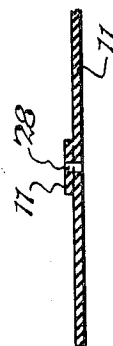


Fig. 4.

Fig. 6.



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1
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HEAD HARNESS

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U.S. Cl. 2—8 6 Claims

ABSTRACT OF THE DISCLOSURE

The head harness comprises a pair of elongated straps lying flat in spaced, diverging side by side relation. A connecting web extends between the straps at a position adjacent to but spaced from the most widely spaced ends of the straps. Corrugations and protruding dimples are formed along opposite faces of the straps adjacent their opposite ends. In use, the straps extend diagonally about the head in hoop tension with the longer strap portions crossing one another back of the head whereby opposite ends strap connect with buckles located on diagonally opposite sided of the face mask.

Background of the invention

This invention relates to a head harness for face masks and particularly to unitary, one piece essentially two strap head harness.

Conventional three trap and six-strap head harnesses for face masks usually provide a central web engaging the rear portion of the wearer's head with the straps extending forwardly at diverse directions therefrom for insertion through buckles secured about the periphery of the face mask. Such hardnesses are relatively both wide and long when flat and therefore required a relatively large mold. The manufacturing costs of such harnesses are accordingly high. Also, the webs often cannot be adjusted to a comfortable position about the head for various head sizes and still maintain uniform tension in the straps. Lack of uniform tension tends to cant and displace the face mask from its proper position against the wearer's face.

Summary of the invention

A primary object of the present invention is to provide a multi-strap head harness which can be relatively easily and inexpensively manufactured.

Another object of the present invention is to provide a head harness wherein the straps are arranged to fit comfortably about a wearers head. To this end, the harness has a unitary, two-strap construction, and the straps have a connecting web providing a comfortably fitting cap about the top of the wearers head. The straps cross one another, adjacent the back of the head in spaced relation to the web portion, the opposite ends of each strap connecting to the mask at diametrically opposed points. In this manner, the bearing engagement of the hardness is spread over a wide area of the wearers head with the individual straps and web portion being distributed to prevent binding and unequal pressure against the wearer's head.

It is a further object of the present invention to provide a head harness which is readily adjustable to comfortably fit various head sizes. With the harness of this invention, the straps are easily adjusted to cross one another at substantially an infinite number of positions therealong within a limited range whereby the curvature of the straps and web can be varied to accommodate and fit comfortably about heads of various sizes.

The foregoing and other objects, advantages and characterizing features of a head harness construction of the present invention are pointed out in the following de-

2

tailed description of a typical embodiment thereof considered in conjunction with the accompanying drawing depicting the same wherein like numerals represent like parts throughout the various views.

Brief description of the drawing figures

FIG. 1 is a plan view of one form of head harness constructed in accordance with the present invention as it appears upon manufacture and when not in use;

FIG. 2 is an enlarged edge, elevational view of one of the straps thereof with portions broken out for ease of illustration;

FIG. 3 is a bottom plan view of one of the straps, showing the reverse side thereof with portions broken out for ease of illustration;

FIG. 4 is a perspective view of the head harness as applied to a face mask;

FIG. 5 is a fragmentary view of the crossing strap portions as viewed in FIG. 4; and at the rear of the head harness.

FIG. 6 is a sectional view thereof taken about on line 6—6 of FIG. 5.

Description of the preferred embodiment

There is shown in FIG. 1 a head harness 10 comprising a pair of identical, elongated straps 11 lying flat in the same plane in diverging relation. The opposite ends of straps 11 are provided with semi-circular pull tab formations 12 which are diametrically wider than straps 11 and, as seen in FIG. 2, project downwardly, preferably at about a forty-five degree angle from the plane straps 11.

A connecting grid or web 15 extends between intermediate portions of straps 11, in the plane of straps 11, being located closer to the most widely spaced ends of straps 11 (the left hand ends as seen in FIG. 1) than to the more closely spaced ends thereof (the right hand ends in FIG. 1). Grid 15 comprises a pair of diagonally extending cross strap formations 16 which intersect medially between straps 11, a transversely extending cross strap formation 17 and a central, longitudinally extending reinforcing strap 18 between transverse strap 17 and the intersection of diagonal straps 16. Strap portions 16, 17 and 18 have substantially the same width, and are narrower than straps 11.

Transverse ribs 20 and dimples 21 are formed along the outer and under faces, respectively of straps 11 adjacent the opposite ends thereof, with ribs 20 extending along a major portion of the relatively longer portions of straps 11. Ribs 20 and dimples 21 are formed to engage the strap engaging parts of buckles 22 (FIG. 4) to provide increased resistance against withdrawal of straps 11 from their respective buckles, whereby straps 11 may be pulled through buckles 22 by tab formations 12 in the usual manner and to the desired extent, and then released with assurance that the desired lengths of straps about the wearers head will be maintained.

It is a significant feature of the present invention that the head harness can be formed or molded flat whereby the manufacturing cost thereof is minimized. Straps 11 with their straps 12, ribs 20 and dimples 21, and grid 15 preferably are formed integrally of rubber or other elastomeric material molded flat in the illustrated shape. The unitary head one piece head harness thus formed does not require precision and complex mold forms to manufacture the same and, in use, can be readily disposed to the a arcuate shape necessary to fit comfortably about a wearers head as described in detail hereinafter.

As seen in FIG. 4, head harness 10 is adapted to be fastened to a face mask generally designated 23 which can be of any suitable type. In the illustrated embodiment,

mask 23 has a semi-rigid transparent facial mask bubble 24, a peripheral seal 25 and an inhalation-exhalation valve 26.

To apply head harness 10 to face mask 23, tabs 12 at the most widely spaced ends of straps 11 are threaded through the upper pair of buckles 22 on face mask 10 and pulled to engage the adjacent corrugated, dimpled portions of straps 11 in buckles 22. The longer strap portions are crossed, such that tab ends 12 thereof can be brought forwardly to thread through the lower buckles 22 on face mask 23. In this manner, the tab ends 12 of each strap 11 connect with face mask 23 on opposite sides thereof diagonally opposite one another.

The lower ends of straps 11 can be threaded through their associated lower buckles to a limited extent thereby forming a sufficiently large opening through the bottom of harness 10 to permit face mask 23 and harness 10 be drawn over the top of a wearers head and face mask 23 disposed about a wearers face. The tab ends 12 of straps 11 associated with the lower buckles can then be pulled to draw mask 23 into sealing engagement about the wearers face. As apparent from FIG. 4, the diverging relation of straps 11 enables straps 11 to cross naturally adjacent the back of the wearers head and allows the flat undersurfaces of straps 11 to bear against the wearers head without twisting the straps or otherwise applying unequal pressure about the wearers head. Straps 11 are thus configured when applied about a wearers head, to be in hoop tension substantially the largest diameter portions of the head, each strap lying substantially in a plane. In this manner, the pressure applied by the straps is equally distributed about the wearers head and a substantially uniform force is applied to the buckles of the associated straps whereby canting of mask 23 on the face is avoided.

Also, as seen in FIG. 4, web 15 and the crossing straps form a cap about the top and rear portions of the head which further distributes the load bearing against the wearers head. Note that the curvature of the web when the harness is applied to a wearers head lies about axes substantially normal to the length of the web straps 16 and 17 thus avoiding twisting or bunching of the web and unequal pressure distribution against the wearers head.

Straps 11 need not be interconnected at the crossing portions thereof and, when not connected, the harness can thus be stored as seen in FIG. 1 or folded as desired. In the illustrated form, however, an opening 28 is formed through each strap at an intermediate point therealong corresponding to the intersection of straps 11 as they cross adjacent the back of a wearers head. A rivet 29 can be applied through corresponding openings 28 fixing the straps in cross position as illustrated in FIGS. 4-6. Other suitable means for fastening the straps together at their appropriate crossing positions, such as

vulcanizing the straps together, obviously can be utilized if desired, and a separable fastener also can be used.

It is thus apparent that the objects of my invention are fully accomplished. The foregoing harness can be inexpensively and easily manufactured flat, and in its flat position each harness is relatively narrow whereby a large number thereof can be molded in side by side relation. Moreover the harness is constructed to provide a comfortable fit about a wearers head with the pressure of the straps being equally distributed thereabout.

What I claim as new is.

1. A head harness in combination with a face mask comprising a pair of elongated straps formed to lie flat in spaced diverging side by side relation, a connecting web extending between said straps intermediate the opposite ends thereof, and means adjacent the ends of said straps fastening the same to said face mask, said straps being adapted to extend substantially diagonally about the head of the wearer and cross one another adjacent the back of the head whereby opposite ends of each strap connect with said associated face mask on diagonally opposite sides thereof with said connecting web extending across the top of the head, wherein said connecting web is located substantially closer to the most widely spaced ends of said straps than to the more closely spaced ends thereof when said harness is in a flat condition.

2. A head harness according to claim 1 wherein the strap portions between the connecting web and the more closely spaced ends of said straps cross one another adjacent the back of the wearers head.

3. A head harness according to claim 1 wherein said straps and said web comprise an integral one-piece construction.

4. A head harness according to claim 3, together with transverse ribs adjacent the opposite ends of said straps on one side thereof, and dimples protruding from the opposite sides thereof adjacent the opposite ends thereof.

5. A head harness according to claim 4, together with laterally enlarged tabs inclined relative to said straps at the opposite ends thereof.

6. A head harness according to claim 5, molded of elastomer material.

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JAMES R. BOLER, Primary Examiner

U.S. Cl. X.R.

2—14; 128—142.4