

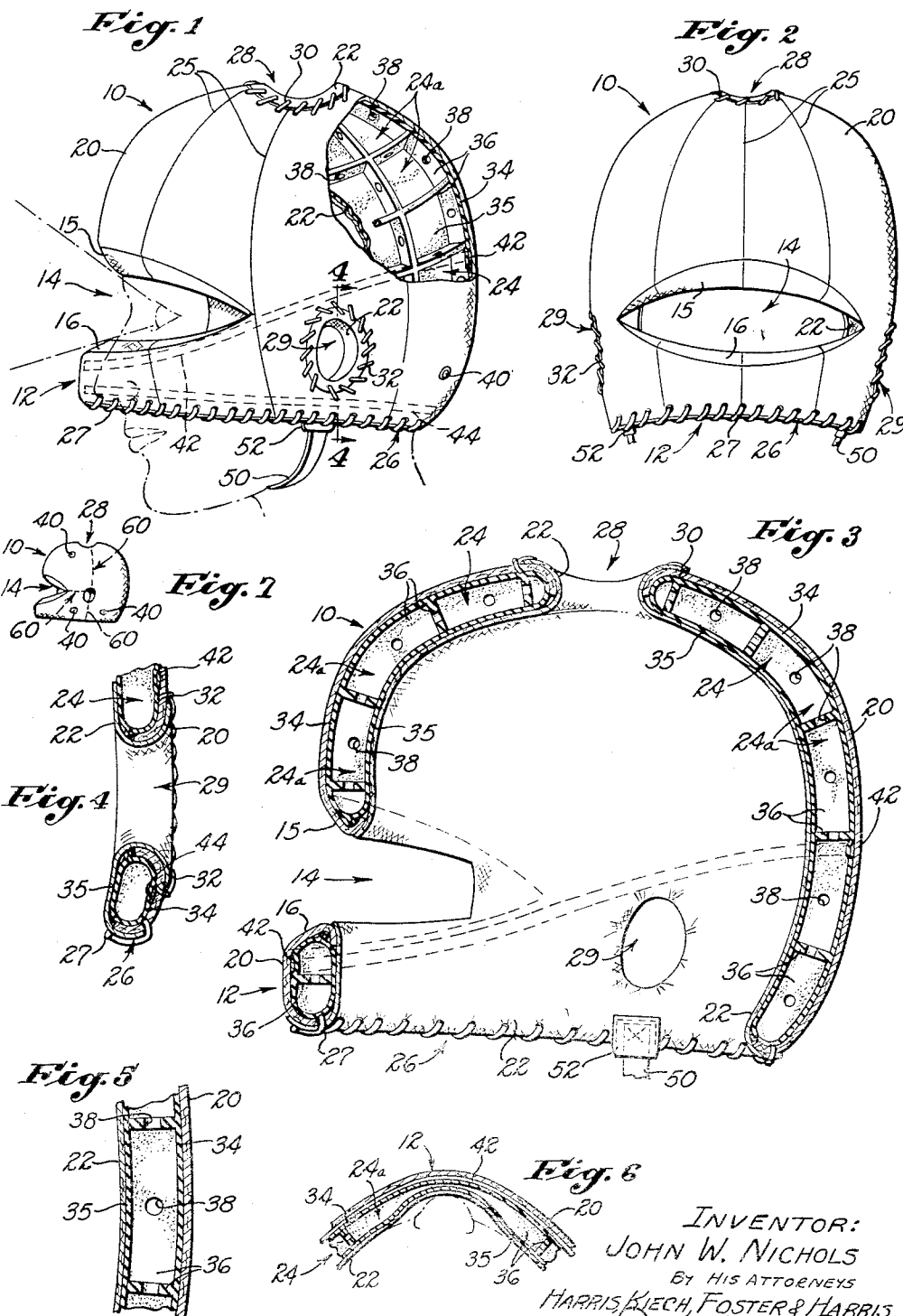
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PNEUMATIC BOXING HELMET

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PNEUMATIC BOXING HELMET

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13 Claims. (Cl. 2—3)

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This invention relates to protective helmets for boxers.

One object of the invention is to provide a helmet which may be advantageously used in boxing contests, and also in training, to protect the boxer's head from serious injuries, its training usage being especially intended for application in preparing recruits in the armed services in the art of personal defense.

In boxing in the ring, and also in training armed service recruits in boxing, many very serious injuries have been encountered which have resulted in permanent damage to the head and in some instances in death.

As a consequence, it is one important object of this invention to prevent serious injuries of the nature indicated.

More specifically, it is an object of the invention to prevent injuries to the eyes, such as cuts over the eyes that have resulted eventually in blindness. Another object is to prevent skull fractures, as when the head comes in violent contact with the floor in a knockdown. Similarly, it is an object to prevent concussions and other brain injuries, such as have been the result of devastating head punishments often incurred by participants in boxing contests. A further object is to prevent disfigurement of the ears and nose so well known in the case of professional boxers and heretofore long considered the badge of the profession. Avoidance of ruptured ear drums and kindred hearing impairment or complete deafness is another object of the invention. Even apart from these latter objects, the present invention possesses important value merely from the standpoint of preventing deaths and brain injuries.

It is a still further object of this invention to provide a helmet structure for boxers and for other sports contestants and for similar uses, which, considering the value of the device for protecting the head, is comparatively easy to construct, assemble, and use.

It is another object of the invention to provide a helmet construction adaptable to the employment of pneumatic means as the most satisfactory method of cushioning against the impact of blows struck by another boxer or suffered by the head striking the floor when the wearer is knocked down.

Other objects of the invention, and the various features of construction thereof, will become apparent to those familiar with the boxing art and to those skilled in helmet manufacture, especially upon reference to the following specifica-

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tion and the accompanying drawing wherein one embodiment of the invention is illustrated.

In the drawing:

Fig. 1 is principally a side view of a boxer's helmet constructed in accordance with this invention, a portion of the head member being broken away to illustrate the internal construction, and the location upon a wearer's head and about his face being indicated in broken lines;

Fig. 2 is a front elevation of the helmet of Fig. 1;

Fig. 3 is a median vertical section from front to back, the showing being on an enlarged scale;

Fig. 4 is a vertical sectional detail on an enlarged scale, taken on the line 4—4 of Fig. 1, to illustrate a possible structural feature at the ear openings, whereby to provide for the installation or removal of a pneumatic envelope which constitutes an important element of the helmet;

Fig. 5 is a sectional detail indicating a construction and location of the pneumatic envelope;

Fig. 6 is a cross-sectional detail of a possible form of construction employed adjacent the nose;

Fig. 7 indicates employment of a plurality of pneumatic envelopes rather than a single envelope.

The form of invention illustrated in the drawing comprises an upper member or head member 10 adapted to enclose the forehead, top, back and sides of the wearer's skull, and a nose member 12 which extends forward from the sides of the head member to cover all of the lower portion of the wearer's nose and preferably extends about one-half inch below the wearer's nostrils to make a stronger pneumatic bridge. The forward portions of the head member and the nose member are separated by a comparatively narrow, transverse vision opening 14, provided between a sloping under face 15 of the head member and a sloping upper face 16 of the nose member. These sloping faces 15 and 16 diverge outwardly from positions slightly above and below the eyes so that adequate vision both upward and downward is assured, as indicated by the dotted lines at the left of Fig. 1.

In practice the head member 10 and the nose member 12 are constructed as a single unit separated by the vision opening 14. These members of the helmet are produced from a strong, durable, outer covering 20 appropriately connected to a strong inner lining 22. Between the outer covering 20 and the lining 22 is disposed a sealed or air-tight, inflatable pneumatic envelope 24.

The outer covering may be formed from an adequately heavy leather such as three-ounce calf-belly leather, being made up in segments with welted seams 25 approximately as indicated. At the inner edges of the opposing sloping walls 15 and 16 at the sides of the vision opening 14, and preferably just within that opening 14, the adjacent edge of the lining 22 is suitably secured to the inner edge of the outer covering 20, as by cementing in overlapping relation as shown. Since it is necessary that the pneumatic envelope 24 be installed within the chamber provided between the covering 20 and the lining 22, the lower lining edge at the bottom opening 26, which extends across from the under side of the nose to the base of the skull, is detachably connected to the adjacent lower edge portion of the outer covering 20, as by lacing 27 as shown. Since it is desirable to provide a small ventilating opening 28 at the top of the head member 10, as well as small hearing openings 29 opposite the ears, the adjacent edges of the outer covering 20 and the lining 22 are similarly detachably connected as by lacings 30 and 32 respectively.

The envelope 24, which is of rubber or similar material, is formed of outer and inner walls 34 and 35 respectively which are appropriately connected through molding or cementing, or otherwise as is well understood in the art. In order to provide a multiplicity of air cells, as indicated at 24a, crossing partition members 36 are secured to the opposing walls 34 and 35. These partitions 36 may, as shown, be formed integrally with one wall 34 and cemented to the other wall 35. Inasmuch as it is desired that the cells 24a may collapse somewhat more than would be permitted by mere compression of air under pressure contained therein, small bleeder ports 38 are provided in the partitions 36, so that cells adjacent the point of impact may gradually bleed out their air to adjacent cells, whereby to provide additional cushioning. Appropriate air pressure is supplied to the pneumatic envelope 24 in any suitable manner, such as through any conventional type of valve 40 (Fig. 1) such as a self-sealing valve made accessible through the outer covering 20, or the like. Thus, appropriate pressure having been produced in all of the cells 24a of the envelope 24, a severe impact will gradually be further dissipated by bleeding of the air in the respective cells through the ports 38 to adjacent cells as above indicated.

For the purpose of further protecting the back of the skull and the sides of the head against serious injuries, especially from the impact with the floor of a boxing ring, steel spring bands may be provided around the inner wall of the covering 20 and outside the pneumatic envelope 24. Thus, a band 42 may run from the middle of the nose member 12 rearward around the head and above the hearing openings 29 to the back of the skull as indicated in Figs. 1 and 3, or, a similar steel band 44 may run around the bottom of the structure, as indicated in Fig. 1, or both of the bands 42 and 44 may be employed as indicated in Fig. 1. These spring bands 42 and 44 will particularly guard against basal fracture of the skull. Such steel bands 42 and 44 may be, for example, half-inch, flat, spring steel bands having appropriate thickness, for example .026 to .03 inch. These will provide desirable springy bumper guards to protect not only the back of the head but also the nose and eyes. Such spring bands serve the further purpose of preventing upward dislodgment of the nose member 12, as

by a grazing upper-cut, which dislodgment would obstruct vision.

For proper retention of the helmet upon the wearer's head, any suitable form of retainer band 50, adapted to pass under the wearer's chin, may be used. This may, for example, be a leather strap whose ends are affixed in tabs 52 secured to the lining 22 as illustrated.

Instead of employing the form of construction at the front of the nose member as seen in Fig. 3, where the nose member is relatively thick, the immediate forward portion may be made relatively thin by tapering off the air cells 24a at the sides of the nose as shown in Fig. 6, and relying upon the spring band 42 or 44 to protect the nose further, especially the bridge.

To assemble the helmet described, or to remove the pneumatic envelope 24, the lacings 27, 30, and 32 will be removed, and the portions of the lining 22 at the ventilating and hearing openings 28 and 29 will be drawn inward, so that the pneumatic envelope 24 may be moved upward through the bottom opening 26 and the upper lobe thereof passed over the inwardly drawn upper lining portions, the lower lobe being passed upward between the lower portions of the lining 22 and the covering 20. This results in proper installation of the envelope 24, whereupon the lining 22 is pressed out into the operative position shown, the corresponding portions being forced out through the ventilating and hearing openings 28 and 29, and all of the lacings 27, 30, and 32 being installed as illustrated. As illustrated, the openings 28 and 29 preferably have maximum widths not greatly exceeding twice the thickness of the helmet in order to insure adequate protection to the corresponding exposed portions of the head.

Various appropriate materials, other than those indicated may be employed in the construction of the different parts of the helmet, as may seem best suited for the respective purposes.

The envelope and outer and inner coverings will be formed in appropriate sizes and shapes as necessary to accommodate various wearers. If desired, the envelope 24 may be made in a plurality of separate sections to be separately inflated, such as an upper section and a lower section, or a forward head section, a rearward head section, and a lower section, as indicated in Fig. 7 by the dotted line 68, each section having its own inflation valve 49 and providing for a different pressure therein if required.

It is therefore intended to cover all modifications which fall within the scope of the patent claims.

I claim as my invention:

1. In an athletic helmet: a cupped cushioning head member having forward, top, back and side portions to protect the forehead, top, back and sides of a wearer's skull; a cushioning nose member secured to the side portions of said head member and extending forward to lie alongside the wearer's cheek bones and extending across in front of such cheek bone positions in front of the position of the wearer's nose to protect the wearer's nose, there being thereby provided a transverse vision opening between said nose member and the forehead-covering portion of said head member, said head member and nose member including an outer wall means; and separate pneumatic cushioning means enclosed within said wall means.

2. A helmet as in claim 1 wherein a resilient metal band extends around the wearer's head through said nose member and side and back

portions of said head member to cushion impact shock.

3. A helmet as in claim 1 wherein said vision opening is narrow, said nose and head members are of substantial thickness to afford cushioning effects, said members having, at opposite sides of said vision opening, opposed inclined walls which diverge outward to avoid closely overhanging and underlying outer portions of said members and afford clear vision upward and downward.

4. In combination in a helmet: a head member having forward, top, back and side portions to protect the forehead, top, back and sides of a wearer's skull; a nose member secured to the side portions of said head member and extending forward therefrom to a position below said forward portion of the head member and to lie at the front of a wearer's nose to protect the nose, said members thereby providing between them a transverse vision opening above the nose member, said head and nose members having inner and outer wall elements providing between them a chamber; and a separate pneumatic envelope disposed in said chamber between said wall elements to provide a cushion for protecting the wearer's skull and nose against impact.

5. A combination as in claim 4 wherein said pneumatic envelope is provided with a plurality of partitions dividing it into a plurality of air cells.

6. A combination as in claim 5 wherein said partitions are provided with bleeder passages between adjacent cells for retarded flow of air to assist cushioning of impacts.

7. A combination as in claim 4 wherein the bottom edges of said inner and outer wall elements are detachably connected to provide for passage of said envelope to and from said chamber.

8. A combination as in claim 4 wherein the bottom edges of said inner and outer wall elements are detachably connected to provide for passage of said envelope to and from said chamber, and openings are provided in the top and sides of said head member for ventilation and hearing, and said inner and outer wall elements are detachably connected at the openings to provide for installation of said envelope in said chamber and removal therefrom.

9. A combination as in claim 4 wherein ventilation and hearing openings are provided in said head member which do not greatly exceed in width twice the thickness of said head member with its pneumatic envelope whereby to protect adjacent parts of the wearer's head from impacting objects.

10. A combination as in claim 4 including a cushioning resilient metal band extending through said nose member and around the sides and back of said head member.

11. In a helmet: a cushioning head member to protect a wearer's skull; a transverse nose member solidly connected to side portions of said head member against upward and downward

movement relative to said head member and extending forward therefrom and having a portion positioned to lie in front of and protect the wearer's nose and portions positioned to lie alongside and protect the wearer's cheek bones, such nose portion lying below an overhanging portion of said head member to provide a transverse vision opening, and cushioning resilient metal means extending through said nose member and around the sides and back of said head member for maintaining the position of said nose member and guarding the back of the wearer's skull against impact on knockdowns.

12. In a helmet: a cushioning head member to protect a wearer's skull; a transverse nose member connected to side portions of said head member and extending forward therefrom and having a portion positioned to lie in front of and protect the wearer's nose and portions positioned to lie alongside and protect the wearer's cheek bones, such nose portion lying below an overhanging portion of said head member to provide a transverse vision opening; cushioning resilient metal means extending through said nose member and around the sides and back of said head member for maintaining the position of said nose member and guarding the back of the wearer's skull against impact on knockdowns, said head member and nose member having inner and outer wall means providing a chamber between them; and a separate sealed cellular, pneumatic envelope disposed between said inner and outer wall means and serving to cushion impact.

13. In a helmet: a cushioning head member to protect a wearer's skull; a transverse nose member connected to side portions of said head member and extending forward therefrom and having a portion positioned to lie in front of and protect the wearer's nose and portions positioned to lie alongside and protect the wearer's cheek bones, such nose portion lying below an overhanging portion of said head member to provide a transverse vision opening, said head member and nose member having inner and outer wall means providing a chamber between them; and a separate, sealed, cellular, pneumatic envelope disposed between said wall means and serving to cushion impact on said head member and on said nose member at said nose and cheek bone positions.

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