July 19, 1960 H. H. HERMAN, JR 2,945,493

BREATHING ATTACHMENT FOR SWIMMERS

Original Filed March 16, 1950

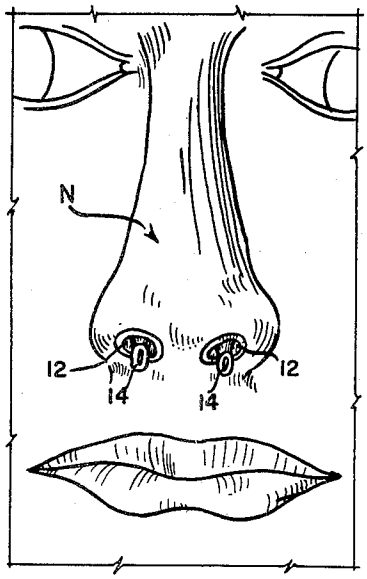


FIG. — 1

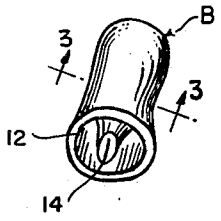


FIG — 2

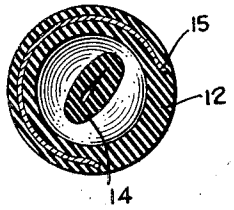


FIG. —3

INVENTOR.
Harry H. Herman Jr.
BY
Horace B. Van Valkenburgh
ATTORNEY

United States Patent Office 2,945,493 Patented July 19, 1960

2,945,493

BREATHING ATTACHMENT FOR SWIMMERS

Harry H. Herman, Jr., Denver, Colo.

Original application Mar. 16, 1950, Ser. No. 149,957, now Patent No. 2,693,799, dated Nov. 9, 1954. Divided and this application Oct. 28, 1954, Ser. No. 465,226

4 Claims. (Cl. 128—148)

This invention relates to breathing attachments for swimmers. This application is a division of my copending application Serial No. 149,957, filed March 16, 1950, now U.S. Patent No. 2,693,799.

The human species is equipped with breathing or respiratory mechanism specifically adapted to extract oxygen from the air, but this mechanism is not adapted to extract oxygen from water. Thus, it is not only disagreeable and uncomfortable for a person to receive water through or into the respiratory passages or tracts, but even sometimes fraught with danger. Since normal inhalation and exhalation take place through the nose, there is a tendency for a swimmer to draw in water through the respiratory opening and into the respiratory passages. For a number of swimming strokes, particularly wherein the head of the swimmer is submerged for at least a portion of a stroke or a number of strokes, and also in water disturbed by wind or the like to form waves, it is particularly desirable for a swimmer to inhale through the mouth and exhale through the nose. With proper training, a swimmer can avoid inhalation of water through the nose a large proportion of the time, but for individuals who have not been so trained, or individuals who have difficulty in so doing, it often happens that water passes into the nose during inhalation. Also, in rough or choppy conditions, water is often accidentally forced into the nose. One attempt to overcome such a problem has resulted in devices for closing off the nose entirely, such as a device fitting over the nose and held in place by a band passing rearwardly around the head. However, such devices require both inhalation and exhalation to be made through the mouth, which is contrary to the desired breathing procedure in many swimming strokes and thus prevent the proper training of a swimmer for such strokes. Also, such devices tend to cause the wearer to gulp or drink greater quantities of water than would otherwise be the case, since the mouth is not only open for inhalation when out of the water, as for example, when the head is turned to the side, but is also open under water, during exhalation. The drinking of excess quantities of water does not cause discomfort in the respiratory tract, but often causes discomfort or inconvenience in the alimentary tract.

Among the objects of the present invention are to provide a novel breathing attachment for swimmers; to provide such an attachment which permits inhalation through the mouth and exhalation through the nose, in the manner utilized in certain swimming strokes; to provide such an attachment which may be worn during training of a swimmer, and which will assist in such training; to provide such an attachment by which proper breathing operations are encouraged; to provide such an attachment which may be placed on and taken off with ease; to provide such an attachment which may be worn with a relative minimum of discomfort; and to provide such an attachment which is comparatively easy to manufacture.

Additional objects of this invention, together with the novel features thereof, will become apparent from the following description, taken in connection with the accompanying drawings, in which:

Fig. 1 is a front elevation of the nose and adjacent portions of the face of a person equipped with breathing attachments constructed in accordance with the present invention;

Fig. 2 is a perspective view of one of a pair of attachments, constructed in accordance with this invention;

Fig. 3 is an enlarged cross section taken along line 3—3 of Fig. 2.

As illustrated in Figs. 1–3, inclusive, the invention may comprise a single body or plug B, two conveniently being used as a pair of bodies or plugs B, adapted to be inserted in the nostrils of the nose N of the user. Each body B may include a generally cylindrical outer portion **12**, having an outer diameter or shape corresponding to that of the nostril, and an inner portion **14**, connected at its rear end with the outer portion **12** or formed integrally therewith. Inner portion **14** extends outwardly within the outer portion **12**, and also may be formed as a flattened tube, so as to act as a valve. Thus, when the air within the nostrils is relatively quiescent, or when suction is produced therein, as during inhalation through the mouth, the tubular portions **14** will be closed. However, during exhalation, air may be expelled through the nostrils since the inner portions **14** will be distended. Thus, when the valves are not opened by escaping air, i.e., when the pressure within the nostril does not exceed that outside the nostril, the valves will be closed, thus preventing an inflow of water into the nostrils, even during inhalation through the mouth.

Bodies B may be made of any suitable material adapted to conform generally to the inside of the nostrils, such as rubber, synthetic rubber, plastic or the like, although it will be understood that the inner portions **14**, which provide valves, may be made of a different material, such as more readily expansible rubber or the like, but joined to or formed integrally with the outer portions **12**. It will be evident, of course, that the bodies B not only form plugs in the nostrils, but also provide a wall having an opening and valves controlling the flow of fluid through the opening, so as to permit the flow of air from the nose but prevent flow of fluid, such as water, into the nose.

A spring **15** may be embedded in each of the outer portions **12**, as illustrated in Fig. 3, each such spring **15** extending circumferentially for a sufficient distance around the periphery of the outer portion **12**, so that the plug or body B will be held securely within the nostril. The spring **15** may be made of round wire or a relatively wide, thin strip, and more than one spring may be provided in a body B. Also, the material of which the bodies B are made may be selected so that the outer portions **12** will have sufficient resilient strength to hold the plugs in the nostrils, without the necessity of embedding springs therein. It will be evident, of course, that the springs may be placed in other positions and have other shapes.

It will be evident, of course, that various changes may be made in the attachment of this invention. As will be noted, a valve is provided in the body fitting into each nostril, such as the tubular flap valve shown, although the outer end of each body B may be provided with a flap valve, or a cage valve, such as shown in Patent No. 2,693,799. When metal springs are utilized, they are preferably embedded in the rubber or other material of which substantially the remainder of the attachment is made, to prevent direct metal contact with the skin of the user. However, in some instances such contact may be unobjectionable, in which case the springs may be only partly embedded in, or otherwise attached to, the remainder of the attachment, as by riveting or the like.

Non-metallic spring material also may be utilized, it being understood, of course, that ordinarily metal spring material has considerably greater torsional strength and resistance to bending and twisting, than plastic. Furthermore, the attachment may be formed integrally but of composite material, to provide the different properties desired in each portion of the attachment. Thus, that portion which engages the interior of the nostril may be made of plastic or similar material having sufficient spring qualities to hold the attachment in the nose, while the remainder of the attachment may be made of relatively soft rubber, synthetic rubber or plastic. The valves, of course, when tubular or flap valves, are preferably made of relatively highly resilient material, such as natural rubber or equivalent synthetic rubber, which can be stretched or distended with little difficulty, to permit easy exhalation, yet will spring back quickly to prevent the accidental inhalation or splashing of water into the nostrils. Retention of such elastic qualities during a relatively long life is, of course, highly desirable for the valve material. The entire attachment, except for metal springs where used, may be of a relatively highly resilient rubber, with certain portions having a thicker section where maximum resilience is not desired.

The attachment of this invention may be made in a number of different ways. Perhaps the simplest way to make the attachment is in a single molding operation, it being noted that when the attachment includes a spring, the spring may be inserted in the mold and the rubber vulcanized or plastic molded therearound. When the cage of a cage valve is made of metal, the cage may have legs embedded in the metal, and when the cage is made of the same material as the front wall, the cage may be molded integrally therewith. It will be evident, of course, that different portions of the attachment may be made of different materials, and in such instances more than one operation may be desirable for making the same.

From the foregoing, it will be evident that the breathing attachment for swimmers of this invention fulfills to a marked degree the requirements and objects hereinbefore set forth. Through the provision of a wall having an opening and valve means controlling the flow of fluid through the opening, so that the outflow of fluid from the nose is permitted but the inflow of fluid is prevented, inhalation through the mouth and exhalation through the nose, as in certain swimming strokes, is clearly permitted. Also, since the attachment permits inhalation through the mouth and exhalation through the nose, it may be worn during training and will assist in the training of a swimmer in such strokes, as well as encouraging the proper breathing operations. As will further be evident, the attachment may be placed in the nose and taken off with relative ease, since there is no necessity for tying bands or straps around the head, which tend to slip off during use. In distinction thereto, it is a relatively simple matter merely to slip the attachment of this invention into the nose, or to remove the same. Because of the material of which the attachment is preferably made, and also because the attachment tends to fit the nostrils, it may be worn with a relative minimum of discomfort.

It will further be evident that additional variations and embodiments of this invention may exist, without departing from the spirit and scope thereof.

What is claimed is:

1. A breathing attachment for swimmers, comprising a body formed of resilient, rubber-like material and having a generally cylindrical outer portion constructed and arranged to fit within a nostril of a user, said body having an inner portion connected at its rear end with said outer portion and extending outwardly within said outer portion, said inner portion being formed as a flattened tube adapted to provide a valve to permit discharge of air from the nostril but prevent flow of fluid into the nostril.

2. A breathing attachment for swimmers, as defined in claim 1, including a spring extending circumferentially of the outer portion of said body and adapted to press said outer portion against the wall of a nostril of a user.

3. A breathing attachment for swimmers, comprising a body formed of resilient, rubber-like material and having a generally cylindrical outer portion constructed and arranged to fit within a nostril of a user, said body having an inner portion connected at its rear end with said outer portion and extending outwardly within said outer portion, said inner portion being formed as a flattened tube adapted to provide a valve for discharge of air from the nostril but prevent flow of fluid into the nostril; and a spring extending circumferentially of said outer portion but less than the complete circumference of said outer portion, and embedded therein at a position spaced from both the front and rear ends of said outer portion.

4. A breathing attachment for swimmers, comprising a body formed of resilient, rubber-like material and having a generally cylindrical outer portion constructed and arranged to fit within a nostril of a user, said body having an inner portion connected at its rear end with said outer portion within said nostril and extending outwardly within said outer portion, said inner portion being provided with a valve to permit discharge of air from the nostril but prevent flow of fluid into the nostril.

References Cited in the file of this patent

UNITED STATES PATENTS

2,317,237	Wilen	Apr. 20, 1943

FOREIGN PATENTS

509,546	Germany	Sept. 25, 1930
439,942	Italy	Oct. 4, 1948