This invention relates to breathing attachments for swimmers.

The human species is equipped with breathing or respiratory mechanisms 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 doing so, 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 tends to make the 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 open for inhalation when out of the water, as for example, when the head is turned to the side, but is also open for exhalation, during exhalation. The difficulty of receiving water does not require 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 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 the proper training of a swimmer; 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 during swimming, without causing 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 a breathing attachment constructed in accordance with this invention;

Fig. 2 is a transverse longitudinal section taken through the attachment and the lower end of the nose of the user of Fig. 1;

Fig. 3 is a perspective view of the attachment of Figs. 1 and 2;

Fig. 4 is a side elevation of the nose and the adjacent portion of the face of a person equipped with another form of breathing attachment constructed in accordance with this invention;

Fig. 5 is a partial transverse longitudinal section taken along line 5-5 of Fig. 4;

Fig. 6 is a fragmentedly frontal elevation of the lower portion of the nose of a person equipped with an additional form of breathing attachment constructed in accordance with this invention;

Fig. 7 is a transverse longitudinal section, on an enlarged scale, taken through the attachment and the lower end of the nose of the user of Fig. 6;

Fig. 8 is a cross section taken through the attachment, along line 8-8 of Fig. 7;

Fig. 9 is an enlarged fragmentary cross section, taken similarly to Fig. 8 and illustrating an alternative valve construction;

Fig. 10 is a top plan view of a valve similar to that of Fig. 9;

Fig. 11 is a perspective view of one of a pair of attachments which can be utilized in lieu of the unitary construction of Figs. 1-3; and

Fig. 12 is an enlarged cross section taken along line 12-12 of Fig. 11.

As illustrated in Figs. 1-3, inclusive, one form of this invention may comprise an attachment which includes a pair of bodies or plugs B, adapted to be inserted in the nostrils 10 and 11 of the nose N of the user. Each body B may include a generally cylindrical outer portion B1, having an outer diameter or shape corresponding to that of the nostrils 10 and 11, and an inner portion B2, connected at its rear end B3 with the outer portion B1 and forming integrally therewith. Inner portion B2 extends outwardly within the outer portion B1, and also may be formed as a flattened tube, so as to act as a valve. Thus, when the air enters the nostril 10 or 11, it is relatively quiescent, or when suction is produced therein, as during inhalation through the mouth, the tubular portions B2 will be closed, as shown in solid lines in Fig. 2. However, during exhalation, air may be expelled through the nostrils 10 and 11 since the inner portions B2 will be distended, as to approximately the position indicated by the dotted lines of Fig. 2. But 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.

In order to mount the bodies B securely within the nostrils 10 and 11, the former may be connected by a strip 16 having embedded therein a spring 17, which is adapted to clamp the septum 18 of the nose N. The form of the spring 17 is preferably U-shaped, so that the spring will be spread in slipping over the enlargement of the end of the septal cartilage, and then will spring together to hold the attachment in place. Also, the spring 17 may be provided with a small bow 19, which may be covered with rubber or the like and extend forwardly to form a knob 20, which permits the attachment to be placed in, and taken out of, the nostrils more readily. On the front end of the spring 17 may be fastened, so as to permit the elimination of a knob or protuberance, as in the case of the strip 16 of Fig. 1.

Bodies B and strip 16 may be made of any suitable resilient or rubber-like 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 B2, 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 B1. The spring 17 may be made of any suitable spring material, such as spring steel or the like. It will be evident, of course, that the bodies B not only form plugs in the nostrils, but also provide a water valve 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.

In another form of the invention, illustrated in Figs. 4 and 5, the attachment may comprise a wall or partition 22 which extends across the front of the nose N and into
engagement with the upper lip 23 of the user, and is provided with an outer extension 24 adapted to engage the lower top surface of the nose, as well as with the outer surface of each ala or wing 25 of the nose. Wall 22 is further provided with an opening 26 and cooperating valve means 27, to permit flow of fluid from the nose but to prevent contamination of fluid into the nose. Opening 26 may be manipulated and normally covered by a flap or strip valve 27, larger than opening 26 and attached to wall 22 at each end of opening 26, as shown. Flap 26 is formed of sufficiently resilient material so that, as in Fig. 5, during exhalation, the air, such as following along the lines of the arrows, will force the flap 27 away from the opening 26, to permit discharge of air, or, if a reverse pressure on the flap 27, it will close against the opening 26, thus preventing flow of fluid into the nose.

The wall 22 of the attachment of Figs. 4 and 5 may be mounted on the nose by being clipped to each ala or wing 25, as by U-shaped springs 28, the outer leg of each spring being embedded in the outer extension 24 and each inner wall or wing 29 of the wall 22, each inner extension 29 being adapted to engage the inside of the corresponding wing 25. In general, the springs 28 are made sufficiently strong so that they will stay in the attachment being blown off the nose during a sudden exhalation, but preferably exert insufficient clamping pressure to cause pain or acute discomfort. The wall or partition 22, as well as the extension 24, conventionally formed with the wall 22, may be made of rubber, synthetic rubber, plastic, or other suitable material, while the springs 28 may be made of suitable spring material of the type indicated previously.

In the embodiment illustrated in Figs. 6 to 8, the attachment fits inside the nostrils, but only a single valve is utilized. Thus, as in Fig. 7, the attachment may comprise a partition 30, which is arced in front, or relatively flat in front and arcuate at the sides, as shown, and may have a relatively flat top 31 and a corresponding bottom 32, as in Figs. 6 and 8, to permit the attachment to be more readily grasped by the fingers of a user in placing and removing the attachment from the nose. The top, bottom and sides of outer wall 30 may also be slotted at each side into a rearwardly extending, generally cylindrical legs 33, each of which extends rearwardly into one of the nostrils 10 and 11. On the inside, the legs 33 are joined by a bridge or strip 34 which extends around the end of the septum 18 and is spaced from the outer wall 30 to form a passageway 35 connecting the legs 33, i.e. the nostrils 10 and 11. The outer wall 30 may be provided with a single opening 36 and a flap or fiber, or, as in Fig. 10, the cage 41' may be made of rubber, synthetic rubber, plastic, or other suitable material, as in Figs. 9 and 10, to permit the opening 36 upon exhalation, to permit the discharge of air, but adapted to be closed against the opening 36 upon a reverse pressure, to prevent the inflow of fluid, or, as in Figs. 9, the cage 41' may be made of metal or fiber, or, as in Fig. 10, the cage 41' may be made of the same material, such as rubber or rubber substitute, as the wall 30. The cage 41' may be formed integrally with the wall 30, as in Fig. 10, and the disc 40' may be inserted later by distention of the opening 36'. When the cage 41' is made of metal, as in Fig. 9, it may be attached to the wall 30' in a suitable manner, such as by the legs between openings 42 between the legs of each wall. The disc and cage preferably have a similar shape, such as a generally circular disc 40' and a generally cylindrical cage 41', as in Fig. 9, or, as in Fig. 10, a shape corresponding to an elongated oval or an elongated rectangle with rounded corners, generally similar in shape to the flap of Figs. 4 and 5. It will be evident, of course, that a cage may be substituted for the flap valve in the embodiment of Figs. 4 and 5.

In an additional embodiment of this invention, illustrated in Figs. 11 and 12, a separate body or base 42 is provided for each nostril, rather than the two plugs being connected together, as in Figs. 1 to 3. Thus, the body 42 may include a cylindrical outer portion 12 and a flat tubular inner portion 14, being connected at the rear with the inner portion 14 adapted to provide a valve, in the same manner as in the case of the bodies B of Fig. 2. However, a spring 45 may be provided in the outer portion 12, as illustrated in Fig. 12, such as in Fig. 4, extending circumferentially for a sufficient distance around the periphery of the outer portion 12', so that the plug or body B' will be pressed against 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 chosen so that the outer portions 12' will have sufficient resilience to hold the plugs in the nostrils, without the necessity of embed-}


The attachments of this invention may be made in a number of different ways. Perhaps the simplest way to make the attachment of Fig. 5 is to mold, while the rubber is being vulcanized or plastic molded therearound. The embodiment of Figs. 4 and 5, and also of Figs. 6-8, may be made in two operations, the first being the molding of the plastic or rubber except for the valve, and the second being the attachment of the valve flap to the front wall. As indicated previously, when the cage of a cage valve is made of metal, the cage may have legs embedded in the mold, while the rubber is being vulcanized or plastic molded therearound. The plug or body of Figs. 11 and 12 may be completely formed in a single molding operation. It will be evident, of course, that different portions of the various attachments may be made of different materials, and in such instances more than one operation may be desirable for making the attachment.

From the foregoing, it will be evident that the breathing attachment for swimmers of this invention fulfills the requirements of the attached claims in that it permits the wearer to breathe while wearing a mask or nose piece and makes a valve means available which permits the wearer to breathe while submerged. It will be evident that this invention fulfills the requirements of the attached claims in that it includes a valve means which permits the wearer to breathe while submerged.

What is claimed is:

1. A breathing attachment for swimmers, comprising the combination of a wall having an opening, said wall being shaped to fit against a portion of the nose of a user and when so fitted preventing the flow of fluid into or out of each nostril of such nose except through said opening, and said opening being adapted to provide a valve for discharge of air from the nostril, a strip connecting the outer portions of said bodies, said strip extending across the end of the septum of a user with said bodies in the nostrils; and a spring embedded in said strip and in said outer portions of said bodies, said spring being adapted to engage the inside surface of said wall and thereby maintain said attachment in position.

2. A breathing attachment for swimmers, comprising a wall formed of rubber-like material and having an opening, said wall being shaped to fit against a portion of the nose of a user and having an extension engaging the outer surface of the outer portion of each nostril, said end of said extension connecting to a surface of said wall, and also extending into engagement with the upper lip of said user, said wall having an inner extension adapted to engage the inside surface of the wall of each nostril, said openings in the central portion of said wall, said wall when so fitted preventing the flow of fluid from or into the nostril; a strip extending across said opening to permit flow of fluid from said nose but to prevent flow of fluid into said nose.

3. A breathing attachment for swimmers, comprising an outer wall having an arcuate front, a relatively flat top and bottom and a pair of rearward extending, generally cylindrical, each being a valve means which permits the wearer to breathe while submerged, and having a spring means associated with said opening to permit discharge of fluid from the nostril but prevent flow of fluid into the nostril; a U-shaped spring at least partially embedded in the inner portion of each leg of said bridge for clamping said attachment to said septum.

4. A breathing attachment for swimmers, as defined in claim 8, wherein said spring is embedded in said legs and bridge so that rubber-like material contacts said septum.

5. A breathing attachment for swimmers, comprising the combination of a wall having an opening, said wall being shaped to fit against a portion of the nose of a user and when so fitted preventing the flow of fluid into or out of each nostril of such nose except through said opening; and a valve means associated with said opening to permit flow of fluid from said nose but to prevent flow of fluid into said nose.

6. A breathing attachment for swimmers, as defined in claim 10, wherein said said spring is embedded in said legs and bridge so that rubber-like material contacts said septum.
ing sufficient extent to prevent the flow of fluid through the nostril openings; valve means associated with said body to permit flow of fluid from said nostrils, but prevent flow of fluid into said nostrils; and means including at least one spring for clamping said body to at least one cartilage of said nose.

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