United States Patent

Gongwer

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[54] STREAMLINE SWIM MASK

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[52] **U.S. Cl.** **9/329**, 128/145

[51] **Int. Cl.** **A63b 33/00**

[58] **Field of Search** ..... 128/145, 145 A, 141, 146, 146.3, 128/146.7; 2/2.1, 9; 9/303, 301, 329–332, 400; 272/71

[56] **References Cited**

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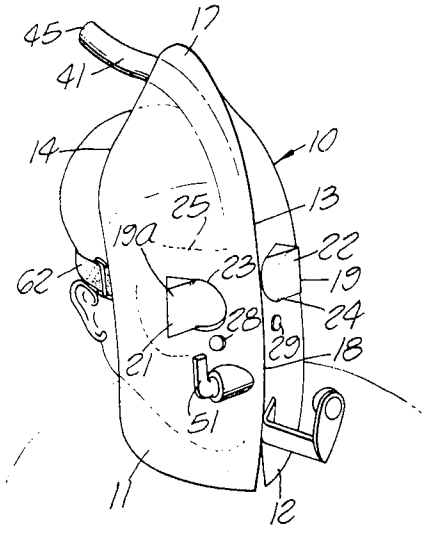
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[57] **ABSTRACT**

A streamline face mask for swimmers which can be used with either a snorkel or underwater air equipment is secured to the head of the swimmer to provide a smooth surface over the face and across the head of the swimmer and thereby reduce drag. The shape of the mask is determined by a pair of connected side members which cooperate to form a forwardly projecting prow portion and a centrally positioned relatively sharp edge which extends longitudinally from the prow.

15 Claims, 3 Drawing Figures



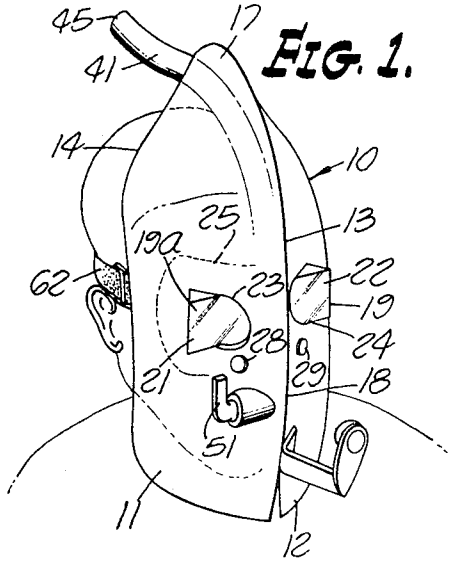


FIG. 1.

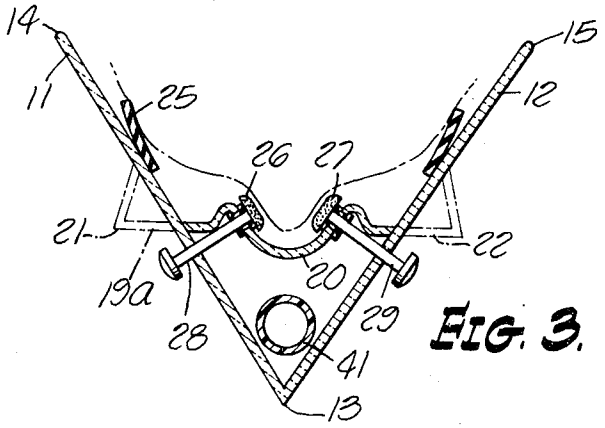


FIG. 3.

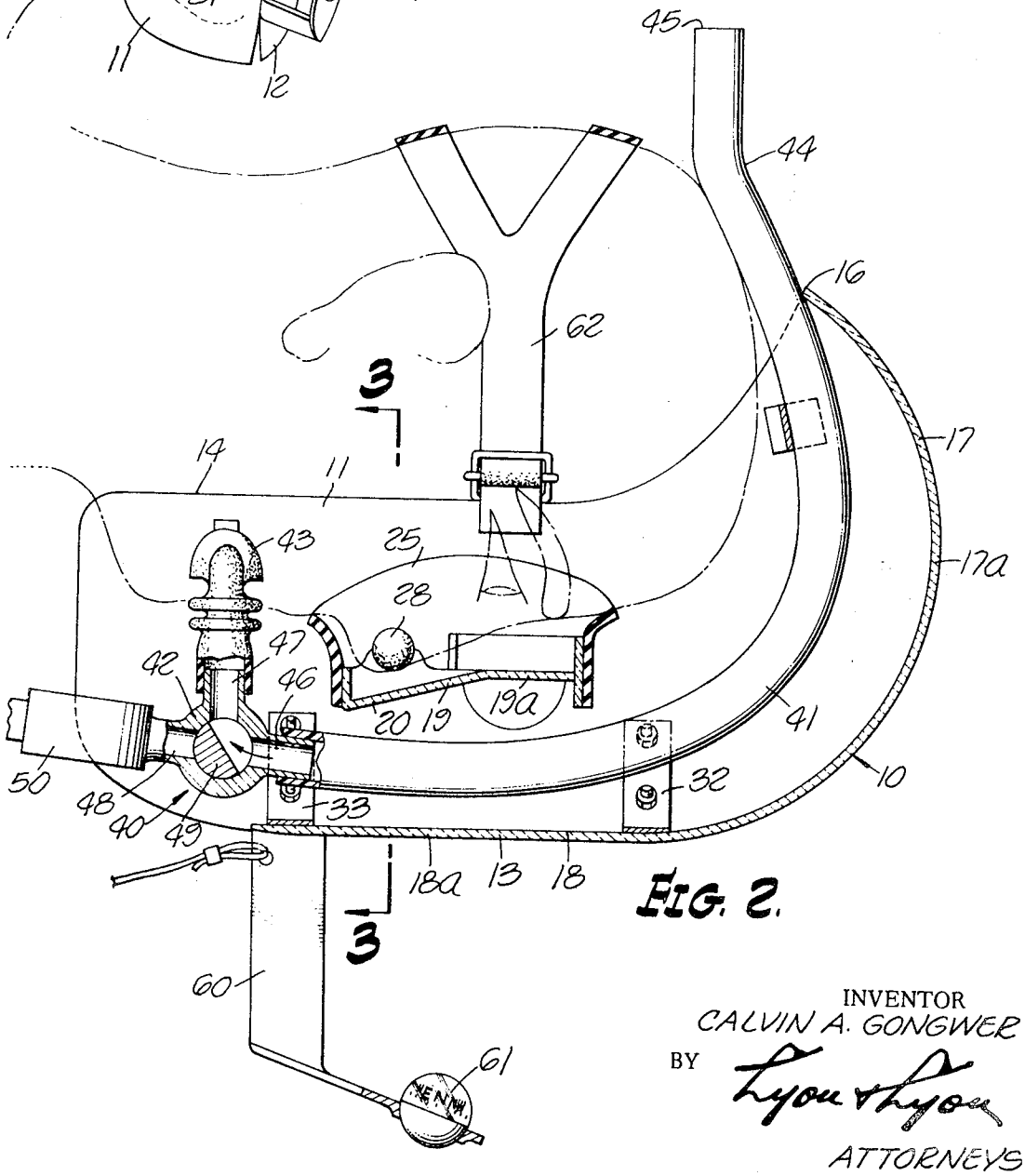


FIG. 2.

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STREAMLINE SWIM MASK

The invention relates to a mask for swimmers and divers and is particularly directed to a mask adapted for use during relatively high speed and long distance travel through the water.

Face masks for swimmers and divers have long been used to provide improved vision underwater and to generally shield the nose and eyes of the swimmer from the water. The typical face mask includes a watertight gasket, one end of which encircles the eyes and nose of the swimmer. The gasket projects generally outward from the face of the swimmer and the other end is connected to and encircles a transparent member. Such masks therefore include a relatively large amount of surface area which is normal or substantially normal to the direction of travel of the swimmer or diver. The water acts on these surfaces to increase the already present drag forces which resist the movement of the swimmer in the water. The effect of drag is particularly detrimental during relatively high speed and long distance travel. This is aptly illustrated by the fact that swimmers shave the hair on their body in order to reduce the effect of drag during races. Moreover, when a swimmer is swimming in relatively turbulent water, such as the ocean, waves and swells cause further increased drag. Therefore, the primary object of the present invention is to provide a face mask for swimmers which will not cause increased drag, but will instead reduce the normal drag forces acting on a swimmer without a mask.

Another object sought to be accomplished by this invention is the reduction of drag created by the waves and swells when swimming in turbulent water. A further object of this invention is to provide a mask which is adaptable for use with either a snorkel or underwater air equipment. A still further object is to provide a mask which provides a wide field of vision without distortion.

Moreover, there have been many developments directed to increasing the travel speed of an individual through the water, including fins which can be secured to the hands and feet of a swimmer. Another such development which is particularly effective in increasing the water travel speed of an individual is referred to in my U.S. Pat. No. 3,122,759.

In accordance with these objects, the present invention comprises a mask which is adapted to be secured to the head of the swimmer to provide a smooth surface over the face and across the top of the head of the swimmer. The mask includes a pair of side members which are symmetrical about a central plane between them and which diverge laterally and longitudinally from the plane. The intersection and connection at the sides on the plane form an edge, which resembles in part the keel of a ship, and a forwardly projecting portion which resembles the prow of a ship. The keel-like edge and forwardly projecting prow act much the same as they do on a ship and are particularly effective in reducing wave drag in relatively turbulent water. The cooperation of the sides also provide a V-shaped channel between them into which the face of the swimmer extends. A gasket within the channel is adapted to encircle the eyes and the nose of the swimmer's face and provide a substantially watertight space between the face and a transparent window for underwater vision. The mask can be used with either a snorkel or underwater air equipment and the snorkel is adapted to extend substantially within the bottom of the channel from the mouth receiving end to an open air receiving end to reduce drag on the snorkel. A valve operable from the exterior of the mask allows the swimmer to quickly and easily change from the snorkel to the underwater air equipment.

In addition the mask is sturdy in construction and economical to manufacture. Other and further objects and advantages of this invention will be made readily apparent from the following drawings and detailed description.

In the drawings:

FIG. 1 is a perspective view illustrating the mask on a swimmer or diver.

FIG. 2 is a side view of the mask in cross-section illustrating approximate normal position of the mask during surface swimming.

FIG. 3 is top sectional view of the mask taken on the lines 3—3.

Referring now to the drawings in detail, the streamline mask, generally designated **10**, is generally V-shaped in cross-section as illustrated by FIG. 3. The mask **10** is adapted to substantially cover the face and the top of the head of a swimmer or diver. The mask is preferably formed of transparent plastic and the flexible nature of the plastic along with the V-shape of the mask **10** makes the mask adjustable to various sizes and shaped heads. This same shape also causes the longitudinal edges of the mask **10** to fit tangent to the sides of the face and the top of the head and thereby provide a smooth transition between the outer surface of the mask and the head of the swimmer.

The mask **10** is formed by a pair of sheet-like side members, **11** and **12**. These longitudinally extending side members **11** and **12** are mirror-image and symmetrical about an imaginary plane which would generally vertically divide the face of a person wearing the mask **10**. The side members **11** and **12** converge to intersect on this plane and form a relatively sharp edge **13**. This centrally located edge **13**, as best seen in FIG. **2**, extends longitudinally in front of the face of the wearer of the mask and curves up over the head of the wearer. However, it should be noted that the mask can comprise a single integral sheet-like body formed by molding and the edge **13** can be rounded, particularly along the portion of the edge which is adapted to extend in front of the face, without detracting from the scope of this invention. The unconnected side edges **14** and **15** of the side members **11** and **12**, respectively, extend longitudinally along the side of the face of the wearer and curve towards the top and back of the head of the wearer. All three edges, **13**, **14** and **15** terminate at a common point **16** which is spaced a small distance from the top of the head for a purpose which will be explained below. As seen in the drawings, the cooperation of the sides in this manner form a mask which resembles the shape of a ship; with the side members **11** and **12** meeting along a curved portion **17***a* of the edge **13** to form a prow **17** and meeting along a longitudinally extending relatively straight portion **18***a* of the edge **12** which is generally normal to the curved edge portion to form a keel **18**. Moreover, the prow **17** and the keel **18** act much like the prow and keel of a ship to lower the drag. This shape is particularly effective when the wearer is surface swimming in relatively turbulent water.

A flat transparent window or sight plate **19** extends between the side members **11** and **12** with surface portion **19***a* normal to the plane described above and normal to the mean line of sight of a wearer. This plate is adapted to cover the eyes and the nose of a wearer and includes recessed portion **20** to accommodate the nose of the wearer. As best seen in FIG. **3**, portions **21** and **22** on each side of the sight plate **19** project outwardly beyond the side members **11** and **12** through sight ports **23** and **24**, respectively, in the side members **11** and **12**. The projected portions **21** and **22** of the sight plate **19** provide for a wide field of underwater vision. Moreover, because the surface portion **19***a* of the sight plate **19** is generally normal to the mean line of sight, vision is not distorted as it is when viewing through a slanted or curved member. The sight ports **23** and **24** also permits access to front side of the sight plate **19** for cleaning. Moreover, the open ports **23** and **24** permit the area between the sight plate **19** and the bottom of the channel to be flooded and because of the low index of refraction of plastic in water the multiple thicknesses of plastic become invisible so that the wearer can see out of the mask in almost any direction.

A rubber gasket **25** is sealably connected at one end to the sight plate **19** and extends from the sight plate **19**. The other end of the gasket **25**, is adapted to encircle the eyes and the nose of a wearer as shown and substantially prevent water from entering this area between the face of the wearer and the sight plate **19** in the same fashion a conventional mask protects the eyes and nose from water and provides for underwater vision.

A pair of nostril pads 26 and 27 connected to a pair of plungers 28 and 29, respectively, are adapted to be pressed against the nostrils of a wearer whereby the wearer when diving can equalize the pressure in his inner ear and eustachian tube. The plungers 28 and 29 mounted for limited axial movement extend from the area enclosed by the sight plate 19 and the gasket 25 through openings in the sight plate 19 and side members 11 and 12 beyond the side members 11 and 12 to permit the wearer to operate the pads 26 and 27 from beyond the exterior of the mask 10. Grommets 30 and 31 prevent leakage between the sight plate 19 and the plungers 28 and 29.

V-brackets 32 and 33 which are mounted to the interior surfaces of the side members 11 and 12 connect the side members 11 and 12 at the edge 13 and together with the sight plate 19 add rigidity to the mask 10.

The breathing apparatus, generally designated 40, adapted for use with the mask 10 includes a snorkel tube 41, a passage member 42, and a conventional hollow mouthpiece 43. The mouthpiece is adapted to be received at one end by the mouth of the swimmer and is preferably of a flexible material such as rubber. The snorkel tube 41 is preferably transparent plastic, however, this is not absolutely necessary for vision purposes because the tube 41 is positioned between the eyes of a wearer. The tube 41 extends out from the mask 10 in the space provided between the end 16 and the head of the wearer. The portion of the tube 41 extending beyond and above the end 16 of the curved portion 17*a* of the edge 13 is adapted to lie relatively tangent to the head of a wearer and then is bent at 44 in order that the snorkel tube 41 will be approximately perpendicular to the surface of the water during surface swimming.

The other end 46 of the snorkel tube 41 is connected to the passage member 42. The passage member 42 includes passages 46, 47 and 48, and a valve member 49. Passage 46 is in alignment with the passage through the snorkel tube 41 and passage 48 is in alignment with a passage (not shown) which extends through regulator 50, of the single hose type, to the underwater air equipment (also not shown) such as scuba diving equipment. Passage 47 is in alignment with the passage through the hollow mouthpiece 43 which is adapted to pass air into the mouth of a diver or swimmer from either the snorkel or the underwater air equipment. During surface swimming the valve member 49 can be adjusted to pass air entering the open end 45 of the snorkel 41 from the passage 46 into the passage 47 and at the same time block the passage 48. During underwater swimming the valve member can be adjusted to pass air from the underwater air equipment through the passage 48 into the passage 47 and at the same time block the passage 46. A valve member control 51 extends out through a side member to allow the swimmer or diver to adjust the valve member 49 from the exterior of the mask.

The breathing apparatus 40 is contained substantially within the interior of the mask 10 and thus eliminates drag on the snorkel, mouthpiece and regulator normally experienced when using this equipment during swimming. The valve member 49 allows the swimmer to change from the use of either the underwater air equipment or the snorkel without switching mouthpieces. It should be noted that the regulator 50 can be removed when underwater air equipment is not being used.

A streamlined bracket 60 which projects out from the mask 10 in parallel alignment with the above referred to plane can be mounted on the mask 10 to carry a compass 61 or other instruments, such as a depth gauge, in a proper viewing position.

An adjustable and flexible strap 62 connected at each end to the side members 11 and 12 is adapted to fit around the back of the head and generally above the ears of a wearer to secure the mask 10 tightly to the head. The tension of the strap 62 is such that it provides adequate pressure between the face of the wearer and the gasket 25 to prevent leakage between the gasket 25 and the face.

The streamlined swim mask provides a smooth continuous surface over the face and top of the head of a swimmer or diver to reduce drag in addition to providing a wide field of undistorted vision underwater. The shape of the mask is such that it acts to reduce drag and is particularly effective in reducing wave drag during surface swimming in relatively turbulent water. The mask is adapted for use with either snorkel or underwater air equipment and the mask also reduces some of the drag normally inherent with the use of this equipment. In addition means are provided to allow the switch from the underwater air equipment to snorkel or visa versa, to be made easily and quickly. The mask is particularly useful during relatively high-speed and long distant travel in the water.

I claim:

1. A streamline mask for a swimmer, comprising: a pair of longitudinally extending side members defining the shape of the mask, said side members being symmetrical about a central plane extending between them; an edge being formed by the intersection and connection of said side members on the plane, said edge comprising a longitudinally extending first edge portion and a relatively sharp second edge portion extending generally normal to said first edge portion; said side members diverging from both said edge portions and forming a generally V-shaped channel closed at one end along said second edge portion; and mask securing means connected to said side members whereby the mask can be secured to the head of the swimmer with the face of the swimmer extending inward toward the bottom of said channel and the top of the head being covered by the closed end of said channel to provide a pair of smooth and continuous exterior surfaces over the face and a sharp leading exterior edge above the top of the head of the swimmer to reduce drag between the swimmer and the water.

2. The mask of claim 1, wherein said second edge portion defines a smooth continuous convex curve in the central plane with the end of said curve adapted to be positioned adjacent to the top of the head of the swimmer and tangent to the back of the head.

3. The mask of claim 1, wherein a gasket member is located within said channel, said gasket member sealably encircling at one end a transparent sight means, said other end of said gasket member being adapted to sealably encircle a portion of the swimmer's face including the eyes to provide a potential water free space between the swimmer's eyes and said transparent sight means.

4. The mask of claim 3, wherein said other end of said gasket member is adapted to sealably encircle the nose of the swimmer.

5. The mask of claim 4, wherein plugs are provided which are adaptable to engage and compress the nostrils of the swimmer, means operably connected to said plugs, said means extending from within the area encircled by said gasket member through said side member wherein said means are operable from the exterior of the mask.

6. The mask of claim 4, wherein said transparent sight means includes a recess, said recess being adapted to receive the nose of said swimmer.

7. The mask of claim 3, wherein said transparent sight means comprises a sight plate, said sight plate being connected to said side members and extending between said side members substantially normal to the central plane between them.

8. The mask of claim 7, wherein said side members are each provided with a sight port and a portion of said sight plate projects through said sight ports beyond said side members to provide a wide field of vision for the swimmer.

9. The mask of claim 1 wherein means connected to the mask extend outwardly from the mask to carry instruments visible from within the mask.

10. The mask of claim 1, wherein said mask securing means comprises an adjustable strap connected at each end to said side members.

11. A streamline mask for a swimmer, comprising: a pair of longitudinally extending side members symmetrical about a central plane between them and cooperating to define a ship-

like body; a keel section and a forwardly projecting sharp prow section on said body being formed by the side members converging to intersect and connect on the plane; said side members forming an open cavity between them, said cavity adapted to receive the face of a swimmer and said side members adapted to fit generally flush along the side of the face of a swimmer, and means being adapted to secure said ship-like body on the head of a swimmer whereby the face and the top of the head of a swimmer are covered, and said side members including a pair of smooth continuous exterior surfaces converging substantially normal to said keel section to provide said sharp prow section.

12. The mask of claim 11, wherein a flexible gasket within said cavity is adapted to encircle a portion of the face of a swimmer including the eyes, transparent means connected to said gasket, and said gasket, adapted to cooperate with said transparent means and the face of a swimmer to seal off the area between said transparent means and the eyes of a swimmer in a watertight fashion.

13. The mask of claim 12, wherein said transparent means comprises a sight plate, said sight plate having a portion which is adapted to be normal to the mean line of sight of a swimmer wearing the mask and which extends between the connects to said side members, each said side member having a sight port, and said portion of said sight plate cooperating with said sight ports to provide a wide field of underwater vision substantially without distortion for a swimmer.

14. A streamline mask for a swimmer, comprising: a sheet like body having a smooth continuous outer surface adapted to cover the face of a swimmer and a top portion of the head of a swimmer; said body forming a cavity adapted to be at least partially water filled during swimming and having a pair of straight longitudinally extending and diverging sides, said sides being adapted to extend along the sides of the face of a swimmer; transparent means for underwater viewing and a flexible gasket within said cavity, said gasket having one end sealably connected to said transparent means with the other end being adapted to encircle a portion of the face of a swimmer including the eyes for forming a substantially watertight space between said transparent means and the encircled portion of a swimmer's face; said body having a streamlined forwardly projecting portion, said forwardly projecting portion being adapted to fit over the top portion of the head of a swimmer, and means being adapted to secure said body to the head of a swimmer, whereby the smooth outer surface of said body reduces drag between the water and face and the top portion of the head of a swimmer.

15. The mask of claim 14, wherein said body comprises a single integral unit.

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