United States Patent [19]

Green

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[54] **DUAL VALVE SNORKEL**

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[52] **U.S. Cl.** ..... **128/145 A**
[51] **Int. Cl.** **A63b 7/00**
[58] **Field of Search** ..... 128/145 A, 145 R, 147, 128/142, 142.3, 142.4, 146.3, 146.4, 146.5

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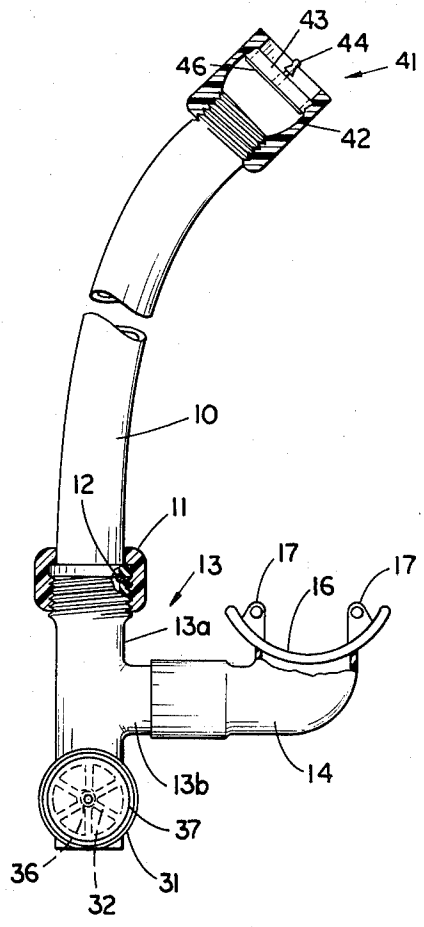
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[57] **ABSTRACT**

Disclosed is a snorkel assembly (underwater swimming aid) which has an inhalation check valve at the upper end of the elongated tube, the tube having a mouthpiece at its lower end. Adjacent the mouthpiece the assembly is provided with dual exhalation check valves. Air is inhaled by the swimmer through the upper check valve and exhaled through the lower check valves and rebreathing of exhaled carbon dioxide is thus avoided.

1 Claim, 3 Drawing Figures



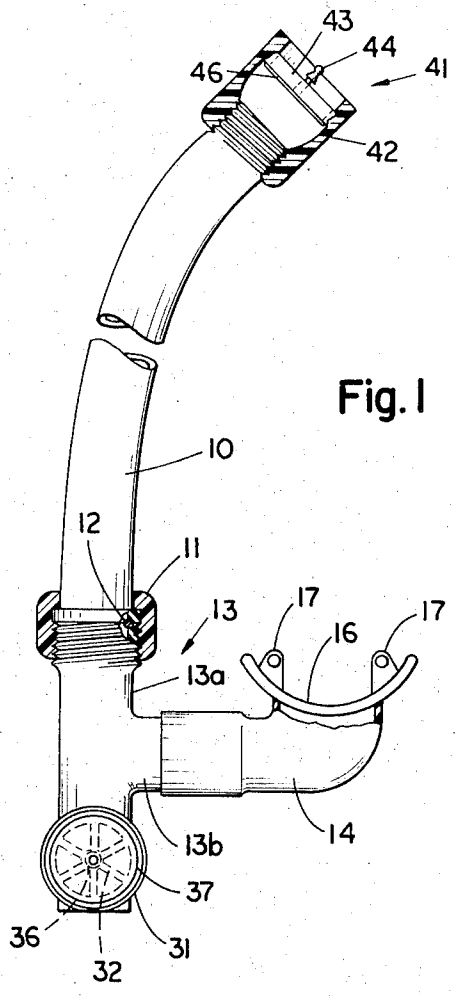


Fig. 1

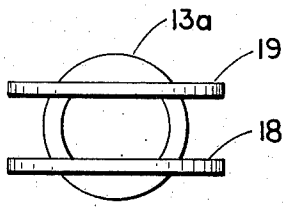


Fig. 3

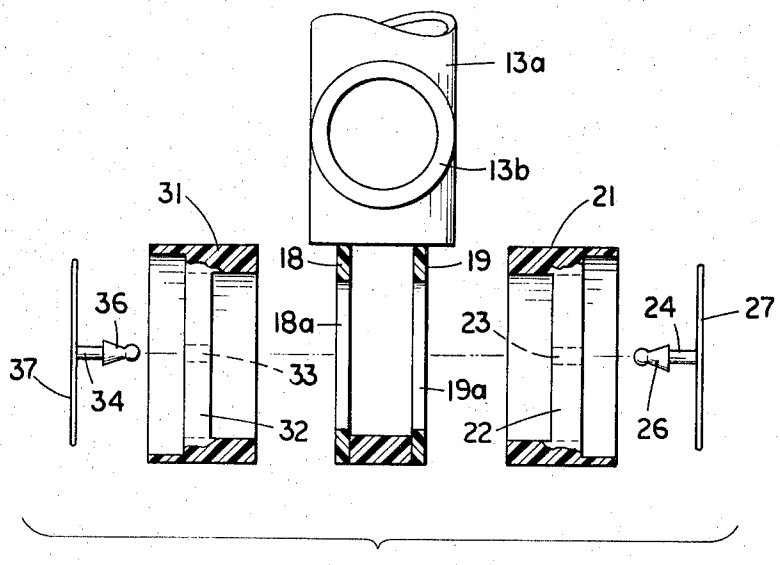


Fig. 2

DUAL VALVE SNORKEL

BACKGROUND OF THE INVENTION

Snorkel tubes are commonly used to permit swimmers to breathe with their head partially or totally submerged. With conventional devices of this type, where inhalation and exhalation takes place through the same tube, a portion of the carbon dioxide laden exhaled air is rebreathed or re-inhaled. Accumulation in the swimmer's lungs can cause shortness of breath, fatigue and in severe instances eventual loss of consciousness. Conventional structures have, in their elongated tube, a trap bend to hold any water which might enter the extending end of the tube from reaching the mouthpiece. A small quantity of water accumulating in this trap bend produces an audible gurgle with each breath of the swimmer which is psychologically annoying. Further, conventional structures, after a period of use must be purged of water in the tube by blasting or forcing water out through the tube by exhaling sharply into the mouthpiece.

The structure of the present invention obviates these difficulties by providing dual exhalation valves adjacent the mouthpiece and an inhalation check valve at the remote end of the tube.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side view of a snorkel assembly embodying the present invention.

FIG. **2** is an exploded view of a portion of the apparatus shown in FIG. **1.**

FIG. **3** is a bottom view of the central portion of the structure shown in FIG. **2** prior to assembly of the check valve components.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring initially to FIG. **1,** the assembly embodying the present invention includes an elongated main tube **10** which may be straight or of any desired curved configuration. A threaded collar **11,** together with an O-ring **12** provides a pressure fit of the lower end of the tube **10** to the vertical leg **13***a* of a T-shaped fitting indicated generally at **13.** A tubular portion **13***b* accommodates a hollow rubber mouthpiece component **14.** The mouthpiece component **14,** as is conventional, is provided with a curved portion **16** which fits the mouth of the wearer and nodules **17** which are clasped between the teeth of the wearer to retain the mouthpiece in place.

The mouthpiece thus extends sidewardly from the leg **13**a of the fitting **13** and the horizontal leg of the fitting is formed by the exhalation check valve assemblies as will be evident from FIG. **2.** As will be evident from comparing FIGS. **2** and **3** side portions of the lower end of the leg **13***a* are cut away and accommodate discs **18** and **19.** The discs have central apertures **18***a* and **19***a* respectively and, as indicated in FIG. **2** the outer face of the disc **19** accommodates in abutting relation the adjacent end of a sleeve **21,** the sleeve being fastened to the disc **19** by any suitable adhesive.

The disc **21** has extending transversely across its bore a rigid perforated disc **22** which is provided with a central aperture **23.** The perforations through the disc **22** may take any suitable configuration and as here indicated are of pie-shaped sector configuration. Received within the aperture **23** is the shank portion **24** of the molded head **26** which forms a part of the flexible rubber disc **27.** It will be understood that when the member **26** is inserted through the aperture **23** the disc **27** will be secured at its center in overlying relation to the perforate disc **22** and will seal off flow through the sleeve **21** when subjected to pressure on its face remote from the disc **22,** but will flex away from the perforate disc to permit flow therethrough when subjected to unbalanced pressure on its face adjacent the disc **22.** The disc **18** receives an identical check valve assembly which includes the sleeve **31,** having a rigid perforate disc **32.** The central aperture **33** in the disc accommodates the head **36** and shank **34** of the flexible rubber disc **37.** The flexible disc **37** acts to permit flow only in the outward direction through the sleeve **31** in the same fashion as the disc **27** previously described. While the flexible disc members and their mounting means are preferably integrally molded of rubber, it will be understood that other similar elastomeric material might also be utilized.

Referring again to FIG. **1,** the upper end of the tube **10** is threaded and receives an inhalation check valve assembly indicated generally at **41.** The check valve **41** includes a sleeve **42** which supports a perforate disc **43** which is centrally apertured to accommodate the mounting head **44** of a flexible rubber disc **46.** The flexible disc serves to seal off flow through the disc **43** when subjected to pressure on its face remote from the disc **43** but flexes away from the disc **43** to permit flow through it when subjected to unbalanced pressure on its face adjacent the disc **43.** The check valve assembly **41** is substantially identical to the exhalation check valve assemblies previously described.

In operation, with the mouthpiece in place, inhalation by the wearer will draw air through the check valve assembly **41** and exhalation by the wearer will exhaust through the dual exhalation valves forming a part of the T-shaped fitting **13.** It will be noted that water pressure seals the discs **37** and **27** preventing flow through the sleeves **31** and **21** during inhalation and, similarly, the check valve **41** will be closed by pressure against the underface of the disc **46** during exhalation which functions to open, by flexure of discs **37** and **27,** the sleeves **31** and **21.** There is a one-way flow of air both in exhalation and inhalation and no appreciable portion of the air in the tube is rebreathed. When the wearer surfaces after a dive or a period of complete submersion, the snorkel assembly of the present invention may be purged of water merely by permitting the water to flow out of the sleeves **21** and **31** with only a slight exhalation of the wearer to flex the valve discs **27** and **37.**

I claim:

1. A snorkel-type swimming aid comprising an elongated tube, a hollow T-shaped fitting removably secured to and communicating with one end of said tube, a mouthpiece member secured to and extending sidewardly from that leg of said T-fitting to which said tube is secured and communicating with the interior thereof, inhalation valve means removably secured to the other end of said tube permitting air to be drawn into the tube but not expelled therefrom, exhalation valve means disposed at the opposed ends of the other two legs of said T-fitting, said exhalation valve means permitting air to be expelled from said fitting but preventing water flow into said fitting when air is drawn into said tube through said inhalation valve means.

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