



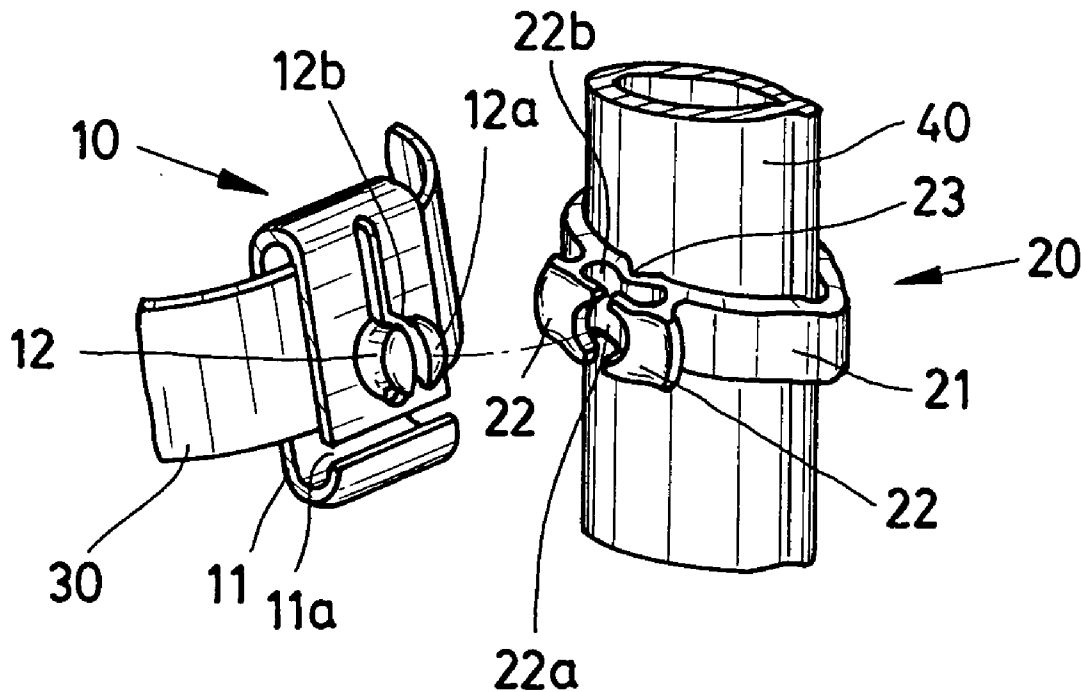
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(19) **United States**(12) **Patent Application Publication**
Shiue(10) **Pub. No.: US 2007/0272238 A1**(43) **Pub. Date: Nov. 29, 2007**(54) **ARRANGEMENT FOR RELEASABLY
FASTENING MASK STRAP TO BREATHING
TUBE OF SNORKEL**(52) **U.S. Cl. 128/201.11**(75) **Inventor: Chih-Cheng Shiue, Escondido, CA
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B63C 11/16 (2006.01)(57) **ABSTRACT**

A flexible fastening device includes a male fastening unit including a hook member securely looped around a mask strap, and a stud, and a female fastening unit including a clip put on a breathing tube of a snorkel, and two opposite latched members projected from the clip. The clip includes a bent bridge interconnected the latched members. The latched members include an aperture formed between its open ends. A space is defined by the latched members and the bridge and is communication with the external through the aperture. In a fastened position of the male and the female fastening units the stud is lockingly received in the space. Compressing opposite portions of the clip toward each other will deform the bridge, splay the latched members, and enlarge the aperture so as to permit a subsequent pulling of the stud out of the space through the aperture.



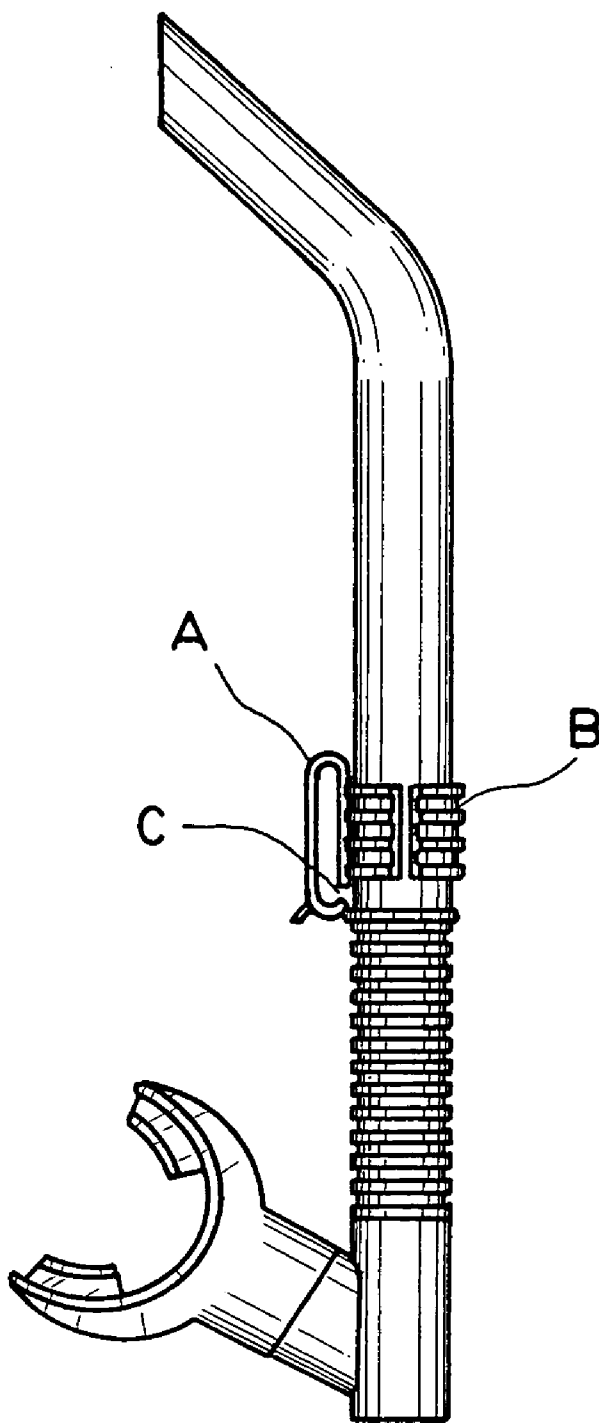


FIG. 1
(PRIOR ART)

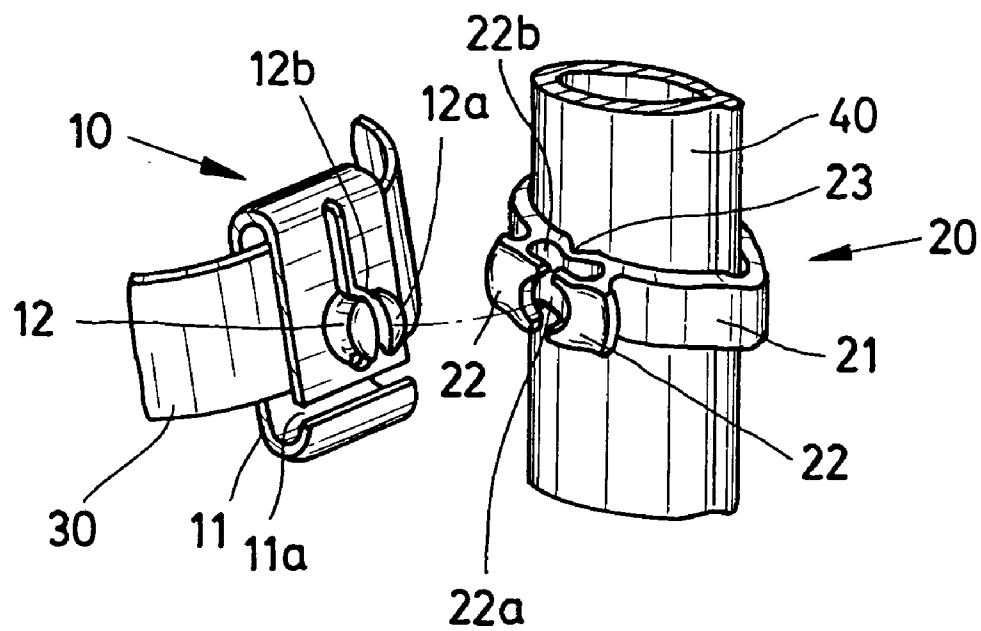


FIG. 2

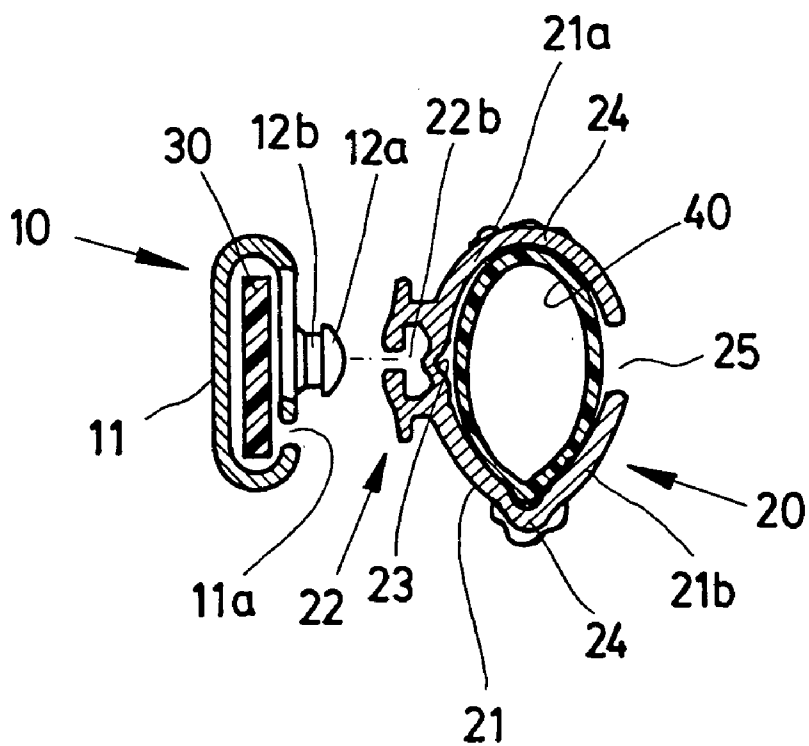
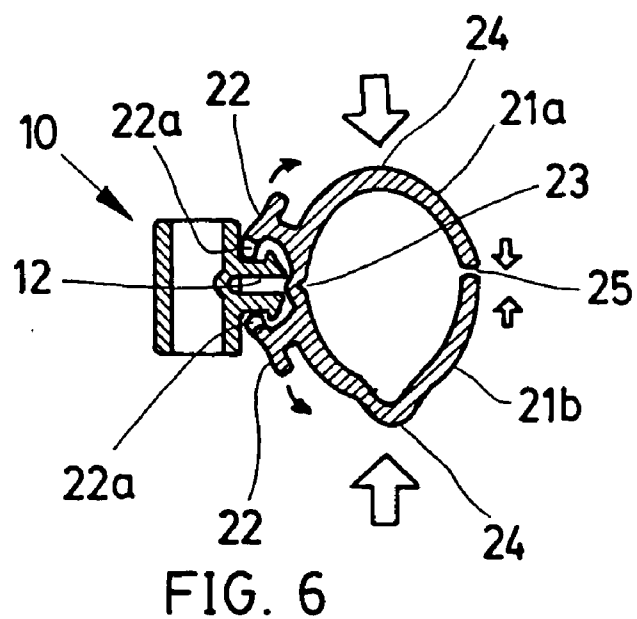
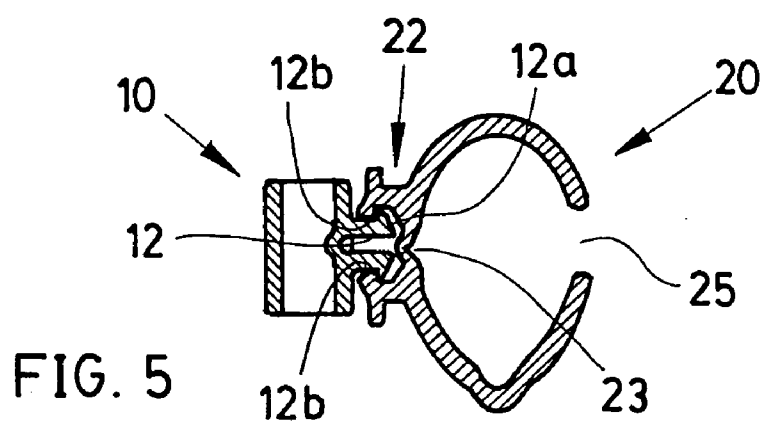
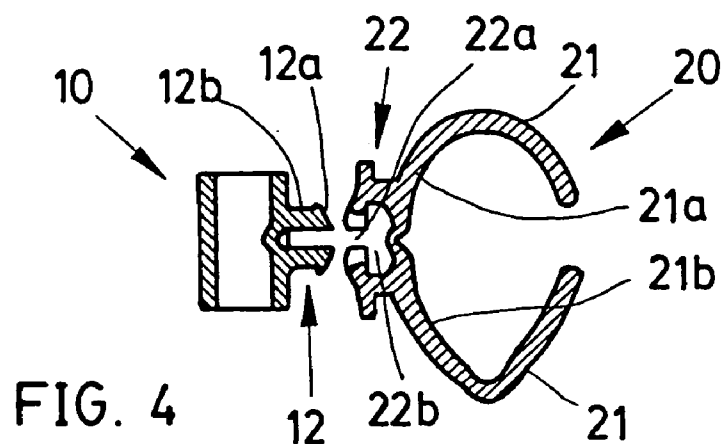


FIG. 3



ARRANGEMENT FOR RELEASABLY FASTENING MASK STRAP TO BREATHING TUBE OF SNORKEL

BACKGROUND OF THE INVENTION

[0001] 1. Field of Invention

[0002] The present invention relates to snorkels and more particularly to a device for releasably fastening a head strap of a mask for swimming (including a face mask) to a breathing tube of snorkel for a diver engaging in deep diving, surface diving or the like with improved characteristics (e.g., safety and quick fastening and releasing).

[0003] 2. Related Art

[0004] Snorkels are ubiquitous tools for divers engaging in deep diving, surface diving or the like. A snorkel typically comprises a breathing tube secured to a head strap of a mask for swimming (including a face mask) such that a diver may freely inhale and exhale. Also, the breathing tube together with a mask strap retaining clip are detached from the mask strap for ease of storage.

[0005] A conventional snorkel is shown in FIG. 1 and comprises a clip A attached to a head strap by looping around it, and a sleeve-like retaining member B integrally formed with the clip A and tightly put on a breathing tube. Both the clip A and the retaining member B are attached onto the breathing tube in a storage state of the snorkel. In use, hold the head strap around the head and open an opening C of the clip A to allow the head strap to pass. The head strap is thus attached to the clip A. To the contrary, open an opening C of the clip A to allow the head strap to exit from the clip A. It is understood that it may be difficult of detaching the breathing tube from the head strap if opening C of the clip A is relatively small. To the contrary, the head strap may be disengaged with the breathing tube unintentionally or slide relative to the breathing tube if the opening C of the clip A is relatively large.

[0006] Preferably, the head strap is held in position by the clip A. Also, the retaining member B is secured to the breathing tube in a predetermined position. Further, a simple engaging or disengaging operation of the breathing tube and the head strap is able to achieve its purpose quickly. Furthermore, the fastening of the breathing tube and the head strap is reliable (i.e., an unintentional disengagement of the breathing tube with the head strap is not possible). It is clear that the prior arrangement shown in FIG. 1 is not able to achieve that goal. Another point to be considered is that many breathing tubes are made of an elastomeric material. Thus, the need for improvement still exists.

SUMMARY OF THE INVENTION

[0007] It is therefore an object of the present invention to provide a snapping based device for quickly fastening or unfastening a head strap of a mask for swimming and a breathing tube of a snorkel.

[0008] It is another object of the present invention to provide a device comprising a flexible male fastening unit securely loop around a head strap of a mask for swimming, and a flexible female fastening unit tightly put on a breathing tube of a snorkel, wherein the male fastening unit includes a stud, and the female fastening unit includes a space open

to the external through an aperture, and wherein in a fastened position of the male and the female fastening units the stud is lockingly received in the space.

[0009] In one aspect of the present invention the female fastening unit further includes a clip put on the breathing tube such that compressing opposite portions of the clip toward each other will enable a subsequent pulling of the stud out of the space.

[0010] In another aspect of the present invention the female fastening unit further includes two opposite latched members projected from the clip. The clip includes a bent bridge interconnected the latched members. The aperture is formed between open ends of the latched members. The space is defined by the latched members and the bridge. Compressing opposite portions of the clip toward each other will deform the bridge, splay the latched members, and enlarge the aperture.

[0011] The above and other objects, features and advantages of the present invention will become apparent from the following detailed description taken with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a front view of a conventional snorkel;

[0013] FIG. 2 is a perspective view of a preferred embodiment of device for releasably fastening a head strap of a mask for swimming to a breathing tube of a snorkel according to the invention;

[0014] FIG. 3 is a sectional view of FIG. 2; and

[0015] FIGS. 4, 5, and 6 are views similar to FIG. 3 showing the male fastening unit prior to securing to the female fastening unit, the male fastening unit secured to the female fastening unit, and the female fastening unit being compressed to flexibly deform so as to allow the male fastening unit to detach therefrom respectively.

DETAILED DESCRIPTION OF THE INVENTION

[0016] Referring to FIGS. 2 and 3, a preferred embodiment of the invention is shown and comprises a male fastening unit 10 and a female fastening unit 20. A head strap 30 of a mask for swimming is adapted to pass through the male fastening unit 10 for attachment and the female fastening unit 20 is adapted to tightly put on a predetermined position of the breathing tube 40.

[0017] The C-shaped male fastening unit 10 comprises a hook member 11 and a stud 12. The hook member 11 is constructed similar to one well known in the art but has a narrow slit 11a such that the head strap 30 is prevented from unintentionally disengaging with the male fastening unit 10 by passing the slit 11a. The stud 12 is shaped as a mushroom and comprises an enlargement 12a having a tapered end and an enlarged base, and a post 12b having a diameter smaller than that of the enlargement 12a. The stud 12 is dimensioned and shaped to easily insert into an aperture 22a formed by two opposite latched members 22 of the female fastening unit 20 as detailed later.

[0018] The female fastening unit 20 comprises a C-shaped clip 21 put on the breathing tube 40, the latched members 22,

an outward bent bridge **23** interconnected the latched members **22** and adapted to divide the C-shaped clip **21** into a first curved section **21a** and a second curved section **21b**, and a gap **25** formed between open ends of the first and second curved sections **21a** and **21b**. The latched members **22** are projected from the C-shaped clip **21** and are disposed oppositely. A space **22b** is defined by the latched members **22** and the bridge **23**, and the aperture **22a** is formed between open ends of the latched members **22**. The stud **12** is adapted to insert into the aperture **22a** with the enlargement **12a** fitted in the space **22b** as detailed later.

[0019] Two opposite pressing portions **24** are formed on the C-shaped clip **21** with the bridge **23** disposed therebetween. One of the pressing portions **24** is less convex than the other one. In use, a diver may press the pressing portions **24** to compress the bridge **23** and the gap **25** is thus decreased. Also, the latched members **22** are splayed to increase the sizes of the aperture **22a** and the space **22b**. Further, the breathing tube **40** is also flexibly deformed.

[0020] Referring to FIG. 4, it shows the male fastening unit **10** prior to securing to the female fastening unit **20**. As shown, the enlargement **12a** is about to pass the aperture **22a** to enter the space **22b**. The latched members **22** are slightly splayed and the stud **12** is slightly decreased in size during the engagement. By configuring as above, the enlargement **12a** is adapted to easily insert into the space **22b**.

[0021] Referring to FIG. 5, it shows that the stud **12** is secured by the latched members **22** in which the post **12b** is clamped by the open ends of the latched members **22** and the enlargement **12a** is fastened.

[0022] Referring to FIG. 6, a diver may compress the first and second curved sections **21a** and **21b** toward each other so as to flexibly deform the bridge **23**. The latched members **22** are splayed and the aperture **22a** is enlarged. Thus, the diver may easily pull the stud **12** out of the aperture **22a**. The female fastening unit **20** may return to its inoperative state as shown in FIG. 4 when a compressing force exerted on the first and second curved sections **21a** and **21b** is removed.

[0023] While the C-shaped clip **21** has a section of C in the described embodiment, it is possible that the C-shaped clip **21** is completely closed (i.e., formed as a ring clip) and the ring clip is also adapted to tightly put on the flexible breathing tube **40** for fastening in other embodiments. Similarly, pressing the C-shaped clip **21** will flexibly deform the bridge **23** and enlarge the aperture **22a** so as to easily pull the male fastening unit **10** out of the female fastening unit **20**.

[0024] In brief, the characteristics of the invention are that the female fastening unit **20** are adapted to flexibly deform, the aperture **22a** is therefore enlarged, and the male fastening unit **10** is thus capable of easily pulling out of the engaged female fastening unit **20** by passing the enlarged aperture **22a**.

[0025] While the invention herein disclosed has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the invention set forth in the claims.

What is claimed is:

1. A device comprising a flexible male fastening unit attached to a head strap of a mask for swimming, and a flexible female fastening unit attached to a breathing tube of a snorkel, wherein:

the male fastening unit includes a hook member securely looped around the head strap, and a stud including an enlargement and a post; and

the female fastening unit includes a clip put on the breathing tube, and two opposite latched members projected from the clip wherein the clip includes a bent bridge interconnected the latched members, and the latched members include an aperture formed between its open ends; wherein a space is defined by the latched members and the bridge; and wherein in a fastened position of the male and the female fastening units the enlargement is fitted in the space and the post is clamped by the aperture;

whereby compressing opposite portions of the clip toward each other will deform the bridge, splay the latched members, and enlarge the aperture so as to permit a subsequent pulling of the stud out of the space through the aperture.

2. The device of claim 1, wherein the bridge is bent outward.

3. The device of claim 1, wherein the clip has a section of C.

4. The device of claim 1, wherein the clip has a section of ring.

5. The device of claim 1, wherein the clip further comprises two opposite pressing portions.

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