

12

EUROPEAN PATENT APPLICATION

21 Application number: **89500049.5**

51 Int. Cl.4: **B 63 C 11/16**

22 Date of filing: **21.04.89**

30 Priority: **22.04.88 ES 8801454**

43 Date of publication of application:
02.11.89 Bulletin 89/44

84 Designated Contracting States: **FR GR IT**

71 Applicant: **Molina Zamora, Pablo**
c/ Enrique Granados Esquina Industria
E-08830 Sant Boi de Llobregat (Barcelona) (ES)

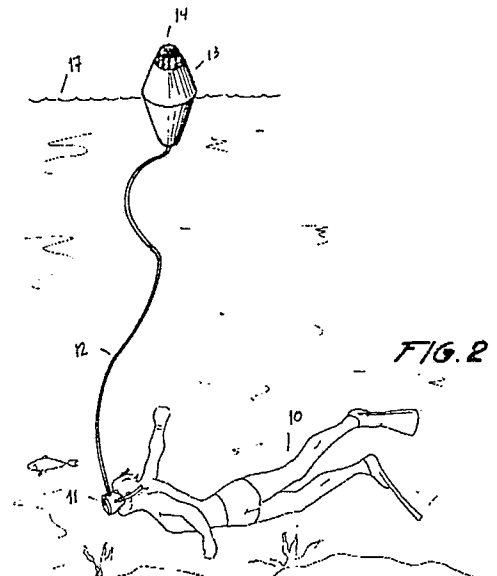
72 Inventor: **Molina Zamora, Pablo**
c/ Enrique Granados Esquina Industria
E-08830 Sant Boi de Llobregat (Barcelona) (ES)

74 Representative: **Morgades Manonelles, Juan Antonio**
Calle Valencia, 300 - entresuelo 1a
E-08009 Barcelona (ES)

The title of the invention has been amended (Guidelines for Examination in the EPO, A-III, 7.3).

54 **Air supply for divers.**

57 A BUOY (13) FOR UNDERWATER DIVER'S FACE MASK (11) of the type constituted by a glass plate and an adaptable rubber gasket, which is secured to the diver's head by means of a likewise rubber strap, comprising a flexible tube (12) which emerges from the top part of said mask (11) and is joined to a buoy (13) which is endowed with its own ventilation means.



Description

This Utility Model Patent, as stated in its title, relates to an "IMPROVED BUOY FOR UNDER-WATER DIVER'S FACE MASK", whose new features of construction, shape and design fulfill the mission for which it has been specifically designed with maximum safety and efficiency.

At present, many models of diver's face mask are available in the market which present the limitation of the time that the user can remain underwater while wearing them, primarily owing to the need of the diver to periodically inhale and exhale a certain quantity of air for his lungs.

With such face mask, the diver is periodically forced to rise to within 20 or 30 cm of the surface so that the fixed tube or snorkel which is attached to the face mask can be used to expel the depleted air from his lungs and inhale fresh oxygen that passes through said tube. In order to prevent the entry of water into the tube, when the diver is under the surface or practically on the surface or if there are waves, the top of the tube widens out somewhat and contains a small ball which acts as a valve to prevent the sea water from entering the tube, as previously mentioned, and reaching the diver's face mask.

The diver's face mask described above is thus completely limited by the diver's need to be able to periodically breathe, whereby the autonomy of the diver as concerns his underwater task is totally limited by the need to periodically rise to the surface and descend again, or else if he is working in a shallow area, he cannot in any case descend lower than 20 or 30 cm below the surface of the water because at greater depths, as previously explained, his operativity is limited by the need for air.

To solve the foregoing problems and limitations, the object of this application for Utility Model Patent is a face mask that can be used uninterruptedly and at any depth by attaching to same a special buoy by means of a flexible corrugated tube, which permits the underwater diver to enjoy complete movement around the buoy, and his autonomy depends on the length of the tube that joins the face mask to the buoy and on his natural capacity of remaining submerged beneath the water. By means of this invention, it is not necessary for the diver to periodically rise to the surface or practically to the surface to inhale fresh air and exhale the depleted air, inasmuch as through his own face mask and the buoy, he can inhale and exhale in a fully convenient way without any type of limitations.

Given the light weight of the materials used, if the diver so desires, by means of a light pressure or thrust forward of the diver himself, the buoy may be displaced, drawn by the tension that the diver exerts through the tube that joins the aforementioned face mask with the aforementioned buoy.

In order to prevent the waves or else the passage of a boat from presenting a hazard to the user of the aforementioned face mask, said buoy, constructed of a lightweight material, will have a central bore through which the flexible tube will be inserted that

is joined to the improved face mask, with suitable sealing to ensure a better watertightness of the coupling of the tube to the buoy by means of separate protective rubber gaskets which besides preventing the entry of water between the tube and the central bore of the buoy, provide a certain protection for the tube inasmuch as it is inserted into the buoy, because the repeated swaying of same could otherwise cause breakage or cracking in the point of union of said tube and said buoy.

At the top of the buoy, for the purpose of preventing the water from entering through same and flood the tube with the resulting detriment to the diver, a double protective grille or screen system has been arranged with the respective holes for the breathing of the diver, but said holes are not set opposite each other and there is a protective screen between the two which, in the case in which water enters through the top, causes the water to flow to some drains, which prevents, as previously mentioned, the possibility of water entering the tube.

Other details and features of this application for Utility Model Patent will be stated in the course of the description that will be given below, in which reference will be made to the drawings that accompany this Specification and which, in a somewhat simplified way, represent the preferred details. These details are given for exemplary purposes, referring to a possible case of practical embodiment; but it is not limited to the details that are set out herein; therefore, this description shall be considered to be indicative and in no way limiting.

Figure no. 1 shows a cross section in elevation of the buoy no. 13, whose top part shows the aeration windows (14) and (16) and, between them, the protective screen (15). The flexible tube (12) is inserted in the central part, ensuring the sealing of the tube with respect to the buoy by means of the gaskets (12a) and (12b).

Figure no. 2 shows a diver (10) in working position with the face mask that is the object of this Utility Model Patent that includes the tube (12) and the buoy (13), with the latter floating freely on the surface of the water (17), stabilized by means of the counterweight (18).

In one of the preferred embodiments of this application for Utility Model Patent, the diver's face mask (11) have an outlet through which a flexible tube, preferably of the corrugated type, is inserted, joining said face mask (11) with the bottom part of the buoy (13). Said buoy (13) has a configuration formed on a first level by a truncated cone which is prolonged below by another truncated cone of larger diameter, and in a third area by another truncated cone of the same diameter but of greater height.

The buoy (13) has in its center, as may be seen in Fig. no. 1, a central transecting bore through which the tube (12) is inserted to the first zone or level, and said tube (12) is secured within the buoy (13) in its central bore with the help of separate gaskets (12a) and (12b), the latter with the mission of preventing

wear or premature breakage at the point of union of the bottom part of the buoy (13) with the tube (12). On the top part of the buoy, there are separate protective screens (14) and (16), which have separate holes or windows of small dimensions (14a) and (16a), with the particularity that said windows are not set opposite each other, which entails that even if the protective screen (15) were not to exist, the sea water, upon striking the window (16a), would meet a screen space (14) that does not correspond to a window (16) space, so the water would be forced to drain through the lowest holes (14a), and the surface (21) may be flat, in the manner of a disk, or have the side surface of a cone.

Notwithstanding all the foregoing, and to provide greater security between the protective screens (14) and (16), another screen (15) has been foreseen, which has no type of hole, thus ensuring the sealing against water in a perfectly delimited way without this reducing the ventilation of the tube (12) inside the buoy (13).

These protective screens have the shape of a truncated cone and are arranged concentrically as their diameters are of different sizes.

In order to prevent excessive swaying of the buoy (13) when it is in a working position on the surface of the water (17), a stabilizer counterweight (18) is set in the bottom part of the third zone of the buoy (13) which ensures that said buoy (13) will remain, at all times, in practically vertical position.

In the normal working position, as shown in Fig. no. 2, the diver (10) has a capacity of movement within a distance equal to the length of the tube (12), covering practically a hemisphere whose radius is practically equal to the length of the tube (12), whereby said diver (10) can go to areas whose depth coincides with the length of said tube (12), but he can also move the position of the buoy (13) along the full length of the tube (12), but in horizontal position, thus ensuring total autonomy, above all as, owing to the light weight of the materials used in the construction of said face mask, tube and buoy, the buoy can be moved with the thrust of the diver himself who, by means of the tube (12), will draw along the buoy (13) floating on the surface of the water (17).

After looking at the drawings and reading the foregoing description of them, it will be understood that the application for this Utility Model Patent that is the subject of this Specification entails a simple and efficient construction that can be put into practice very easily, undoubtedly constituting an industrial advance.

For all pertinent effects, it is stated that, in the object that constitutes this application for Utility Model Patent, all such variations and changes of details as may be advised by the circumstances and by practice may be introduced, as long as said variations that are introduced do not alter or modify the essence that is summarized in the following CLAIMS.

Claims

5 1.- An IMPROVED BUOY FOR UNDER-WATER DIVER'S FACE MASK of the type constituted by a glass plate and an adaptable rubber gasket, which is secured to the diver's head by means of a likewise rubber strap, characterized in that a flexible tube (12) emerges from the top part of said mask (11), and is joined to a buoy (13) which is endowed with its own ventilation means.

10 2.- An IMPROVED BUOY FOR UNDER-WATER DIVER'S FACE MASK, as claimed in Claim 1, characterized in that the buoy (13) has a first zone in the shape of a truncated cone (14), which is prolonged on the bottom into another zone (19), likewise of truncated cone shape but of larger diameter, which in turn is prolonged below into another zone of truncated cone shape of the same diameter but of greater height (20).

15 3.- An IMPROVED BUOY FOR UNDER-WATER DIVER'S FACE MASK, as claimed in Claim 2, characterized in that the buoy (13) has a central cylindrical transecting bore through which the flexible tube (12) is inserted, and the union between the tube (12) and the buoy (13) is sealed by means of the assembly of separate gaskets (12a) and (12b) in the top and bottom parts of said unions between (12) and (13).

20 4.- An IMPROVED BUOY FOR UNDER-WATER DIVER'S FACE MASK, as claimed in Claims 2 and 3, characterized in that the top part of the buoy (13) contains the protective screens (14) and (16) of truncated cone shape and different diameter, concentrically arranged, and set between (14) and (16) is the screen (15), likewise of truncated cone shape and of a diameter between those of (14) and (16). Screens (14) and (16) have separate holes or windows that are not set opposite each other.

25 5.- An IMPROVED BUOY FOR UNDER-WATER DIVER'S FACE MASK, as claimed in Claims 2, 3 and 4, characterized in that there is a stabilizer counterweight (18) in the bottom part of the buoy (13) and in the third zone of truncated cone shape.

30 6.- An IMPROVED BUOY FOR UNDER-WATER DIVER'S FACE MASK. All as described in the Specification and Drawings comprising nine sheets written on one side alone.

FIG. 1

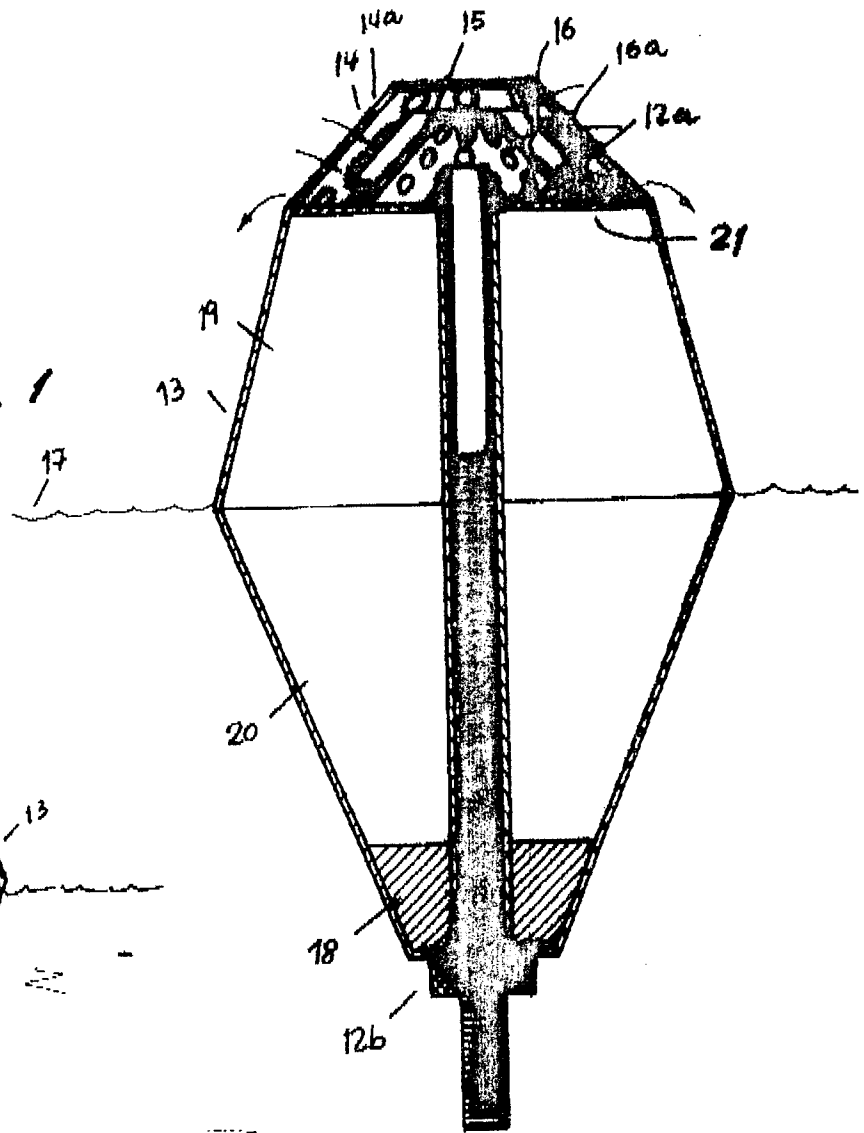
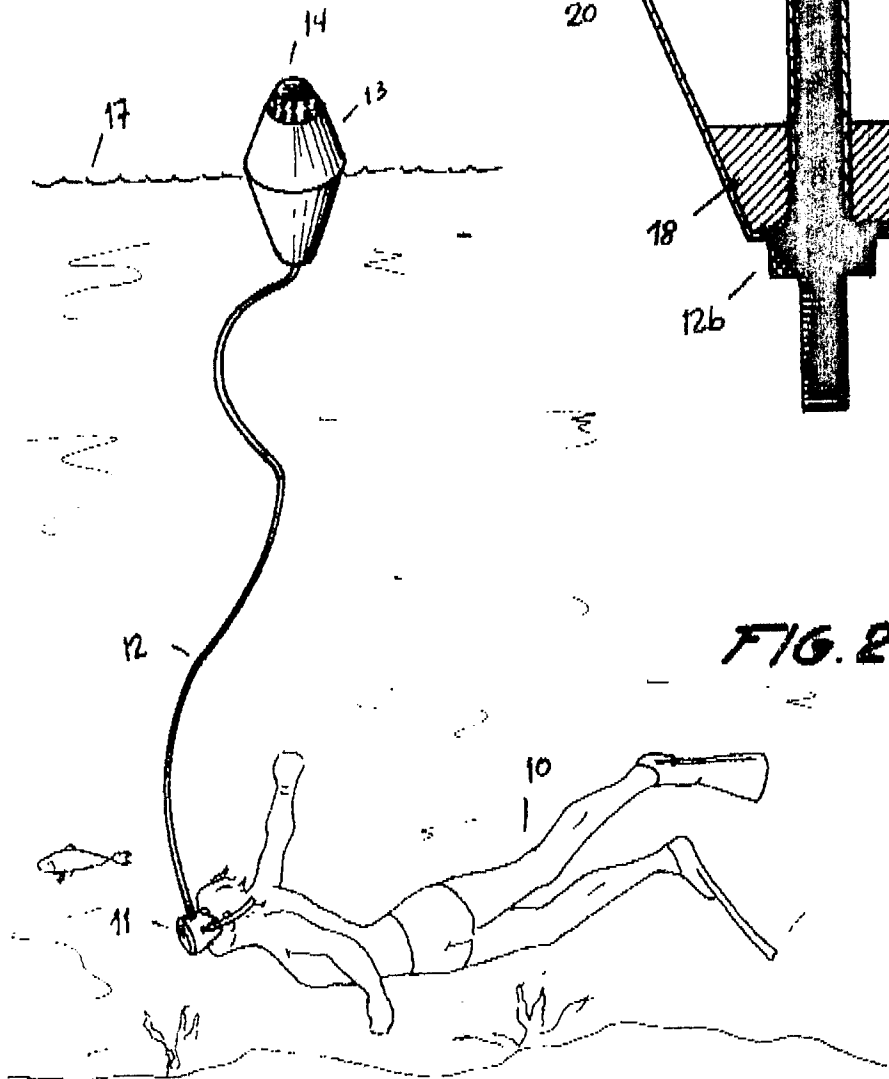


FIG. 2





| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|---|--|--|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl. 4) |
| X | GB-A-2 187 103 (WRIGHT) * Page 1, lines 48-115; figures 1,2 * | 1-3 | B 63 C 11/16 |
| Y | ---- | 4-6 | |
| Y | US-A-3 370 586 (ARAGONA et al.) * Column 2, line 57 - column 3, line 57; figures 1-7 * | 4-6 | |
| A | ---- | 1-3 | |
| A | US-A-2 818 067 (REBIKOFF et al.) * Column 2, lines 5-8; figure 1 * | 1 | |
| A | US-A-3 265 066 (KATEHIS) * Column 2, lines 40-54; figure 1 * | 2,4 | |
| A | US-A-1 374 943 (MELVIN) * Page 1, lines 65-76; figure 1 * | 2 | |
| A | US-A-4 269 182 (LE) ----- | | |
| The present search report has been drawn up for all claims | | | TECHNICAL FIELDS SEARCHED (Int. Cl.4) |
| | | | B 63 C |
| Place of search THE HAGUE | | Date of completion of the search 03-08-1989 | Examiner DE SENA Y HERNANDORENA A |
| <div>CATEGORY OF CITED DOCUMENTS</div> <div>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</div> <div>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document</div> | | | |