

Description

Title of the invention: Diving mask with a pressure balancing means

Technical field

[0001] The present invention relates to the field of diving masks, and in particular masks used for snorkeling.

Prior art

[0002] Generally, the snorkeler is equipped with a mask for vision and with a snorkel for breathing. The snorkel consists of a tube, the lower end of which is provided with a buccal portion which is received in the mouth of the user, and an upper end allowing both the intake of fresh air and the exhaust of expired air.

[0003] It is known that such equipment has many drawbacks. First, because breathing through the mouth is not natural, some people find it difficult to breathe orally using a snorkel. Another drawback is that it is not possible to speak underwater when you have a snorkel in your mouth.

[0004] Also, the use of this mask-snorkel device is not very comfortable. To overcome this drawback, document FR 3 020 620 proposes a diving mask that allows breathing through the nose and through the mouth.

[0005] This diving mask includes: a body provided with a visor and a flexible skirt, said flexible skirt including a partition delimiting an upper chamber for the vision of a lower chamber for breathing, the partition being arranged to bear above the user's nose so that the user's mouth and nose are located in the lower chamber, while the user's eyes are located in the upper chamber, the partition including at least a passage arranged to allow a flow of fresh air between the upper chamber and the lower chamber during a phase of inspiration of the user; a snorkel disposed in the extension of an upper portion of the body, the snorkel comprising at least one air duct; in which the body includes an expired air exhaust device which fluidly links the lower chamber with the air duct of the snorkel.

[0006] This mask also includes a snorkel provided with several channels and a plate which includes check valves in order to close off the air outlet channels during an

inspiration phase, on the one hand, and in order to close off the air inlet channel during an expiration phase.

[0007] More specifically, the upper end of such a snorkel generally includes a valve allowing the closing of the snorkel when it is completely immersed, in order to prevent water from entering the mask.

[0008] However, sometimes after being completely immersed, the valve of the snorkel remains in the closed position, even after the user has returned to the surface of the water. In addition, in this case, the mask may also be more difficult for the user to remove by hand.

Disclosure of the invention

[0009] The present invention aims at solving the various technical problems stated above. Particularly, the present invention aims at proposing a diving mask that allows improving the reopening of the snorkel when it comes out of the water after having been completely immersed. The present invention also aims at facilitating the removal of the mask from the user's face after the snorkel has been completely immersed.

[0010] Thus, according to one aspect, a diving mask comprising a snorkel with a valve is proposed, the valve including:

- a valve orifice intended to allow fluid circulation, in particular of air, between the outside of the snorkel and the inside of the snorkel, and
- a valve closure member, for example a float, which can move between an open position in which the valve orifice is open and a closed position in which the valve orifice is closed by the valve closure member,

in which the mask also includes a balancing means for limiting a pressure difference between the internal pressure of the mask and the external pressure, the balancing means being configured to allow fluid circulation between the outside of the mask and the inside of the mask when the mask is used by a user and when the closure member is in the closed position.

[0011] Thus, thanks to the invention, it is possible to balance the pressure difference which may appear between the inside and the outside of the mask. More specifically, when the snorkel is completely immersed, that is to say when the valve is in the closed position, the user can create, in spite of himself, a

depression inside the mask by trying to inspire. Such a depression can on the one hand create a suction effect of the mask on the face of the user, which can make the use of the mask unpleasant for the user, and on the other hand hold the valve of the snorkel in the closed position, even when the user pulls his head out of the water. Indeed, the valve generally includes a float which, when the level of the water reaches the upper end of the snorkel, closes off the valve under the effect of the buoyancy and which, when the level of the water goes down, reopens the valve under the effect of gravity. However, in case of depression inside the mask, the float may be held in the closed off position of the valve, thus preventing the user from breathing again as long as he has not expired in the mask to cancel depression. On the contrary, in the mask according to the present invention, the balancing means allows compensating for the pressure difference between the inside and the outside of the mask: this avoids having a depression inside the mask and therefore holding the valve in the closed position when the snorkel is out of the water. Particularly, the balancing means is configured to allow a fluid circulation, in this case a circulation of water and/or outside air, from the outside of the mask to the inside of the mask, when the mask is used by a user and when the closure member is in the closed position.

[0012] Preferably, the balancing means is mounted on the closure member.

[0013] In this embodiment, the closure member of the valve integrates the balancing means: the balancing means is then positioned directly on the member which can close the internal volume of the mask. Such an embodiment therefore allows creating a fluid connection between the inside and the outside of the mask only when the closure member closes off the valve that is to say only when the valve is in the closed position. Conversely, when the valve is in the open position, the closure member is not in fluid connection with the interior of the mask, so that the balancing means cannot create a fluid connection between the inside and the outside of the mask.

[0014] Preferably, the valve also includes a body in which the valve orifice is provided, and the balancing means is mounted on the valve body.

[0015] In this embodiment, the balancing means is mounted at the valve that is to say at the device capable of closing the internal volume of the mask. The

balancing means is therefore positioned to be immersed only when the valve is also immersed, that is to say in the closed position. This avoids premature immersion of the balancing means, as long as the valve is not in the closed position.

[0016] Preferably, the snorkel also includes a wall delimiting the inside of the snorkel relative to the outside, and the balancing means is mounted on the wall of the snorkel.

[0017] In this embodiment, the balancing means is mounted on the snorkel, between the valve and the body of the mask. This makes it possible in particular, when the snorkel includes both an inspired air intake channel and at least a first expired air exhaust channel, to provide the balancing means on the expired air exhaust channel in order to avoid possible entry of water through the upper chamber of the mask.

[0018] Preferably, the snorkel includes a proximal portion and a distal portion. The snorkel is mounted on the body of the mask by the proximal portion. The balancing means is preferably mounted on the wall of the distal portion of the snorkel.

[0019] Preferably, the balancing means is mounted on the wall of the distal portion of the snorkel so that the valve is located between the proximal portion and the balancing means. Thus, it is possible to mount the balancing means above the valve such that the balancing means can still be out of the water when the valve is in the closed position.

[0020] Preferably, the mask also includes a body delimiting the inside of the mask relative to the outside, and the balancing means is mounted on the body of the mask.

[0021] In this embodiment, the balancing means is mounted directly on the body of the mask that is to say on the immersed portion when the mask is used. Such an embodiment makes it possible in particular to bring the water into the mask, in case of depression, at the desired location, preferably in the bottom portion of the mask that is to say in the lower chamber of the mask.

[0022] Preferably, the balancing means has a tubular shape or is in the form of a hole.

[0023] The purpose of the balancing means is to allow a balancing between the internal pressure of the mask and the external pressure. To this end, one embodiment of the balancing means consists of an opening between the inside of the mask and the outside, in order to allow fluid circulation between the two under the effect of a pressure difference. The opening can thus be in the form of a preferably small-sized hole, a tube or channel.

[0024] Preferably, the balancing means has a geometry configured to allow fluid circulation through the balancing means only when the pressure difference is greater than a determined value.

[0025] In such an embodiment, the balancing between the pressure inside the mask and the outside occurs only when the pressure difference is greater than a given value. This avoids a possible excessive and unnecessary entry of water inside the mask: on the contrary, water will enter the mask by the balancing means only if the pressure difference is greater than a given value allowing fluid circulation in the balancing means. Such a given pressure difference value may in particular be due to the geometry of the balancing means. Thus, when the opening of the balancing means is particularly small, this results in a significant pressure loss on either side of the balancing means: it is then necessary to have a minimum pressure difference on either side of the balancing means to allow fluid circulation through said balancing means.

[0026] Preferably, the balancing means also includes a valve element, for example a flexible membrane, configured to allow fluid circulation through the balancing means only when the pressure difference is greater than a determined value.

[0027] In such an embodiment, the pressure difference required to open the balancing means does not only result from the geometry of the balancing means, but also from the presence of a valve element in the balancing means. The addition of a valve element allows better controlling the pressure difference value necessary to obtain fluid circulation between the inside and the outside of the mask.

[0028] Preferably, the determined pressure difference value for which the balancing means is configured to allow circulation of a liquid between the outside of the mask and the inside of the mask, is greater than the determined pressure difference value for which the balancing means is configured to allow air circulation between the outside of the mask and the inside of the mask.

[0029] In such an embodiment, the balancing of the pressure difference can be done in two stages, when the depression inside the mask is significant: in a first stage, when the balancing means is immersed, the pressure difference will decrease by the entry of water in the mask until the pressure difference reaches the determined value allowing circulation of a liquid through the balancing means, then, in a second stage, when the balancing means is again out of the water, the pressure difference will continue to decrease by the entry of air in the mask until the pressure difference reaches the determined value allowing circulation of a gas through the balancing means. This limits the amount of water entering the mask under the effect of the pressure difference, while allowing the reopening of the valve and easy removal of the mask by hand by the user when the mask is again out of the water.

[0030] Preferably, the balancing means comprises a through channel.

[0031] Such an embodiment is particularly advantageous when the balancing means is mounted in the float which generally has an elongated shape.

[0032] Preferably, the ratio of the area of the valve orifice to the area, in particular the cross section, of the balancing means is greater than 1, preferably comprised between 1 and 1,000,000, more preferably comprised between 10 and 100,000, and more preferably comprised between 100 and 10,000.

[0033] It is understood that the balancing means is not intended to allow fluid circulation with a flow rate similar to that of the valve. The balancing means is provided, or configured, to decrease a pressure difference, not to allow the user to continue to breathe normally when the valve is in the closed position. Thus, the balancing means has a flow rate that allows a pressure balancing but which is lower than that of human breath. The user will be able to realize, in use, the closure of the valve, while having a pressure inside the mask which differs little from the one outside.

[0034] Preferably, the mask includes a body delimiting the inside of the mask relative to the outside, the body comprising:

- a frame surrounding the user's face,
- a visor surrounded by the frame,
- a flexible skirt fixed to the frame, the skirt including a partition delimiting an upper chamber for the vision of a lower chamber for breathing, the partition being arranged to bear above the user's nose such that the user's mouth and nose are located in the lower chamber, the partition including at least one passage arranged to allow circulation of inspired air directed from the upper chamber to the lower chamber during a phase of inspiration of the user,

wherein the frame, in particular the rigid frame, comprises at least a first duct for the expired air, said first duct having an upper end opening inside the snorkel, and a lower end fluidly communicating with the lower chamber.

[0035] Preferably, the snorkel has an inspired air intake channel and at least a first expired air exhaust channel, said snorkel being the extension of an upper portion of the frame, the inspired air intake channel opening into the upper chamber while the first expired air exhaust channel communicates with the lower chamber, and wherein the first duct of the frame has an upper end opening into the expired air exhaust channel.

[0036] According to another aspect, a snorkel for a diving mask as described above is also proposed, the snorkel comprising a valve including:

- a valve orifice intended to allow fluid circulation between the outside of the snorkel and the inside of the snorkel, and,
- a valve closure member, for example a float, which can move between an open position in which the valve orifice is open and a closed position in which the valve orifice is closed by the valve closure member,

wherein the snorkel also includes a balancing means for limiting a pressure difference between the internal pressure of the snorkel and the external pressure, the balancing means being configured to allow fluid circulation between the outside of the snorkel and the inside of the snorkel when the mask is used by a user and when the closure member is in the closed position. Particularly, the balancing means is configured to allow fluid circulation, in this case a circulation of water and/or outside air, from outside the snorkel to inside the snorkel, when

the mask is used by a user and when the closure member is in the closed position.

Brief description of the drawings

[0037] [Fig. 1] Figure 1 is a perspective view of a diving mask according to the invention, comprising a snorkel;

[0038] [Fig. 2] Figure 2 is a sectional view of the snorkel of the mask of Figure 1, when the valve is in the open position;

[0039] [Fig. 3] Figure 3 is a partial exploded view of the snorkel of Figure 2;

[0040] [Fig. 4] Figure 4 is a partial sectional view of the snorkel of the mask of Figure 1, when the valve is in the closed position.

Description of the embodiments

[0041] Figure 1 represents an exemplary embodiment of a diving mask 1 according to the present invention. The diving mask 1 includes a body 2 and a snorkel 4 mounted, preferably removably, on the body 2.

[0042] The body 2 comprises in particular a frame 6, a visor 8 and a flexible skirt 10.

[0043] The frame 6 is generally oblong with an upper portion 6a and a lower portion 6b, and forms, in use, a banding surrounding the user's face.

[0044] The frame 6 may also include a first duct for the expired air (not represented) making it possible to convey, at least partly, the air expired by the user to the snorkel 4, in particular from the lower chamber defined below, and a first duct for the inspired air (not represented) making it possible to convey, at least partly, the inspired air from the snorkel 4 to the user, in particular to the upper chamber defined below.

[0045] The frame 6 finally includes slots 11 intended to receive one or more elastic straps (not illustrated here).

[0046] The visor 8 is secured to the frame 6. In this example, the visor 8 is made of a rigid and transparent plastic material, for example polycarbonate.

[0047] As can be understood from Figure 1, the frame 6 surrounds the visor 8. In this non-limiting example, the frame 6 is a part distinct from the visor. Without

departing from the scope of the invention, the frame could however form a single piece with the visor.

[0048] Referring to Figure 1, it is seen that the visor 8 is shaped to cover the face of the user. The visor includes a transparent flat portion 8a intended to be located substantially at the user's eyes, and a domed portion 8b intended to be located at the user's nose and mouth. In this non-limiting example, the domed portion 8b is transparent. However, and without departing from the scope of the present invention, the domed portion 8b could be opaque or transparent and covered with an opaque cover.

[0049] The visor 8 can also include a purge valve element 12 for the discharge of water which could have entered the mask 1. The purge valve element 12 can be mounted on the visor 8, in its lower portion, on the side of the lower portion 6b of the frame 6.

[0050] The skirt 10 is made of a flexible material, for example in a silicone elastomer such as LSR silicone. The skirt 10 is fixed to the visor 8 in particular thanks to the frame 6 and is intended to provide the sealing between the inside of the mask 1 and the outside, efficiently and comfortably for the user.

[0051] The flexible skirt 10 includes a partition 14 delimiting an upper chamber 16 for vision, and a lower chamber 18 for breathing, the partition 14 being arranged to bear above the user's nose such that the user's mouth and nose are located in the lower chamber 18, while the user's eyes are located in the upper chamber 16.

[0052] The upper chamber 16 is in fluid communication with the first duct for the inspired air of the frame 6, while the lower chamber 18 is in fluid communication with the first duct for the expired air of the frame 6.

[0053] The partition 14 is fixed to the visor 8 by an added fixing part which is clipped to fixing lugs 20 protruding from an inner face of the domed portion 8b of the visor 8.

[0054] The partition 14 includes two orifices which engage with the fixing lugs 20 before positioning the fixing part.

[0055] The partition 14 also includes two check valves 22 which are arranged to allow only a flow of fresh air directed from the upper chamber 16 to the lower chamber 18 during a phase of inspiration of the user.

[0056] Thus, during an expiration phase, the expired air has the effect of closing the check valves 22, which has the effect of preventing the expired air from passing from the lower chamber 18 to the upper chamber 16. The expired air will therefore be conveyed from the lower chamber 18 to the snorkel 4 by the first duct for the expired air.

[0057] During an inspiration phase, the pressure drop which occurs in the lower chamber 18 has the effect of opening the check valves 22, whereby the fresh air can flow from the snorkel 4 to the lower chamber 18 by passing through the first duct for the inspired air and the upper chamber 16.

[0058] The diving mask 1 also includes the snorkel 4, of generally tubular shape, with a proximal portion 4a connected to the upper portion 6a of the frame 6, and a distal portion 4b opposite the proximal portion 4a.

[0059] In this example, the proximal portion 4a of the snorkel 4 is mounted on the body 2 of the mask, and more particularly on the frame 6, in a removable manner. The snorkel 4 can therefore be unclipped from the frame 6, which allows reducing the bulk of the mask 1 when the latter is not used.

[0060] In the example illustrated in Figures 2 to 4, the proximal portion 4a of the snorkel 4 has a general tubular shape delimited by a wall 24 and extending up to the distal portion 4b. The distal portion 4b is closed by a cover 26, or end-piece, and includes an internal chamber 28 and a cage 30 with air circulation openings 32 and a valve 34. The valve 34 allows the closure of the snorkel 4 when the latter is immersed, in order to avoid the entry of water into the mask 1, and in particular includes a body 36 with a valve orifice 38 and a valve closure member 40.

[0061] The snorkel 4 comprises an inspired air intake channel 42 and at least one expired air exhaust channel 44. The inspired air intake channel 42 and the expired air exhaust channel 44 both extend between the proximal portion 4a of the snorkel 4 and the internal chamber 28 of the distal portion 4b. Thus, when the snorkel 4 is mounted on the body 2 of the mask, the inspired air intake channel

42 of the snorkel is in fluid communication, at the proximal portion 4a of the snorkel 4, with the first duct for the inspired air of the frame 6, and the expired air exhaust channel 44 is in fluid communication, at the proximal portion 4a of the snorkel, with the first duct for the expired air of the frame 6.

[0062] Furthermore, at the distal portion 4b of the snorkel, the inspired air intake channel 42 and the expired air exhaust channel 44 both open into the internal chamber 28, respectively through check valves 46 and 48 for fluidly linking the internal chamber 28 to the inspired air intake channel 42 when the user inspires, and to the expired air exhaust channel 44 when the user expires.

[0063] The internal chamber 28 is delimited on the one hand by the cover 26 and on the other hand by the valve body 36 and by the check valves 46, 48. As illustrated in Figure 4, the valves 46, 48 and the valve orifice 38 can be produced in a single piece, for example in the form of a plate, forming the body of the valve 36.

[0064] The valve orifice 38 allows fluid circulation between the outside and the inside of the snorkel 4, and more precisely between the outside and the internal chamber 28 of the snorkel 4. The closure member 40, for example a float, is mounted movable in translation, in the cage 30, relative to the valve body 36. The closure member 40 has in particular an open position (see Figure 2) in which the valve orifice 38 is open, and a closed position (see Figure 4) in which it closes the valve orifice 38.

[0065] The operation is as follows.

[0066] When the snorkel 4 is out of the water, the float 40 is in the low position, so that air can flow from the inspired air intake channel 42 or from the expired air exhaust channel 44, to the internal chamber 28 then to the atmosphere via the valve 34 and the openings 32 of the cage 30.

[0067] When the snorkel 4 is immersed, the float 40 rises to press against the valve body 36, which has the effect of closing off the valve orifice 38, as a result of which air cannot enter the snorkel 4.

[0068] More specifically, when the valve 34 is closed, the inside of the mask becomes a closed space which can be depressed if the user continues to inspire.

A more pronounced crushing of the skirt 10 of the mask (suction effect) is then observed, which can be unpleasant for the user. In addition, the valve 34 can also remain in the closed position once the snorkel 4 has emerged, if the depression inside the mask 1 is greater than the weight of the float 40.

[0069] In order to avoid such drawbacks, the mask 1 according to the present invention comprises a balancing means 46. As illustrated in Figures 2 to 4, the balancing means 46 is in the form of a through channel 47 disposed on the float 40 of the valve 34. When the valve 34 is in the closed position, the through channel 47 opens on one side to the outside of the mask 1, and on the other side to the valve orifice 38. Thus, even when the valve 34 is in the closed position, there is a fluid connection between the outside and the internal chamber 28 of the snorkel 4 via the balancing means 46. The balancing means 46 therefore allows compensating for a pressure difference between the inside and the outside of the snorkel 4, in order to avoid the suction effect or to avoid holding the valve 34 in the closed position.

[0070] In order to limit the entry of water into the mask 1, the through channel 47 of the balancing means 46 has a cross section much smaller than the area of the valve orifice 38. For example, the ratio of the area of the valve orifice 38 on the cross section of the through channel 47 may be greater than 1, preferably comprised between 1 and 1,000,000, more preferably comprised between 10 and 100,000, and more preferably comprised between 100 and 10,000.

[0071] Furthermore, the balancing means 46 may also comprise a valve element 48, mounted in the through channel 47, and making it possible to create the fluid connection only when the pressure difference on either side of the balancing means 46 is greater than or equal to a determined pressure.

[0072] Alternatively, or in addition, the shape of the balancing means 46, for example its shape factor such as the ratio of the cross section to the length of the through channel 47, can also allow introducing a minimum pressure difference on either side of the balancing means 46 in order to obtain a fluid connection.

[0073] Thus, the balancing means 46 allows limiting the pressure difference that may exist between the inside and the outside of the mask 1, by allowing an entry of

fluid (air or water) inside the snorkel 4, under the effect of the existing depression, when the valve 34 is in the closed state.

[0074] It should be noted that the figures represent only one embodiment of the invention, in which the balancing means 46 is mounted on the closure member 40 of the valve 34. However, the invention is not limited to this single embodiment, but also covers its variants.

[0075] Thus, the balancing means can be mounted on the body 36 of the valve 34, for example in the form of a hole, possibly with a valve element, positioned next to the valve orifice 38 and allowing the entry of fluid from outside in the internal chamber 28.

[0076] Alternatively, the balancing means can be mounted on the cover 26, so as to create a fluid connection between the outside and the internal chamber 28. In the latter case, it can be noted that the balancing means may allow the entry of air in the snorkel 4 if only the valve 34 is immersed, but not the entire cover 26.

[0077] Alternatively, the balancing means can be mounted on the wall 24 of the snorkel, in the proximal portion 4a, preferably between the outside and the expired air exhaust channel 44, so that water which can enter the mask 1 via the balancing means is found in the lower chamber 18 of the mask and not in the upper chamber 16.

[0078] Alternatively, the balancing means can be mounted on the body 2 of the mask, for example on the visor 8, in the bottom portion next to the purge valve element 12.

[0079] Thus, thanks to the balancing means according to the present invention, it becomes possible to limit the pressure difference between the inside of the mask and the outside, when the valve is in the closed position. This avoids a potential of blockage of the valve in the closed position when the mask is out of the water, as well as the difficulties in removing the mask by hand by the user, while limiting and controlling the possible amount of water entering the mask. The mask thus becomes more comfortable and more pleasant to use, while providing the same functions and advantages as previously.

CLAIMS

[Claim 1] A diving mask (1) comprising a snorkel (4) with a valve (34), the valve (34) including:

- a valve orifice (38) intended to allow fluid circulation, in particular of air, between the outside of the snorkel and the inside of the snorkel, and
- a valve closure member (40), for example a float, which can move between an open position in which the valve orifice (38) is open and a closed position in which the valve orifice (38) is closed by the valve closure member (40),

characterized in that the mask (1) also includes a balancing means (46) for limiting a pressure difference between the internal pressure of the mask and the external pressure, the balancing means (46) being configured to allow fluid circulation from the outside of the mask to the inside of the mask when the mask (1) is used by a user and when the closure member (40) is in the closed position.

[Claim 2] The mask (1) according to claim 1, wherein the balancing means (46) is mounted on the closure member (40).

[Claim 3] The mask (1) according to claim 1 or 2, wherein the valve (34) also includes a body (36) in which the valve orifice (38) is provided, and wherein the balancing means (46) is mounted on the valve body (36).

[Claim 4] The mask (1) according to any one of claims 1 to 3, wherein the snorkel (4) also includes a wall (24, 26) delimiting the inside of the snorkel (4) relative to the outside, and wherein the balancing means (46) is mounted on the wall (24, 26) of the snorkel, for example wherein the snorkel (4) includes a proximal portion (4a) and a distal portion (4b), and the balancing means (46) is mounted on the wall (26) of the distal portion (4b) of the snorkel.

[Claim 5] The mask (1) according to any one of claims 1 to 4, also including a body (2) delimiting the inside of the mask relative to the outside, and wherein the balancing means (46) is mounted on the body (2) of the mask.

[Claim 6] The mask (1) according to any one of claims 1 to 5, wherein the balancing means (46) has a shape, for example a tubular shape, configured to allow fluid circulation through the balancing means (46) only when the pressure difference is greater than a determined value.

[Claim 7] The mask (1) according to any one of claims 1 to 6, wherein the balancing means (46) also includes a valve element (48), for example a flexible membrane, configured to allow fluid circulation through the balancing means (46) only when the pressure difference is greater than a determined value.

[Claim 8] The mask (1) according to claim 6 or 7, wherein the determined pressure difference value for which the balancing means (46) is configured to allow circulation of a liquid between the outside of the mask (1) and the inside of the mask (1), is greater than the determined pressure difference value for which the balancing means (46) is configured to allow air circulation between the outside of the mask (1) and the inside of the mask (1).

[Claim 9] The mask (1) according to any one of claims 1 to 8, wherein the balancing means (46) comprises a through channel (47).

[Claim 10] The mask (1) according to any one of claims 1 to 9, wherein the ratio of the area of the valve orifice (38) to the area of the balancing means (46) is greater than 1, preferably comprised between 1 and 1,000,000, more preferably comprised between 10 and 100,000, and more preferably comprised between 100 and 10,000.

[Claim 11] The mask (1) according to any one of claims 1 to 10, including a body (2) delimiting the inside of the mask relative to the outside, the body (2) comprising:

- a frame (6) surrounding the user's face,
- a visor (8) surrounded by the frame (6),
- a flexible skirt (10) fixed to the frame (6), the skirt (10) including a partition (14) delimiting an upper chamber (16) for the vision of a lower chamber (18) for breathing, the partition (14) being arranged to bear above the user's nose such that the user's mouth and nose are located in the lower chamber (18), the partition (14) including at least one passage (22) arranged

to allow circulation of inspired air directed from the upper chamber (16) to the lower chamber (18) during a phase of inspiration of the user, wherein the frame (6), in particular the rigid frame, comprises at least a first duct for the expired air, said first duct having an upper end opening inside the snorkel (4), and a lower end (6b) fluidly communicating with the lower chamber (18).

[Claim 12] The mask (1) according to claim 11, wherein the snorkel (4) has an inspired air intake channel (42) and at least a first expired air exhaust channel (44), said snorkel (4) being the extension of an upper portion (6a) of the frame (6), the inspired air intake channel (42) opening into the upper chamber (16) while the first expired air exhaust channel (44) communicates with the lower chamber (18), and wherein the first duct of the frame (6) has an upper end opening into the expired air exhaust channel (44).

[Claim 13] A snorkel (4) for a diving mask (1) according to any of claims 2 to 4, comprising a valve (34) including:

- a valve orifice (38) intended to allow fluid circulation between the outside of the snorkel and the inside of the snorkel, and
- a valve closure member (40), for example a float, which can move between an open position in which the valve orifice (38) is open and a closed position in which the valve orifice (38) is closed by the valve closure member (40),

characterized in that the snorkel (4) also includes a balancing means (46) for limiting a pressure difference between the internal pressure of the snorkel and the external pressure, the balancing means (46) being configured to allow fluid circulation from the outside of the snorkel to the inside of the snorkel when the mask (1) is used by a user and when the closure member (40) is in the closed position.