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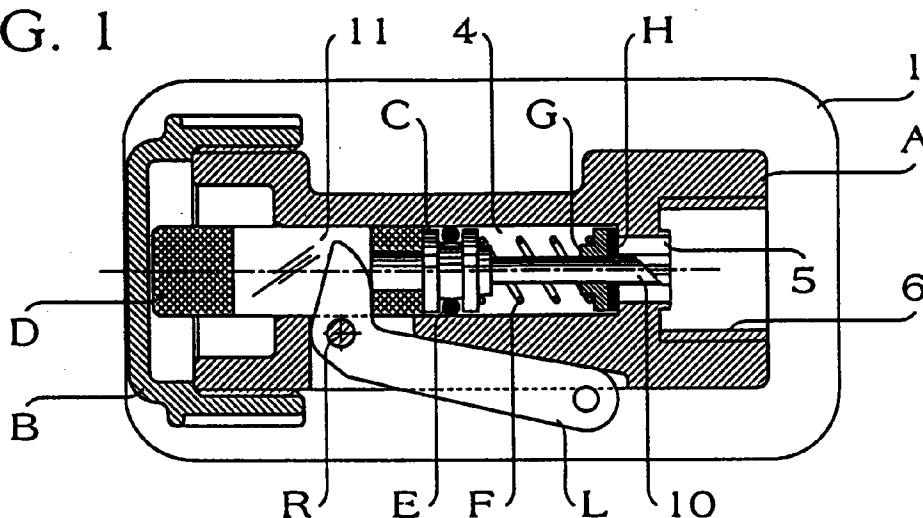
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(54) **Valved device with automatic and/or manual actuation for quickly inflating life-jackets or other items**

(57) A valved device with automatic and/or manual actuation, for quickly inflating life-jackets or other items, comprising a main body (A) having a flat base (1) for fixing to the fabric of a life-jacket, said jacket being provided with a hole. The flat base (1) perimetrically delimits a recess (2), in said main body (A), into which an opening (3) leads. The opening (3) is provided in a

cylindrical seat (4) for the sliding of first elements (C,10) meant to tear the closure of a bottle of compressed air or gases and of second elements (F,G,H) which are coaxial to said first elements (C,10) and subsequently keep the life-jacket inflated.

FIG. 1



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Description

[0001] Inflatable life-jackets are conventionally equipped so that they can be quickly inflated by air or by the compressed gases of a bottle whose closure is broken, when necessary, by a device which also conveys the flow into the check valve of the life-jackets.

[0002] In some cases, the device is designed to be actuated only manually and by means of a lever, while other cases also allow the automatic intervention of a snap-action device which is activated by contact with water.

[0003] According to known technical solutions and to market demand, two versions of inflatable life-jacket are commercially available which differ only in the type of actuation, which is either manual or mixed, for the same inflation device. Fitting the inflation device to the valved support already fixed to the life-jacket, and the optional application of the automatic actuation unit to the device already equipped with a manual actuation system are operations which can be performed only along the assembly lines of said inflatable life-jackets.

[0004] Clearly, if dealers or buyers themselves could apply or remove the automatic actuation unit directly and without tools, the advantages of such a possibility would be both practical and economical, also in view of the significant reduction in stock reserves.

[0005] This is the aim of the present invention, which is obtained with a valved device with automatic and/or manual actuation, for quickly inflating life-jackets or other items, characterized in that it comprises a main body having a flat base for fixing to the fabric of a life-jacket, said jacket being provided with a hole, a seat being provided at said hole for the sliding of first elements meant to tear the closure of a bottle of compressed air or gases and of second elements which are coaxial to said first elements and subsequently keep the life-jacket inflated.

[0006] These and other characteristics and advantages of the present invention are described in greater detail hereinafter with reference to the accompanying drawings, which are given only by way of non-limitative example and wherein:

Figures 1, 2 and 3 are longitudinal sectional views of the manually-actuated device, according to the present invention, respectively in the configuration in which it is inactive, in the one for perforating the closure of the bottle, and in the one for inflating the life-jacket;

Figures 4, 5 and 6 are longitudinal sectional views of the manually- and automatically-actuated device of the invention in the inactive configuration, in the bottle perforation configuration, and in the life-jacket inflation configuration respectively;

Figures 7, 8 and 9 are, respectively, a side view, a transverse sectional view and a longitudinal sectional view of the main body of the device;

Figures 10, 11 and 12 are respectively a side view, a transverse sectional view and a longitudinal sectional view of the rear extension of the plunger;

Figures 13 and 14 are a front view and a longitudinal sectional view of the caliper for locking the pusher of the snap-action device.

[0007] With reference to the above figures, it is clearly illustrated that the main body A of the device has a flat base 1 which is meant to be fixed around a hole of the life-jacket by heat-sealing or other suitable methods and perimetrically delimits the recess 2 into which the opening 3 leads. The opening 3 is provided in the cylindrical seat 4 in the portion that acts as a seat for the check valve, i.e., proximate to the front end of the seat which, by means of a choke 5 with radial slits, is connected to a threaded seat 6 into which a bottle of air or compressed gases is to be screwed.

[0008] A slit 8 for a manual actuation lever L is also provided laterally and at the cylindrical seat 4 in the body A of the device, which is externally threaded at a rear end 7 in order to allow to screw thereon a cap B or a body M of a snap-action device. The lever L is pivoted by the insertion of a pivot R in a suitable seat 9 of the body A.

[0009] Considering the entire device in greater detail in its manually-actuated version (Figures 1, 2 and 3), it can be seen that the elements meant to perforate the bottle screwed at 6 and to subsequently keep the life-jacket inflated are inserted in the cylindrical seat 4 of the body A before applying the cap B and transversely inserting the lever L. The seat in fact accommodates a metal plunger C, which is rigidly coupled to a rear cylindrical extension D, is provided with a sealing ring E and enters the choke 5 with a pointed stem 10 which also acts as an internal guide for an annular valve G and for a related gasket H, pushed by a spring F so as to hermetically close the choke 5.

[0010] One end of the lever L enters a transverse slit 11 of the extension D. The lever L is pivoted in R, can be activated by means of a cord and is almost entirely accommodated, when inactive, in the appropriately provided recess of the body A.

[0011] An axial hole 12 (Figure 12) is connected to the transverse slit 11, and the rear stem of the plunger C enters said hole for coupling. This is done so that the metal lever L acts directly on the plunger C rather than on the plastic extension D which acts as a support and guiding element for the plunger.

[0012] The activation of the lever (Figure 2) forces the assembly constituted by the extension and by the plunger to shift, in the seat 4 and in contrast with a spring F, so that the pointed stem 10 protrudes from the choke 5 enough to tear the closure of the bottle which is screwed in 6.

[0013] Since during the perforation of the bottle the spring F is compressed only partially, the pressure of the air or gases flowing through the radial slits of the

choke 5 pushes the annular valve G and the gasket H so that they shift backward, further compressing the spring F and allowing the stream to flow into the jacket through the opening 3. Although Figure 3, for the sake of convenience in explanation, shows the valve G and the gasket H in such a retracted position as to fully expose the opening 3, in practice this is not indispensable in order to achieve inflation of the life-jacket, since the gasket H provides a front seal and it therefore merely has to shift from its resting position to allow the flow to pass peripherally and in any case enter the opening 3.

[0014] Inflation ceases when the pressure in the life-jacket counterbalances the pressure in the bottle; this allows the spring F to return the valve to the closure position.

[0015] To allow the device to also utilize an automatic actuation device (Figures 4, 5 and 6), the invention provides for the screwing of a body M of a snap-action device in the rear end 7 of the main body A instead of the cap B. The device has a pusher N which is inserted in a helical spring O which acts between the flange 15 of the pusher and the flange 14 of a caliper P the jaws whereof, shaped so as to wedge into a groove 13 of the pusher N, keep the spring O compressed until they remain clamped by a ring Q which, being made of water-soluble or at least hygroscopic material, breaks quickly, decomposing or changing shape, when water flows in from the large hole 16 provided for this purpose on the bottom of the body M.

[0016] Since the pusher N is retained by resting with an inclined or wedge-shaped portion against a corresponding portion of the jaws of the caliper P, which are fastened by a ring Q made of paper or other suitable material, the breakage of the ring and the tension of the spring O allow the pusher to move, spacing the jaws apart while the flange 14 of said caliper continues to rest against an internal abutment of the body M.

[0017] The pusher moves into abutment against the rear end of the body A and pushes axially, by means of the extension D, the plunger C, whose movement and related effects are identical to those which can otherwise be obtained by manually actuating the lever L, which instead has no effect in this circumstance.

[0018] It is evident that the scope of the present invention must be understood to also include those modifications or variations which, suggested by production requirements, might for example relate to the production of the plunger C and of the extension D in a monolithic body which comprises the stem 10 or not, said stem being optionally added if it is made of a different material.

[0019] The disclosures in Italian Patent Application No. FO97A000024 from which this application claims priority are incorporated herein by reference.

[0020] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of

increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A valved device with automatic and/or manual actuation, for quickly inflating life-jackets or other items, characterized in that it comprises a main body (A) having a flat base (1) for fixing to the fabric of a life-jacket, said jacket being provided with a hole (2), a seat (4) being provided at said hole for the sliding of first elements meant to tear the closure of a bottle of compressed air or gases and of second elements which are coaxial to said first elements and subsequently keep the life-jacket inflated.
2. The valved device according to claim 1, characterized in that the two ends of the main body (A) are preset so that the bottle of compressed air or gases is screwed coaxially to said seat (4), at one end and, at the other end, an automatic actuation unit or a cap, a lever for manual actuation being pivoted within the main body (A) and laterally entering said sliding seat to determine, when necessary, a translatory motion of said first and second elements.
3. The valved device according to the preceding claims, characterized in that said first and second elements consist of a plunger (C), which is provided with a sealing ring (E) and from which an extension (D) protrudes axially at one end and a pointed stem (10) protrudes axially at the other end, said extension (D) being provided with a transverse slit (11) for the manual actuation lever (L), said stem (10) acting both as a perforation element and as an internal guide for an annular valve (G), complete with a gasket (H) and a helical spring (F).
4. The valved device according to claim 3, characterized in that said transverse slit (11) of the extension (D), entered by one end of the lever (L), is connected to an axial hole (12) in which the rear stem of the plunger (C) is stably inserted, so that said lever (L) acts directly on the plunger (C) and the extension (D) acts as support and guide for said plunger (C).
5. The valved device according to claim 4, characterized in that the translatory motion of the assembly constituted by the extension (D) and the plunger (C), which is obtained by actuating the lever (L) compresses said spring (F) only partially, an opening (3) being provided in the seat (4) of the body (A) so as to face the inside of said plate (1) for fixing the body (A) to the fabric of the life-jacket.

6. The valved device according to the preceding claims, characterized in that a body (M) of a snap-action device is screwed into a rear end (7) of the main body (A) from which the rear end of the extension (D) of the plunger (C) protrudes, a pusher (N) 5 being inserted in a helical spring (O) acting between a flange (15) of said pusher (C) and a flange (14) of a caliper (P), the jaws whereof are shaped so as to wedge into a groove (13) of the pusher (C) and keep the spring (O) compressed 10 until they are clamped by a ring (Q), which is made of at least hygroscopic material and breaks quickly, decomposing or changing shape, when water flows in from a large hole (16) provided on the bottom of the body (M). 15
7. The valved device according to claim 6, characterized in that the pusher (C), whose stroke ends against the rear end of the body (A), axially pushes, by means of the extension (D), the plunger (C). 20

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FIG. 1

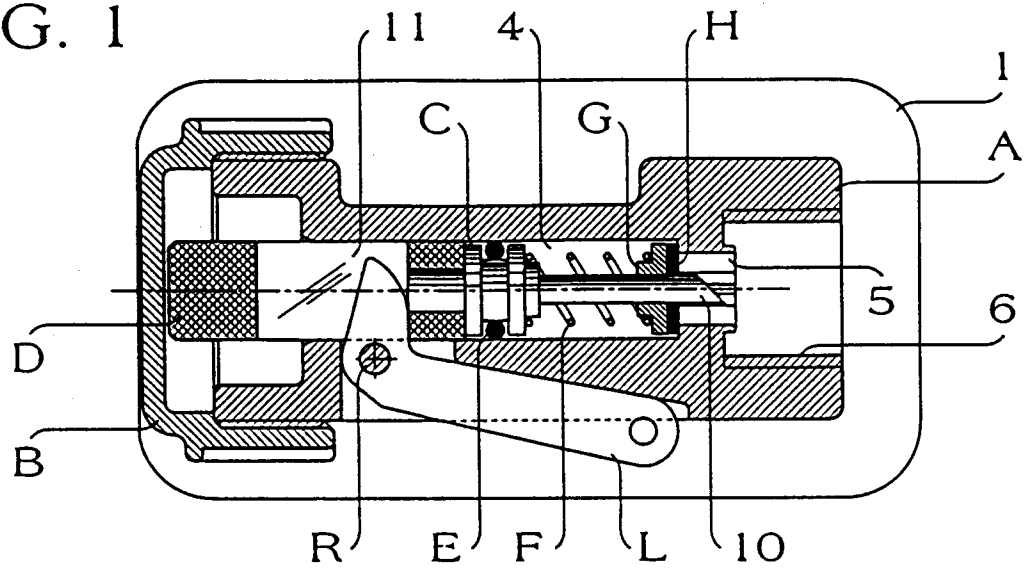


FIG. 2

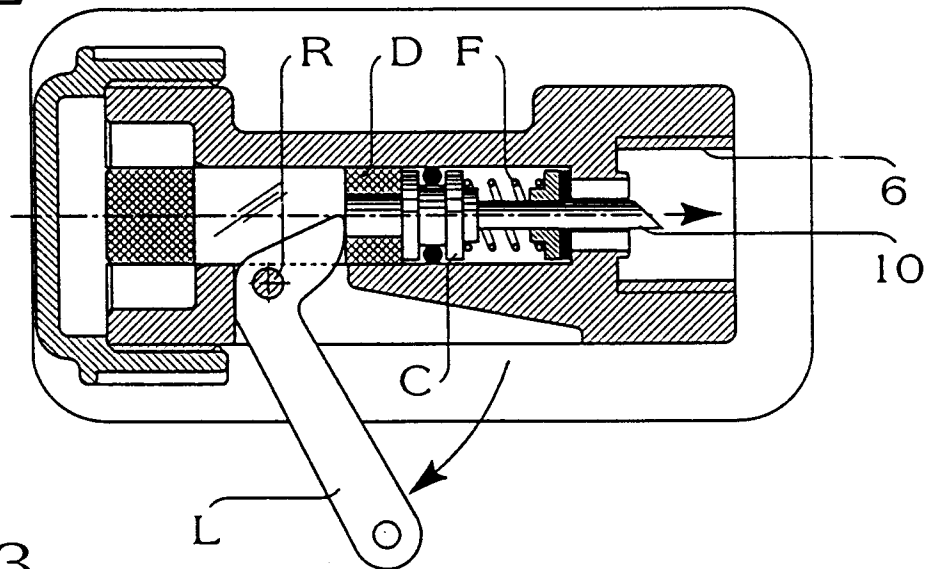


FIG. 3

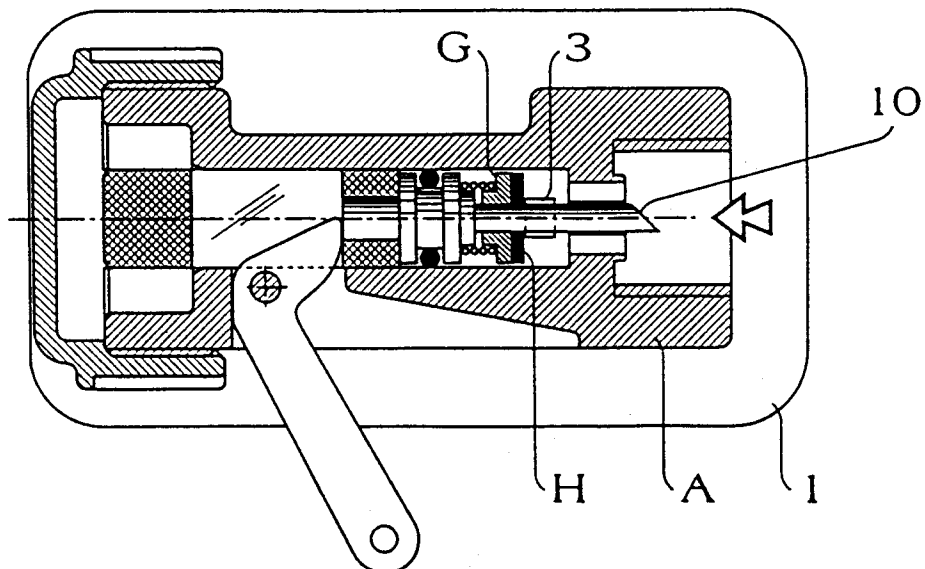


FIG. 4

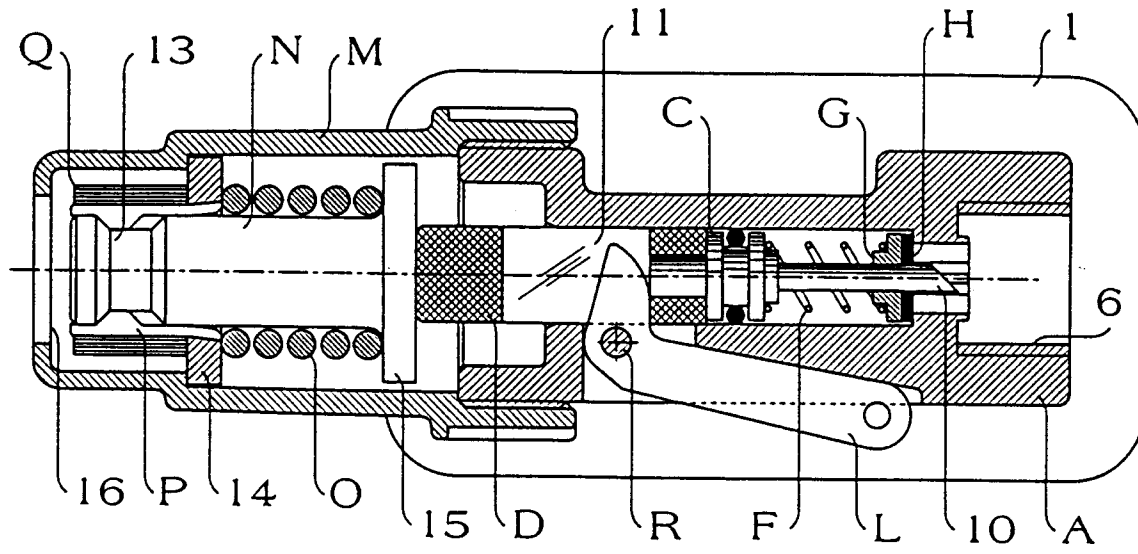


FIG. 5

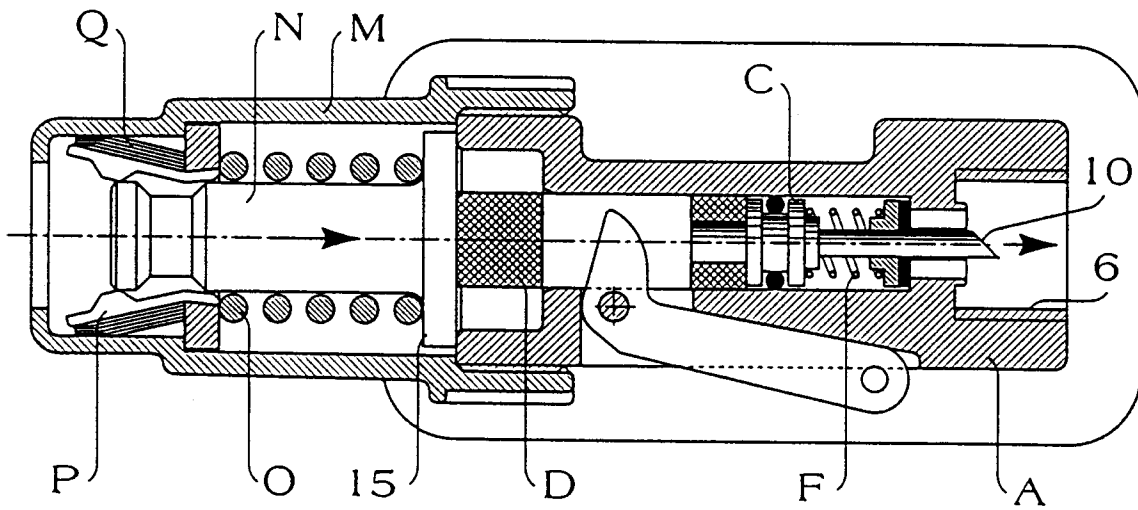


FIG. 6

