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(54) Safety device and method for retaining a gas bottle in a gas apparatus

(57) A safety device for a bottle, in a gas apparatus (1) of the type comprising at least a body or case (3), an apparatus (5) for drawing the gas which is partially inserted in the body or case (3), a bottle (4) destined to be inserted in the body (3) to interact with the drawing apparatus (5), an optional gas flow regulator, means for retaining the bottle or cartridge (4) in the body (3) and prevent its accidental egress,
is characterised in that said means comprise an element (7) which is inserted in the body (3) and is so shaped as to allow the extraction or egress of the bottle (4) only after a rising movement of the bottle or cartridge (4) inside the body (3).

The method provides for the egress or extraction of the bottle from the body to be able to occur only after a step of raising the bottle inside the body.

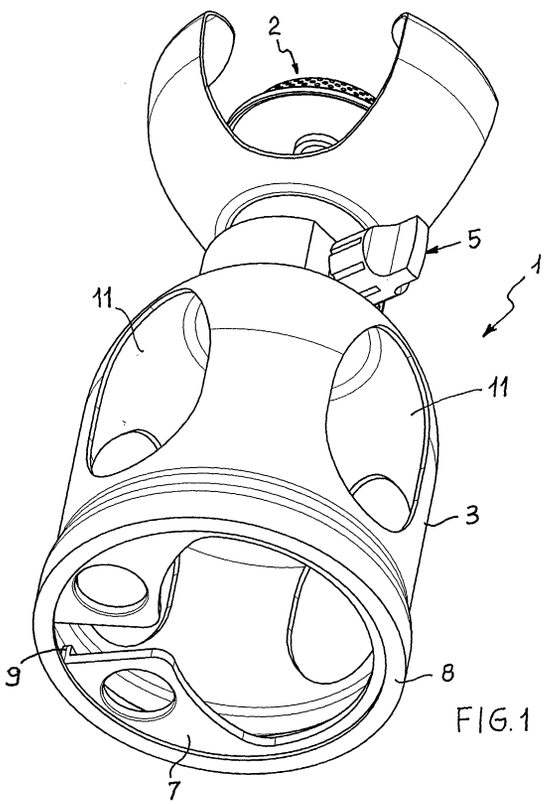

FIG.1

EP 1 353 115 A2

Description

[0001] The present invention relates to a safety device and method for bottles, in gas apparatus.

[0002] Portable or camping gas burners, and more generally gas apparatuses provided with bottle or cartridge for feeding a butane, propane or LPG type of gas, generally have the problem of the accidental detachment of the bottle from the gas drawing apparatus with the consequent danger of fire (if the flame is ignited) or gas leak (if the flame is off).

[0003] The prior art gas apparatuses described above normally have a laterally closed or open cylindrical body, provided with an upper opening through which is inserted the gas drawing apparatus and with a lower opening, larger than the previous one, through which is inserted the bottle, which is then coupled with the gas drawing apparatus, in the sense that the apparatus partially penetrates in the bottle perforating it in gas tight fashion.

[0004] The bottle can be maintained in its seat and in the correct operating position by means of a typical bayonet coupling (with obvious problems with the possible accidental uncoupling of the bottle) or by means of an elastic device. The elastic device can be obtained by means of a wire-like metallic element, so shaped as to be able to be inserted elastically and manually in the body of the apparatus to lock the bottle inferiorly and/or extracted therefrom to allow the extraction of the bottle, or a closure element with bayonet coupling can be used.

[0005] However, operator error or particular tampering with the equipment can cause the locking device to be extracted, freeing the bottle and causing its egress, when the bottle is not completed exhausted or when the gas is still ignited and the flame is still present.

[0006] An aim of the present invention is to eliminate the drawbacks described above and to allow to obtain a device and a method for locking/unlocking the bottle that allow the extraction of the bottle itself only when the ignition or gas drawing apparatus is completely removed from the equipment and hence the flame is absent.

[0007] An additional aim is to achieve this in an extremely simple and economical manner.

[0008] Said aims are fully achieved by the device and by the method of the present invention, which are characterised by the content of the claims set out below. In particular, the device comprises an element for retaining the bottle in the body of the apparatus and prevent its accidental egress, which device is inserted in the same opening through which the bottle is inserted and is so shaped as to allow the extraction or egress of the bottle only after a rising movement of the bottle within the body.

[0009] Said element is so shaped that the rising movement of the bottle or cartridge can take place only after extracting the drawing apparatus from the body or case.

[0010] Said element is preferably constituted by an annular retaining element that is elastically inserted into the body or case, encompassing the lower part or bottom of the bottle or cartridge and simultaneously constituting a lower end stop thereof.

[0011] The method for safely extracting a bottle or cartridge from a gas apparatus provides for the egress or extraction of the bottle or cartridge from the body or case to be possible only after a step of rising the bottle or cartridge inside the body or case.

[0012] This and other features will become more readily apparent from the following description of a preferred embodiment, illustrated purely by way of non limiting example in the accompanying drawing tables in which:

- figure 1 shows a bottom perspective of the apparatus;
- figure 2 shows a bottom perspective view of the bottle;
- figure 3 shows a plan view of the element for retaining the bottle;
- figure 4 shows a vertical section according to the straight line A-A of Figure 3 of the retaining element in a vertical.

[0013] With reference to the figures, the number 1 globally indicates a gas apparatus of the type comprising an ignition apparatus 2, a body or case 3 for housing a bottle or cartridge 4 of gas (preferably butane, propane or LPG), and a known gas regulation and drawing group 5 for regulating the flow of the gas that feeds the ignition apparatus, accordingly regulating the produced flame and for guaranteeing both the gas tight coupling with the cartridge and the drawing of the gas.

[0014] The apparatus 5 is inserted in known fashion into the body or case 3, being screwed in a first upper threaded opening, not shown herein.

[0015] The bottle 4 is instead inserted inferiorly into the body through a second opening 6 having larger dimensions than the previous one. The bottle is retained in its seat by an original annular element 7 which is elastically inserted in the same opening 6 through which is inserted the bottle 4, and is so shaped as to allow the extraction or egress of the bottle only after a rising movement of the bottle inside the body 3.

[0016] To enable the bottle to perform said rising movement, it is necessary for the drawing apparatus 5 to be unscrewed and extracted from the body 3.

[0017] When the bottle is inserted in the body and the annular retaining element 7 is also positioned correctly, the drawing apparatus 5 is superiorly screwed until a needle-like element punctures the bottle, penetrating therein, whilst an appropriate gasket creates a seal between the ignition apparatus and the bottle, thereby preventing gas from escaping.

[0018] The perforation of the bottle takes place as a result of the thrust exerted on the bottle by the drawing apparatus and of the fact that the bottle cannot move away inferiorly because it is retained in the case by the

element 7 which bears down on a recess 8 that constitutes the lower edge of the body or case 3.

[0019] The element 7, which constitutes means for retaining the bottle 4 in the body 3, is preferably made of nylon 6 or in any case of a suitable material with elastic properties, and is inserted elastically in the body 3 encompassing the lower part or bottom of the bottle 4 and constituting a lower end stop thereof. For this purpose the element 7, which extends in annular fashion for about 320-350°, is originally provided with a step 9 along its own peripheral edge to house within it the bottom of the bottle.

[0020] The element 7 comprises two holes 10 (which in an embodiment variation not shown herein can be replaced by simple suitable shapes) for the insertion of two fingers to grip the annular element manually and extract it from the body 3.

[0021] However, because of the presence of the step 9 that encompasses the bottle 4, the element 7 can be gripped and extracted only when the bottle does not bear down within the step 9, i.e. it is necessary to raise the bottle inside the body 3 by a few millimetres (preferably, 1 mm to 10 mm) to disengage it from the step 9. But the bottle is prevented from rising by the presence of the drawing apparatus inserted therein in gas tight fashion, and therefore it is necessary preliminarily to unscrew the drawing apparatus and completely extract it from the body 3 to allow an adequate movement of the bottle.

[0022] The height of the step (preferably from 1 mm to 10 mm) is calculated in such a way as to cause the extraction of the element 7 (and hence of the bottle) to be preferably able to take place only when the drawing apparatus 5 is completely extracted from the body or case 3.

[0023] In this way, the accidental extraction or egress of the bottle from the apparatus, since to extract the bottle it is necessary completely to unscrew the ignition apparatus and then act in a certain manner on the element 7, therefore it is guaranteed that such operations can take place only because the operator specifically wills it and not because of accidental movements.

[0024] The body or case 3 comprises a plurality of lateral openings 11 having the purpose of lightening the body 3, of allowing the vision of the cartridge (when present), and of improving the vaporisation and combustion of the gas.

[0025] The method of the present invention originally provides for the egress or extraction of the bottle 4 to be enabled only after the rise of the bottle in the body 3, preferably possible only as a result of a complete extraction of the ignition apparatus 2 from the body 3.

[0026] The device and the method of the present invention therefore provide a high degree of safety to the gas apparatus.

[0027] It is specified that with the use of the ring 7, any opening (by means of unscrewing the drawing apparatus 5) with a cartridge in which gas is still present, entails a leak but with the apparatus 5 still screwed to the body 3. In this way, the operator can intervene by re-screwing the apparatus and eliminate gas leaks at the origin.

[0028] If it were possible to extract the cartridge from the opening 6, i.e. in the absence of the ring 7 of the present invention, it would be nearly impossible in the above situation to re-insert the cartridge. The obvious consequence is that all the gas would be released in the environment where one is operating. This situation, which may seem remote, can actually take place for instance because of the clogging of the injector so that the user is led to believe that the failure to operate derives from the lack of gas and hence can find him or herself in the situation described above.

Claims

1. Safety device for bottle, in gas apparatus (1) of the type comprising at least:

   - a body or case (3) provided with at least two openings (6);
   - an apparatus (5) for drawing the gas which is partially inserted in the body or case (3) through one of said openings;
   - a bottle (4) or cartridge destined to be inserted in the body or case (3) through the other opening to interact with the drawing apparatus (5);
   - an optional gas flow regulator positioned on the drawing apparatus (5), for regulating the flame obtained in correspondence with the ignition apparatus (2);
   - means for retaining the bottle or cartridge (4) in the body or case (3) and prevent its accidental egress from the opening,

   characterised in that said means comprise an element (7) which is inserted in the same opening (6) through which is inserted the bottle or cartridge (4) and is so shaped as to allow the extraction or egress of the bottle or cartridge (4) only after a rising movement of the bottle or cartridge (4) inside the body or case (3).

2. Device as claimed in claim 1, wherein said element (7) is shaped in such a way that the rising movement of the bottle or cartridge (4) can take place only after extracting the ignition (2) or drawing (5) apparatus from the body or case (3).

3. Device as claimed in claim 1, wherein said element (7) is shaped in such a way that it can be extracted from the body or case (3) only after disengaging the bottle or cartridge (4) from the element (7) itself.

4. Device as claimed in claim 1, wherein said element

(7) is an annular retaining element that is elastically inserted in the body or case (3) encompassing the lower part or bottom of the bottle or cartridge (4) and simultaneously constituting a lower end stop.

5. Device as claimed in claim 4, wherein the annular retaining element (7) is constituted by an annular element that extends for about 320-350° and is provided with a step (9) along its own peripheral edge to house within it the bottom of the bottle or cartridge (4).

6. Device as claimed in claim 4, wherein the annular retaining element (7) comprises two shaped openings (10) to allow its elastic manipulation with two fingers.

7. Device as claimed in claim 6, wherein the height of the step (9) is calculated in such a way as to allow the extraction of the element (7), and hence of the bottle or cartridge (4) only after the extraction of the ignition (2) or drawing (5) apparatus.

8. Method for safely extracting a bottle or cartridge from a gas apparatus of the type comprising:

- a body or case for containing the bottle or cartridge;
- an apparatus for drawing the gas which is partially inserted in the body or case;
- a bottle or cartridge destined to be inserted in the body or case to interact with the drawing apparatus;
- an optional gas flow regulator, positioned on the drawing apparatus, for regulating the flame obtained in correspondence with the ignition apparatus;
- means for retaining the bottle or cartridge in the body or case and prevent its accidental egress or extraction,

characterised in that it provides for the extraction or egress of the bottle or cartridge from the body or case to be able to occur only after a step of raising the bottle or cartridge inside the body or case.

9. Method as claimed in claim 8, wherein said raising step can take place only after a complete extraction of the ignition or drawing apparatus from the body or case.

10. Gas apparatus operating with bottle or cartridge inserted in a containment body or case, **characterised in that** it comprises a device as claimed in any of the claims from 1 to 7 or it operates with a method as claimed in claim 8 or 9.

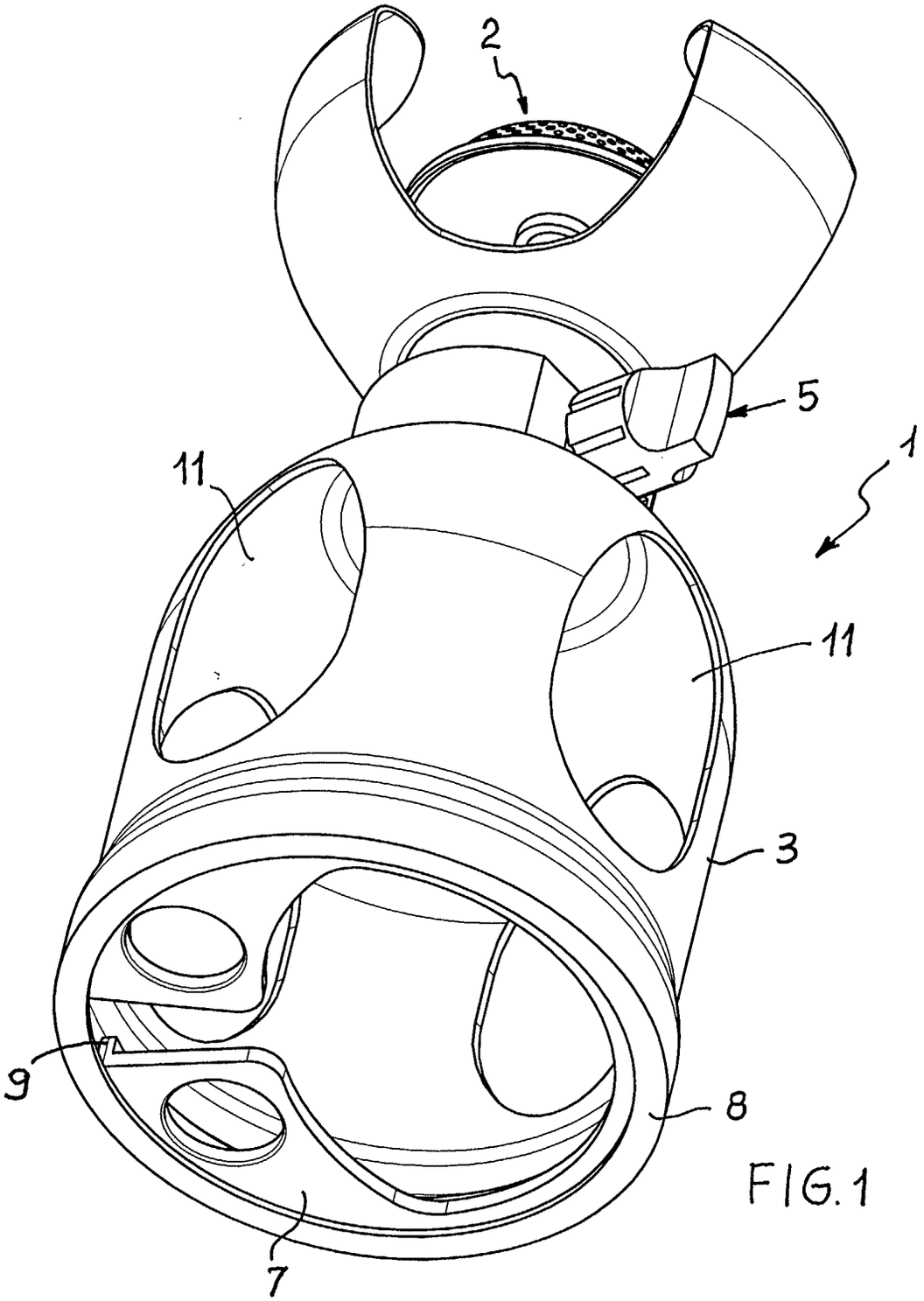

FIG.1

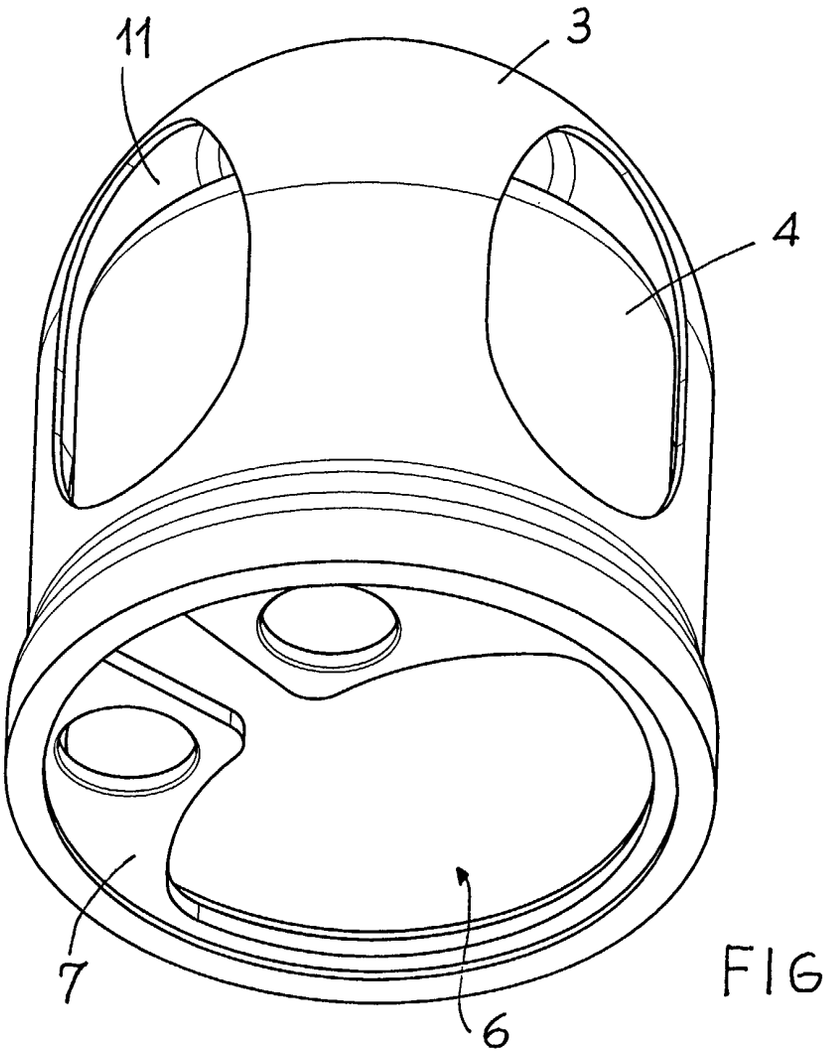

FIG.2

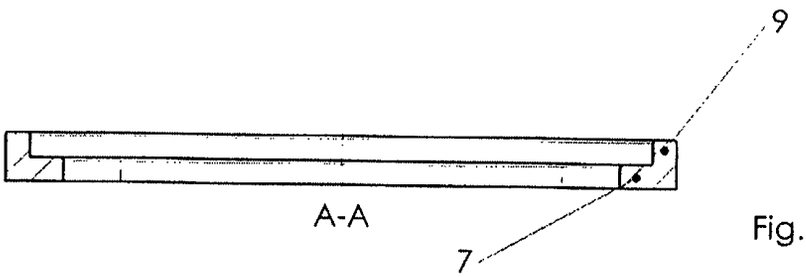

Fig. 4

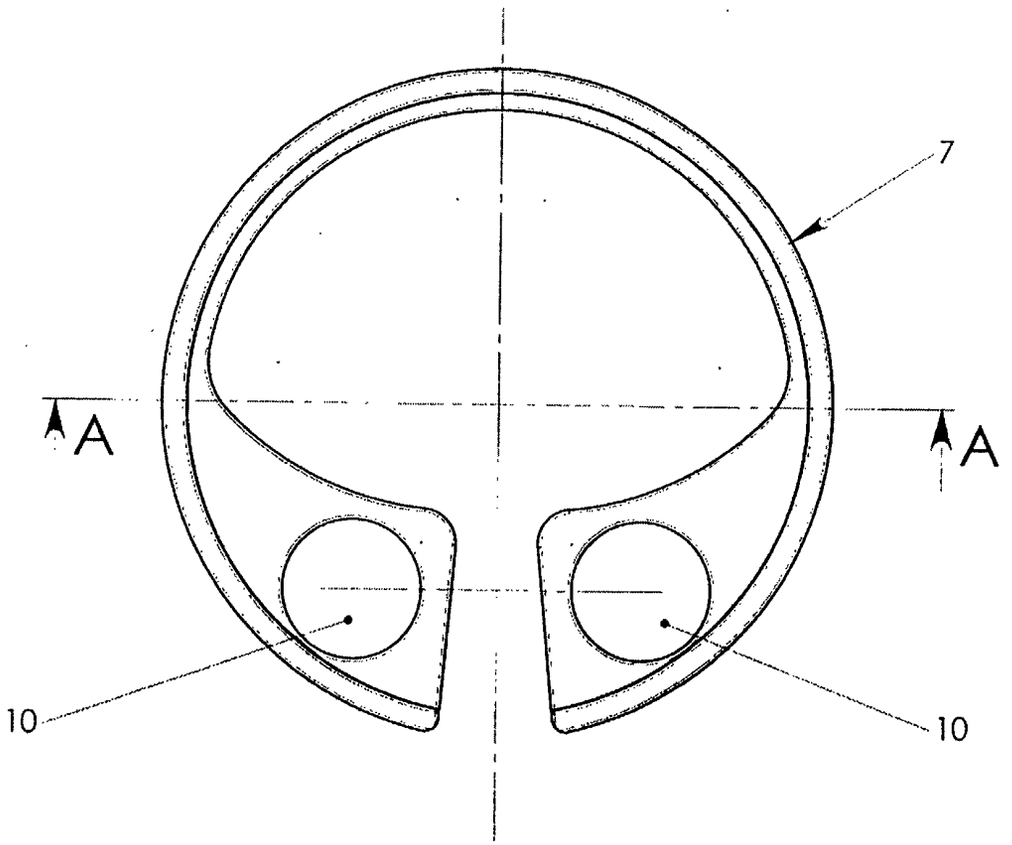

Fig. 3