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

Sicherheitshaltevorrichtung für ein Gasbehälter und entsprechende Methode

Système sécurisé de maintien d'une bouteille de gaz dans un appareil à gaz

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EP 1 353 115 B1

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Description

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

[0002] 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.

[0003] 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.

[0004] FR 150 3773, considered as closest prior art, discloses such a bayonet coupling.

[0005] 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.

[0006] 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 completely exhausted or when the gas is still ignited and the flame is still present.

[0007] An aim of the present invention is to eliminate the drawbacks described above and to allow to obtain a device 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.

[0008] An additional aim is to achieve this in an extremely simple and economical manner.

[0009] Said aims are fully achieved by the device of the present invention, which are characterised by the content of the claims set out below.

[0010] 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.

[0011] 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.

[0012] 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.

[0013] 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:

- 10 - 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;
- 15 - figure 4 shows a vertical section according to the straight line A-A of Figure 3 of the retaining element in a vertical.

[0014] 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

[0015] 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.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] 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.

[0025] 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.

[0026] The device of the present invention therefore provides 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.

[0029] 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, said means comprising an annular retaining 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), said annular element (7) encompassing the lower part or bottom of the bottle or cartridge (4) and simultaneously constituting a lower end stop, **characterized in that** said annular element (7) is elastically inserted/extracted in/from the body or case.

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 the annular retaining element (7) 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).

5. Device as claimed in claim 1, wherein the annular retaining element (7) comprises two shaped openings (10) to allow its elastic manipulation with two fingers.

6. Device as claimed in claim 5, 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.
7. 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 6.

Patentansprüche

1. Sicherheitsvorrichtung für Flasche in einem Gasbehälter (1) des Typs, enthaltend mindestens:

- einen Körper oder ein Gehäuse (3), der/das mit mindestens zwei Öffnungen (6) versehen ist;
- eine Einrichtung (5) zum Absaugen des Gases, die teilweise durch eine dieser Öffnungen in den Körper oder das Gehäuse (3) eingeführt wird;
- eine Flasche (4) oder eine Kartusche, die dazu bestimmt ist, durch die andere Öffnung in den Körper oder das Gehäuse (3) eingeführt zu werden, um mit der Absaugeinrichtung (5) zusammenzuwirken;
- einen auf der Absaugeinrichtung (5) positionierten optionalen Gasdurchflussregler zum Regulieren der an der Zündeinrichtung (2) erzeugten Flamme;
- Mittel zur Halterung der Flasche oder der Kartusche (4) im Körper oder Gehäuse (3) und um dessen unbeabsichtigten Austritt aus der Öffnung zu verhindern, wobei diese Mittel ein ringförmiges Halteelement (7) umfassen, das in dieselbe Öffnung (6) eingeführt wird, durch die die Flasche oder die Kartusche (4) eingeführt werden, und das so ausgebildet ist, dass das Herausnehmen oder der Austritt der Flasche oder der Kartusche (4) nur nach einer Aufwärtsbewegung der Flasche oder der Kartusche (4) im Körper oder Gehäuse (3) möglich sind, wobei dieses ringförmige Element (7) den unteren Teil oder Boden der Flasche oder der Kartusche (4) umgrenzt und gleichzeitig einen unteren Endanschlag bildet, **dadurch gekennzeichnet, dass** dieses ringförmige Element (7) elastisch in den/aus dem Körper oder in das/aus dem Gehäuse eingeführt/herausgezogen wird.

2. Vorrichtung nach Anspruch 1, wobei dieses Element (7) so ausgebildet ist, dass die Aufwärtsbewegung der Flasche oder der Kartusche (4) nur nach dem Herausziehen der Zündeinrichtung (2) oder Absaugeinrichtung (5) aus dem Körper oder dem Gehäuse (3) erfolgen kann.

3. Vorrichtung nach Anspruch 1, wobei dieses Element (7) so ausgebildet ist, dass es aus dem Körper oder dem Gehäuse (3) nur herausgezogen werden kann, nachdem die Flasche oder die Kartusche (4) vom Element (7) losgelöst wurde.

4. Vorrichtung nach Anspruch 1, wobei das ringförmige Halteelement (7) sich um zirka 320-350° erstreckt und mit einer Stufe (9) an seiner Umlaufkante versehen ist, um darin der Boden der Flasche oder der Kartusche (4) unterzubringen.

5. Vorrichtung nach Anspruch 1, wobei das ringförmige Halteelement (7) zwei geformte Öffnungen (10) umfasst, um seine elastische Handhabung mit zwei Fingern zu ermöglichen.

6. Vorrichtung nach Anspruch 5, wobei die Höhe der Stufe (9) so berechnet ist, dass das Herausziehen des Elements (7) und dementsprechend der Flasche oder der Kartusche (4) nur nach dem Herausziehen der Zündeinrichtung (2) oder der Absaugeinrichtung (5) erfolgen kann.

7. Gasbehälter, der mit einer Flasche oder einer Kartusche arbeitet, die in einem Haltekörper oder -gehäuse eingesetzt ist, **dadurch gekennzeichnet, dass** er eine Vorrichtung nach irgendeinem der Ansprüche von 1 bis 6 enthält.

Revendications

1. Système sécurisé pour une bouteille dans un appareil à gaz (1) de type comprenant au moins :

- un corps ou carter (3) équipé au minimum de deux orifices (6) ;
- un appareil (5) pour aspirer le gaz, partiellement introduit dans le corps ou carter (3) par l'un de dits orifices ;
- une bouteille (4) ou cartouche faite pour être introduite dans le corps ou carter (3) par l'autre orifice pour interagir avec l'appareil à aspirer (5) ;
- un régulateur de débit du gaz en option positionné sur l'appareil à aspirer (5) pour régler la flamme obtenue au niveau de l'appareil d'allumage (2) ;
- moyens pour maintenir la bouteille ou cartouche (4) dans le corps ou carter (3) et pour l'empêcher qu'elle ne sorte accidentellement de l'orifice, lesdits moyens comprenant un élément de maintien en forme d'anneau (7), qui est introduit dans le même orifice (6) où se trouve la bouteille ou cartouche (4) et dont la forme permet l'extraction ou la sortie de la bouteille ou cartouche (4) uniquement après avoir soulevé la bouteille

ou cartouche (4) dans le corps ou carter (3), ledit élément en forme d'anneau (7) enveloppant la partie inférieure ou bas de la bouteille ou cartouche (4) et formant, en même temps, une butée inférieure, **caractérisé en ce que** ledit élément en forme d'anneau (7) est élastiquement introduit/extrait dans le/du corps ou carter. 5

2. Système selon la revendication 1, dans lequel ledit élément (7) présente une forme telle qu'il n'est possible de soulever la bouteille ou cartouche (4) qu'après avoir extrait l'appareil d'allumage (2) ou l'appareil à aspirer (5) du corps ou carter (3). 10
3. Système selon la revendication 1, dans lequel ledit élément (7) présente une forme telle qu'il n'est possible de l'extraire du corps ou carter (3) qu'après avoir desangager l'élément (7) de la bouteille ou cartouche (4). 15
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4. Système selon la revendication 1, dans lequel l'élément de maintien en forme d'anneau (7) se déploie sur 320-350° environ et présente un palier (9) sur tout son bord périphérique pour loger la partie inférieure de la bouteille ou cartouche (4). 25
5. Système selon la revendication 1, dans lequel l'élément de maintien en forme d'anneau (7) comprend deux orifices formés (10) de façon à permettre sa manipulation élastique avec deux doigts. 30
6. Système selon la revendication 5, dans lequel la hauteur du palier (9) est calculée pour ne permettre l'extraction de l'élément (7) et, par conséquent, de la bouteille ou cartouche (4), qu'après avoir extrait l'appareil d'allumage (2) ou l'appareil à aspirer. 35
7. Appareil à gaz fonctionnant avec une bouteille ou cartouche introduite dans un corps ou carter de logement, **caractérisé en ce qu'il** comprend un système selon l'une quelconque des revendications 1 à 6. 40
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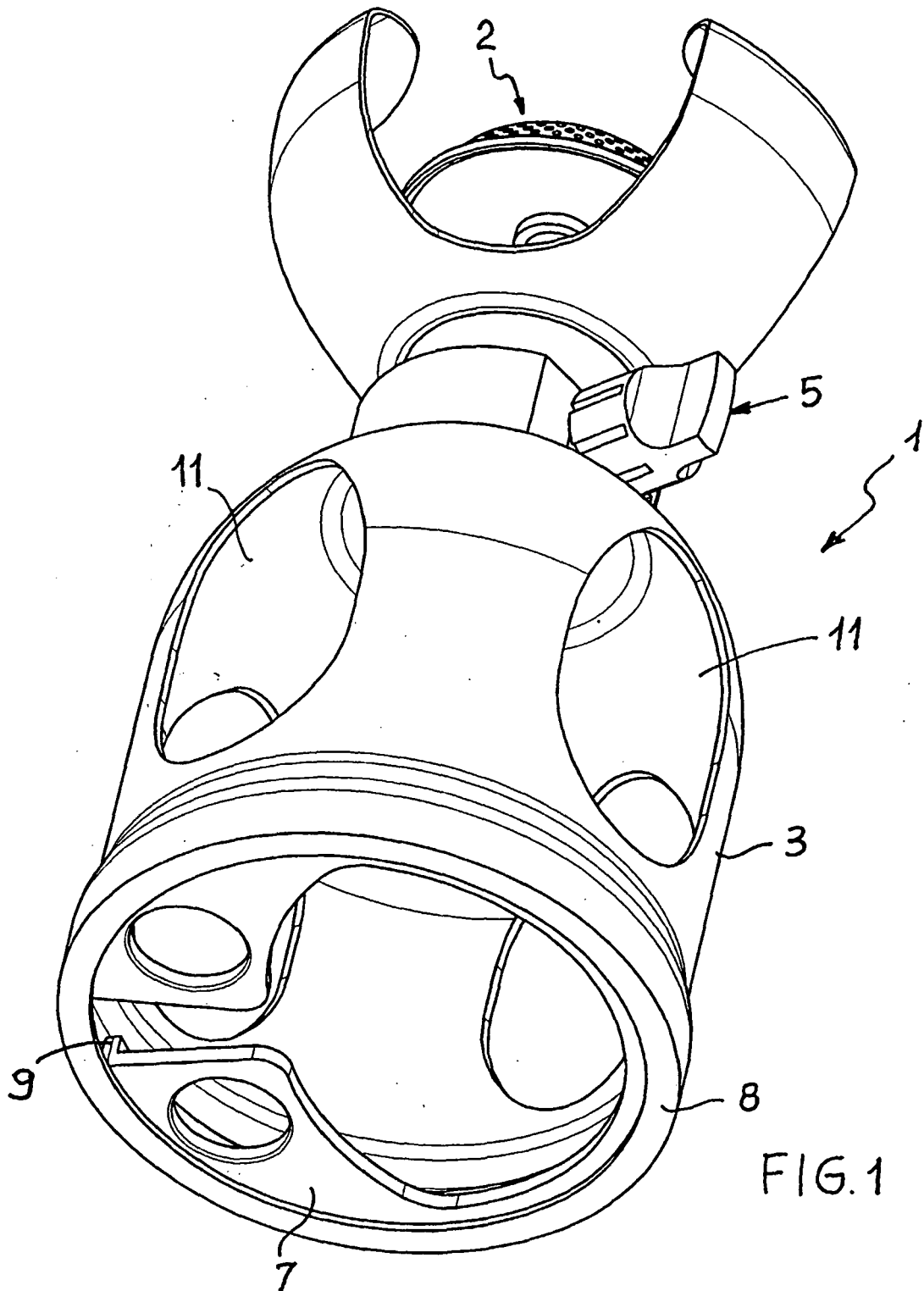
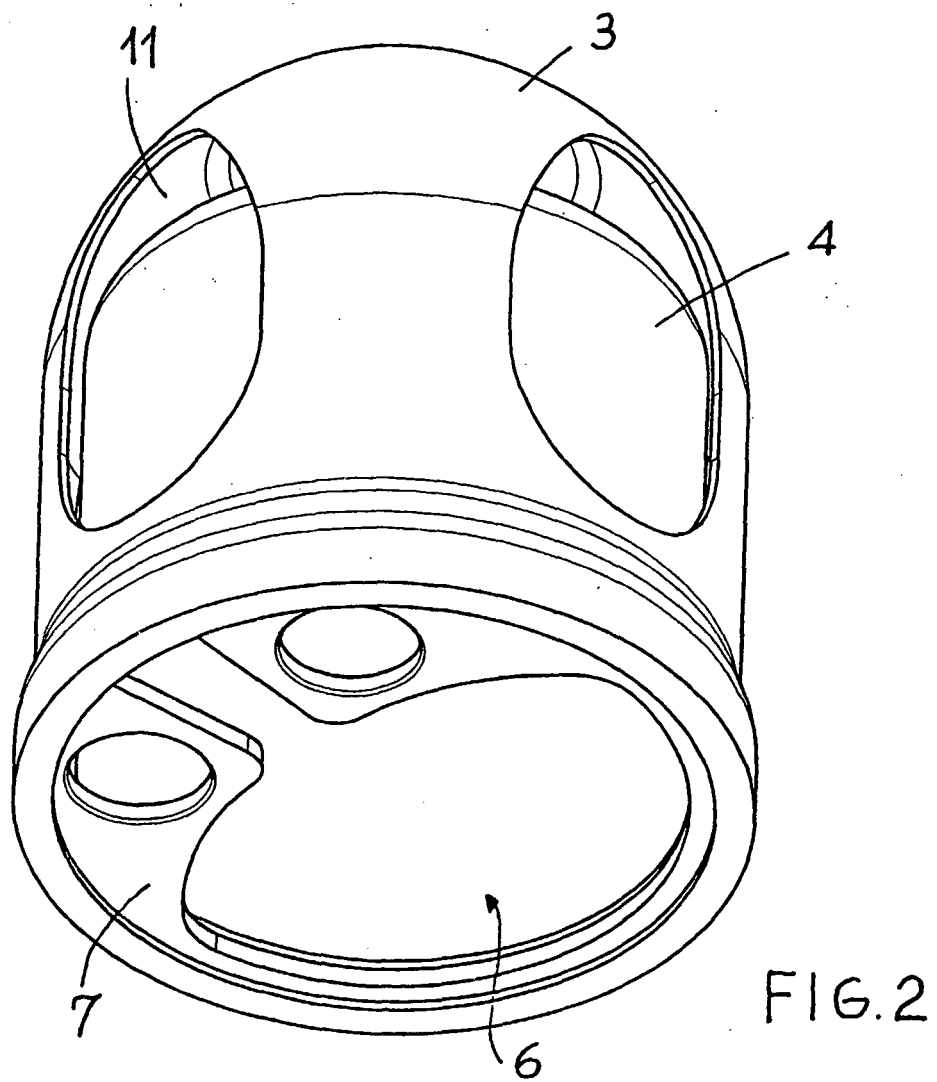


FIG. 1



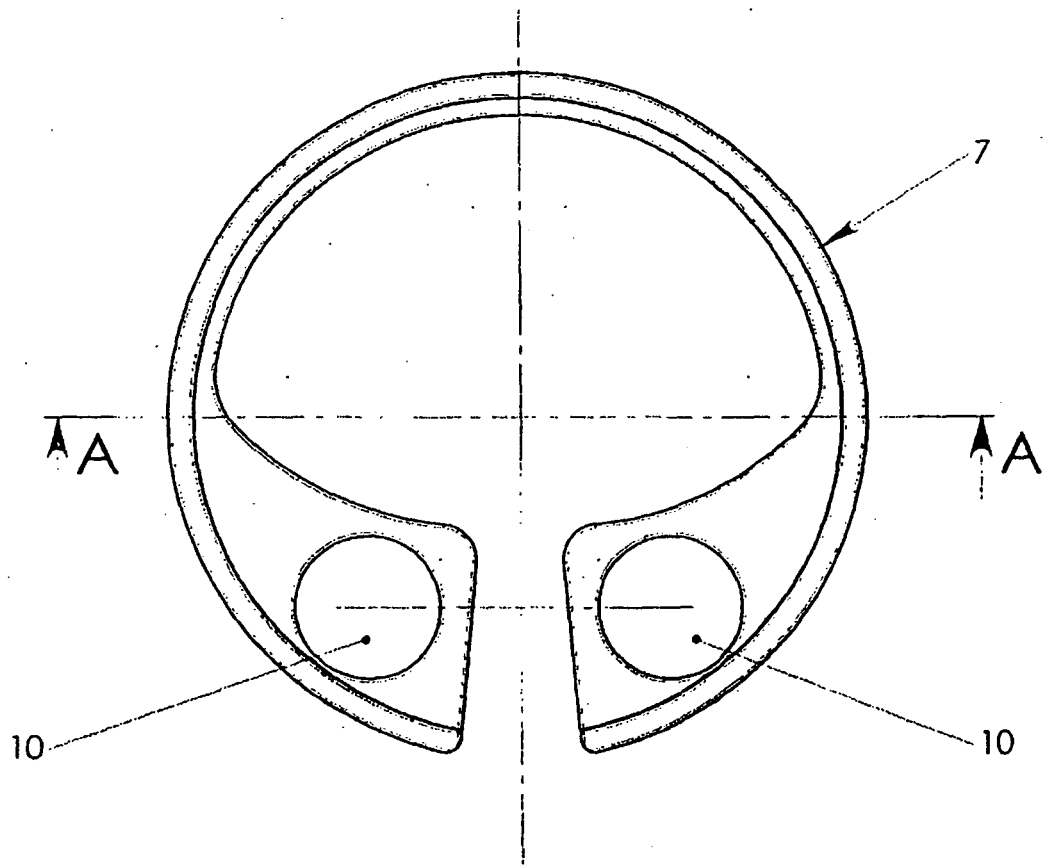
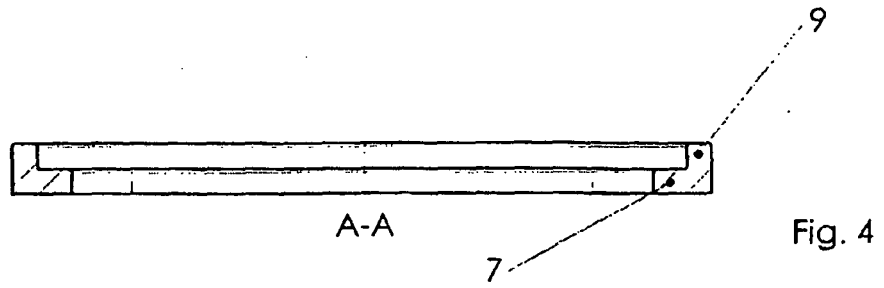


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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