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Sidelinker

[11] **3,828,976**

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[54] **METHOD AND APPARATUS FOR DEGASSING AEROSOL CANS AND THE LIKE**

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[52] **U.S. Cl.** **222/83.5,** 241/99

[51] **Int. Cl.** **B67b 7/24**

[58] **Field of Search** 222/80, 83.5; 83/660; 241/99, 31, 37.5

[56] **References Cited**

UNITED STATES PATENTS

2,644,430	7/1953	Lang	222/83.5
3,438,548	4/1969	Ceyba	222/80

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Attorney, Agent, or Firm—Munroe H. Hamilton

[57] **ABSTRACT**

Release of residual pressure in a used aerosol can or similar pressurized enclosure is carried out in a closed container in a controlled manner to avoid safety hazards. A collapsible puncture element adjustably received in an operating handle supported on the container is arranged to be guided into the container and to pierce the aerosol can. Pressurized gas leaving the aerosol can is momentarily confined and allowed to discharge through suitable vent means. The container is provided with a hinged top section fastened to a lower can-supporting section by a latch mechanism. Safety locking means located through the hinged top section prevents disengagement of the latch mechanism while gas pressures of significantly dangerous nature are present in the container after the aerosol can is punctured.

5 Claims, 6 Drawing Figures

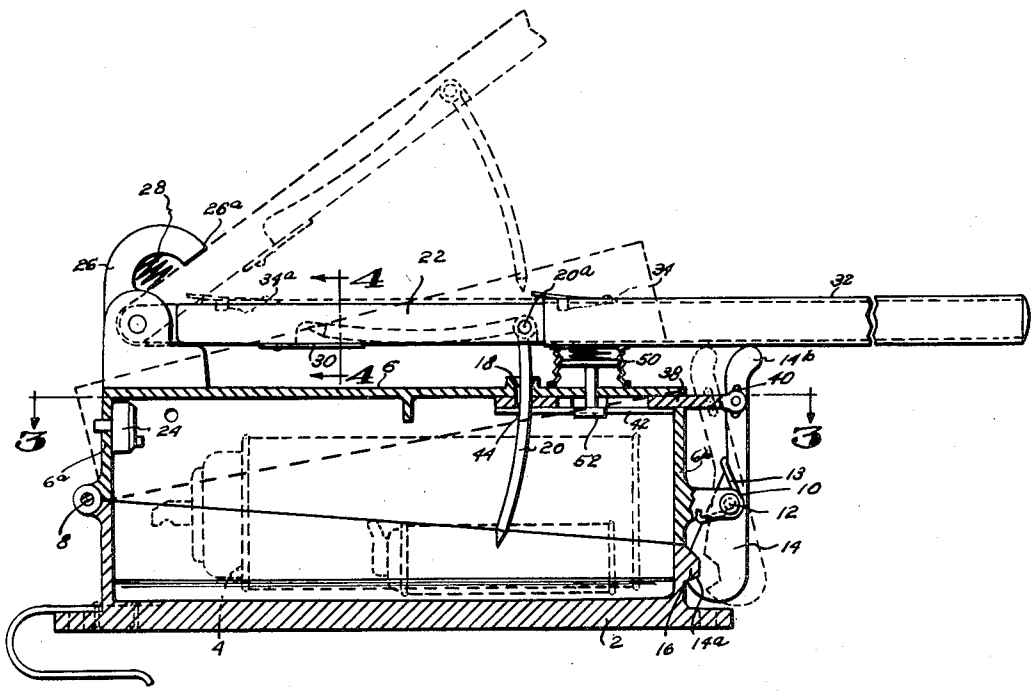

Fig. 1.

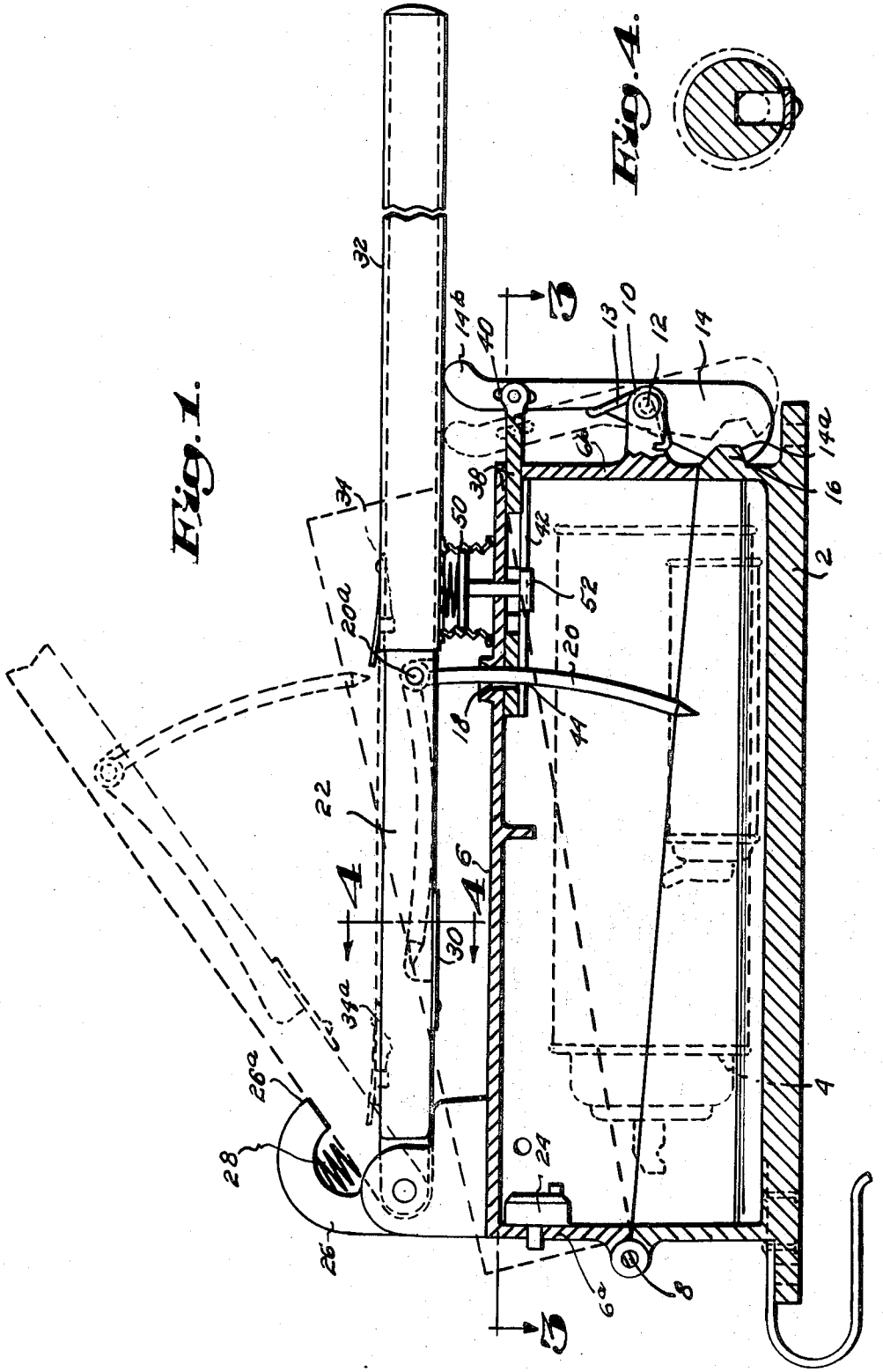
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Fig. 4.

Fig. 2.

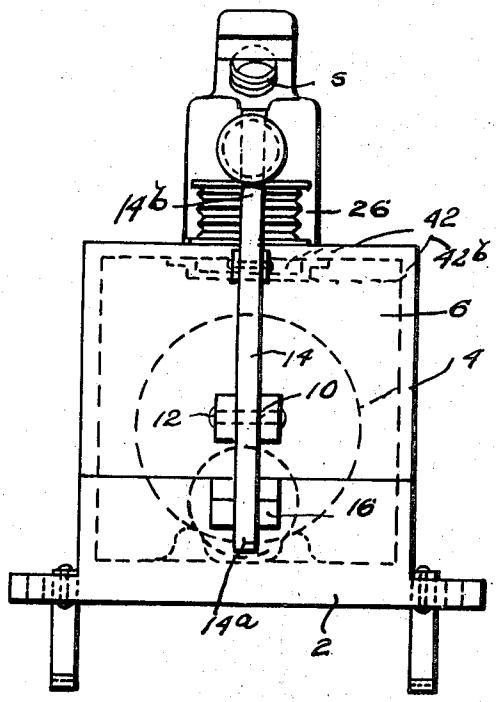


Fig. 3.

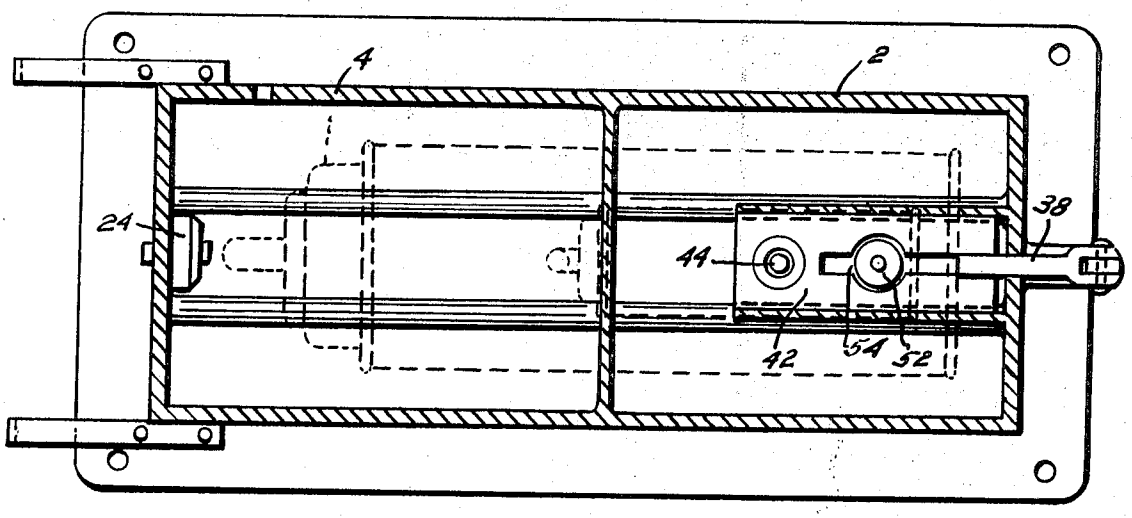


Fig. 5.

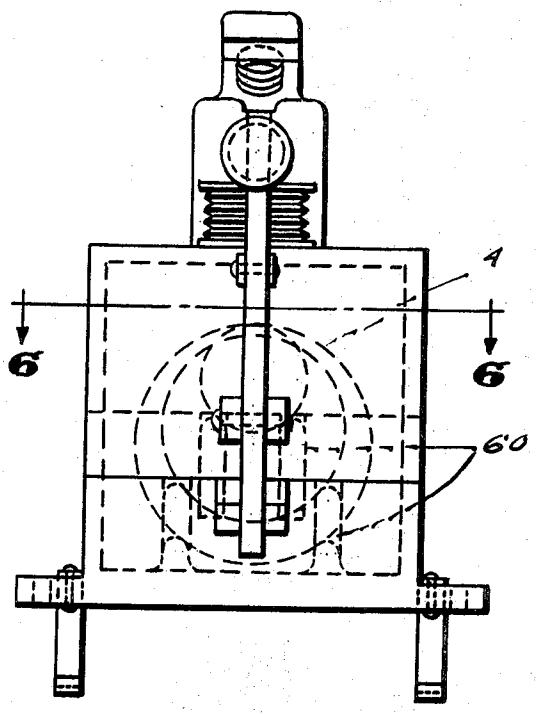
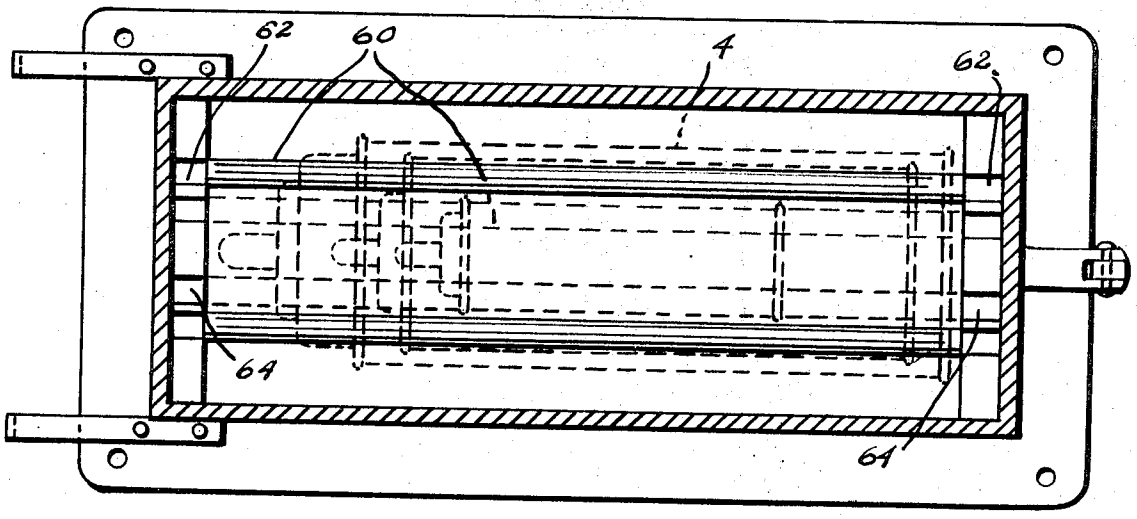


Fig. 6.



METHOD AND APPARATUS FOR DEGASSING AEROSOL CANS AND THE LIKE

This invention is, in general, directed to the field of safety devices and relates specifically to a method and apparatus for releasing residual gas from aerosol cans in a controlled manner so as to minimize or avoid explosive hazards.

It is wellknown in the art that disposing of used aerosol cans and other pressurized containers by crushing in a compactor or by burning in an incinerator can be rendered safer by releasing gas from used aerosol cans to thus avoid the risk of explosion. The danger inherent in disposal of used aerosol cans has been set forth in U.S. Pat. No. 3,333,735 and also in U.S. Pat. No. 3,438,548, and there have been disclosed in these patents devices for containing aerosol cans and puncturing them to release residual gases into a protective container body.

These prior art devices are constructed with puncture elements which are mounted on hinged cover members for enclosing gases releasable into a confined space. However, there are no safety devices in these prior art disclosures for preventing accidental opening of the cover member by residual gas pressure, and as a result, a safety hazard may be created by use of the puncture elements to release pressures of a magnitude sufficient to burst open the cover and cause an explosive discharge into the atmosphere surrounding the body of the user of the puncturing device.

It is a chief object of the invention, therefore, to provide an improved method and apparatus for degassing used aerosol cans and the like and to deal with the safety hazard attendant upon the use of a pressure releasing cover structure with which a puncture element is associated.

Specifically, it is an object of the invention to devise a degassing method and enclosure means whereby sudden release of pressurized gas may be prevented from opening the cover with a dangerous burst of the pressurized gas.

A further object of the invention is to provide a combination of container and cover portions with latch means and locking mechanism selectively operative to control the latch mechanism.

Still another object of the invention is to devise an improved means for containing and storing a puncture element at the upper side of an enclosure cover.

With these objects in mind, I have conceived of a combined cover, latch and locking means for a container body in which a used aerosol can may be received and punctured. Essentially, my concept is based on the use of a releasably engagable latch for securing a cover element against a container body. Engageable in the latch means in a locking mechanism located through the cover in a manner such that the puncture element cannot be introduced into the container unless the latch is fully secured, and in addition, after the puncture element has pierced a can and released pressurized gas the latch may not be disengaged if the released pressurized gas is of a pressure intensity likely to cause a safety hazard. In general, the method of confining pressurized gas released from a punctured aerosol can may be carried out by exposing one side of a pressure sensitive device to release gas pressure in a position such that it may be moved into a locking position relative to the latchlocking mechanism.

The nature of the invention and its other objects and novel features will be more fully understood and appreciated from the following description of a preferred embodiment of the invention selected for purposes of illustration and shown in the accompanying drawings, in which:

FIG. 1 is a side elevation view illustrating a preferred form of safety degassing apparatus of the invention;

FIG. 2 is an end elevational view of the apparatus of the invention, and

FIG. 3 is a cross section taken on the line 3—3 of FIG. 1.

FIG. 4 is a cross section taken on the line 4—4 of FIG. 1;

FIG. 5 is an end elevational view; and

FIG. 6 is a cross section taken on the line 6—6 of FIG. 5.

Referring more in detail to the drawings, numeral 2 denotes a container body which may be of a box-like shape and of a size suitable for receiving and supporting therein a used aerosol can as indicated by the dotted line, part 4.

Mounted at the upper side of the container body 2 is a hinged cover member 6. This cover is, in one preferred form, constructed with a relatively shallow back section 6*a* and a relatively larger front section 6*b*. The back section, 6*a*, is secured to an adjacent portion of the container 2 by hinge means 8 and lower edges of cover 6 are arranged to fit tightly against upper edges of the container body 2, preferably in substantially sealing relationship therewith.

At the front section, 6*b*, of the cover element 6, I provide a projecting stud portion 10 which may be formed as an integral part of the cover as shown. The stud portion 10 has, transversely located therethrough, a pivot pin 12 on which is pivotally mounted on latch arm 14. At its lower end, the latch arm 14 is formed with a notched part 14*a* which is formed to fit over and engage with a projection 16 provided at the front side of the container 2, and the latch is normally held in a resiliently secured position by a spring 13, as is best shown in FIG. 1. It will be apparent that in the engaged position indicated, the latch 14 operates to solidly lock the cover element 6 against upward displacement.

At the upper side of the cover member 6 is formed an aperture 18 through which may be received an elongated puncture element 20. The puncture element 20 is carried on a lever handle 22 and in the lowered position shown in FIG. 1, extends downwardly into the container interior in a position to pierce and pass through the aerosol can 4 and thus release pressurized gas therefrom. A vent device 24 in the back section of the cover member 6 permits escape of released gas in a suitably regulated manner, and if desired, the vent may have a conduit connecting it with a discharge outlet at some desired location.

The lever handle 22 is rotatably supported in yoke part 26 mounted at upper side of cover 6. As shown in FIG. 1, a spring 28 normally operates to maintain the handle 22 in its upper position to act as a cushion stop to prevent puncture pin 20 from coming out of aperture 18. It is only compressed to its fullest when handle 32 is moved to maximum upper position against stop 26*a* to move puncture pin 20 out of aperture 18 to be stored in the handle 22 or visa versa. One end of the puncture element 20 is pivotally mounted on a pin 20*a* located through the handle part 22, as shown, and the

lower side of the handle is open to receive the puncture element **20** in a stored position substantially as shown in dotted lines in FIG. **1.** If desired, an adjustable holding stop **30** may be used to retain the puncture element in a stored position when not in use.

An extension handle part **32** is slidably supported over the outer end of handle **22** and in the extended position shown, allows the puncture element to drop downwardly into an operative position. When the extension handle part **32,** in a fully closed position, as shown in dotted lines in FIG. **1,** it operates to move the puncture element upwardly into a stored position. A pin **34** extends downwardly from the top side of the handle extension, as shown in FIG. **1,** and engages in a slot **34***a* indicated in dotted lines in the arm **22.**

In accordance with the invention, I provide an improved method of operating the handle **22** and puncture element **20** in a manner such that sudden release of pressurized gas is controlled and cannot create a safety hazard as a result of the cover **6** being burst open when the latch arm handle **14***b* is moved to an open position. I may carry out my method of control, in one desirable form, at the point where a sudden flow of pressurized gas may be released from the can at the time the can is punctured. To accomplish this, I provide a slide member **38** which is arranged in pivotally pinned relationship to the upper end of latch arm **14** in an elongated slot **40.** The slide **38** is located through an opening in the front section, **6***b*, of cover member **6** and supports at an inner end thereof a locking slide plate **42,** better shown in FIG. **2.** Formed in the locking slide plate **42** is an opening **44** through which the puncture element **20** may be received when the latch arm **14** is in the engaged position shown in FIG. **1.**

It is pointed out that the opening **44,** allowing movement of the puncture element into the container, is controlled by the latch arm **14,** and the puncture element cannot be moved into the cover element **6** when the latch is disengaged and the locking plate **42** moved outwardly. This is so since the opening **44** is no longer in register with the aperture **18,** thus a safety hazard is avoided by insuring that the cover must always be in a locked position when piercing of a can is carried out.

In addition to the above-disclosed method of control, I may also carry out a further control step after the puncture element has been moved downwardly and immediately raised upwardly. This I accomplish by means of a diaphragm element **50** mounted in the upper side of the cover member **6,** as shown in FIG. **1,** having a spindle and cap **52.** The diaphragm is of the pressuresensing type and is operable in response to a predetermined pressure range in the container to move upwardly carrying the spindle and cap **52** into a cap aperture **54** in the locking slide **42,** best shown in FIG. **3.** In a raised position, it will be seen that the cap prevents outward movement of the slide **38** and thus the latch arm **14** cannot be disengaged to permit the cover to burst open under pressure.

As shown in FIGS. **5** and **6,** I may provide movable supports **60** for different size cans. The puncture pin **20** can then be shortened for better operation. It can also be located closer to pivot pin **26** for more leverage if desired. Slots indicated at **62** and **64** are designed to fit movable supports **60** and allow for quick change to different diameter aerosol cans.

I claim:

1. Apparatus for puncturing pressurized aerosol cans and the like including a container having a receptacle portion for receiving an aerosol can, a cover secured in hinged relation at the upper side of the container for closing the receptacle portion and defining a confined space into which residual pressurized gas from a used aerosol can may be released, said cover having an opening formed at the upper side thereof, vent means in the container for conducting gas out of the confined space, a lever arm rotatably supported on the cover, a puncture element pivotally attached to the underside of the lever arm and movable through the cover aperture into and out of the confined space to pierce an aerosol can disposed therein, latch mechanism for releasably securing the cover portion on the container, said latch mechanism including a latch arm and a slide locking member for controlling movement of the latch member, said slide-locking member being attached to one end of the latch arm and slidably supported through the front of the said cover, said slide element having a locking plate portion formed with an opening arranged to register with the said cover aperture when the latch mechanism is closed and through which the puncture element may be received, said locking slide portion being movable out of a position of register with the said cover aperture in response to disengagement of the latch mechanism to prevent passage of the puncture element into the container when the cover is not locked.

2. A structure according to claim **1** in which the locking means includes a slide element attached to the latch mechanism and located through the front of the said cover, said slide element having at its inner end a locking plate portion formed at an intermediate point with a trapping recess, a pressure-responsive diaphragm member mounted at the upper side of the cover in a position to be compressed by the said lever handle when the latter is in a lowered position, said diaphragm member being located above the trapping recess and having a spindle and cap device attached to one side of the diaphragm member, said spindle and cap device being movable into the trapping recess in response to a predetermined pressure in the confined space of the container to lock the latch mechanism in a holding position.

3. A structure according to claim **1** in which the locking means includes a slide element attached to the latch mechanism and slidably supported through the front of the said cover, said slide element having a locking plate portion formed with an opening arranged to register with the said cover aperture when the latch mechanism is closed and through which the puncture element may be received, said locking slide portion being movable out of a position of register with the said cover aperture in response to disengagement of the latch mechanism to prevent passage of the puncture element into the container when the cover is not locked, and said slide locking portion further having at its inner end a locking plate portion formed at an intermediate point with a trapping recess, a pressure-responsive diaphgram member mounted in the upper side of the cover in a position to be compressed by the said lever handle when the latter is in a lowered position, said diaphragm member being located above the trapping recess and having a spindle and cap device attached at the underside thereof, said spindle and cap device being movable into the trapping recess in response to a predetermined

pressure in the confined space of the container to lock the latch mechanism in a holding position.

4. A structure according to claim 1 in which the lever arm includes a tubular extension part telescopically supported around the lever arm and operable to swing the puncture element into a stored position when moved from an extended position inwardly.

5. A structure according to claim 1 in which the latch mechanism includes a projecting part on the front of the container and a spring loaded latch bar pivotally supported on the cover and being formed with an notched extremity engageable over the projecting part to lock the cover in a securely closed position.

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