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Hansen

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[54] **SAFETY HEAD ARRANGEMENT FOR FIRE EXTINGUISHER**

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[52] **U.S. Cl.** ..... **169/31 R**, 169/31 P, 220/40 R

[51] **Int. Cl.** **A62c 13/00**

[58] **Field of Search** ..... 169/31 P, 31 R; 220/40 R

[56] **References Cited**

UNITED STATES PATENTS

3,530,942	9/1970	Hansen	169/31 R
1,932,135	10/1933	Hall	220/40 R X
1,576,580	3/1926	Ellis	220/40 R
2,531,860	11/1950	O'Neal, Jr.	220/40 R
2,361,704	10/1944	Patterson	220/40 R X
2,942,754	6/1960	Young et al.	220/40 R
3,010,673	11/1961	Marconi	220/40 R X

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[57] **ABSTRACT**

Apparatus for dispensing a fluid medium under pressure is disclosed, including a container for storing the fluid medium and having a substantially tubular neck defining an opening. A control head is mountable within the opening and is movable relative to the longitudinal axis of the container to an outer position to seal the opening and to an inner position to vent the container. The control head is interlocked with the container by means of a bayonet type connection including a pair of inwardly extending flanges on the container and a pair of outwardly extending flanges on the control head. Inwardly and outwardly extending flanges are provided with mutually engageable abutment surfaces to constrain the control head against movement relative to the container when the control head is in its outer position.

12 Claims, 3 Drawing Figures

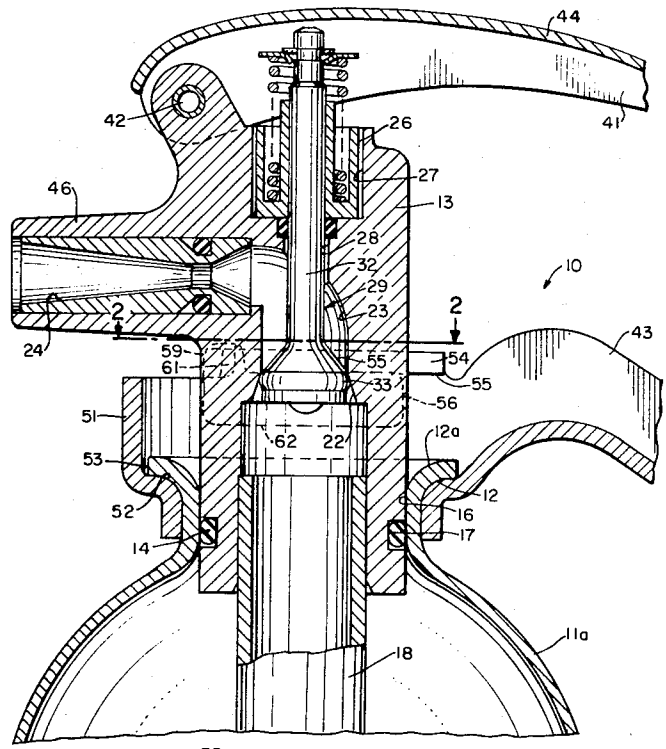


FIG. 1

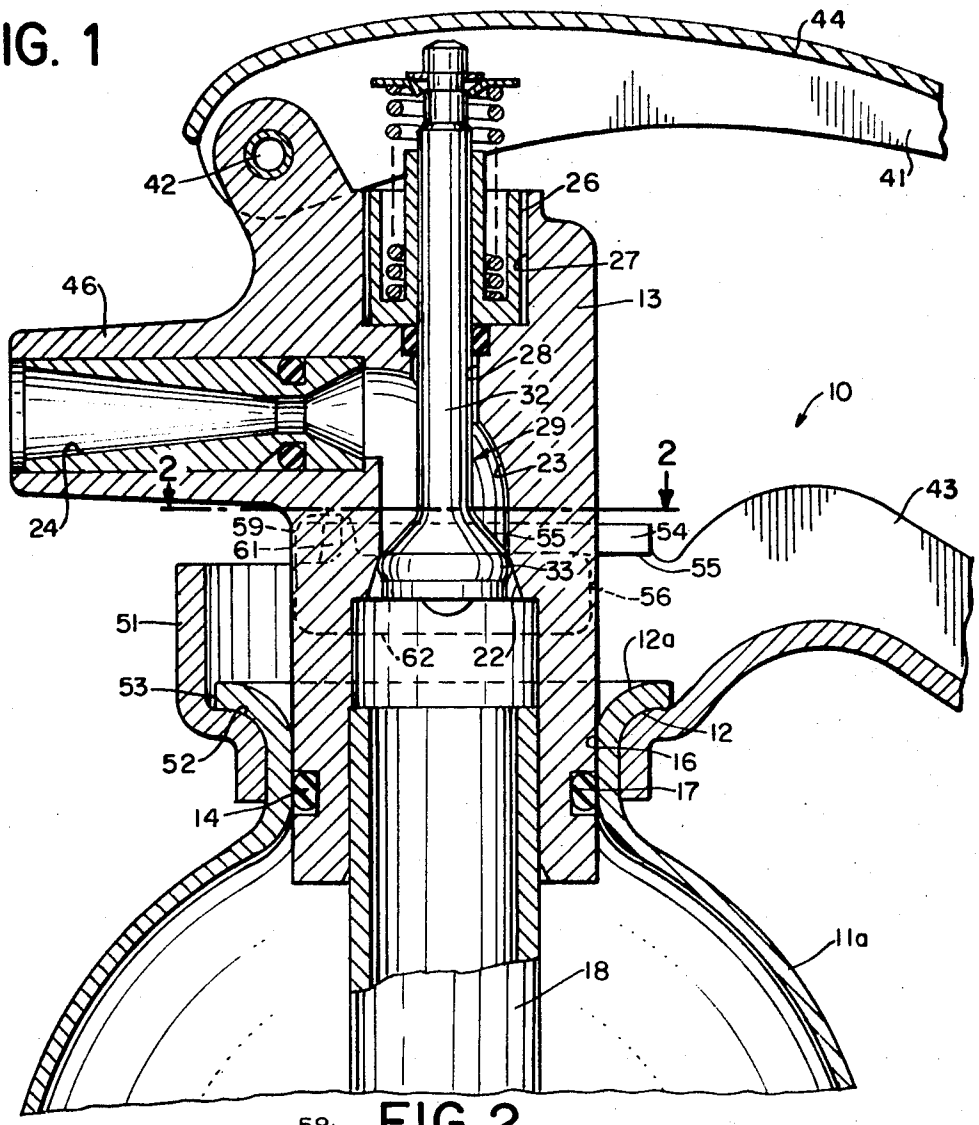


FIG. 2

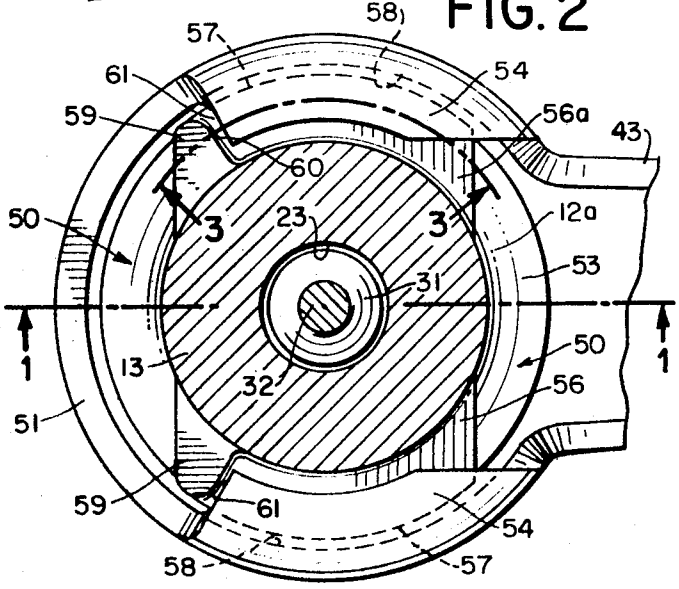
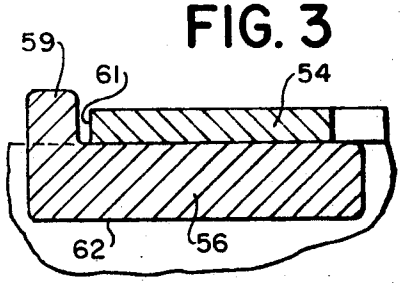


FIG. 3



SAFETY HEAD ARRANGEMENT FOR FIRE EXTINGUISHER

BACKGROUND OF THE INVENTION

The present invention relates to apparatus for confining and dispensing a fluid medium under pressure, such as portable fire extinguishers and the like, and more particularly to a bayonet type arrangement for locking the control head of the fire extinguisher to the container.

Portable fire extinguishers of the type referred to herein have been heretofore provided with either a metal control head which is threaded onto the neck of a metal container or a plastic head which frequently is likewise threaded to the container. Such construction is particularly used in connection with smaller, portable fire extinguishers which carry a powdered extinguishing agent.

In applications where a low cost extinguisher is desired, such as portable extinguishers for home, car and boat use, extinguishers with metal heads have been found to be relatively expensive. This is because metal control heads are difficult and costly to produce due in part to the relatively high cost of machining the metal materials. Plastic control heads are less expensive to manufacture. However, it has been found that where a plastic head is joined to the container by cooperating threaded portions, the threads of either the control head or the container may be damaged or otherwise rendered ineffective if a misalignment occurs in the attachment of the control head to the container and the cooperating threaded portions become crossed. Such damage would require replacement of either the head or the container or both, making the cost of such accidental misalignment extremely high.

The present invention relates to extinguishers of the type having a metal container and a plastic control head and provides a bayonet type of connection between the control head and the container. In the preferred embodiment the control head is slidably mounted in the opening to the container. A portion of the container adjacent it opening is provided with a pair of laterally inwardly protruding lip portions or flanges positioned at diametrically opposite positions around the periphery of the opening. The control head is preferably provided with a cooperating pair of radially outwardly extending flanges to fit respectively beneath each of the fixed flanges on the container thereby to hold the control head in position. A pair of raised stop members is provided at one end respectively of each of the control head flanges to engage respective end portions of the fixed flanges to prevent the control head from rotating when it is in its operating position.

The control head is removed from the container by pressing downwardly on the control head to move the upper extremity of each of the stop members to a position beneath the undersurfaces of the respective fixed flanges. In this position, the control head may be rotated approximately 90° to move its flanges out of alignment with the fixed flanges.

To affix the control head to the container it is only necessary to reverse the disengagement procedure outlined above. The control head is inserted into the container opening sufficiently to position the upper extremities of the stop members beneath the undersurfaces of the respective fixed flanges, and is then rotated approximately 90° until its flanges move into alignment with the fixed flanges. The control head may then be moved upwardly until the upper surfaces of its flanges abut against the lower surfaces of the fixed flanges. In this position each of the stop members protrudes above the upper surface of its adjacent fixed flange, thereby preventing further rotation of the control head. Under normal circumstances, fluid pressure within the container will insure that the control head remains in such raised position.

It is therefore an object of the present invention to provide a control head arrangement for a fire extinguisher having an improved threadless control head locking arrangement.

Another object is to provide a safety arrangement for a fire extinguisher having a bayonet type locking arrangement between the control head and the container of the extinguisher.

BRIEF DESCRIPTION OF THE DRAWINGS

For a further understanding of the present invention, reference may be had to the accompanying drawings in which:

FIG. 1 is a longitudinal view taken partly in cross-section of the upper portion of a preferred embodiment of a fire extinguisher equipped with the safety locking arrangement of the resent invention; and

FIG. 2 is a top view taken in cross-section along the line 2—2 of FIG. 1;

FIG. 3 is a view taken along the line 3—3 of FIG. 2.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, there is shown, by way of example, a fire extinguisher, generally indicated by reference numeral **10**, having a preferably metal container or receptacle **11** for storing a fluid medium under pressure. The container **11** may be formed of a suitable metal such as stainless steel and is preferably provided with a domed end **11a** having an outwardly flared neck portion **12** defining an opening **12*a***.

A control head **13** is inserted into the opening **12*a*** in such a way as to form a fluid-tight seal with an inner surface **16** on the neck. The sealing arrangement between the neck **12** and the control head may be accomplished in several ways; however, it has been found convenient to provide on the head **13** a sealing member, such as an O-ring **14**, to engage the neck's inner surface **16**. For this purpose, the control head **13** is provided adjacent its lower end with an annular recess **17** to hold the O-ring.

The body of the control head **13** is preferably made of a plastic material such as polymerized formaldehyde, and is provided part way therethrough with a first axial bore **15** having an enlarged diameter lower end portion **21** for receiving a siphon tube **18**. Tube **18** extends downwardly from the control head **13** into the container **11** where the chemical, for example an extinguishing agent in powder form, is stored. The upper end of the enlarged diameter portion **21** is formed with an inwardly tapered wall portion **22** to serve as a valve seat for a valve member **29** movable to control the charging and discharging of fluid from the container **11**. A reduced diameter portion **23** of the bore **15** extends above the valve seat **22** and has an angled bend of substantially 90° to be in fluid flow communication with a substantially laterally extending discharge passageway **24**. The discharge passageway is formed

within a protruding nose portion **46** of the control head, which may be pointed at the fire to be extinguished to direct the flow of exhausting pressurized fluid.

The control head **13** is further provided with a stepped axial bore **26** which is coaxial with the enlarged diameter bore **21** and extends inwardly from the upper end of the control head. The upper portion **27** of bore **26** is of the largest diameter, and a reduced diameter portion **28** is in fluid flow communication with the bore **15.**

The valve **29** has a head **31** and a stem **32** and is mounted within the control head **13** so that the head **31** is positioned and can travel within the enlarged diameter bore **21.** The stem **32** extends upwardly from the head **31** through the stepped bore **26** above the upper surface of the control head. The valve stem **32** therefore, extends along an axis common to the bores **21** and **26** and the siphon tube **18.** An O-ring **33** is preferably mounted on the valve head **31** for engagement with the valve seat **22** to provide a fluid tight seal between the bore **21** and the discharge passageway **24.**

A valve operating lever **41** is pivotally mounted at the top of the control head **13.** Preferably, the lever **41** is mounted at pivot **42** on one side of the top portion of the control head and extends laterally across over the top or upper end of the control head and the protruding valve stem **32.** In the embodiment illustrated the lever **41** extends laterally outwardly from the control head substantially coextensively with a handle **43** which is swaged or otherwise rigidly secured to the flared neck portion **12.** The lever **41** may be provided with an outwardly protruding flange **44** which extends directly over the upper end of the valve stem **32** to engage the valve stem when the lever is pivoted in a clockwise direction, as viewed in the drawing. The valve **29,** accordingly, may be operated when the lever **41** and the handle **43** are grasped in one hand and squeezed together.

In the preferred embodiment, the handle **43** is provided with an integral, substantially annular, support **51** the diameter of which is greater than the diameter of the flared neck **12** of the container **11.** The support **51** is provided with an inwardly directed shoulder **52** which engages the undersurface of the flared neck **12.**

The upper periphery of support **51** is provided with a pair of preferably sector-shaped, laterally inwardly protruding lips **54,** illustrated in FIGS. **2** and **3.** These lips **54** preferably protrude inwardly from substantially diametrically opposite positions around the periphery of the support, and each is provided with a substantially flat lateral abutment surface **55** formed along its lower extremity.

The control head **13** is provided with a pair of substantially sector-shaped laterally outwardly extending wing or flange portions **56.** The flanges **56** are preferably integral with the control head **13,** and protrude laterally from diametrically opposite positions around the periphery of the control head. Each of the flanges **56** is provided with a substantially flat lateral abutment surface **56*a*** formed along its upper extremity and engageable with the abutment surface **55** of the lips **54** when the control head is in its operating position. The distance measured from the outermost point of one flange **56** through the center of the control head to the outermost point of the other flange **56** is determined to be only slightly less than the outer diameter of the support **51.** Similarly, the radius of the curved outer periphery of each of the flanges **56** is slightly less than the radius of curvature of the inner circumference of the support **51.** This arrangement will permit the control head with its flanges **56** to rotate freely within the space enclosed by the support **51.**

In the preferred embodiment, the sector angle of each of the lips **54** is substantially the same as the sector angle of each corresponding flange **56.** It has been found that a suitable sector angle for the lips and flanges is approximately 50°, although the invention is not to be limited by such angle. This is merely preferred since the lips and flanges may therefore be provided with sufficient surface area to insure suitable stability for the control head in its operating position.

Each of peripheral area or spaces **50** located between the lips **54** of support **51,** is preferably defined by a sector angle which is greater than the sector angle of the flanges **56** on the control head. The control head having the flanges **56** therefore may be easily inserted or removed from the opening **16** of the container **11** when it is turned approximately 90° from the position shown in FIG. **2** to a position in which the flanges **56** have been moved out of alignment with the lips **54.**

It should be noted that the invention is not to be limited by the provision of a total of four flanges for interconnecting the control head and the container. It is possible to provide only one outwardly extending flange member on the control head and one inwardly extending lip member on the support **51** without departing from the scope of the invention. The use of four flanges in the present configuration is preferred however, in that it offers superior stability to the control head while it is in its operating position.

It is also important to note that the use of substantially sector-shaped lip and flange members is by way of example only, and that other configurations having corresponding abutment surfaces for relative engagement in the operating position of the control head may be employed without departing from the scope of the invention.

Referring to FIGS. **2** and **3,** each of the flanges **56** is provided at one end with a raised stop member or promontory **59.** Each of the stop members is provided with an abutment surface **60** transverse to the substantially flat and horizontal abutment surface **56*a***. Each of the surfaces **60** preferably extends upwardly beyond the upper extremity of the corresponding lip **54,** and is adapted to be engagable with a cooperating shoulder portion **61** formed at one end of each of the lips. The stop members **59** are positioned relative to the control head such that the abutment surfaces **60** face in substantially the same direction. Therefore, any attempt to rotate the control head in either direction while it is in its upper operational position will be inhibited by engagement of one or the other of the stop members **59** with the corresponding shoulder **61.**

It will be understood that the invention is not to be limited by the particular embodiment described in connection with FIGS. **1–3.** In an alternative configuration, for example, (not shown) one or both of the lips **54** may be apertured or recessed to receive corresponding projections located on the control head flanges. Such an arrangement would likewise serve to prevent rotational movement of the control head when it is in its upper operating position. The embodiment illustrated in FIGS. **1–3** is preferred however, because it obviates

any difficulties in aligning the lips and flanges in their locking position during insertion of the control head.

FIGS. 1–3 illustrate the upper operational position of the control head **13**. In this position the upper lateral surfaces of the flanges **56** abut against the lower lateral surfaces respectively of the lips **54** (FIG. **1**), and the O-ring **14** cooperates with the inner surface **16** of the tubular neck **12** to seal the opening. When the container **11** is filled, pressure from the fluid within the container exerts an upward force against the bottom of the control head **13** thereby pressing the flanges **56** and **54** together.

In the operating position of the control head, the stop members **59** protrude upwardly beyond the upper lateral surface of the flanges **54**, as seen in FIGS. **1** and **3**. Rotational movement of the control head in either direction will be prevented by engagement between one or the other of the abutment surfaces **60** with its corresponding shoulder **61** on the lips **54**.

To remove the control head from the container, it is only necessary manually to depress the control head downwardly relative to the container, until the upper end or extremity of each of the stop members **59** has been moved below the undersurface of the lips **54**. The control head **13** may then be rotated approximately 90° in either direction without interference until the flanges **56** have been moved out of alignment with lips **54**. It is then possible to lift the control head upwardly and away from the container.

The control head is locked to the container by reversing the process described above. It is first necessary to orient the control head in relation to the lips **54** such that the flanges **56** are positioned within the spaces **50** formed between the lips. The control head is then manually pushed downwardly until the lower surface **62** (FIG. **1**) of the flanges **56** engages the outwardly flared portion **53** of the tubular neck **12**. The control head **13** may then be rotated 90° to move the lips and flanges **54–56** into alignment. Upward pressure may then be manually applied to move the abutment surfaces of the flanges together. Alternatively, the control head may be moved upwardly by a force applied to it by the pressure of the extinguishing agent within the container as the apparatus is being charged. In this instance, frictional forces between the periphery of the control head and the inner surface **16** of the tubular neck **12** are generally sufficient to hold the head in position until the container **11** is charged with sufficient pressure to move the control head into position.

The safety feature of the invention operates to vent fluid to the atmosphere before the control head is removed, or alternatively to indicate to the serviceman that the level of contained fluid or pressure is too high to allow safe removal of the control head. Upon downward motion of the control head sufficient to move the upper extremity of the stop members **59** below the undersurface of the lips **54** so that the control head may be rotated, the O-ring **14** is moved out of engagement with the surface **16** and breaks the pressure seal between the control head and the neck. Any pressure remaining in the container is thereby vented to the atmosphere before the control head is removed. If the extinguisher being serviced has not been completely discharged and a substantial pressure remains therein, the serviceman will known immediately from the force required to depress the control head. Under this condition, the serviceman will discharge the unit by operating the valve **29** before he proceeds to disassemble the extinguisher.

The invention thus provides a simple and inexpensive bayonet type mount for securing the control head to the previous container, and incorporates a safety feature for protecting individuals attempting to remove the control head under the usual fire extinguisher maintenance program.

What is claimed is:

1. Fluid medium dispensing apparatus comprising:
- a container for storing the fluid medium under pressure and having a neck portion at one end defining an opening;
- a control head mountable within said opening and having means thereon for sealing the opening, said control head being movable relative to the container between an upper operational position in which said sealing means seals the opening and a lower venting position;
- at least first and second mutually engagable flange elements connected respectively to the container and to the control head, each of said elements having an abutment surface engagable with the other to limit upward movement of the control head;
- a pair of radially inwardly extending substantially vertical stop surfaces formed on said container within said neck, said surfaces facing in opposite directions around the circumference of the opening in said neck;
- a pair of radially outwardly extending substantially vertical stop surfaces formed on said control head, each of said outwardly extending stop surfaces being aligned with a corresponding one of said inwardly extending stop surfaces to constrain rotational movement of said control head when said control head is in said operational position.

2. The apparatus of claim **1** wherein the abutment surface of said first flange element overlies the corresponding abutment surface of said second flange element when the control head is in said operation position.

3. The apparatus of claim **2** wherein at least one of said inwardly extending stop surfaces is formed as part of said first flange.

4. The apparatus of claim **3** wherein at least one of said outwardly extending stop surfaces is formed as part of said second flange.

5. The apparatus of claim **4** wherein one of said flange elements comprises a promontory, the stop surface of said one flange being formed on said promontory and having a portion aligned with the corresponding stop surface of the other of said flange elements when the control head is in said operating position.

6. The apparatus of claim **5** wherein said promotory is formed on said second flange member.

7. The apparatus of claim **6** wherein said container comprises a pair of said first flange elements protruding from substantially diametrically opposite positions along the periphery of said neck.

8. The apparatus of claim **7** wherein said control head comprises a pair of said second flange elements protruding from substantially diametrically opposite positions along the periphery of said control head.

9. The apparatus of claim **8** wherein each of said flange elements comprises a substantially sector shaped member having a substantially flat surface area forming one of said abutment surfaces.

10. The apparatus of claim 9 wherein the sector angle of each of said flange elements is substantially the same.

11. The apparatus of claim 10 wherein each element of said pair of second flange elements comprises one of said promontories located adjacent one end and forming an integral part thereof, a portion of the stop surfaces of each of said promontories being adapted to align with a corresponding shoulder portion forming one end of each element of said pair of first flange elements when said control head is in said operational position.

12. The apparatus of claim 11 wherein said shoulder portions face in substantially opposite directions around the circumference of the opening in said neck.

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