United States Patent [19]

Burke

[11] **3,907,012**

[45] **Sept. 23, 1975**

[54] **ADAPTOR FITTING FOR BLOWING UP INFLATABLE DEVICES**

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[73] Assignee: **VCA Corporation,** Greenwich, Conn.

[22] Filed: **May 31, 1974**

[21] Appl. No.: **475,137**

[52] **U.S. Cl.** **141/349;** 137/223; 222/3

[51] **Int. Cl.** **B67c 3/26**

[58] **Field of Search** 137/223, 231; 141/17, 38, 141/349, 350, 383, 385, 382; 222/3, 5, 182, 538; 9/316

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Attorney, Agent, or Firm—H. Gibner Lehmann; K. Gibner Lehmann; E. Donald Mays

[57] **ABSTRACT**

A fitting adapted to be used with pressurized aerosol containers and the like, for enabling inflating gas or liquid to be supplied to tires and other inflatable articles. The fitting comprises a tubular, double-ended member with recesses or sockets respectively at its two ends. One end of the member can be applied to a pressurized container in a manner to actuate the valve thereof for effecting a discharge through the fitting. The other end of the member can be fitted to the valve stem of a tire or other inflatable articles, whereby the pressurized gas or liquid will transfer to the article and inflate the same. The fitting is provided with means at one of its ends, cooperable with the closure structure of the aerosol container for temporarily mounting the fitting on the container for shipping and storage purposes.

9 Claims, 11 Drawing Figures

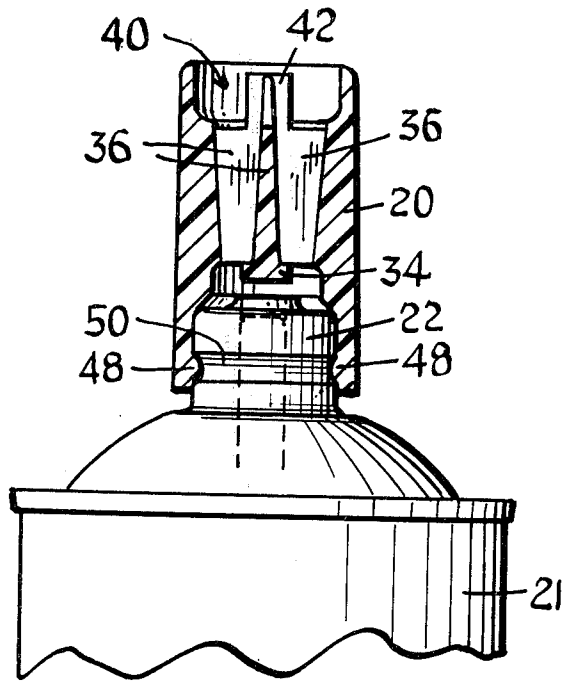


Fig. 1

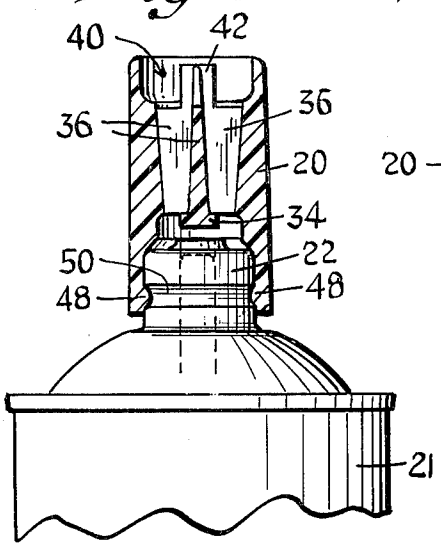


Fig. 3

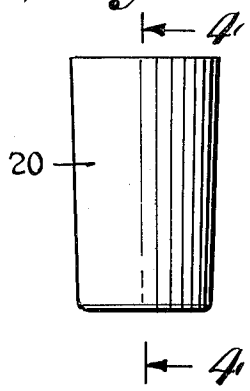


Fig. 4

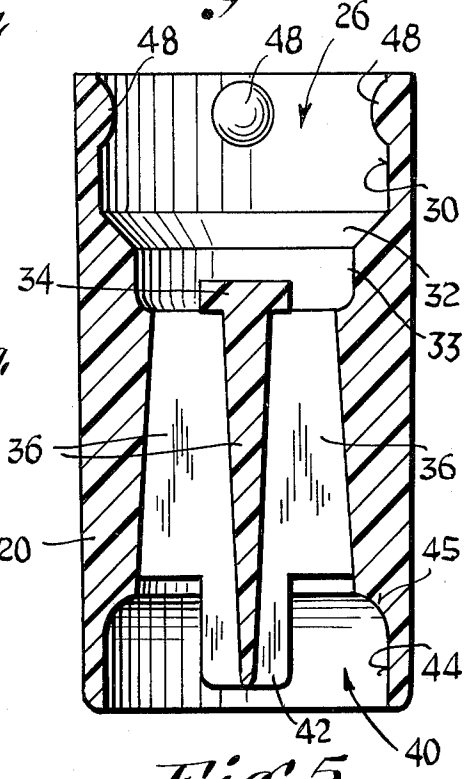


Fig. 2

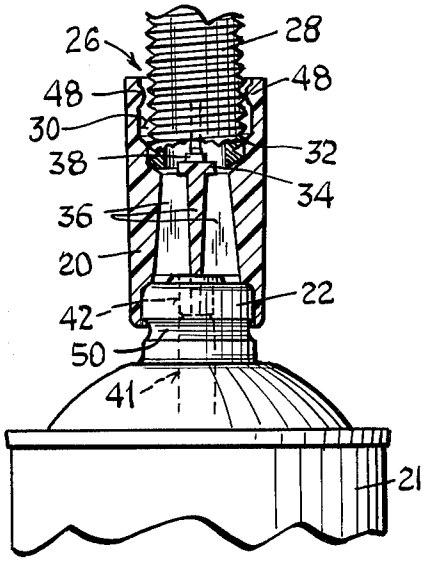


Fig. 5

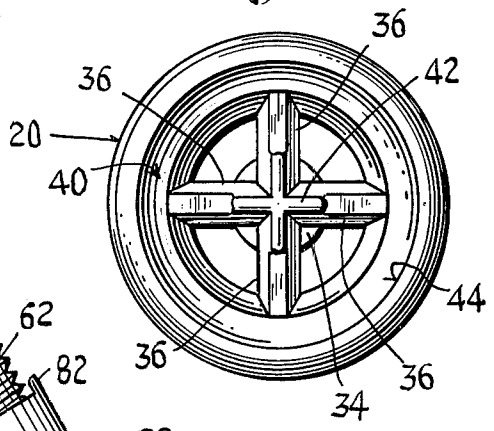
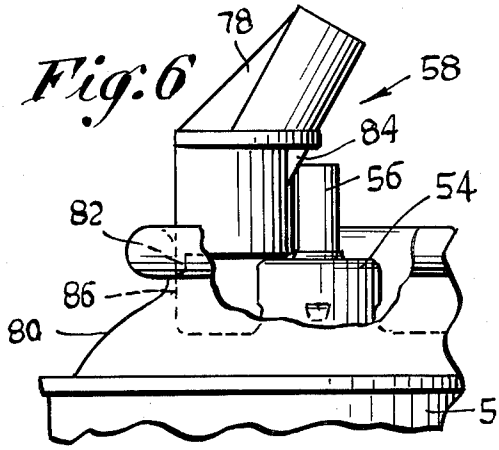


Fig. 6



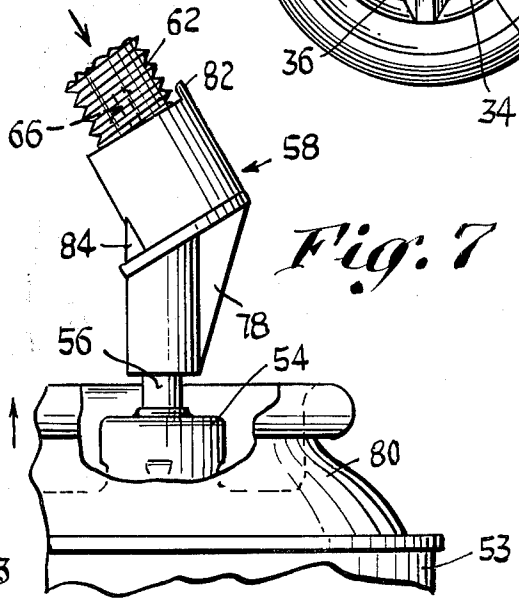


Fig. 7

Fig. 8

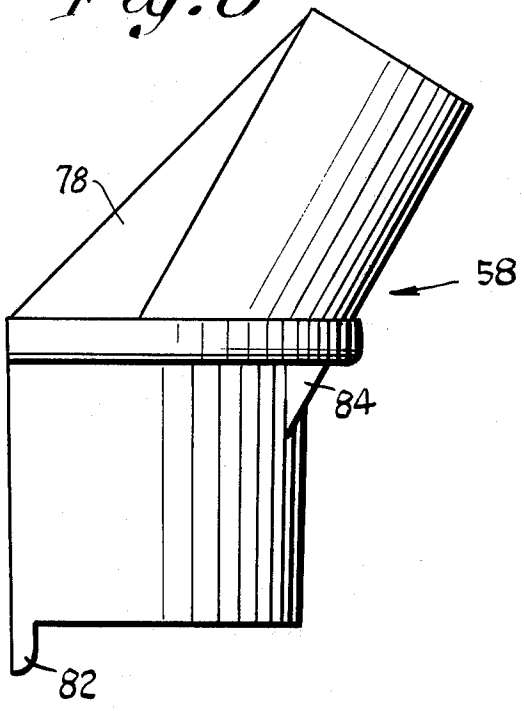


Fig. 9

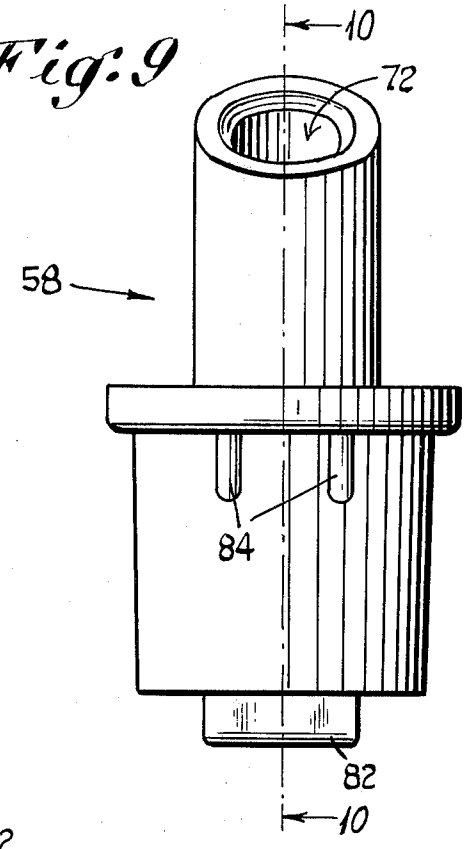


Fig. 11

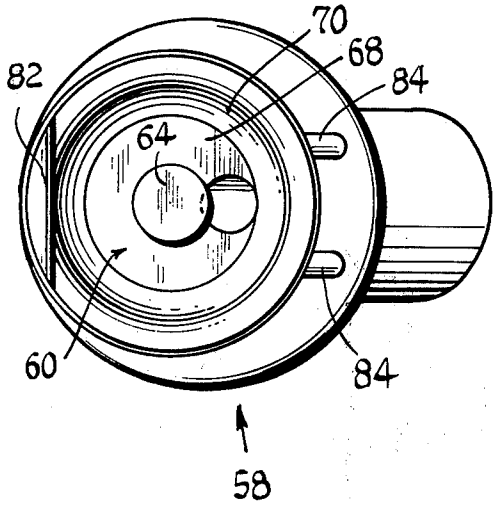
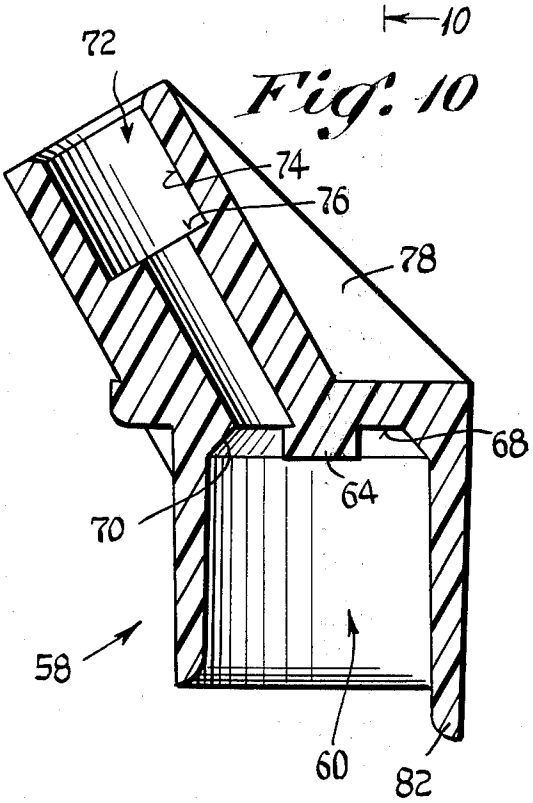


Fig. 10



ADAPTOR FITTING FOR BLOWING UP INFLATABLE DEVICES

BACKGROUND

This invention relates to actuator-inflator fittings or adaptors intended for use with pressurized gas or liquid thereof to be transferred to inflatable articles such as automobile tires, sporting equipment, etc. Heretofore, various types of adaptor devices have been proposed and produced for utilizing the pressurized gas of an aerosol container. These fittings have been especially constructed for the special purposes intended, and in most instances they were not practical for inflating articles such as automobile tires, bicycle tires, rubber and other inflatable goods like pontoons, swimming gear, etc. Moreover, the prior fittings were supplied loose from the container, and being small, often fell out of the box or package and became lost. In some cases the fittings were not sufficiently rugged to withstand the intended use, or else were so constructed as to be expensive and costly to manufacture.

SUMMARY

The above drawbacks and disadvantages of prior adaptor fittings intended for transferring pressurized gas or liquid from a small, hand-held container are obviated by the present invention, which has for one object the provision of a unique combined inflator-actuator fitting which is especially simple and economical in its construction and which is not likely to become lost since it can be stored on the pressurized container with which it is supplied. A related object of the invention is to provide an improved actuator fitting as above set forth, which is sturdy in its construction and reliable in operation under all conditions of use. A feature of the invention resides in the provision of an improved actuator fitting which is especially easy and convenient to use, without requiring any special skills on the part of the user.

Still other features and advantages will hereinafter appear;

In the accompanying drawings, illustrating several embodiments of the invention:

FIG. 1 is an axial sectional view of an inflator-actuator fitting as provided by the invention, shown mounted on a pressurized aerosol can for storage and shipping.

FIG. 2 is an axial sectional view of the fitting in reversed position on the pressurized can and also applied to the valve stem of an article which is to be inflated, this figure illustrating the operative position of the fitting.

FIG. 3 is a side elevational view of the fittings of FIGS. 1 and 2.

FIG. 4 is an axial sectional view of the fitting, taken on the line 4—4 of FIG. 3.

FIG. 5 is an end elevational view of the fitting, looking at the bottom of FIG. 4.

FIG. 6 is a side elevational view of an adaptor fitting mounted on a pressurized aerosol can, constituting another embodiment of the invention.

FIG. 7 is a side elevational view of the fitting of FIG. 6 shown in operative position on the aerosol can and also applied to a tire valve stem, as for the purpose of transferring pressurized gas or liquid from the can to the stem.

FIG. 8 is a side elevational view, enlarged, of the fitting of FIGS. 6 and 7.

FIG. 9 is a front elevational view of the fitting.

FIG. 10 is an axial sectional view of the fitting, taken on the line 10—10 of FIG. 9.

FIG. 11 is a bottom plan view of the fitting of FIGS. 6–10.

Referring first to the fitting shown in FIGS. 1–5, this is seen to comprise a tubular double-ended member 20 adapted for use with a pressurized aerosol can 21 having a valve retainer cup 22 of usual construction, in which there is mounted a female discharge valve (not shown) of ordinary type. The valve mounting cup 22 and its female discharge valve may be of a type illustrated and described in U.S. Pat. No. 2,900,114 issued Aug. 18, 1959 to E. J. Utz; or U.S. Pat. No. 3,074,601 issued Jan. 22, 1963 to C. O. Kuffer.

The fitting 20 is provided with means forming a recess 26 (FIG. 4) at one end to receive the valve stem 28 of an inflatable article (FIG. 2) such as an automobile or bicycle tire, or equipment used in connection with swimming, bathing, boating, etc. The recess 26 has a generally cylindrical interior wall 30 of a size to loosely, slidably receive the valve stem 28. Adjacent the bottom of the recess 26 there is a conical annular wall portion 32 which centralizes the valve stem 28 with respect to the fitting. Cylindrical wall 33 constitutes the sealing surface with valve stem 28. At its bottom there is provided in the recess 26 a stud 34 which is supported in the member 20 by a plurality of radially-disposed webs 36 located intermediate the ends of the member and in the bore thereof. The stud 34 is engageable with the usual valve pin 38 which is longitudinally movable in the valve stem 28 and functions to open and close the well known valve (not shown) disposed in said stem.

The fitting member 20 at its other end has means including a socket 40, which is engageable with the valve part 41 of the aerosol container mounting cup 22 to actuate said part for releasing pressurized gas or liquid from the container to the fitting. Such means comprises a ribbed protuberance 42 which is disposed in the socket 40 and is carried by the webs 36. The protuberance 42 preferably is constituted of downward extensions of centrally located portions of the webs. The socket 40 has an annular internal wall 44 adapted to closely slidably receive the valve mounting cup 22 of the aerosol container, as seen in FIG. 2. When the adaptor fitting is applied to the pressurized can, as in this figure, the protuberance 42 will extend into the valve mounting cup 22 and depress the valve part 41 contained therein, thereby opening the valve and enabling discharge of the pressurized gas of the container. Such discharging gas will be transferred to the stem 28 and its connected article during the transfer operation depicted in FIG. 2 wherein the stem is being held in the recess 26. A tight sealing fit is effected by the hollow concave portion 45 of the wall 44 of the socket 40 engaging the outer top periphery of the valve mounting cup 22 whereby leakage of gas is prevented at this juncture. Also, the pressure at the end of the valve stem 28 against the cylindrical wall surface 33 in the recess 26 results in a tight leakage-resistant fit between the adaptor fitting and the tire stem, minimizing the likelihood of gas leakage at this point.

In accordance with the present invention several detent nibs 48 are disposed in the recess 26 and adapted

to be received in an annular groove **50** of the valve mounting cup **22** when the fitting is reversed from the operative position of FIG. **2** and applied to the mounting cup as illustrated in FIG. **1.** The nibs **48** are so arranged that they can be forced past the outer periphery of the cup **22** and into the annular groove **50** so as to constitute yieldable detents for retaining the fitting in the storage position shown in FIG. **1.** Alternately, in place of the groove **50,** the mounting cup **22** could be provided with multiple depressions or indentations (not shown) to receive the detent nibs **48** respectively, and retain the fitting **20** on the cup in the position of FIG. **1.**

Another embodiment of the invention is illustrated in FIGS. **6–11.** This embodiment is intended for use with aerosol containers having a valve construction characterized by a projecting valve stem, such as the valve shown in U.S. Pat. No. 3,559,851 issued Feb. 2, 1971 to Wolf Steiman. As shown, the aerosol container **53** has a valve mounting cup **54** from which there protrudes the usual depressible valve stem **56.** As provided by the invention, there is an adaptor fitting for cooperation with the stem **56,** comprising a tubular double-ended member **58** having means at one end providing a recess **60** to receive the valve stem **62** of the article which is to be inflated. In the recess **60** there is a low, flat stud **64** adapted to depress the usual valve pin **66** carried in the stem **62.** The recess **60** has an end wall **68** adapted for engagement with the circular rim of the stem **62** to effect a seal therewith. Optionally the end wall **68** includes a conical portion **70** along its outer periphery, by which the stem **62** is centralized and also sealingly engaged for preventing leakage of gas.

The fitting **58** at its other end includes a socket **72** which is engageable with and adapted to receive the valve stem **56** of the aerosol can. The socket **72** has a cylindrical inside wall **74,** and has a bottom wall **76** for sealing engagement with the valve stem **56** whereby leakage of gas is minimized at this juncture. To reinforce the fitting **58** there is provided a sloping rib **78** extending from that end of the fitting having the socket **72,** to a point intermediate its ends.

It will now be understood that when the fitting **58** is placed on the valve stem **56** of the aerosol can and pressed over the valve stem **62** of the article which is to be inflated, with suitable pressures applied as indicated by the arrows in FIG. **7,** the stem **56** will be depressed, enabling discharge of gas under pressure to the fitting, and the valve pin of the stem **62** also depressed whereby such pressurized gas will be transmitted to the article for inflating the same.

In accordance with the present invention, the fitting **58** is provided with means for reliably, frictionally mounting it on the usual closure cup **80** of an aerosol can. Such means comprises a tab extension **82** provided on one end of the fitting adjacent the recess **60,** and further comprises a pair of ribs **84** provided on the exterior of the fitting intermediate its ends, such ribs functioning to position between them the valve stem **56** of the aerosol can. The tab extension **82** is adapted to engage the inner annular surface **86** of the closure cup when the ribs **84** straddle the valve stem **56,** all as illustrated in FIG. **6.** By such organization the adaptor **58** can be mounted on the aerosol container or can for storage and shipping, and during other periods of non-use, whereby it will not easily become dislodged or lost. In FIG. **6** it is seen that one portion of the adaptor **58** (the cylindrical side wall) engages the stem **56** for support. Another portion (the rim) engages the valve mounting cup **54.** It is intended by the present invention that either engagement, by itself, together with the frictional engagement of the tab extension **82** with the annular surface **86** of the closure cup **80,** could lend adequate support to the adaptor **58** when the latter is disposed in the non-use position of FIG. **6.**

It will now be seen from the foregoing that I have provided novel and improved adaptor fittings for enabling pressurized aerosol cans to be utilized for the purpose of injecting an inflating gas or liquid in inflatable objects such as tires, sporting equipment and the like. The fittings illustrated are seen to be especially simple, and can be quickly, economically fabricated by molding them of suitable plastic substance. If the plastic material is somewhat yieldable, as for example, low density polyethylene, and with the choice of proper dimensions, the fitting can be easily and conveniently put into use without the likelihood of excessive leakage of gas.

Variations and modifications are possible without departing from the spirit of the invention.

I claim:

1. A compressed gas device for inflating tires and other inflatable articles, comprising in combination:

a. a pressurized aerosol container having a valve-mounting cup and a depressible valve part carried by said cup;

b. a combined actuator-inflator fitting for transferring pressurized gas from the container to the article to be inflated;

c. said fitting comprising a tubular, double-ended member;

d. means providing a recess at one end of said tubular member to receive a valve stem, having a valve pin therein, of the inflatable article;

e. means including a socket at the other end of said tubular member engageable with the valve part of the aerosol container;

f. at least one radially extending, integrally formed web member positioned within said tubular member intermediate said recess and said socket;

g. imperforate extension means projecting axially from each end of said web member, one of said extension means adapted to engage said valve stem, the other of said extension means adapted to engage said valve part to actuate the same for releasing pressurized gas from the container to the fitting; and

h. cooperable means on the fitting and valve mounting cup for releasably frictionally mounting the fitting on the cup in an inoperative position when the fitting is not in use.

2. An inflating device as in claim **1** wherein:

a. the pressurized container has a female-type discharge valve, and

b. said tubular member having four webs disposed in its bore at approximately ninety degrees to each other.

3. An inflating device as in claim **2,** wherein:

a. the fitting comprises an essentially straight tube,

b. said extension means which is engageable with the valve pin comprising a stud carried by said webs.

4. An inflating device as in claim **1,** wherein:

a. said cooperable means on the fitting comprises wall portions of the recess at one end of the double-ended member.

5. An inflating device as in claim 4, wherein:

a. said cooperable means on the fitting comprises an internal projection on the inner wall of said recess, adapted for engagement with a spun-in portion of the valve-retainer cup of the container.

6. An inflating device as in claim 1, wherein:

a. said cooperable mounting means comprises a detent nib in said recess,

b. said mounting cup having a depression adapted to receive and to be engaged by said nib when the fitting is mounted in said inoperative position.

7. A compressed gas device for inflating tires and other inflatable articles, comprising in combination:

a. a pressurized aerosol container having a valve-mounting cup and a depressible male type discharge valve part carried by said cup;

b. a combined actuator-inflator fitting for transferring pressurized gas from the container to the article to be inflated;

c. said fitting comprising an angular-shaped, tubular double-ended member;

d. means providing a recess at one end of said tubular member to receive a valve stem, having a valve pin therein, of the inflatable article;

e. means including a socket at the other end of said tubular member engageable with the valve part of the aerosol container in a frictional pit;

f. a perforate, transverse end wall being provided within said angular-shaped, tubular member at the end of said recess;

g. axially aligned projecting means on said end wall adapted to engage said valve part to actuate the same for releasing pressurized gas from the container to the fitting;

h. a projecting tab at the recess end of the fitting for engagement with an inwardly facing annular wall provided on the container for frictionally mounting the fitting on the valve mounting cup in an inoperative position when the fitting is not in use; and

i. external positioning means intermediate the ends of the fitting for engagement with the actuator stem of the container valve in said inoperative position.

8. An inflating device as in claim 7, wherein:

a. the positioner means comprises ribs adapted to engage opposite side portions of said actuator stem.

9. An inflating device as in claim 7, wherein:

a. said projecting tab has a curved wall engageable with the annular wall of the container.

* * * * *