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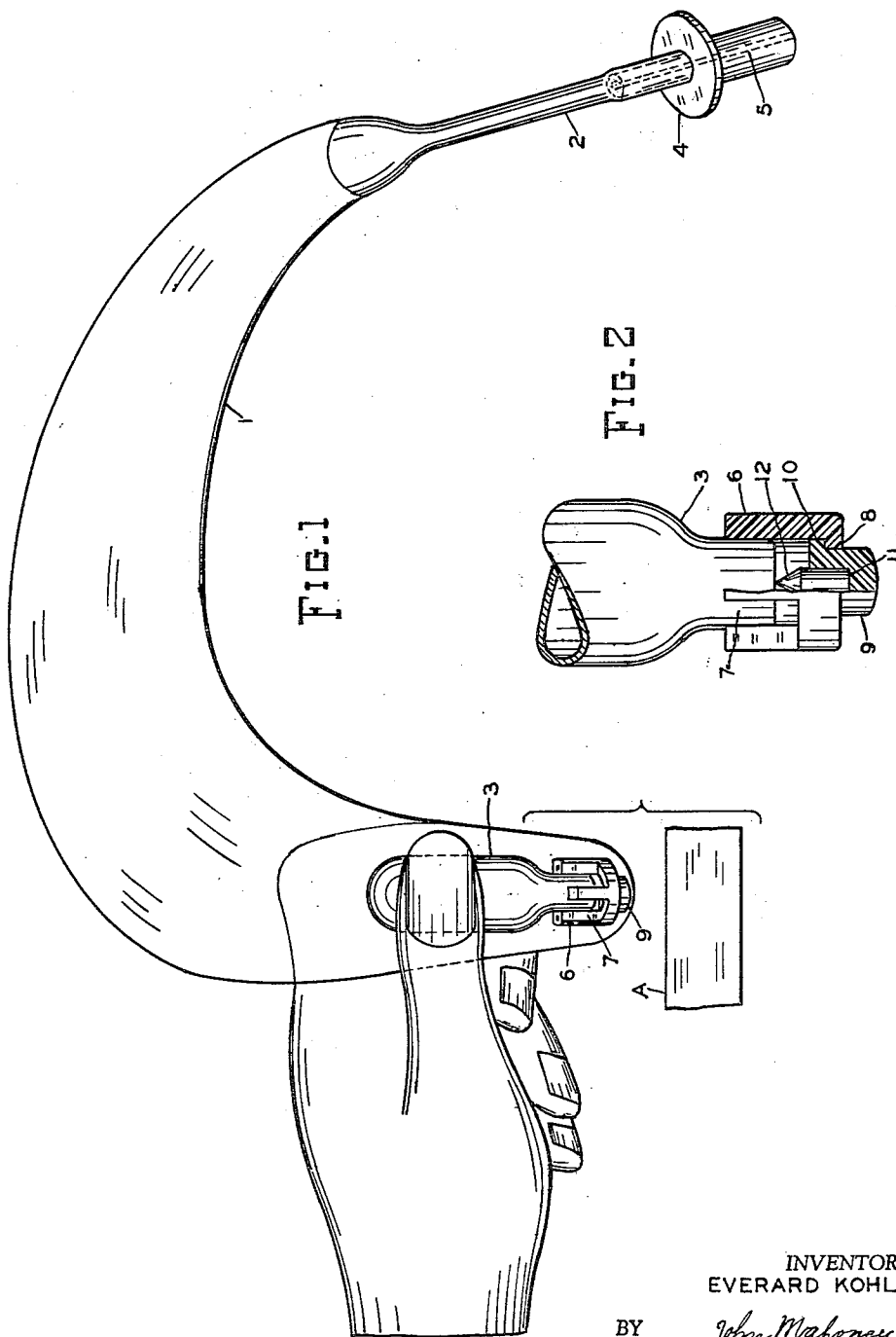
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APPARATUS FOR PROVIDING GASES AT A DESIRED PRESSURE

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2 Sheets-Sheet 1



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APPARATUS FOR PROVIDING GASES AT A DESIRED PRESSURE

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The present invention relates to an improved apparatus or kit for providing a gas at a desired pressure.

At the present time, canisters are provided that may be punctured to release a gas which is confined under pressure within the canister. When the canister is punctured, however, the gas being under pressure issues from the canister at high velocity and consequently means must be provided to impede the flow of the gas to a rate at which it may be efficiently utilized. To prevent loss of gas when the canister is punctured and means are applied thereto for dispensing the gas, it is also necessary to provide a gasket or sealing means to maintain a tight seal between the dispensing means and the canister and when the dispensing means is provided with a nipple which is to be inserted in the mouth or nose of a patient to administer a gas, such as oxygen, means must be provided to maintain the dispensing means in a sterile condition until used. When such kits are utilized in emergencies, such as to provide oxygen in the case of a heart or asthma attack, it is therefore the practice to dispose of the kit after use. To enable apparatus or kits of this type to be extensively utilized, they must therefore be constructed or assembled of readily available materials in a simple manner so that the kit may be sold at a low price.

It is the aim of the present invention to provide an apparatus or kit in which a canister or flask having a gas under pressure is arranged within a flexible bag and in which means associated with the canister or flask is provided whereby the canister may be punctured by a force applied through the bag to release the gas within the bag to thereby reduce its pressure so that it may be dispensed at the desired rate. The gas which is maintained under pressure within the canister may be of a type which is needed in an emergency, such as oxygen, which may be required in the event of a heart or asthma attack, or it may be a gas having anesthetic properties for use in surgery, such as nitrous oxide, or the canister may contain a gas under pressure, such as carbon monoxide or sulphur dioxide, which may be utilized as a fumigant for the extermination of insects, such as moths.

It is therefore an object of the present invention to provide an improved apparatus or kit including a flexible bag having an outlet opening, a canister or flask arranged within the bag, and means associated with the canister by means of which the canister may be punctured by a force applied through the bag.

Another object of the invention is to provide an improved kit or apparatus including a flexible bag, a canister arranged within the bag, and penetrating means associated with the canister which may be actuated by a force applied through the bag to puncture the canister to release the gas through the bag.

A still further object of the invention is to provide an improved kit or apparatus including a flexible bag, a canister or flask arranged within the bag containing a gas under pressure, and a movable actuating button or plunger associated with the canister having an outer exposed surface and penetrating means on its inner face for engaging one end of the canister so that when a portion of the flexible bag is pressed around the canister, the canister, together with the portion of the bag in contact therewith, may be held in one hand and the end of

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the canister provided with the actuating button may be struck against or with a hard object to move the actuating button inwardly to cause its penetrating means to puncture the canister to release the gas within the bag.

My invention will be better understood by reference to the accompanying drawings in which:

FIG. 1 is a side elevational view of one form of my improved kit showing a canister containing a gas under pressure arranged within a flexible bag and in which the canister is provided with puncturing means to release a gas under pressure within the bag;

FIG. 2 is an enlarged detail view, partly in elevation and partly in section, of one end portion of the canister showing a cap thereon and an actuating button associated therewith having an outer surface and penetrating means embedded in its inner face by means of which one end of the canister may be punctured to release the gas when the actuating button is struck against a hard surface;

FIG. 3 is a side elevational view of a modification of my improved kit or apparatus, showing a pair of canisters arranged within a flexible bag, each of which is provided with a cap having penetrating means associated therewith for puncturing the canister; and

FIG. 4 is an enlarged cross sectional view taken on a plane passing through the line 4—4 of FIG. 3 and looking in the direction of the arrows.

As shown in FIG. 1 of the drawings, a bag 1 is provided which may be formed of any suitable flexible material which is substantially impervious to gases. The bag is preferably formed of a flexible material that is transparent or at least translucent to enable a canister arranged within the bag to be readily located although this is not essential because the canister may be located by applying the hand over the lower portion of the bag even when the bag is opaque.

As illustrated in FIG. 1, the bag is formed of an elastic flexible material, such as rubber which is substantially transparent or translucent and which expands under the pressure of the released gas when the canister is punctured. As shown, the bag is provided with a restricted portion 2 which may be expanded sufficiently to enable a canister 3 containing a gas under pressure to be inserted within the bag and the restricted portion 2 is provided with an outlet opening within which a nipple 4 may be inserted having a restricted opening 5 therein. The bag must of course be of sufficient size and strength to resist the pressure of the gas formed therein. Usually the bag will be of sufficient size so that when the gas in the canister is released, the bag will be expanded and the gas will be above atmospheric pressure but materially below that in which the gas was confined within the canister. In the event that the canister contains a fumigant, the bag with the punctured canister therein may be hung in a closet for exterminating insects, such as moths, and the opening 5 may be restricted to such an extent that the gas will issue from the bag at a comparatively slow rate.

As previously stated, means associated with one end of the canister is provided whereby the canister may be easily punctured by a force exerted through the bag and while any convenient means may be provided for this purpose, as shown in FIG. 2, the canister is provided with a cap 6 having an annular portion which frictionally engages the reduced end portion of the canister and to enable the gas to escape after the canister is punctured, the annular portion of cap 6 is provided with spaced slots or openings 7. The cap may be formed of any suitable material, such as metal, rubber, or a plastic material.

Cap 6 extends beyond the end of the canister and means formed integral with the cap or associated therewith in any desired manner is provided to puncture the canister when the outer face of the puncturing means

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is struck or impinged against a hard surface. For instance, the penetrating means may be formed integral with or secured to the inner face of the cap and the entire cap may be pressed inwardly to a sufficient extent to cause its penetrating means to puncture the canister. As shown, cap 6 which is formed of a plastic material is provided with an inwardly extending annular flange 8 and a plunger or actuating button 9 which is also formed of a plastic material, is inserted within the cap and is retained in place by an outwardly extending flange 10 extending beneath the inwardly extending flange 8 of the cap. As shown, the actuating button or plunger 9 is slidable relative to the cap and has a metal insert 11 embedded therein which terminates in a penetrating point 12 that is in engagement with the restricted end portion of the canister.

In utilizing the kit shown in FIG. 1, the canister is grasped through the flexible bag with one hand and the canister is quickly moved to impinge the actuating button or plunger 9 by impact against a comparatively hard surface, such as a desk or table as designated by the letter A in FIG. 1 of the drawing, to force the actuating button inwardly to puncture the canister, or while the canister is held in one hand, the actuating button or plunger 9 may be struck with a golf club or a hammer to move it inwardly to puncture the canister. The force of the compressed gas within the canister then moves the actuating button outwardly and the gas flows through the slots 7 in cap 6 and expands the bag, thereby materially reducing the pressure of the gas. The gas may then be inhaled or will flow through the restricted outlet 5 at a low rate as the resilient bag collapses to assume its normal shape.

Another modification of my invention is shown in FIG. 3 of the drawings in which a pair of canisters 3a and 3b are arranged within a bag 13 although it will of course be understood that the bag may contain only a single canister. In this modification, a plastic holder 14 may be provided which if desired may be cemented to the bag by a plastic strip 14a and the enlarged ends of the canisters may be inserted within the holder with a portion of each canister extending outwardly from the holder and the bottom and side margins of the bag may be sealed together and the top edges which are integral with each other may be provided with an opening, to the edges of which is sealed the flap of a flexible outlet tube 15. When the bag is formed of a plastic material, such as polyethylene, the sealing may be easily effected by heat and pressure.

The tube 15 may be formed of rubber or a yieldable plastic material and is preferably provided with a control valve which may be of any suitable type. As shown, a collar 16 is provided having a threaded extension projecting therefrom and a movable arcuate-shaped insert 17 is arranged within the collar which is connected to the threaded shank 18 of a small bolt or screw having a knurled head 19 thereon so that when the bolt is threaded inwardly through the extension on the collar, it moves insert 17 inwardly to compress tube 15 as shown in dotted lines to restrict the opening and when the bolt is threaded outwardly, the pressure of insert 17 upon tube 15 is released to enlarge the opening through the tube. A nose or mouth piece 4 having a small opening 5 therein may be inserted within the outer end portion of tube 15 through which the gas may be inhaled.

In utilizing the kit disclosed in FIG. 3, a canister 3a may be first grasped through the flexible bag with one hand and the actuating button or plunger 9 struck against a hard object or the actuating button may be hit with a golf club or hammer to puncture the canister and release the gas which inflates the bag and the rate at which the gas flows through the tube 15 may be regulated by the inward and outward movement of insert 17. When the bag is formed of a material which is not resilient to any appreciable extent, the bottom portion of the bag may

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be grasped with one hand which hand may be moved upwardly around the bag to force the gas therefrom. If additional gas is required, canister 3b may be grasped with one hand and punctured in a similar manner to provide additional gas under pressure, the flow of which may be regulated and forced outwardly in the manner described.

Because in each of the modifications, the canister or canisters are small and the bag is flexible, the bag may be wrapped around a canister or a pair of canisters to provide a comparatively small kit which may be inserted in an outer container, such as a bag or box, not shown, which may be sealed to maintain the kit in a sterile condition prior to use and because the kit may be constructed in a simple manner from readily available material and sold at a low price, it may be disposed of without much expense when the released gas has been inhaled. When the kit is used to provide a fumigant, an additional canister may of course be placed in the bag at desired intervals and punctured to release the gas in the manner described.

What is claimed is:

1. Gas providing apparatus comprising, in combination, a flexible bag having an outlet opening, a canister arranged within said bag, said canister containing a gas under pressure and having a penetrable end portion, means arranged within the bag for penetrating the penetrable end portion of said canister to release the gas therefrom, said means including an actuating button associated with the penetrable end portion of the canister and having inner and outer faces, penetrating means secured to the actuating button and having a pointed end extending toward the penetrable end portion of the canister from the inner face of said actuating button, means for normally holding said actuating button and penetrating means in such relation to said canister that the pointed end of said penetrating means is substantially in engagement with the penetrable end portion of said canister, said canister being engageable by the hand of an operator through said bag and being freely movable by the operator within said bag to a position in which the outer face of the actuating button engages the inner face of a portion of said bag so that a quick impact blow may be applied to the outer face of that portion of the bag which is opposite to the outer face of the actuating button to transmit sufficient force through the bag against said actuating button to move the pointed end of said penetrating means into the penetrable end portion of the canister while the canister is being held through the bag by the hand of the operator, and means including the force of the gas issuing from said canister immediately after it has been punctured for automatically moving the actuating button to its normal position to enable gas to be released from said canister after the canister is released from the hand of the operator.

2. Gas providing apparatus comprising, in combination, a flexible bag provided with a flexible outlet tube, a canister arranged within said bag, said canister containing a gas under pressure and having a penetrable end portion, means arranged within the bag for penetrating the penetrable end portion of said canister to release the gas therefrom, said means including an actuating button associated with the penetrable end portion of the canister and having inner and outer faces, penetrating means secured to the actuating button and having a pointed end extending toward the penetrable end portion of the canister from said actuating button, means for normally holding said actuating button and penetrating means in such relation to said canister that the pointed end of said penetrating means is substantially in engagement with the penetrable end portion of said canister, said canister being engageable by the hand of the operator through said bag and being freely movable by the operator within said bag to a position in which the outer face of the actuating button engages the inner face of a portion of said bag so that a quick impact blow may be applied to the outer face of that portion of the bag which is opposite to the outer

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face of the actuating button to transmit sufficient force through the bag against said actuating button to move the pointed end of said penetrating means into the penetrable end of the canister while the canister is being held through the bag by the hand of the operator, means including the force of the gas issuing from said canister immediately after it has been punctured and the hand of the operator is removed for automatically moving the actuating button to its normal position to enable gas to be released from said canister, means associated with said tube which is movable inwardly into engagement with the tube to restrict the flow of gas through the tube and outwardly relative to the tube to permit an increased flow of gas through the tube, and said bag being sufficiently flexible so that it may be compressed by the hand of the operator to force all the gas outwardly through said tube when said restrictive means is at least partly released from said tube.

References Cited in the file of this patent

UNITED STATES PATENTS

642,057 Von Walcher-Uysdal et al. Jan. 23, 1900

1,230,290
1,449,047
1,921,452
2,324,744
2,428,425
2,533,446
2,577,045
2,580,639
2,631,757
2,641,253
2,784,791
2,786,599
2,919,833
2,970,326
6,550
5,687
364,980
803,675

6

Geiger June 19, 1917
Johnson Mar. 20, 1923
Bronander Aug. 8, 1933
Ward July 20, 1943
Levitt Oct. 7, 1947
Fisher Dec. 12, 1950
Stout Dec. 4, 1951
Baker June 1, 1952
Alexander Mar. 17, 1953
Engelder June 9, 1953
Austin Mar. 12, 1957
Higbee Mar. 26, 1957
Wolshin Jan. 5, 1960
Keefe Feb. 7, 1961

FOREIGN PATENTS

Great Britain of 1894
Great Britain of 1904
Italy Nov. 19, 1938
Great Britain Oct. 29, 1958