

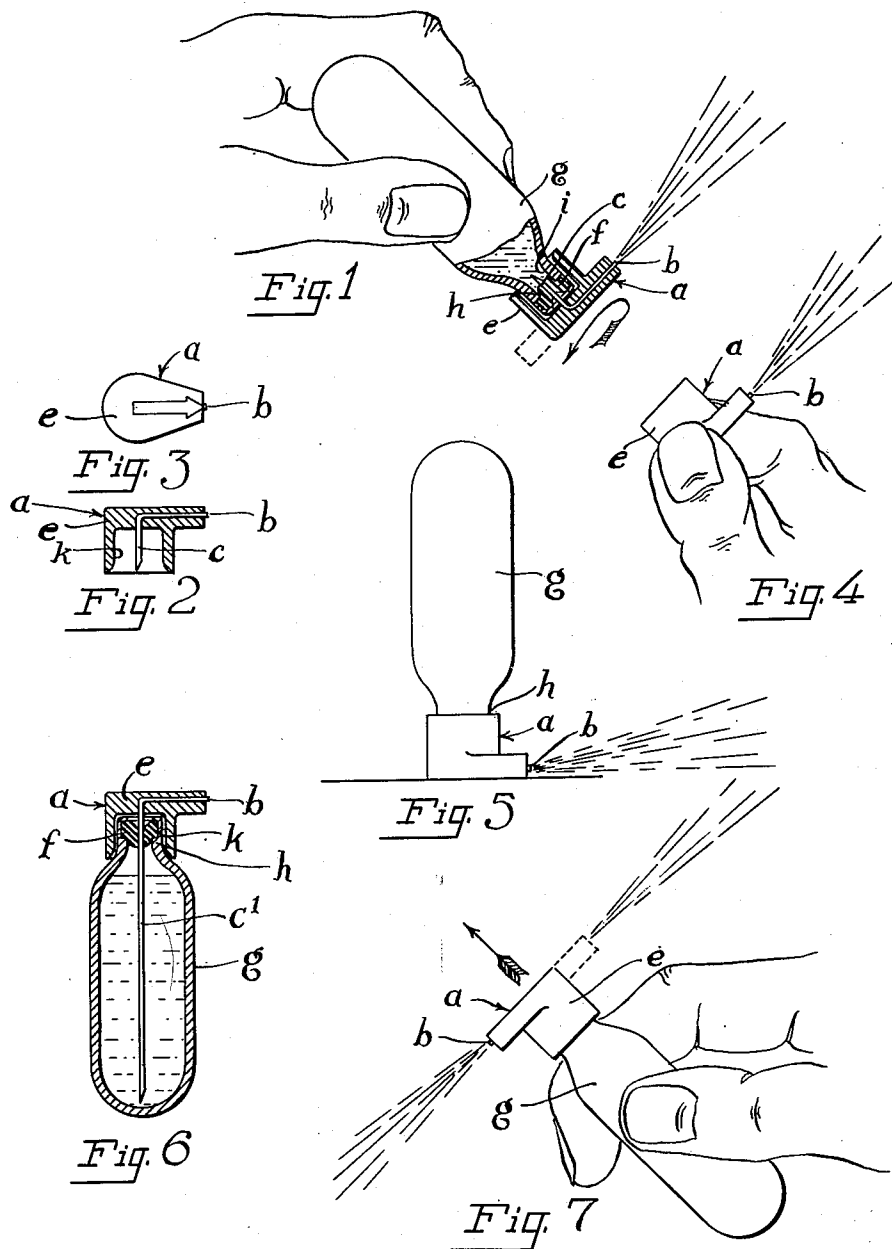
March 17, 1953

P. ALEXANDER
DISPENSING DEVICE

2,631,757

Filed March 22, 1946

2 SHEETS—SHEET 1



Philip Alexander
INVENTOR

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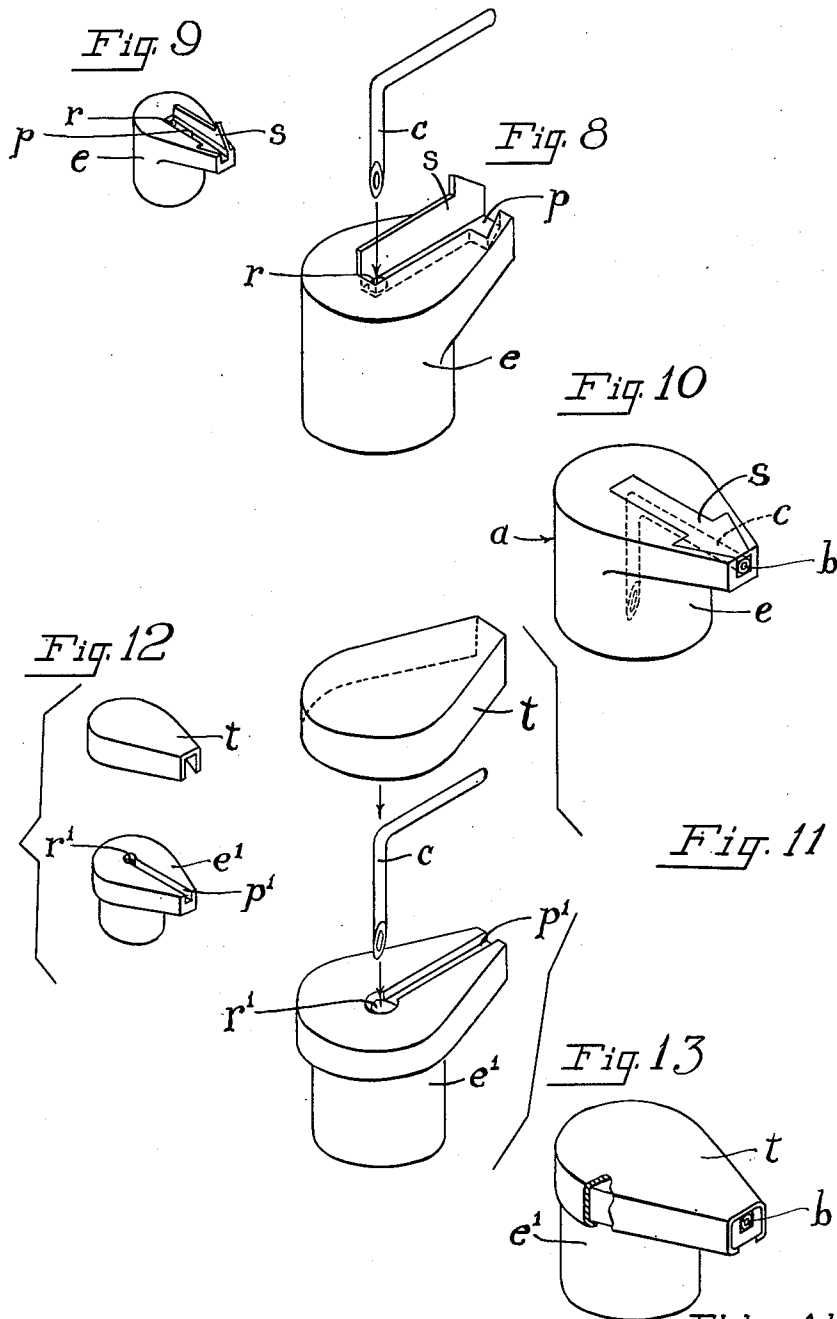
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2 SHEETS—SHEET 2



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DISPENSING DEVICE

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Application March 22, 1946, Serial No. 656,235

2 Claims. (Cl. 222-82)

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The present invention relates to the dispensing of liquid chemicals or gases under pressure, and more particularly to a device for spraying, atomizing or dispensing the liquids from an enclosed vessel.

Many products, such, for example, as perfumes, lubricating oils, lacquers, medicaments, fumigants, and insecticides, are marketed in liquid form, to be used in an atomizer or spray device. These may be sold in small containers or capsules, in which the liquid is sealed together with a compressed gas which acts as a propellant when the container is pierced. Even when purchased in quite small containers, it is often desired to use only a portion of the contents at one time, due to the qualities of the particular liquid and uses to which it is to be put. It is a purpose of the present invention to provide a dispenser for use with such containers, and particularly for use with a sealed container such as is described in my copending application Serial No. 656,234, now Patent No. 2,601,938, filed March 22, 1946, and of even date herewith. With such a container and a dispensing device according to the present invention, products so packaged may be inexpensively marketed and dispensed in convenient small quantities and with a maximum of convenience and economy for the purchaser, who may use any part of the contents of the container at a time, without wasting the remainder.

An object of this invention is the provision of a piercing and dispensing unit having a tubular piercing pin of such inside diameter as to provide the desired atomization or spraying qualities, depending upon the viscosity of the fluid to be dispensed and the pressure of the propellant within the container.

A further object is the provision of a simple, efficient dispensing device that is inexpensive to manufacture and small in size and which may be reused a number of times, with the same or a plurality of containers.

Still another object is to provide a dispensing device that is simple and positive in operation and small in size for easy handling, whereby a large variety of liquid products may be sprayed, atomized or discharged in the desired quantities, with a minimum of effort.

With these and other objects in view, as may appear from the following specification, the invention consists of various features of construction, and arrangements and combinations of parts, as described in connection with the accompanying drawings, illustrating a dispensing device embodying the invention in a preferred

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form, the features forming the invention being more specifically pointed out in the claims.

In the drawings:

Figure 1 is a view partly in section and partly in elevation of a dispensing device embodying the features of the present invention, and showing the manner of using the same;

Figure 2 is a cross section through a dispensing device embodying the features of the present invention;

Figure 3 is a top plan view of the dispensing device shown in Figure 2;

Figure 4 is a view showing the dispensing device held in position for inserting the same in the container of Figure 1;

Figure 5 is a side view of a container and dispensing device in inverted position;

Figure 6 is a cross-section through a modified form of the invention;

Figure 7 is a view of the device in operation;

Figure 8 is a perspective view illustrating the method of assembly;

Figure 9 is a perspective view of the body portion of my dispensing device;

Figure 10 is a perspective view showing the assembled device;

Figure 11 is a perspective view, similar to Figure 8, and showing a modified form of the device;

Figure 12 is a perspective view of the body portion of the device of Figure 11, before assembly; and

Figure 13 is a view showing the assembled device of Figure 11.

Referring more particularly to the drawings, the dispensing device of this invention is shown associated with a container *g* filled with a liquid chemical or gas under pressure. This container may be of any desired type, shape or size but preferably embodies a sealing plug or element *f* of the type described in my copending application of even date herewith. The container *g* has a cylindrical neck *h* formed thereon having a cylindrical opening *i* in which the sealing element *f* is located, as fully described in the above mentioned application.

The dispensing device *a* consists of a metal or plastic housing *e*, substantially cylindrical in shape and carrying a tubular piercing pin *c* at its center, the pin *c* being of such internal diameter as to secure the desired particle size, atomization, spray or dispensing quality when used in connection with the particular liquid or chemical under the predetermined pressures within the container *g*.

The housing or body *e*, substantially cylindrical

in shape, has a recess *k* formed in one end thereof adapted to fit neatly over the mouth of neck *h* of the container *g*, when the device is to be used.

The tubular piercing pin or needle *c* is chamfered at its lower end to provide a sharp edge for the purpose of piercing the plastic sealing plug or member *f* located in the opening of the container *g*. The tube *c* is bent into a right angle so as to direct the spray from its discharge or nozzle end at right angles to the axis of the container *g* and housing *e*. This arrangement permits the spray or discharge to be directed either upward or downward, as illustrated in Figure 7, while keeping the end of the tube *c*, within the container, immersed in the contents.

The neck *h* of the container *g* is placed within the recess *k* of the housing *e*, which recess acts as a guide and locates the tubular piercing pin *c* in the center of the sealing plug *f*. When the tubular piercing pin *c* has completely passed through the sealing plug *f*, the opening in the end of the piercing pin is exposed to the fluid contents of the container and, since the contents are under pressure, the liquid is forced through the tubular pin *c* and released through the orifice *b* at its outer end into the air.

By revolving either the container *g*, or the housing *e* upon the container *g*, it is possible to direct the spray or discharge either upward or downward (see Figure 1). By removal of the piercing pin and dispensing unit, as illustrated in Figure 4, the puncture in sealing plug *f*, which plug is self-sealing, is closed and the discharge immediately ceases. The remaining chemicals and fluid within the container are kept intact until the piercing and dispensing unit is reinserted.

Figure 5 shows a container *g* and dispensing unit in operative condition, standing in an inverted position, unassisted, as may be desirable when dispensing fumigants, vermicides, insecticides, etc.

By reason of the short tubular pin *c* employed in the form of dispensing device illustrated in Figures 1 and 2, it is necessary to hold the container *g* in an inverted position when using it. In cases where it is desired to use the device in an upright position, an extended tubular pin *c'* may be used, as illustrated in Figure 6. The pin *c'* pierces the sealing element *f* and extends to the bottom of the container *g*. Inasmuch as the propellant pressure is on top of the liquid, the liquid is forced upward through the tubular pin *c'* and is exhausted through the orifice *b*. The manner of using this form of the device is shown in Figure 7. Where preferred, a straight tube may be utilized, and in this case the spray will be directed along the axis of the container, indicated by the arrow of Figure 7.

With reference to the construction of the piercing and dispensing unit *a* described above, Figure 8 illustrates a housing body *e*, of metal or plastic, provided with a channel or groove *p* formed in its upper surface for receiving the right angle portion of the tubular piercing pin *c*. This channel *p* communicates at its inner end with the interior of the body *e* and recess *k* therein by a bore *r*, through which the pin *c* is inserted. The bore *r* is located on the axis of the body of the housing *e* and recess *k*, centering the pin *c* therein.

Integral with the housing *e* is a raised section *s*, which is folded into the channel *p* over the tube *c* after the latter has been inserted through the bore *r* and into the channel *p*, securely lock-

ing the tube *c* in position. Section *s* may be secured in position in various ways, but a driven or compressed fit within the channel *p* will ordinarily suffice to hold it securely. The projection *s* may be so shaped as to form the design of an arrow or pointer indicating the position of the discharge orifice *b*, as illustrated.

As stated above, the bore *r* is centered within the housing *e* and its recess *k* so that after assembly of the device, when the housing is slipped over the neck *h* of the container *g*, the tubular pin *c* will pierce the center of the sealing element *f*. Furthermore, when such a dispensing device has been withdrawn from a container before the contents thereof are exhausted, and it is desired to use the remainder, the piercing pin *c*, guided by the recess *k* in the housing *e*, will pierce the sealing element *f* at the same point as the original puncture, avoiding a multiplicity of punctures therein with possible consequent weakening of the sealing element. It is to be understood, of course, that when the longer tubular pin, illustrated in Figure 6, is employed, this centering action of the recess is not possible. In such case, however, the puncture point may be located by eye. In most cases, the preferred form embodying the shorter pin *c*, illustrated in Figure 2, will be used, such pin being only long enough to pierce the sealing plug completely and to expose its opening to the contents of the container. The pin does not extend beyond the walls of the recess *k*, and further advantage of this preferred form is the complete protection of the tubular pin by the walls of the housing *e* when the dispensing device is not attached to a container, preventing bending, crushing or breaking of the pin.

A modification of the above structure is illustrated in Figures 11, 12 and 13, wherein a two-piece housing is provided. In Figure 11 is shown a metal or plastic body *e'* of substantially the same shape and configuration as the body *e* of the previous form, having a bore *r'* at its axis and a channel *p'* extending radially therefrom to receive the angle portion of the tubular piercing pin. A metal or plastic cover plate *t* is provided, shaped to conform to the configuration of the top of the body *e'* and having downturned edges formed thereon which fit snugly against the sides of the body. The tubular pin *c* having been inserted through the bore *r'* and into the channel *p'*, the cover plate *t* is fitted over the body *e'* and the downwardly extending edges thereof are crimped or turned in against the body *e'*, as shown in Figure 14, to hold the plate *t* thereon. The plate *t* thereby provides a secure means for holding the tubular pin *c* in position within the body *e'* and at the same time provides a free discharge orifice *b'*, at the upper termination of the pin *c*.

I claim:

1. A piercing and dispensing device comprising a body portion, a cylindrical recess therein, a bore through said body portion in line with the axis of said recess, a channel in the surface of said body portion at right angles to said bore, a tubular piercing pin having an angle therein extending through said bore and said channel, a discharge orifice in the end of said pin at the end of said channel opposite the bore, said pin extending downwardly beyond said bore within said recess, and the said body being fastened together so that the body forms a handle for holding a container neck within the cylindrical

recess for manipulating the piercing pin with relation to the container.

2. A piercing and dispensing device comprising a body portion, a cylindrical recess therein, a bore through said body portion in line with the axis of said recess, a channel in the surface of said body portion at right angles to said bore, a tubular piercing pin having an angle therein adapted to fit within said bore and said channel, a discharge orifice in the end of said pin at the end of said channel opposite the bore, a cover plate for said body adapted to closely fit the surface thereof in which said channel is located, said cover plate having downwardly extending edges cooperating with the sides of said body to form a secure attachment therebetween, and said pin extending downwardly beyond said bore within said recess.

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