

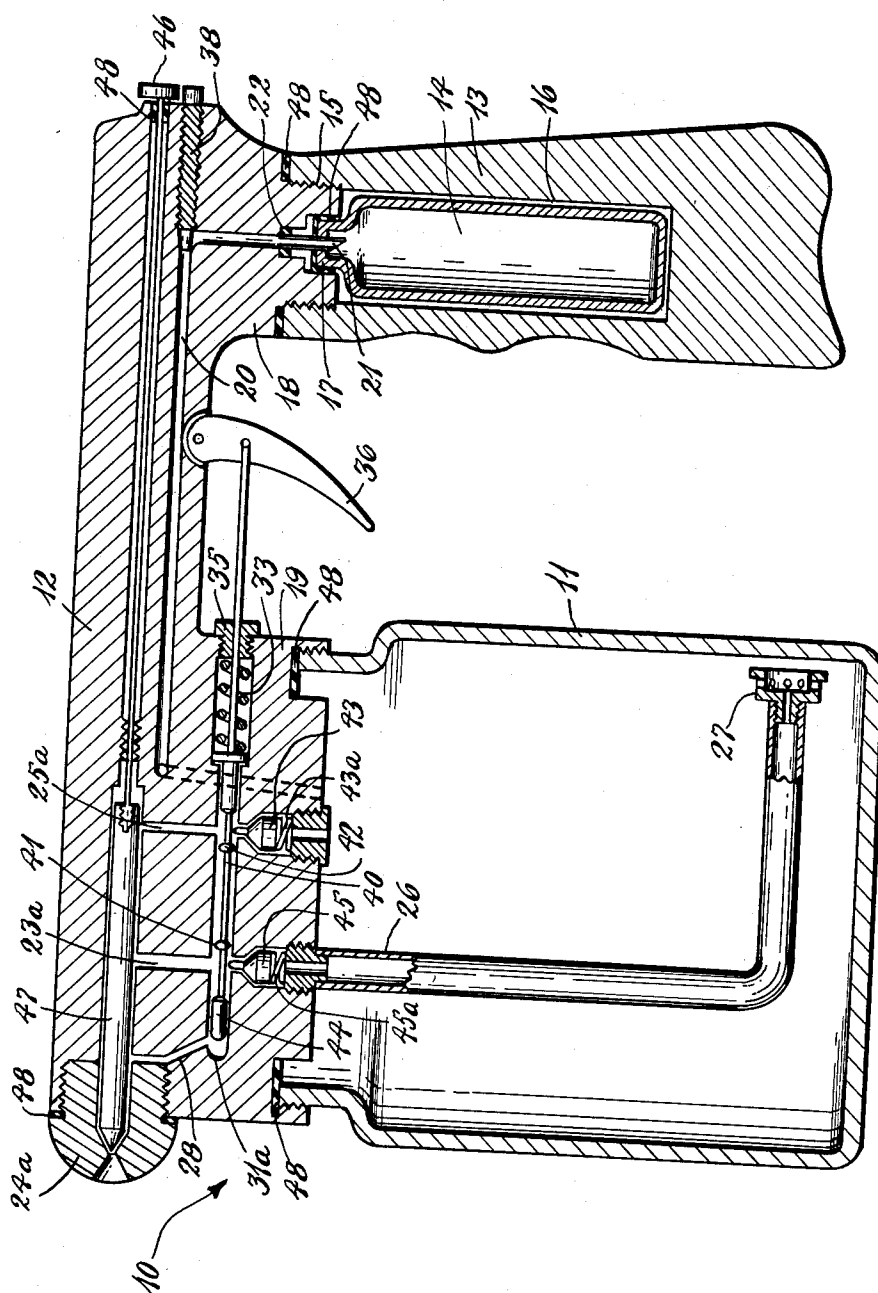
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SPRAY GUN

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SPRAY GUN

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3 Claims. (Cl. 299—86)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

This application is a division of my copending application Serial No. 667,549 filed May 6, 1946, entitled Spray Gun, now Patent No. 2,595,317 issued May 6, 1952.

This invention relates in general to spraying apparatus and in particular to a spray gun for paint or the like.

An object of this invention is to provide a spraying device that is adapted to operate from a portable reservoir of compressed gas.

Another object is to provide a spray gun that operates from a small container of a compressed gas or the like.

An additional object is to provide a spray gun adapted to utilize as a source of compressed gas a cylinder of carbon dioxide, nitrogen, neon or the like.

Further objects and advantages of this invention, as well as its construction, arrangement and operation will be apparent from the following description and claims in connection with the accompanying drawings, in which the single figure is a side elevation in cross section of a spray gun, showing a preferred embodiment of the invention.

The drawing shows a spray gun generally designated 10 and including a reservoir 11 secured removably to a head or connector 12 on which is mounted a removable handle 13 containing a gas reservoir 14.

A gas reservoir 14 comprises a container of compressed, liquified, or solidified gas, such as a small cylinder of highly compressed carbon dioxide. In the preferred form of the invention, the cylinder is so arranged that the compressed gas contained therein is made available for use by puncturing the top of the cylinder.

The handle 13 is adapted to fit on the head and connector 12 by means of a threaded connection 15. The handle is hollow, having a recess 16 adapted to receive and retain the gas reservoir 14 and to hold the reservoir 14 in such a position that the top 17 of the reservoir is almost flush with the top of the handle. Optionally, the handle is shaped so as to fit comfortably within the hand of the operator and is designed with a finger grip or other structure conventional in tool handles and the like.

The head 12 has two studs 18 and 19 extending at an angle thereto, one at each end thereof. Stud 18 has one extremely threaded or otherwise fitted to receive handle 13. Stud 19 preferably has a portion threaded internally at its end to receive reservoir 11 thereon. A channel or tube 20 passes through head 12, opening at one end on the surface of stud 18 distal head 12 and opening at the other end in stud 19 so as to terminate within reservoir 11. Tube 20 is curved toward one end to by-pass a valve arrangement, hereinafter described, contained in head 19. Suitable packing 48 provides substantially tight connections between various parts of the sprayer 10.

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Mounted on the lower side of stud 18 at the end of tube 20 is a sharp, hollow needle 21, which is positioned and adapted to feed into tube 20. This needle is mounted on stud 18, for example by means of washer 22, and optionally can be countersunk partially within stud 18. The lower or pointed end of needle 21 is adapted to engage and enter the top 17 of reservoir 14.

When reservoir 14 is placed within handle 13 and the handle is screwed on to the stud 18, needle 21 punctures the top 17 of reservoir 14, thereby opening the seal of the reservoir and making the gas contained therein available for use.

Positioned on stud 19 and adapted to feed into channel 23a is a tube 26, which extends to a point near the bottom of reservoir 11 and is open thereat to permit entrance of the liquid, paint or the like stored in reservoir 11. This tube 26 optionally is threaded and thus mounted removably on stud 19. At the open end of tube 26 a filtering screen 27 or similar device may be provided to prevent entrance of dirt and other impurities into the tube and consequently to protect nozzle 24a from clogging.

In the form of the invention shown, a valve and valve-trip combination is used to control the flow of gas and liquid. A valve stem 40 is mounted in a bore 31a, the position of the stem 40 being controlled by spring 33 and plug 35. Mounted on valve stem 40 is a guide 41 that divides bore 31a between channel 23a and channel 25a, guiding stem 40. Said guide 41 is oval in cross-section, permitting passage of gas about bore 31a to clean out channel 23a and nozzle 24a. A valve-trip 42 mounted on stem 40 is adapted to coact with a valve 43 positioned in channel 25a adjacent to valve stem 40, so that valve 43 can be opened to permit the escape of gas through channel 25a. A second valve-trip 44, oval in cross-section, is positioned at the inner end of valve stem 40 and is adapted to open valve 45, which is similarly positioned in tube 23a. Thus, when trigger 36 is pulled back, valve-trip 42 first opens valve 43 and permits an escape of gas, which serves to clear out nozzle 24. As trigger 36 is pulled further back, valve trip 44 opens valve 45, thus ejecting liquid through nozzle 24a. As the trigger is released, the flow of liquid through valve 45 is cut off, and subsequently valve-trip 42 opens valve 43, permitting the bleeding off of excess gas pressure for cleaning of nozzle 24a. Springs 43a and 45a hold valves 43 and 45 normally in a closed position.

A thumb screw adjustment 46 controls an adjusting member 47 adapted to vary the character of the ejected spray.

It is understood, of course, that reservoir 14 can be an integral part of handle 13, whereby the entire handle and reservoir is replaceable.

The spray apparatus described herein is adapted to use with a small portable reservoir of compressed gas, and accordingly is sufficient within itself and does not need an external power source or the like. The choice of the compressed gas obviously will depend on the nature of the spray. For example, in paint spraying where paint to be used is not substantially a solvent for carbon dioxide, it is understood that the most convenient gas reservoir will be a small cylinder of carbon dioxide. However, where carbon-dioxide gas is substantially soluble in the paint, it will be necessary to use another gas such as compressed air, nitrogen, neon or the like.

The spraying apparatus described herein is particularly adapted for use in connection with a dissolved-type paint such as lacquer or the like, or in connection with a sediment-type paint wherein the particles are sufficiently small so as not to clog the nozzle or valve arrangement.

It is further understood that numerous variations in

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the structure and operation of the spraying apparatus can be made without departing from the scope of the invention.

I claim:

1. A sprayer comprising a head, a spray nozzle, liquid reservoir and compressed-gas reservoir mounted in said head, means to feed gas from said gas reservoir to said liquid reservoir, a tube carried dependingly from said head and adapted to deliver liquid from the nether portion of said liquid reservoir to said nozzle, a channel in said head providing a conduit for delivery of gas from the upper portion of said liquid reservoir to said nozzle, a first spring-loaded valve adapted to control the flow of liquid through said tube, a second spring-loaded valve adapted to control the flow of gas through said channel, and a reciprocable spring-loaded trigger-actuated valve stem mounted slidably in a bore in said head, said valve stem carrying a plurality of valve trips operable to unseat said first valve only and said second valve only at selected positions of said valve stem.

2. A sprayer comprising a head, a spray nozzle, liquid reservoir and compressed-gas reservoir mounted in said head, means to feed gas from said gas reservoir to said liquid reservoir, a tube carried dependingly from said head and adapted to deliver liquid from the nether portion of said liquid reservoir to said nozzle, a channel

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in said head providing a conduit for delivery of gas from the upper portion of said liquid reservoir to said nozzle, a first spring-loaded valve adapted to control the flow of liquid through said tube, a second spring-loaded valve adapted to control the flow of gas through said channel, and a reciprocable spring-loaded trigger-actuated valve stem mounted slidably in a bore in said head, said valve stem carrying a plurality of valve trips, the first of said valve trips being adapted to unseat said second valve upon partial retraction of said stem, another of said valve trips being adapted to unseat said first valve upon further retraction of said stem to a position where said first valve trip has released said second valve from such unseated position.

3. The combination set forth in claim 2 wherein the transverse cross-sectional configuration of said valve trips differs from the transverse cross-sectional configuration of said bore.

References Cited in the file of this patent

UNITED STATES PATENTS

1,630,977	Smoot	May 31, 1927
1,912,759	Clark	June 6, 1933
2,027,103	Johnson et al.	Jan. 7, 1936
2,595,317	White	May 6, 1952