Dec. 22, 1936. J. L. ARMSTRONG 2,064,815

APPARATUS FOR FILLING SYRINGE CARTRIDGES AND THE LIKE

Filed Aug. 10, 1933 2 Sheets-Sheet 1

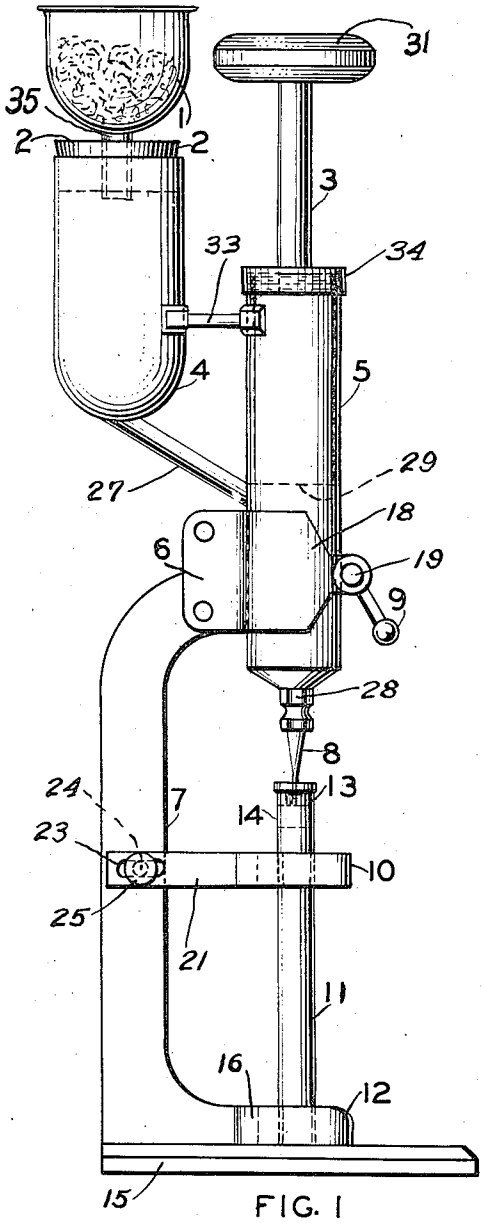


FIG. 1

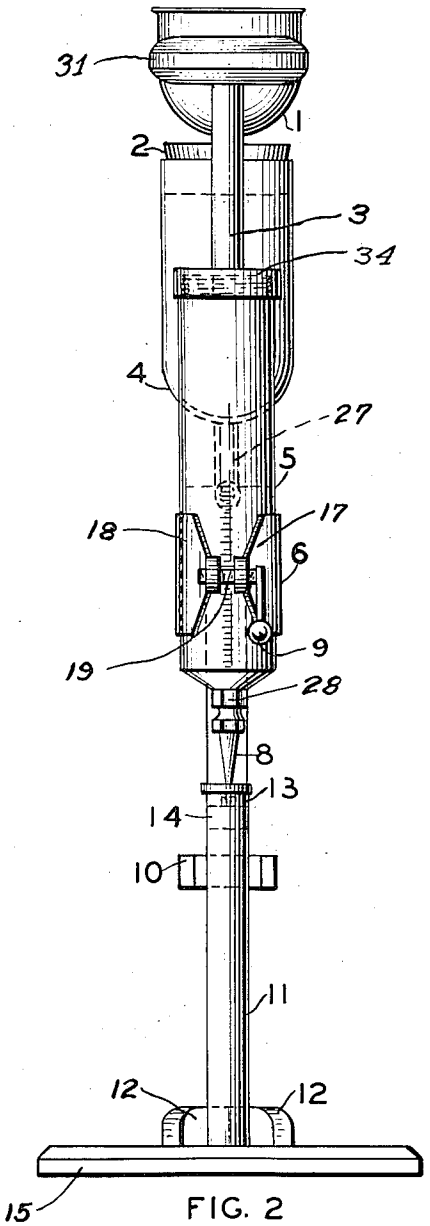


FIG. 2

INVENTOR
JAMES L. ARMSTRONG.

ATTORNEY
Charles G. Wills

Dec. 22, 1936. J. L. ARMSTRONG 2,064,815

APPARATUS FOR FILLING SYRINGE CARTPIDGES AND THE LIKE

Filed Aug. 10, 1933 2 Sheets-Sheet 2

Fig. 4

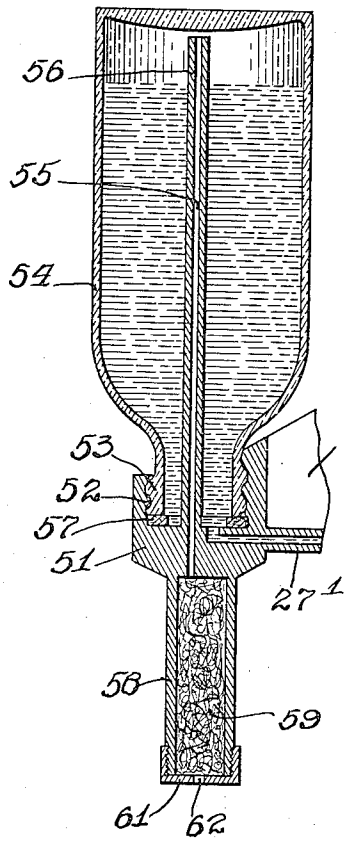


Fig. 3

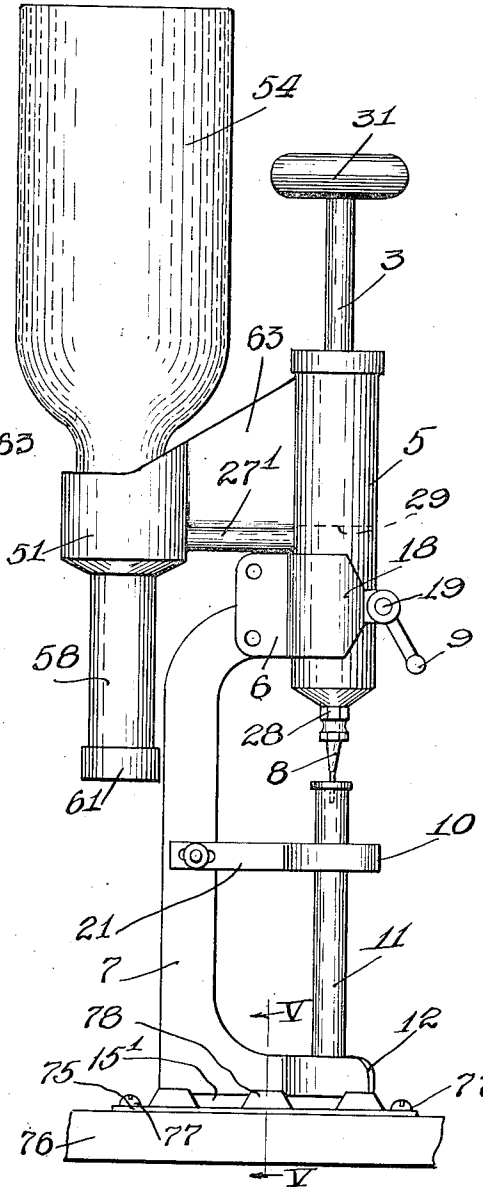
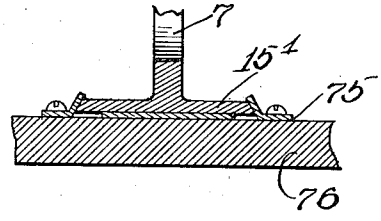


Fig. 5



Inventor
James L. Armstrong.
By Charles G. Wright
Atty.

Patented Dec. 22, 1936 2,064,815

UNITED STATES PATENT OFFICE

2,064,815

APPARATUS FOR FILLING SYRINGE CARTRIDGES AND THE LIKE

James L. Armstrong, Miami Beach, Fla.

Application August 10, 1933, Serial No. 684,525

4 Claims. (Cl. 226—116)

This invention relates to an apparatus for filling syringe cartridges and the like.

An object of this invention is the provision of a device for economically filling, or refilling, under sterile conditions, tubular containers variously known as syringe cartridges, ampules or carpules, with anesthetic or other solutions or medicaments.

Another object of this invention is the provision of such a device of a simple and inexpensive construction whereby users of ampules and the like may economically fill or refill their own ampules or cartridges obviating the necessity for the purchase of filled cartridges. The use of this invention makes it possible for the user to have a choice of medicaments not commercially available in cartridges.

A further object is the provision of such a device, utilizing the atmospheric pressure for assisting in the filling operation.

Other objects and advantages of this invention will become apparent to those skilled in the art from the following detailed description with reference to the accompanying drawings.

On the drawings:

Figure 1 is a side elevation of a cartridge filling device incorporating my invention.

Figure 2 is a front elevation of the device shown in Figure 1.

Figure 3 is a side elevation of a modification of my invention;

Figure 4 is a fragmentary vertical section through a portion of that shown in Figure 3; and

Figure 5 is a section taken on the line V—V of Figure 3.

As shown on the drawings:

The cartridge filling device herein illustrated comprises a supporting frame 7 pivotally fixed on a base plate 15 and including an integrally formed cartridge guide 16 consisting of two diverging arms 12 also disposed over a portion of the base plate 15 and cooperating therewith to serve as a guide and a seat for the lower end of an ampule or cartridge 11 to be filled with liquid. On the upper end of the frame 7 is rigidly secured an adjustable clamp 6 comprising opposed clamping elements 17 and 18 which are adapted to be adjusted toward and from each other by the appropriate rotation of the clamp bolt 19 by the handle 9 permanently fixed on one end thereof.

Intermediate the ends of the frame 7 is provided an adjustable guide 21 including diverging arms 10 which serve as a guide adapted to engage the cartridge 11 adjacent the upper end, whereby the cartridge may be held in proper alignment with the filling device by simply pressing the cartridge snugly into the space between the diverging arms on the brackets 16 and 21. Means whereby the bracket 21 may be adjusted is provided and comprises a slot 23 in the bracket so disposed with relation to the frame 7 that a screw or bolt 24 passing into the frame 7 may be forced down upon the bracket 21 by the enlarged head 25 to securely hold the bracket 21 in any adjusted position.

The arms 17 and 18 of the bracket 6 embrace the lower end of a pump cylinder 5 which has communication through a tube 27 with a tank 4 adapted to contain the liquid to be transferred to the cartridge 11. A nozzle or syringe needle 8 is removably secured to the lower end of the cylinder 5 by suitable means as indicated at 28. Within the upper end of the cylinder 5 is disposed a piston 29 having a relatively tight fit within the cylinder and being secured to the plunger or piston rod 3 which extends from the upper end of the cylinder and is provided with a handle 31 adapted to transmit reciprocatory motion to piston rod 3 and to the piston 29 for withdrawing air from the cartridge 11 and from the lower portion of the cylinder and for subsequently forcing liquid from the cylinder into the cartridge.

The tank or liquid container 4 is preferably supported by a bracket 33 secured thereto and to the cylinder 5 adjacent the upper end thereof. The extreme upper end of the cylinder 5 is preferably provided with a cap 34 which is threaded thereon and adapted to prevent accidental removal of the piston 29 from the cylinder when the rod 3 is moved upwardly. The tank 4 is preferably provided with a suitable stopper 2 through which extends a tubular portion 35 of a thistle tube 1 which is adapted to contain sterile gauze for the purpose of filtering air which may pass from the atmosphere to the tank 4 and by which liquid in the tank 4 is caused to flow downwardly into the lower portion of the cylinder 5 when the piston 29 is in its uppermost position as indicated in the drawings. Within the cartridge 11 are positioned two stoppers 13 and 14, the utility of which will be best understood from the following description of the method of operation:

In the process of filling or refilling a cartridge the entire device, together with the cartridges to be used, are properly sterilized. Without a cartridge in position, the piston 29 is forced downwardly to the lower end of the cylinder 5 for closing the tube 27 leading to the tank 4 and for expelling air from the cylinder. With the piston in this position, the liquid to be discharged into

the cartridge may be put in the tank 4. The thistle tube 1 should then be put into position preferably containing sterilized gauze to filter air which will pass through the same. The cartridge 11 is next placed in position by placing the stopper 13 of the cartridge against the end of the needle, to push the needle through the stopper. The arms 10 and 12 serve to aid in positioning the cartridge 11 in alignment with the cylinder 5 with the needle through the stopper 13. The piston is next moved to its uppermost position in the cylinder 5, which causes air to be withdrawn from the needle and from the space between the stoppers 13 and 14, and as the piston 29 reaches its uppermost position, the tube 27 leading from the tank 4 is opened permitting liquid to enter the lower end of the cylinder 5 through the tube 27 by means of gravity and assisted by atmospheric pressure by reason of the rarefied condition of gases contained in the lower portion of the cylinder 5. The piston 29 is next forced downwardly for forcibly injecting the liquid through the nozzle 8 into the cartridge, at the same time forcing the stopper 14 from the position shown in the drawings to the lower end of the cartridge. The cartridge, having been filled, is removed from the position shown in the drawings, the needle 8 being withdrawn and the stopper 13 automatically sealing the opening formed by the needle.

In this manner it is possible to fill the refill cartridges and give the user a choice of medicaments not commercially available in cartridges. If desired, the cylinder 5 may be graduated to indicate the amount of medicaments being put into the cartridge.

The modification of my invention illustrated in Figures 3, 4 and 5, comprises a frame 7 and pump cylinder 5 and associated parts substantially identical to that shown in Figure 1. This modification distinguishes from that shown in Figure 1, however, by the substitution of liquid supply means of a different construction, comprising a socket member 51 provided with internal threads as indicated at 52 for receiving the threaded neck 53 of a reservoir 54 which may consist of the original container which is inverted over a breather tube 56, and having its upper end disposed downwardly and in engagement with a gasket 57 seated in the socket member 51 for making a fluid-tight seal within the socket.

The lower end of the socket member is provided with an integrally secured filter tube 58 communicating with the breather tube 56 by a duct 55. The filter tube 58 is preferably filled with suitable air filtering material 59, and the lower end of the tube 58 is provided with a cover 61 having an aperture 62 therethrough to permit the passage of air into the filter tube. The socket member 51 is preferably rigidly secured to the pump cylinder 5, by a web portion 63, the lower edge of which is of substantially cylindrical form, defining a feed tube 27', through which liquid may be discharged from the container 54 to the pump cylinder 5, when the lower end of the piston 29 is disposed above the level of the tube 27'. For the successful operation of this device it is of course necessary that the breather tube 56 extend substantially to the bottom of the container 54 in order that liquid from the container 54 will not find its way into the tube 56 and thus downwardly through the filter tube 58.

In this modification, the base 15' for the frame 7, is secured in position upon a base plate 75 which is in turn permanently secured to a table top 76 by suitable screws or bolts 77. The base plate 75 has formed from the body thereof upwardly extending integral lugs 78 disposed at opposite edges of the base 15', and between which the base is adapted to be slid, in order that the entire mechanism may be removed together with its base 15' from its working position for sterilization, by simply drawing the base 15' from between the lugs 78.

In the practical application of this device the threaded engagement by which the liquid container is attached to the socket member, is by a specially designed thread adapted to fit containers dispensed only by a particular dealer or dealers, in order to encourage the use of medicaments dispensed by such dealer, when employing this refilling mechanism.

From the foregoing description it will be appreciated by those skilled in the art that my invention may be modified and changed in many details without departing from the principle thereof, and I desire that the patent to be granted hereon shall not be limited in any manner except as necessitated by the prior art.

I claim as my invention:

1. Means for filling syringe cartridges, including in combination, a standard, means forming a chamber adapted to be evacuated supported on said standard, said last mentioned means having a needle-like discharge nozzle for entering a cartridge to be filled, means on said standard for supporting a cartridge in position to be filled by said nozzle, a liquid container, means removably supporting said container for gravital discharge of its contents into said chamber, said container supporting means and said container having interlocking portions to removably secure said container in operative position, and a breather tube on said container supporting means extending into a supported container to a point above the contents of the container.

2. Means for filling a cartridge, in combination, a standard, means providing a chamber adapted to be evacuated supported on said standard, said last means having a needle-like discharge nozzle for entering a cartridge to be filled, a liquid container, means for supporting said container in position for gravital discharge into said chamber, said container supporting means and container having interlocking portions for removably supporting said container in operative position, a feed tube between said supporting means and chamber, and a breather tube on said supporting means extending into a supported container to a point above the liquid contents of the container.

3. Means for filling syringe cartridges, including a standard, means providing a chamber adapted to be evacuated mounted on said standard, a liquid container, means for removably supporting said container in position for gravital discharge into said chamber, said supporting means and container including interlocking portions to removably secure said container in operative position, a feed tube between said supporting means and said chamber, a breather tube on said supporting means extending into a supported container to a point above the liquid contents thereof, and means for filtering air admitted to said breather tube.

4. Means for filling syringe cartridges, comprising in combination, a base and a standard, a piston pump removably supported by said standard above the base, said pump having a needle-like discharge nozzle, means carried by

said pump for receiving a supply of liquid filler for the cartridge, a duct between said supply and the interior of said pump communicating with the pump interior adjacent the active face of the piston when the same is at the end of its stroke in a direction away from the pump nozzle, means for clamping a cartridge in position to receive fluid from said nozzle, said piston being adjacent the nozzle end of the pump for closing fluid admission to the pump on initiation of the filling operation, movement of the piston away from the nozzle evacuating the cartridge prior to fluid entry and movement of the piston toward the nozzle forcing fluid into said cartridge.

JAMES L. ARMSTRONG.