

[72] Inventor **Theodore H. Stawski**
Union, N.J.
 [21] Appl. No. **822,658**
 [22] Filed **May 7, 1969**
 [45] Patented **Aug. 31, 1971**
 [73] Assignee **Becton Dickinson and Company**
East Rutherford, N.J.

[56] **References Cited**
UNITED STATES PATENTS
 2,064,815 12/1936 Armstrong 141/375 X
 2,174,329 9/1939 O'Neill 141/375
 2,914,096 11/1959 Foreman 222/309 X
 3,492,876 2/1970 Bull et al. 141/27 X

Primary Examiner—Houston S. Bell, Jr.
Attorney—Kane, Dalsimer, Kane, Sullivan and Kurucz

[54] **MANUAL SYRINGE FILLING DEVICE**
5 Claims, 5 Drawing Figs.

[52] U.S. Cl. 141/27,
 141/375, 141/383
 [51] Int. Cl. B65b 3/32,
 B67c 3/16
 [50] Field of Search 141/13-28,
 369-386, 392; 222/309; 73/425.6

ABSTRACT: An improved device for controlling the amount of medicant that may be drawn into the barrel of a syringe from a container of the type provided with a transfer needle assembly having a hub with spaced radial flanges is provided. The device includes means for limiting the displacement of the syringe barrel plunger relative to the syringe barrel and for securing the transfer needle assembly.

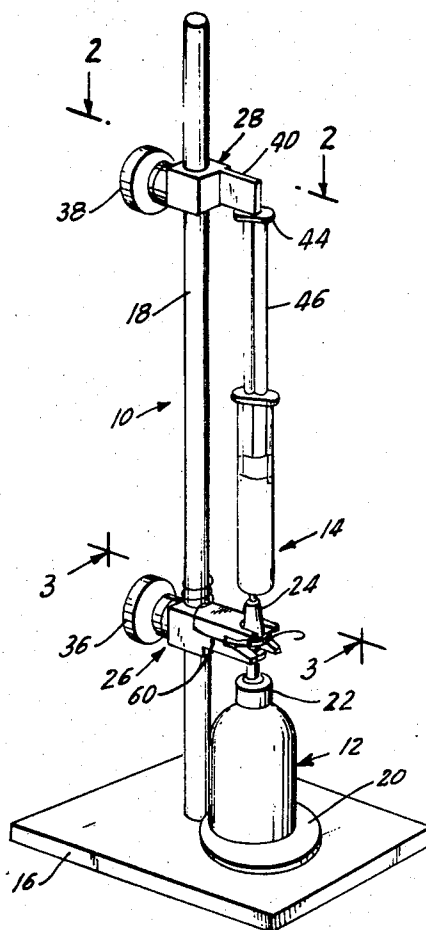


FIG. 1

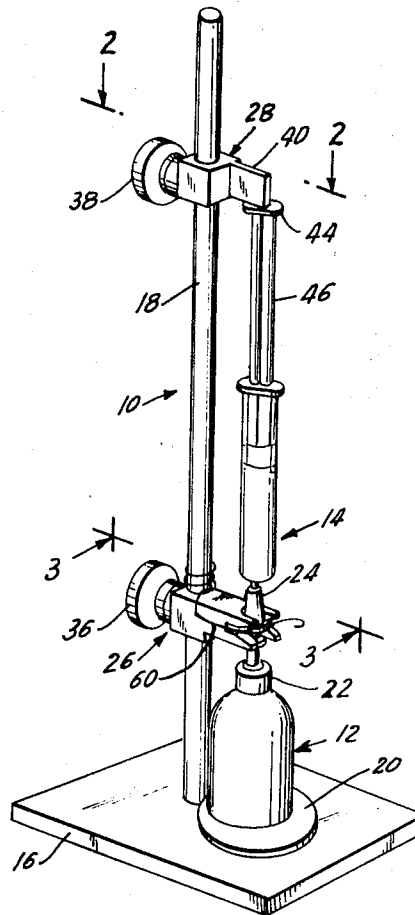
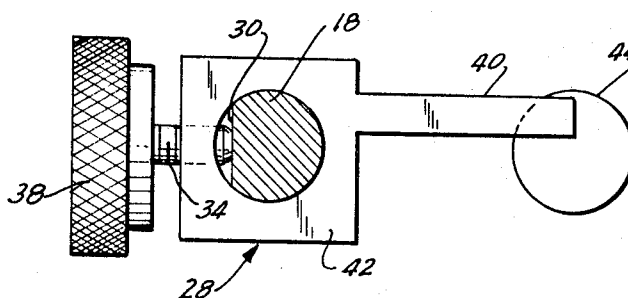


FIG. 2



INVENTOR

THEODORE H. STAWSKI

BY

BY
Karl, Johnson, Kane, Sullivan & Smith
ATTORNEYS:

ATTORNEYS:

FIG. 3

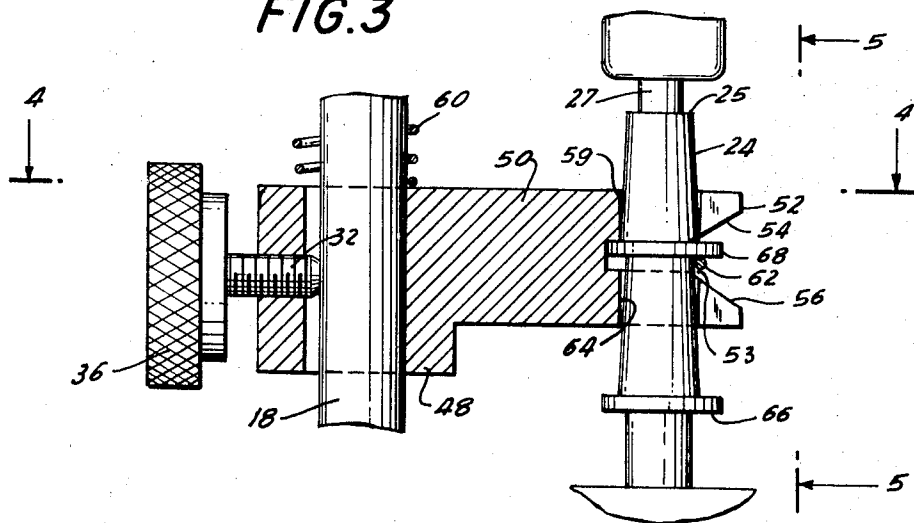


FIG. 4

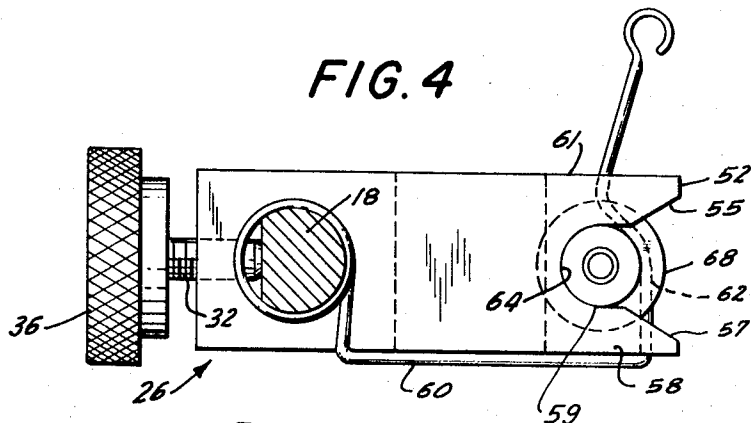
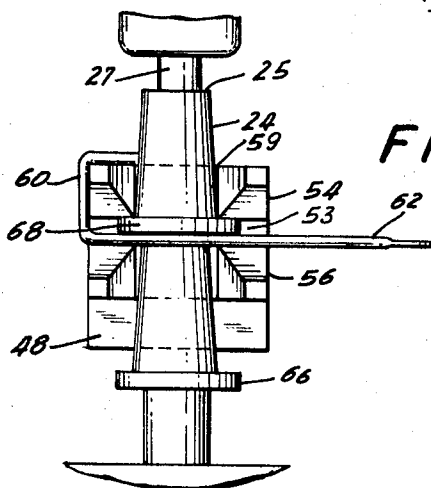


FIG. 5



INVENTOR
THEODORE H. STAWSKI

BY

Kane, Dabrowski, Kane, Sullivan & Smith
ATTORNEYS

MANUAL SYRINGE FILLING DEVICE

BACKGROUND OF THE INVENTION

In the hospital and related medical and technical fields, the use of prefilled hypodermic syringes has grown increasingly popular over the past few years. Such syringes are commonly filled at a central location distant from the eventual administration location where large quantities of medicant may be stored in multidose containers. The efficiency of such an arrangement is readily apparent, particularly with respect to the savings in time that it affords to the doctor, nurse or other administering technician, and also with respect to the economic savings that usually accompanies the purchasing of medicants or other supplies in bulk rather than in single dose containers.

With the growth of prefilled syringes, the need has arisen for a fast, economical and efficient device to facilitate the accurate loading of such syringes. In this connection, the importance of insuring the proper dosage of a medicant to be administered cannot be overemphasized.

It is, therefore, a principal object of the present invention to provide an economical syringe filling device that is simple to operate, the operation of which requires a minimum amount of training, which may be quickly set up and adjusted to accommodate a wide range of dosages, and which may be easily disassembled, cleaned, and sterilized.

SUMMARY OF THE INVENTION

These and other beneficial objects and advantages are attained in accordance with the present invention by providing a syringe filling device adapted to receive and secure a hypodermic syringe and a medicant supply container. The mouth of the supply container is to be provided with a transfer needle assembly adapted to couple the barrel of the syringe to be filled to the interior of the container and includes a hub portion which extends outwardly from the mouth of the container and is provided with two vertically spaced flanges. The device includes a base structure for the supply container, a support structure affixed to the base structure and extending upwardly therefrom; means for securing a supply of medicant to the syringe filling device, and means for limiting the displacement of the plunger of a syringe to be filled relative to the syringe barrel. The means for securing the supply container to the device includes a first portion having surfaces adapted to interengage with the container transfer needle assembly so as to prevent vertical movement of the container relative to the base, a second portion, and means adapted to bias the transfer needle assembly toward the first portion.

BRIEF DESCRIPTION OF THE DRAWINGS

in the accompanying drawings:

FIG. 1 is a perspective view of a syringe filling device in accordance with the present invention wherein a medicant container provided with a transfer needle assembly and syringe are shown associated with the device

FIG. 2 is a sectional view taken along reference lines 2—2 of FIG. 1 in the direction indicated by the arrows;

FIG. 3 is a fragmentary enlarged sectional view taken along reference lines 3—3 of FIG. 1 in the direction indicated by the arrows;

FIG. 4 is a sectional view taken along reference lines 4—4 of FIG. 3 in the direction indicated by the arrows; and

FIG. 5 is a fragmentary front elevational view taken in the direction of the arrows of FIG. 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is illustrated in the accompanying figures wherein similar components are indicated by the same reference numeral throughout the several views. Reference is now made to FIG. 1 in particular wherein the syringe filling device 10 of the present invention is depicted with a medicant

supply container 12 and a hypodermic syringe 14 suitably mounted thereto. The syringe filling device 10 includes a base 16 from which an elongated support rod 18 extends upwardly. The base and rod may be formed of any suitable material although stainless steel is preferred because of the ease with which it may be cleaned and sterilized. A pad 20 of rubber or other suitable material is affixed to the top side of the base 18 and serves as a nonslip platform to receive the medicant container 12. Affixed to the neck 22 of container 12 is a transfer needle assembly 24 which has portions extending into and out of the container and serves to connect the interior of the syringe barrel with the interior of the medicant supply container. Such a transfer needle assembly is disclosed in detail in my currently pending and commonly assigned patent application Ser. No. 822,455 for a TRANSFER NEEDLE ASSEMBLY filed on May 7, 1969. For the present, it need only be noted that the transfer needle assembly comprises an elongated member having one end 25 adapted to receive the tip 27 of a hypodermic syringe to be filled and provided with vertically spaced radial flanges 66 and 68 the function of which will be described forthwith.

Two collars 26 and 28 are shiftably mounted to rod 18. In this regard, and as may be seen in FIGS. 2 and 4, rod 18, although generally round in cross-sectional configuration, has a flat surface 30 which is adapted to cooperate with set screws 32 and 34 of collars 26 and 28, respectively in fixing the collars at a predetermined position along the rod. Flat surface 30 also serves to align transverse arms 40 and 50 which are associated with collars 28 and 26 respectively. To this end, knurled knobs 36 and 38 are associated with each of the set screws to permit the manual adjustment and resetting of the collars.

As seen in FIG. 2, collar 28 which serves to limit the stroke of the plunger of the syringe to be filled, includes an arm 40 which extends outwardly from the main body portion 42 of the collar transverse to the longitudinal axis of rod 18. In this connection, arm 40 extends into the path of motion of the plunger of a syringe which may be coupled to the transfer needle since both arm 40 and the transfer needle securing arm 50 are aligned by virtue of flat surface 30. In use, the plunger may be drawn back only until such time as the syringe thumb rest 44 abuts the underside of arm 40 at which time further motion will be prevented. In this manner, by fixing the transfer needle to which the front end of the syringe is coupled, an exact dosage of medicant may be drawn into the syringe.

The lower collar 26 serves to fix the forward end of the syringe by positively locating the vertical position of the transfer needle 24. Reference will now be made to FIGS. 3, 4, and 5 wherein collar 26 is shown in considerable detail. Thus, it will be noted that collar 26 includes a main body portion 48 through which rod 18 and set screw 32 extend. An arm 50 extends outwardly from the main body portion 48 transverse to the longitudinal axis of rod 18 and as was previously mentioned, arm 50 will normally align with arm 40 of collar 28. A slit 53 extends inwardly from the free end 52 of arm 50 for some distance dividing the free end of arm 50 into an upper and lower portion designated 54 and 56 respectively in FIG. 3. A bore 59 extends through arm 50 from top to bottom close to the free end 52 and the material between the free end and the bore is cut away along diagonal lines 55 and 57 so as to further divide the forward end of arm 50 into front and rear portions designated 58 and 61 in FIG. 4. It should be realized that each of these front and rear portions 58 and 61 will include a top and bottom portion defined by slit 53 so that the front of the arm 50 is actually quartered. The diameter of bore 59 is substantially equal to the diameter of the hub of the transfer needle 24 with which the device is to be used although less than the diameter of flanges 66 and 68. However, the angle generated by diagonal lines 55 and 57 is such that at some point between bore 59 and free end 52 the spacing between front and rear portions 58 and 61 is greater than the diameter of flanges 66 and 68 of the transfer needle hub. Thus, when the hub is positioned rearwardly of the above

mentioned point, the hub will be prevented from vertical movement by the interaction of flange 68 and slit 53 of arm 50. Conversely, when the hub is positioned in front of the aforementioned point, the hub will be free to move vertically.

A spring 60 extends from rod 18 about the front of arm 50 so that when the device is in operation, the forward end 62 of spring 60 will urge the transfer needle hub 24 against the rear wall 64 of bore 59 into a position where vertical motion is prevented. Spring 60 is sufficiently resilient so that fingertip pressure is sufficient to enable the hub to be moved forwardly against the rearward bias of spring 60 so that although transfer needle 24 is normally positioned in such a manner as to prevent any vertical movement, under slight urging the transfer needle may be shifted to a position wherein vertical movement is possible.

In use, a transfer needle is first affixed to a medicant or other supply container in a manner described in the copending patent previously referred to. The hub of the transfer needle is then positioned within bore 59 and spring 60. This fixes the transfer needle and prevents vertical movement thereof. A syringe, the plunger of which is initially in the forwardmost portion of the barrel, is then securely fitted to the top end 25 of the transfer needle hub. The plunger limiting arm collar 28 is then positioned above collar 26 a distance such as to enable plunger 46 of the syringe to travel the necessary distance to draw the required dosage into the syringe barrel. The syringe plunger is then drawn upwardly until the syringe plunger thumbrest 44 abuts the underside of arm 40 of the plunger limiting collar. At this time, the required dosage of medicant is contained within the syringe barrel. The technician then exerts a slight forward force on the transfer needle assembly which shifts the entire assembly forward a sufficient distance so that the top flange 68 of the transfer needle assembly clears the slit 53 of securing arm 50, thereby enabling the syringe to be disengaged from the plunger limiting means without causing any displacement of the plunger. The tip of the syringe is then uncoupled from the transfer needle assembly and a tip cap or hub may then be affixed thereto to permit the administration of the dosage contained within the syringe barrel. Spring 62 will automatically urge the transfer needle back to its normal position to await the attachment of a new syringe.

Thus, in accordance with the above description, the aforementioned objects and advantages are effectively obtained.

What I claim is:

1. A syringe filling device for drawing a predetermined dosage of fluid from an associated supply container into the barrel of an associated hypodermic syringe having a plunger disposed for movement within said barrel, said container hav-

ing a transfer needle assembly affixed to the top end thereof adapted to couple the bottom end of said syringe barrel to the container interior, said filling device comprising: a base structure to receive said supply container; a support structure coupled to said base structure and extending upwardly therefrom; means for releasably coupling said transfer needle assembly to said support structure while said transfer needle interconnects said container and syringe in vertical registry, said coupling means including a collar disposed about said support structure, means for fixing said collar to said support structure, an arm extending outwardly from said collar transverse to said support structure, a first portion of said arm having surfaces adapted to interengage with said transfer needle assembly to prevent the vertical displacement of said transfer needle assembly relative to said support structure, and biasing means coupled to said arm and adapted to urge said transfer needle assembly toward said first portion; and plunger limiting means movably mounted to said support structure, said means having stop portions vertically aligned with said arm first portion whereby said stop portions extend into the path of motion that the plunger of said syringe will travel when said plunger is withdrawn from said syringe barrel whereby to fix the dosage that may be withdrawn from said container.

2. The invention in accordance with claim 1 wherein said plunger limiting means includes a second collar disposed about said support structure, means for fixing said second collar to said support structure, said second collar includes an arm portion extending transverse to the longitudinal axis of said support structure, and said device further comprises means for aligning said arm portion and said transfer needle assembly coupling means so as to position said arm portion in the path of motion to be traveled by the plunger of a syringe operatively coupled to said transfer needle assembly.

3. The invention in accordance with claim 2 wherein said support structure comprises an elongated member generally round in cross-sectional configuration and said aligning means includes a longitudinally extending flattened section of said elongated rod whereby said arm portion and said transfer needle assembly coupling means may be aligned relative to said flattened section.

4. The invention in accordance with claim 1 wherein said biasing means includes a spring.

5. The invention in accordance with claim 1 wherein said arm further includes a second portion in communication with said first portion, and said biasing means extends into said second portion and exerts a biasing force toward said first portion.

50

55

60

65

70

75