

Nov. 25, 1958

E. L. BEECHER
SYRINGE FILLING DEVICE

2,861,570

Filed April 30, 1956

2 Sheets-Sheet 1

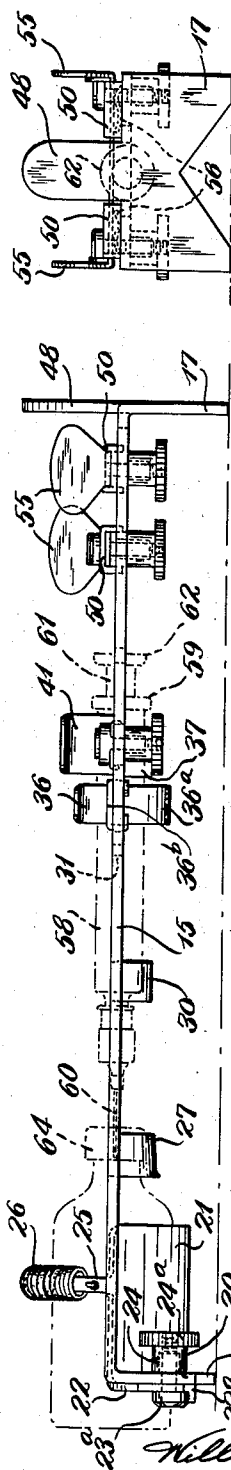
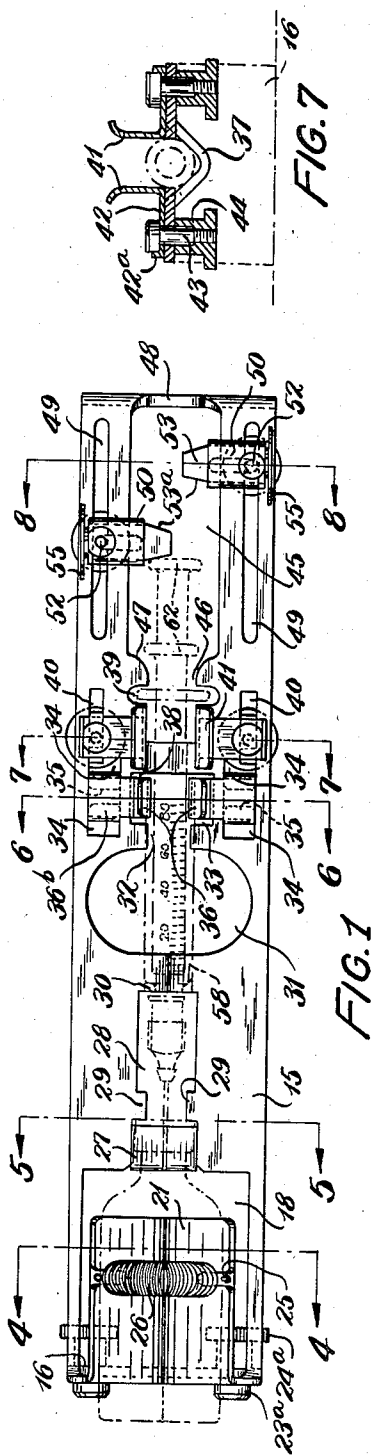


FIG. 3

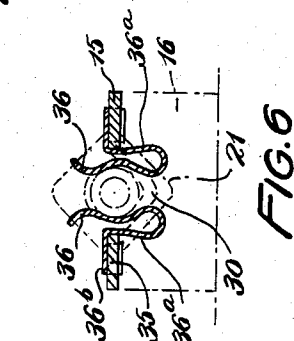


FIG. 5

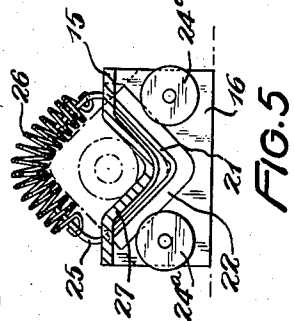


FIG. 7

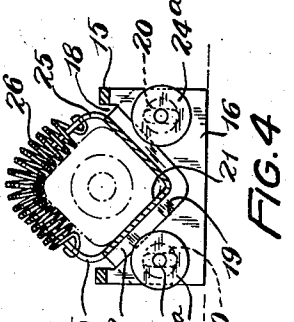


FIG. 8

FIG. 9

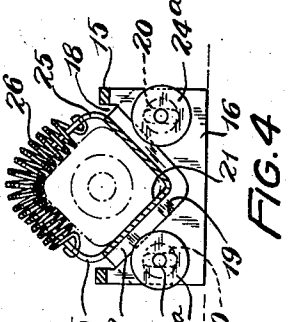


FIG. 10

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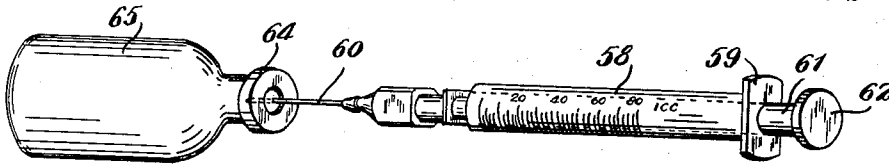


FIG. 11

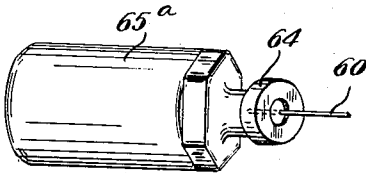


FIG. 13

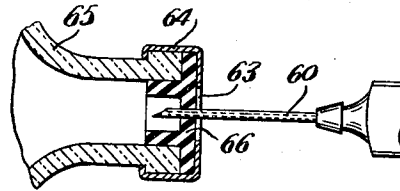


FIG. 12

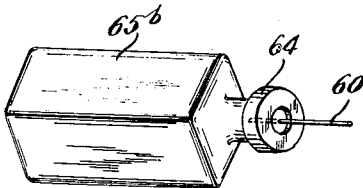


FIG. 14

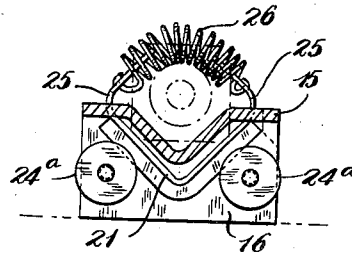


FIG. 9

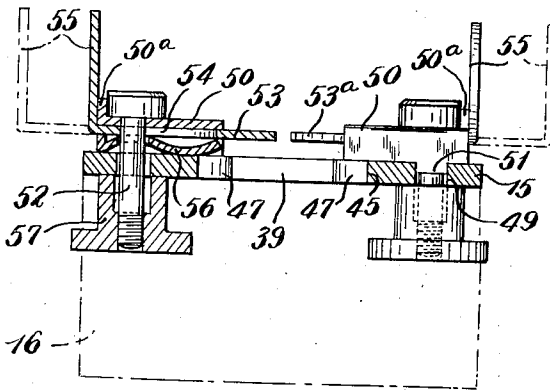


FIG. 8

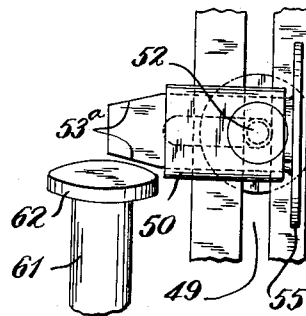


FIG. 10

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2,861,570

SYRINGE FILLING DEVICE

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13 Claims. (Cl. 128—215)

This invention relates to a device for filling a medical injection syringe from a vial containing a liquid medicine, serum or other solution that is to be injected subcutaneously into a patient.

Ordinarily, it is of the utmost importance that a medical injection syringe be filled with a quantity of the liquid exactly as prescribed, as otherwise the patient might receive an improper dosage which, of course, could have a serious adverse effect.

Of course, the filling of an injection syringe when done by a physician, nurse or other skilled person usually is properly done. The likelihood of improper filling of injection syringes is much greater when the filling operation is carried out by unskilled persons as is often necessary.

In addition to the danger of filling an injection syringe with an improper amount of the liquid, there is the difficulty of correctly inserting the needle of the syringe into the sealed neck end of the vial of liquid, especially when this is attempted in improper light or by a person not accustomed to the operation and who may be affected by nervousness.

The vials of liquid medicine, serum or solutions from which injection syringes are filled usually have their open or neck ends closed by an imperforate rubber stopper over which is a metal retaining cover or cap provided with a small size central opening through which the needle must be correctly inserted.

An inexperienced person frequently causes the pointed end of the needle of the syringe to strike the metal retaining covering or cap when attempting to pass the needle through the central opening therein. The striking of the point of the needle of the syringe against the metal retaining covering or cap frequently results in damaging the needle so that when the syringe is used for the actual injection into the patient the operation is painful and also can cause injury to the patient.

An object of the invention is to provide a novel and improved device such that a medical injection syringe can be filled accurately and repetitively with the correct and prescribed amount of the liquid medicine, serum or solution and the needle of the syringe will always pierce the rubber stopper of the vial containing the liquid exactly on the longitudinal center line of the vial, thus obviating likelihood of injuring the point of the needle, and such filling operation can be performed by an inexperienced and unskilled person and, if necessary, in a dim light.

Another object is to provide a device as referred to in the above object and which includes adjustable means that can be set in the exact position for the prescribed dosage and which means assures the proper filling of the syringe placed in the device.

Another object is to provide a device of the kind specified such that the needle of the syringe will pierce the rubber stopper of the vial and extend into the latter only to the extent necessary to reach the liquid in the vial.

A still further object is to provide a device for filling

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a medical injection syringe from a vial containing the liquid medicine, serum or solution and which device is so constructed as to function properly with vials varying in size and in cross-sectional configuration and will, regardless of the shape of the vials, always properly correlate the vials to the needle of the syringe so that the needle will properly puncture the stopper and enter the vial.

A still further object is to provide a device as hereinbefore specified and which can be readily used by an unskilled person as well as a skilled person and which greatly facilitates the correlating of the syringe and vial for carrying out the filling operation.

An additional object is to provide a device of the type referred to which is so constructed that the syringe and the vial can be readily, easily and accurately positioned in the device for the filling operation.

A still further object is to provide a device for properly filling a medical injection syringe and which has adjustable stop means that can be set and secured in proper position for limiting the filling movement of the plunger of the syringe but which can be moved in a direction laterally to the direction of the filling movement of the plunger without disturbing the set adjustment of the stop means, wherefore the insertion or removal of the syringe with respect to the device is facilitated.

A still further object is to provide a device for filling a medical syringe and which has a plurality of separately adjustable stops for limiting the filling movement of the plunger of the syringe, wherefore the syringe can be filled first with a predetermined amount of liquid medicine and subsequently with a different predetermined amount of the same or of a different liquid medicine such as might be desirable where two successive spaced dosages of different size of the same or different liquid medicine are to be given or where in one dosage intermixed predetermined amounts of different liquid medicines are to be injected.

A further object is to provide a device as referred to above and which is provided with means preventing outward movement of the plunger of the syringe, such that said plunger is completely withdrawn from the barrel of the syringe and which means may be located at one end of the device and cooperate with other portions thereof to form a base upon which the device may stand in a vertical position.

Additional objects and advantages residing in the device embodying the invention will become apparent hereinafter during a detailed description which is to follow of an embodiment of the invention and which embodiment is illustrated in the accompanying drawings forming a part of this specification and wherein—

Fig. 1 is a plan view of a device embodying the invention with the syringe and the vial containing the liquid shown by broken lines mounted in the device, two positions of the head end of the plunger of the syringe being indicated.

Fig. 2 is a side elevational view of the device shown in Fig. 1 and is taken looking toward the lower side of the device shown in Fig. 1.

Fig. 3 is an end elevational view of the device taken looking at the right hand end of Figs. 1 and 2.

Figs. 4, 5, 6, 7 and 8 are transverse sectional views taken respectively on lines 4—4, 5—5, 6—6, 7—7 and 8—8 of Fig. 1 looking in the direction of the arrows, the leg at the vial end of the device being indicated in phantom in Figs. 6, 7 and 8.

Fig. 9 is a view similar to Fig. 5 but illustrating how a vial, square or polygonal in cross section, is stopped by the spring gate when improperly positioned in the device.

Fig. 10 is a detached detail view showing the relationship between the head of the plunger of the syringe and

a stop and indicates the clearance that is present if the syringe is raised on an angle with respect to the horizontal when the stop is not retracted.

Fig. 11 illustrates in elevation a medical injection syringe, the needle of which has pierced the stopper of a vial round in cross section and containing a liquid medicine.

Fig. 12 shows on an enlarged scale and in section the stopper end of the vial shown in Fig. 11 and with the needle of the syringe piercing the stopper.

Figs. 13 and 14 are views similar to Fig. 11 but showing only the needle of the syringe as piercing the stoppers of vials of different configuration from that shown in Fig. 11.

Although the device embodying the invention can be used in connection with various types of vials containing liquid medicines, serums or solutions and with various types of medical injection syringes it will be described herein by way of illustration as used with vials containing insulin that is to be injected by the syringe subcutaneously into a diabetic patient.

The device embodying the invention may be formed of various suitable materials, but preferably it can be formed mainly by stamping the same from suitable gauge sheet metal.

Referring to the drawings, the device is of rectangular configuration and includes a planular bed 15 having at its opposite ends downturned legs 16 and 17 which act to support the bed 15 in a horizontal plane and which, in this instance, are shown as integral with the bed. The bed 15 adjacent its left hand end as viewed in the drawing has a rectangular cutout 18 while the leg 16 is provided with an upwardly facing V-shaped recess 19 extending downwardly from the cutout 18. The leg 16 on each side of the angular edges of the V-shaped recess 19 is provided with elongated slots 20 for a purpose later to become apparent.

An upwardly facing V-shaped cradle 21 is located in the cutout 18 and has at its outer end, i. e., its left hand end as viewed in Fig. 1, downwardly extending securing portions 22 which lie against the outer side of the leg 16 and which portions are provided with openings that align with the elongated slots 20 in the leg 16. Clamping bolts 23 extend through the openings in the downwardly extending securing portions 22 of the cradle 21 and through said slots 20 and have their heads 23a located outwardly of the portions 22 and just above an outturned flange 22a on the lower ends of said portions 22. The clamping bolts 23 on their inner threaded ends have screwed thereon internally threaded clamping sleeves or nuts 24 which are provided with enlarged knurled operating heads 24a.

It will be seen that when the clamping sleeves or nuts 24 are backed off the cradle 21 can be adjusted vertically within the limits of the slots 20 and then clamped in adjusted position by screwing down the clamping sleeves or nuts 24. This adjustment is provided for properly locating the cradle so as to hold the vial containing the liquid in the correct position as will later be pointed out.

The upper longitudinal edges of the cradle 21 are each provided with upwardly and inwardly extending arcuate arms 25 which are shown as integral with the cradle, although they could be separate from the cradle but secured to it. The upper ends of the arms 25 extend into the opposite ends of an arcuately disposed coil spring 26 and the opposite ends of said spring are anchored to the arms 25. The coil spring 26 can be designated as a spring gate which serves a dual function. One function of the spring gate 26 is to hold the vial for the liquid in position in the cradle 21.

As previously stated, these vials differ in cross-sectional configuration in that some are circular in cross section and others are square or polygonal in cross section. It is essential that the vial be properly positioned in the cradle and this means that when a vial of polygonal or

square cross section is being positioned in the cradle it must be correctly positioned to interfit the V of the cradle.

If it is attempted to place a vial of square or polygonal cross section improperly in the cradle that is so that the vial does not interfit the cradle, then the spring gate 26 functions to prevent the full insertion of the vial into the cradle until the vial has been turned so as to properly interfit the contour of the cradle and this situation is illustrated in Fig. 9, wherein a polygonal-shaped vial is shown as being placed improperly in the cradle.

The bed 15 at the inner end of the rectangular cutout 18 and on the longitudinal center line of the bed has a downwardly extending V-shaped portion 27 which contacts the metal retaining cap on the neck of the vial and acts as a support for the neck of the vial.

It will be understood that the cradle 21 is adjusted vertically so that said cradle and the portion 27 will support the vial exactly horizontally when the bed 15 is in a horizontal plane and the reason for this will later become apparent.

The bed 15 to the right of the portion 27 is provided with a rectangular cutout 28 that is substantially narrower in width than the cutout 18 and which is provided at its end that is adjacent to the portion 27 and on its opposite longitudinal side edges with inwardly extending stop tabs 29 that contact the metal cap on the neck of the vial that is positioned in the cradle 21 and which act to limit the inward positioning movement of the vial.

At the right hand end of the narrow rectangular cutout 28 the bed 15 has a downwardly extending V-shaped supporting portion 30 of smaller size than the portion 27 and which portion 30 is for the purpose of receiving and supporting the end of the barrel of the injection syringe that is adjacent to the needle thereof.

The bed 15 to the right of the supporting portion 30 is provided with an enlarged oval cutout 31 which furnishes space for the user's fingers in positioning the syringe in the device. On the longitudinal center line of the bed 15 there is a straight-sided opening 32 of relatively short length and of a width sufficient to clear the underside of the barrel of the syringe. The opening 32 not only communicates with the oval cutout 31 but also communicates at its opposite end with a rectangular opening 33 in bed 15 and which opening 33 has its longitudinal or longer dimension extending transversely of the bed as clearly shown in Fig. 1.

Between the opposite ends of the rectangular opening 33 and the longitudinal side edges of the bed 15 there are two openings 34 adjacent each side of the bed and spaced apart longitudinally of the bed, said openings 34 on each side of the bed being separated by a strip 35 that is integral with the bed.

Spring arms 36 shaped to engage with and clamp the opposite sides of the barrel of a syringe mounted in the device are located in the rectangular opening 33 and extend upwardly above the plane of the bed 15. The spring arms 36 are provided with reversely bent portions 36a that have at their free ends connecting tabs 36b which overlie the strips 35 and are clinched or clamped around said strips as clearly indicated in Figs. 1, 2 and 6. It will be noted by reference to Fig. 6 that the spring arms 36 engage the barrel of the syringe only above the transverse center line thereof and hence produce a resultant force on the barrel that acts to hold it in position in the device.

The bed 15 immediately to the right of the rectangular opening 33 as viewed in Figs. 1 and 2 is provided with a second downwardly extending V-shaped syringe supporting portion 37 similar to the supporting portion 30 previously referred to. At the right hand edge of the supporting portion 37 the bed 15 is provided with a rectangular opening 38 which extends transversely of the bed 15 and on its right hand side as viewed in Fig. 1 communicates with a narrow oval opening 39 in the bed. The rectangular opening 38 has its longer dimension extending trans-

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versely of the bed 15 as does the longer dimension of the narrow oval opening 39, it being observed that the length of the rectangular opening 38 is shorter than the length of the opening 33 in the transverse direction of the bed.

The narrow oval opening 39 is provided to receive the enlarged flange at the end of the barrel of the syringe and which is usually gripped by two of the fingers of the user of the syringe when pushing or pulling the plunger thereof inwardly or outwardly of the barrel.

The bed 15 intermediate its longitudinal side edges and the ends of the rectangular opening 38 and of the oval opening 39 is provided with longitudinally extending narrow rectangular openings 40. Spring guide plates 41 are secured to the upper side of the bed 15 and project upwardly therefrom adjacent the opposite ends of the rectangular opening 38 and said plates have their upper ends outwardly curved. The purpose of the plates 41 is to guide the barrel of the syringe into position in the V's and between the spring arms 36 when the syringe is being mounted in the device.

The spring guide plates 41 extend upwardly a greater distance than do the spring arms 36 and are wider in the longitudinal direction of the bed than the spring arms 36. The plates 41 at their lower ends are provided with securing portions 42 which extend laterally toward the longitudinal edges of the bed 15 and bear upon the bed and overlie the narrow rectangular openings 40. The securing portions 42 at their outer ends have upturned flanges 42a and just inwardly of said flanges are provided with openings registering with the narrow rectangular openings 40. The securing portions 42 also are provided with downturned locating prongs which at one side of the portions 42 extend into the openings 40 and at the other side thereof extend into the adjacent ones of the spaced openings 34.

Securing screws 43 pass through the openings in the securing portions 42 and have their heads on their upper ends engaging the upper sides of said portions 42 and the upturned flanges 42a thereof. Clamping sleeves 44 having knurled operating heads are screwed upon the lower threaded ends of the screws 43 and engage the underside of the bed 15 to securely clamp the portions 42 and the spring plates 41 in position on the bed.

The bed 15 at its right hand end as viewed in Fig. 1 is provided with a rectangular cutout 45 centered on the longitudinal center line of the bed 15 and which communicates at one end with the narrow oval opening 39 by means of a throat opening 46 having rounded sides 47 to provide the requisite operative clearance for the operating head of the plunger of the syringe.

The bed 15 at its right hand end where the leg 17 is located is provided on its longitudinal center line with an upwardly extending arm 48 which can be termed a stop and supporting arm. The stop function of the arm 48 is that the head of the plunger of the syringe will contact said arm to prevent complete withdrawal of the plunger from the barrel of the syringe. The supporting function of the arm 48 is that the device can be stood in vertical position and will be supported in such position by the leg 17 and the arm 48.

Intermediate the longitudinal sides of the rectangular cutout 45 and of the bed 15 are elongated longitudinally extending parallel slots 49. Downwardly facing channel-shaped guide members 50 extend transversely of the bed at opposite sides of the cutout 45 and their inner ends overlie said cutout.

The guide members 50 extend across the slots 49 and the sides of said guide members on their lower edges have downwardly extending lugs 51 that have guiding sliding movement in the slots 49 so that the guide members 50 can be adjusted longitudinally of said slots. The guide members 50 at their outer ends and on their upper sides have upturned flanges 50a and just inwardly of the flanges 50a are provided with openings through which

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extend clamping bolts 52, the heads of which engage said flanges 50a.

Stop members 53 are slidable within the guide members 50 and transversely of the bed 15 from a position wherein their inner ends lie in the path of movement of the head of the plunger of the syringe as the plunger is being withdrawn from the barrel of the syringe to a position wherein such inner ends are out of the path of movement of said head of the plunger.

The stop members 53 have elongated slots 54 through which the clamping bolts 52 extend and the outer ends of the stop members 53 are provided with upwardly extending actuating handles 55. The clamping bolts 52 also extend through openings formed in retaining springs 56 interposed between the undersides of the stop members 53 and the upper side of the bed 15 and which function to maintain the stop members by spring friction in either their extended operative position or their retracted idle position.

Knurled headed clamping sleeves or nuts 57 are screwed onto the threaded lower ends of the clamping bolts 52 and can be screwed against the underside of the bed 15 to clamp the guide members 50 in any desired position longitudinally of the slots 49. The bed adjacent the slots 49 can have graduations and numerals formed thereon and calibrated in terms of volume of liquid to be drawn into the syringe. The inner ends of the stop members 53 are beveled or tapered and have inclined side edges 53a as clearly shown in Figs. 1 and 10, and the purpose of which will later be more fully pointed out.

It will be observed that a guide member 50 having a stop member 53 slidable therein is secured to the bed 15 at each side of the rectangular cutout 45. It will also be observed that the guide members 50 and the stop members 53 are symmetrical and hence can be interchangeably used for either side of the cutout 45.

In Fig. 11 a medical injection syringe is illustrated in elevation and said syringe as will be well understood in the art includes a barrel 58 having at one end the flange 59 and mounting at its opposite end the needle 60. The plunger of the syringe is indicated at 61 and its operating head at 62.

In Figs. 11 and 12 the needle 60 of the syringe is shown as passing exactly centrally through the central opening 63 in the metal retaining cap 64 secured to the neck of a vial 65 that is of circular cross-sectional configuration. Also the needle 60 is shown as penetrating the rubber plug 66 of the vial.

In Fig. 13 the needle 60 of the syringe is shown as passing through the central opening 63 of the metal cap 64 and penetrating the rubber plug in the neck of a vial 65a that has a portion of circular cross-sectional configuration and a portion of hexagonal cross-sectional configuration.

In Fig. 14 the needle 60 of the syringe is similarly indicated with respect to a vial 65b that is of square or polygonal cross-sectional configuration. The manner in which the device is employed will now be described.

It may be assumed that the cradle 21 has been adjusted vertically to and secured in the correct position relative to the downwardly extending V-shaped portion 27 and to the downwardly extending portions 30 and 37, such that when a vial is properly positioned in the cradle 21 the needle 60 of the injection syringe that is properly positioned in the portions 30 and 37 will exactly align with the longitudinal center line of the vial so the pointed end of the needle will be centered with respect to the opening 63 in the metal retaining cap 64 of the vial and the needle can puncture the rubber stopper or plug 66 and extend the proper distance into the vial.

It will also be presumed that the guide plates 41 have been properly adjusted and that one or both of the guide members 50 for the stops 53 have been adjusted longitudinally of the slots 49 and locked in adjusted position such that the head 62 of the plunger 61 of the syringe

will engage the stops 53 to limit the filling movement of the plunger to provide for the right single dosage if only one stop is used or for a mixed dosage or successive dosages if both stops are used.

The setting of the guide members 50 for the stops 53 will be done accurately in accordance with the dose or dosages to be given the patient and can be carried out by the physician, nurse or other person competent to make such setting.

To facilitate the setting the bed may be provided on one or both sides of the slots 49 with graduations and numbers calibrated in dosage sizes for which the syringe is to be filled with liquid from the vial.

The user may take the syringe and withdraw the plunger slightly from the barrel 58 thereof and then position the syringe in the downwardly extending portions 39 and 37 of the bed and with the flange 59 of the barrel properly located in the narrow oval opening 39 of the bed. The guide plates 41 will facilitate the positioning of the syringe in the device while the spring arms 36 when the syringe is positioned will contact the syringe above the center line thereof so as to exert a downward pressure upon the barrel that maintains the syringe in the downwardly extending V-shaped portions 39 and 37.

The user now takes the vial of liquid which we will assume is of polygonal cross section, such as the vial 65b shown in Fig. 14. The neck of the vial is inserted into the cradle 21 and if the vial is properly oriented, as indicated in Fig. 4, it can be pushed fully into the cradle until the neck of the vial is supported by the downwardly extending V-shaped portion 27 and the metal cap 64 of the vial is in engagement with the stop tabs 29 of the bed.

It will be recalled that when a polygonal cross-sectioned vial is used in the device it will only pass the gate coil spring 26 if properly oriented relative to the cradle 21 and if it is improperly oriented it will engage with the gate 25, 26 as indicated in Fig. 9 so that the user must turn the vial to its proper position to complete the insertion of the same into the device.

The positioning of the vial in the device causes the point of the needle to pass centrally through the opening 63 in the metal retaining cap 64 of the vial and to puncture or rupture the plug 66 and extend the correct distance into the vial.

The user now makes sure that the sliding stop 53 which is adjacent to the head 62 of the plunger of the syringe is moved to its projected or inward position wherein it is located in the path of movement of the head 62 as the plunger of the syringe is drawn outwardly during the filling operation. The user now stands the device vertically and grasps the head 62 of the plunger 61 of the syringe and draws the plunger downwardly until the head 62 contacts the stop 53, at which time the proper amount of the liquid has been drawn into the barrel of the syringe from the interior of the vial.

If a single unmixed dosage is required the user may now position the device horizontally, remove the vial from the needle of the syringe and then remove the properly filled syringe from the device, it being noted that due to the inclined edge 53a on the end of the stop 53 the syringe can be readily tilted to perform the removing operation, since there is only a line contact between the stop and the head 62 of the plunger. The user may now employ the properly filled syringe for the actual injection step.

It may be that the next injection which is to be given the patient requires a larger dosage and hence in filling the syringe for the next injection the stop that is closer to the head 62 of the syringe when mounted in the device will be retracted and the user will then pull the plunger of the syringe outwardly until the head 62 engages the more remote stop.

On the other hand, it may be desired to fill the syringe with a predetermined amount of liquid of one type and

then to further fill the syringe with a predetermined amount of liquid of a different type and use the mixed liquid in a single injection. In such instance the vial of the liquid of the first type is first mounted in the device and the syringe is filled therefrom utilizing the stop 53 that is adjacent to the head 62 of the plunger for this purpose. Then the first vial is removed from the device and the vial containing the second type of liquid is inserted therein until the needle of the syringe punctures the rubber plug and enters the vial. Then the stop that is adjacent to the head 62 of the plunger is retracted and the plunger of the syringe is withdrawn still farther until it engages the remote stop 53 and this fills the syringe with the second type of liquid to the desired amount.

It will be noted that the large oval cutout 31 provides adequate space to accommodate the fingers of the user when inserting the syringe into the device and during the filling operation, thus facilitating the use of the device. It will also be understood that since the actual filling operation is carried out with the device positioned vertically only the liquid will be drawn into the syringe and the likelihood of drawing air into the syringe from the vial is removed.

The foregoing detailed description of an embodiment of the invention explicitly indicates the advantageous features of the device and the fact that it accomplishes the hereinbefore enumerated advantages.

Although a preferred embodiment of the invention has been illustrated and described herein, it will be understood that the invention is susceptible of various modifications and adaptations within the scope of the appended claims.

Having thus described my invention, I claim:

1. A device for filling to an exact amount a medical injection syringe from a vial containing liquid to be injected into a person subcutaneously, said device comprising an elongated bed provided with longitudinally spaced means for mounting therein a vial and a syringe in a relationship such that the needle of the syringe will penetrate the exact center of the stopper of the vial on the longitudinal center line of the latter, and means carried by the bed and adjustable longitudinally thereof, and stop means carried by said last named means and movable therein transversely of the bed to an extended position in the path of movement of the head of the plunger of the syringe mounted in the device as the plunger is drawn outwardly of the barrel during the filling operation to limit positively such outward movement of the plunger to effect the filling of the syringe with the exact desired amount of the liquid or to a retracted position outside the path of movement of the head of the plunger, and means for maintaining said stop means in either said extended position or said retracted position.

2. A device as defined in claim 1 and wherein said bed at one end thereof is provided with a cutout portion and a vial supporting cradle is mounted in said cutout portion, said bed at the inner end of said cutout portion being provided with a substantially V-shaped portion adapted to support the neck of a vial mounted in the cradle and with stop tabs adapted to engage the metal retaining cap on the neck of the vial when the vial is fully inserted into position in the cradle.

3. A device as defined in claim 2 and wherein means is provided for adjusting said cradle in a direction perpendicular to the plane of the bed and for clamping said cradle in adjusted position.

4. A device as defined in claim 2 and wherein said cradle is of substantially upwardly facing V-shape and carries a spring gate extending between its opposite upper longitudinal edges and above the cradle and which functions to hold a vial in position in the cradle and also to prevent the insertion into the cradle of a vial that is improperly oriented with respect to the configuration of the cradle.

5. A device for filling to an exact amount a medical

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injection syringe from a vial containing liquid to be injected into a person subcutaneously, said device comprising an elongated bed provided with spaced means for mounting therein a vial and a syringe in a relationship such that the needle of the syringe will penetrate the exact center of the stopper of the vial on the longitudinal center line of the latter, and means adjustably carried by the bed and clamped in adjusted position thereon and extending into the path of movement of the head of the plunger of the syringe mounted in the device when the plunger is withdrawn from the barrel of the syringe during the filling operation to limit positively the withdrawing movement of the plunger to effect the filling of the syringe with the exact desired amount of the liquid, said means for mounting the syringe in the bed including longitudinally spaced substantially V-shaped supporting portions in which the barrel of the syringe is positioned, said bed being provided with an opening in which the flange at the end of the barrel of the syringe remote from the needle thereof can be positioned to maintain the barrel against longitudinal movement during the filling operation.

6. A device as defined in claim 5 and wherein said bed has secured thereto on its upper side spring arms which engage the barrel of the syringe that is positioned in the longitudinally spaced V-shaped supporting portions, such engagement being confined to a location above the transverse center line of the barrel wherefore said spring arms act to hold the barrel in said supporting portions.

7. A device as defined in claim 6 and wherein said bed intermediate said longitudinally spaced substantially V-shaped supporting portions for the syringe barrel is provided with an enlarged cutout affording space for the user's fingers in mounting the syringe in the device, said bed also being provided intermediate the opening for the flange on the end of the barrel and said spring fingers with guiding plates facilitating the insertion of the syringe into the device, said guiding plates being secured to the bed by means providing limited adjustment of the plates longitudinally of the bed.

8. A device as defined in claim 5 and wherein said means adjustably carried by the bed and clamped in adjusted position thereon includes a guide member having a stop slidable therein in a direction transversely of the bed, and spring means within said guide member and acting to maintain said stop frictionally in a projected position wherein its inner end is in the path of movement of the head of the plunger of the syringe or in a retracted position wherein its inner end is out of the path of movement of said bed of the plunger.

9. A device as defined in claim 8 and wherein the inner end of said stop is tapered so that the head of said plunger engages a side edge of the inner end of the stop with a line contact.

10. A device for filling to an exact amount a medical

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injection syringe from a vial containing liquid to be injected into a person subcutaneously, said device comprising an elongated bed provided at its opposite ends with supporting legs and adjacent one end with means for mounting the vial therein and adjacent its opposite end with means carried by the bed longitudinally thereof and clamped in adjusted position thereon, stop means carried by said last named means and movable therein transversely of the bed to an extended position in the path of movement of the head of the plunger of a syringe mounted in the bed when the plunger is withdrawn from the barrel of the syringe to limit such withdrawing movement of the plunger or to a retracted position without the path of movement of the head of the plunger, means for maintaining said stop means in either said extended position or said retracted position, said bed being provided intermediate said first two mentioned means with means for mounting therein a syringe in a relationship such that the needle of the syringe will penetrate the exact center of the stopper of the vial on the longitudinal center line of the latter.

11. A device as defined in claim 10 and wherein said bed adjacent its end opposite to the end thereof that is provided with the means for mounting a vial therein is provided with a longitudinally extending cutout and intermediate the sides of said cutout and the longitudinal sides of the bed with elongated parallel slots, while guide members are adjustable longitudinally of said slots and means are provided for clamping said guide members in adjusted position, said guide members having stops slidable therein in a direction transversely of the bed so as to be positioned in the path of movement of the head of the plunger of the syringe during the filling operation or to be positioned out of the path of movement thereof, spring means in said guide members and acting on said slidable stops to frictionally maintain the same in the various positions to which they have been moved.

12. A device as defined in claim 11 and wherein said bed at the end of the longitudinally extending cutout which is adjacent to the end of the bed is provided with a fixed stop element that prevents complete withdrawal of the plunger of the syringe from the barrel thereof.

13. A device as defined in claim 12 and wherein said bed at its end that is provided with the longitudinally elongated cutout has a supporting leg, while said stop element is located substantially in the same plane as said leg and functions with said leg as a support for the device when the device is placed in a vertical position.

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