United States Patent

[11] 3,612,051

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[45] Patented **Oct. 12, 1971**

[54] **HYPODERMIC SYRINGE APPLICATING DEVICE**
1 Claim, 12 Drawing Figs.

[52] **U.S. Cl.** **128/215,** 128/329
[51] **Int. Cl.** **A61m05/00,** A61m 05/20
[50] **Field of Search** 128/215, 329, 253

[56] **References Cited**

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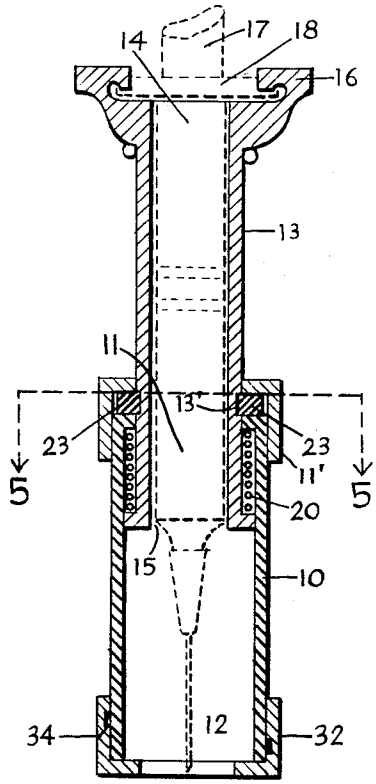
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Attorney—Charles Richard Werner

ABSTRACT: The applicator includes a hypodermic syringe holder telescopingly mounted for movement within a guide portion. A spring normally biases the holder and guide into a telescoped position. A pair of arcuate segments within the guide portion are spring biased into an annular groove in the holder for releasably positioning the holder and guide in an extended relationship under spring tension. Adjacent ends of the segments are bevelled and cooperate with bevelled ends of an actuator for releasing the segments from the groove.



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SHEET 1 OF 2

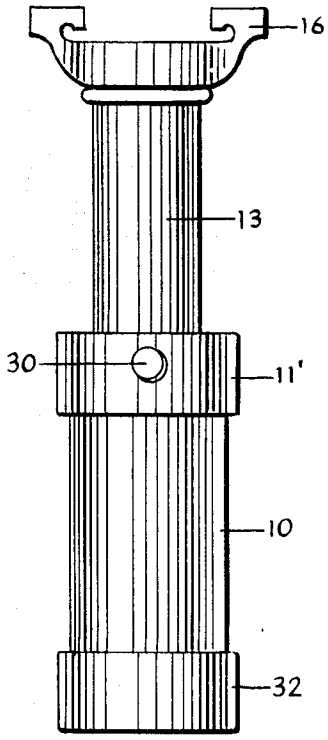


FIG. 1

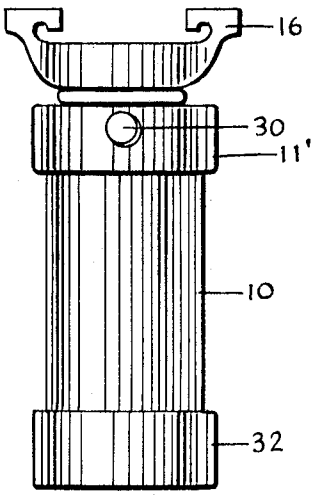


FIG. 2

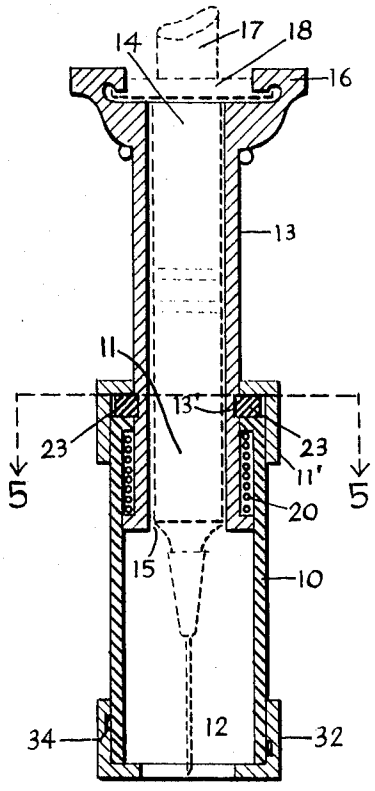


FIG. 3

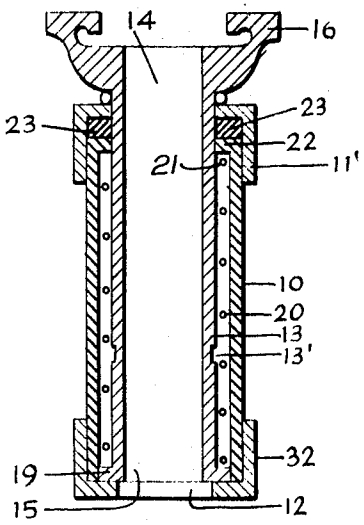


FIG. 4

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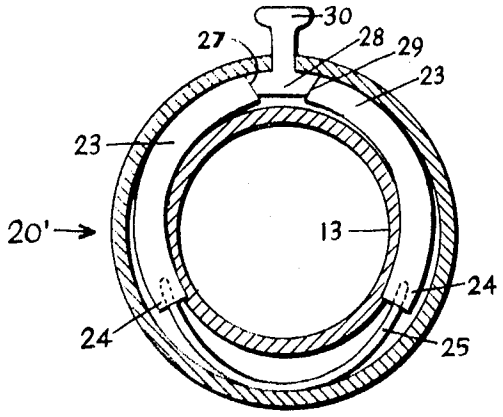


Fig. 5

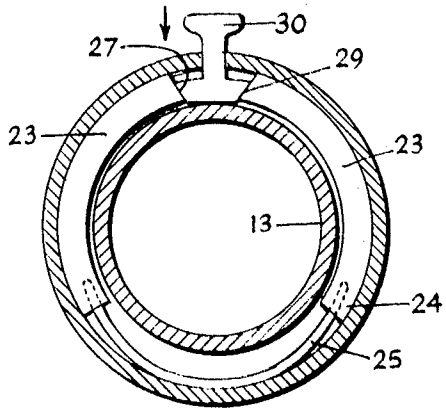


Fig. 6

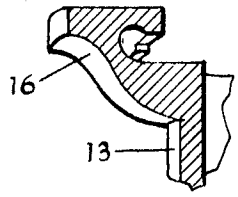


Fig. 7

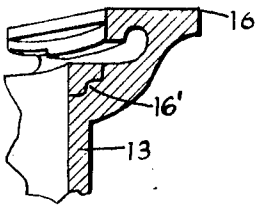


Fig. 7a

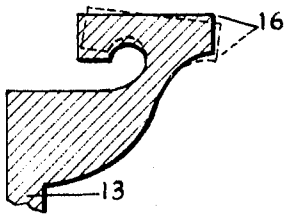


Fig. 8

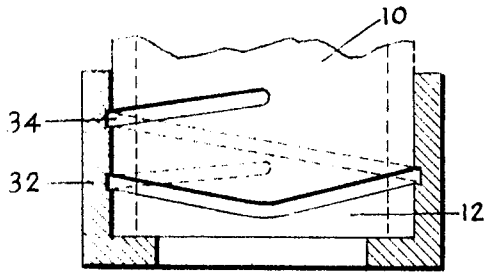


Fig. 9

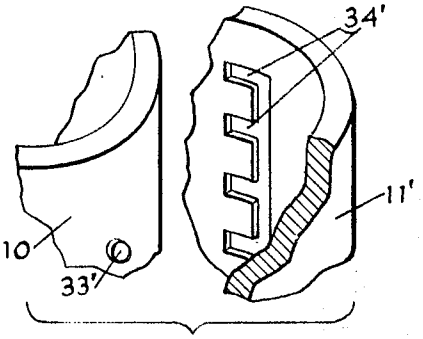


Fig. 10

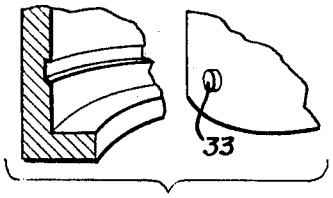


Fig. 9a

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HYPODERMIC SYRINGE APPLICATING DEVICE

BACKGROUND OF THE INVENTION

Insofar as I am aware there is nothing in the prior art which contemplates the use of an instrument which receives a hypodermic syringe needle, is capable of being adjusted to regulate the depth of entrance of the needle into the flesh, and which can be rested on the skin and the needle quickly and easily released for rapid entrance into the skin the proper depth with no relative movement in any lateral direction to cause movement or possibility of breakage of the needle.

To my knowledge all hypodermic needles are applied in one standard fashion which is by gripping a portion of the flesh, or in the case of intravenous injections seeking a suitable vein and then manually forcing the needle therein estimating the proper depth and angle of needle entrance.

The injection of liquids in humans or animals requires the insertion intravenous, intramuscular or subcutaneous of the hypodermic needle affixed to a syringe, the application and use of such syringes being delicate, because it is necessary to observe certain rules not only respective to the zone of injection but also the depth of insertion of the needle.

Also, use of a hypodermic syringe needle is accompanied by an emotional reaction by the patient, naturally averse to use of a hypodermic injection, giving the sensation of pain, real or imaginary, related to habit or actual feeling by the patient receiving the injection, which is due to the manner in which the needle is introduced in the muscular or subcutaneous portion of the patient.

SUMMARY OF THE INVENTION

One essential object of the device is to provide mechanical means for holding the syringe and the rapid and controlled insertion of the needle to the person receiving the injection, in such a manner that the needle insertion is always in a rapid and equal manner, in respect to the depth, assuring the compliance with respective medical rules and practices and assuring almost completely the elimination of emotional reaction and pain normally occasioned by such hypodermic applications.

Another object of the invention is to provide a device of the class described of simple design, not subject to decomposition and capable of repeated use, which is required in hospitals and clinics.

One other object of the invention is to provide a device which accomplishes mechanically the most difficult aspect of hypodermic injections which permits such injections to be made by the patient himself or by any other person in the home or elsewhere without any previous experience, this normally being most difficult or impossible to achieve until one has been trained and has at least some experience in the use of a hypodermic needle in its present everyday form of use.

Another object of the invention is to provide a device of this nature at a low cost of manufacture, permitting its purchase and use in all manners of situations where hypodermic injections are required.

Another object of the invention is to provide a device in which the insertion of the hypodermic needle in the zone of a subcutaneous, intramuscular, or other area is accomplished by applying the apparatus in a simple and easy form.

One other object of the invention is to provide a device for the application of hypodermic injections in which the insertion of the needle is accomplished mechanically and with rapidity, preventing any emotional shock, which is particularly important with children and with animals.

Another object of the invention is to provide a device which may be employed for the support of various types of hypodermic syringes.

Still another object of the invention is to provide a device in which the same needle may be used for different methods of hypodermic injections, such as subcutaneous or intramuscular.

With these and other objects in mind and which may be apparent hereinafter, the invention consists in the design, construction and functional combination of a device for hypodermic injections which are specified in detail hereinafter and which are illustrated in the annexed drawings, it being understood that changes and modifications in form, structure and size may be made without departing from the spirit of the novelty of the invention.

DESCRIPTION OF THE DRAWINGS

In the following figures of the drawings the same reference numerals are applied to the same portions of the invention, the drawings being as follows:

FIG. **1** is a front, elevational view of the device in its working position, with the supporting cylinder for the hypodermic syringe displaced outwardly preparatory for injection.

FIG. **2** is a front elevational view of the device illustrated in FIG. **1** in which the cylindrical support has been displaced to its internal or injection position.

FIG. **3** is a vertical sectional view through the device shown in FIG. **1**.

FIG. **4** is a vertical sectional view through the device shown in FIG. **2**.

FIG. **5** is a cross-sectional view on the line **5—5** of FIG. **3** illustrating the retention segments in their cylinder supporting position.

FIG. **6** is a similar transverse cross-sectional view on the line **5—5** of FIG. **3**, showing the position of the supporting segments after they have been displaced to permit free movement of the cylinder.

FIG. **7** is a fragmentary perspective sectional view of one form of the design of the upper end of the cylinder support.

FIG. **7***a* shows a modification of the upper end of the cylinder support with stepped portions for reception of various size hypodermic syringes.

FIG. **8** is a fragmentary sectional view of a portion of the cylinder support showing by dotted lines the distortion displacement possible for receiving and supporting the hypodermic syringe.

FIG. **9** illustrates one form of the device with respect to its lower end and the telescopic cylinder adjustment, a fragmentary part of the cylinder guide being shown in dotted lines.

FIG. **9***a* illustrates a fragmentary perspective part of the structure of FIG. **9** with a portion of the guide cylinder member offset therefrom to illustrate the pin and groove arrangement between the cylinder and its supporting element.

FIG. **10** illustrates in a fragmentary perspective disassociated view the upper portion of the guide cylinder and a cap member showing an alternate form of the retention means therebetween when the cylinder is in raised position.

DETAILED DESCRIPTION

The invention comprises substantially the provision of a mechanical means for firmly supporting a hypodermic syringe in such a form that the mechanical means results in the desired displacement of the syringe assembly which includes a needle fixed in conventional form at its lower extremity and placed on any desired part of the body, resulting in controlled insertion of the needle in said part of the body, in such manner that the needle is inserted the proper depth which corresponds to the method of hypodermic injection as applied, the device functioning by operation of a button which frees a cylinder supporting the syringe for its displacement within the device.

With this general assembly and relationship the basic form of the invention illustrated in the drawings, particularly in FIG. **1**, comprises a main support or guide **10** which is a substantially cylindrical portion open at its upper end **11** and lower end **12**.

Another tubular support **13** is adapted to operate within the first-mentioned support **10**, which is also open at both ends **14** and **15**, as may be seen in FIGS. **3** and **4**, the tubular section **13** being provided with projections **16** at its upper end **14** for sup-

porting a hypodermic syringe 17 shown in dotted lines in FIG. 3.

The projections 16 are of specific internal form which permits the easy reception of lateral projections 18 of the conventional hypodermic syringe, said projections being normally used by the user of the syringe for manipulating same by reception of his fingers.

For the purpose of accommodating various types of hypodermic syringes in the tubular support 13, the projections 16 may have stepped portions 16' which may be seen in FIG. 7*a*, and also may have an inherent amount of elasticity as indicated by dotted lines. (See FIG. 8).

The projections 16 also have the facility of providing the finger reception faculty of conventional hypodermic syringes as the index and forefinger can be received thereby for the easy operation of the plunger of the syringe and the injection of the liquid contained therein.

The lower extremity 15 of the tubular support 13 comprises externally disposed projections 19, which receive and support spiral spring 20, held at its upper extremity 21 by the projecting flange 22 of the main support or guide member 10, all of which may be seen in FIGS. 3 and 4 of the drawings.

The spring 20 may be placed in its compressed position illustrated in FIG. 3, when the tubular support 13 is displaced externally of the main support member 10 in which position it is held by means of a retention member and latch assembly 20' generally illustrated in FIGS. 5 and 6. This retention member and latch are adapted to release the spring 20 to control the operation of the device and are formed of the functional combination of a pair of segments 23 at whose ends 24 are provided a spring segment 25 which normally forces the segments 23 into closed or securing position, the ends of the segments remote from the spring 25 being inclined as at 27 and against which rest the inclined surfaces 29 of interior portion 28 of a finger operated button 30 extending through an opening in upper cap or collar 11'. (See FIGS. 3 and 4).

Thus, when the tubular section or support 13 is raised to extreme upper position the segments 23 urged by the spring segment 25 are seated in the annular groove 13' and retain the tubular support in the extreme upper position compressing the spring 20.

The operation of the button inwardly in the direction of the arrow causes an interaction between the inclined surfaces 27 and 29 and the displacement of the segments 23 from the annular groove 13' which permits the spring 20 to act rapidly, forcing the tubular support 13 to move instantaneously downwardly.

The hypodermic syringe is located within the tubular support 13 as is illustrated in FIG. 3, the displacement of the tubular support in the manner described resulting in the displacement of the hypodermic syringe and consequent insertion of the needle in the zone to be injected, to the predetermined and proper depth.

The displacement of the tubular support 13 within the body 10 is determined by the position of telescopic stop member 32 situated at the lower end of the main support or guide 10 and which may be placed at any one of various distances in relation to the lower end 12 of said main support 10 by adjusting means illustrated in one form as shown in FIGS. 9 and 10.

For the purpose of adjusting the telescopic stop member 32, one modification shown in FIGS. 9 and 9*a* illustrates the lower end 12 of the main support cylinder 10 provided with a projection or pin 33 adapted to slidably operate in the slots 34 of the telescopic stop member 32.

In the modification shown in FIG. 10, the projection or pin 33' at the upper end of the main support or guide cylinder 10 is adapted to be positioned in any one of the lateral slots 34' of upper collar 11', the depth of the needle insertion being determined by the lateral slot selected.

What I claim as new and desire to Secure by Letters Patent is:

1. A hypodermic-applicating device comprising a syringe-supporting member,

a guide support member telescopingly receiving the syringe-supporting member,

a spring means between the syringe-supporting member and the guide support member for biasing the members into a telescoping folded position,

means for releasably cocking the syringe-supporting member into an extended position in relation to the guide-supporting member,

the cocking means comprising an annular groove in the lower portion of the hypodermic syringe-supporting member,

a pair of spaced arcuate segments oppositely disposed between the upper portion of the guide-supporting member and the hypodermic syringe-supporting member and adapted to be received in the annular groove,

a spring segment positioned between one pair of adjacent ends of the arcuate segments normally urging said arcuate segments into groove engaging position,

the other pair of adjacent ends of the arcuate segments being bevelled,

and release means comprising a manually operable element having bevelled surfaces contacting the bevelled ends of the arcuate segments and adapted to force said bevelled ends apart to release the segments from the annular groove, releasing the syringe-supporting member from the guide support member for rapid longitudinal movement of the hypodermic syringe and its supporting member through the guide support member and insertion of the needle of the syringe into the patient receiving the injection.