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OPERATING MECHANISM FOR AUTOMATIC HYPODERMIC SYRINGES

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Fig. 1

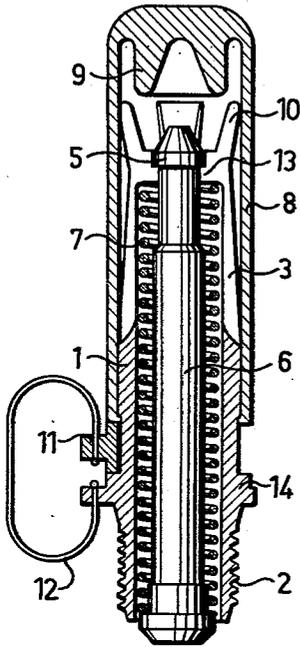


Fig. 2

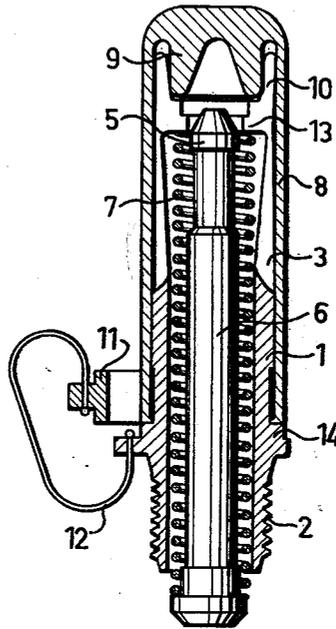


Fig. 3

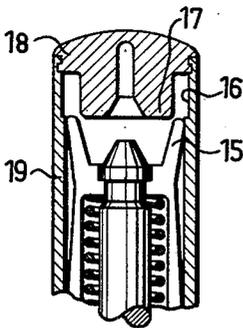
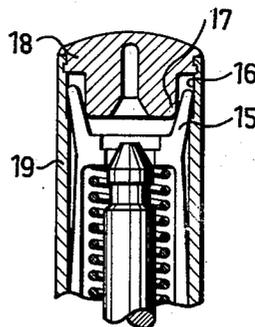


Fig. 4



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OPERATING MECHANISM FOR AUTOMATIC HYPODERMIC SYRINGES

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3 Claims. (Cl. 128—218)

This invention deals with an operating mechanism for automatic hypodermic syringes, that is to say syringes where the injection occurs automatically after the mechanism has been released so that the injection needle is brought into an active position and the injection fluid is squirted out through the needle. Automatic syringes are particularly intended for such civilian or military use where the patient gives himself an injection.

Syringes of this type are often kept for long periods in a charged condition, that is to say, they are ready for immediate use. It is therefore a prerequisite that the releasing device provides a guarantee against involuntary release as well as of satisfactory functioning when needed. Further it is important that after use the syringe can be reloaded in a simple way, that is to say, it must be easy to re-apply the tension so that the syringe is ready for further use when new injection fluid is inserted, usually in the form of a full ampoule.

The operating mechanism according to the present invention comprises a spring-driven operating device for the moving parts of the syringe, a retaining catch for holding the operating device taut, as well as an arrangement for releasing the operating mechanism from the retaining catch, and is characterised in that it consists of at least two tongues of a springy material running along the body of the syringe and arranged to engage with as well as holding in a taut position, a spring-loaded rod that serves as a driving device and is arranged to move along the centre of the syringe body, and also in that the rear end of the syringe body is provided with a release arrangement which can be moved along the syringe and which is arranged to engage with the rear portions of the tongues and which, when moved towards the body of the syringe, presses these tongues outwards so that they release the rod.

The invention will subsequently be described by reference to the accompanying drawing, where FIGS. 1 and 2 show an embodiment of the invention with FIG. 1 showing the arrangement in a loaded, secured state and FIG. 2 showing the same arrangement where the release has just occurred following the withdrawal of the securing arrangement. FIGS. 3 and 4 show a second embodiment, FIG. 3 in a loaded state, and FIG. 4 in a state of beginning release, analogous to FIG. 2.

The arrangement according to FIGS. 1 and 2 consists of a substantially cylindrical portion 1 which, by means of threads 2, is designed to be screwed into the upper end of a hypodermic syringe, which is not shown. Thus the portion 1 will constitute the rear part of the body of the syringe.

The rear part of the member 1 is divided into a number of preferably four, flexible tongues 3. The tongues 3 are arranged to engage with a flange 5 on a rod 6 arranged in the cylindrical member 1, by means of heels 13. This rod 6 is actuated by a coil-spring 7 which endeavours to push it in the direction of the front part of the syringe. The member 1 is surrounded by a cylindrical cover 8. The inside of the bottom of said cover has projections 9 arranged to engage with the upper ends

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10 of the tongues 3 and to move these outwards when the cover 8 is pressed down to its extreme position, as to secure the mechanism against involuntary release there is a resilient split ring 11, which is furnished with a handle 12, preferably in the form of a nylon cord ranged round the member 1 so that it rests partly against the lower edge of the cover 8 and partly against a flange 14 on the member 1.

When the mechanism is to be released one first pulls out the ring 11 with the aid of the handle 12. Then one grips the cover 8 and jabs or pushes the front end of the syringe against that part of the body where the injection is to be made. The cover 8 is pressed down over member 1, and the projections 9 press the obliquely ranged ends 10 of the tongues 3 outwards towards the inner wall of the cover 8, by which the heels 13 release the flange 5 on the rod 6. The spring 7 now pushes the released rod 6 forward in the body of the syringe towards its front part.

The events that take place in the front part of hypodermic syringe, which is not shown, will not be described here since they do not constitute any part of this invention.

When the injection is finished and the syringe is to be prepared for immediate use the complete operating mechanism is unscrewed from the front part of the body of the syringe and the securing ring is replaced, and the coil spring is compressed by pressing in the rod 6 until a click is heard. No special tool is required for this operation but the rod can simply be pressed against a table, for instance, until it reaches the secured position illustrated in FIG. 1, where the lower end of the rod reaches somewhat beyond the threaded portion of the cylindrical portion 1. Thereafter the operating mechanism is screwed into an already prepared front part and the syringe again ready for use.

The device of FIGS. 3 and 4 differs from that of FIGS. 1 and 2 only as regards the cover, designated 19 in FIGS. 3 and 4. The cylindrical portion of the cover is closed at its top by a member 18 which is provided with projecting portions 17, arranged to engage with the upper portions 15 of the springy tongues which hold the spring-loaded rod in a taut position. The upper portion of the wall of the cylindrical cover 19 has a thinner portion 16. The space between said portion 16 and the projecting portion 17 is so wide that the tongue portions 15 can enter in said space without changing their upward-outward direction. Compare with the embodiment of FIGS. 1 and 2 where the tongue portion 1 must be bent from the position of FIG. 1 into the position of FIG. 2 when the mechanism is to be released.

What is claimed is:

1. An operating mechanism for an automatic hypodermic syringe of the type including a spring-driven operating device for the moving parts of the syringe, a retaining catch for holding the operating device taut and an arrangement for releasing the operating mechanism from the retaining catch, characterized in that said mechanism comprises a generally cylindrical hollow body the same being at one end thereof threaded to mate with a threaded end of such syringe, a coil spring and an actuating rod within the coil thereof, said coil spring and actuating rod being disposed within said hollow body said actuating rod being provided with a shoulder at the rear end of the same which is remote from said threaded portion, a plurality of resilient tongues extending from and mounted on said hollow body rearwardly with respect to said threaded portion and surrounding the adjacent rear portions of said actuating rod and coil spring said tongues being interiorly provided with a first shoulder constituting a support for the rear end of said coil

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and with a second shoulder engaging the said der of said operating rod to hold the operating rod in spring-loaded position, a release arrangement movable along said hollow body and adapted to engage said shouldered tongue and which, when moved toward the rear end of said body, presses said shouldered tongue outwardly so as to release said spring-loaded actuating rod from said tongues.

The mechanism according to claim 1, characterized at the release arrangement is in the form of a cover surrounding the rear end of the syringe, and that the cover is provided inside with projections arranged to engage the rear ends of the tongues.

An operating mechanism for an automatic hypodermic syringe of the type including a spring-driven opening device for the moving parts of the syringe, a retaining catch for holding the operating device taut, an arrangement for releasing the operating mechanism from the retaining catch, characterized in that the mechanism comprises a generally cylindrical hollow body the same being at one end thereof threaded to mate with the threaded end of such syringe, a coil spring and an actuating rod within the coil thereof, said coil spring actuating rod being disposed within said hollow body, said actuating rod being provided with a shoulder at the rear end of the same which is remote from said threaded portion, a plurality of resilient tongues extending from and mounted on said hollow body rearwardly

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with respect to said threaded portion and surrounding the adjacent rear portions of said actuating rod and coil spring, said tongues being interiorly provided with a first shoulder constituting a support for the rear end of said coil spring and with a second shoulder engaging the said shoulder of said operating rod to hold the operating rod in spring-loaded position, a release arrangement movable along said hollow body and adapted to engage said shouldered tongue and which, when moved toward the threaded end of said body, presses said shouldered tongue outwardly so as to release said spring-loaded actuating rod from said tongues, and latch means removably inactivating said release arrangement.

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