

- [54] FOIL SEALED SYRINGE**

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- [58] **Field of Search** ... 128/235, 234, 239, 224, 173,  
128/218

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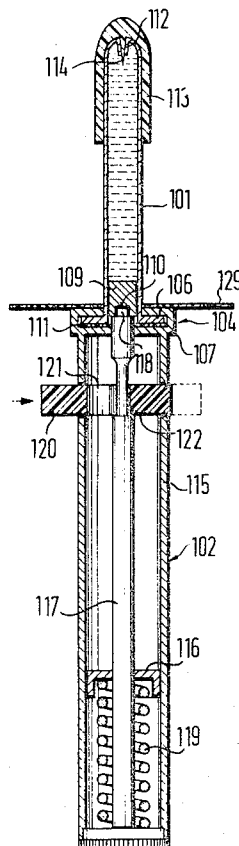
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- [57]
- ABSTRACT**

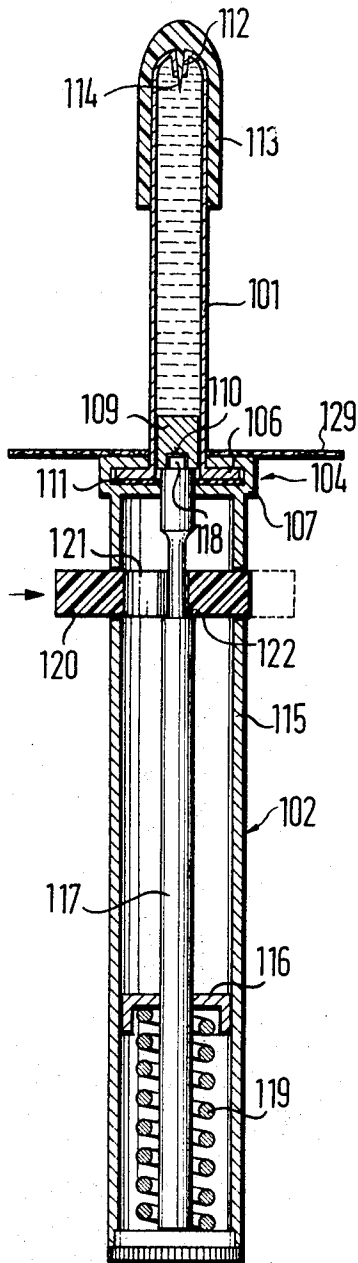
A spring loaded syringe device is provided with a liquid container which is foil sealed. The foil is pierced by an actuating rod of the device which also engages the piston of the syringe when the syringe is operated, for example as an enema device.

**4 Claims, 1 Drawing Figure**



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INVENTOR

BY

## FOIL SEALED SYRINGE

This invention relates to a syringe comprising a cylindrical liquid container with an injection tube and a push-out piston movable in said liquid container between a container-full position and a container-empty position.

It is the object of this invention to provide a syringe which can be used by the patient himself and which allows exact dosing of the medicine.

With this object and others in view, as will presently become apparent, the invention provides an otherwise conventional syringe including an actuating device for moving said push-out piston so as to push out liquid.

A further object of this invention is to provide a syringe in which only a simple finger or hand operation is sufficient for actuating the syringe when it has been brought into operational position.

With this object in view this invention provides a syringe in which the actuating device comprises a spring device biased when said push-out piston is in its container-full position and in which the push-out piston is arrestible in its container-full position by an easily releasable holding means for holding said push-out piston in the container-full position against the action of the spring device.

A further object of this invention is to provide a syringe in which the actuating device can be used repeatedly.

With this object in view the invention further provides a syringe in which the actuating device is a unit separate from the liquid container and the push-out piston and easily connectable with the liquid container and the push-out piston.

It is a further object of this invention to provide a syringe in which the actuating device is of very simple and consequently of very cheap construction.

With this object in view the invention further provides a syringe in which the actuating device is a simple actuating rod to be brought into engagement with the outer end of the push-out piston.

Other features, additional objects, and many of the attendant advantages of this invention will readily be appreciated as the same becomes better understood from the following description of a preferred embodiment when considered in connection with the appended drawing.

The syringes of this invention can for the most part be produced from cheap plastic material. The production cost for the spring are so low, particularly if the spring is made of wire coiled at the production place of the syringe, so that repeated use is not necessary.

In the embodiment of the Drawing the syringe consists of two basic portions, i.e. from the liquid container **101** being formed as injection tube and an actuating device **102** which can be coupled to this liquid container. The injection tube **101** is connected to the respective actuating device **102** by means of a slide lock **104**, the one part arranged to the injection tube **101** being marked with **106** and the other part arranged to the actuating device being marked with **107**. In its operational position the part **106** is embraced by part **107** so that the respective injection tube **101** is held at the actuating device **102**.

The injection tube **101** shows a push-out piston **109** which is provided with a recess being part of a contact

connection for engagement of another part of a contact connection (still to be described) of the actuating device. The push-out piston **109** forms a sealing of the liquid container being formed as injection tube; said container is sealed by an easily pierceable foil **111**. The open end of the injection tube has an opening **112** and can be closed by a cap **113** which has a pin **114** for piercing a membrane which seals said opening **112**.

The actuating device **102** consists of a sleeve **115**. An actuating rod **117** is movably guided in the interior of this sleeve by means of a guide piston **116**. The actuating rod is provided at its outer end with a tenon being the part **118** of the contact connection; this tenon enters in operational position into the opening **110** of the push-out piston **109** when the actuating rod **117** has pierced the foil **111**, which may e.g. consist of aluminum, during the arresting of the injection tube **101**.

The actuating rod **117** is spring-loaded by a helical coil compression spring **119** which abuts on the one hand against the guide piston **116** connected to said actuating rod **117**, and on the other hand against the sealed end of the sleeve **115**. In the position as shown in FIG. 8 the helical coil compression spring **119** is biased, the actuating rod being held in its position by a locking slide **120** passing in diametral direction through said sleeve. This locking-slide is provided with an aperture **121**, one shoulder **122** of the actuating rod **117** interacting with said aperture; by moving the locking-slide **120** in arrow direction into the position illustrated by the dotted lines the actuating rod **117** pushes forward the push-out piston **109** and presses the contents of the injection tube **101** through the opening **112** opened by the piercing of the membrane.

What is claimed is:

1. A syringe unit, comprising a cylindrical liquid container with a push-out piston, movable in said liquid container between a container-full position and a container-empty position, and an actuating device for moving said push-out piston so as to push out liquid, said actuating device being detachably connected to said liquid container and said push-out piston, and comprising a sleeve, one end of said sleeve detachably connected to said liquid container, an actuating rod guided in said sleeve, one end of said actuating rod in engagement with said push-out piston, a helical coil compression spring supported in said sleeve and acting with said actuating rod, a locking-slide passing axially through said sleeve, said locking-slide having an aperture, said actuating rod having a shoulder interacting with said aperture so as to pass through said aperture when said locking slide is in a releasing position and to be retained when said locking slide is in a retaining position, the compression spring being compressed when said shoulder is retained, the outer end of said liquid container being sealed by pierceable foil, said actuating rod being adapted to pierce said foil and engage said push-out piston when in a released position.

2. In a syringe unit as set forth in claim 1, wherein said locking slide is nearer to said one end of said sleeve than to the other end of said sleeve.

3. In a syringe unit as set forth in claim 1, wherein said liquid container is connected to said end of said sleeve by a slide lock.

4. In a syringe unit as set forth in claim 1, wherein said liquid container is made from plastic material.

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