Jan. 18, 1938. S. M. LEWIS 2,105,946

APPLICATOR

Filed Dec. 6, 1935

Fig. 1.

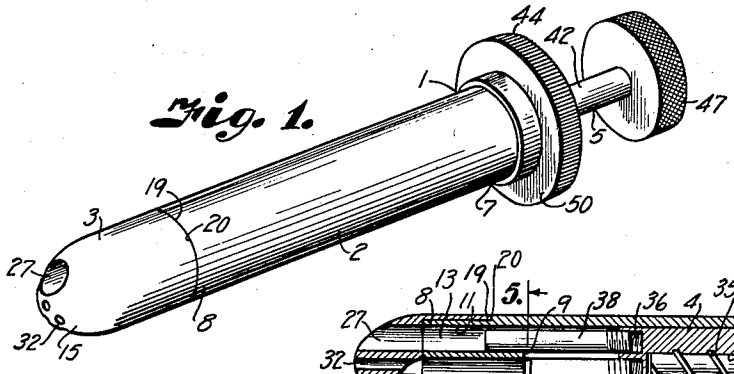


Fig. 2.

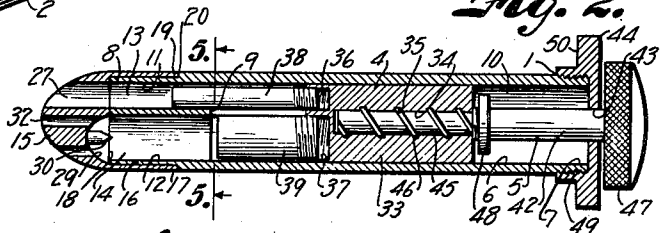


Fig. 3.

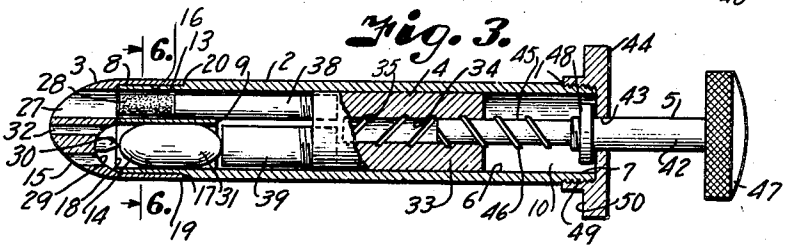


Fig. 4.

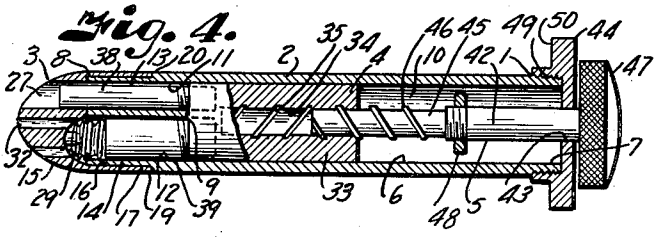


Fig. 5.

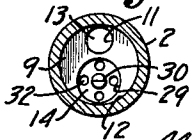


Fig. 6.

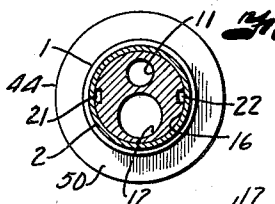


Fig. 7.

Fig. 8.

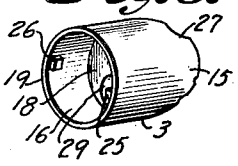


Fig. 9.

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APPLICATOR

Sidney M. Lewis, St. Joseph, Mo.

Application December 6, 1935, Serial No. 53,165

9 Claims. (Cl. 128—260)

This invention relates to applicators, particularly to those for administering medicaments into body cavities at the point where they are to become effective. It is well known that many unstable compounds are highly suitable for medicaments and their effectiveness is dependent upon their decomposition or upon chemical unison of the separate ingredients of which the compounds are composed. Such compounds, however, cannot be dispensed because of their unstable nature and even when dispensed in the separate elements composing them they cannot be successfully administered.

It is, therefore, the principal object of the present invention to provide an applicator with means for simultaneous injection of separate ingredients that are capable of chemical reaction to produce a medicine which is ordinarily unstable in combined form, or for the simultaneous injection of a medicament and its solvent where the natural body fluids are not sufficient in quantity to act as a solvent.

It is also an important object of the invention to provide for injection of separate chemicals in tablet or capsule form or a combination of these forms, that is two or more tablets or capsules, or one or more capsules and one or more tablets.

Other important objects of the invention are to provide a simple, inexpensive device of this character which may be loaded with separate ingredients and kept ready for use, to provide a device which is of small size and compact character, to provide against accidental discharge of the device when loaded, and to provide a device that is readily cleaned and kept in sanitary condition.

In accomplishing these and other objects of the invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing wherein:

Fig. 1 is a perspective view of an applicator constructed in accordance with the present invention.

Fig. 2 is a longitudinal section through the applicator showing the stem for actuating the plunger in telescoped position to provide compactness and to prevent accidental discharge of the ingredients in case the device is loaded.

Fig. 3 is a similar section illustrating the stem in extended position and the device loaded with separate medicaments, one of which is in capsule and the other in table form.

Fig. 4 is a perspective view of the applicator showing the parts after the tablet and contents of the capsule have been ejected.

Fig. 5 is a cross section through the barrel of the applicator on the line 5—5 of Fig. 2.

Fig. 6 is a similar section on the line 6—6 of Fig. 3.

Fig. 7 is a detail perspective view of the parts of the applicator shown in disassembled spaced relation.

Fig. 8 is a detail perspective view of the applicator nozzle.

Fig. 9 is a modified form of capsule or cartridge adapted for use in the applicator.

Referring more in detail to the drawing:

1 designates an applicator constructed in accordance with the present invention and which is shown as including a barrel 2 having a nozzle 3 and containing a plunger 4 that is operated in the barrel by an actuating stem 5. The barrel 2 is preferably cylindrical and has an axial bore 6 opening from its rear end 7 but terminating short of its forward end 8, as at 9, to provide a plunger chamber 10. Extending through the forward end of the barrel in parallel relation with the axis of the bore 6 are spaced bores 11 and 12 extending to the plunger chamber 10 to form separate medicament compartments 13 and 14.

The compartments 13 and 14 conform to the shape and size to which the separate medicaments are compounded, the medicaments being retained therein by the nozzle 3 which is removably connected with the applicator barrel to permit insertion of the medicaments. The nozzle 3 conforms in outer diameter to that of the barrel and has a rounded forward end 15 and a socket 16 at its opposite end of suitable diameter to snugly engage over the end of the barrel which is reduced in diameter, as at 17, to provide sufficient material in the wall of the nozzle and at the same time form a smooth continuation of the barrel. The end of the barrel thus seats against the bottom 18 of the socket and the rim 19 of the nozzle against the shoulder 20 formed by the reduced diameter of the barrel.

In order to removably secure the nozzle on the barrel for quick adjustment, the reduced portion of the barrel is provided at opposite diametrical sides with bayonet grooves 21 and 22 including longitudinal ways 23 and transverse arcuate ways 24 located adjacent the shoulder 20. The inner face of the socket end of the nozzle has lugs 25 and 26 which engage in the longitudinal ways as the nozzle is slipped into the barrel, and in the arcuate ways 24 upon slight rotation of the nozzle to lock the nozzle thereon.

The nozzle has an outlet passageway 27 which

registers with the compartment 13 and forms a continuation thereof through which the medicament, such as a tablet 28, is expelled as later described. Also formed in the nozzle at the bottom of the socket and in registry with the compartment 14, is a concave recess 29 having a spur or prong 30 projecting rearwardly in substantial alignment with the compartment 14 to puncture a capsule 31 that is contained therein, and to allow outlet of the medicament through ports 32 that are arranged in circular series about the prong 30 and extend forwardly in substantially parallel relation with the outlet passage 27. The plunger 4 includes a cylindrical body 33 freely slidable within the chamber 10 and having an axial bore 34 provided with a long lead internal thread 35.

Formed in the opposite end of the plunger are internally threaded sockets 36 and 37 aligning with the bores 11 and 12 that form the medicament compartments 13 and 14. Adjustably threaded therein are ejector pins 38 and 39 conforming in diameter to the bores of the compartments and having their forward ends 40 and 41 projecting thereinto for engaging the medicaments.

The sockets are preferably of sufficient depth to adjustably mount the ejector pins so that their forward ends may be positioned in conformity to the size of capsule or tablet used in the respective medicament compartments. At least one of the ejector pins, and preferably both, are of such length that they will engage within the bores of the compartments when the plunger is in retracted position to prevent rotation thereof in the barrel.

The plunger actuating stem 5 has a cylindrical portion 42 slidable through an opening 43 in a cap 44 closing the rear end of the barrel, and a reduced portion 45 having a thread 46 for engaging the thread of the plunger, as shown in Fig. 2. Formed on the outer end of the stem is knurled knob 47 for actuating the stem, as later described. In order to limit retractive movement of the stem when it is threaded out of the bore of the plunger the portion 42 thereof is threaded and provided with a stop nut 48 to engage the inner face of the cap when the stem is moved to retractive position. The cap 44 is preferably threaded upon the rear end of the barrel, as indicated at 49, and has an enlarged peripheral portion 50 to form a finger hold to cooperate with the knob 47 in effecting operation of the plunger.

In asembling a device constructed as described, the plunger is inserted into the bore 6 through the rear end thereof so that the ejector pins 38 and 39 enter the bores forming the medicament compartments 13 and 14, as shown in Fig. 2.

The stem 5 is then extended through the opening in the cap 44, after which the nut 48 is sleeved over the threaded portion of the stem and threaded on the end of the portion 42 to cooperate with the knob 47 in retaining the stem in fixed relation to the cap. The stem is then rotated by turning the knob 47 so that the threaded end thereof will engage and enter the threaded bore of the plunger. The cap 44 is then threaded onto the end of the barrel after which the knob 47 is turned until the stem is in completely retracted position At this point the knob 47 lies close against the end of the barrel, as shown in Fig 2. The nozzle 3 is then applied to the opposite end of the barrel in such a manner that the lugs 25 and 26 enter the longitudinal ways of the bayonet slots after which it is rotated to latched position.

When the device is thus asembled it is in substantially compact character and may be conveniently carried. If desired, the device may be carried in loaded condition without danger of accidental discharge of the medicaments due to the fact that when the stem is in retracted position, as shown in Fig. 2, it is impossible to actuate the plunger so that the ejector pins thereon will expel the medicaments that might be contained in the medicament compartments.

To load the device, the nozzle 3 is rotated to release the lugs 25 and 26 thereof after which it can be withdrawn from the barrel. A suitable tablet 28 is then inserted in the compartment 13, and a capsule in the compartment 14 after which the nozzle is reapplied, as above described.

When the device is to be used, the knob 47 is rotated so as to effect retraction of the stem relatively to the plunger. When the nut 48 engages the inner face of the cap the stem is then in condition to effect actuation of the plunger by pressing inwardly on the knob 47, which causes the plunger to move in the direction of the medicaments and the ejector pins 38 and 39 to pass into the respective compartments effecting expulsion of the tablet and collapse and puncture of the capsule so that the tablet, and liquid contained in the capsule, are simultaneously discharged through the passageways 27 and 32 respectively, to react with each other after expulsion.

The capsule contemplated may be of gelatine type, however in the instance of some medicaments such a capsule may be soluble and in lieu thereof I may use a metallic capsule made of relatively thin material, such as illustrated in Fig. 9, the capsule including a tube 51 having a rounded end 52 adapted to be punctured by the prong 30 and having its opposite end sealed by rolling the open end thereof, as at 54.

While I have specifically illustrated and described the invention as employing a tablet and a gelatine capsule for containing liquid, jelly or other fluid medicament, it is obvious that the applicator may be constructed by providing two or more of the chambers 14 located in circular series about the axis of the barrel whereby liquids alone may be ejected or two or more of the compartments 13 may be provided for ejecting only medicaments of tablet form.

From the foregoing it is apparent that I have provided a simple, inexpensive applicator for the simultaneous ejection of a plurality of medicaments capable of reaction with each other after ejection, or the device may be used for ejecting a solid medicament, such as a tablet, and a liquid for dissolving the tablet.

What I claim and desire to secure by Letters Patent is:

1. A device of the character described, including a barrel having compartments for containing separate chemicals capable of inter-reaction, a nozzle on the barrel for retaining the chemicals in said compartments and having outlet passages in communication with said compartments, and means in the barrel for effecting simultaneous ejection of the chemicals from said compartments for discharge through said passages.

2. In a device of the character described, a barrel having compartments for containing a tablet and a capsule respectively, a nozzle on the barrel having outlet passageways connecting with

the compartments, capsule puncturing means in the capsule compartment, a plunger slidable in the barrel, and ejector pins on the plunger for respectively engaging the tablet and capsule upon reciprocation of the plunger to effect expulsion of the tablet and puncture and collapse of the capsule.

3. In a device of the character described, a barrel having compartments for containing a tablet and a capsule respectively, puncturing means in the capsule compartment, and means for effecting expulsion of the tablet, puncture of the capsule by said puncturing means, and collapse of the capsule.

4. In a device of the character described, a barrel having compartments for containing a tablet and a capsule respectively, a nozzle on the barrel having separate outlet passageways aligning with the compartments, capsule puncturing means in the capsule compartment, and ejectors reciprocable in the compartments for respectively engaging the tablet and capsule to effect expulsion of the tablet and puncture and collapse of the capsule.

5. In a device of the character described, a barrel having compartments for containing separate medicaments respectively in capsule and tablet form, a plunger slidable in the barrel, ejector pins on the plunger for respectively engaging in the compartments upon reciprocation of the plunger to effect expulsion of the tablet and puncture and collapse of the capsule, a stem for effecting actuation of the plunger, and means for threadedly connecting the stem with the plunger.

6. In a device of the character described, a barrel having compartments, a nozzle on the barrel having separate outlet passageways aligning with the compartments, a prong in one of the compartments for puncturing a medicament containing capsule inserted in said compartment, a plunger slidable in the barrel, and ejector pins on the plunger for reciprocation in the compartments to effect puncture and collapse of the capsule and to eject a medicament from the other compartment.

7. In a device of the character described, a barrel having separate compartments for containing a tablet and a capsule respectively, a nozzle on the barrel having outlet passageways aligning with the compartments, a prong in the capsule compartment, a plunger slidable in the barrel, ejector pins on the plunger for respectively engaging the tablet and capsule upon reciprocation of the plunger to effect expulsion of the tablet and puncture and collapse of the capsule, and a stem threadedly mounted in the plunger for effecting actuation of the plunger.

8. In a device of the character described, a barrel provided with separate compartments for containing separate medicaments one of which is in capsule form, a plunger movable in the barrel toward said compartments, means on the plunger respectively projectable into the compartments to eject the medicaments, and puncturing means in the compartment containing the medicament in capsule form for puncturing the capsule incidental to operation of the plunger.

9. In a device of the character described, a barrel provided with separate compartments for containing separate medicaments one of which is in capsule form, a plunger movable in the barrel toward said compartments, means on the plunger respectively projectable into the compartments to eject the medicaments, puncturing means in the compartment containing the medicament in capsule form for puncturing the capsule incidental to operation of the plunger, and an actuating stem for the plunger having threaded engagement with said plunger.

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