

J. T. GREELEY.
HYPODERMIC SYRINGE.
APPLICATION FILED MAR. 25, 1911.

1,015,952.

Patented Jan. 30, 1912.

Fig. 4.

Fig. 1.

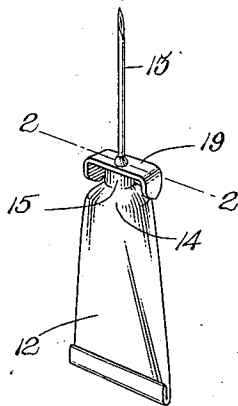


Fig. 5.

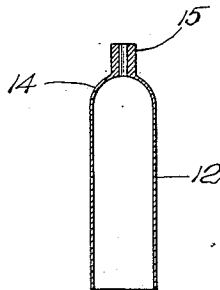
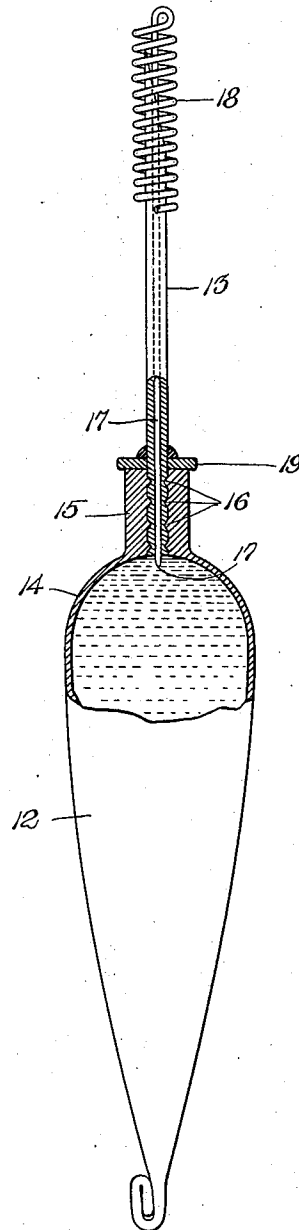
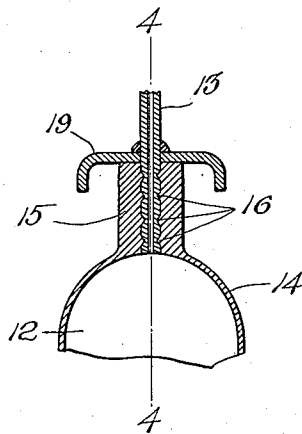


Fig. 2.



Witnesses:
Harry L. Allen
P. H. Pyzetti

Inventor:
J. T. Greeley
by Hugh Brown Limely May
Attorneys

UNITED STATES PATENT OFFICE.

JAMES T. GREELEY, OF NASHUA, NEW HAMPSHIRE, ASSIGNOR OF ONE-FOURTH TO
LUELLA L. GOOLD, OF PITTSBURGH, PENNSYLVANIA.

HYPODERMIC SYRINGE.

1,015,952.

Specification of Letters Patent.

Patented Jan. 30, 1912.

Application filed March 25, 1911. Serial No. 616,934.

To all whom it may concern:

Be it known that I, JAMES T. GREELEY, of Nashua, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in Hypodermic Syringes, of which the following is a specification.

Two of the underlying principles of hypodermic medication are asepsis and celerity, its successful employment requiring both speed and surgical cleanliness. Since the first employment of this method of medication the principle of construction of the hypodermic syringe has not changed at all. The only alterations have been in the line of improvements of the construction, but, up to now a piston syringe; a separate needle, to be attached by the operator; and medicine, usually in tablet form, in yet another container, are required. The syringe and needle are not destroyed, or rendered useless by a single application, but may be, and usually are, employed over and over again on different individuals, as was the old vaccine scarifier in vaccination. The surgeon, when called upon to employ hypodermic medication, must either sacrifice cleanliness for speed, and employ an unsterile syringe, needle, and remedy, or he must delay the employment of his remedy until he has sterilized, (usually by boiling), the syringe itself, the needle, and the water in which he intends to dissolve the hypodermic tablet. This also implies on the part of the operator, sterile hands, or the use of sterile rubber gloves, as he has to handle the needle in adjusting it.

The use of the hypodermic syringe is a surgical procedure, by which nature's protective (aseptic) dressing, the skin, is penetrated, and, as in any other surgical operation, if by the means of the instrument employed, or otherwise, infection is introduced beneath the skin, the surgeon has failed in his technique, and grave or even fatal consequences may follow. The employment of an unsterile needle, syringe or medical solution invites these risks. Yet the most modern and least complicated hypodermic syringe, by its very cumbersomeness, forces the surgeon to assume these risks rather than lose valuable time in properly pre-

paring the several agents that he is about to employ.

Every step in the ordinary procedure in hypodermic medication is out of accord with the principles of modern surgery and bacteriology, and occasional unfortunate consequences are forcing the medical profession to look for something better than the present hypodermic syringe, a syringe that can be used without delay, and one that may be safely assumed to be sterile.

My invention has for its object to provide a syringe which avoids the dangers and overcomes the objections above recited, and constitutes an applicator, the use of which involves practically no delay and which is always sterile.

The invention consists in a new article of manufacture, to wit, a hypodermic syringe composed of a collapsible capsule, charged with the liquid solution to be hypodermically administered, and a hypodermic needle having a practically non-renewable connection with the capsule, and constituting the only outlet for the capsule, which is hermetically closed at all points, excepting at its junction with the needle, and is adapted to be collapsed to expel its contents through the needle, the capacity of the capsule being sufficient for one injection only, and the collapsed capsule and the needle attached thereto being rendered useless by the operation of collapsing the capsule to expel its contents. By a practically non-renewable connection, I mean a connection which cannot be made by an operation equivalent to screwing the needle into or upon the liquid holder, and is of such nature that a second use of the same needle is not practicable. The capsule and needle constitute a one-charge syringe, which may be one of a number of similar syringes with which a practitioner may be supplied, the syringes being placed upon the market filled and ready for use, and labeled to indicate the contained solution.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view of a hypodermic syringe embodying my invention. Fig. 2 represents a section on line 2—2 of Fig. 1. Fig. 3 represents a longitudinal section of

the capsule before it is closed and connected with the needle. Fig. 4 represents an enlarged side view, partly in section, the plane of the section being indicated by the line 4—4 Fig. 2.

The same reference characters indicate the same parts in all of the figures.

In the drawings, 12 represents a capsule, and 13 a hypodermic needle attached thereto. The capsule has no opening, except that provided by the lumen of the needle, and is charged with a liquid solution through one of its ends, the said end being closed and sealed after the insertion of the charge, so that the capsule is non-refillable. The capsule is preferably a tube composed of a ductile metal or alloy, such as that usually employed for collapsible tubes containing glue, paint, &c., the wall of the tube being relatively thin so that it may be collapsed and flattened by external pressure between the thumb and fingers. One end of the tube is tapered and contracted to form a breast 14, the central portion of which is extended to form a tubular neck 15, integral with the breast and of much smaller diameter than the main portion of the tube, the internal diameter of the neck being practically the same as the external diameter of the base portion of the needle. The base or inner end portion of the needle may be of any suitable formation, whereby it is adapted to be interlocked with the material of the neck 15 to prevent endwise movement of the needle relatively to the neck.

In Fig. 4 I show the external surface of the portion of the needle which enters the neck, roughened or corrugated, at 16. When the needle is inserted in the neck, the latter is compressed by a suitable tool to force portions of its material into engagement with the prepared surface of the needle, thus establishing a suitable non-renewable union between the needle and the neck. If desired, the non-renewable union may be a solder joint, applied in any suitable way.

17 represents a stylet which is adapted to enter the lumen of the needle and constitute a plug to prevent leakage of liquid through the needle. The stylet is composed of a single length of wire, formed to somewhat closely fit the lumen, the upper portion of the wire being formed into a series of coils 18, collectively forming a resilient shield or guard surrounding and protecting the point of the needle.

The capsule is preferably charged after the needle is attached thereto and temporarily closed by the stylet 17. When the capsule has been charged, the open end shown by Fig. 3, is closed by flattening the mouth of the capsule and folding over the edges, as indicated by Fig. 1, the folded portion being preferably made liquid-tight by solder. The form of the capsule, including

the breast 14, is such that the flattening or collapsing of the entire capsule will expel the entire charge through the needle, the collapsing pressure being applied by the thumb and fingers of the hand in which the syringe is held.

In Figs. 1 and 2 I have shown the syringe provided with a non-collapsible grip member 19, adapted to support pressure of the thumb and fingers and prevent such pressure from collapsing the tube when the pressure is exerted to force the needle into the skin. In some cases considerable pressure is required, and this pressure, if exerted on the collapsible portion of the capsule, would be likely to cause leakage of the solution before the entrance of the needle into the skin. This is prevented by the grip member 19, which is preferably a relatively stiff sheet metal piece, soldered or otherwise attached to the syringe, the ends of the piece being preferably bent or curved to support the pressure of a thumb and finger between which the member is grasped.

It will be seen that the described syringe is practically one article, the parts thereof being incapable of separation and reengagement, for permitting repeated use of the syringe. The syringe may conveniently be supplied in a sterile casing or holder, and requires only removal from the holder to adapt it for use, the syringe being already charged and sterilized. After the capsule has been once collapsed the syringe is, of course, unfit for further use, which is a new feature in the art of hypodermic medication.

Owing to the fact that the syringe is supplied to the medical profession charged and ready for use, the practitioner is enabled to administer a solution made of sterile distilled water and containing the exact amount of the pure drug demanded for the operation. The common practice when a syringe of the ordinary type is used, is to dissolve a tablet containing the drug in water. Most hypodermic tablets contain, in addition to the drug, a binder to maintain the drug in tabloid form, the binder being soluble in water. This binder may be, and usually is harmless, but it is not in the line of surgical perfection to force into living tissues any material, however harmless, which has no useful result.

I claim:—

1. As an article of manufacture, a hypodermic syringe composed of a collapsible capsule charged with liquid and having a collapsible breast at one end and a neck integral with the breast, said capsule, breast and neck being composed of ductile material, and a hypodermic needle inserted in said neck, said needle being of substantially uniform diameter throughout its length, the material forming the neck being compressed around the needle to form a permanent and

practically non-renewable connection between the neck and needle.

2. As an article of manufacture, a hypodermic syringe composed of a collapsible capsule charged with liquid and having a breast at one end and a neck integral with the breast, said capsule, breast and neck being composed of ductile material, and a hypodermic needle inserted in said neck, said needle being of substantially uniform diameter throughout its length and provided with a plurality of peripheral grooves, the material forming the neck being compressed around the needle and into said grooves to form a permanent and practically non-renewable connection between the neck and needle.

3. A hypodermic syringe comprising a collapsible capsule charged with liquid, a hypodermic needle having a practically non-renewable connection therewith, the lumen of the needle constituting the outlet of the capsule, and a non-collapsible grip member attached to the syringe and adapted to sustain pressure applied to force the needle through the skin, whereby such pressure is prevented from collapsing or indenting the capsule.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JAMES T. GREELEY.

Witnesses:

WILLIAM H. BARRY,
JAMES H. CONNOR.