Dec. 21, 1965 N. W. MELOTT 3,224,445

ASPIRATING SYRINGE

Filed March 1, 1956

FIG. 1

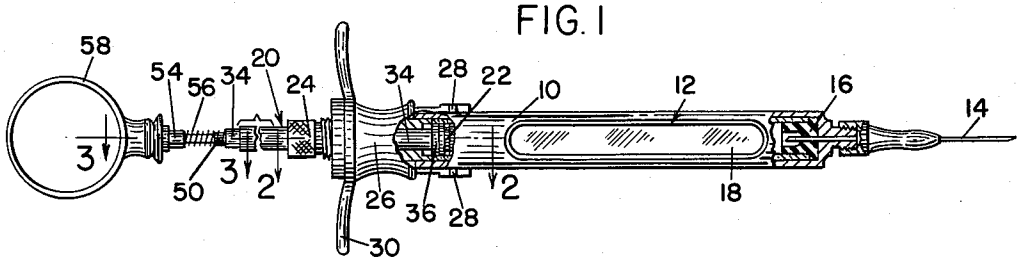


FIG. 2

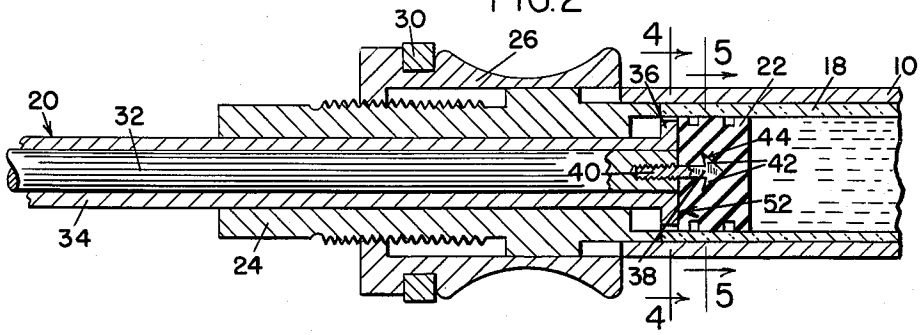


FIG. 3

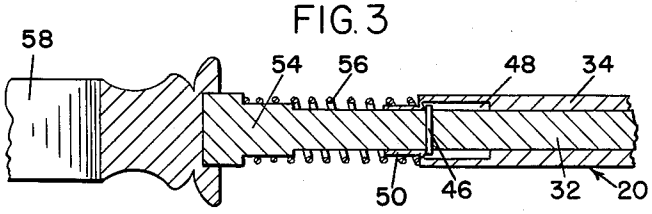


FIG. 4

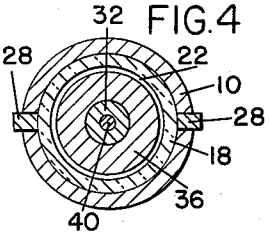


FIG. 5

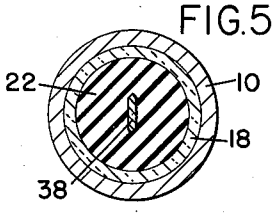
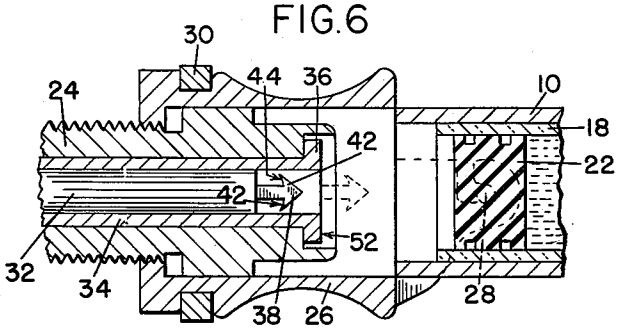


FIG. 6



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ASPIRATING SYRINGE

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3 Claims. (Cl. 128—218)

This invention relates to a new and improved plunger rod for use in a syringe with a disposable cartridge having a piston cork, and the principal object of the present invention comprises the provision of a dental-type cartridge syringe having a movable plunger rod provided with a retractible barbed or spearpoint head at the inner end thereof for piercing the piston cork of the conventional disposable cartridge and thereby affixing the plunger rod of the syringe to the cartridge piston cork, converting the conventional disposable cartridge into an aspirating cartridge.

In a conventional dental cartridge syringe, the plunger rod merely bears upon the piston cork of the cartridge and presses the cork inwardly to expel the cartridge contents through the syringe needle, but this does not provide for an aspirating action, which may be accomplished by a slight retraction of the cartridge piston cork in order to provide the operator with an indication as to whether or not the needle of the syringe has punctured a vein.

This invention provides simple, economical, and easily operated means for quickly affixing the plunger rod of the syringe to the piston cork of the cartridge, so that both aspiration and injection may be provided, merely by thrusting the novel barbed plunger rod inwardly, thereby piercing the piston cork with a sharp arrow or spearpoint, and hence assuring fixation of the plunger rod with respect to the cartridge piston cork; such fixation, however, being easily disrupted when the cartridge has been used and it is desired to throw it away merely by manually retracting the extending spearpoint within a sleeve provided for the purpose, and thus in effect pushing the cartridge piston cork from the spearpoint.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

FIG. 1 is a view in elevation of a syringe according to the present invention, parts being broken away and in section;

FIG. 2 is an enlarged section in the line 2—2 of FIG. 1;

FIG. 3 is an enlarged section on line 3—3 of FIG. 1;

FIGS. 4 and 5 are sections on the respective lines in FIG. 2; and

FIG. 6 is a view similar to FIG. 2 but illustrating the action of the spearpoint.

The invention may be used with any type of syringe presently used with disposable cartridges. The syringe illustrated is provided with a conventional barrel **10** having an observation window or windows **12** therein for viewing the cartridge for information as to content and aspiration. The barrel is provided with the usual needle **14** which extends rearwardly interiorly of the barrel to puncture the forward end **16** of the disposable ampoule or cartridge indicated at **18**.

The syringe is provided with an axially movable plunger rod generally indicated at **20** which is used to engage the cartridge piston cork **22** to move the same along the cartridge for expelling the contents thereof through the needle **14**.

The syringe also has a locking sleeve **24** which is threaded into the head **26**, the latter being hinged as at **28**

to the sides of the barrel. The head is provided with a fingerhold **30**. When the locking sleeve is retracted, it becomes disengaged from the inner end of the barrel and thus the head **26** may be pivoted in order to expose the inner end of the barrel. However, when the locking sleeve is tightened with the head in place, the head becomes relatively immovable for use of the syringe in the normal manner.

The plunger rod for any syringe comprises a pair of relatively axially movable parts, one of which is shown as a rod indicated at **32** and the other part being a surrounding elongated sleeve **34** which is provided with an annular lateral flange **36** at the inner end thereof for forming a firm contact with the cartridge plunger **22**, see particularly FIG. 2.

The inner end of the rod **32** of the present case is provided with a sharpened spearpoint indicated at **38**. This spearpoint may be made integral with the rod **32**, or it may be made separable and replaceable as for instance by means of screw-threads such as are shown at **40**. The spearpoint is provided with barbs **42** and these may be sharpened at their rear surfaces **44** (see FIG. 6) for a purpose to be described.

The rod **32** has a limited axial motion relative to the surrounding sleeve **34** and limiting means may be provided as for instance by a through crosspin **46** in the rod **32** which engages a shoulder **48** to limit the extent of outward motion of the spearpoint relative to the inner end of the sleeve **34**; and it may engage a necked-down or brazed collar **50** forming the limit stop for the other end of relative motion of rod **32** in the sleeve **34**. In any event, the spearpoint **38** is provided with approximately the limit of motion between the solid and dotted line showings thereof in FIG. 6. This spearpoint may be completely housed within the sleeve or it may be extended outwardly thereof, so that the barbs **42** are in spaced relation with the inner end surface **52** of the flange or annular abutment **36**.

The outer end of rod **32** is provided with an enlargement as at **54**, this enlargement providing a guide and abutment for a coil spring **56** which normally serves to maintain the spearpoint in retracted housed position when not in use.

In the use of the device, the locking sleeve **24** is backed off, the head **26** pivoted to one side, the disposable cartridge is inserted in the barrel; the head is then re-positioned, the locking sleeve is tightened and the rod **20** is moved forwardly so as to engage the flange **36** thereof with the exterior surface of the cartridge piston cork **22**. Continued thrust on the plunger rod **20** results in the piercing of the cork **22** by the spearpoint **30** until it becomes completely embedded therein as in FIG. 2. After the plunger is fixed, the needle is attached to the syringe.

The plunger rod of the syringe and the cork of the cartridge are now fixed together and the syringe may be operated both for aspirating and injecting as will be clear to those skilled in the art.

When the cartridge is to be disposed of, the rod **32** is retracted by fingerpiece **58**, and this action brings the spearpoint back in sleeve-housed position as shown in solid lines in FIG. 6, thus disrupting the sprearpoint from the cork **22**, allowing the entire cartridge to be disposed of, and a new cartridge replaced in the barrel. The spearpoint is more easily withdrawn from the cork due to the sharp edges **44** on the barbs.

It will be seen as in FIG. 2 that when the spearpoint is in its forwardmost position, the flange **36** engages the exposed surface of the piston cork **22**. The spring **56**, tending to retract the spearpoint maintains this relationship, so that upon aspiration and injection, but particularly upon the latter operation, the sleeve **34** and rod **32**

act as a unit and the sprearpoint alone is not depended upon to provide the motion of the cartridge piston cork 22.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. An aspirating syringe comprising a generally cylindrical magazine, a plunger reciprocable longitudinally within said magazine, and a substantially flat aspirator hook rigidly fixed to the forward end of said plunger; said magazine being adapted to receive therein a cylindrical ampoule having a piston stopper slidable forwardly therein to expel a medicament therefrom and retractible to afford aspiration, said hook having substantially similar opposite side faces approximately parallel to the line of reciprocal movement of the plunger; said hook being adapted to become embedded in said stopper without turning relatively thereto, and having a portion opposing its withdrawal from said stopper upon a retraction stroke of the plunger.

2. An aspirating syringe according to claim 1, said hook having a neck portion, and said withdrawal-opposing portion of the hook being a barb extending laterally from said neck portion.

3. An aspirating syringe according to claim 2, said barb having a rearwardly pointing end.

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