Jan. 10, 1956 E. R. SULLIVAN 2,730,099

HYPODERMIC NEEDLE INJECTOR

Filed Aug. 13, 1954

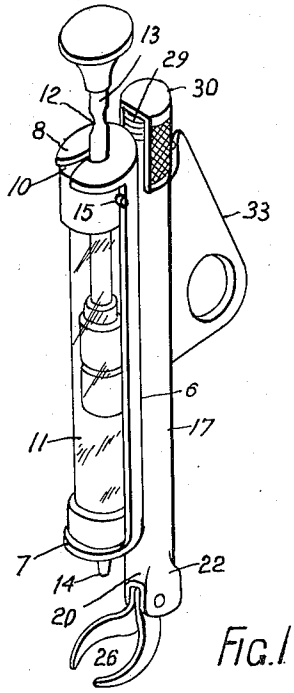

FIG. 1

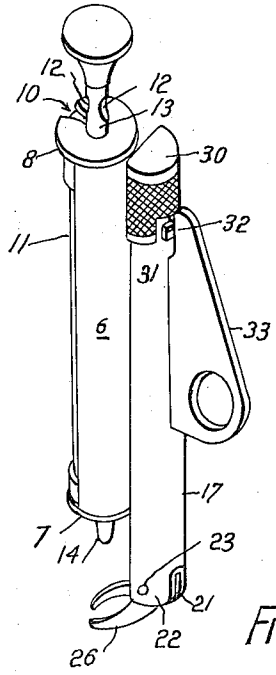

FIG. 2

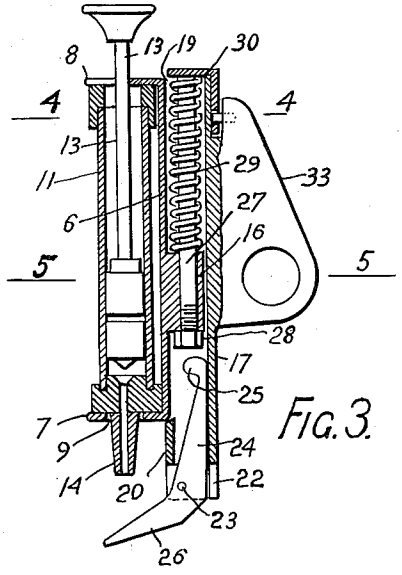

FIG. 3

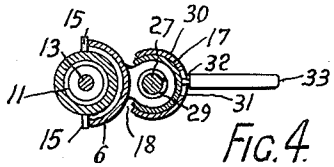

FIG. 4

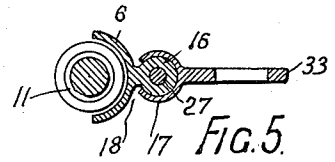

FIG. 5

INVENTOR
ERNEST R. SULLIVAN

By Lemuel Hoff Atty

United States Patent Office 2,730,099 Patented Jan. 10, 1956

2,730,099

HYPODERMIC NEEDLE INJECTOR

Ernest Ruben Sullivan, Bronte, near Sydney, New South Wales, Australia, assignor to Washington H. Soul Pattinson and Company Limited, Sydney, New South Wales, Australia, a corporation of New South Wales

Application August 13, 1954, Serial No. 449,546

Claims priority, application Australia August 28, 1953

4 Claims. (Cl. 128—218)

This invention has been devised to provide a hypodermic needle injector which can be easily manipulated to effect a self-administered injection.

Injectors made hitherto required two operations to make an injection, namely the release of a spring catch whereby the needle is forced under the skin, then manipulation of the plunger of the syringe to force liquid through the needle. It is difficult to hold the injector steady while carrying out these operations and if not held steady there is a danger of the needle breaking or injuring the skin. The injector of this invention overcomes this difficulty. In addition it provides simple means for adjusting the depth of penetration of the needle.

This injector briefly consists of a syringe holder, slidably mounted on a carrier with a needle projecting from one end and a syringe plunger projecting from the other end. A form of bell crank is pivoted to the carrier, one limb of the bell crank having a "forked foot" to bear on the body to be injected. The syringe holder can move through a vertical distance by means of a spring and a stop mounted in the carrier.

One embodiment of the invention is described with reference to the annexed drawings wherein Figs. 1 and 2 are perspective views of the injector from the front and back respectively; Fig. 3 is a longitudinal central sectional elevation; Figs. 4 and 5 are sections on lines 4—4 and 5—5 respectively of Fig. 3.

In this embodiment the syringe holder is an arcuate cradle **6** provided with ends **7** and **8**. The end **7** has a hole **9** axially therein and the end **8** has a slot **10** extending from the top edge to a part circular bottom in alignment with the hole **9**. A syringe **11** to be held in the cradle has two kerfs **12** formed in its plunger **13**. The syringe nedle holder **14** projects through the hole **9** and the plunger **13** at the position of the kerfs **12** is entered into the slot **10**. The plunger is then turned so that the kerfs do not register with the slot and the syringe is thus retained in the holder. The syringe may be provided with guide pins **15** which bear on the edges of the cradle **6** and prevent the syringe turning in the cradle. The guide member is a tube **16** fixed to the back of the arcuate cradle **6**.

The cradle carrier is a tubular member **17** with a longitudinal slot **18** therein which extends from the end **19** which is open to the other end near which there is a bridge **20** across the slot. The slot **18** extends beyond the bridge **20** reduced in width to the end **21** which is also open. The sides of the member **17** at this end are pressed inwardly to form guide cheeks **22**.

The bell crank is housed in the cradle carrier **17**. It is mounted on a pivot pin **23** fixed in the cheeks **22**. Limb **24** of the bell crank is accommodated in the cradle carrier and the travel of the bell crank is limited by said limb contacting the bottom of the cradle carrier **17** when retracted and by the bridge **20** when moved in the opposite direction. In the latter position an offset stop **25** on said limb **24** is in the track of the end **7** of the cradle

6. The other limb of the bell crank is in the form of a forked foot **26**.

A rod **27** slidably mounted in the guide tube **16** is screwed on the end juxtaposed the bell crank and has an adjusting nut **28** thereon. The other end of the rod **27** projects through the guide tube **16** and has a helical spring **29** thereon which is retained in position and compressed between said guide tube and a part cylindrical cap **30** on the end of said rod. The cap has a bayonet slot **31** therein; it is adopted to slidably fit on the end of the cradle carrier **17** where it is retained by a pin **32** entered into the bayonet slot.

The travel of the cradle **6** in the injecting direction is regulated by adjusting the nut **28**. The end of the rod **27** projecting from the nut abuts the end of the bell crank limb **24** when the cradle reaches the end of its travel. The cradle **6** is moved to injecting position by the helical spring **29** when pressure on the forked foot **26** of the bell crank moves the offset stop **25** clear of the end **7** of the cradle **6**.

A pin **33** fixed to the cradle carrier **17** constitutes a handle.

A spring may be provided to move the limb **24** of the bell crank to the position where its stop **25** engages the end **7** of the cradle **6** when said cradle is retracted against the resistance of the spring **29**.

I claim:

1. A hypodermic needle injector consisting of a syringe holder from which a nedle projects at one end and the syringe plunger projects from the other end, a carrier on which said syringe holder is slidably mounted, an adjustable stop to regulate the travel of the syringe holder on the carrier, a bell crank pivoted on one end of the carrier, one limb of said bell crank being adapted to bear upon the body where the injection is to be made, the other limb of said bell crank having an offset stop adapted to abut the syringe holder, a spring in the carrier adapted to force the syringe holder to the end of its travel as regulated by said stop when the bell crank stop is moved out of the track of the syring holder by pressure applied to the bell crank foot.

2. A hypodermic needle injector as claimed in claim 1 wherein the syringe holder is an arcuate cradle provided with ends, one end having a hole axially therein and the other end having a slot from the edge to a part circular bottom in alignment with the mentioned hole, a tubular guide member fixed to the back of the arcuate cradle.

3. A hypodermic needle injector having a syringe holder as claimed in claim 2 and having a cradle carrier made as an open ended tubular member with a longitudinal slot extending from one end to the other and having a bridge across the slot near one end with the sides of the tubular member beyond the bridge pressed inwardly to form guide cheeks, and having a handle in the form of a fin fixed to the tubular member, a bell crank mounted on a pivot pin fixed in said cheeks, one limb of said bell crank being accommodated in the cradle carrier, said limb having an offset stop adapted on movement of the bell crank in one direction to project through said longitudinal slot, the other limb of said bell crank being in the form of a forked foot having its prongs extending on each side of the track on a hypoderic needle mounted in the injector.

4. A hypoderic needle injector consisting of a syringe holder made as an arcuate cradle provided with ends, one end having a hole axially therein and the other end having a slot from the the edge to a part circular bottom in alignment with said hole, a tubular guide member fixed to the back of the arcuate cradle, a cradle carrier made as an open ended tubular member with a longitudinal slot extending from one end to the other and having a bridge across the slot near one end with the

sides of the tubular member at the end adjacent the bridge pressed inwardly to form guide cheeks, a bell crank mounted on a pivot pin fixed in said cheeks, one limb of said bell crank being accommodated in the cradle carrier, said limb having an offset stop adapted on movement of the bell crank in one direction to project through said longitudinal slot, the other limb of said bell crank being in the form of a forked foot having its prongs extending on each side of the track of a hypodermic needle mounted in the injector, a rod slidably mounted in said tubular guide member, said rod being screwed on the

end juxtaposed the bell crank limb in the cradle carrier, an adjusting nut on said screwed end, a helical spring on the other end of said rod compressed between said tubular guide member and a cap on said rod, said cap having means whereby it can be secured to said cradle carrier.

References Cited in the file of this patent

UNITED STATES PATENTS

1,320,536	Di Falco et al.	Nov. 4, 1919
2,047,010	Dickinson	July 7, 1936