Jan. 29, 1952 M. L. LOCKHART 2,583,743

HYPODERMIC SYRINGE

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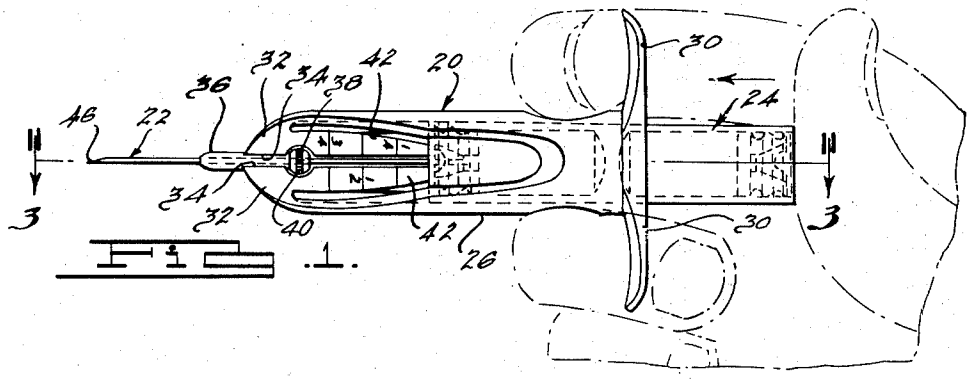


Fig. 1.

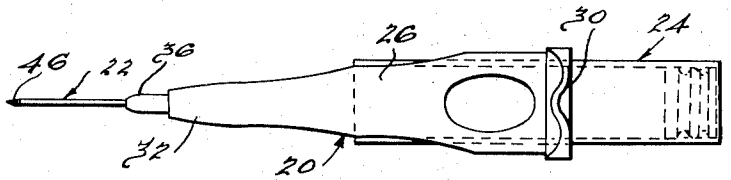


Fig. 2.

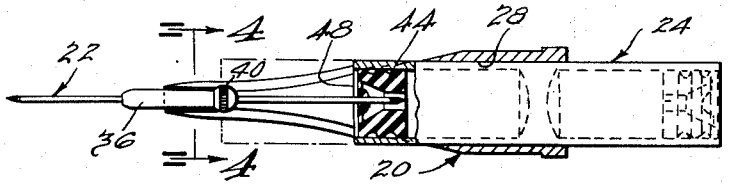


Fig. 3.

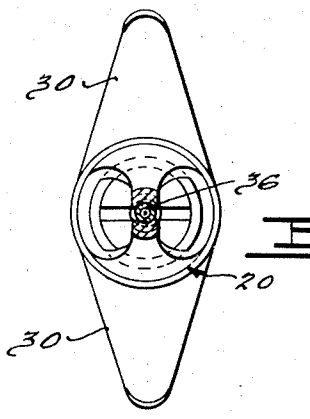


Fig. 4.

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HYPODERMIC SYRINGE

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Application October 2, 1944, Serial No. 556,737

5 Claims. (Cl. 128—220)

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This invention relates to hypodermic syringes and has particular reference to certain new and useful improvements of the type shown in my prior copending application Serial No. 522,188, filed February 10, 1944 now Patent Number 2,410,351.

It is an object of the invention to furnish a hypodermic syringe embodying functionally and structurally improved characteristics, the parts of such syringe being capable of ready sterilization and manipulation.

A further object is that of furnishing a unit which will embody relatively few simple and rugged parts, such parts being capable of economical and quantity manufacture and when assembled efficiently cooperating over long periods of time with freedom from difficulties.

A still further object is that of furnishing a unit of this type in which the needle will be capable of ready association with the holder or of being detached therefrom. Accordingly, the needle may be removed with facility or detached for purposes of sterilization; the needle when remounted being properly supported against movement with respect to or accidental detachment from the holder.

With these and other objects in mind, reference is had to the attached sheet of drawings illustrating one practical embodiment of the invention, and in which:

Fig. 1 is a side view;

Fig. 2 is an edge view thereof;

Fig. 3 is a longitudinally sectional view taken along the lines 3—3 and in the direction of the arrows as indicated in Fig. 1; and

Fig. 4 is a transverse sectional view taken along the lines 4—4 and in the direction of the arrows as indicated in Fig. 3.

In these views, it will be seen that the syringe assembly includes in general a holder 20, a needle 22, and an ampule 24. The holder 20 comprises a body formed of metal or other suitable material including a tubular part 26 the interior of which forms a guide and holder 28 in which the ampule is received and in which it is axially slidable. The guide 28 is open at its base or inner end so as to permit the insertion of the ampule therein.

Wings 30 project laterally from the tubular part 26 at the rear end thereof so as to provide finger rests and form a means by which the holder may be held by the fingers with the part 26 extending therebetween and as illustrated in Fig. 1. The tubular part 26 has open sides as illustrated in Figs. 1 and 2 and is bifurcated so as to form a pair of fingers or arms 32.

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The holder preferably is made of metal having a certain amount of spring in it so that the fingers or arms 32 may be displaced relative to each other in order to insert and mount the needle therein. The opposed faces 34 of the fingers 32 are appropriately curved to form a seat for receiving the cylindrical shank 36 of the needle, the overall diameter of the shank 36 being slightly greater than the normal clearance between the faces 34 which are circular in cross section as illustrated in Fig. 4. Therefore, the arms or fingers 32 will serve to firmly grip the needle between them.

Rearwardly of the faces 34 the arms 32 are notched as indicated at 38 to form a space for accommodating the head 40 on the shank 36. The head 40 forms a thrust member which cooperates with the edges of the spaces 38 on the arms 32 so as to take the thrust of the needle 22. Accordingly, the needle will not be subject to axial displacement with respect to the holder.

The arms 32 have projecting toward the rear end of the holder thrust members 42 which cooperate with the stopper or cork 44 in the ampule for displacing the stopper 44 into the ampule as the same is axially moved toward the needle end of the holder 20. The space between the thrust members 42 and the sides of the holder is shaped so as to accommodate and guide the wall of the ampule as it is pushed toward the needle end of the holder. These thrust members may be provided with graduations for indicating the percentage of the contents of the ampule which have been discharged therefrom as the same is moved toward the needle end of the holder.

As will be noted from the drawings, the outer end of the holder is formed with a longitudinally extending slit or slot. This is defined by the space existing between the ends of the fingers, the notches 38 and the space between the thrust members 42. Therefore, the needle may be shifted laterally to be associated with the holder or removed therefrom without either of its ends becoming contaminated. Moreover, the slot being preferably of substantially uniform width (excepting only with respect to the notches 38) it follows that the cylindrical shank 36 of the needle is firmly gripped between the faces 34 while the rear end of the needle 22 is not engaged by the inner faces of the thrust portions 42 between which it extends.

The needle 22 is provided with a passage therethrough and has its outer end 46 pointed so as to facilitate the penetration of the needle into

the skin. The end of the needle which projects rearwardly toward the rear or inner end of the holder 20 extends beyond the ends of the thrust members 42 so that it may penetrate the cork 44 of an ampule, as illustrated in Fig. 3, when the ampule is axially slid into the holder 20. This inner needle end is also pointed to facilitate penetration. The faces 48 of the thrust members are flat and adapted to form a seat for the outer face of the stopper 44. Further movement of the ampule 24 to the left (Fig. 3) will engage the outer face of the stopper 44 with the seat 48 and further movement of the ampule 24 toward the needle end of the holder 20 will cause the stopper 44 to slide within the bore of the ampule 24 and to function as a piston so as to displace the contents of the ampule through the needle 22.

When the holder 20 is held in the hand as illustrated in Fig. 1, the thumb of the hand may be pressed against the outside end of the ampule for forcing the same into the holder. This will cause the inner end of the needle to penetrate the cork 44. Thereafter, the cork will engage the seat 48. Continued movement of the ampule will result in the stopper 44 functioning as a piston to express the contents of the ampule through the bore of the needle and discharge such contents through the end 46 thereof.

When the ampule 24 is removed, the needle 22 may be removed from the holder 20 for sterilization or other purposes. This may be readily accomplished by pressing laterally on the shank 36 of the needle which projects forwardly of the arms 32 so as to tilt the needle and its shank transversely of the holder thereby to expedite the removal thereof. In such tilting it will be understood that the shank 36 of the needle gripped between the inner faces of the arms 32 will pivot with respect to these arms. In such pivoting the head 40 may freely swing clear of the notches 38. Likewise, the rear end of the needle may move sideways from within the slot defined between the thrust portions 42.

Thus among others the several objects of the invention as specifically aforenoted are achieved. Obviously, numerous changes in construction and rearrangements of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

I claim:

1. A hypodermic syringe including a body comprising a base, a pair of legs fixedly connected adjacent their inner ends to said base, said legs extending from said base in spaced relationship to define an ampule-receiving chamber between them and having free outer ends, said body being formed of material such that the outer ends yieldingly resist separation, needle-gripping portions adjacent the outer ends of said legs and disposed beyond the end of said chamber, said portions providing between them a needle-gripping structure such that, by flexing said legs to separate the gripping portions, a needle may be moved laterally into position therebetween, said base being formed with an opening in line with the space defined between said legs, and a thrust portion integral with and extending from said free outer ends towards said base and into said chamber, said portion forming a fixed part of said syringe body and being engageable with the piston closure of an ampule projected through said base opening and into the chamber between said legs.

2. A hypodermic syringe including a body comprising a base, a pair of legs fixedly connected adjacent their inner ends to said base, said legs extending from said base in spaced relationship to define an ampule-receiving chamber between them and having free outer ends, said body being formed of material such that the outer ends yieldingly resist separation, needle-gripping portions adjacent the outer ends of said legs and disposed beyond the end of said chamber, said portions providing between them a needle-gripping structure such that, by flexing said legs to separate the gripping portions, a needle may be moved laterally into position therebetween, said base being formed with an opening in line with the space defined between said legs, means forming a fixed part of said syringe and providing a thrust portion to engage with the piston-closure of an ampule projected through said base opening and into the receiving chamber, and said holder being formed with spaces intervening the outer faces of the thrust portion and the inner faces of adjacent portions of said body, said spaces slidably receiving an ampule introduced into said chamber through the base opening, as the ampule is telescopically disposed over said thrust portion.

3. A hypodermic syringe including a body comprising a base, a pair of legs fixedly connected adjacent their inner ends to said base, said legs extending from said base in spaced relationship to define an ampule-receiving chamber between them and having free outer ends, said body being formed of material such that the outer ends yieldingly resist separation, needle-gripping portions adjacent the outer ends of said legs and disposed beyond the end of said chamber, said portions providing between them a needle-gripping structure such that, by flexing said legs to separate the gripping portions, a needle may be moved laterally into position therebetween, said base being formed with an opening in line with the space defined between said legs, and thrust portions extending inwardly of said chamber, towards said base and secured one to each of said needle-gripping portions, said thrust portions being separated by a slot aligned with said gripping portions and within which a rearward extension of said needle may be disposed, said thrust portions being engageable with the piston closure of an ampule projected through said base opening and into the chamber between said legs.

4. A hypodermic syringe including a body comprising a base, a pair of legs fixedly connected adjacent their inner ends to said base, said legs extending from said base in spaced relationship to define an ampule-receiving chamber between them and having free outer ends, said body being formed of material such that the outer ends yieldingly resist separation, needle-gripping portions adjacent the outer ends of said legs and disposed beyond the end of said chamber, said portions providing between them a needle-gripping structure such that, by flexing said legs to separate the gripping portions, a needle may be moved laterally into position therebetween, said base being formed with an opening in line with the space defined between said legs, thrust portions extending inwardly of said chamber towards said base and secured one to each of said needle-gripping portions, said thrust portions being separated by a slot aligned with said gripping portions and within which a rearward extension of said needle may be disposed, said thrust portions being engageable with the piston

closure of an ampule projected through said base opening and into the chamber between said legs, and said holder being formed with notches in the face of said slot at a point to the rear of said gripping portions, said notches accommodating the thrust head of a needle having its body disposed in said slot.

5. A hypodermic syringe including in combination a body comprising a base, a pair of legs fixedly connected adjacent their inner ends to said base, said legs extending from said base in spaced relationship to define an ampule-receiving chamber between them and having free outer ends, said body being formed of material such that the outer ends yieldingly resist separation, needle-gripping portions adjacent the outer ends of said legs and disposed beyond the end of said chamber, a needle assembly, said portions providing between them an assembly-gripping structure such that, by flexing said legs to separate the gripping portions, the assembly may be moved laterally into position therebetween, said base being formed with an opening in line with the space defined between said legs whereby an ampule may be projected therethrough into such chamber, said needle assembly including a body,

a shank to be received between said gripping portions and a head adjacent said shank, said legs being formed with notches adjacent said gripping portions for the accommodation of said head to prevent axial movement of said assembly with respect to said body after it is gripped by said portions.

MARSHALL L. LOCKHART.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
937,029	Strong	Oct. 12, 1909
1,008,078	Schroeder	Nov. 7, 1911
1,644,657	Hein	Oct. 4, 1927
1,817,003	Hein	Aug. 4, 1931
1,848,711	Hall	Mar. 8, 1932
2,016,631	Everett	Oct. 8, 1935
2,115,731	Lozier et al.	May 3, 1938
2,159,217	Lozier et al.	May 23, 1939
2,238,582	Dickinson et al.	Apr. 15, 1941
2,313,483	Smith	Mar. 9, 1943
2,448,898	Lockhart	Sept. 7, 1948