PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 :		(11) International Publication Number: WO 90/14119
A61M 5/50, 5/34	A1	(43) International Publication Date: 29 November 1990 (29.11.90)

(21) International Application Number: PCT/AU90/00197

(22) International Filing Date: 15 May 1990 (15.05.90)

(30) Priority data:
PJ 4191 16 May 1989 (16.05.89) AU

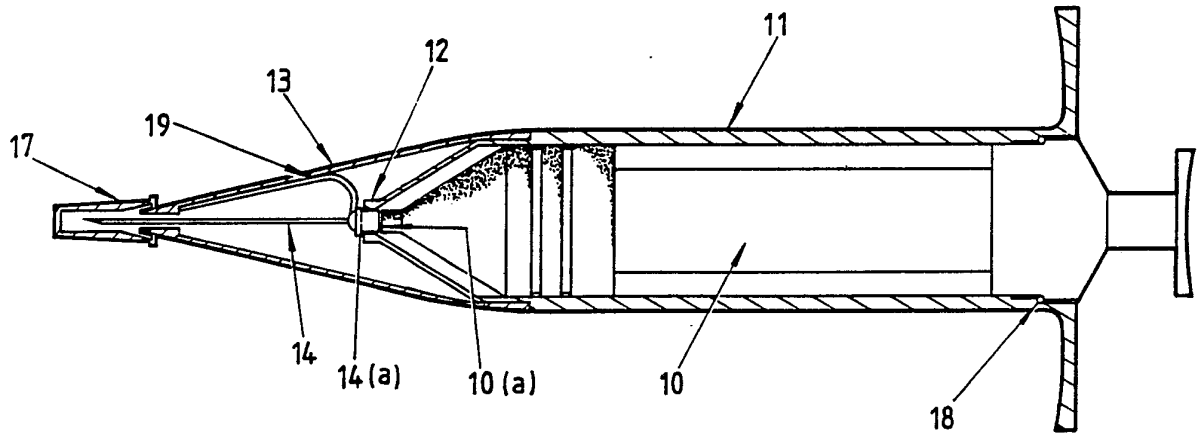
(71)(72) Applicant and Inventor: TAYLOR, David, T. [AU/AU]; 50 Altona Street, Heidelberg Heights, VIC 3081 (AU).

(74) Agent: WATERMARK; The Atrium, 290 Burwood Road, Hawthorn, VIC 3122 (AU).

(81) Designated States: AT (European patent), AU, BE (European patent), CA, CH (European patent), DE (European patent)*, DK (European patent), ES (European patent), FR (European patent), GB (European patent), IT (European patent), JP, KR, LU (European patent), NL (European patent), SE (European patent), US.

Published
With international search report.

(54) Title: A RETRACTABLE HYPODERMIC SYRINGE



(57) Abstract

A retractable hypodermic syringe comprising a conventional cylindrical body (11) and piston (10) to supply serum or the like to a hypodermic needle (14) fitted in sealing relationship to an aperture portion (12) on the cylindrical body, wherein said needle is removably held and at least partially surrounded by a shroud member (13) fitted to the cylindrical body, biasing means (19) in the shroud engaging the needle and, the arrangement being such that when the piston in use is moved to a cylinder empty position said needle is released from the aperture portion whereby the needle is forced by said biasing means to recede or retract within the shroud member.

* See back of page

DESIGNATIONS OF "DE"

Until further notice, any designation of "DE" in any international application whose international filing date is prior to October 3, 1990, shall have effect in the territory of the Federal Republic of Germany with the exception of the territory of the former German Democratic Republic.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	**ES**	Spain	**MC**	Monaco
AU	Australia	**FI**	Finland	**MG**	Madagascar
BB	Barbados	**FR**	France	**ML**	Mali
BE	Belgium	**GA**	Gabon	**MR**	Mauritania
BF	Burkina Fasso	**GB**	United Kingdom	**MW**	Malawi
BG	Bulgaria	**GR**	Greece	**NL**	Netherlands
BJ	Benin	**HU**	Hungary	**NO**	Norway
BR	Brazil	**IT**	Italy	**RO**	Romania
CA	Canada	**JP**	Japan	**SD**	Sudan
CF	Central African Republic	**KP**	Democratic People's Republic of Korea	**SE**	Sweden
CG	Congo			**SN**	Senegal
CH	Switzerland	**KR**	Republic of Korea	**SU**	Soviet Union
CM	Cameroon	**LI**	Liechtenstein	**TD**	Chad
DE	Germany, Federal Republic of	**LK**	Sri Lanka	**TG**	Togo
DK	Denmark	**LU**	Luxembourg	**US**	United States of America

A RETRACTABLE HYPODERMIC SYRINGE

This invention relates to the field of hypodermic syringes which can be made non-reusable.

There has been much publicity over recent use throughout the world over the need to prevent the reuse of hypodermic syringes. Proposals have been put forward for once only syringes, however, one drawback apparently remaining unsolved is the fact that the needle of the used syringe remains exposed and possibly contaminated after use and discarded.

Description of the Prior Art

Many attempts have been made to produce a safety retracting needle or non-reusable needle as evidenced by the number of patents published over the past few years on this subject.

The present invention belongs to the class wherein the needle or "sharp" as it is known, is fully retractable into a protective shroud in a relatively simple and effective manner.

One example of the one time use syringe and retractable needle is disclosed in Australian Patent Application No. 10257/88 showing a retractable needle to be housed in a casing after use and means for blocking the needle extending beyond the casing after the needle has been retracted. The blocking step is achieved by the needle being unaligned with the casing opening so that it cannot re-enter the opening after retraction into the casing.

U.S. Patent Specification No. 4,838,869 also discloses a one time use syringe wherein the needle is spring loaded and automatically irretrievably retracted into the body of the syringe when the plunger is fully depressed whereby protrusions on the end of the plunger engage tabs holding the spring loaded needle to release the needle for retraction.

European Specification No. 0347742 discloses a similar retractable needle to that disclosed in U.S. 4,838,869 and U.S. 4,747,831.

The present invention has as its objective the removal or retraction of the needle of a hypodermic syringe from easy access after use.

It is a more specific objective of the invention to provide a retractable type hypodermic syringe in which the needle is dismantled from the plunger and retracted into a protective shroud thereby procluding the possibility of reuse of the syringe.

There is provided, according to the present invention, a hypodermic syringe comprising a cylindrical body and piston of conventional construction for supply of serum or the like to a hypodermic needle fitted in sealing relationship to an apertured portion on the cylindrical body, wherein said needle is removably held and at least partially surrounded by a shroud member on the cylindrical body, biasing means associated with said shroud and said needle acting to hold said needle in said sealing relationship, the arrangement being such said needle is displaced from engagement with the body when said piston is moved to a cylinder empty position whereby the needle is forced by said biasing means to recede or retract within the shroud member.

Conveniently the needle is sealingly positioned in a shallow recess at the foot of the body and is adopted to be engaged by said piston and moved from said shallow recess whereby the biasing means retract said needle into said housing.

The biasing means may take several forms including coil springs of metal or plastic. The resilient member creating the biasing effect may take any configuration or form.

The invention will be described in greater detail with reference to the accompanying drawings in which

Figure 1 is a sectional view of an assembled hypodermic syringe

Figure 2 is a sectional view of part of the syringe showing the disposal of the needle

Figure 3 is a view of a further embodiment of the hypodermic syringe

With reference to Figure 1, the hypodermic syringe comprises a conventional piston plunger and cylinder 11 which is adapted to be filled through the needle 14 with serum.

The plunger 10 is fitted with a seal member 18 which acts to prevent excessive travel of the plunger in the cylinder during a filling movement. This will be described in more detail later.

The needle is fitted within a shroud member 13. The needle 14 includes a flange section 14A at its inner end which is sealably engaged at the end of the cylinder in a recess 12.

A biasing spring 15 is mounted about the needle to bias the flange 14A into engagement with the recess 12. The splicing spring 15 includes a portion 16 engageable with the wall of the shroud 13 acting to bias the needle laterally of the axis of the syringe. The arrangement is such that the bias of the spring 15 is sufficiently strong to maintain the flange 14A in the recess 12 during normal operation of the syringe.

The plunger piston 10 includes a pointed section 10A which is adapted to contact the flange 14A upon exhaustion of the contents of the syringe to move the flange 14A out of the recess 12 whereupon the lateral biasing force of the spring 16 displaces the needle laterally whereupon the needle will be retracted into the shroud member 13.

The syringe body is moulded with a protruding section thus creating a cavity (formed by the shroud member 13) of sufficient dimension to accommodate the retracted needle. The size of the spring 16 is such that it will ensure that the needle cannot be retrieved through the shroud needle orifice.

The shroud member 13 is constructed as an integral part of the cylinder body 11 to avoid easy entry and therefore tampering with the needle 14.

Preferably a needle protrusion piece 17 may be provided to reduce the risk of needle spike in the ordinary handling of the syringe.

The sealing member 18 acts as a stop to ensure that the needle is not activated in handling when filling the syringe with fluid.

In Figure 3 and 3(A) there is shown a modified form of biasing member 19 which enables the needle to be retracted in a simple and effective manner. The present invention provides a retractable needle arrangement which can be manufactured with a minimum of modification to existing machinery for producing conventional hypodermic needles.

The shroud to contain the needle may be permanently attached to the syringe body or alternatively it may be formed as a separable unit. This allows flexibility in use in hospital and clinical use with various sizes of syringes and needles.

The needle may be seated direct to the syringe canal or have additional fittings on or between the needle and the syringe.

A protrusion from the needle end of the shroud to protect the needle during storage may be provided and can be easily broken off before use of the hypodermic syringe.

It will be appreciated that the retractable needle construction provided by the present invention is a simple and yet effective method of rendering a used hypodermic syringe safe by retracting the needle into a shroud requiring destruction of the syringe to retrieve the needle.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A retractable hypodermic syringe comprising a conventional cylindrical body and piston to supply serum or the like to a hypodermic needle fitted in sealing relationship to an aperture portion on the cylindrical body, wherein said needle is removably held and at least partially surrounded by a shroud member fitted to the cylindrical body, biasing means in the shroud engaging the needle and, the arrangement being such that when the piston in use is moved to a cylinder empty position said needle is released from the aperture portion whereby the needle is forced by said biasing means to recede or retract within the shroud member.

2. A hypodermic syringe comprising a cylindrical body and piston of conventional construction for supply of serum or the like to a hypodermic needle fitted in sealing relationship to an aperture portion on the cylindrical body, wherein said needle is removably held and at least partially surrounded by a shroud member on the cylindrical body, biasing means associated with said shroud and said needle engaging said needle, the arrangement being such that the said needle is displaced from engagement with the body whereby the needle is forced by said biasing means when said piston is moved to a cylinder empty position to recede or retract within the shroud member.

3. A hypodermic syringe as claimed in claim 1 wherein said needle is releasably and sealingly positioned in a shallow recess at the foot of the cylindrical body and is adapted to be engaged by said piston and moved from said shallow recess to allow movement by the biasing means to retract the needle into the shroud.

4. A syringe as claimed in claim 1 or claim 2 wherein a stop member is provided in the cylindrical body to prevent excessive travel of the piston during filling of the serum and so that it is possible to reuse the syringe by qualified staff.

5. In a hypodermic syringe having a cylindrical body and piston for supply of serum or the like to a hypodermic needle fitted in sealing relationship to an aperture portion on the cylindrical body, the improvement comprising a needle shroud member fitted to said cylindrical body, a biasing means associated with the needle and said shroud, the needle being releasably fitted in said aperture portion, said needle being releasable from said aperture portion when engaged by said piston member or part thereof when the piston member is removed to a cylinder empty position, said shroud member being adapted to accommodate said needle after said release.

Fig. 1

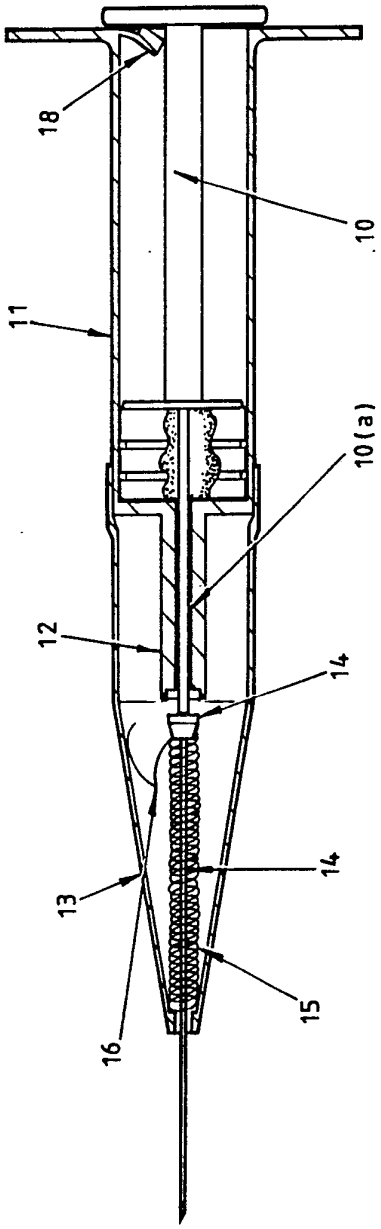
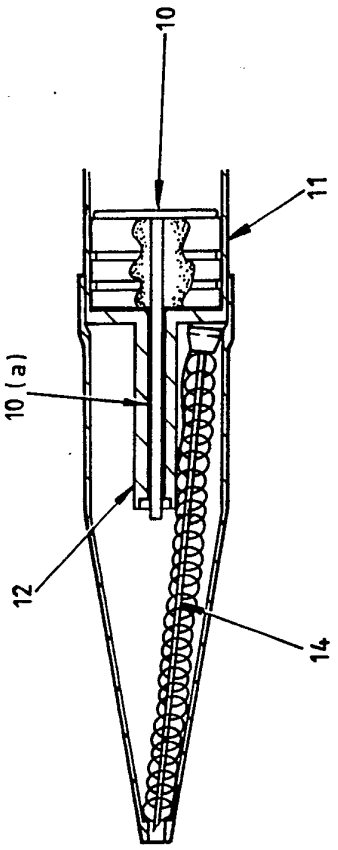


Fig. 2



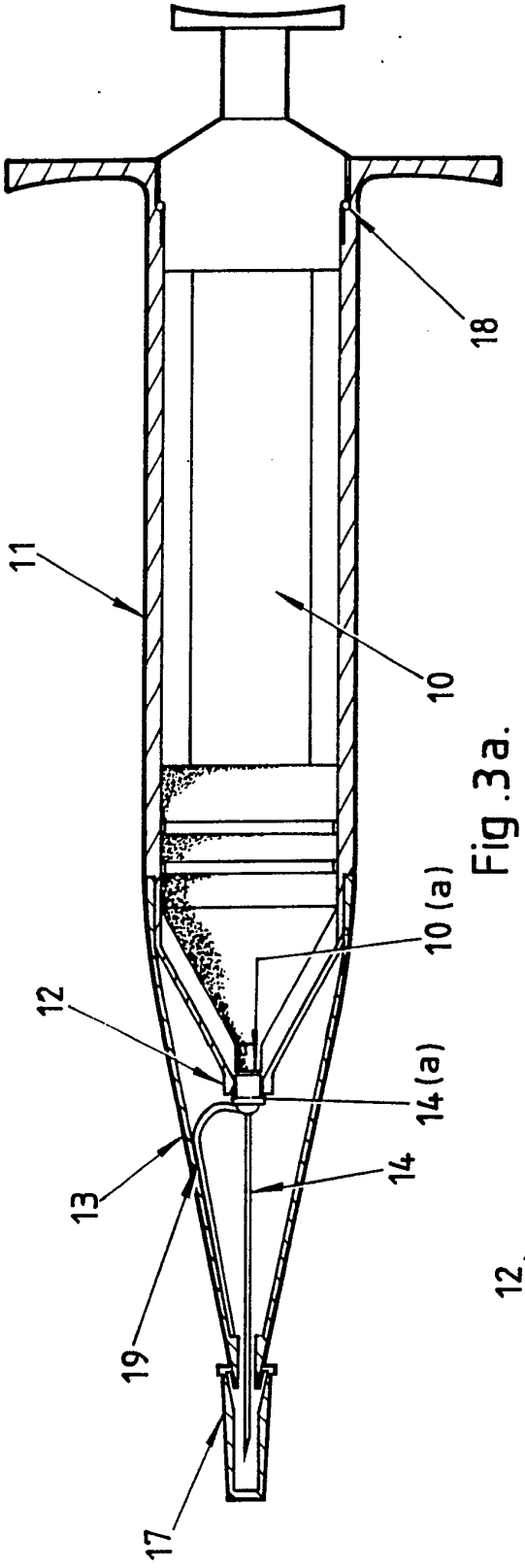


Fig .3.

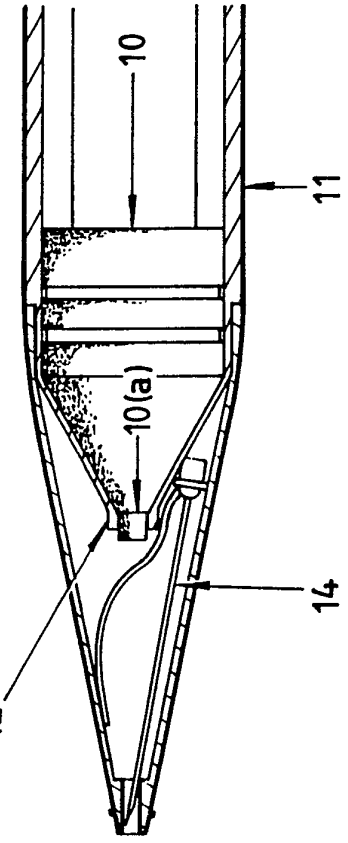


Fig .3a.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/AU 90/00197

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) 6

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl.[5] A61M 5/50, 5/34

II. FIELDS SEARCHED

Minimum Documentation Searched 7

Classification System	Classification Symbols
IPC	A61M 5/32, 5/34, 5/50

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched 8

AU : IPC as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT 9

Category*	Citation of Document, [11] with indication, where appropriate, of the relevant passages 12	Relevant to Claim No 13
X,Y	US,A, 4747829 (JACOB et al) 31 May 1988 (31.05.88). See columns 1 and 2	(1-2, 5)
A	US,A, 4804371 (VAILLANCOURT) 14 February 1989 (14.02.89). See columns 3 and 4	(1-2)
Y,A	AU,B, 13088/88 (598112) (HABLEY MEDICAL TECHNOLOGY CORP.) 22 September 1988 (22.09.88). See figure 2	(1-2, 4-5)
Y,A	AU,B, 15366/88 (KULLI) 3 November 1988 (03.11.88). See pages 35-36	(1-2, 5)
P,A	WO,A, 89/10767 (DEEKS) 16 November 1989 (16.11.89). See page 5	(1-2)

* Special categories of cited documents: 10

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
27 July 1990 (27.07.90)	3 August 1990
International Searching Authority	Signature of Authorized Officer
Australian Patent Office	A. HENDRICKSON

Form PCT/ISA/210 (second sheet) (January 1985)

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON
INTERNATIONAL APPLICATION NO. PCT/AU 90/00197

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report	Patent Family Members		
AU 13088/88	EP 282097 US 4826484	US 4770655	US 4804370
WO 8910767	AU 34387/89		
US 4804371	US 4725267		
US 4747829	AU 10257/88 ZA 8800073	EP 276160	JP 63183072
AU 15366/88	EP 290176 US 4904242	US 4747831 US 4927414	US 4900307