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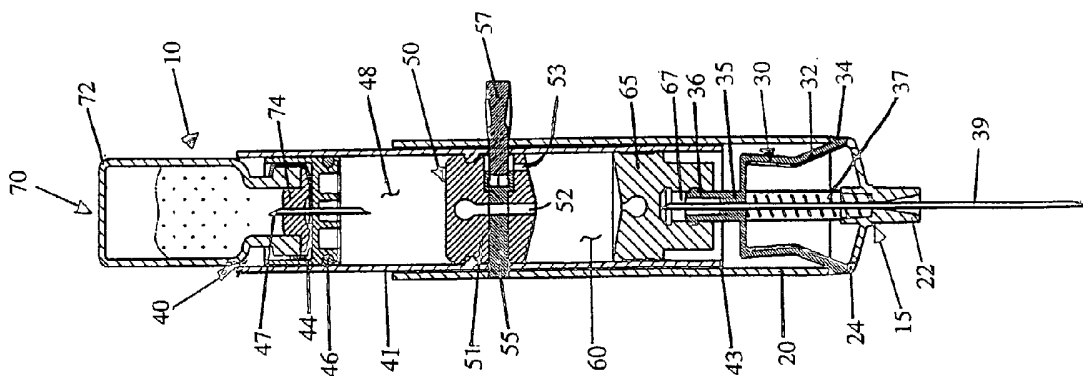
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(54) Title: PRE-FILLED SAFETY VIAL INJECTOR



(57) Abstract: A method and apparatus (10, 110, 210) are provided for injecting medicine from a pre-filled container (70, 190, 270) into a patient through an injection needle (39, 112, 239). After use the needle (39, 112, 239) is automatically shielded so that the contaminated needle is protected to prevent inadvertent contact with the needle. The device operates by pumping medicine out of the vial (70, 190, 270) into a transfer chamber (60, 155, 260). The medicine is expelled from the transfer chamber (60, 155, 260) into the patient during an injection stroke. At the end of the injection stroke, the needle (39, 112, 239) is released for retraction, and a spring (37, 126, 237) then retracts the needle to shield the needle. Preferably, the device includes an injector assembly (15, 115, 215) and a vial holder assembly (40, 150, 240). The injector assembly (15, 115, 215) has a needle retainer (30, 120, 230) for releasably retaining the needle in a projecting position against the bias of the spring (37, 126, 237). The vial holder assembly (40, 150, 240) is attachable with the injector assembly (15, 115, 215) and is operable to transfer the medicine out of the vial (70, 190, 270) and into the transfer chamber (60, 155, 260) to prepare the device for an injection.



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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/07859

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC(7) : A61M 5/00		
US CL : 604/191		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) U.S. : 604/82, 87-89, 134-139, 191, 192, 194-201, 203-205, 500		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Please See Continuation Sheet		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,199,949 A (HABER et al) 06 April 1993, see entire document.	1, 2, 8, 11, 13, 19, 22, 24-26, 31, 33, 34, 39, 41, 43, 47 and 52
Y	US 5,368,568 A (PITTS et al) 29 November 1994, see entire document	15-17, 20, 21, 35, 48, 50 and 51
X	US 4,755,169 A (SARNOFF et al) 05 July 1988, see entire document.	1-5, 7-10, 13, 19 and 22-30
Y	US 5,358,489 A (WYRICK) 25 October 1994, see entire document.	15-17, 20, 21, 33-35, 39, 41, 43, and 47-53
A	US 5,067,948 A (HABER et al) 26 November 1991, see entire document.	1-60
A	US 6,224,568 B1 (MORIMOTO et al) 01 May 2001, see entire document.	1-60
A	US 5,330,426 A (KRIESEL et al) 19 July 1994, see entire document.	1-60
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.		<input type="checkbox"/> See patent family annex.
* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent published on or after the international filing date	"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
"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)	"&"	document member of the same patent family
"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		
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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,354,284 A (HABER et al.) 11 October 1994, see entire document.	

**INTERNATIONAL SEARCH REPORT**

PCT/US02/07859

**Continuation of B. FIELDS SEARCHED Item 3:**

EAST

search terms: (vial or container or ampoule or ampule or cartridge or bottle) same (needle or syringe) same (plunger or piston) same (intermixing or mixing) and ((retractible or retract\$) near5 needle) and (seal or plug) and valve