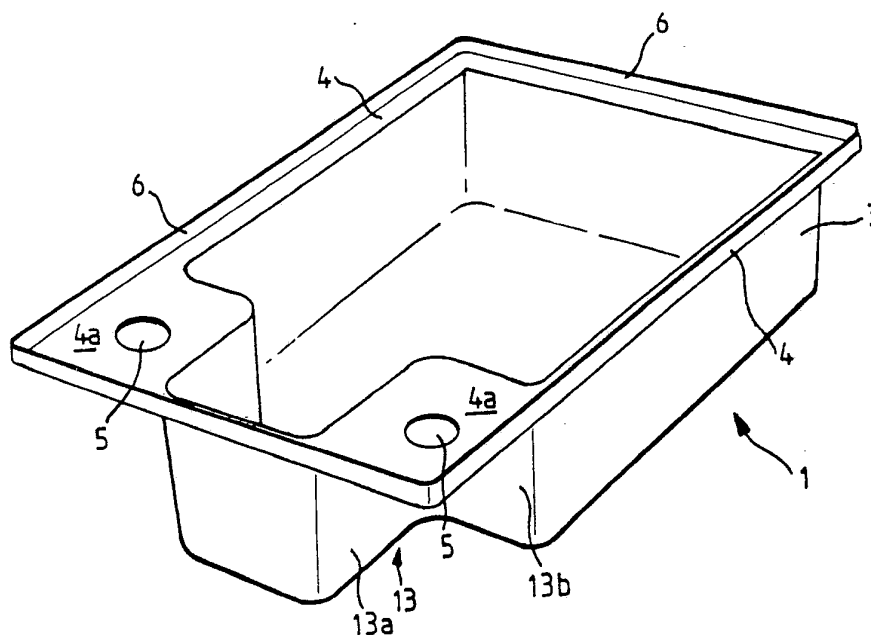




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<p>(21) International Application Number: PCT/AU89/00533 (22) International Filing Date: 13 December 1989 (13.12.89) (30) Priority data: PJ 1929 13 December 1988 (13.12.88) AU (71)(72) Applicant and Inventor: GREENE, Kenneth, Haydn [GB/AU]; 11 Anderson Road, Tecoma, VIC 3160 (AU). (74) Agents: NOONAN, Gregory, J. et al.; Davies & Collison, 1 Little Collins Street, Melbourne, VIC 3000 (AU).</p>		<p>(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), DK, ES (European patent), FR (European patent), GB (European patent), IT (European patent), JP, KR, LU (European patent), NL (European patent), SE (European patent), US.</p> <p>Published <i>With international search report.</i></p>

(54) Title: HYPODERMIC SYRINGE CARRIERS



(57) Abstract

A hypodermic syringe carrier comprising a body defining a tray (1) with a peripheral upstanding side wall (3). The tray is adapted to receive and retain a hypodermic syringe and has a bottom surface (2) by which it may be rested on an underlying support. The tray (1) has an orifice (5) so positioned with respect to the bottom (2) of the tray (1) and so dimensioned that it is adapted to receive and temporarily, stably retain an elongate needle cap.

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HYPODERMIC SYRINGE CARRIERS

Field of the Invention

The present invention relates to hypodermic syringe carriers commonly referred to as injection trays and to a method of handling hypodermic syringes so as to prevent needle-stick injuries.

Background Art

Traditionally, when an injection is to be administered the needle cap is removed and dropped into a small tray. The fluid to be injected is drawn from a supply bottle, the needle is recapped and then

the hypodermic syringe is placed in the tray. This tray is then carried to the patient where the injection is administered. The used hypodermic syringe with its now contaminated needle is then dropped back into the tray with the needle exposed, or in some cases the needle cap is put back onto the hypodermic syringe before disposal.

Some treatments may require two needles to be used, one for drawing up the fluid and a second to administer the injection. The second needle is also carried in this tray, together with a sterile swab.

Many injuries have occurred during the handling of hypodermic syringes because of the exposed needle. Medical workers have been stabbed by these needles, resulting in injuries that may be painful and cause lost productivity. In particular, where AIDS or hepatitis infected patients are being treated, such injuries, commonly known as needle-stick injuries, could prove life threatening. Needle-stick injuries often arise, for example, from inaccurate recapping of the needle or during the syringe/needle disposal procedure, especially if the needle has not been recapped.

Summary of the Invention

It is therefore an objective of the invention to reduce the risk and incidence of needle-stick injury, by providing a modified type of injection tray. This tray facilitates a convenient, safe means of recapping the needle immediately after use.

According to the present invention there is provided a hypodermic syringe carrier comprising a

body defining a tray with a peripheral upstanding side wall, adapted to receive and retain a hypodermic syringe, the tray having a bottom surface by which it may be rested on an underlying support, which body further defines an orifice so positioned with respect to the bottom and so dimensioned that it is adapted to receive and temporarily, stably retain an elongate needle cap.

Preferably the orifice is adapted to receive an elongate needle cap with its axis substantially upright.

Preferably the orifice is positioned within a rim portion of the side wall of the tray. The rim advantageously includes a planar portion which extends generally parallel to the bottom of the tray and, when the tray is rested on an underlying support, is spaced from the support, the orifice being disposed in said planar portion so that the needle cap extends through the orifice and may have its closed end resting on the support. Alternatively, the orifice may be positioned within a planar surface which extends inwardly of the side wall of the tray.

The invention also provides a hypodermic syringe carrier comprising:

a bottom surface

a peripheral upstanding side wall bounding said bottom surface so as to define a tray having a syringe storage space within said peripheral wall;

said peripheral upstanding wall including:

first and second wall portions separated but joined by at least one further wall portion, said first and second wall portions being such that imaginary extensions thereof intersect, said further

wall portion(s) lying inwardly of said imaginary extensions and towards said storage space, whereby said further wall portion(s) and said imaginary extensions define a recess external of said storage space but within said imaginary extensions;

a planar wall portion overhanging said recess; and

an orifice in said overhanging wall portion adapted to receive a needle cap so that said cap extends at least partially into said recess.

There is also provided a method of handling a hypodermic syringe using the aforescribed syringe carrier, wherein whenever the needle cap is removed from the hypodermic syringe the needle cap is placed in said orifice of the hypodermic syringe carrier and the needle cap subsequently reapplied by lowering the needle of the hypodermic syringe into the needle cap while the latter is stably retained in said orifice and applying pressure to press fit the needle cap to the hypodermic syringe for withdrawal of the syringe with the cap in place and placement of the capped syringe in the rimmed tray for further transport or storage.

Brief Description of the Drawings

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 is a perspective view of a hypodermic syringe carrier in accordance with the invention adapted to retain two needle caps;

Figure 2 is a view similar to Figure 1, but showing the needle cap of the syringe temporarily retained in a substantially upright position;

Figure 3 is a perspective view of an alternative hypodermic syringe carrier in accordance with the present invention with a different configuration of cap-retaining orifices; and

Figure 4 is a perspective view of a kidney-shaped hypodermic syringe carrier in accordance with the invention.

Best Modes for Carrying Out the Invention

Figure 1 of the drawings shows a hypodermic syringe carrier of generally rectangular configuration, comprising an integral tray 1 adapted to receive and retain a hypodermic syringe. Tray 1 has a peripheral upstanding side wall 3 and a flat bottom 2 with a surface by which the tray 1 may be rested on an underlying support.

Two orifices 5 at the corners of the tray 1 are so positioned with respect to bottom 2 and so dimensioned that each is adapted to receive and temporarily stably retain an elongate needle cap. More particularly, side wall 3 has an outstanding rim 4 about its upper edge terminating at an upturned lip 6. At each of the two corners of the tray containing orifices 5, the side wall 3 is offset inwardly to form an L-shaped wall segment 13a which defines a recess 12. An integral planar wall portion 4a overhangs recess 12 from the top of wall segment 13a, and extends parallel to tray bottom 2. It is thus spaced from any support on which the tray is

resting. Each orifice 5 is a simple aperture positioned at the centre of overhanging wall portion 4a. Wall portion 4a is contiguous with rim 4.

It will be appreciated that wall segment 13 comprises a pair of perpendicular wall portions 13a, 13b which lie inwardly of the imaginary extensions of side portions 3a, 3b of upstanding side wall 3.

When an injection is to be administered, the needle cap 10 is removed at a first location and dropped into one of the orifices 5 of the hypodermic syringe carrier with its open end up. The needle cap extends partially into recess 12 and the orifice 5 retains the needle cap 10 with its axis substantially upright (Figure 2). To this end, it will be appreciated that syringe carrier should be of a depth whereby the orifice 5 is so positioned with respect to the tray bottom 2 that the needle cap has sufficient of its length under rim portion 4a to enable it to be stably retained upright. The closed end of the needle thereby contacting the underlying tray support. The fluid to be injected is drawn into the hypodermic syringe from a supply bottle. The needle cap 10 is then reapplied to the hypodermic syringe by lowering the needle of the hypodermic syringe into the needle cap 10 which is retained in the orifice 5. Downward pressure is applied to press fit the needle cap 10 onto the hypodermic syringe.

The hypodermic syringe with needle cap 10 applied can then be safely placed in the tray 1. The hypodermic syringe carrier is then taken to a second location where the injection is administered. Once again, when the needle cap 10 is removed it is placed in the orifice 5, and the needle cap 10 after the injection is administered being reapplied to the

hypodermic syringe as before. The hypodermic syringe carrier is then taken to a third location where the syringe can be disposed of. The syringe carrier may be disposable or may be manufactured of a material which can be sterilized and re-used.

It will be appreciated that at any time when the hypodermic syringe is being carried from one location to another the needle cap 10 is applied. The needle cap 10 can be readily applied without any danger of needle-stick injury as the cap is not being held in the medical worker's hand as it is reapplied. There is also no danger of needle-stick injury if the tray is dropped or during disposal of the syringe. The syringe carrier of the present invention is advantageous because the orifice 5 is positioned internally of the outstanding rim 4 and of the generally rectangular profile of the side wall 3. This feature enhances the stability of the hypodermic syringe carrier when a needle cap is being placed in an orifice 5 or a syringe is being recapped.

The tray 1 of Figures 1 and 2 is provided with two orifices 5 and is thus suitable for procedures involving two different injections.

Alternative embodiments of syringe carriers are shown in Figure 3 and 4.

The syringe carrier shown in Figure 3 has a portion of the side wall 3' at one end projecting inwardly to provide a planar wall portion 4a' overhanging a recess 12' centrally of the end of the rectangular tray. Both orifices 5' are in the planar wall portion 4a'. The syringe carrier shown in Figure 3 is particularly advantageous because of the central positioning of the orifices 5'. The central positioning of orifices 5' ensures that the tray

remains balanced when a needle cap 10 is placed within one of the orifices 5.

The syringe carrier shown in Figure 4 comprises a kidney shaped tray 1" and has a rim 4" about its upper edge. Orifice 5" is within the peripheral rim 4" at the concave side of the tray 1. The wall is curved further inwardly to enlarge the rim 4" to accomodate orifice 5".

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CLAIMS:

1. Hypodermic syringe carrier comprising a body defining a tray with a peripheral upstanding side wall, adapted to define a syringe storage space for receiving and retaining a hypodermic syringe, the tray having a bottom surface by which it may be rested on an underlying support, which body further defines an orifice so positioned with respect to the bottom and so dimensioned that it is adapted to receive and temporarily, stably retain an elongate needle cap.
2. Hypodermic syringe carrier according to claim 1, wherein the orifice is adapted to receive an elongate needle cap with its axis substantially upright.
3. Hypodermic syringe carrier according to claim 1 or claim 2, wherein the orifice is positioned within a rim portion of the side wall of the tray.
4. Hypodermic syringe carrier according to claim 3, wherein the rim includes a planar portion which extends substantially parallel to the bottom of the tray.
5. Hypodermic syringe carrier according to claim 4, wherein the orifice is adapted to receive a needle cap such that the closed end of the needle cap

rests on the support.

6. Hypodermic syringe carrier according to claim 1, wherein said upstanding side wall includes:
first and second wall portions separated but joined by at least one further wall portion, said first and second wall portions being such that imaginary extensions thereof intersect, said further wall portion(s) lying inwardly of said imaginary extensions and towards said storage space, whereby said further wall portion(s) and said imaginary extensions define a recess external of said storage space but within said imaginary extensions;
a planar wall portion overhanging said recess; and
said orifice in said overhanging wall portion adapted to receive a needle cap so that said cap extends at least partially into said recess.

7. Hypodermic syringe carrier comprising:
a bottom surface
a peripheral upstanding side wall bounding said bottom surface so as to define a tray having a syringe storage space within said peripheral wall;
said peripheral upstanding wall including:
first and second wall portions separated but joined by at least one further wall portion, said first and second wall portions being such that imaginary extensions thereof intersect, said further wall portion(s) lying inwardly of said imaginary extensions and towards said storage space, whereby said further wall portions(s) and said imaginary extensions define a recess external of said storage space but within said imaginary extensions;

a planar wall portion overhanging said recess; and

an orifice in said overhanging wall portion adapted to receive a needle cap so that said cap extends at least partially into said recess.

8. Hypodermic syringe carrier according to claim 7, wherein there are three further wall portions, which three further wall portions define a substantially U-shaped segment of said peripheral wall.

9. Hypodermic syringe carrier according to claim 8, wherein said tray is generally rectangular and said U-shaped segment is disposed centrally of an end of the tray.

10. Hypodermic syringe carrier according to claim 7, wherein there are two further wall portions, which two further wall portions define a substantially L-shaped wall segment of said peripheral wall at a corner of the tray.

11. Hypodermic syringe carrier according to claim 10, wherein the tray is generally rectangular and there are two such L-shaped wall segments at respective corners of an end of the tray.

12. Hypodermic syringe carrier according to claim 7, wherein the further wall portion is curved.

13. A method of handling a hypodermic syringe using a syringe carrier according to claim 1 or claim 7, wherein whenever the needle cap is removed from

the hypodermic syringe the needle cap is placed in said orifice of the hypodermic syringe carrier and the needle cap subsequently reapplied by lowering the needle of the hypodermic syringe into the needle cap while the latter is stably retained in said orifice and applying pressure to press fit the needle cap to the hypodermic syringe for withdrawal of the syringe with the cap in place and placement of the capped syringe in the rimmed tray for further transport or storage.

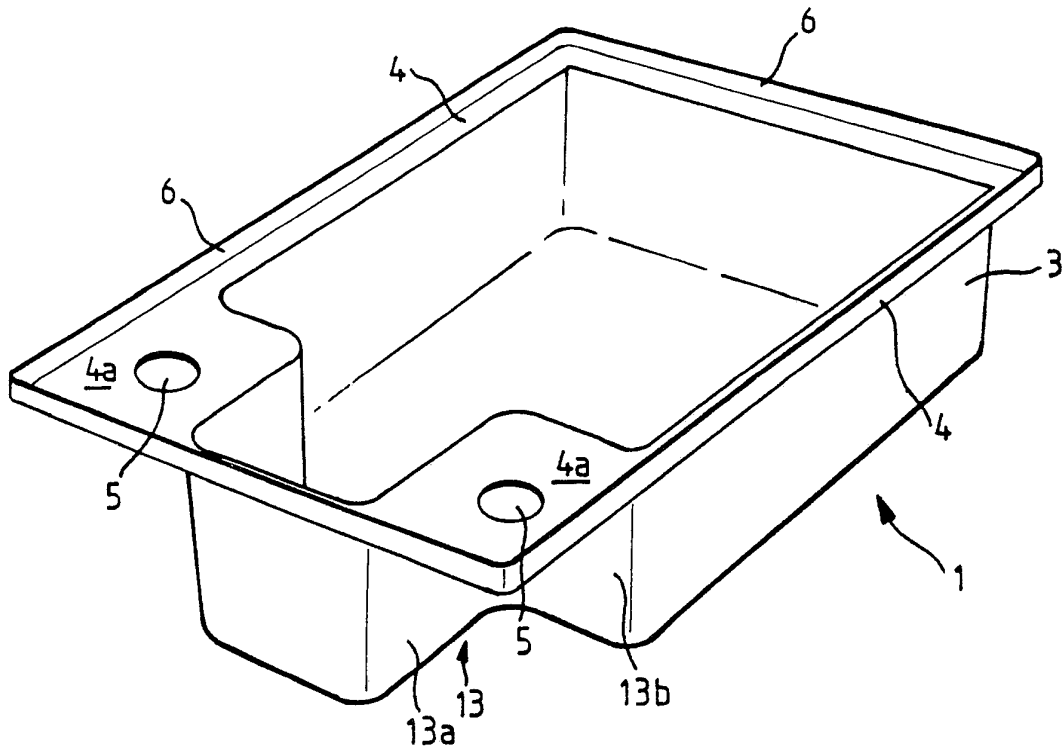


FIG 1

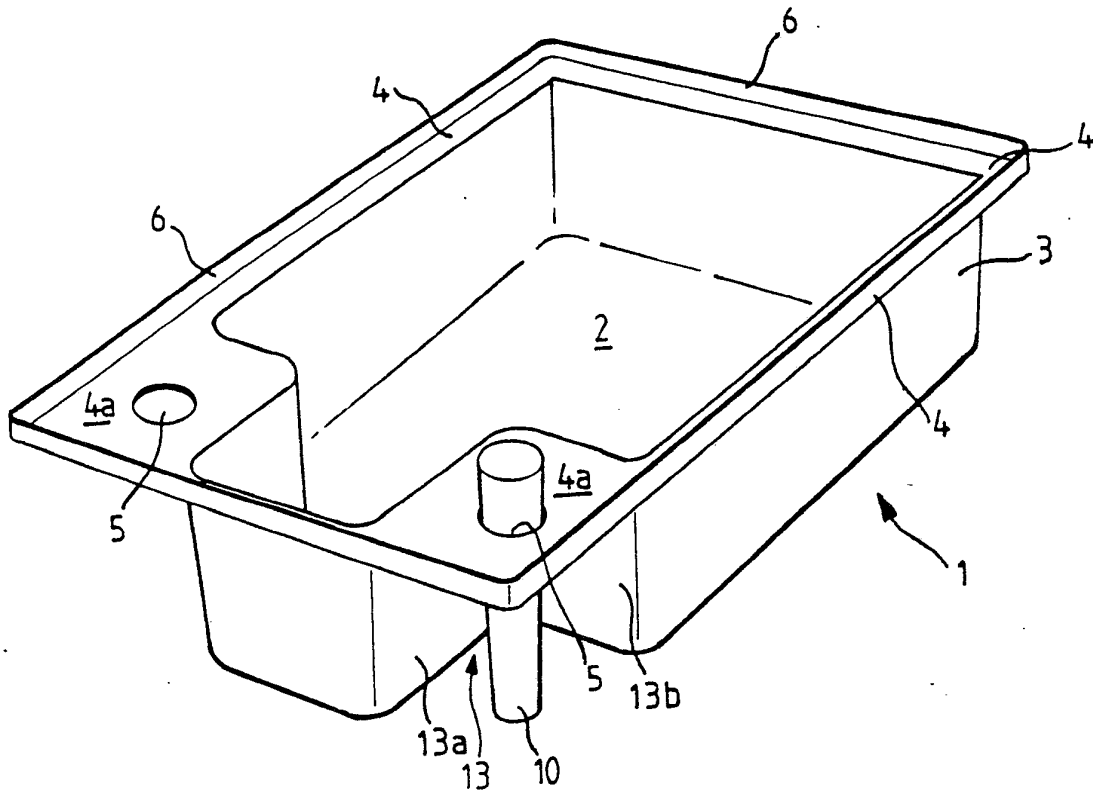
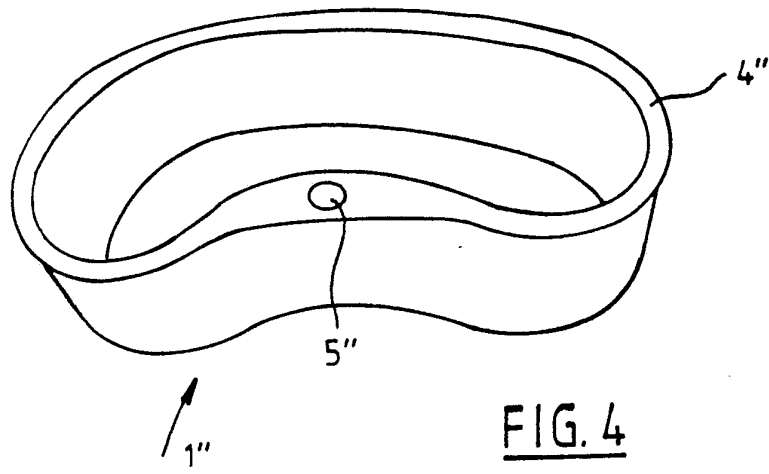
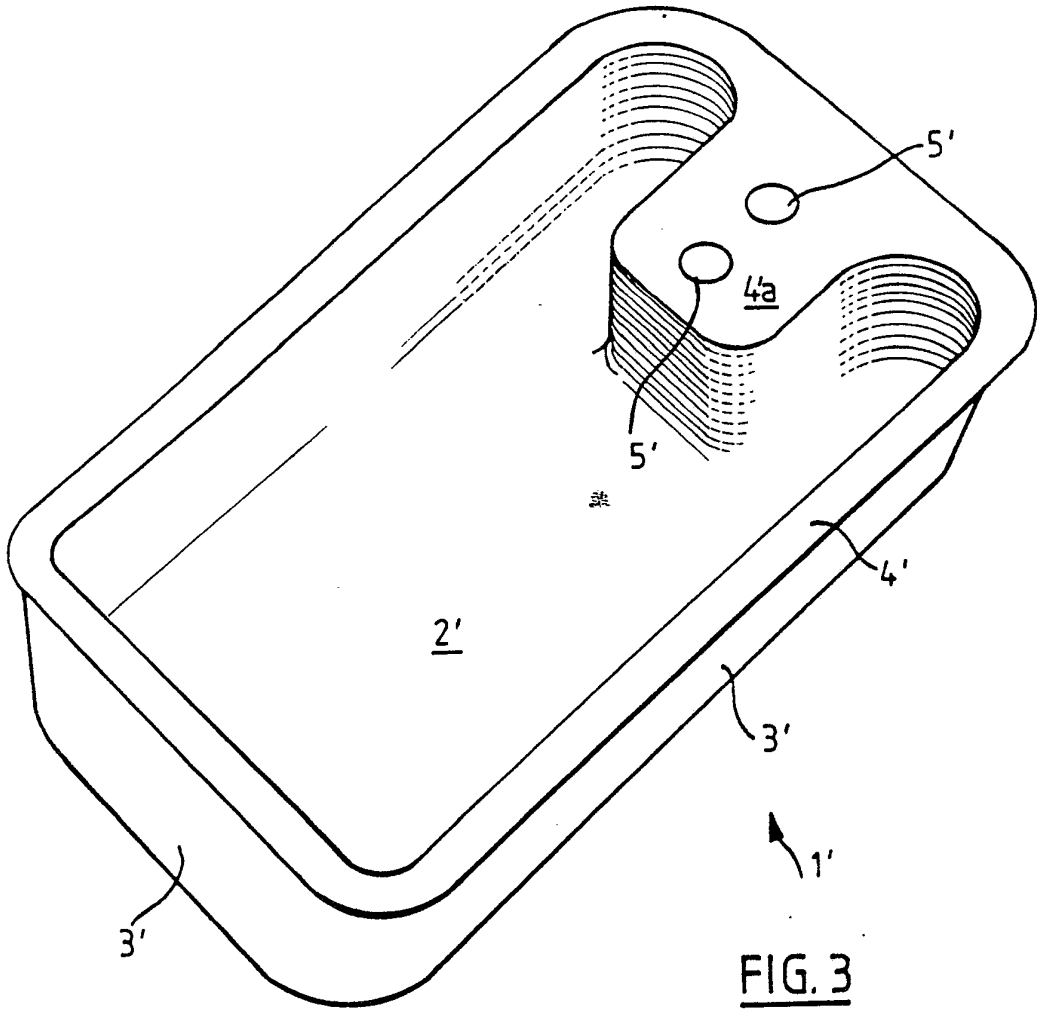


FIG 2



INTERNATIONAL SEARCH REPORT

International Application No. **PCT/AU 89/00533**

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. ⁴ A61M 5/32, B65D 85/24		
II. FIELDS SEARCHED		
Minimum Documentation Searched 7		
Classification System	Classification Symbols	
IPC	5/32, 5/00	
US	206/365, 366	
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
P,X	US,A, 4844249 (COULOMBE) 4 July 1989 (04.07.89)	(1-13)
X	US,A, 4753345 (GOODSIR et al) 28 June 1988 (28.06.88)	(1-13)
X	US,A, 4726466 (COOPER) 23 February 1988 (23.02.88)	(1-13)
X	US,A, 4658957 (GUTH et al) 21 April 1987 (21.04.87)	(1-13)
X	US,A, 4383615 (AQUINO) 17 May 1983 (17.05.83)	(1-13)
P,Y	US,A, 4846803 (EMERSON) 11 July 1989 (11.07.89)	(1-13)
CONTINUED		
* Special categories of cited documents: 10		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier document but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step
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"O"	document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed	
IV. CERTIFICATION		
Date of the Actual Completion of the International Search March 1990 (.03.90)	Date of Mailing of this International Search Report 26 MAR 1990	
International Searching Authority Australian Patent Office	Signature of Authorized Officer <i>Peter T West</i> PETER T WEST	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category*	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
P,Y	US,A, 4836373 (GOLDMAN) 6 June 1989 (06.06.89)	(1-13)
Y	US,A, 4762688 (BERRY, Jr) 9 August 1988 (09.08.88)	(1-13)
Y	US,A, 4742910 (STAEBLER) 10 May 1988 (10.05.88)	(1-13)
Y	US,A, 4728504 (NICHOLS) 1 March 1988 (01.03.88)	(1-13)
P,X	AU,A, 24461/88 (SINCOCK) 11 May 1989 (11.05.89)	(1-13)

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON
INTERNATIONAL APPLICATION NO. PCT/AU 89/00533

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		
US 4726466	4629453		
US 4658957	CA 1243637		
US 4728504	CA 1243468 US 4704254 US 4900519	EP 181119 US 4716025	US 4617178 US 4752453

END OF ANNEX