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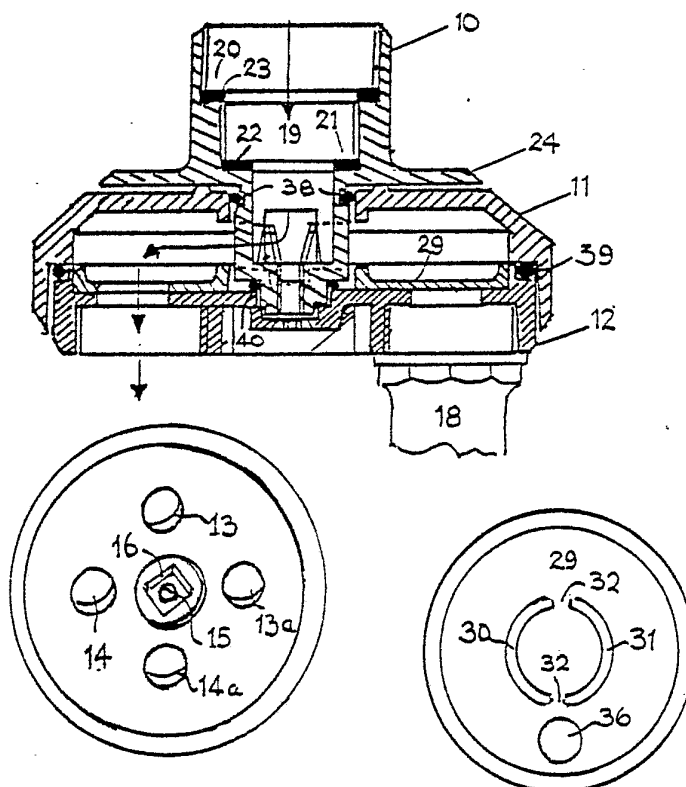
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/AU81/00115 (22) International Filing Date: 17 August 1981 (17.08.81) (31) Priority Application Number: PE 5085 (32) Priority Date: 18 August 1980 (18.08.80) (33) Priority Country: AU (71) Applicant (for all designated States except US): MOSS PRODUCTS PROPRIETARY LIMITED [AU/AU]; 849-853 Nepean Highway, Moorabbin, Vic. 3189 (AU). (72) Inventor; and (75) Inventor/Applicant (for US only): WILSON, Louis, Wencelas [AU/AU]; 17 Tramway Parade, Beaumaris, Vic. 3193 (AU). (74) Agent: DAVIES, John, Loveluck; John L. Davies & Co., P. O. Box 436, 39 Cheviot Road, Mount Waverley, Vic. 3149 (AU).		(81) Designated States: AU, DE (European patent), FR (European patent), GB (European patent), JP, NL (European patent), SE (European patent), US. Published With international search report With amended claims and statement

(54) Title: DISTRIBUTOR HEAD VALVE

(57) Abstract

A distributor head valve having a water tap adapter (10) with a threaded body boss for fitment to threaded water taps, a four-way water flow valve mechanism is provided in the form of a housing with a fixed segment (11) and a movable segment (12) which can be hand turned about the adapter by using the knurled wheel (42) formed as the skirted side wall of the movable segment to rotate a flat circular plastic disc (29) which has a single water flow aperture (36) to successively uncover and thus open each of four water outlet ports (13) (13a), (14) (14a) in the bottom of the fixed housing segment which bottom also has threaded portions to enable attachment of four threaded plastic hose fitment nipples (18) screwed into it.



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DISTRIBUTOR HEAD VALVE

TECHNICAL FIELD

5 This invention relates generally to fittings for distribution of fluids by means of pipes, valves and flexible hoses and more particularly concerns a device which can be fitted to outside, domestic water taps to enable a plurality of outlets to be used alternately from the one supply tap and also enables fitment and use of a number of hoses simultaneously.

BACKGROUND ART

10 It is now possible for laymen to build up water reticulation schemes without the necessity for utilizing the services of plumbers by buying many separate components as "click together" spring-loaded components with male and female sockets and spring-loaded, locking and release sleeves. By this method and by the use of Y
15 connectors, a single tap and hose can be duplicated to supply several outlets which can be operated at the same time. However, even when stop valves are fitted to the end of each hose length, it is not very simple to re-connect for use without first turning off the tap or
20 disconnecting and it is not recommended to leave the tap in turned off position because of pressure build up.

Many industrial or commercial manual valves or taps are heavy, bulky and not simple to operate.

25 The advantages of the invention are that a hand-operated metal valve is provided with means to screw it firmly onto water taps of different size threads and it is a flow distributor head enabling water supply to a number of flexible hoses preferably four, which can be fitted to the multiple hose nipple fittings on the
30 bottom of the housing. These nipples are threaded and quickly interchangeable. The distributor head valve mechanism is simple and smooth in operation and the user



can direct water flow to any one of a number of selected outlets in turn merely by turning a knurled hand wheel clearly marked with direction indications.

5 The distributor head valve of the invention is intended to provide a remedy to the problems of having to install additional water outlets or having to purchase and fit, disconnect and re-connect to taps and to hoses, multiple water reticulation fittings of plastic materials and without necessity to turn the tap on and off, or vice
10 versa each time one of the fittings has to be changed.

The invention provides within a single compact housing a distributor head valve with a fixed segment, the top of which is threaded for easy attachment to a threaded tap and a segment rotatable within the fixed
15 segment for controlling selective and alternate water flow in four different directions through multiple outlets underneath the housing. The bottom of the housing has in an accessible position, detachable or interchangeable hose attachment nipples for supplying water to
20 different fittings alternatively, such as garden sprinklers, spray nozzles and the like.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a side elevation of the assembled four-way valve constructed according to the present invention.

25 Figure 2 is a vertical section along line 2-2 of Figure 1.

Figure 3 is an upper view of the fixed segment of the split valve housing showing fluid outlets.

Figure 4 is a detailed underneath perspective view of the valve operating mechanism.
30

Figure 5 is an upper view of the alternate fluid flow direction control plate.

BEST MODE OF CARRYING OUT THE INVENTION AND PREFERRED EMBODIMENT

35 The distributor valve for four-way alternative



liquid flow directional control as shown, has a tubular tap adapter 10 for fixture to a domestic water tap and is sleeved into the rotatable segment 11 of the split housing of the valve. A non-rotatable, split housing segment 12 is adapted to be bolted onto the internally threaded bolt hole in the bottom of the tap adapter 10 as shown in Figure 3. The fixed housing segment 12 is provided with four, identical, internally threaded, fluid flow apertures 13, 13a, 14, 14a, as shown in Figure 3 and is provided with an inner small cylindrical recess 15 and a larger, outer square recess 16 which is adapted to receive and to hold in a non-rotatable manner, the square-ended lug 17 protruding from the bottom or extremity of the adapter as shown in Figure 4. The four threaded holes of the lower housing segment provide attachment means for the four interchangeable hose connexion nipples 18. In this embodiment the nipples are identical, but can be varied in size, if desired. The hose connexion nipples are preferably made of a synthetic plastics self sealing material such as polyamide e.g. nylon. Referring to the more detailed sectional drawing of Figure 2, the tap adapter portion of the four-way directional flow valve embodiment comprises an internally double-threaded upper portion 19 provided with stepped seats 20 and 21 for fitment to taps having either 12.7mm or 6.35mm water tap threads. The exact thread size will depend upon requirements. Built-in nylon gaskets 22 and 23 are preferably provided. The adapter has a flanged disc portion 24 which overlies or caps the upper surface of the rotatable [or upper] housing segment 11. The lower and cylindrical wall portion 25 of the adapter is sleeved into a pair of complementary-shaped sleeve segments 26 and 27 [Figure 4] which depend from the underside of, and are integrally formed and rotatable with the upper housing segment 11.

The adapter also has fluid outlet gaps such as that shown and designated 28 in the cylindrical walls thereof.

5 A rotatable, apertured, fluid flow direction control disc 29 is used as the means for achieving alternate fluid flow direction control and can be made of any suitable synthetic plastics or resin material such as nylon or pvc preferably made of polyvinyl chloride and is positioned above the upper surface of the fixed [or lower] housing segment and below the end of the adapter when in use with
10 two segments of the interrupted beading 30 and 31 surrounding the perimeter at the cylindrical end of the adapter. Each of the flat portions of the disc 29 at 32 and 33, between the beading is adapted to be held underneath each
15 respective lug 34 and 35 formed by flattened extremities of the segmented or interrupted cylindrical sleeves 26 and 27 of the rotatable [or upper] segment of the split housing, so that when the knurled hand wheel like edge of the rotatable housing segment is moved manually to one of four alternate outlet holes positions corresponding to the holes
20 in the fixed [or lower] housing segment, the disc is constrained to move or rotate until the single fluid flow hole 36 in it, is in alignment with one of the fluid outlet holes in the fixed [or lower] housing segment.

The major components may be constructed of any suitable material, but are preferably of die cast aluminium or
25 zinc alloy as rust-proof material. It will be observed that suitable O-ring seals or gaskets are used to seal the assembled components as illustrated by the solid small circular shadings 38, 39 and 40. Directional settings are preferably
30 marked or impressed upon the top surface of the fixed cap portion of the adapter and an indicatory mark of arrow 41 is shown in Figure 1 on the side of the rotatable upper housing segment. The skirted side wall 42 of the rotatable upper split housing segment 11 is formed as a knurled hand
35 wheel to facilitate operation of the valve.



Claims

1. A distributor head for splitting a single fluid flow into a plurality of streams, the head comprising a body with a fluid inlet port for fluid flow connexion to a pipe line and a valve for controlling fluid flow into a chamber, a valve housing a rotatable plug cock for regulating and/or stopping fluid flow through the chamber and from an outlet port, the distributor head having means for the permanent attachment or installation in a pipe network characterized in that the distributor head incorporates a valve and liquid distribution assembly which comprises a fixed tubular tap adapter (10) for fitment to a tap or pipe and for supporting a split housing comprising a movable segment rotatable about the adapter (10), a fixed housing segment (12) adapted to be fixed to the adapter and which has a plurality of fluid outlets (13)(13a),(14)(14a) in the base thereof, alternative fluid flow directional means (29) being provided in the fixed housing segment (12) to enable the segments to be moved relative to each other whereby a fluid outlet aperture (36) in the fluid flow directional means is aligned with a selected fluid flow aperture (13)(13a),(14)(14a) in the base of the fixed housing segment (12).

2. A distributor head valve according to claim 1, wherein the fixed split housing segment (12), is formed as a multi-apertured disc which is screwed or otherwise fixed to the base of the adapter (10) and the rotatable split housing segment (11) is sleeved onto the adapter and is operatively connected to alternative direction fluid flow control means whereby rotation of the rotatable housing segment of the valve constrains rotation of the alternative direction fluid flow control means (29) to cause alignment of an aperture (36) in the said means with one of the apertures (13)(13a),(14)(14a).



3. A distributor head valve according to claim 1 or 2, wherein said alternative direction fluid flow control means comprises a rotatable, circular disc(29) of synthetic plastics or resin material such as nylon or pvc and is adapted to slide over the floor of the base of the valve fixed housing segment, said disc being provided with a single fluid flow outlet aperture (36) which is adapted to be successively aligned with any one of the apertures (13)(13a), (14)(14a) in the base of the fixed housing segment.

4. A distributor head valve according to claim 3, wherein the disc has a central fixture aperture surrounded by a peripheral wall raised above the plane of the surface of the disc and interrupted at two diametrically opposite points, the valve upper and rotatable housing segment being provided with two lugs (26)(27), formed as interrupted cylindrical sleeves, each lug being adapted to fit into the spaces (32)(33) between wall ends and engage the ends of the raised peripheral wall of the disc to turn the disc when the movable segment is rotated.

5. A distributor head valve according to any preceding claim wherein the adapter (10) is tubular with an intermediate flanged portion (24) overlying the top of the rotatable housing segment (11) which is skirted and provided with a knurled external side wall(42) and indicia (41) to enable the housing segment (11) to be turned by hand and set at a predetermined radial position about the adapter

6. A distributor head valve according to claim 5 wherein the adapter (10) is internally threaded with wells of two different diameters with seats (20)(21) to enable fitment to threaded water taps of different diameters.

7. A distributor head valve according to claim 3 wherein a plurality of hose connexion nipples (18) are provided



for the apertures (13)(13a), (14)(14a), in the base of the fixed housing segment.

- 5 8. A distributor head valve according to claim 7, wherein the nipples (18) are each provided with an upper section of wider diameter than a lower section so that the lower section can be removed to enable the upper section to be connected to a hose of wider diameter than the lower section.
- 10 9. A distributor head valve according to claim 7 or claim 8 wherein the upper end of each hose connection nipple is externally threaded and is adapted to be screwed into and out of an internally threaded aperture in the base of the valve lower or fixed housing segment.



AMENDED CLAIMS

(received by the International Bureau on 29 December 1981 (29.12.81))

1. A Multi-port valve for splitting a single inlet fluid flow into a plurality of outlet flow streams, the valve comprising a body with a fluid inlet port for fluid flow connexion to a pipe line and housing a valve for controlling fluid flow into a chamber, a rotatable, multi-apertured, port flow selection member for regulating and/or stopping fluid flow through the chamber and from multiple outlet ports, the valve having means for the permanent attachment or installation in a pipe network characterized in that the multi-port valve is a distributor head assembly for alternative direction liquid flow when attached to a tap and comprises an axially disposed tubular tap adapter (10) with an inlet port for fitment to a tap, the adapter supporting a split housing comprising a movable segment (11) rotatable by hand about the adapter (10) in forward or reverse directions when a tap to which the adapter is attached is in the "off" position, a fixed housing segment (12) screwed or otherwise fixed to the base of the adapter (10) and which has a plurality of axially disposed fluid outlets (13)(13a), (14)(14a) in the flat disc-like base thereof, the rotatable split housing segment (11) being sleeved onto and being freely rotatable about the adapter (10) in both forward and reverse angular directions, alternative fluid flow directional means (29) being interposed between the base of the adapter and over the flat inner surface of the base for free-sliding rotational movements of the means (29) whereby rotation of the rotatable housing segment (11) constrains rotation of the alternative direction fluid flow control means (29) to cause alignment of a single aperture (36) in the said means with any one of the outlet port apertures (13)(13a), (14)(14a) in the base of the fixed housing segment (12).



2. A distributor head valve according to claim 1, wherein said alternative fluid flow control means comprises a rotatable, circular disc (29) of synthetic plastics or resin material such as nylon or pvc and is adapted to slide over the floor of the base of the valve fixed housing segment, said disc being provided with a single fluid flow outlet aperture (36) which is adapted to be successively aligned with any one of the apertures (13) (13a), (14)(14a) in the base of the fixed housing segment.
3. A distributor head valve according to claim 2, wherein the disc has a central fixture aperture surrounded by a peripheral wall raised above the plane of the surface of the disc and interrupted at two diametrically opposite points, the valve upper and rotatable housing segment being provided with two lugs (26)(27), formed as interrupted cylindrical sleeves, each lug being adapted to fit into the spaces (32)(33) between wall ends and engage the ends of the raised peripheral wall of the disc to turn the disc when the movable segment is rotated.
4. A distributor head valve according to claim 1 or 2 wherein the adapter (10) is tubular with an intermediate flanged portion (24) overlying the top of the rotatable housing segment (11) which is skirted and provided with a knurled external side wall (42) and indicia (41) to enable the housing segment to be turned by hand and set at a predetermined radial position about the adapter in accordance with port outlet position indicia on the flanged portion thereof.
5. A distributor head valve according to claim 4 wherein the adapter (10) is internally threaded with wells of two different diameters with seats (20)(21) to enable fitment th threaded water taps of different diameters.
6. A distributor head valve according to claim 2 wherein a plurality of hose nipples (18) are provided for the apertures (13)(13a), (14)(14a), in the base of the fixed housing segment.



7. A distributor head valve according to claim 6, wherein the nipples (18) are each provided with an upper section of wider diameter than a lower section so that the lower section can be removed to enable the upper section to be connected to a hose of wider diameter than the lower section.

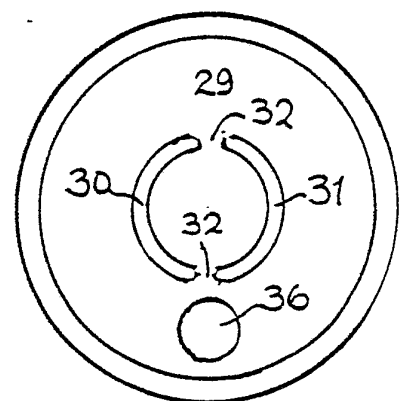
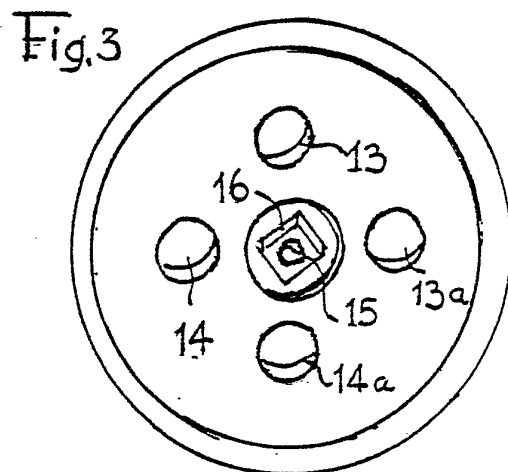
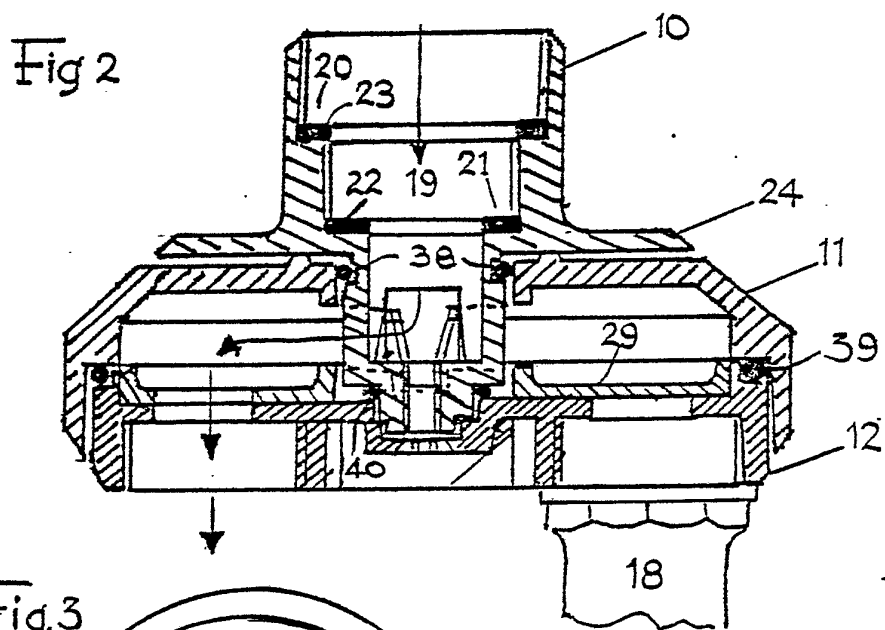
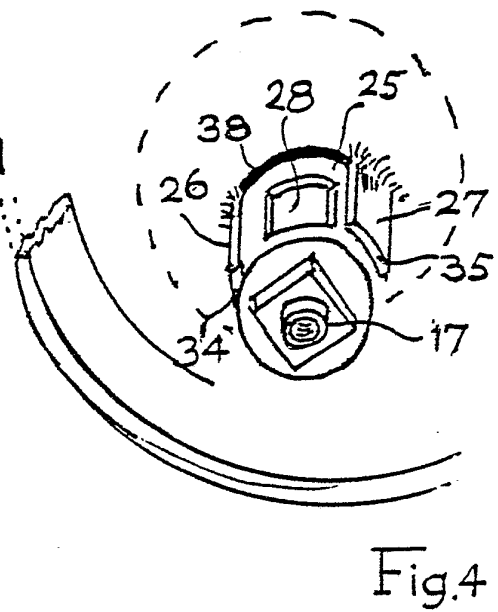
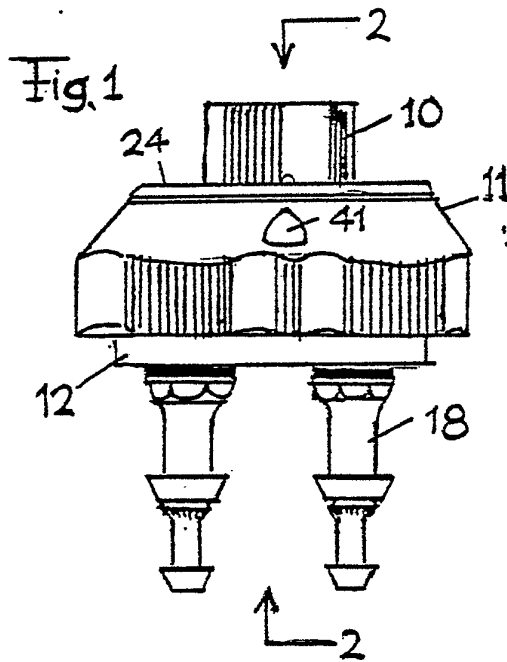
8. A distributor head valve according to claim 6 or claim 7 wherein the upper end of each hose connection nipple is externally threaded aperture in the base of the valve lower or fixed housing segment.



STATEMENT UNDER ARTICLE 19

The amended claim 1 now recites a preamble more consistent with the State of the Art indicated by the four references in the search report which indicated that multi-port valves are known with spring loaded members or in which the fluid flow direction control member is screwed up to release the outlet port selection mechanism which is then clamped into operative position by screwing down the member. Also multi-apertured fluid flow selection discs are known but require to be spring-loaded and remote controlled and motor driven. No spring-loading of members or screw-clamping action is required in Applicant's construction and inlet and outlet ports are aligned in a generally axial direction for compactness of design and installation on site especially on threaded water taps. The alternative fluid flow direction control is freely rotatable by hand in both the forward or reverse direction to any of the indicated pre-selected alternative outlets eliminating the necessity to remove hose fittings from one tap and then refasten the fittings to another tap. The distributor head is of compact easy to install and easy to use design and construction and operation and is believed to have advantages and features which contribute an advance in the art over the cited specifications.





INTERNATIONAL SEARCH REPORT

International Application No. PCT/AU 81/00115

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ³ According to International Patent Classification (IPC) or to both National Classification and IPC Int.Cl. ³ F16K 11/06																	
II. FIELDS SEARCHED Minimum Documentation Searched ⁴ <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%; text-align: left; border-bottom: 1px solid black;">Classification System</th> <th style="text-align: left; border-bottom: 1px solid black;">Classification Symbols</th> </tr> <tr> <td style="padding: 5px;">IPC</td> <td style="padding: 5px;">F16K 11/06</td> </tr> </table> Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵ AU:IPC as above; Australian Classification 74.71			Classification System	Classification Symbols	IPC	F16K 11/06											
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III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴ <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%; text-align: left; border-bottom: 1px solid black;">Category [*]</th> <th style="text-align: left; border-bottom: 1px solid black;">Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷</th> <th style="width: 10%; text-align: left; border-bottom: 1px solid black;">Relevant to Claim No. ¹⁸</th> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">L</td> <td style="padding: 5px;">US, A, 3721268 (ERLICH) 20 March 1973 (20.03.73)</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">X</td> <td style="padding: 5px;">AU, B, 23934/70 (421848) (ESSEX INTERNATIONAL, INC.) 23 March 1972 (23.03.72)</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">X</td> <td style="padding: 5px;">AU, B, 29667/49(146517) (HORWOOD BAGSHAW LIMITED) 7 September 1950(07.09.50)</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">L</td> <td style="padding: 5px;">GB, A, 1334431 (UNITED KINGDOM ATOMIC ENERGY AUTHORITY) 17 October 1973(17.10.73)</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1</td> </tr> </table>			Category [*]	Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸	L	US, A, 3721268 (ERLICH) 20 March 1973 (20.03.73)	1	X	AU, B, 23934/70 (421848) (ESSEX INTERNATIONAL, INC.) 23 March 1972 (23.03.72)	1	X	AU, B, 29667/49(146517) (HORWOOD BAGSHAW LIMITED) 7 September 1950(07.09.50)	1	L	GB, A, 1334431 (UNITED KINGDOM ATOMIC ENERGY AUTHORITY) 17 October 1973(17.10.73)	1
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[*] Special categories of cited documents: ¹⁵ "A" document defining the general state of the art "E" earlier document but published on or after the international filing date "L" document cited for special reason other than those referred to in the other categories "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but on or after the priority date claimed "T" later document published on or 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																	
IV. CERTIFICATION <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black; padding: 5px;"> Date of the Actual Completion of the International Search ² 29 October 1981 (29.10.81) </td> <td style="width: 50%; border-bottom: 1px solid black; padding: 5px;"> Date of Mailing of this International Search Report ² 02 November 1981 (02-11-81) </td> </tr> <tr> <td style="border-bottom: 1px solid black; padding: 5px;"> International Searching Authority ¹ Australian Patent Office </td> <td style="border-bottom: 1px solid black; padding: 5px;"> Signature of Authorized Officer ²⁰ A.S. Moore <i>A.S. Moore</i> </td> </tr> </table>			Date of the Actual Completion of the International Search ² 29 October 1981 (29.10.81)	Date of Mailing of this International Search Report ² 02 November 1981 (02-11-81)	International Searching Authority ¹ Australian Patent Office	Signature of Authorized Officer ²⁰ A.S. Moore <i>A.S. Moore</i>											
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