



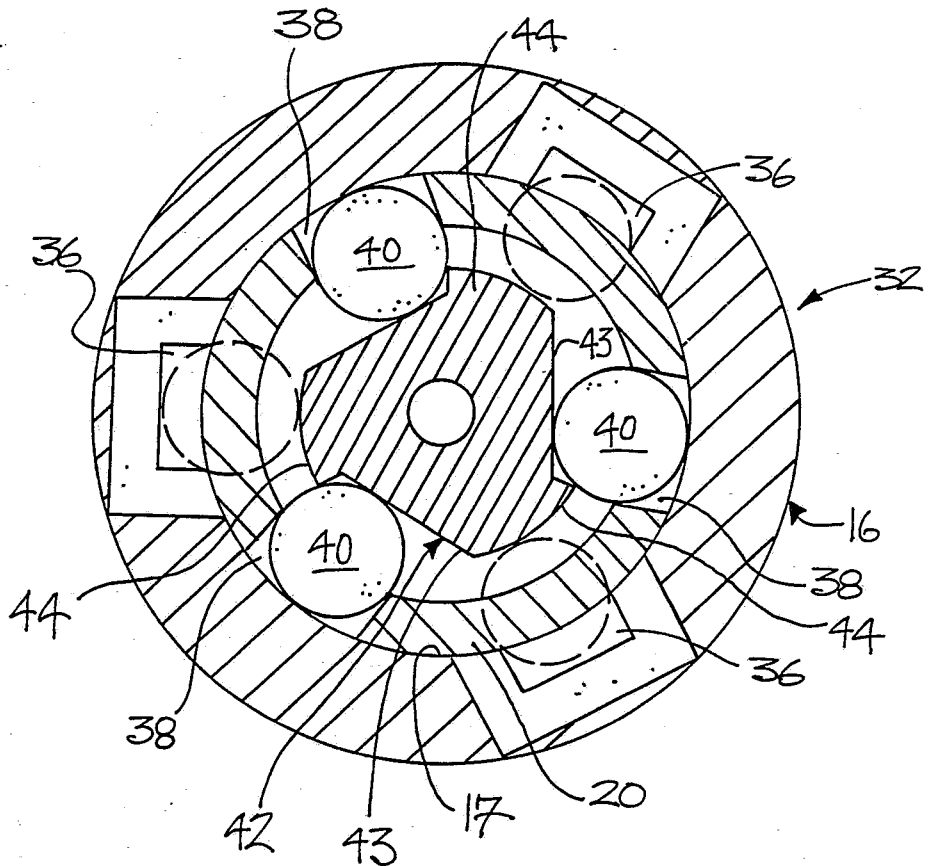
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/AU89/00462 (22) International Filing Date: 26 October 1989 (26.10.89) (30) Priority data: PJ 1153 26 October 1988 (26.10.88) AU (71)(72) Applicant and Inventor: ORBELL, Joseph, Robin [GB/AU]; 63 Pandora Drive, City Beach, W.A. 6015 (AU). (74) Agent: LORD, Kelvin, Ernest; 4 Douro Place, West Perth, W.A. 6005 (AU). (81) Designated States: AT, AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CF (OAPI patent), CG (OAPI patent), CH, CM (OAPI patent), DE, DK, FI, FR (European patent), GA (OAPI patent), GB, HU, IT (European patent), JP, KP, KR, LK, LU, MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NO, RO, SD, SE, SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US.</p>		<p><b>Published</b> <i>With international search report.</i></p>

(54) Title: ANTI-THEFT DEVICE

(57) Abstract

The invention provides an anti-theft device (10) especially intended for cycles in which the handle bars are uncoupled from the front wheel when the cycle is not required for use so that the cycle is unsteerable. The device (10) preferably comprises an inner rotatable tube (20) and an outer rotatable tube (16) with corresponding apertures (38) and recesses (36) respectively, and reciprocally rotatable cam means (42) is provided for interengaging the inner and outer tubes (20, 16) by means of rollers or balls (40) to enable the cycle to be steered.



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TITLE

ANTI-THEFT DEVICE

DESCRIPTION

The present invention relates to an anti-theft device.

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FIELD OF THE INVENTION

In particular the present invention is particularly intended for use with a cycle especially a bicycle, though it is to be understood that the invention is of general applicability.

10

SUMMARY OF THE INVENTION

In accordance with one aspect of the present invention there is provided an anti theft device comprising first inner and second outer rotatable members, the first member being located within the second member, means to secure the anti theft device to a vehicle to be rendered non-steerable when not required for use and a means having a first position in which the first and second members are engaged with one another so as to be arranged to rotate together so that the vehicle can be steered and a second position in which the first and second members are disengaged from one another so as to be independently rotatable so that the vehicle cannot be steered.

In accordance with a further aspect of the present invention there is provided a vehicle such as a cycle fitted with an anti-theft device in accordance with the present invention.

In accordance with another aspect of the present invention there is provided a cycle headstem having an upper end having means for connection to handle bars and a lower end arranged to be connected to fork means wherein the headstem

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comprises adjacent its upper end an antitheft device in accordance with the present invention such that when a cycle is not required for use the handlebars are disengaged from the fork means.

5

BRIEF DESCRIPTION OF THE DRAWINGS

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

Figure 1 is a side view of a cycle head stem incorporating  
10 the anti-theft device of the present invention;

Figure 2 is a sectional side view of the cycle head stem of Figure 1; and

Figure 3 is a sectional plan view of the cycle head stem of Figure 2.

15

DESCRIPTION OF THE INVENTION

Shown in Figures 1 to 3 is a cycle head stem 10 having a clamp means 12 to secure a handle bar (not shown). The clamp means 12 is spaced apart from a first tube member 16 having an inner surface 17, by a bridge member 18.

20 Rotatable within the first tube member 16 is a second tube member 20. The tube member 20 has one end 21 located within the tube member 16 and another end 22 located outside the tube member 16.

The end 22 has a securing means broadly designated by the  
25 numeral 24 arranged to secure the stem 10 into the fork steering post of a bicycle. The securing means 24 comprises a threaded bolt 26 arranged to move a tapered plug 28, the plug 28 having an inclined face 30. The bolt 26 has a head which rests on an internal shoulder 27 of the tube 20. The

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end 22 may also have an inclined face 31 arranged to bear, in use, against the face 30 in known manner. As a result of the inclined faces 30 and 31, when the bolt 26 is rotated, the plug 28 is forced outwardly against the headstock and thereby secures the stem 10. Such securing means 24 are well known in the art of bicycles.

Shown in Figure 3 is an anti-theft device broadly designated by the numeral 32 and comprising a plurality of equiangularly spaced radial recesses 36 on the inner surface 17 of the tube 16.

The tube 20 has a plurality of equiangularly spaced apertures 38 extending therethrough. Each aperture 38 corresponds with a respective recess 36.

Each aperture 38, and its corresponding recess 36, has an associated moveable member, such as a cylindrical roller 40. As can be seen in Figure 3, the axis of each roller 40 is disposed parallel to the longitudinal axes of the tubes 16 and 20. Preferably, the depth of each recess 36 is less than half of the diameter of its corresponding roller 40. The roller 40 is then only able to protrude less than half way into the recess 36.

The rollers 40 are able to be moved by a cam member 42 located centrally of the tube 20. The cam member 42 is able to rotate relative to the tube 20 about the longitudinal axis of the tube 20. The cam 42 has a plurality of lobes 44, each lobe 44 corresponding to a roller 40. Adjacent each lobe 44 there is disposed a corresponding face 43 which bears against the corresponding roller 40 in the position of the cam shown in Figure 3. As seen in Figure 2, the cam

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member 42 rests on an internal shoulder 45, of the tube 16. In Figure 2, there is shown a lock means 46 located above the cam member 42 and operatively connected to the cam member 42 by means of a generally rectangular pin 47. The  
5 lock means 46 is arranged to rotate the cam 42 under control of a key. A grub screw 48 passes through an aperture in the tube 20 to prevent the lock 46 from turning within the tube 20.

A grub screw 50 is disposed between the tubes 16 and the  
10 bridge member 18 so as to secure these members together. Also, for increased strength of the connection a key 52 is preferably disposed between the tubes 16 and the bridge 18. In use, only the tube 20 is initially partly disposed in the fork steering post of a cycle (not shown). The bolt 26 is  
15 rotated by a suitable tool inserted through the end 21 of the tube 20 to cause the inclined face 30, of the plug 28, to bear against the end 22, of the tube 20. The plug 28 is forced outwardly against the fork steering post and thereby secures the tube 20 to the fork steering post.

20 The cam 42 is then placed within the tube 16 to rest upon the shoulder 45. Each roller 40 is then disposed partially in a corresponding aperture 38 as shown in Figure 3 in solid lines.

The tube 16 is then disposed rotatably about the tube 20.  
25 The lock means 46 is then lowered into the tube 20 to engage the cam member 42 by means of the pin 47. The alignable apertures in the tubes 16 and 20 are aligned by relative rotation of the tubes 16 and 20.

A handle bar (not shown) is then secured to the handle bar

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stem 10 by the clamp means 12, in known manner.

The stem 10 is then ready for use. Typically, in this configuration the anti-theft device 32 is in a disengaged state. This disengaged state is shown in Figure 3 in solid  
5 lines.

As seen in Figure 3, the apertures 38 are not aligned with the recesses 36 and the rollers 40 do not protrude into the recesses 36. Further, the lobes 44, of the cam member 42, do not bear on the rollers 40. The tube 16 is thus able to  
10 rotate relative to the tube 20 and the handle bars are hence able to rotate relative to the front wheel of the bicycle. The handle bars are thus uncoupled from the front wheel fork and steering is not possible.

To couple the handle bars to the front wheel, and thus to  
15 enable steering, the anti-theft device 32 must be engaged. The apertures 38 are firstly aligned with the recesses 36 usually by aligning the front wheel with the cycle and with the handle bars in their normal position. The apertures 38 and the recesses 36 are then in alignment. The lock means  
20 46 can then be operated, typically by a key. This rotates the cam member 42 (clockwise as shown in Figure 3) relative to the tubes 16 and 20 such as through 90°. The faces 43 bear on the rollers 40 and initially urge the rollers 40 further into the apertures 38 and thus into the recesses  
25 36. As each roller 40 enters the recess 36 the corresponding lobe 44 engages with the roller 40 and firmly locks the roller 40 in place in the recess 36. The key is then removed from the lock 46, the cam 42 thereby being locked in place. The rollers 40 prevent relative rotation

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of the tubes 16 and 20. The handle bars are not able to move relative to the forks. Thus, the handle bars are coupled to the front wheel and steering is possible. The lobes 44 ensure that the rollers 40 are retained in the desired region adjacent their corresponding recesses 36 and apertures 38 at all times. When the cycle is to be left unattended (and prevention of theft is desired) the lock 46 is operated to disengage the anti-theft device 32. The lock 46 is operated to rotate the cam 42 (anti-clockwise as shown in Figure 3) such as through 90° relative to the tubes 16 and 20. The lobes 44 no longer bear on the rollers 40. This is the configuration shown in solid in Figure 3. The rollers 40 are then free to move out of the recesses 36 when the tubes 16 and 20 are rotated relative to one another.

The tubes 16 and 20 are thus able to move relative to each other. This uncouples the handle bars from the front wheel and renders steering impossible.

The rollers 40 protrude less than half way into the recesses 36 as described hereinbefore. If the tube 16 is rotated relative to the tube 20, the recesses 36 will contact the rollers 40 eccentrically. This will tend to force the rollers 40 away from the recesses 36 and thereby facilitate relative rotation of the tubes 16 and 20 in this configuration.

In comparison to prior art anti-theft devices, the anti-theft device 32, of the present invention cannot readily be forced since it uncouples the handle bars instead of locking them.

Also, bicycles can be put in the boot of a car since the



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handle bars can be rotated relative to the front wheel.

Also, bicycles can be readily leaned against walls since the front wheel can be disposed parallel to the wall whilst the handle bars are against the wall which reduces the tendency  
5 of the bicycle to roll away.

Modifications and variations such as would be apparent to a skilled addressee are deemed within the scope of the present invention. For example, the roller 40 could be replaced by ball bearings.

10 Also, the strength of the mechanism could be increased by increasing the length of the rollers or by fitting a tandem set of rollers one above the other.

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CLAIMS

1. An anti theft device characterised in that it comprises first inner and second outer rotatable members, the first member being located within the second member, means to  
5 secure the anti theft device to a vehicle to be rendered non-steerable when not required for use and a means having a first position in which the first and second members are engaged with one another so as to be arranged to rotate together so that the vehicle can be steered and a second  
10 position in which the first and second numbers are disengaged from one another so as to be independently rotatable so that the vehicle cannot be steered.
2. An anti theft device according to Claim 1, characterised in that the first inner rotatable member has a  
15 plurality of spaced apertures and the second outer rotatable member has a plurality of corresponding spaced recesses and means is provided for interengaging the apertures and corresponding recesses when aligned so that the inner and outer members can be rotated together.
- 20 3. An anti theft device according to Claim 2, characterised in that the means for interengaging the inner and outer member comprises rollers or balls located in the apertures of the inner member.
4. An anti theft device according to Claim 3,  
25 characterised in that means is provided for urging the rollers or balls into engagement with the recesses of the outer member when the apertures and recesses are aligned.
5. An anti theft device according to Claim 4, characterised in that there is provided a reciprocally

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rotatable cam member arranged to be rotated relative to the inner rotatable member and being located within the inner rotatable member, the cam member having a lobe for each roller or ball and being arranged to bear against each roller or ball such that when the apertures and recesses are aligned the rollers or balls are urged into the recesses.

5  
6. An anti theft device according to Claim 5, characterised in that each cam lobe has a corresponding adjacent face which bears against the corresponding roller when the rollers or balls are not engaged with the recesses of the outer rotatable member.

7. An anti theft device according to Claims 5 or 6, in which each recess has a depth less than half of the corresponding dimension of the roller or ball so that the roller or ball can be readily disengaged from the recess when the cam is rotated back.

8. An anti theft device according to Claims 5 or 6, characterised in that there is provided a lock means operatively connected to the cam member, the lock means being arranged to rotate the cam member under control of a key.

9. A vehicle such as a cycle characterised in that it is fitted with an anti theft device according to Claim 1.

10. A cycle headstem having an upper end having means for connection to handle bars and a lower end arranged to be connected to fork means characterised in that the headstem comprises adjacent its upper end an anti theft device according to Claim 1.

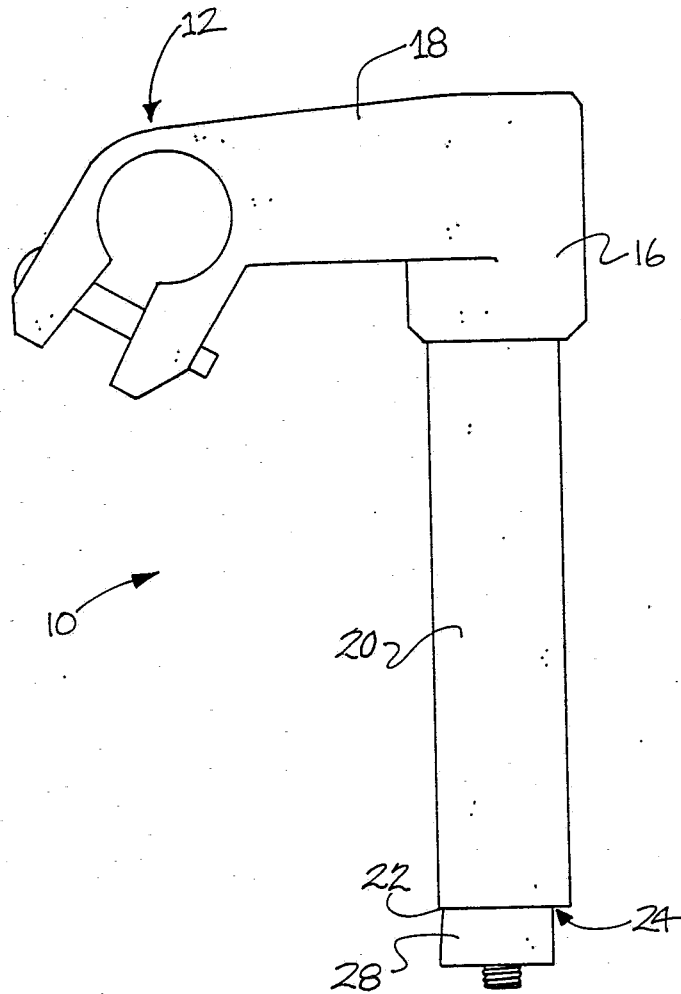


FIG. 1

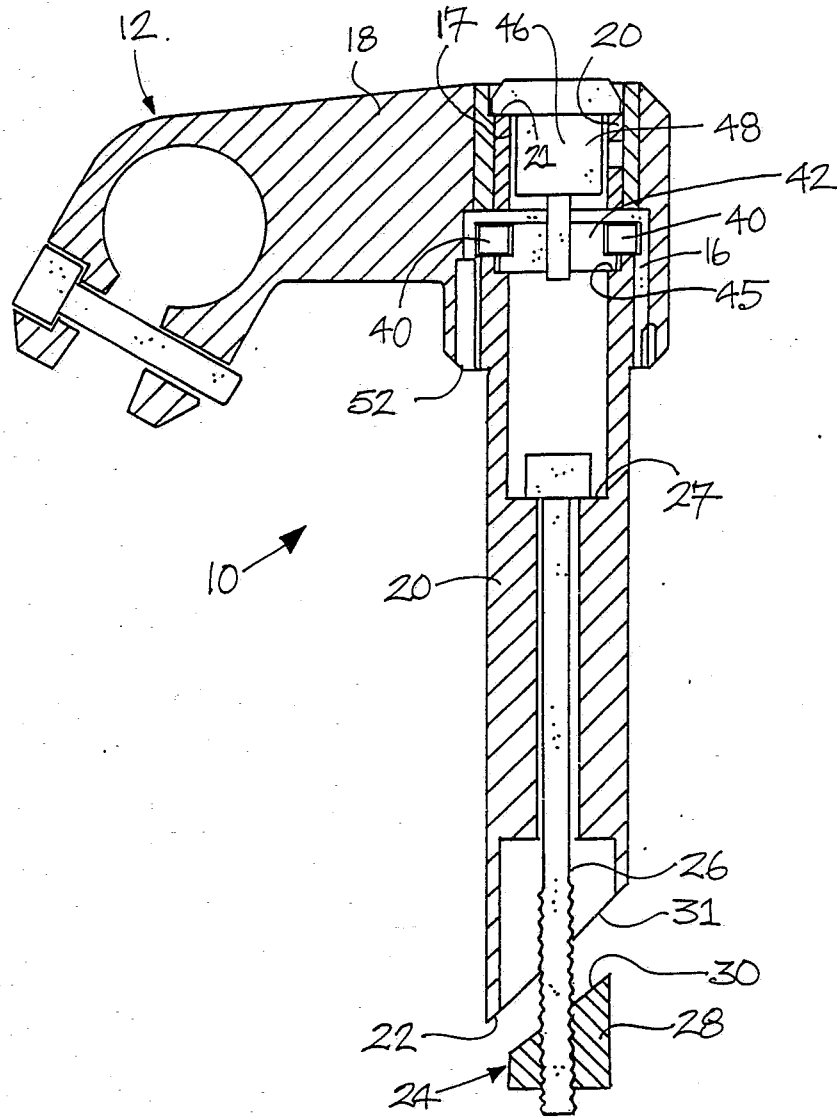


FIG. 2.

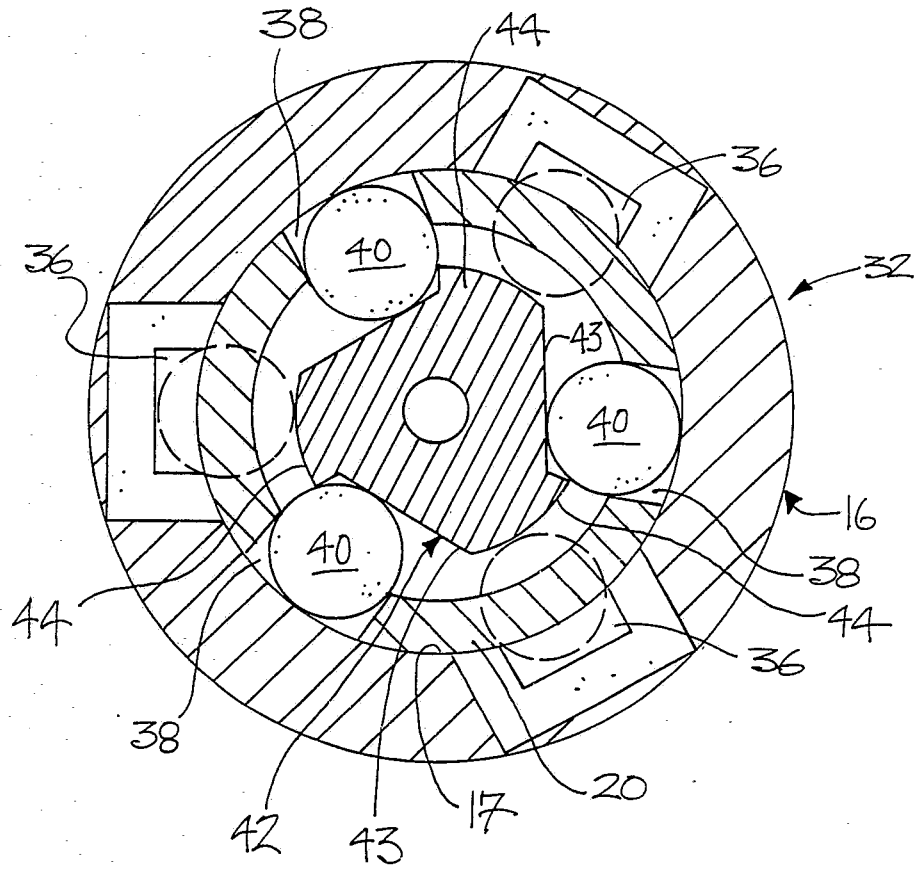


FIG 3

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/AU 89/00462

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. <sup>4</sup> B62H 5/06, B60R 25/02	
II. FIELDS SEARCHED	
Minimum Documentation Searched 7	
Classification System	Classification Symbols
IPC	B62H 5/04, 5/06, B60R 25/02
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, with indication, where appropriate, of the relevant passages 12	Relevant to Claim No 13		
X	US, A, 1471553 (FELL) 23 October 1923 (23.10.23)	1, 2, 9		
X	US, A, 1623455 (ANDREW) 5 April 1927 (5.04.27)	1, 2, 9		
X	GB, A, 176222 (ELVERSON) 9 March 1922 (9.03.22)	1, 2, 9		
X	FR, A, 671451 (MATHIS) 13 December 1929 (13.12.29)	1, 2, 9		
X	FR, A, 755302 (MATHIS) 23 November 1933 (23.11.33)	1, 2, 9		
X	FR, A, 885347 (BOUILLON) 10 September 1943 (10.09.43)	1, 2, 9		
X	FR, A, 691211 (LESPINASSE) 2 October 1930 (2.10.30)	1, 2, 9		
X	FR, A, 2575713 (BERTRAND) 11 July 1986 (11.07.86)	1, 2, 9		
<p>* Special categories of cited documents: 10</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 40%; vertical-align: top;"> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="width: 10%; vertical-align: top;"> <p>"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</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"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.</p> <p>"g" document member of the same patent family</p> </td> </tr> </table>			<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"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.</p> <p>"g" document member of the same patent family</p>
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IV. CERTIFICATION	
Date of the Actual Completion of the International Search 21 December 1989 (21.12.89)	Date of Mailing of this International Search Report 11-01-90
International Searching Authority Australian Patent Office	Signature of Authorized Officer P.J. WHITE <i>[Signature]</i>

## 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
X	DE, A, 460164 (SCHLEGEL) 3 May 1928 (03.05.28)	1, 2, 9
A	WO, A, 83/03082 (NEIMAN S.A.) 15 September 1983 (15.09.83)	



ANNEX TO THE INTERNATIONAL SEARCH REPORT ON  
INTERNATIONAL APPLICATION NO. PCT/AU 89/00462

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		
WO 8303082	DE 3208375	EP	101694

END OF ANNEX