



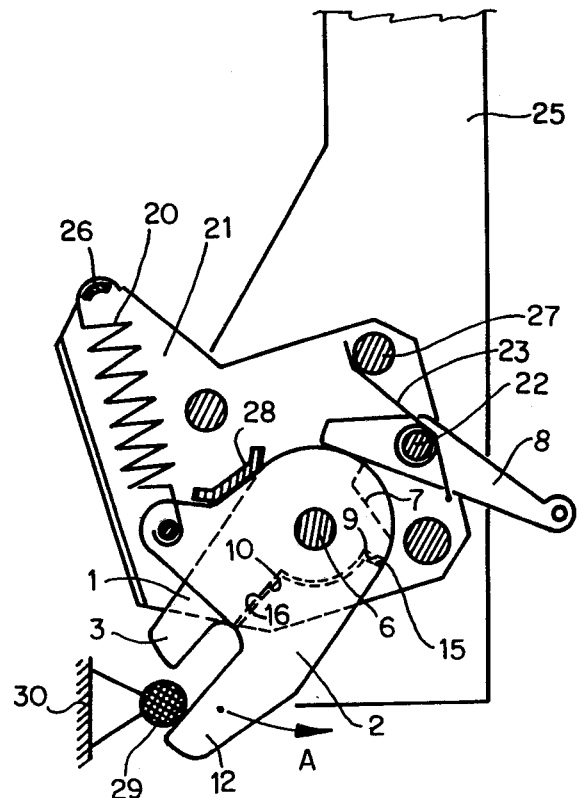
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: <b>PCT/BR91/00029</b> (22) International Filing Date: <b>3 December 1991 (03.12.91)</b> (30) Priority data: PI 9006141 <b>4 December 1990 (04.12.90) BR</b> (71) Applicant (for all designated States except US): <b>MERCEDES-BENZ DO BRASIL S.A. [BR/BR]; Av. Alfred Jurzykowski no. 562, Vila Paulicéia, 09700-São Bernardo do Campo, SP (BR).</b> (72) Inventor; and (75) Inventor/Applicant (for US only): <b>GONZALEZ FERNANDEZ, José [ES/BR]; Rua Georgia no. 145, Apt. 152, Brooklin, SP (BR).</b></p>		<p>(74) Agent: <b>DANNEMANN, SIEMSEN, BIGLER &amp; IPANEMA MOREIRA; Rua Marquês de Olinda no. 70, Botafogo, 22251-Rio de Janeiro, RJ (BR).</b> (81) Designated States: <b>AT, AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CI (OAPI patent), CM (OAPI patent), DE, DE (European patent), DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), GN (OAPI patent), GR (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC (European patent), MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, PL, RO, SD, SE, SE (European patent), SN (OAPI patent), SU<sup>+</sup>, TD (OAPI patent), TG (OAPI patent), US.</b>  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>

(54) Title: **LOCK FOR HINGED LIDS, DOORS AND THE LIKE**

(57) Abstract

A lock for hinged lids, doors or the like, particularly for automobile trunks or boots, is disclosed of the type having a jaw mounted on a base (21) for rotation from an open unlocked configuration to a closed locked configuration. During closure of the lid, door or the like, the jaw is carried on the base plate towards a fixed locking pin (29) separate from the lock, a longer part of the jaw first hits the locking pin and then the jaw rotates with further closure of the lid so that the locking pin (29) enters the jaw. The jaw then snaps into a locked position. According to the invention the jaw comprises two jaw parts (1, 2) arranged for partial relative opening movements against the force of the bias spring (20) that also rotationally biases the complete jaw towards its open unlocked configuration. When the locking pin is initially impacted by the second longer jaw part (2), the impact is partially cushioned by partial opening of the jaw against the spring force and, when the locking pin (29) enters the jaw, it is retained in position under that same force applied by the spring (20) which tends to close the two jaw parts (1, 2) with respect to each other.



**+ DESIGNATIONS OF "SU"**

Any designation of "SU" has effect in the Russian Federation. It is not yet known whether any such designation has effect in other States of the former Soviet Union.

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Title: "LOCK FOR HINGED LIDS, DOORS AND THE LIKE"

The present invention refers to a lock for hinged lids, doors or the like and more specifically to a type of lock conventionally used for closing trunks or boots of automobiles.

Of the many types of such locks or closures that are known in the art, the most usual are basically formed by a housing containing an integral metal fork or jaw and mounted on the hinged element such as the lid of an automobile trunk. When the lid is closed, the jaw picks up a fixed locking pin mounted on a part of the vehicle chassis and rotates with respect to its housing to a closed or locked position.

Locks of this type, however, do not present an optimal locking function and, moreover, have to be oversized so as to be able to withstand the elevated impact and closure forces involved when the integral jaw hits the locking pin.

Apart from this and the general wear suffered from the above mentioned elevated forces during closure, the jaw does not receive the locking pin with a constant pressure whereby, in the case of automobiles, excessive noise is produced due to relative movement between the trunk lid and the locking pin resulting from vibration during movement of the vehicle.

The principal object of the present invention is to provide such a lock that overcomes the above disadvantages by

using a jaw of a pincer type that grips the locking pin, that improves the locking function and that virtually eliminates noise and wear.

The lock of the present invention is therefore of a type comprising a base for mounting on a hinged lid, door or the like, a jaw means rotatably mounted on the base and biased by spring means towards a first rotational unlocked position from a second rotational locked position, the jaw means comprising a first shorter jaw portion and a second longer jaw portion for receiving therebetween a fixed locking pin separate from the lock as the base means moves from an open position to a closed position with the pin entering first into contact with the second longer jaw portion to cause rotation of the jaw means from the unlocked to the locked position against the bias of the spring means, and locking means adapted to retain the jaw means in the second locked position and operable to release the jaw means from the second locked position and thus permit rotation of said jaw means towards the first unlocked position under the bias of the spring means.

According to the invention, the first and second jaw portions comprise a first jaw part and a second separate jaw part rotatably mounted together on the base about a common axis, means being provided to permit limited relative rotation between the jaw parts with the spring means biasing the second jaw part towards the first jaw part, whereby, when the base moves from the said open position towards the closed position and the locking pin enters into contact with the second jaw part, the jaw parts are partially opened with respect to each other against the bias of the spring means to permit entry under pressure of the locking pin between the jaw parts.

It will therefore be understood that the jaw of the lock according to the present invention is of a two-part construction with the two parts capable of limited opening movements with respect to each other against the spring force that biases the jaw as a whole towards the unlocked position. Thus, when the lid or the like passes to the closed position and the longer second jaw part picks up the fixed locking pin, the manual closing force applied to the lid is partially absorbed

due to the jaw no longer being rigid but rather slightly elastic due to a slight opening of that jaw part with respect to the first jaw part. As closure is completed the locking pin enters the gap between the jaws where it is maintained under  
5 pressure of the spring that tends to close the two jaw parts. Such an arrangement not only makes it unnecessary to over dimension the components of the lock but also ensures that the lid is firmly retained on the locking pin.

In a preferred embodiment, the means permitting limited  
10 ited rotation comprise first and second pairs of cooperating stop surfaces on the two jaw parts, defining respective angular limits of relative rotation therebetween so as to prevent excessive opening or closing.

Also in the preferred embodiment the above mentioned  
15 locking means comprises a spring biased latch element mounted on the base and cooperable with a catch formation on the first jaw part to maintain the jaw means in the second rotational locked position.

A stop means is preferably formed on the base to  
20 operate with the second jaw part to determine the first rotational unlocked position.

In view of the fact that the second jaw part suffers the impact with the stationary locking pin on the chassis of the vehicle or the like, it is advantageously made of a tough  
25 plastic material, whereas the first jaw part may be made of metal.

The invention will be better understood from the following description given by way of example, reference being made to the accompanying drawings in which:

30 Figure 1 is a perspective illustration of the main components of a lock according to the preferred embodiment of the present invention;

Figure 2 is a schematic showing of the same lock mounted and in an open configuration; and

35 Figure 3 is a schematic illustration of the lock similar to that of Figure 2 but in a closed or locked configuration.

Referring now to the drawings and firstly to Figure 1, a lock in accordance with a preferred embodiment of the in-

vention comprises a jaw in the form of a first jaw part 1 made of metal and a second jaw part 2 of plastic material. Jaw part 1 is elongated with a jaw end 3 and a generally rounded mounting end 4 with a mounting hole 5 for passage of a mounting pin 5 6. The mounting end 4 is also formed with a catch formation 7 for engagement by a locking latch 8, and with a radial projection defining a clockwise rotation limiting stop surface 9. Jaw part 1 defines, internally of the jaw to be defined with jaw part 2, an anticlockwise rotation limiting stop surface 10. Stop surfaces 9 and 10 are joined by a partially circular surface 11 centered on the axis of mounting hole 5.

Second jaw part 2 also has a jaw end 12 which is longer than jaw end 3 of the first jaw part, and a double walled mounting end 13, the two walls of which are separated 15 by a distance that permits the insertion therebetween of mounting end 4 of the first jaw part. Mounting end 13 is formed with aligned mounting holes 14 in its two walls corresponding to hole 5 in the first jaw part. Between the double walls of mounting end 13 there is a transverse surface comprising an anticlockwise rotation stop surface 15 cooperable 20 with stop surface 9 on the first jaw part, and a clockwise rotation stop surface 16 cooperable with stop surface 10 on the first jaw part. The two stop surfaces are joined by a concave partially circular surface 17 centered on the axis of holes 14 25 and adapted for rotation thereon of circular surface 11 on jaw part 1.

The double walls of the mounting end 13 of jaw part 2 are also formed with upper ears having aligned holes 18 for receiving a pin 19 that serves to anchor one end of a relatively strong helical spring 20 to the second jaw part 2. 30 Apart from a base 21 (see Figures 2 and 3) that is not shown in Figure 1, the remaining components of the lock are the above mentioned latch 8 which has a mounting hole 21, a mounting pin 22 that fits through hole 21 and a small bias spring 35 23 having loops 24 through which, in the mounted configuration, pin 22 passes.

Figures 2 and 3 show the lock components of Figure 1 mounted on the base plate 21, itself fixed to a hinged member 25 to be closed by the lock, for example the lid of an automo-

bile trunk. It will be seen that the base plate 21 is provided with a protuberance 26 for anchoring the other end of helical spring 20 whereas one of its own mounting pins 27 serves as a stop for the free end of small bias spring 23. In addition, 5 base plate 21 also provides a clockwise rotation stop 28 for limiting the clockwise rotation of the jaw in the open configuration shown in Figure 2.

Figure 2 also shows the locking pin 29 that is mounted on a fixed part 30, for example the fixed part of the 10 trunk of an automobile in the region where the lid 25 closes. The configuration of Figure 2 shows lid 25 already rotated to a position slightly prior to closing in which the longer jaw end 12 of the second plastic jaw part 2 is beginning to catch on locking pin 29. As the closure movement continues the im- 15 pact of jaw end 12 against the locking pin causes jaw part 2 to open slightly against the force of spring 20, thereby cushioning the impact, until stop surface 15 abuts stop surface 9 on the first jaw part 1 which then begins to rotate in an anticlockwise direction together with jaw part 2 until latch 8 20 under the bias of spring 23 enters and engages itself in catch formation 7 in jaw part 1 to prevent further rotation and to define the closed configuration of Figure 2.

In this closed or locked configuration, it will be seen that the two jaw parts 1 and 2 are still slightly opened 25 so that the locking pin is secured within the jaw under the pressure applied by helical spring 20.

In order to open the lock, it is sufficient for a small pressure to be applied to the free end of latch 8 which is then liberated from formation 7 so that helical spring 20 30 can cause the clockwise rotation of the jaw with jaw end 12 of jaw part 2 reacting against locking pin 29 to cause opening of lid 25. Operation of latch 8 may be effected in any suitable manner, for example, manually, by means of a key, electro- mechanically, pneumatically, by means of vacuum or the like.

35 It will be understood that the preferred embodiment illustrated in the drawings has been described only as an example and that the scope of the present invention should not be limited thereby. The scope of the invention is defined in the accompanying claim and resides in the fact that the jaw

arrangement is a two jaw part construction in which the two jaw parts are partially openable with respect to each other so as to cushion the impact against the locking pin and are spring biased towards one another so as to ensure that in the closed or locked configuration the jaw firmly retains itself on the locking pin.



## CLAIMS

1. Lock for hinged lids, doors and the like comprising a base for mounting on said lid, door or the like, a jaw means rotatably mounted on said base and biased by spring means towards a first rotational unlocked position from a second rotational locked position, said jaw means comprising a first shorter jaw portion and a second longer jaw portion for receiving therebetween a fixed locking pin separate from said lock as said base means moves from an open position to a closed position with said pin entering first into contact with said second longer jaw portion to cause rotation of said jaw means from said unlocked to said locked position against the bias of said spring means, and locking means adapted to retain said jaw means in said second locked position and operable to release said jaw means from said second locked position and thus permit rotation of said jaw means towards said first unlocked position under the bias of said spring means, wherein said first and second jaw portions comprise a first jaw part (1) and a second separate jaw part (2) rotatably mounted together on said base (21) about a common axis, means (9,15;10,16) being provided to permit limited relative rotation between said jaw parts (1,2) and said spring means (20) biasing said second jaw part (2) towards said first jaw part (1), whereby, when said base (21) moves from said open position towards said closed position and said locking pin (29) enters into contact with said second jaw part (2), said jaw parts (1,2) are partially opened with respect to each other against the bias of said spring means (20) to permit entry under pressure of said locking pin between said jaw parts (1,2).

2. Lock according to claim 1, wherein said means permitting limited rotation comprise first and second pairs of cooperating stop surfaces (9,15;10,16) on said jaw parts (1,5) defining respective angular limits of relative rotation between the jaw parts.

3. Lock according to claim 1 or 2, wherein said locking means comprise a spring biased latch element (8)

mounted on said base (21) and cooperable with a catch formation (7) on one of said jaw parts (1,2) to maintain said jaw means in said second rotational locked position.

4. Lock according to claim 3, wherein said catch formation (7) is on said first jaw part (1).

5. Lock according to claim 1, 2 or 3, further comprising stop means (28) on said base (21), cooperable with said jaw means (1,2) to determine said first rotational unlocked position.

10 6. Lock according to claim 5, wherein said stop means (28) are cooperable with said second jaw part (2).

7. Lock according to any one of the preceding claims, wherein the first jaw part (1) is made of metal and the second jaw part (2) is made of a plastic material.

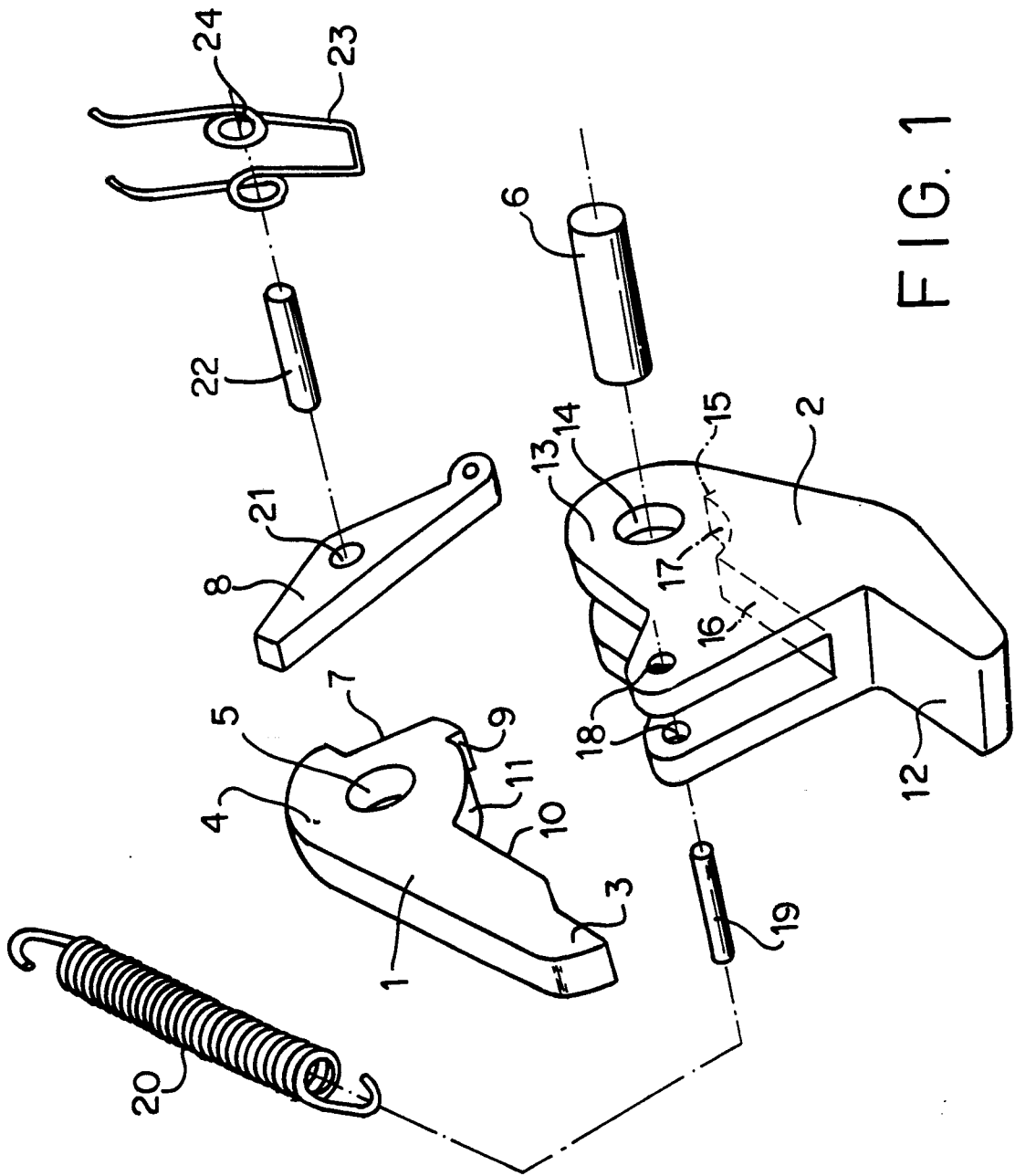
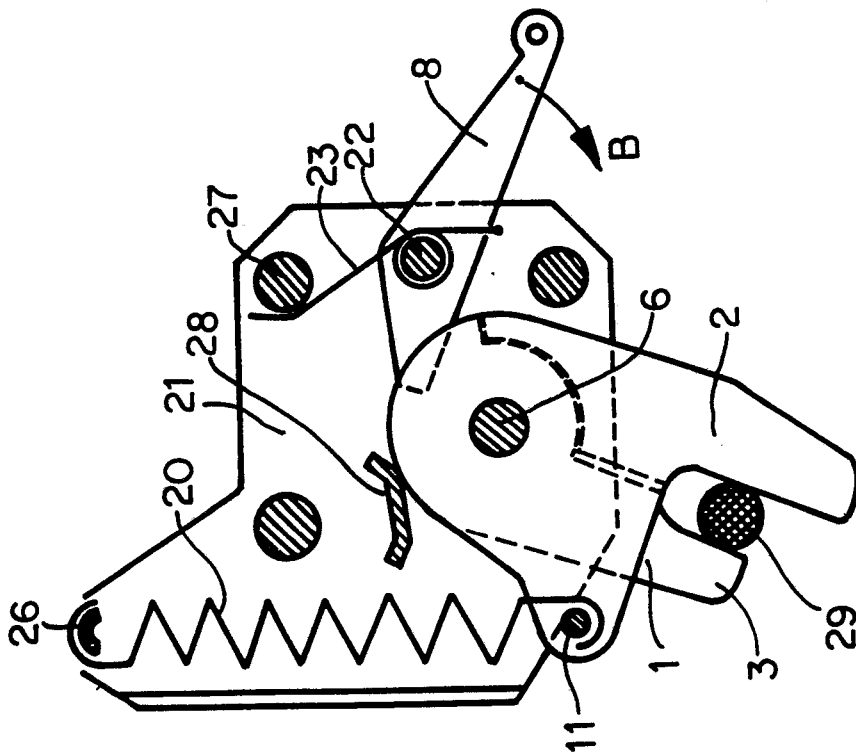
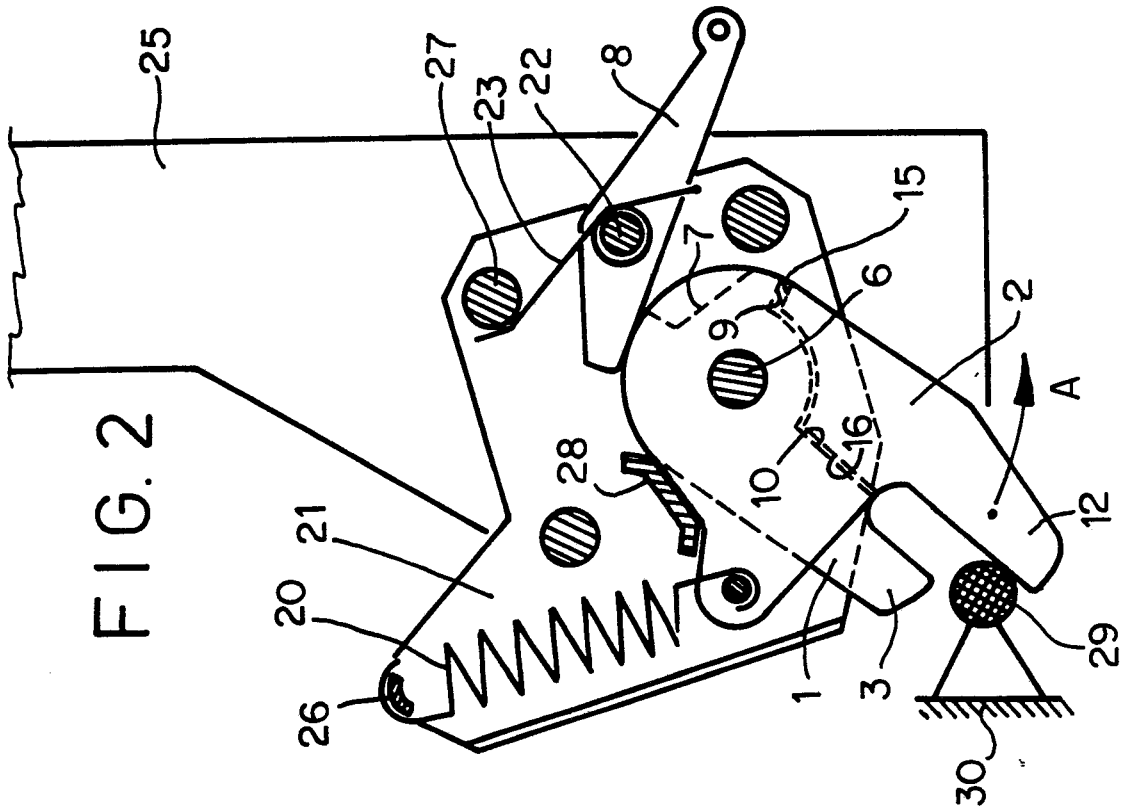


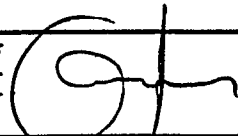
FIG. 1



**INTERNATIONAL SEARCH REPORT**

PCT/BR 91/00029

International Application No

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.C1. 5 E05C3/24		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
Int.C1. 5	E05B ; E05C	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>8</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup></b>		
Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
A	US,A,4 703 961 (WEINERMAN ET AL.) 3 November 1987 see column 5, line 53 - column 6, line 37; figures 1,5-10	1-4
A	US,A,4 875 724 (GRUBER) 24 October 1989 see abstract; figures 13-21	1-3
A	DE,A,3 006 151 (SETEC) 4 September 1980 see page 14, line 12 - page 15, line 15; figures 1,2	1,2
A	DE,C,3 725 074 (KIEKERT) 22 September 1988 see column 3, line 38 - column 4, line 15; figure 1	1
<p><sup>10</sup> Special categories of cited documents :</p> <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>"&amp;" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
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International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	KOUSOURETAS I 	

**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
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US-A-4875724	24-10-89	None	
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