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(71) Applicant: **C.A.S. Locks, S.L.**

**46980 Paterna (ES)**

(72) Inventor: **MONTESINOS ALONSO, Vicente**

**E-46980 Paterna (ES)**

(74) Representative: **Sanz-Bermell Martinez,**

**Alejandro**

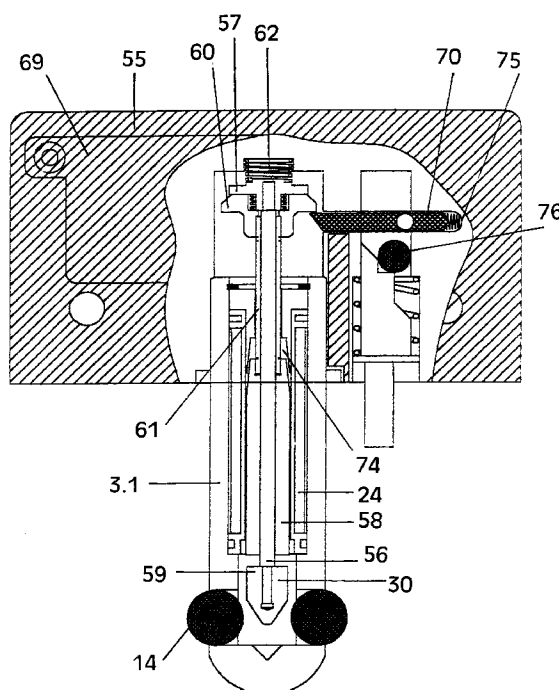
**Játiva, 4**

**46002 Valencia (ES)**

### (54) COMBINED ACTUATION LOCK

(57) The disclosed lock has an anchoring post (1) secured into the ground and into which is locked the corresponding bolt, comprising two parts, the anchoring post (1) which is firmly and unreleasably secured to the ground and the body (2, 55) which has with the anchoring post (1) the actuation devices for opening and closing by means of a stem (3, 3.1) susceptible of being introduced into the anchoring post (1), so that the stem (3, 3.1) is solidly connected to the body (2, 55), and has means for its union and temporary separation with respect to the anchoring post (1); the body has a manual actuation device of at least one lock (15, 17), and an electrical actuation device consisting of an internal device comprised of a solenoid (24) joined to a pin (22) provided with a cap (23) susceptible of being actuated by a cam (21) of the lock (15, 17), controlled by an external pulse, and provided with an automatic interlocking device, susceptible of being linked to a separate electronic station. Application to the fabrication of bolts, locks and specially those which are combined with motor-operated and/or manually operated doors.

Fig. 15



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## Description

The sector of the technique invoked in this patent is that of locks, and particularly those for locking doors whose closing operation is vertical, sliding or tilting. It is also the field of locks for electrically operated doors.

Statement of the prior state of the art. E90904411 for an electrical lock operating device, especially for motor vehicles, made up of an electrical motor which drives an endless screw or worm unit; this is housed in a part of the frame of the device which forms one sole piece with the part of the frame which houses the electric motor.

Recently remote control units have become well-known in systems for unlocking vehicles for example. Outdoor blinds and vertical doors are operated at present by motors which avoid the human work of lifting and lowering these by hand.

Nevertheless locks which can combine both systems, that of motor-driven lifting and operation by remote control, have not yet been heard of.

Unlocking this kind of locks and this kind of doors invokes a series of difficulties stemming from the fact that the lock action has to be internal, as otherwise the lock cannot be efficient because it could easily be forced. Furthermore, the fact that the blind or door mechanically separates from the lock presents problems stemming from the particular adjustment of each item, and as we will see further on in accordance with the solution for this problem.

This invention presents a combined operation lock which, though it can be mechanically operated, can also be run by remote control and is electrically operable, thus electronically determining the situation and anomalies of the locking operation.

There is also a description of an embodiment of the lock consisting in a communication system using two codified units, one external and another in the lock, which are in a permanent dialogue situation, so that the motor can only be operated when both units are in proper communication, and consisting of the set of internal and external devices for detection of the status of the door and consequently the means for carrying out opening or closing operations.

In order to make the explanation to follow clearer, thirteen sheets of drawings are enclosed, representing the essence of this invention in nineteen figures.

Figure 1 shows an outside view of the assembly.

Figure 2 shows an outside view of the assembly.

Figure 3 shows a view of the anchorage with interior view.

Figure 4 shows a view of the anchorage in perspective with the rod inserted into the anchorage.

Figure 5 shows a schematic view of the structure of electrical and mechanical operation.

Figure 6 shows a schematic view of the electrical and mechanical operation according to its position on the rod.

Figure 7 shows a view perpendicular to the previ-

ous one in closed position.

Figure 8 shows a schematic view of the locking device with the automatic retaining device assembly for locking.

Figure 9 shows a schematic view of the assembly shown in the previous figure in the open position.

Figure 10 shows a view of the automatic locking retaining assembly in the open position.

Figure 11 shows a schematic view of the assembly from the side.

Figure 12 shows a view of the cover.

Figure 13 shows a view of the assembly in which the locking of the rod in the anchorage can be seen.

Figure 14 shows a detail of the balls.

Figure 15 shows a front view whose cutaway enables the internal part of a preferential embodiment to be seen.

Figure 16 shows a section and detail of the triggering mechanism according to a preferential embodiment.

Figure 17 shows the rear part of the body in the preferential embodiment.

Figure 18 shows a section view of the cover in which the housing for the electronic system of the lock is set.

Figure 19 is a side view with a cutaway which shows a cross-section of the arrangement of the electronic board and contacts.

In these Figures 1 indicates the anchorage, 2 the body, 3 the rod, 3.1 the rod of the double body, 4 the cover, 5 the edge of the anchorage, 6 the annular reinforcements of the anchorage, 7 the rings for securing the anchorage, 8 the inner thread of the anchorage, 9 the inner plunger of the anchorage, 10 the threaded ring or stop of the plunger, 11 the spring set underneath the plunger 9, and 12 the recess of the plunger, 13 being the upper surface of the plunger, 14 the balls for locking the rod in respect of the anchorage, 15 the side lock, 16 the cover of the side lock, 17 the rear lock, 18 the electrical connection, 19 the attachments for securing the locking assembly to the corresponding door, 20 the bar or axle of the triggering device, 21 the locking cam, 22 the axle of the core, 23 the cap, 24 the solenoid, 25 the core, 26 the electrical connection of the solenoid, 27 the waterproofing seal, 28 the vertical wall of the upper part of the bar or axle of the trigger device, 30 the cone joined to the cylinder 29 or pusher, 31 the detector of the position of the locking device, 32 the thread of the rod, 33 the acute shape of the cap along its lower edge, 34 being the detector arm, 35 the retaining pawl, 36 the ball of the trigger device, 37 the upper housing of the ball, 38 the upper form of the bar or axle of the triggering device, 39 the rear spring of the pawl, 40 the stop of the bar or axis of the trigger device 20, 41 the guide of the bar or axle of the trigger device 20, 42 the rounded lower shape of the pawl, 43 the angular or sharp shape of the retaining pawl, 44 the recess for the retaining pawl, 35, 45 the cable guide hole for connection to the cover, 46 being the electrical connection of the cover 4, 47 the attachment of the rod 3 to the body 2, 48 being the inner

shape of the anchorage which can accommodate the balls 14, 49 the through holes of rod 3, 50 the annular narrowing formed in the outer parts of said through holes, 51 the rear pusher spring of the pawl 35, and 52 being the upper spring of the cap 23, 53 being the recoil spring of the bar or axle of the trigger device, 54 the pawl 35 travel retainer, 55 the body in the preferential embodiment which seen in plan view has a trapezoidal shape, 56 being the pusher bar, 57 the upper part of the cap, 58 the core, 59 the top of the pusher 30, 60 the lower part of the cap, 61 the neck of the core, 62 the return spring of the top of the cap, 63 being the housing for the electronic part, 64 the wedge of the trigger mechanism, 65 the slot for allowing the electronic detectors through, 66 the housing of the cylinder of the manual lock, 67 the housing of the core and opening system, 68 the wedge shaped space for housing the electronic part in hollow 63, 69 being the cover of the electronic section which is to be fitted with a cable guide, 70 being the thumb latch, 71 the thumb latch stabilizing pin, 72 the spring, 73 the pivot of the cam, 74 the core tube, 75 the thumb latch spring, 76 the ball, 77 the hole for the cam pivot, 78 the upper hollow of the ball travel for its housing, 79 the contacts for locking detection, 80 the contacts for detection of impulses prior to the locking command, 81 the cover of the lock, and 82 the electronic circuit board.

The anchorage 1 has a central form fitted with annular reinforcements 6, whose lower part has rings 7 for securing these, and its upper part has an edge 5 which aligns with the outer surface of the place in which this is encased. This can be of the type which is threaded to the body of the anchorage 1. The inner part with its annular reinforcements 6 has an internal widening 48 which can retain the balls 14 held in the rod when these come through the ports opening in the lower side of said rod. The anchorage has an internal plunger 9 set on a spring 11 which has a recess 12 which limits its travel upwards in respect of a threaded ring 10 which is inserted in the inner thread 8. Through the effect of an upward pressure the upper surface of said plunger 13 gives way until it is lodged in the lower end of the anchorage (fig. 4).

The rod 3 is joined by means of a thread 32 to the body 2, and can be locked by means of fixing 47. This thread can also constitute a regulation of the length of the rod 3. Said rod 3 contains the devices for locking and unlocking in respect of the anchorage.

One embodiment of the rod 3 could be joined by means of a pin device with the same effect.

The assembly has for example one or two locks: when installed in a door, one of these is in a position to be operated from the inside of the premises and the other, fitted with a cover 16, from the outside.

The body 2 operates the assembly for the corresponding closing and opening operations. It can be operated by means of the outdoor lock 15, by the indoor lock 17 and by an electrical impulse.

The advertising and informative cover is a part that

can be lit up but is not inherent to the locking device strictly speaking, and is formed of a cover which matches the body 2 in shape and size, and has a channel 45 through which cables can be threaded for its electrical connection 46. It has selective lighting and for example words such as "open" or "closed" or alarm or locking failure symbols.

The part next to the end of the rod 3 has two balls 14 that can protrude through the two through holes 49, of greater diameter than these and becoming narrower at their outer ends by annular neckings 50, which enable a range of movement covering the cylindrical space lying between them, without letting them drop out.

A preferential embodiment consists in the one shown in figures 15 to 19, which will now be explained.

This embodiment is totally based on the electronic configuration of the two units, lock and motor control. According to this basic scheme, there needs to be a microprocessor in the lock, which is set in the housing 63, and a microprocessor in the outer unit, not shown. The logical system for communication between both microprocessors is highly complex, but can be schematically expressed in such a way as to outline the basic functions. Both microprocessors establish a dialogue so that they can recognize each other. Apart from the recognition code, the lock sends out a status code, which enables the outer unit to react according to said status. One special function of the lock processor is to inform of the lock status. Whether dealing with one or two locks, the motor must be aware that the door lock is open, to allow motor-driven opening, for if not the motor could operate inefficiently, burn out and furthermore not open the door. For this reason, in this function, when the remote control unit informs it that it should open, the motor gives the order to the lock to open. If the lock does not open, it informs the motor of this circumstance. The motor turns in reverse to free the balls 14 from its tension. The verification process is continuous, especially if there are two or more locks on the same door. When it receives the information that both are open, the motor lifts for the time required and predetermined for the door to be opened.

The closing operation is carried out by means of a similar function the other way round. From the top position, the closing order determines the order in the motor to lower the door. Detection in the motor of the operation being concluded takes place by means of the pressure of the rod 20, and a combination of codified impulses which identify the proper closing. The limiter is bar 20. Otherwise, if the coding is not correct, the electronic device gives an order to reactivate the system, being set open again and ready to receive the closing codes. A detector 79, 80 connected to the electronic system, verifies the impulses, so that the door is left closed. Said impulses are made, in respect of the contact 80, by the top of the cap which commands the bar 56 of the pusher moved by the pusher 30 in relation with the movement of the balls on going through the narrowing of the anchorage 1; as regards the contact 79, by the lowering

process, caused by releasing the thumb latch 70 which holds underneath the bottom of the cap 60. The thumb latch 70 has a pin 71 which is contacted by the ball 76 on being pushed by rod 20 set in a recess 77 formed by the cam pivot 73, temporarily moving the thumb latch by the lifting motion, and said latch returns to its initial position by means of the spring 75. Once at the top the ball is free to drop, recovering the hollow 77, and becoming operative once more. The triggering for the closing operation acts in this way. Nevertheless the closure is definitively determined as follows: said detector has the two contacts already mentioned, one at the top 80 and one at the bottom 79. Closing occurs when both are in agreement, as if the lock were to be manually triggered by means of the closing rod 20, closure of the lower contact 79 would occur without the upper one having received the coding, so that the electronic system would give the reactivation order, lifting the cap to the top position waiting for the mechanical triggering to be in accordance with the electronic prompt.

This can be used in industrial applications for making lock closure devices and especially those which are combined with motor-driven and/or manually operated movement doors.

## Claims

1. Combined operation lock, of the type with an anchorage fixed to the ground in which the corresponding lock is held, characterized in that this is made up of two parts, namely the anchorage (1), joined firmly and inseparably to the ground, and the body (2, 55) which has along with the anchorage the devices for activating opening and closing processes in a rod (3, 3.1) that can be inserted into the anchorage, so that the rod (3, 3.1) is firmly joined to the body (2,55) and has means for its temporary coupling with and separation from the anchorage (1); the body has a manual activation device by at least one external lock (15) with a cover (16) articulated about an axle, said cover being made with a recess which houses the protruding part of the cylinder with which its shape coincides, and with electrical operation by an internal device commanded by an external impulse, being fitted with an automatic interlocking device, all of this being able to be connected with a separate central electronic unit.
2. Lock, according to claim 1, characterized in that the part next to the lower end of the rod (3, 3.1) has two balls (14) that are able to protrude through two through holes (49) made in said rod (3, 3.1) of greater diameter than these and narrowed (50) at their outer ends and the axle (22) of the vertically moveable core (25) has a conical end or pusher (30) as the prolongation of a cylinder (29), inseparably joined to said rod, with the anchorage (1) having in its central part an annular space (48) that can lodge and retain the end of the rod (3, 3.1) when the balls (14) protrude, as a result of the lower position of the axle (22) of the core (25) with said anchorage (1) having at the top a nylon lock which is made up of a plunger (9), that can move into the anchorage, retained by a recovery spring (11), said plunger having an annular recess (12) which determines the levelling flush with the surface of a threaded ring (10), which constitutes the outer part of said lock.
3. Lock, according to claims 1 and 2, characterized in that the rod (3, 3.1) is able to be joined to the body (2, 55) by means of a thread (32) which it has at its top end, which determines a longitudinal matching, and which has a locking device (47), able to join with the body (2, 55) by means of a pin and/or stud-bolt device.
4. Lock, according to claim 2, characterized in that the manual action makes the cap (23) rise and the electrical operation causes the core (25) to rise, both of these linked about the axle (22) to said cap which can be held by a lateral pawl (35), by a cam (21) of either of the locks (15), (17) and its presence being detected by a position detector (31); the rod (3) has a solenoid (24) inside, outside the core (25); the position detector can transmit the information on the inner status of the axle (22) position, for example, open, closed or improperly closed.
5. Lock, according to claims 1 and 4, characterized in that the device for automatic interlocking formed by the pawl (35) which is permanently set in the cap's line of movement, activated by a spring (39) whose shape; rounded (42) at the bottom and angular (43) at the top, is able to retain the cap (23) which has a curved shape at the top and an angular one (33) at the bottom; the position detector (31) has a sensor arm (34) which is pressed or released by the profile of the cap (23).
6. Lock, according to claims 4 and 5 characterized in that the pawl (35) has inside it a hole (44) that can allow the free descent of a ball (36) which can move vertically upwards lodged on the top (38) of a bar or axle of the triggering device (20) whose rising motion causes the horizontal movement of the pawl (35) for an instant, determining a separation with the cap (23) which was retained by said pawl (35), which is pushed at the rear by a spring (51) and said bar or axle of the triggering device (20) having a lower end in the position ready to be closed, substantially protruding from the body (2) and whose upper end (38) has a special shape and can temporarily house the ball (36) which has a structure that on one side has a wedge shape which determines a vertical wall (28) and a base perpendicular to said wall (28), with the ball being able to fit between said wall and said base.

7. Lock, according to claims 2 and 4, characterized in that the axle (22) has at its bottom a joint (27) set in the inside of the rod between the holes through which the balls (14) come out and the bottom end of the core (25). 5
8. Lock, according to claim 1, characterized in that over the body (2) it has a publicity cover (4) that can house luminous media for indications of status, advertising, etc., whose electrical communication with the inside is channelled through a hole (45) through which cables go (46) with the body, (2) covered by said cover, being solid. 10
9. Lock, according to claims 1 and 2, characterized in that a preferential embodiment has a body (55) fitted with a lock cover (81) and a trapezoidal shape in the plan view, which has on the inside a retention wedge in the open position formed by a thumb latch (70) which has a pin (71) able to be laterally pushed temporarily by the downward pressure of a ball (76), housed in a recess (77) of a cam pivot (73), connected with the triggering bar (20), which retains at the bottom the cap (60) which is made up of a double cap formed by an upper part (57) linked with a bar of the pusher (56) and a lower part (60) as stated, linked with a core (58); the pusher bar can move in the highest point of the core elevation, so that it lifts the top part of the cap (57), separating this from the bottom part (60) located in the top position and retained by the wedge (64) and producing an impulse in a contact (80) connected with an electronic part (82); said electronic part has a contact (79) under the former, which can be activated by the skirt of the lower part of the cap (60) in its bottom position and is covered by a cover (69) which has a cable guide for connecting to a central electronic unit commanding the motor. 15 20 25 30 35
10. Lock, according to claims 1 and 4 and 9, characterized in that for lifting the separate central electronic unit commands an initial impulse for lowering the corresponding door, after which the electrical activation of the solenoid (24) determines the lifting of the core, and after which the door is lifted through inversion of the initial impulse. 40 45

50

55

Fig. 1

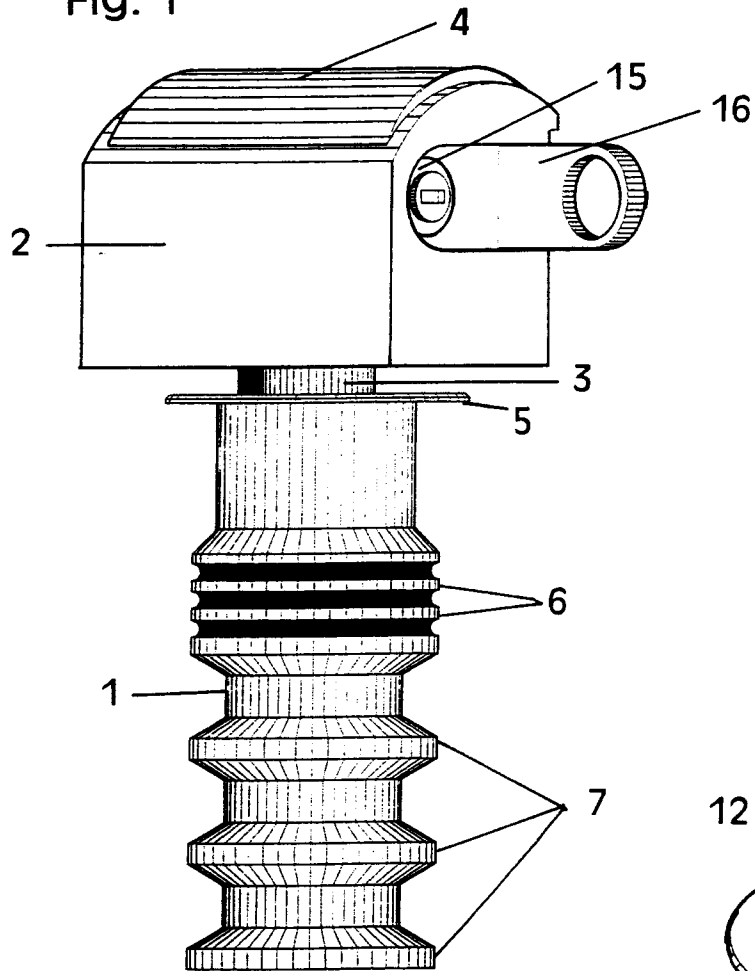


Fig. 2

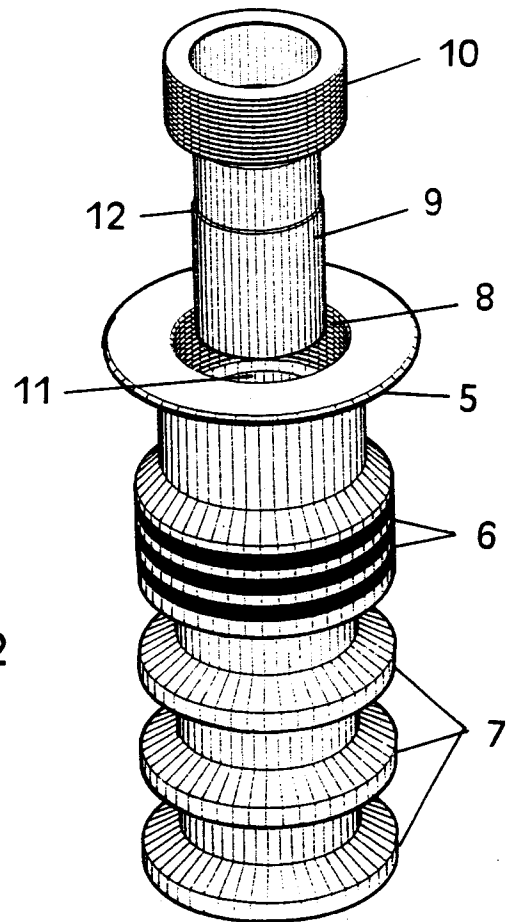


Fig. 3

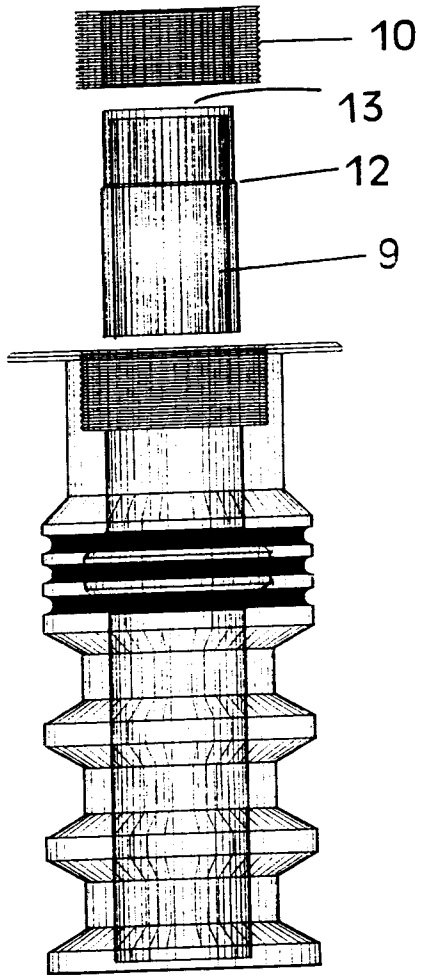


Fig. 4

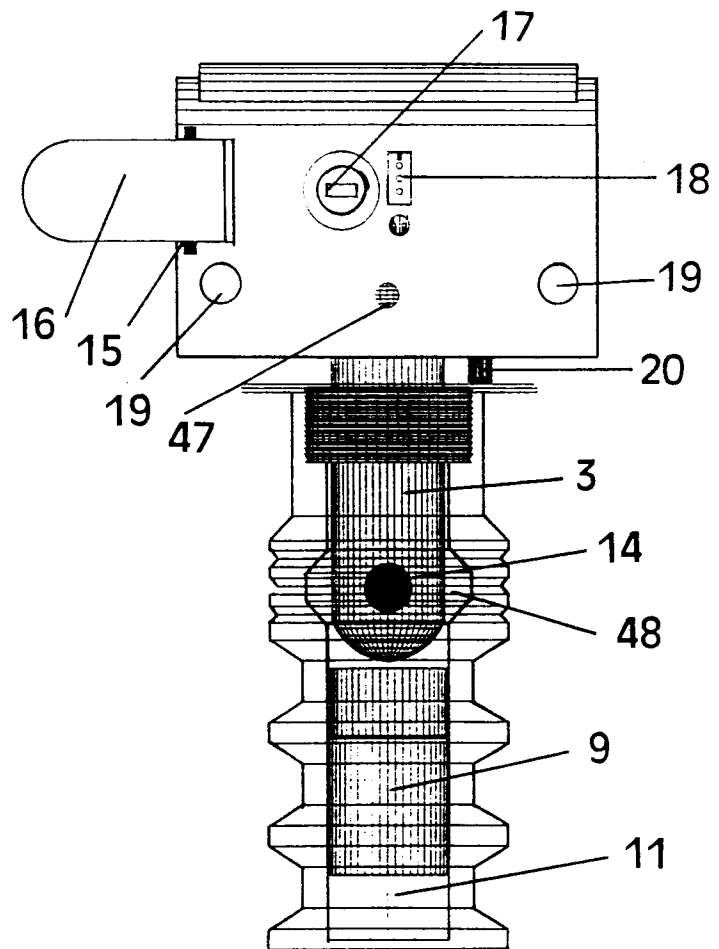


Fig. 5

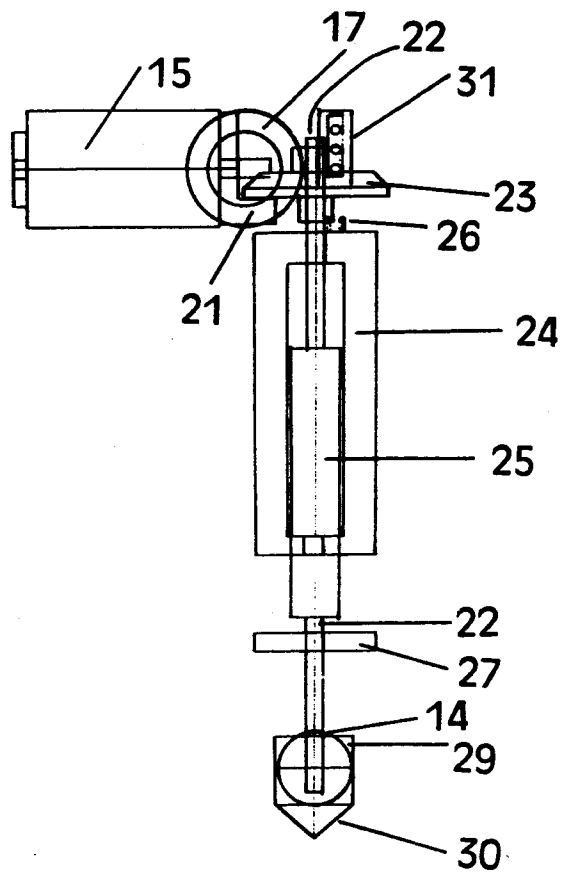
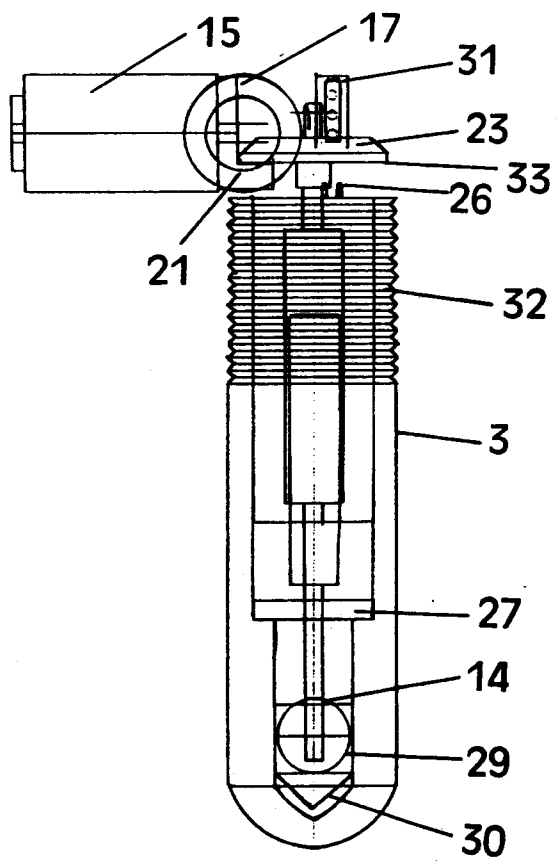
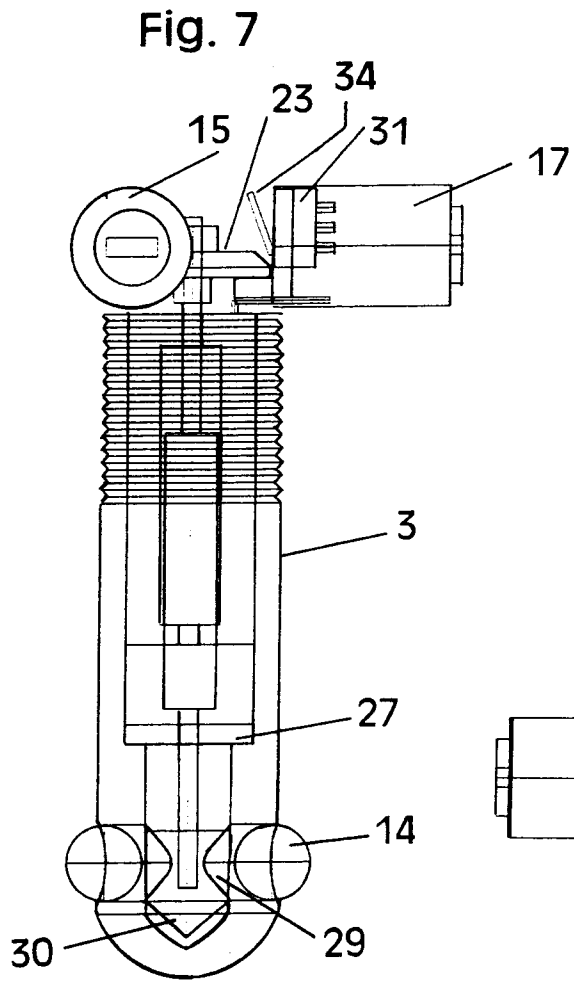


Fig. 6





**Fig. 8**

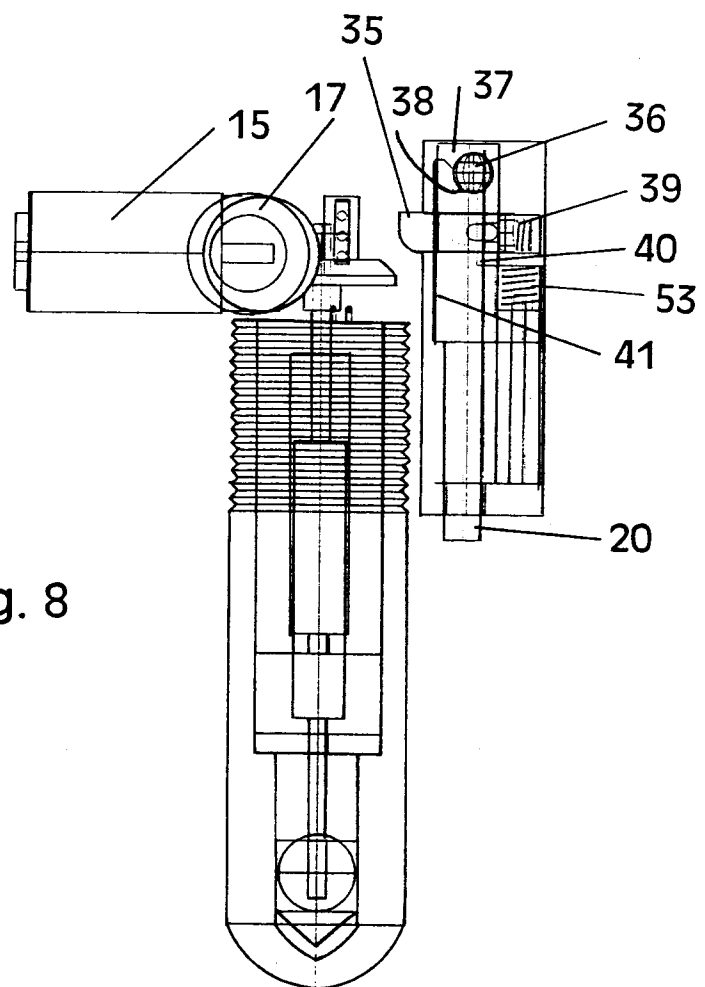


Fig. 9

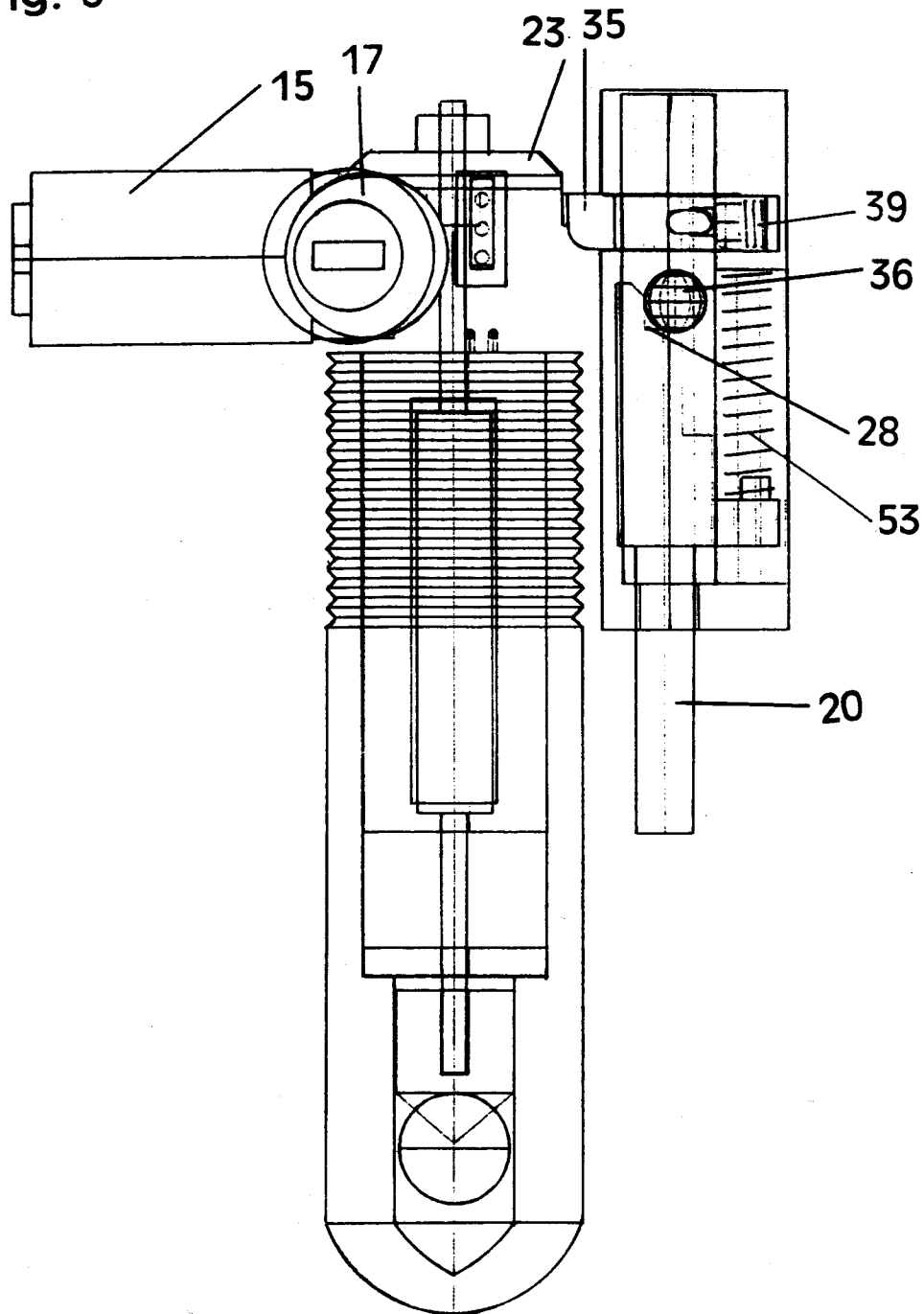
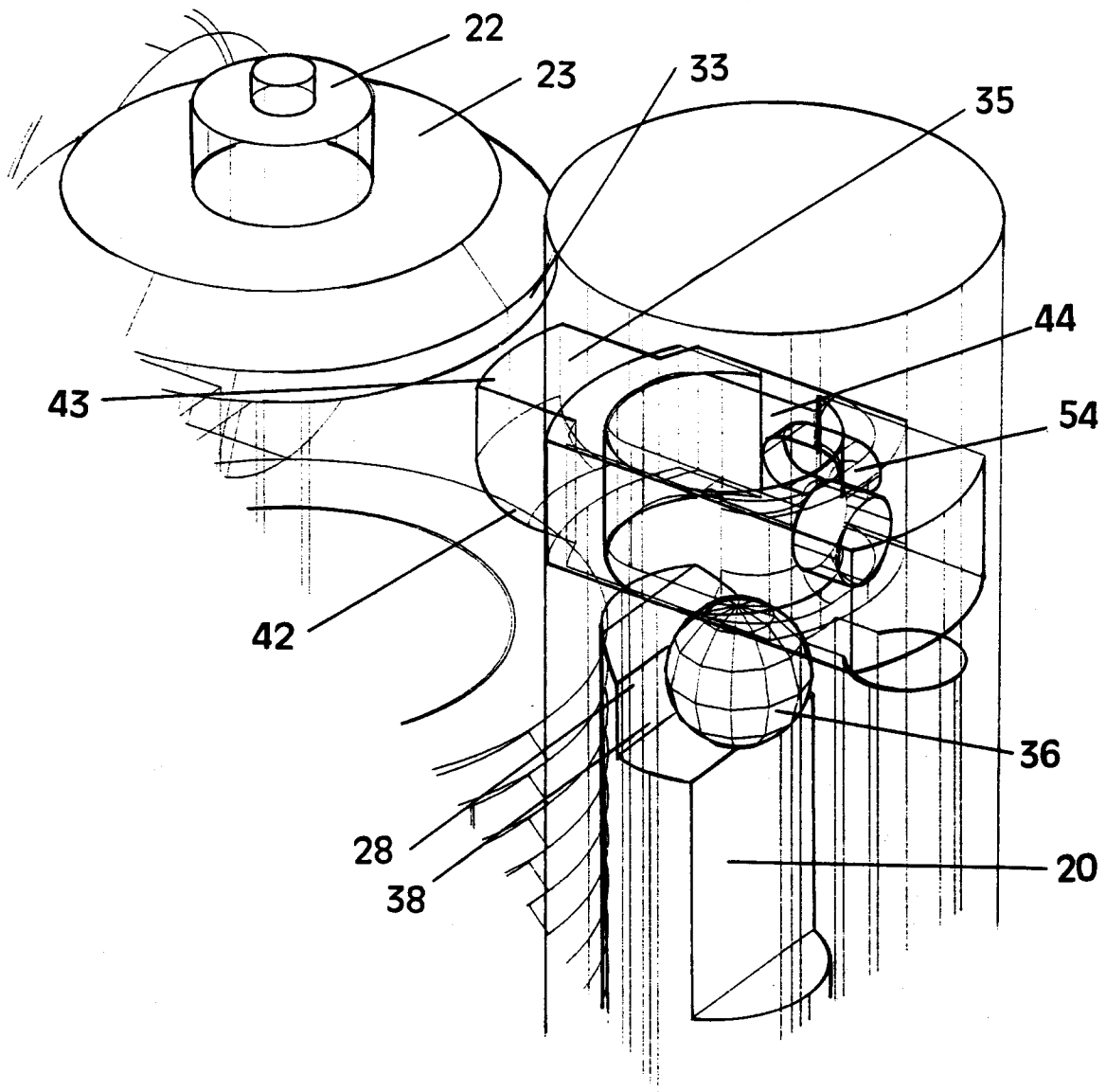
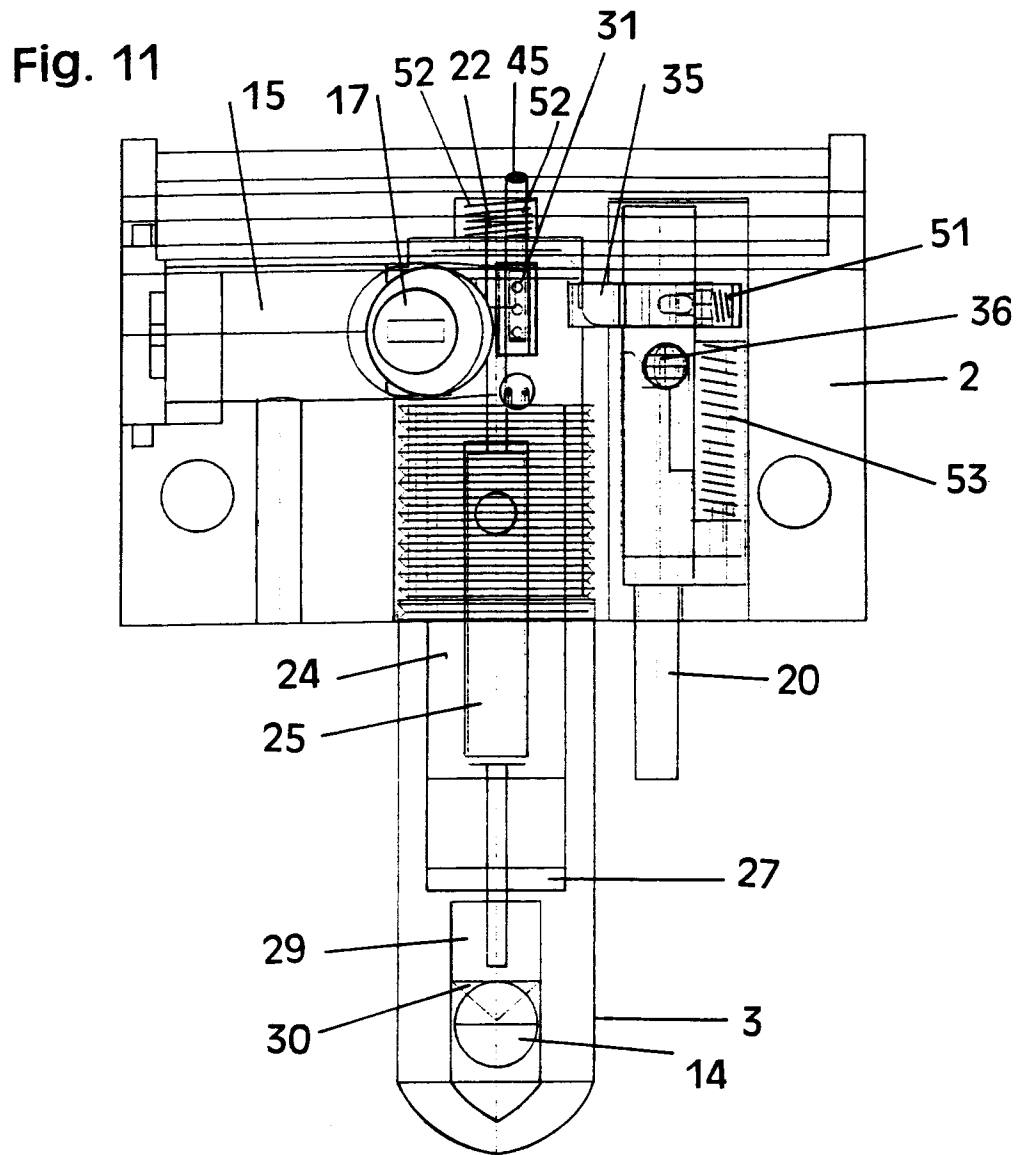


Fig. 10





**Fig. 12**

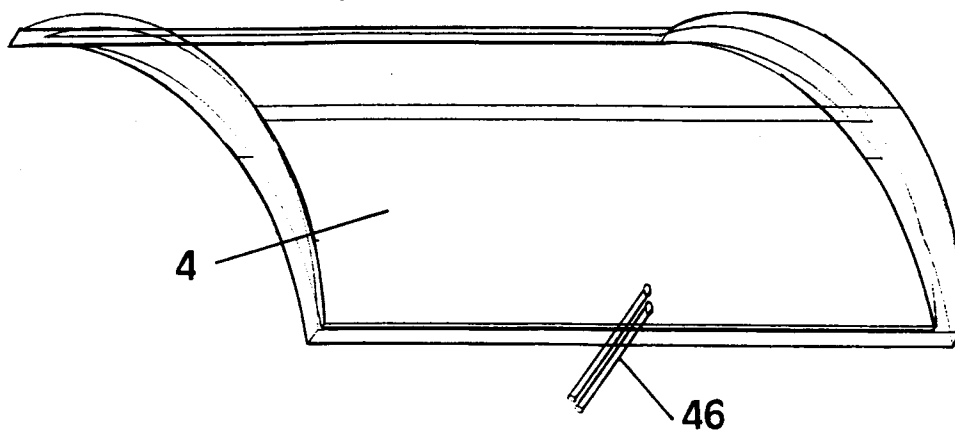


Fig. 13

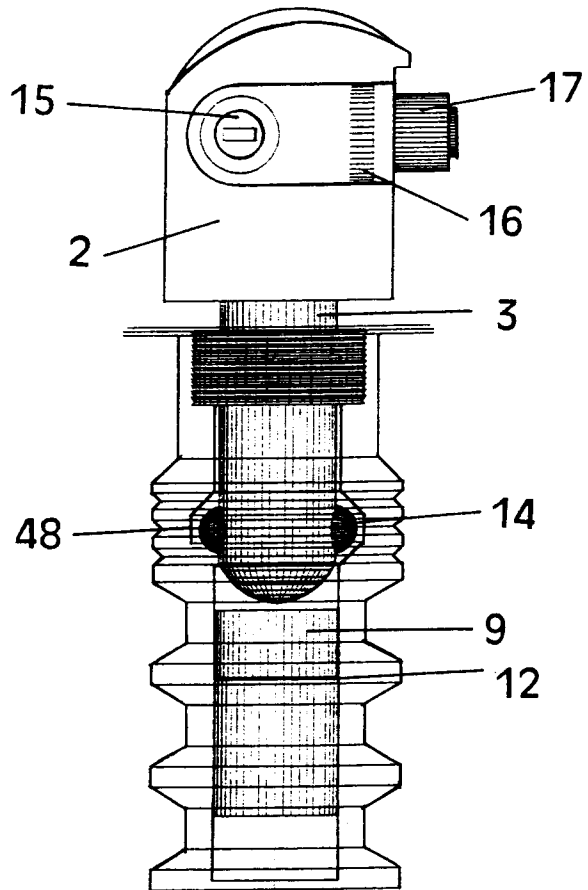


Fig. 14

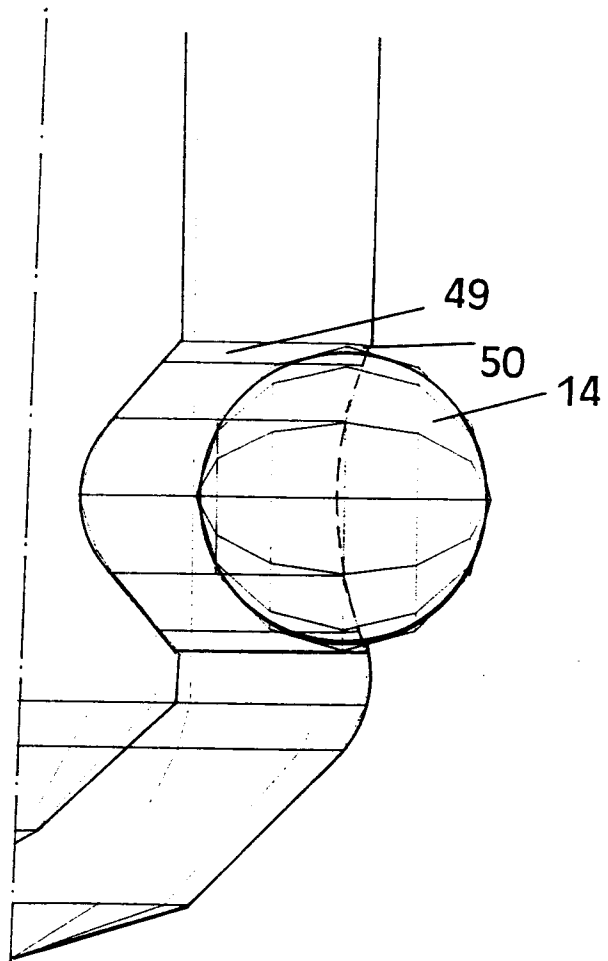


Fig. 15

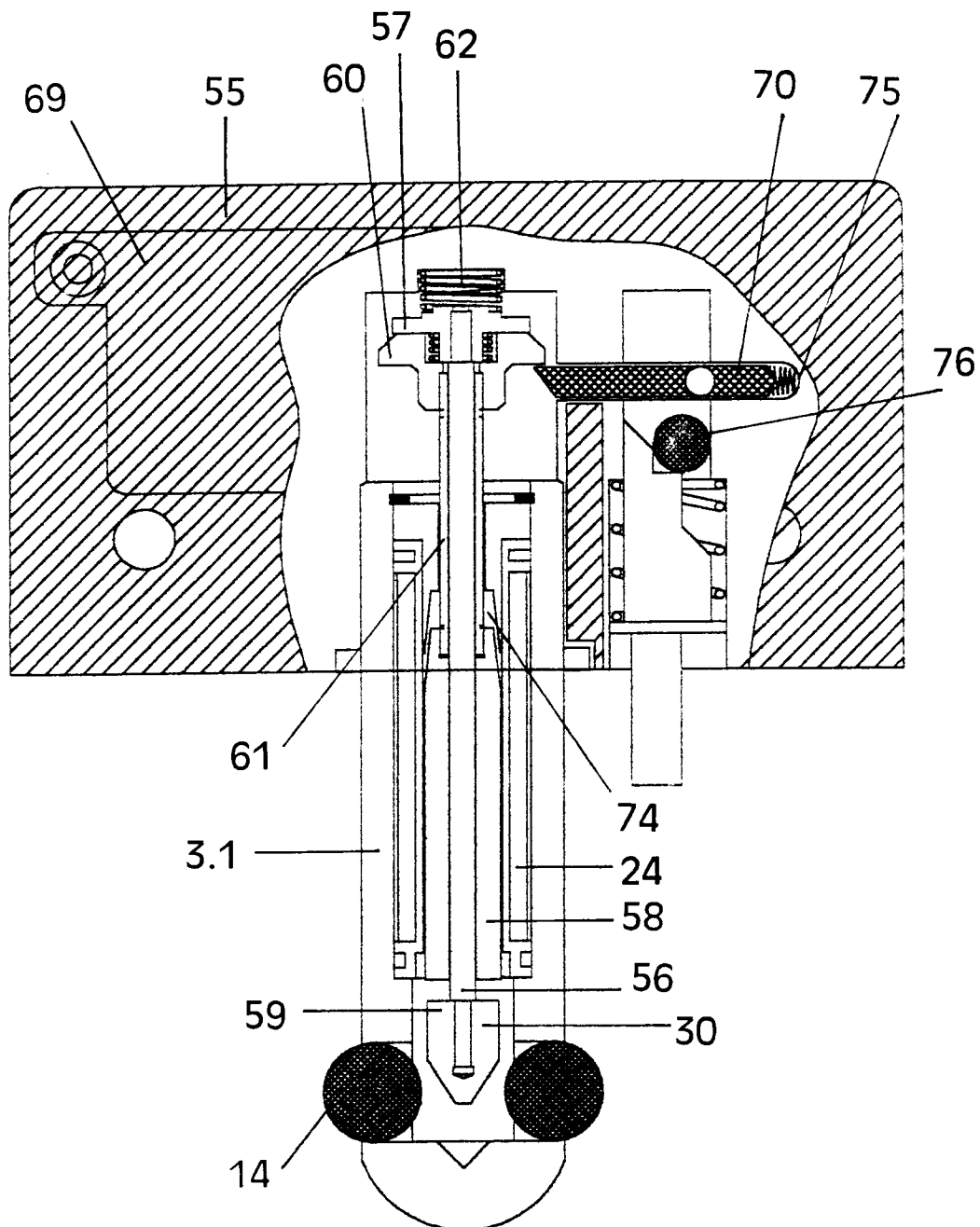


Fig. 16

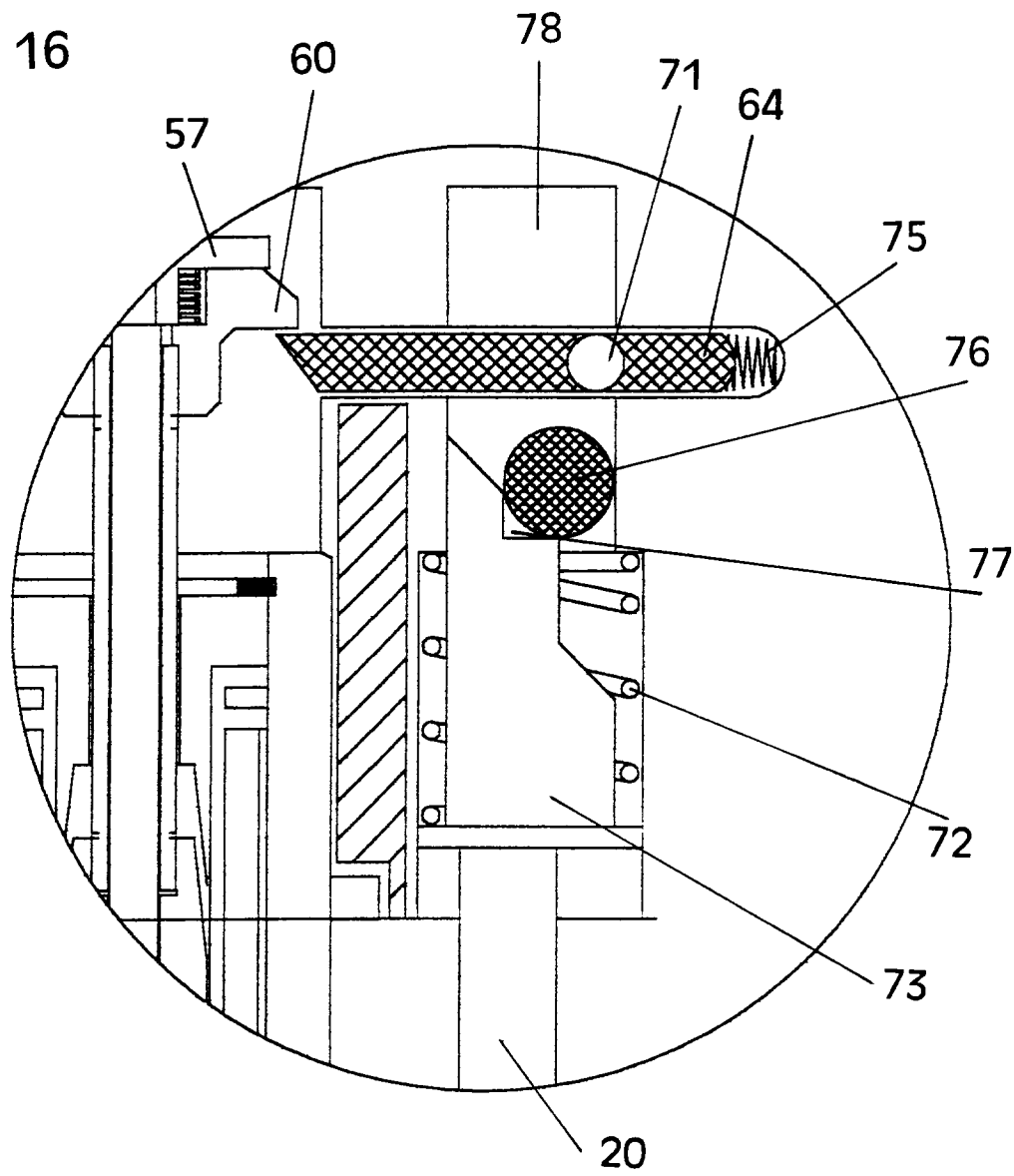


Fig. 17

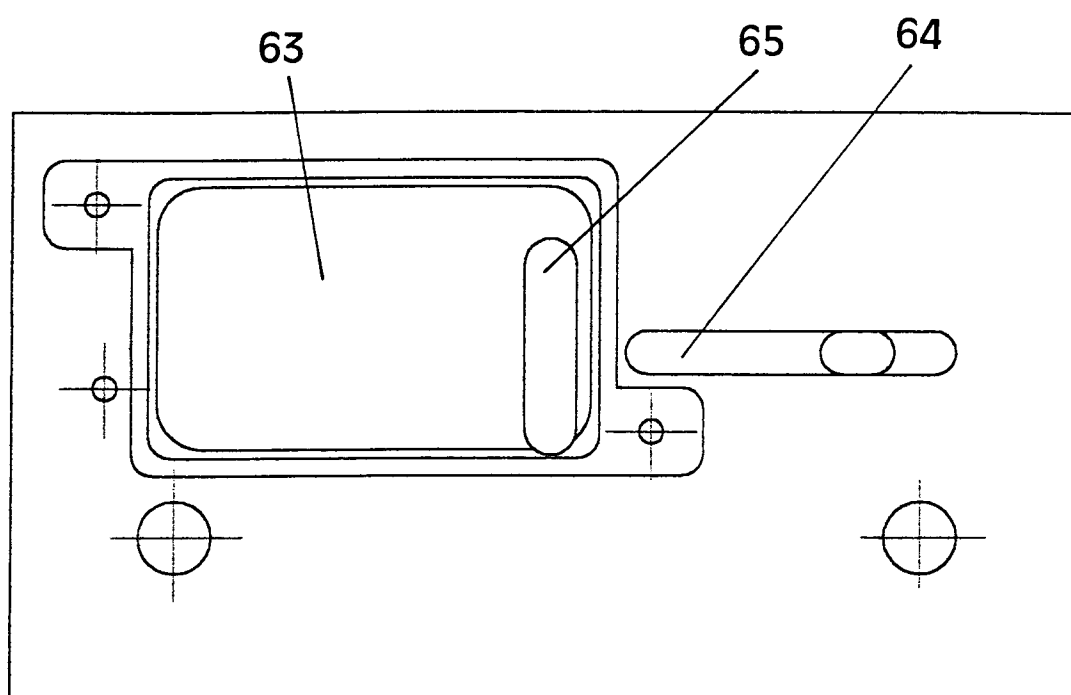


Fig. 18

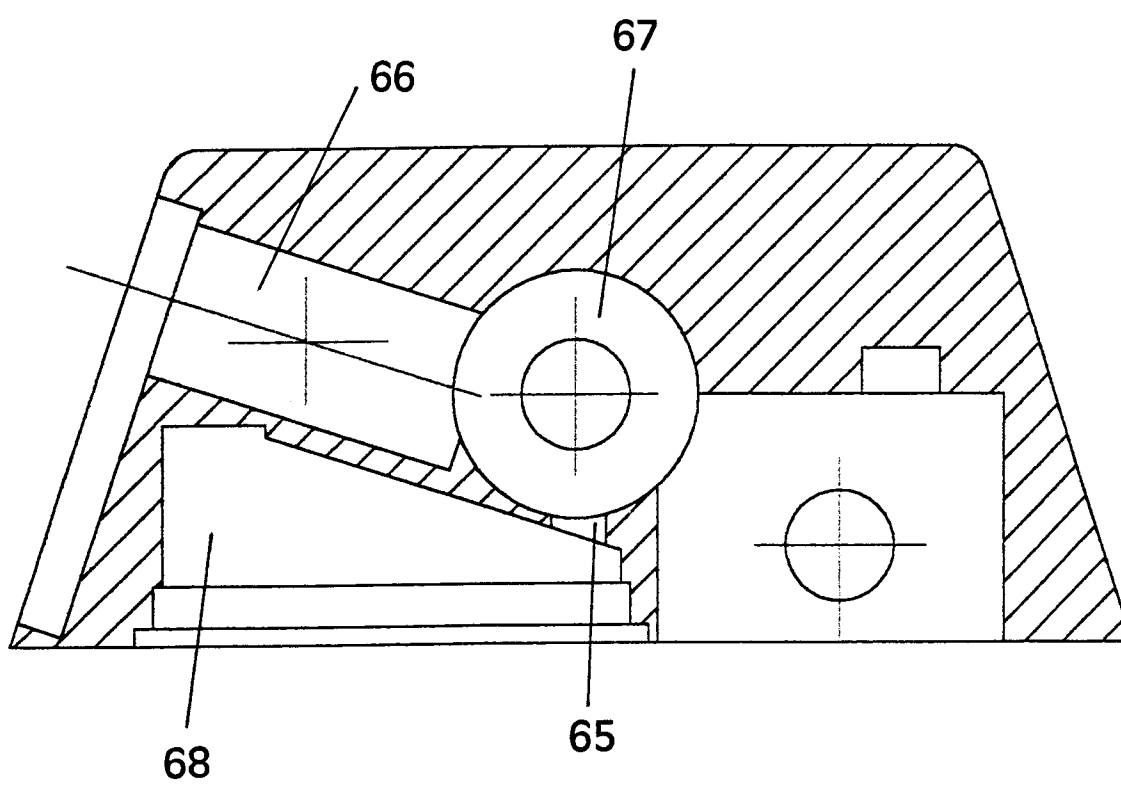
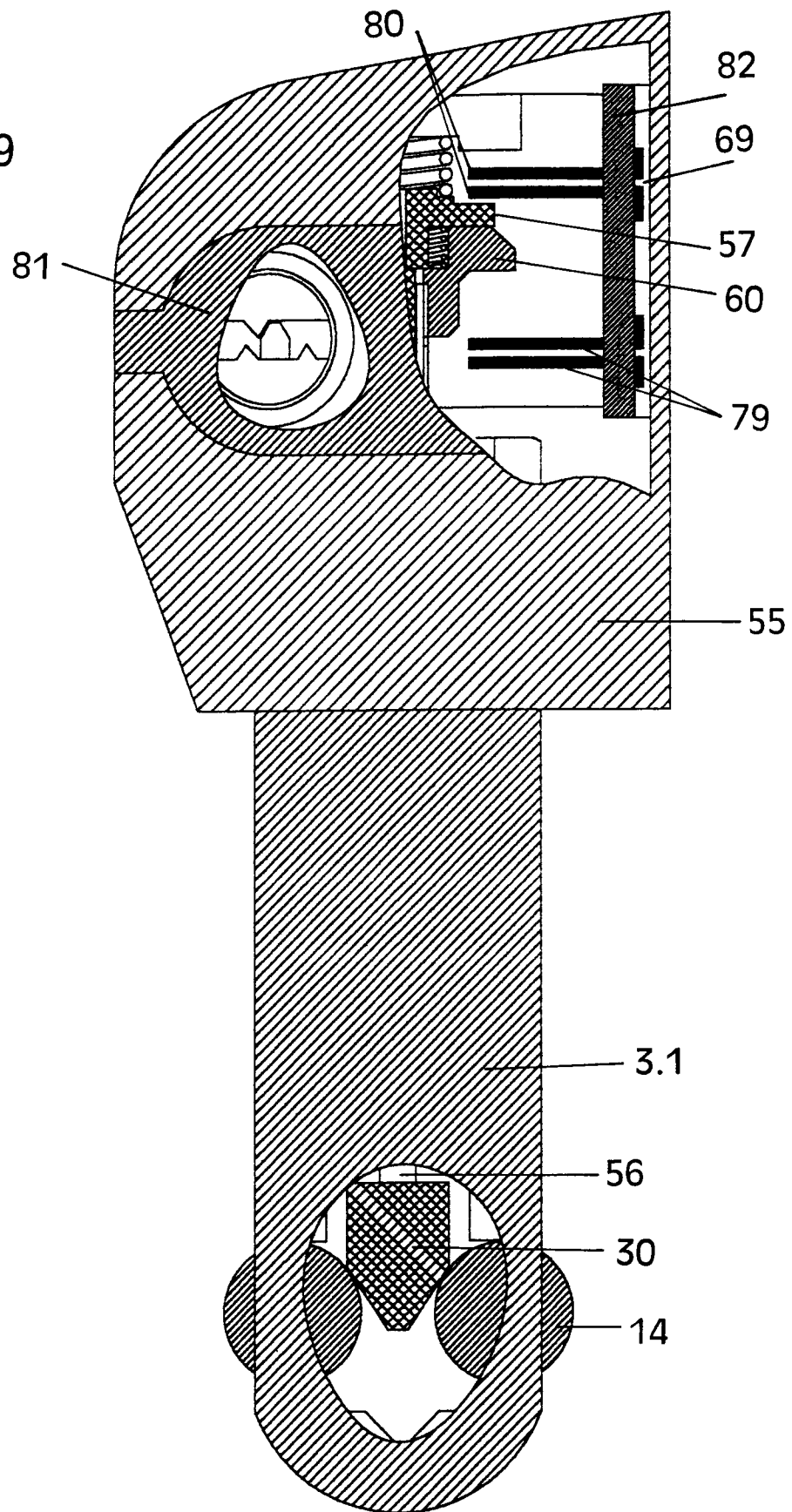


Fig. 19



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES 96/00016

A. CLASSIFICATION OF SUBJECT MATTER		
IPC 6 E05B47/06 E05B63/20 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC 6 E05B		
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)		
CIBEPAT, EPODOC, WPIL, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB,A,2 267 115 (ROLLS-ROYCE PLC) 24 November 1993 (24.11.93) see the whole document---	1
A	DE,A,37 36 194 (FÖRMER) 11 May 1989 (11.05.89) see the whole document---	1
A	WO,A,91 00405 (ASSA AB) 10 January 1991 (10.01.91) see the whole document---	1
A	FR,A,2 319 758 (R. ALKAN & CIE.) 25 February 1977 (25.02.77) see the whole document---	1,2
A	US,A,4 866 963 (LEININGER ET AL) 19 September 1989 (19.09.89) see the whole document---	1,3,4
A	US,A,4 702 095 (BEN-ASHER) 27 October 1987 (27.10.87) see the whole document---	1
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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Date of the actual completion of the international search 10 May 1996		Date of mailing of the international search report 10.05.96
Name and mailing address of the ISA/ SPTO		Authorized officer
Facsimile No.		Telephone No.

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES 96/00016

## 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,A,4 372 419 (BARNETT ET AL.) 8 February 1983 (08.02.83) see the whole document---	1

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