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(54) Remote controlled locking device for doors of trucks, trailers and the like

(57) A remotely controlled device for opening and closing the door of the body of trucks, trailers and the like, comprising a substantially box-like base (2), which is fixed externally to the door and is adapted to rotatably support a bar (4), which is associated with pawl means for fastening the door, a handle (5) for manually actuating the pawl means being keyed rigidly along the bar and being able to rotate, about the axis of the bar (4), from an angular door closure position, in which the handle (5) is accommodated in the base and is retained by locking and release means (6) of the button type (10) and in which the pawl means are engaged in respective abutments rigidly coupled to the frame of the body of the truck, to an angular door opening position, in which the handle is substantially disengaged from the base (2) and in which the pawl means are disengaged from the abutments, allowing the free rotation of the door about its own axis of pivoting to the frame of the body; the locking and release means (6) comprise a mechanism (7) for actuating a bolt (8) controlled by an actuator (9), means for remote control of the actuator (9) being provided which are adapted to move the mechanism (7) reversibly from a first configuration, in which the button (10) is rigidly coupled to the bolt (8), so that its manual actuation to release the handle (5) is prevented, to a second configuration, in which the bolt (8) is disengaged from the button (10), allowing its manual actuation, so as to turn the handle (5) about the axis of the bar (4).

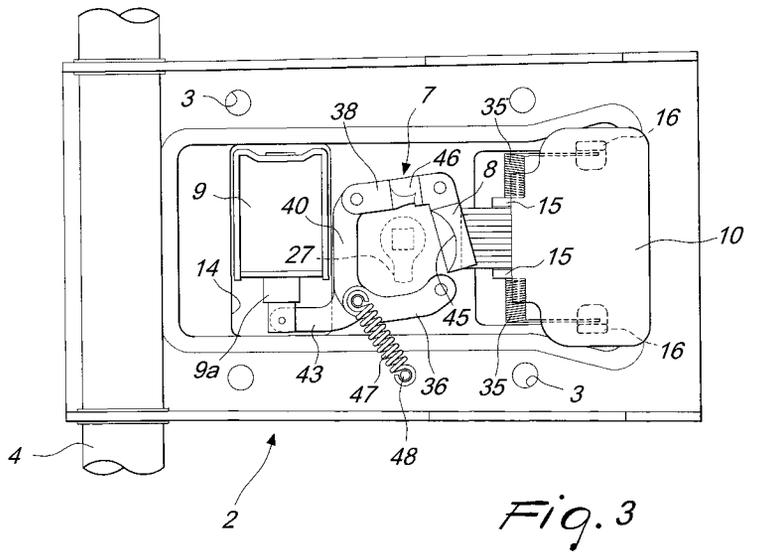

Fig. 3

EP 1 550 785 A1

Description

[0001] The present invention relates to a remotely controlled device for opening and closing the door of the body of trucks, trailers and the like.

[0002] A device for opening and closing the door of the body has long been widely installed in trucks and heavy goods vehicles, with particular reference to those in which the body forms internally a hermetic cell; such device comprises an actuation bar, which is supported rotatably within the door and is provided with pawl means, which are suitable to engage respective abutments provided in the frame of the body; a handle is rigidly keyed along the bar and can rotate manually from an angular door closure position, in which the pawl means are coupled to the abutments, to an angular position for freely opening the door, in which the pawl means are disengaged from the abutments, so that said door can be turned about its own axis of pivoting to the frame of the body.

[0003] The bar actuation handle is usually associated with a box-like base, which is rigidly coupled externally to the door and is provided with means for retaining the handle in the angular door closure position, in order to prevent said door from opening accidentally: such retention means can be actuated manually by the operator, for example by means of a lever or button.

[0004] For obvious reasons related to the security of the vehicle and of the goods being transported, and also to achieve more convenient and quicker use, the need is currently felt to have a device that is suitable to be operated remotely by the authorized operator reliably and quickly: the operator in fact currently has to first open the security lock with the key and then act on the button of the retention means in order to be able to open the door. This laborious action usually requires the use of both hands, and this is often too inconvenient, especially when the operator has to store goods inside the vehicle body.

[0005] The aim of the present invention is to meet the above-cited requirement, by providing a device for opening and closing the door of the body of trucks, trailers and the like that can be operated remotely, so as to allow the authorized operator to act with maximum speed and in optimum security conditions.

[0006] Within this aim, an object of the present invention is to provide a device that is extremely versatile, i. e., perfectly adaptable to all doors of currently circulating goods transport vehicles.

[0007] Another object of the present invention is to provide a device that is simple, relatively easy to provide in practice, safe in use, effective in operation, and has a relatively low cost.

[0008] This aim and these and other objects that will become better apparent hereinafter are achieved by the present remotely controlled device for opening and closing the door of the body of trucks, trailers and the like, which comprises a substantially box-like base, which is fixed externally to the door and is adapted to rotatably support a bar, which is associated with pawl means for fastening the door, a handle for manually actuating said pawl means being keyed rigidly along said bar and being able to rotate, about the axis of said bar, from an angular door closure position, in which said handle is accommodated in said base and is retained by button-type locking and release means and in which said pawl means are engaged in respective abutments rigidly coupled to the frame of the body of the truck, to an angular door opening position, in which said handle is substantially disengaged from said base and in which said pawl means are disengaged from said abutments, allowing the free rotation of the door about its own axis of pivoting to the frame of the body, characterized in that said means for locking and releasing said handle comprise a mechanism for actuating a bolt controlled by an actuator, means for remote control of said actuator being provided which are adapted to move said mechanism reversibly from a first configuration, in which said button is rigidly coupled to said bolt, so that its manual actuation to release said handle is prevented, to a second configuration, in which said bolt is disengaged from said button, allowing its manual actuation, so as to turn said handle about the axis of said bar.

[0009] Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of a remotely controlled device for opening and closing the door of the body of trucks, trailers and the like according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a partially sectional front view of the device, with the handle in the angular door closure position;

Figure 2 is a partially sectional bottom view of said device, with the handle in the angular door opening position;

Figure 3 is a partially sectional front view of the device, with the locking and release means in the first configuration, in which the bolt is rigidly coupled to the button;

Figure 4 is a partially sectional front view of the device, with the locking and release means in the second configuration, in which the bolt is disengaged from the button.

[0010] In the embodiment that follows, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other embodiments.

[0011] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0012] With reference to the figures, the reference nu-

meral 1 generally designates a remotely controlled device for opening and closing the door of the body of trucks, trailers and the like, according to the invention.

[0013] The device comprises a base, generally designated by the reference numeral 2, which is substantially box-like and is fixed externally to the door of the body of the truck, for example by means of bolts engaged in through holes 3. The base 2 is adapted to rotatably support a bar 4 for actuating pawl means (not shown for the sake of simplicity in the figures, since they are conventional) for fastening the door hermetically; such pawl means are preferably constituted by conveniently shaped tabs, which are rigidly coupled to the ends of the bar 4 and can be engaged in respective abutments, which are rigidly coupled to the frame of the body, for example above and below the door.

[0014] A handle, generally designated by the reference numeral 5, for actuating the pawl means is rigidly keyed along the bar 4; the handle 5 can rotate manually, about the axis of the bar 4, from a first angular position for closing the door, in which it is accommodated in the base 2 and in which the pawl means are coupled to the respective abutments, to an angular position for freely opening the door, in which the handle 5 is disengaged from the base 2 and in which the pawl means are disengaged from the abutments, thus allowing the door to rotate about its own axis of pivoting to the frame of the body.

[0015] The handle 5 is kept in the angular door closure position, in order to prevent the door from opening accidentally, by button-type locking and release means, generally designated by the reference numeral 6, which are provided in the base 2. According to the invention, the locking and release means 6 comprise a mechanism, generally designated by the reference numeral 7, for actuating a bolt 8, which is controlled by an actuator 9 provided with a stem 9a; the actuator can be actuated by way of remote actuation means, which are not shown for the sake of simplicity in the figures but are of a substantially known type. By acting with the means for remotely operating the actuator 9, it is possible to move the mechanism 7 reversibly from a first configuration (Figure 3), in which the bolt 8 is substantially coupled to a button 10 of the locking and release means 6 (so that its manual actuation to release the handle 5 is prevented), to a second configuration (Figure 4), in which the bolt 8 is disengaged from the button 10, allowing its manual actuation in order to disengage the handle 5.

[0016] The base 2 is constituted by a curved metal plate, which forms on the door a substantially flat reference surface 11 and two side walls 12, each of which is affected, at one end, by a respective circular seat 13 for rotatably supporting the bar 4 and, at the opposite end, by a respective eye 13a. The reference surface 11 is provided centrally with a substantially rectangular opening 14 for mounting the actuator 9 and with a first pair of lugs 15 and a second pair of mutually facing lugs 16; the first pair of lugs 15 is affected by respective coaxial holes 17.

[0017] The handle 5 forms an end 18 for keying along the bar 4 and a grip end 19 provided with a covering 20 preferably made of plastic material. At the covering 20, the handle is affected by two mutually opposite small circular holes 20a, which are adapted for the optional mounting of security closure elements with the aid of the eyes 13a of the base. A central portion 21 of the handle 5 forms an edge 22 and is affected by a circular opening 23, at which a cylinder 24 of a security lock 25 is fixed: the lock, which controls the locking and release means 6, can be operated manually by means of a key 26 and acts on a rotatable wing 27.

[0018] A door 28 is provided on the central portion 21, is articulated to the handle 5 by means of pivots 29, and is retained in the closure position by a helical cylindrical spring 30.

[0019] The button 10 of the locking and release means 6 is substantially shaped like a rocker and is supported so that it can rotate at its centerline about a pivot 31, which is fixed in the holes 17 by means of its respective opposite ends. The button 10 forms an end portion 32 and, on the opposite side with respect to the pivot 31, a flat portion 33 for manual actuation and a protruding edge 34 for abutment, which is substantially rounded in an upper region.

[0020] Two retention springs 35 of the coiled type are engaged along the pivot 31 and have first ends that abut against the button 10 and second ends that are locked at the second pair of lugs 16. The retention springs 35 are adapted to keep the button 10 in a stable position, in which the end portion 32 is substantially in abutment against the reference surface 11 of the base 2.

[0021] When the handle 5 is in the angular door closure position, i.e., accommodated in the base 2, the protruding edge 34 of the button 10 is engaged on the edge 22, preventing the rotation of the handle 5 about the axis of the bar 4: it is possible to rotate the handle only by applying pressure to the flat portion 33 and overcoming the resistance of the retention springs 35, so that the edge 22 disengages from the edge 34.

[0022] The actuator 9 is preferably of the electrically-operated type, suitable to produce a translational motion, by way of impulses transmitted by remote control means, of the stem 9a between two mutually opposite stroke limiting end positions.

[0023] The mechanism 7 is advantageously of the type configured like an articulated parallelogram and is constituted by a first rocker 36, which is pivoted to the abutment surface 11 at a first axis 37, by a second rocker 38, which is pivoted to the surface 11 at a second axis 39, and by a linkage 40, which is articulated on opposite sides to the first and second rockers 36 and 38, respectively about a third axis 41 and a fourth axis 42.

[0024] The first rocker 36 has an extension 43 for articulation, about a fifth axis 44, to the stem 9a of the actuator 9; the bolt 8 is instead rigidly coupled to the second rocker 38, forming substantially a right angle with

it. The bolt 8 is affected in an upper region by a sort of semicircular recess 45, which allows the free rotation of the wing 27. The second rocker 38 instead forms in an upper region a substantially convex three-dimensional profile 46.

[0025] The third axis 41 is connected to the first end of a traction spring 47, in which the second end is rigidly coupled to the abutment surface 11 by means of a stem 48, which is rigidly coupled to said surface. In this manner, the mechanism 7 is kept stably in the first configuration for locking the button 10, i.e., with the bolt 8 substantially superimposed on the end portion 32, so that rotation of said button about the pivot 31 is prevented.

[0026] The operation of the device according to the invention is as follows. Considering the device initially with the handle 5 in the angular door closure position, the mechanism 7 is in the first configuration, in which the bolt 8 is superimposed on the end portion 32 of the button 10. Moreover, the rotatable wing 27 is in an inactive angular position, shown in Figure 3.

[0027] To open the door, the remote control means are used and transmit a pulse to the actuator 9: this causes the retraction of the stem 9a, which in turn forces the mechanism 7 to assume the second configuration, in which the bolt 8 is disengaged from the end portion 32. This allows to rotate the button 10 freely by way of the pressure applied to the flat portion 33, about the axis of the pivot 31, so that the edge 34 disengages from the edge 22, thus allowing in turn to rotate the handle 5 about the axis of the bar 4.

[0028] To fasten the door, instead, once the handle 5 has been arranged in the angular closure position, it is necessary to transmit, by way of the remote control means, an additional pulse to the actuator 9, making the stem 9a protrude: by doing so, the mechanism 7 is induced to assume its first stable configuration for locking the handle 5.

[0029] In case of failure or malfunction of the actuator 9, it is possible to act by means of the key 26 on the lock 25, moving the wing 27 from an inactive angular position (Figure 3) to an angular position for releasing the bolt 8 (Figure 4), in which the wing 27 interacts by contact with the three-dimensional profile 46 of the second rocker 38, moving the mechanism 7 from the first configuration to the second configuration: this ensures the possibility to open and close the door manually by means of the lock 25.

[0030] It has thus been shown that the invention achieves the intended aim and objects.

[0031] The device can be controlled remotely in an extremely quick and simple manner, and this is a considerable advantage in terms of practicality in day-to-day use of the vehicle, as well as in terms of security and reliability.

[0032] The device can be installed easily on any kind of vehicle, requiring only an electric power supply.

[0033] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0034] The actuator 9 may further be of the simple- or double-acting pneumatic type, which is particularly advantageous if a pneumatic power supply system is already provided on the vehicle.

[0035] All the details may be replaced with other technically equivalent ones.

[0036] In practice, the materials used, as well as the shapes and dimensions, may be any according to requirements without thereby abandoning the protective scope of the appended claims.

[0037] The disclosures in Italian Patent Application No. BO2003A000791 from which this application claims priority are incorporated herein by reference.

[0038] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A remotely controlled device for opening and closing the door of the body of trucks, trailers and the like, comprising a substantially box-like base (2), which is fixed externally to the door and is adapted to rotatably support a bar (4), which is associated with pawl means for fastening the door, a handle (5) for manually actuating said pawl means being keyed rigidly along said bar and being able to rotate, about the axis of said bar (4), from an angular door closure position, in which said handle (5) is accommodated in said base and is retained by locking and release means (6) of the button type (10) and in which said pawl means are engaged in respective abutments rigidly coupled to the frame of the body of the truck, to an angular door opening position, in which said handle is substantially disengaged from said base (2) and in which said pawl means are disengaged from said abutments, allowing the free rotation of the door about its own axis of pivoting to the frame of the body, **characterized in that** said locking and release means (6) comprise a mechanism (7) for actuating a bolt (8) controlled by an actuator (9), means for remote control of said actuator (9) being provided which are adapted to move said mechanism (7) reversibly from a first configuration, in which said button (10) is rigidly coupled to said bolt (8), so that its manual actuation to release said handle (5) is prevented, to a second configuration, in which said bolt (8) is disengaged from said button (10), allowing its manual actuation, so as to turn said handle (5) about the axis of said bar (4).

2. The device according to claim 1, **characterized in**

that said actuator (9) has a stem (9a) that can move between two mutually opposite stroke limiting end positions.

3. The device according to claims 1 and 2, **characterized in that** said mechanism (7) is of the type configured like an articulated parallelogram, which comprises a first rocker (36) and a second rocker (38), which are pivoted to said base (2) respectively about a first axis (37) and a second axis (39), and a linkage (40), which is pivoted on opposite sides to the free ends of said first and second rockers (36, 38), said first rocker having an extension (43) in which the end is articulated to said stem (9a), said bolt (8) being rigidly coupled to said second rocker (38) about said second axis (39).

4. The device according to one or more of the preceding claims, **characterized in that** said button (10) is substantially rocker-shaped and is supported so that it can rotate, substantially at its centerline, about a pivot (31), which is rigidly coupled to said base (2) and is parallel to the plane of said door, said button (10) forming an end portion (32) and, on the opposite side, a flat portion (33) for manual actuation and a protruding edge (34) for abutment against an edge (22) of said handle (5), said bolt (8) being adapted to be arranged, in said first configuration, so that it is substantially superimposed on said end portion (32), so as to prevent the rotation of said button (10) about said pivot (31) in order to release said handle (5), said button being associated with at least one retention spring (35), which is adapted to retain it stably so that said end portion (32) abuts against said base (2) and below said bolt (8).

5. The device according to one or more of the preceding claims, **characterized in that** said means (6) for locking and releasing said handle (5) are controlled by a security lock (25), which can be operated manually by means of a key (26) and is provided with a wing (27), which can rotate from an inactive angular position to an angular position for releasing said bolt (8), in which it acts on a three-dimensional profile (46), which is formed by said second rocker (38), in order to move said mechanism (7) into said second configuration and accordingly disengage said bolt (8) from said end portion (32).

6. The device according to one or more of the preceding claims, **characterized in that** said actuator (9) is of the electrically-operated type that uses pulses transmitted by said remote control means.

7. The device according to one or more of the preceding claims, **characterized in that** said first rocker (36) is connected to a first end of a traction spring (47), the second end of which is rigidly coupled to said base (2), said spring being adapted to stably keep said mechanism (7) in said first configuration for locking said button (10), with said stem (9a) in the outer stroke limiting position.

8. The device according to one or more of the preceding claims, **characterized in that** said actuator (9) is of the single-acting pneumatic linear type.

9. The device according to one or more of the preceding claims, **characterized in that** said actuator (9) is of the double-acting pneumatic linear type.

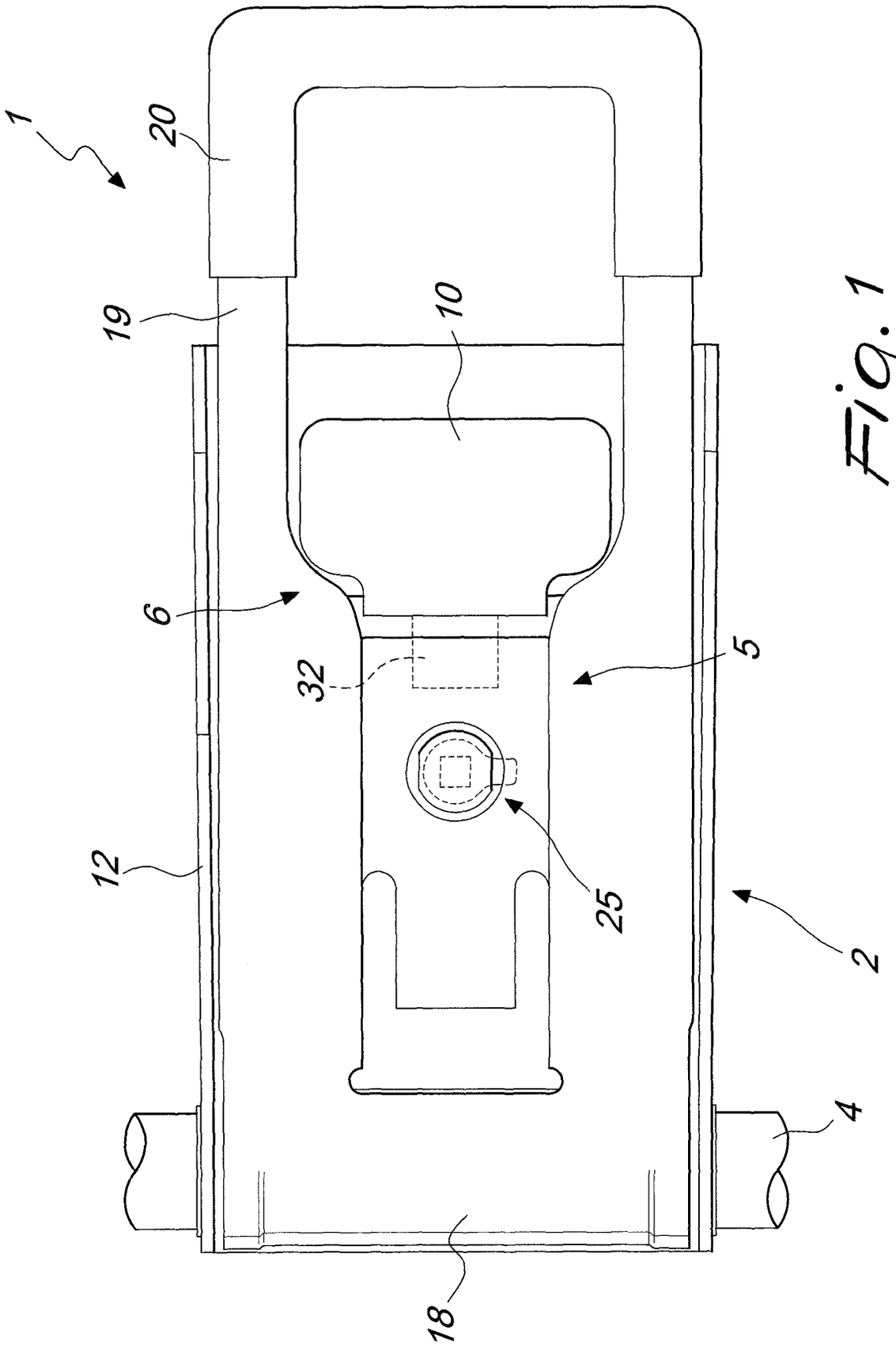

Fig. 1

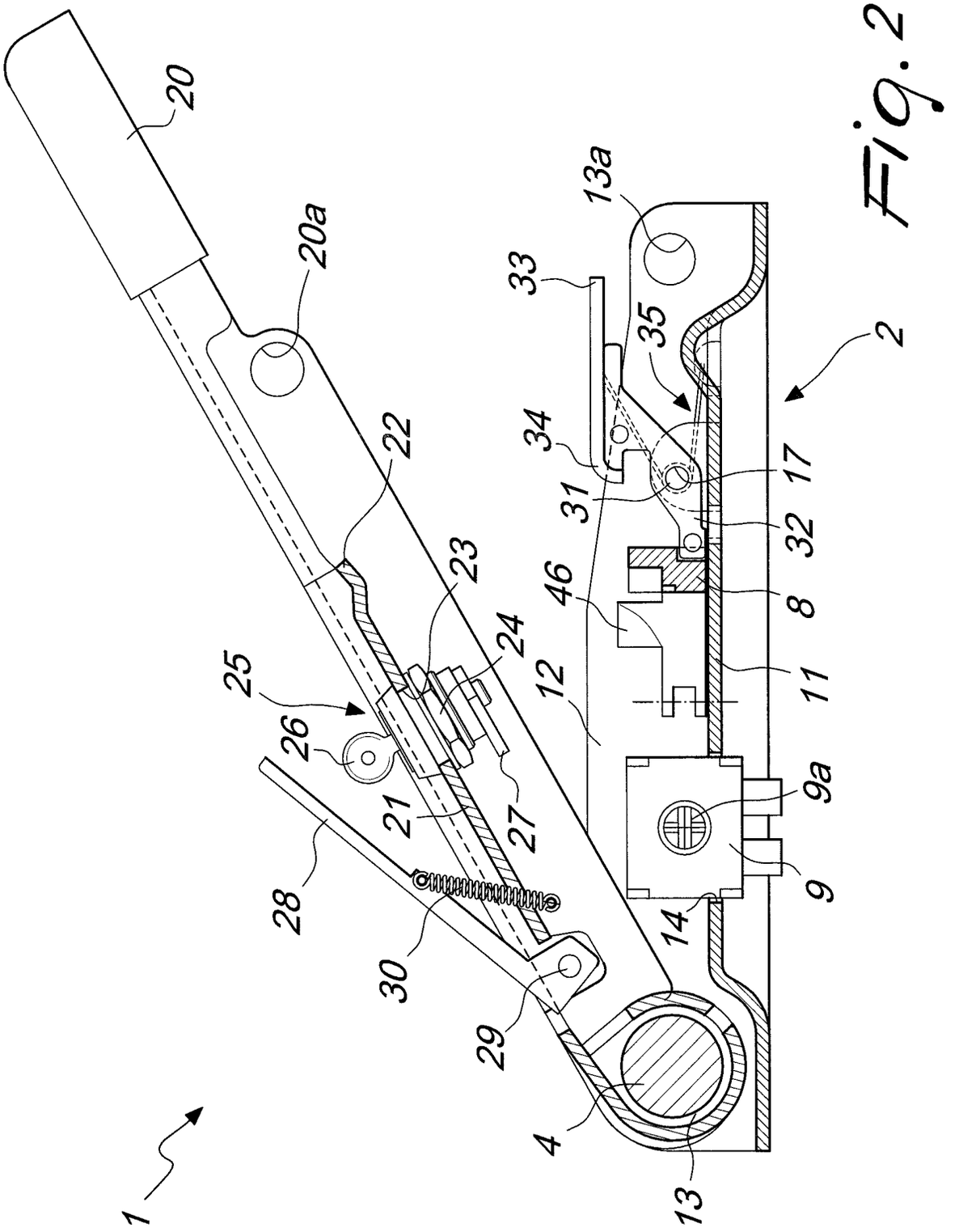
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Fig. 2

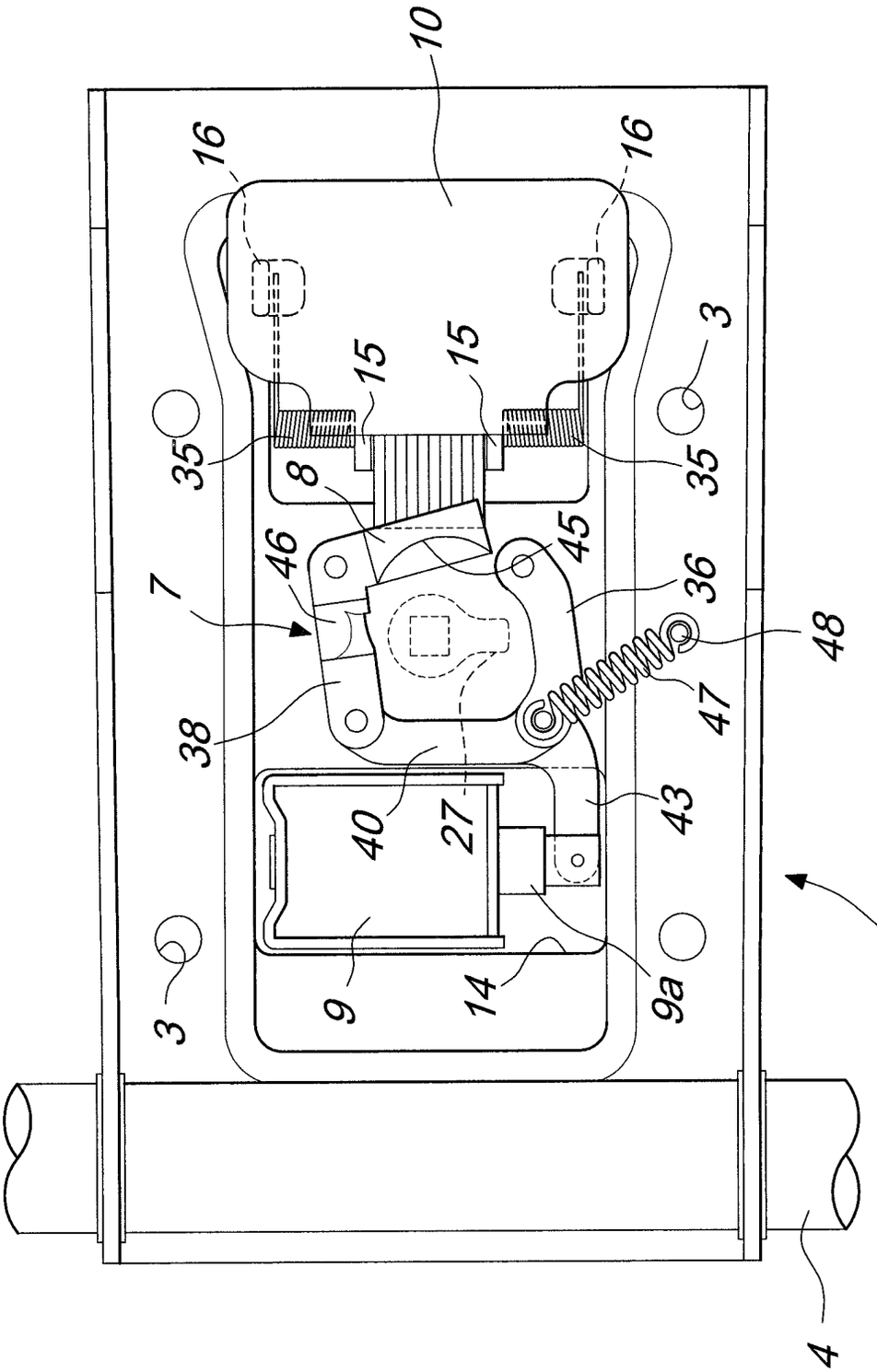

Fig. 3

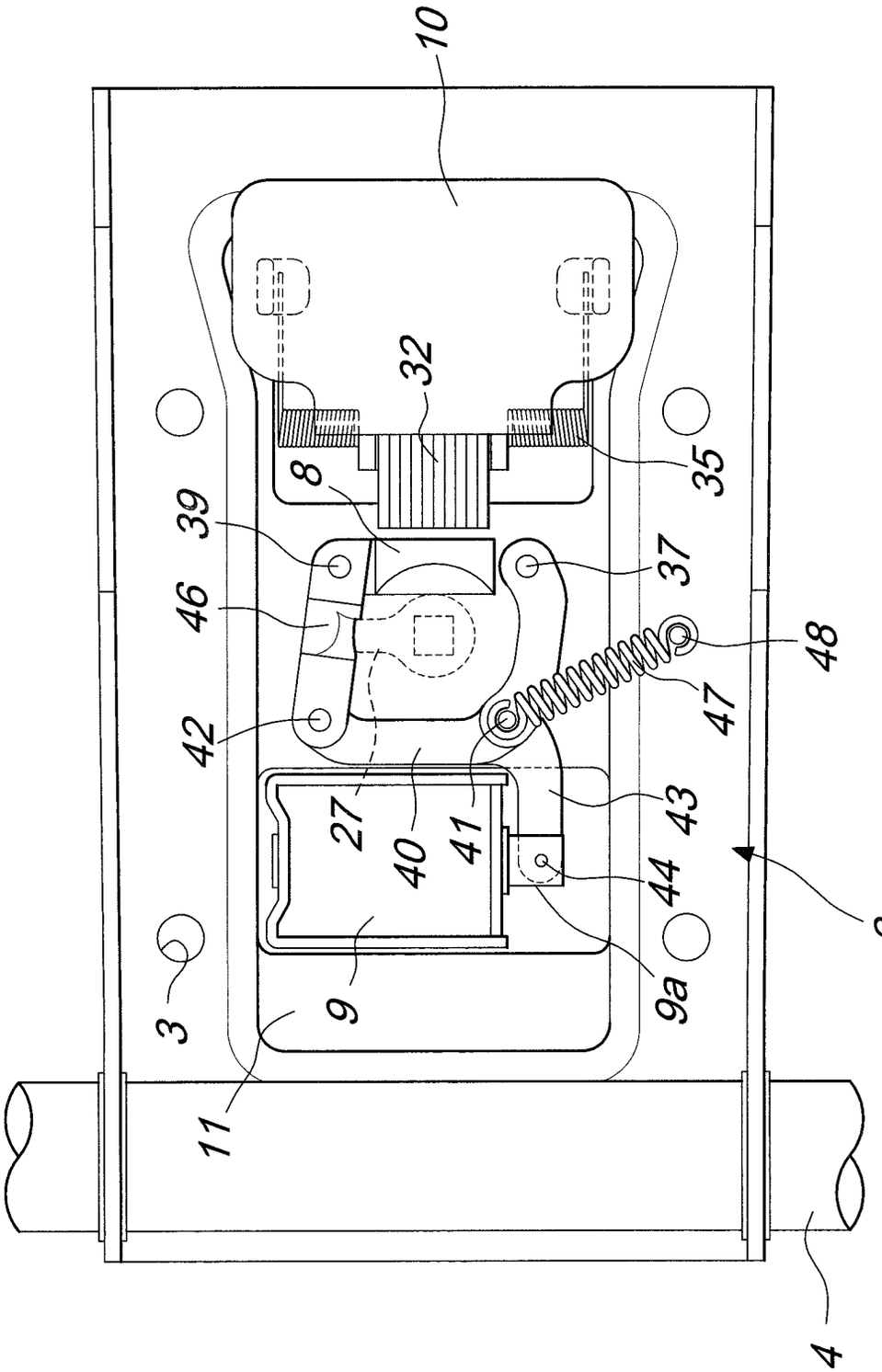

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 04 10 6804

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	DE 200 12 724 U1 (F. HESTERBERG & SOEHNE GMBH & CO KG) 26 October 2000 (2000-10-26) * page 4, lines 1-18 * * pages 5-7; claims 1-4; figures 1-6 *	1-9	E05B65/16
Y	DE 298 06 974 U1 (EMKA BESCHLAGTEILE GMBH & CO. KG, 42551 VELBERT, DE) 2 July 1998 (1998-07-02) * pages 3-8; claims 1-5; figure 1 *	1-9	
Y	EP 1 253 266 A (TAKIGEN MANUFACTURING CO., LTD) 30 October 2002 (2002-10-30) * pages 5-7 * * pages 12-34; claim 1; figures 1-3 *	1,2	
Y	US 5 058 258 A (HARVEY ET AL) 22 October 1991 (1991-10-22) * column 2, line 15 - column 4, line 55; claim 1; figures 4-8 *	1-3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7) E05B E05D E05F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 February 2005	Balice, M

CATEGORY OF CITED DOCUMENTS

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08-02-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 20012724 U1	26-10-2000	NONE	
DE 29806974 U1	02-07-1998	NONE	
EP 1253266 A	30-10-2002	JP 3515083 B2	05-04-2004
		JP 2002317575 A	31-10-2002
		CN 1382892 A	04-12-2002
		EP 1253266 A2	30-10-2002
		TW 517136 B	11-01-2003
		US 2002152778 A1	24-10-2002
US 5058258 A	22-10-1991	NONE	

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