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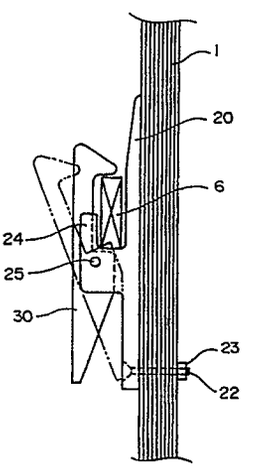
(54) Latch holding apparatus of handle for opening and closing door.

(57) The invention relates to a latch holding apparatus of a handle for opening and closing a door, in which a latch (30) pivotally secured to a base (20) fixed to a door main body (1) is held in a locked position, whereby the handle (6) is placed in a locked state. The latch holding apparatus includes a pair of handle grips (24) in each of which a recess is formed for insertion of the handle, a pivot shaft (25) for turnably supporting the latch on the handle grips, and holding means (40) for holding the latch in the locked position when the handle is inserted into the handle grips, and turning the latch and holding it in an unlocked position when the handle is separated from the handle grips. The latch can be opened easily by hand. At closing, the latch can be held in the locked position automatically after insertion of the handle.

Fig. 1



EP 0 412 632 A1

LATCH HOLDING APPARATUS OF HANDLE FOR OPENING AND CLOSING DOOR

FIELD OF THE INVENTION

This invention relates to a latch holding apparatus of a handle for opening and closing a door, in which the handle is placed in a locked state by holding a latch in a locked position. More particularly, the invention relates to a latch holding apparatus used in a double-leafed hinged door attached to the rear or side of, e.g., a van-type vehicle, and adapted in such a manner that when a handle to be locked is placed in a locked state or unlocked state, the latch can be held reliably in a locked position or unlocked position, respectively.

RELATED BACKGROUND ART

Conventionally, a latch apparatus for locking a handle which opens and closes a door is used in a double-leafed hinged door of a van-type vehicle or sea-borne container. Prior art disclosed in US Serial No. 19867 filed on March 16, 1970 will now be described with reference to Figs. 15 and 16 as an example of such a latch apparatus.

First, in Fig. 15, numeral 1 denotes a double-leafed hinged door attached to an opening at the rear or side of a van-type vehicle V or sea-borne container. The double-leafed hinged door 1 is mounted by hinges 2 on a side column 3 of the opening. Numeral 4 denotes a locking rod constituting a lock device. The rod 4 has cams 5 at its upper and lower ends and is mounted on the main body of the door 1 so as to be capable of turning. A handle 6 for turning the locking rod 4 about its axis is provided on the rod 4 as a integral part thereof. Numeral 7 denotes a cam keeper provided on upper and lower frame members of the opening. The upper and lower cams 5, 5 of the locking rod 4 turn when the door 1 is opened, whereupon the cams engage with their respective cam keepers 7. Numeral 8 denotes a latch apparatus for retaining the handle 6, which turns in unison with the locking rod 4, in a horizontal attitude, and for locking the handle 6 at the time of a closing operation.

Fig. 16, which is a perspective view of the portion indicated by the arrow XXIV in Fig. 15, shows the details of the latch apparatus and handle 6. In this conventional latch apparatus, the handle 6 is engaged with and supported by a bracket 9 fixedly secured to the double-leafed hinged door. A door lock latch 10 capable of being turned up and down has a simple structure in which the latch 10 is engaged with the handle 6 from above to prevent the handle 6 from separating from the bracket 9. Numeral 11 denotes concentric holes provided in the bracket 9 and latch 10. Locking is achieved by inserting the shank of a padlock 12 through the holes 11. The handle cannot be turned unless the padlock 12 is opened.

The conventional latch apparatus 8 thus constructed involves a troublesome opening and closing operation since the latch is held by the padlock 12. Specifically, in terms of the operation performed at unlocking,

(1) first the padlock 12 is unlocked by means of a key;

(2) the shank of the padlock 12 is withdrawn from the concentric holes 11 of the bracket 9 and door lock latch 10;

(3) the door lock latch 10 is turned clockwise about a pivot shaft 13; and

(4) the handle 6 is turned upwardly slightly by hand and pulled forward from the position indicated by the two-dot chain lines to turn the locking rod 4, thereby opening the door.

Though the double-leafed hinged door 1 is opened by the series of operations (1) through (4) mentioned above, these operations are difficult to perform when the user is carrying a load, unless the load is first set on the ground. In particular, operations (2) and (4) cannot be carried out with only one hand, and even greater difficulties are encountered in case of rainy weather.

A biasing apparatus is known as a latch holding apparatus for holding the latch reliably in its locked position or unlocked position. For example, in the case of a lock device of a handle for an apparatus which locks a van-type vehicle, the biasing apparatus uses a spring which applies a force in mutually opposing directions in such a manner that the locked position and unlocked position of the locking latch member can be reliably maintained.

As shown in Fig. 17, numeral 71 denotes a biased body moved between the position of a·pin a and the position of a pin b. The biased body is a latch member for locking the handle of a van-type vehicle, by way of example. The biased body 71 turns about a pivot shaft 72 to be changed over between the position of pin a and the position of pin b. Numeral 73 denotes a coil spring having one end engaged with a pin 74 provided on an end of the biased body 71, and another end engaged with a fixed pin 75 separate from the biased body 71.

A force is applied in the direction of arrow A in order to change over the biased body 71 from the position of pin a in Fig. 17(a) to the position of pin b in Fig. 17(b). When this is done, the coil spring 73a stretches to a point beyond a straight line X-X'

passing through the pivot shaft 72, namely a point beyond a neutral position. Therefore, the biased body is turned against the spring force, though when the straight line X-X′ is surpassed, the biased body is turned automatically to the position b, where it comes to rest. At the position of pin b, the coil spring 73a causes the spring force to act upon the biased body 71 between the pins 74 and 75, thereby producing a moment in a direction where the force attempts to turn the biased body further. As a result, the biased body 71 is held at the position b.

Figs. 18(a), (b) shows another example of the biasing device. Here a leaf spring 73b is used as the spring which applies the spring force to the biased body 71. If the biased body 71 is pushed against a maximum repulsive force, produced when it passes over a central projection 76b of the leaf spring 73b, at such time that the biased body 71 is moved from the a position to the b position, the biased body 71 will turn automatically and be held at the b position.

Figs. 19(a) (b) also show another example of the biasing device. Here the arrangement used is one in which one end of a torsion coil spring 73c is engaged with a pin 77 provided on the lower portion of the biased body 71. Operation is the same as in the foregoing two examples, with the biased body being held at the a and b positions by the coil spring 73c.

Figs. 20(a) (b) show yet another example of the biasing device. Here a spring seating member 80 is attached to the lower portion of the biased body 71 via a pin 78, and a spring seating member 81 is attached via a pin 79 to a fixed position separate from the biased body 71. A coil spring 73d is attached between the two spring seating members 80, 81. Accordingly, when the biased body is in line with the neutral line X-X′, the coil spring 73 is compressed to the maximum extent, whereby the maximum spring force is generated. When this neutral position is exceeded, the biased body is turned automatically toward the b position or the a position, where it comes to rest.

Among the foregoing well-known biasing devices, spring lengths ℓ_1, ℓ_2 in the examples of Figs. 17 and 20 are of considerable size in a case where a prescribed biasing force is required. In the example of Fig. 18, the width ℓ_3 of the leaf spring 73b is large. In the example of Fig. 19, the length and width of the coil spring 73c are of considerable size. For these reasons, problems arise when it is attempted to make the well-known biasing devices smaller in size and more compact.

DISCLOSURE OF THE INVENTION

The present invention has been devised in order to solve the foregoing problems and its object is to provide a latch holding apparatus of a handle for opening and closing a door used very frequently, in which a latch member can be held in its locked and unlocked positions reliably and the handle can be locked and unlocked by a single touch.

Another object of the present invention is to provide a safely operable latch holding apparatus of a handle for opening and closing a door, in which the apparatus can be attached at a hidden position of a latch device or the like for locking the handle, and in which the positioning of a held latch can be performed in reliable fashion.

In accordance with the present invention, there is provided a latch holding apparatus of a handle for opening and closing a door, in which a latch pivotally secured to a base fixed to a door main body is held in a locked position, whereby the handle is placed in a locked state, the apparatus comprising a pair of handle grips in each of which a recess is formed for insertion of the handle, a pivot shaft for turnably supporting the latch on the handle grips, and holding means for holding the latch in the locked position when the handle is inserted into the handle grips, and turning the latch and holding it in an unlocked position when the handle is separated from the handle grips.

ADVANTAGEOUS EFFECTS OF THE INVENTION IN THE CONTEXT OF THE BACKGROUND ART

Accordingly, the latch holding apparatus of a handle for opening and closing a door in the present invention is such that the latch member is pivotally secured to the base and is capable of being held in its open and closed positions by a simply constructed holding device. The invention therefore is very effective when utilized in a collection and delivery vehicle for parcels and the like, in which a door is opened and closed very frequently.

In particular, the holding apparatus is such that when the handle is manipulated in a state where the latch member is in the open position, the latch can be held in the open position automatically. Conversely, the latch member can readily be turned to the open position by hand, whereupon it can be held in this position immediately. Therefore, the apparatus is convenient in that it can be operated very easily even by an operator busily involved in collection and delivery.

Other features and advantages of the present invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which like reference characters

designate the same or similar parts throughout the figures thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

Figs. 1 through 4 show a first embodiment of the present invention, in which:

Fig. 1 is a side sectional view;

Fig. 2 is a perspective view of a latch member;

Fig. 3 is a sectional view of a holding device; and

Fig. 4 is a perspective view of a base;

Figs. 5 through 7 show a second embodiment of the present invention, in which:

Fig. 5 is a side sectional view;

Fig. 6 is an enlarged sectional view illustrating the state of the holding device holding a latch in a locked position; and

Fig. 7 is an enlarged sectional view illustrating the state of the holding device turning the latch and holding it in an unlocked position;

Figs. 8 and 9 show a third embodiment of the present invention, in which:

Fig. 8 is a side sectional view, and

Fig. 9 is a perspective view of a base;

Figs. 10 through 12 show a fourth embodiment of the present invention, in which:

Fig. 10 is a sectional view illustrating the state of a biasing device for biasing a latch pivotally secured to a base;

Fig. 11 is a front view showing a pin seat constituting the biasing device; and

Fig. 12 is an explanatory view showing the action of the biasing device;

Fig. 13 is a sectional view showing another biasing device;

Fig. 14 is a sectional view showing a well-known biasing device;

Fig. 15 is a front view of a well-known double-leafed hinged door;

Fig. 16 is a diagram showing the details of a portion indicated at arrow XVI in Fig. 15; and

Figs. 17 through 20 are explanatory views illustrating biasing devices using well-known springs.

BEST MODE FOR CARRYING OUT THE INVENTION

Embodiments of the present invention will now be described in detail with reference to the drawings.

The basic structural elements of an apparatus according to a first embodiment of the invention illustrated by Figs. 1 through 4 are four members, namely a base 20, a latch member 30 which operates in cooperation with the base 20, and a holding device 40 for holding the latch member 30 in a closed position.

Fig. 3 is a sectional view showing a principal portion of the latch holding apparatus. As shown in Fig. 1, the base 20 is fixedly secured to, e.g., the main body of a double-leafed hinged door 1, by a bolt 22 inserted from the inner side of the main body of the door 1 and passed through the handle 6 at a prescribed position. Tightening is accomplished by a nut 23. To this end, the base 20 is rectangular in shape and is provided with a bolt-insertion hole 21 at each of the four corners of the rectangle, as shown in Fig. 4.

A pair of left and right handle grips 24 are provided on the top side of the base 20. The handle grips 24 project upwardly by a distance t from the base 20 in such a manner that the handle 6 can be inserted from above. A recess 24a for inserting the handle is formed between the handle grips 24 and the base 20.

Fig. 2 is a perspective view of the latch member. The latch member 30 has a transverse dimension that allows it to fit between the pair of left and right handle grips 24, and is attached to the handle grips 24 by a pivot shaft 25. The upper portion of the latch member protrudes upward from the handle grips 24 and has an inwardly directed projection 31 forming a C-shaped recess 32. The handle grips 24 are provided with respective holes 25a for attaching the pivot shaft 25, which is attached to the latch member 30 substantially at the central portion thereof. The latch member 30 turns up and down with the pivot shaft 25 serving as the center of turning motion. The lower portion of the latch member 30 has the shape of a downwardly directed wedge. The holding device 40 is attached to the latch member 30 at a portion thereof below the position of the pivot shaft 25.

The construction of the latch holding device 40 will now be described in greater detail. A hole 42 for mounting the holding device is provided in the lower portion of the latch member 30 below the hole for the pivot shaft 25 serving as the center of turning motion. Fitted into the hole 42 are pins 41 having a hemispherical shape and constituting the holding device 40. When the latch member 30 is turned, the pins 41 are urged outwardly by a compression spring 43 in such a manner that the heads of the pins are fitted alternately into two recesses 41a, 41b provided in each of the handle grips 24 on the inner side thereof below the hole 25a. More specifically, the two recesses 41a, 41b are spaced apart by about 20° and have the same radii with the hole 25a as center. The locking device holds the latch member 30 in the locked position (the position of the solid lines in Fig. 1) or in the

unlocked position (the position of the phantom lines in Fig. 1) after the latch is turned.

Accordingly, in order to turn the latch member 30, place it in the unlocked position and unlock the handle 6, the side of the latch member 30 below the pivot shaft 25 is pressed or the head portion of the latch member 30 is pulled forward. In a case where the handle 6 is to be locked, the handle 6 is swung down from above the latch, whereupon the handle 6 fits between the latch member 30 and the base 20 and strikes a bottom 32a of the C-shaped recess 32 in the latch member 30. As a result, the latch member 30 turns in the locking direction (clockwise in Fig. 1). At this time the holding device 40 also turns so that the pins 41 fit into the recesses 41a, which is on the side of the locking position of the latch member 30. The holding device holds the latch member 30 is this position.

A second embodiment of the invention will now be described with reference to Figs. 5 through 7.

As in the first embodiment described above, the latch holding apparatus of this embodiment includes the base 20 and the latch member 30, which cooperates with the base 20, as basic structural elements. The holding device for holding the latch member 30 in its locked position has a construction described below.

Fig. 6 is an enlarged sectional view showing the state of the locking device holding the latch member 30 in the locked position. The holding device comprises two projections 33a, 33b provided on the latch at positions below the pivot shaft 25 on the inner side of the latch, and a leaf spring 44 provided astride a recess 46 formed in the base. The two projections 33a, 33b are situated on the latch member 30 within a radius R at a position below the pivot shaft 25. The leaf spring 44 is secured to the base 20 by fixtures 45 and is formed to have two projections 44a, 44b corresponding to the projections 33a, 33b. The arrangement is such that when the latch member 30 turns, the leaf spring 44 is capable of flexing without effort.

The operation of the latch holding device of a handle for opening and closing a door will now be described. When the locked position is maintained, the projection 33a on the side of the latch member 30 fits into the recess 44c of the leaf spring 44, as shown in Fig. 6, and this position is maintained.

Next, in order to establish the unlocked position, the lower portion of the latch member 30 is urged in the direction of arrow a in Fig. 5. As a result, the projection 33b on the lower side of the latch member 30 is turned upward, slides over the projection 44b on the lower side of the leaf spring 44 and fits into the recess 44c. Thus the latch member 30 is held in its unlocked position (the position indicated by the two-dot chain lines in Fig. 5).

A third embodiment of the present invention will now be described with reference to Figs. 8 and 9.

In this embodiment, magnets 46a and 46b are imbedded in upper and lower portions of the base 20. The magnet 46a corresponds to the inwardly directed projection 31 provided on the upper portion of the latch member 30, which is made of metal. The magnet 46b is provided to correspond to the wedge-shaped portion at the lower part of the latch member 30. It goes without saying that the magnets 46a, 46b may be provided on the latch member 30 rather than the base 20.

In the operation of the latch holding device, the inwardly directed projection 31 is magnetically attracted to the magnet 46a with the latch member 30 in the locked position, which is indicated by the solid line in Fig. 8. This position is maintained as a result of the attraction between the projection 31 and the magnet 46a.

When the lower portion of the latch member 30 is pushed against the attractive force of the magnet 46a, the lower portion of the latch member 30 is attracted to the magnet 46b and this position is maintained (the position indicated by the two-dot chain line in Fig. 8).

A fourth embodiment of the present invention will be described with reference to Figs. 10 through 13.

As in the first embodiment described above, the latch holding apparatus of this embodiment includes the base 20 and the latch member 30, which cooperates with the base 20, as basic structural elements. Here the holding device for holding the latch member 30 in its locked position employs a biasing device using a spring applying a biasing force in mutually opposing directions in such a manner that the latch member for locking can be held reliably in its locked and unlocked positions.

Fig. 10 is a sectional view showing a biasing device according to this embodiment. A biased body 53 urged in a positioning direction is a latch member capable of being turned between pins a and b about a pivot shaft 54. Numeral 55 denotes a pin having a hemispherical head for supporting the upper portion of the biasing device 52. The pin 55 is fixedly secured to a portion of the biased body 53 below the pivot shaft 54. Numeral 56 denotes a pin having a hemispherical head for supporting the lower portion of the biasing device 52. The pin 56 is attached to a fixed base 57.

Fig. 11 is a sectional view illustrating a pin seat constituting the biasing device. The pin seat 58 has a bowl-shaped recess 59 provided in one end thereof in the axial direction. This end of each pin seat is formed to have a spring seating flange 60 surrounding the recess 59. The pin seats 58 are

installed end to end with their recessed portions facing away from each other, and heads 55a, 56a of the pins 55, 56 are fitted into the recesses 59 of the pin seats. Numeral 61 denotes a spring loaded between the spring seating flanges 60 of the upper and lower pin seats 58.

As shown in Fig. 12, the biasing device 52 is such that when the center of the upper pin 55 is at a position O_1 to the left of a straight line X-X′ connecting the center of the head portion of pin 56 and the center O of the pivot shaft 54 serving as the rotational center of the biased body 53, the biased body 53 is biased in the locking direction or unlocking direction. When the center of the head portion of pin 55 is at a position O_2 to the right of the straight line X-X′, the biased body 53 is biased conversely in the locking direction or unlocking direction.

The biasing device 52 is characterized in that it operates in an effective manner even if a distance E between the center O_3 of the pin 56 and the rotational center (pivot shaft) O of the biasing body 53 is very small.

In the fourth embodiment constructed as set forth above, the biased body 53 is restrained and positioned by the pin a in the state shown in Fig. 10. However, when the biased body 53 is turned in the direction of the arrow, it rotates about the pivot shaft 54. As a result, the pin 55 turns at the same time and so does the pin seat 58 while the bowl-shaped recess 59 is in contact with the tip of the pin. The turning motion takes place against the spring force of the coil spring 61 and becomes maximum when the line X-X′ connecting the pivot shaft 54 and pin 56 is surpassed. When this line is surpassed, the biased body 53 turns under its own force and is positioned at pin b on the opposite side.

In comparison with the well-known biasing devices having the springs shown in Figs. 17 through 20 described earlier, the biasing device 54 of the fourth embodiment can be easily mounted in the small mounting space between the base 57 attached to the door 1 of the van-type vehicle and the latch member, which is the biased body 53, and the biasing device 54 is capable of performing fully the function of a latch holding device.

Fig. 13 shows another embodiment. Here the pin 55 with the hemispherical head and the pin seat 58 are integrated into a unitary body. More specifically, upper and lower pin seats 58′ have an identical construction, and a pin 55′ and spring seating flange 60′ are formed into a unitary body.

Since the pin 55′ is integrated with the pin seat 58′, bowl-shape recesses 59′ are provided on the side of the biased body 53 which is positioned and on the side of the base 57. Numeral 68 denotes a coil spring installed between the opposing upper and lower spring seating flanges 60′, 60′.

Fig. 14 shows a well-known biasing device corresponding to the principle of Fig. 20. This will be compared with the fourth embodiment of the invention shown in Fig. 10.

Let the following hold:

A = A′ (distance between the pivot shaft of the biased body and the center of the pin tip)

B = B′ (length of spring)

We will then have

$C < C'$, $D > D'$, $E < E'$

where C, C′: distance between centers of upper and lower pin tips

D, D′: deviation of pin tip from neutral position

E, E′: overall length of device

Thus, in accordance with the apparatus of the fourth embodiment, it is possible to achieve the relation $C < B$, whereas $C' > B'$ holds in the case of the well-known apparatus of Fig. 14. In other words, even if the length B of spring 61 is made sufficiently large, the overall biasing device can be made compact. As a result, the apparatus can be installed easily even in a small space.

Claims

1. A latch holding apparatus of a handle for opening and closing a door, in which a latch pivotally secured to a base fixed to a door main body is held in a locked position, whereby the handle is placed in a locked state, comprising:
a pair of handle grips in each of which a recess is formed for insertion of the handle;
a pivot shaft for turnably supporting the latch on said handle grips; and
holding means for holding the latch in the locked position when the handle is inserted into said handle grips, and turning the latch and holding it in an unlocked position when the handle is separated from said handle grips.

2. The apparatus according to claim 1, wherein said holding means comprises:
an urging device comprising a compression spring and pins on both sides of said compression spring, said urging device being fitting into a hole provided in the latch at a position below said pivot shaft and lying parallel to said pivot shaft; and
recesses provided in said handle grips so as to be capable of being engaged and disegaged by the pins on both sides of said urging device, said recesses corresponding to respective ones of a locked position and unlocked position of the latch.

3. The apparatus according to claim 1, wherein said holding means comprises:
two projections provided on said latch at positions on an inner side thereof below said pivot shaft, said two projections being provided on identical radii

having said pivot shaft as the center; and
a leaf spring provided astride a recess provided in the base and corresponding to the projections, said leaf spring having two projections forming a recess between them.

4. The apparatus according to claim 1, wherein said holding means comprises:
magnets imbedded in upper and lower positions of said latch or in upper and lower positions of said base, said magnets attracting said latch to said base to hold said latch at positions corresponding to the locked position and unlocked position of said latch.

5. The apparatus according to claim 1, wherein said holding means is provided between the base and the latch of a portion below the pivot shaft supporting the latch in such a manner that the latch can be turned up and down.

6. The apparatus according to claim 5, wherein said holding means comprises:
a pair of pins attached in opposing relation to the base and the latch of a portion below the pivot shaft supporting the latch in such a manner that the latch can be turned up and down;
a pin seat having a recess which engages with the pin on the side of said latch, and a spring seating flange; and
a pin seat of the lower portion having a recess which engages with the pin on the side of said base, and a spring seating flange; and
a spring fitted between the spring seating flanges of said upper and lower pin seats, said latch being held in the locked position or being turned and held in the unlocked position by moving a straight line connected centers of said pair of pins to mutually opposing positions with respect to a line connecting a center of turning motion of said latch and a center of the pin on the side of said base.

7. The apparatus according to claim 6, wherein recesses are formed at opposing positions in the base and the latch of a portion below the pivot shaft supporting the latch in such a manner that the latch can be turned up and down, and said spring is provided by spring seats having pins engaged with these recesses.

Fig. 1

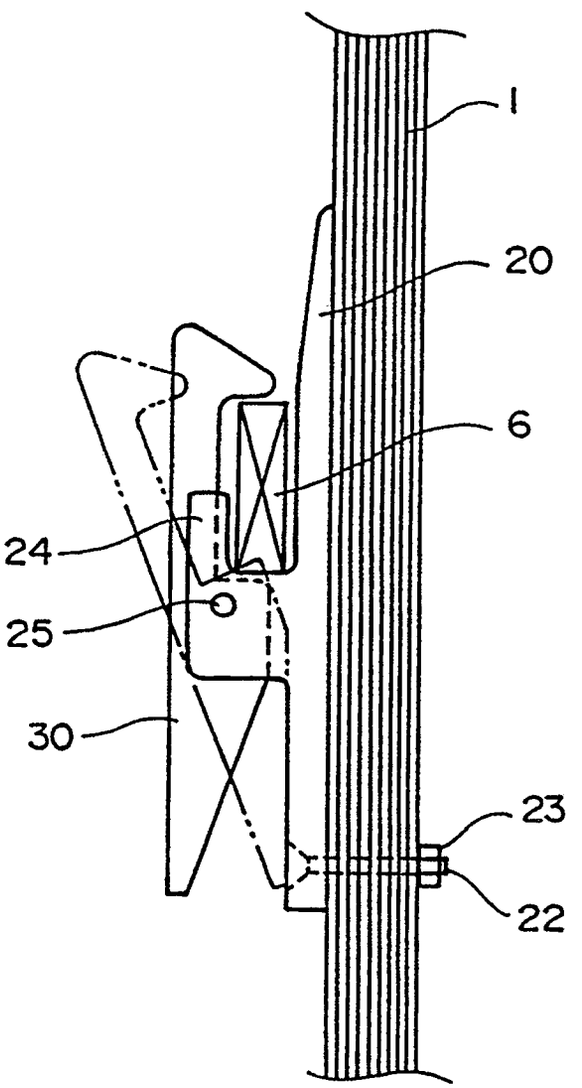


Fig. 2

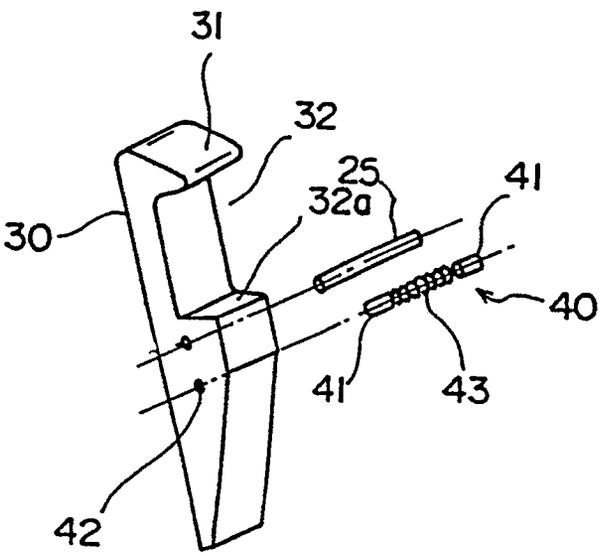


Fig. 3

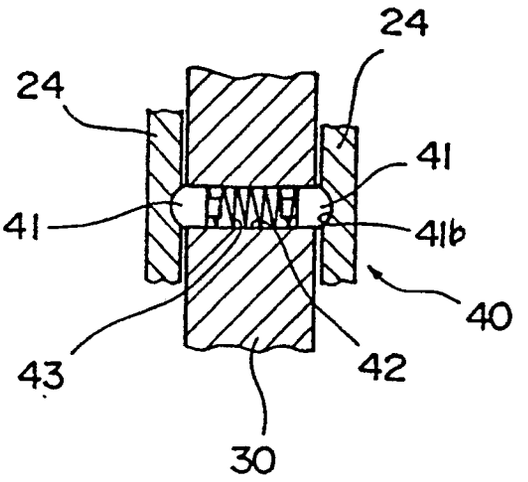


Fig. 4

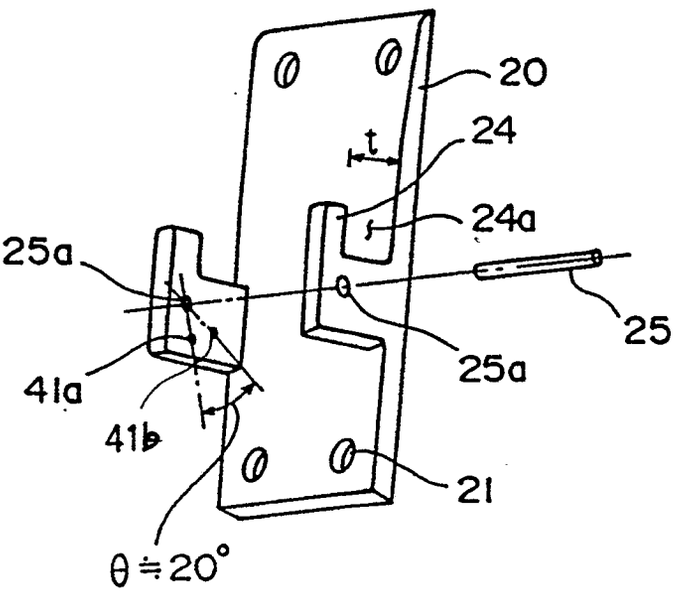


Fig. 5

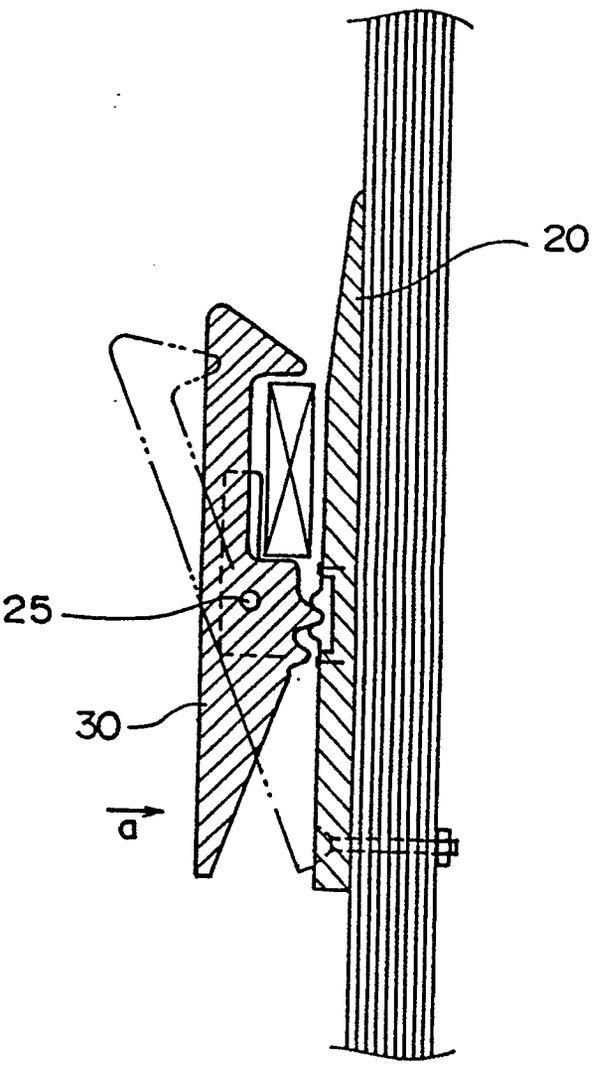


Fig. 6

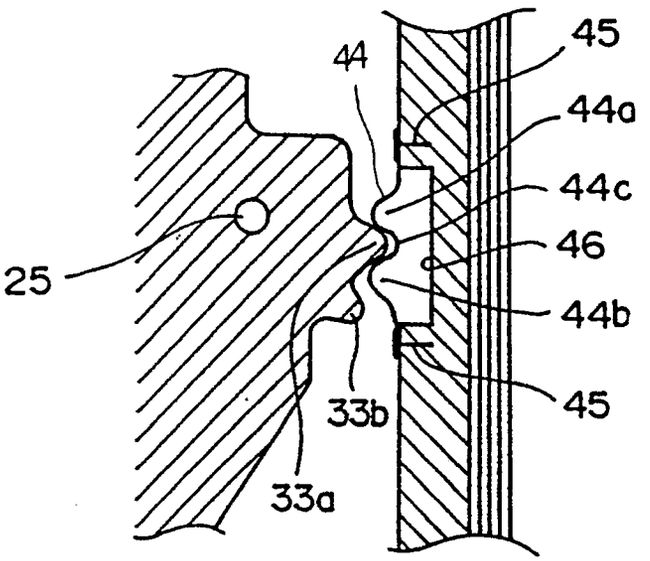


Fig. 7

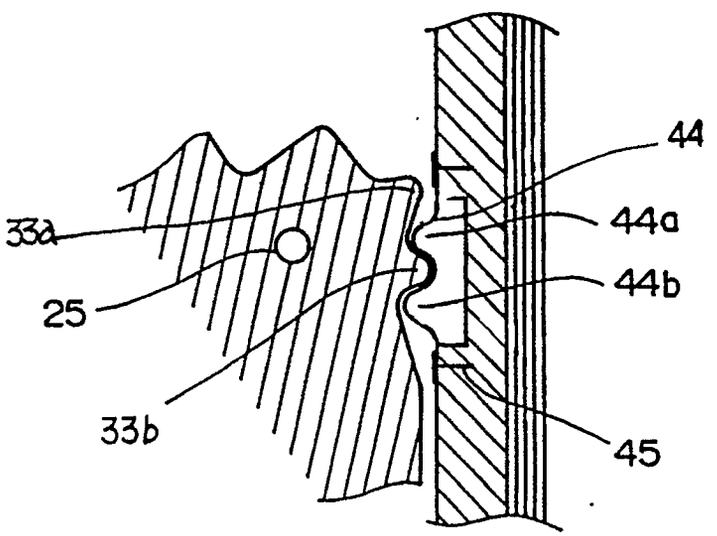


Fig. 8

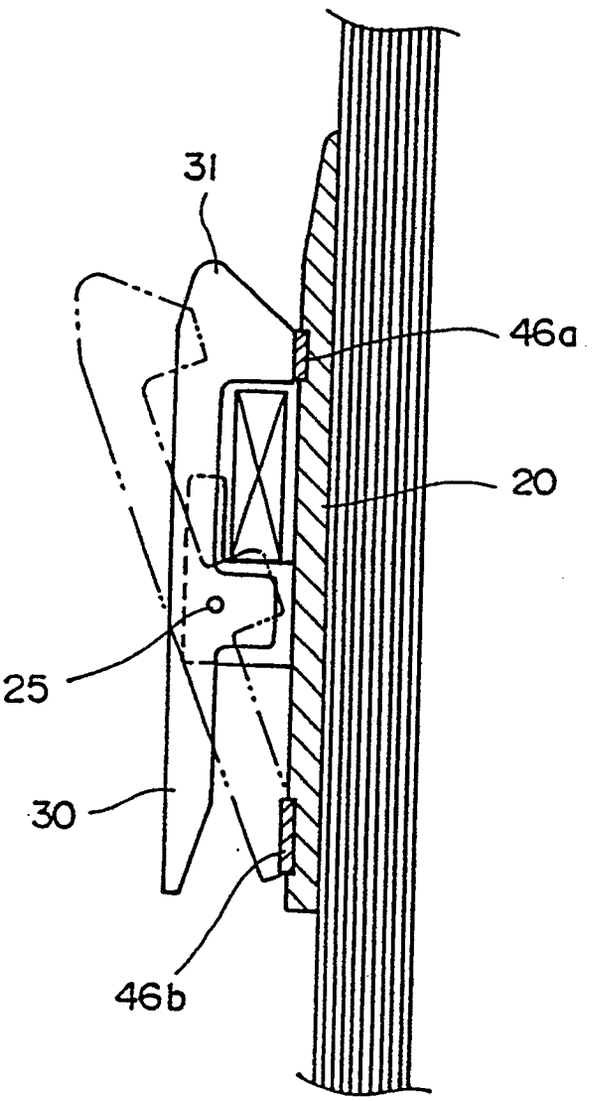


Fig. 9

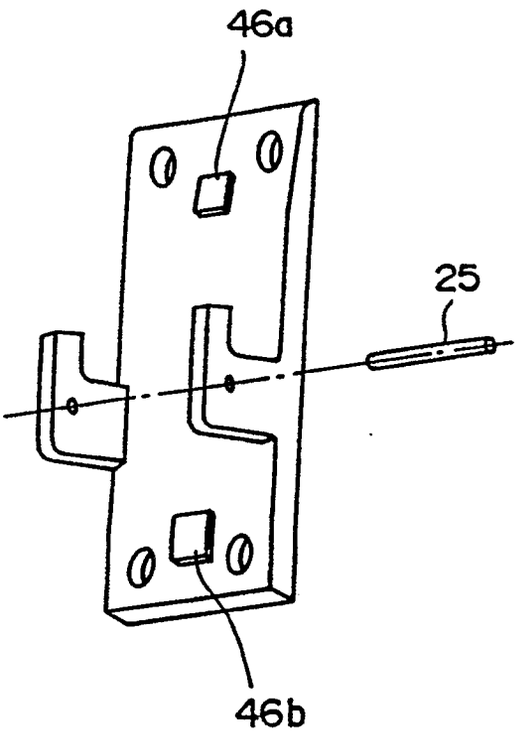


Fig. 10

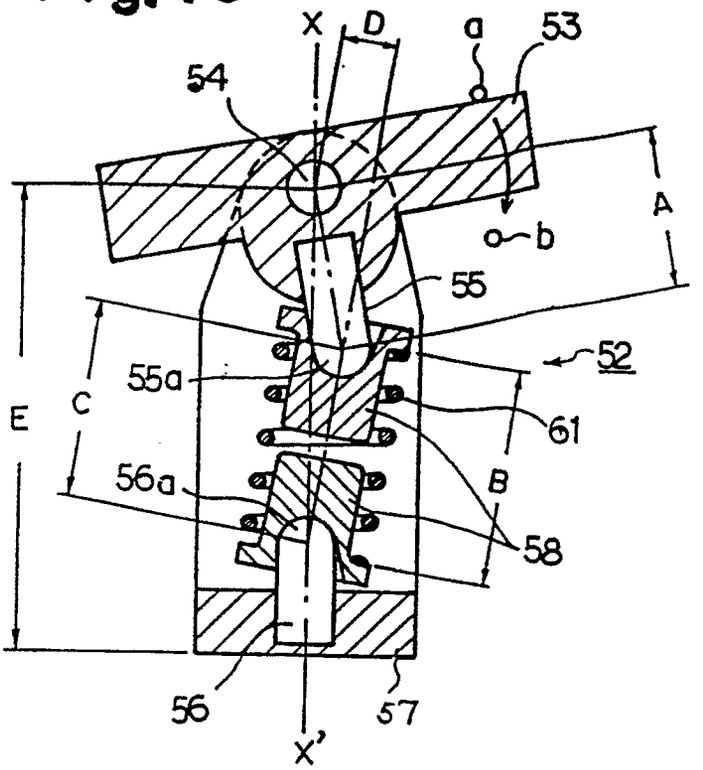


Fig. 11

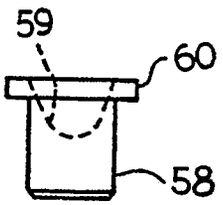


Fig. 12

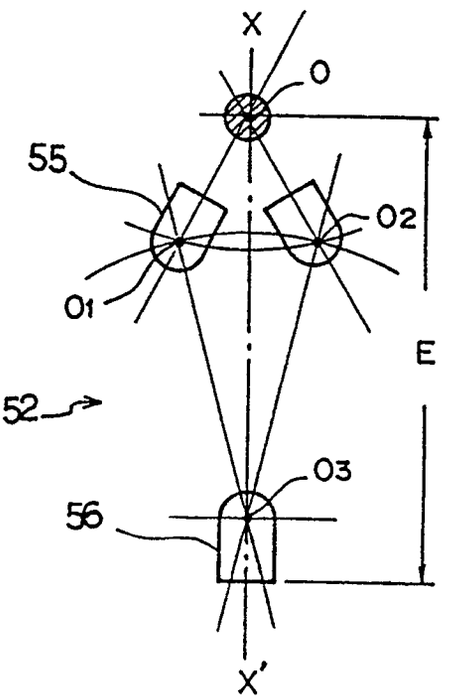


Fig. 13

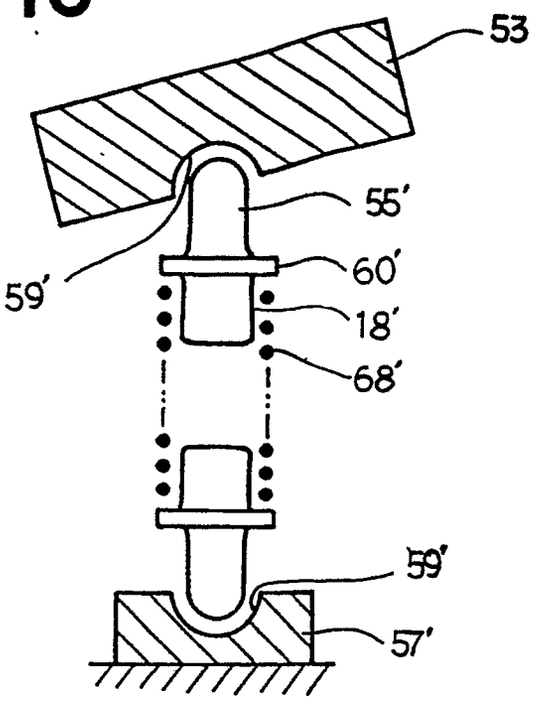


Fig. 14

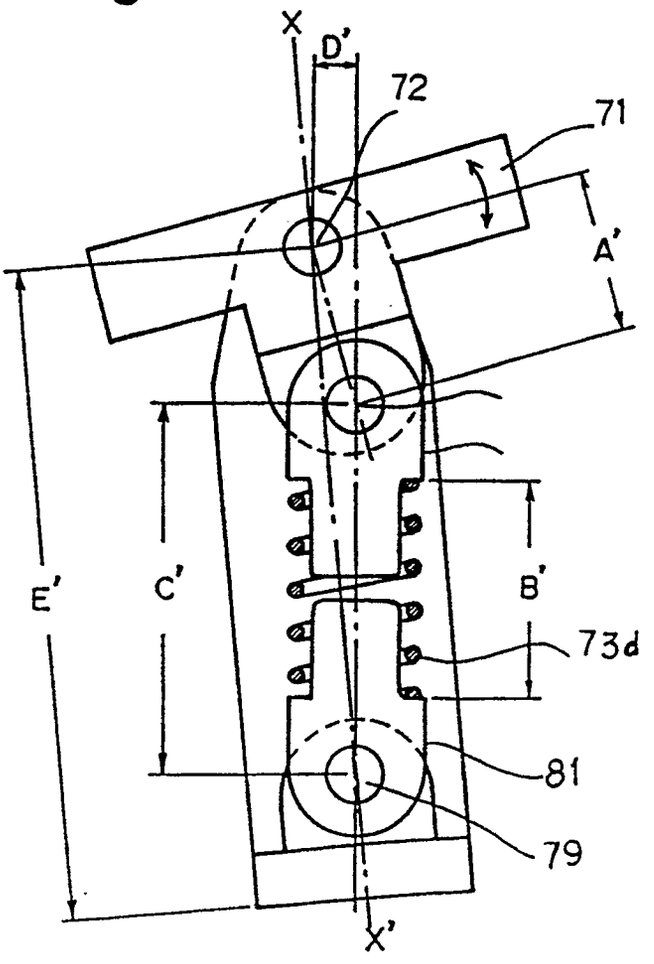


Fig. 15

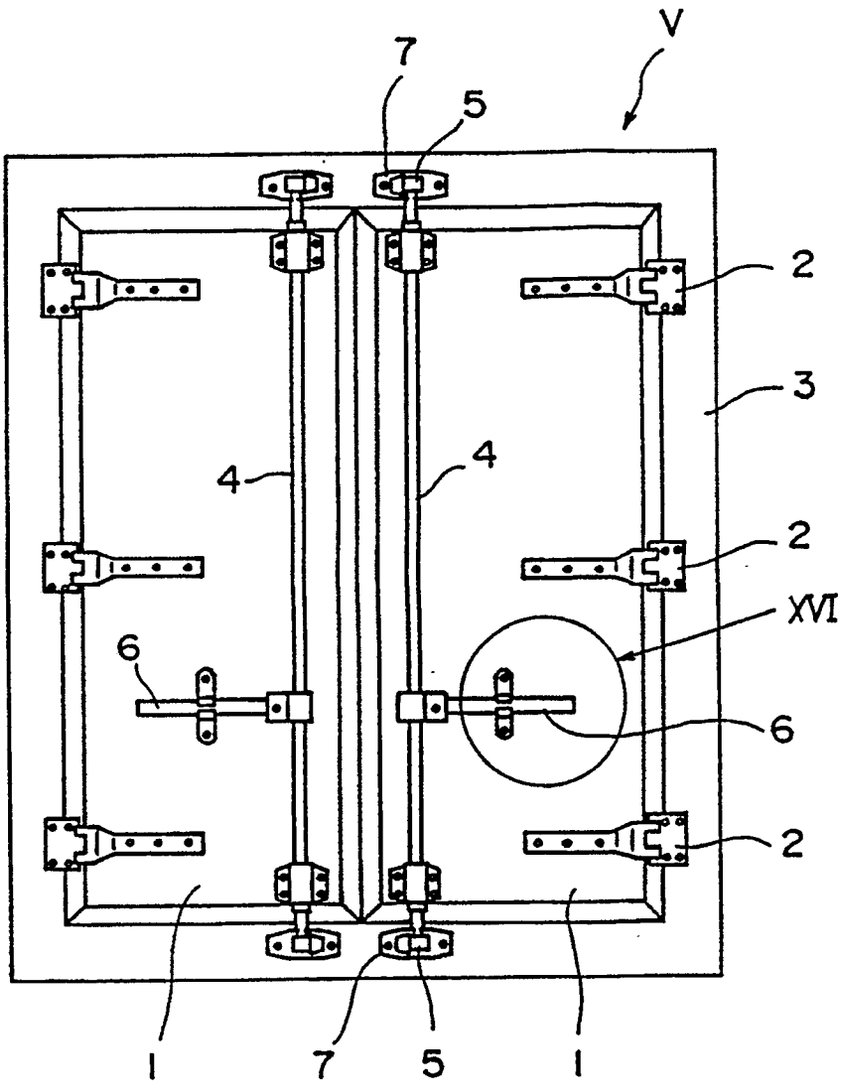


Fig. 16

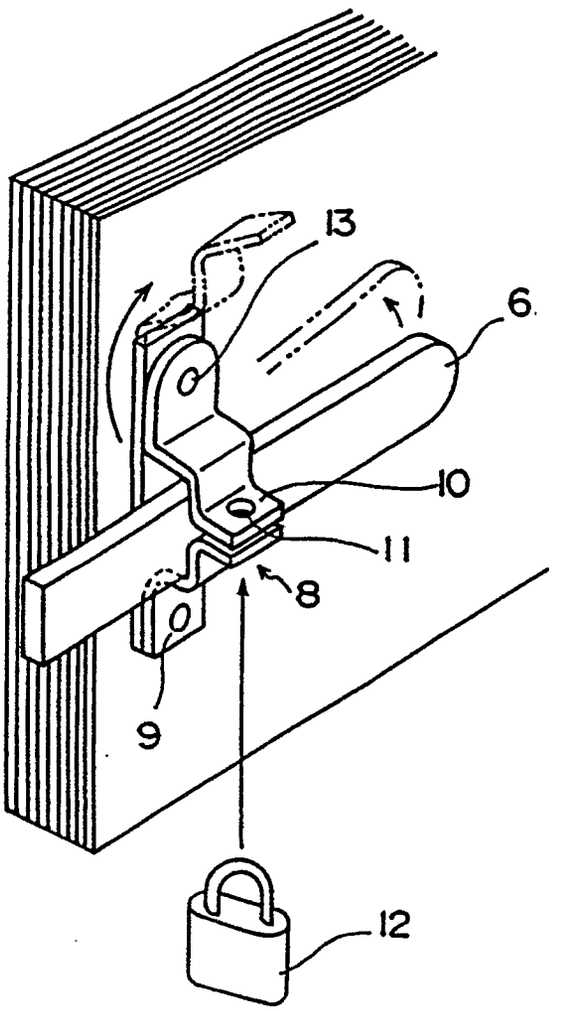


Fig. 17

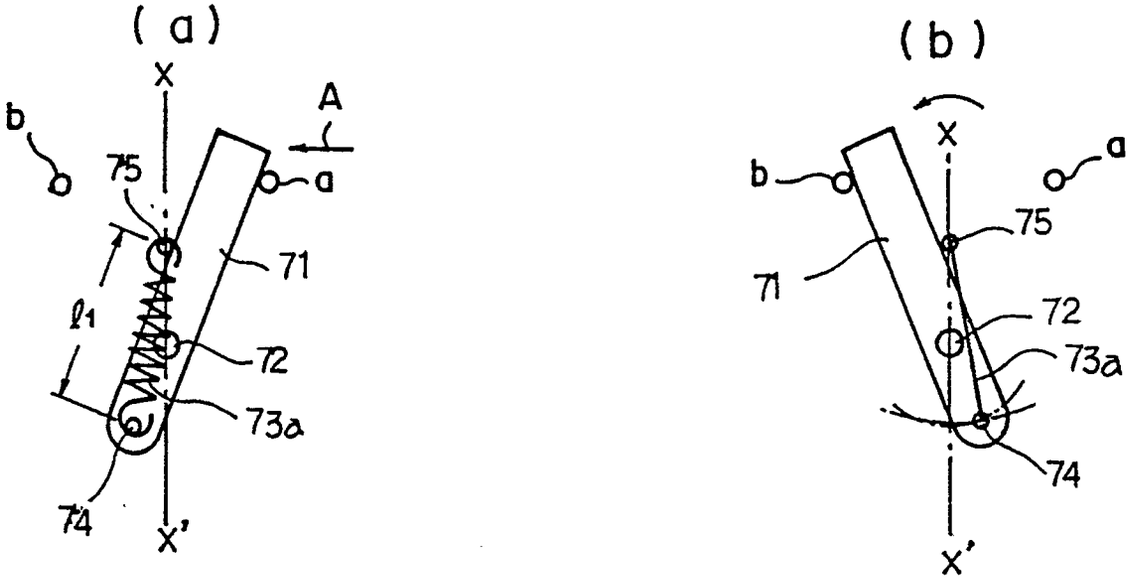

(a)
X
A
b
75
a
71
ℓ_1
72
73a
74
X'
(b)
X
a
b
75
71
72
73a
74
X'

Fig. 18

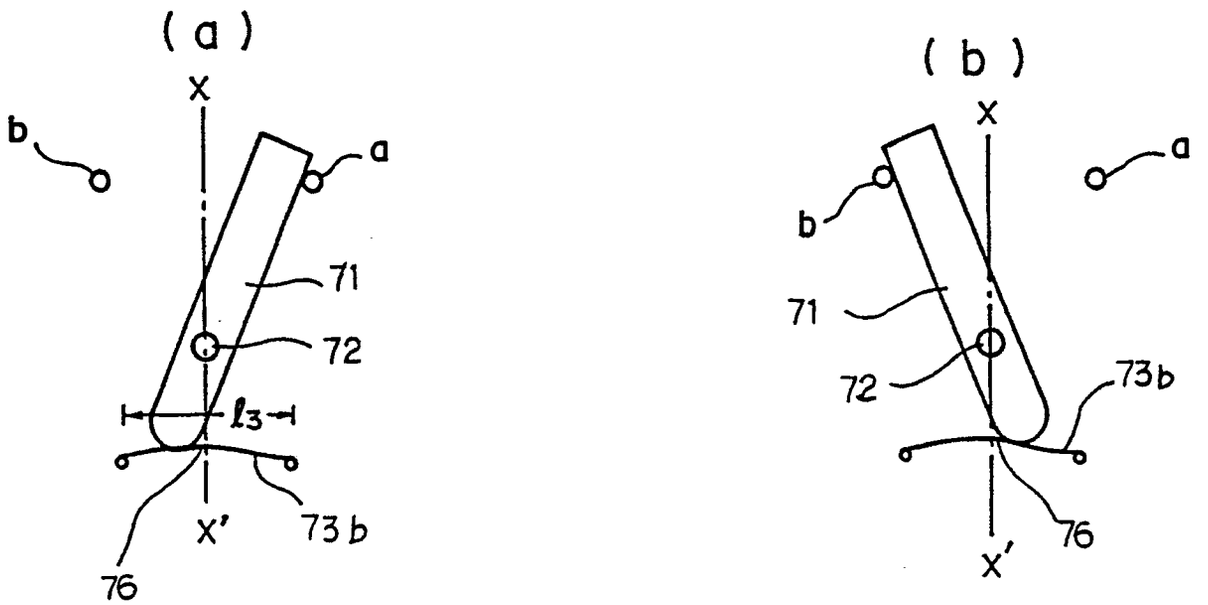
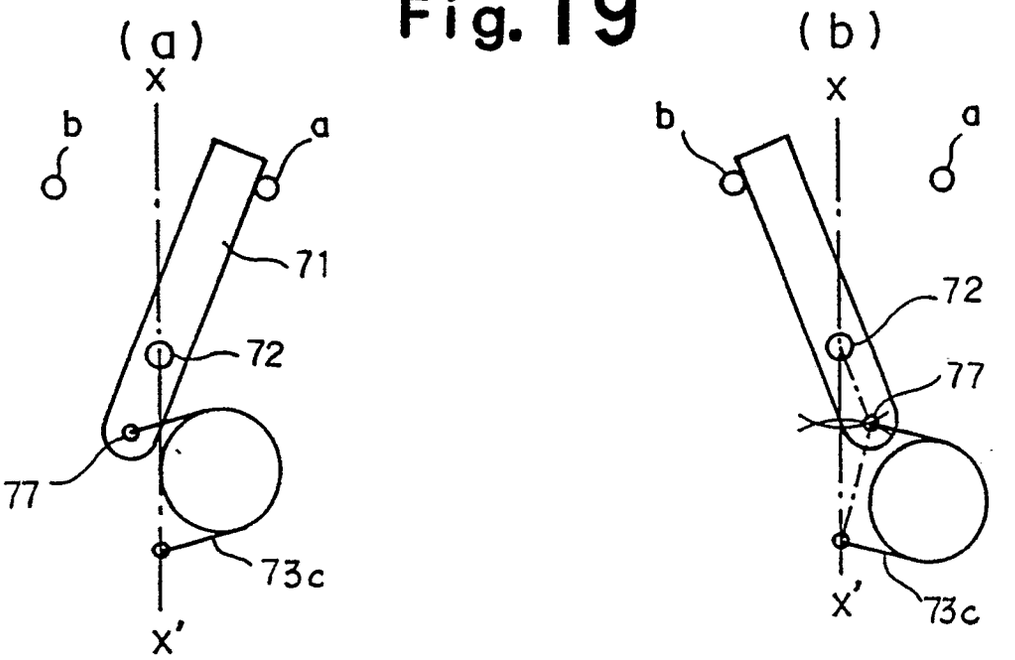

(a)
X
b
a
71
72
ℓ_3
X'
73b
76
(b)
X
a
b
71
72
73b
76
X'

Fig. 19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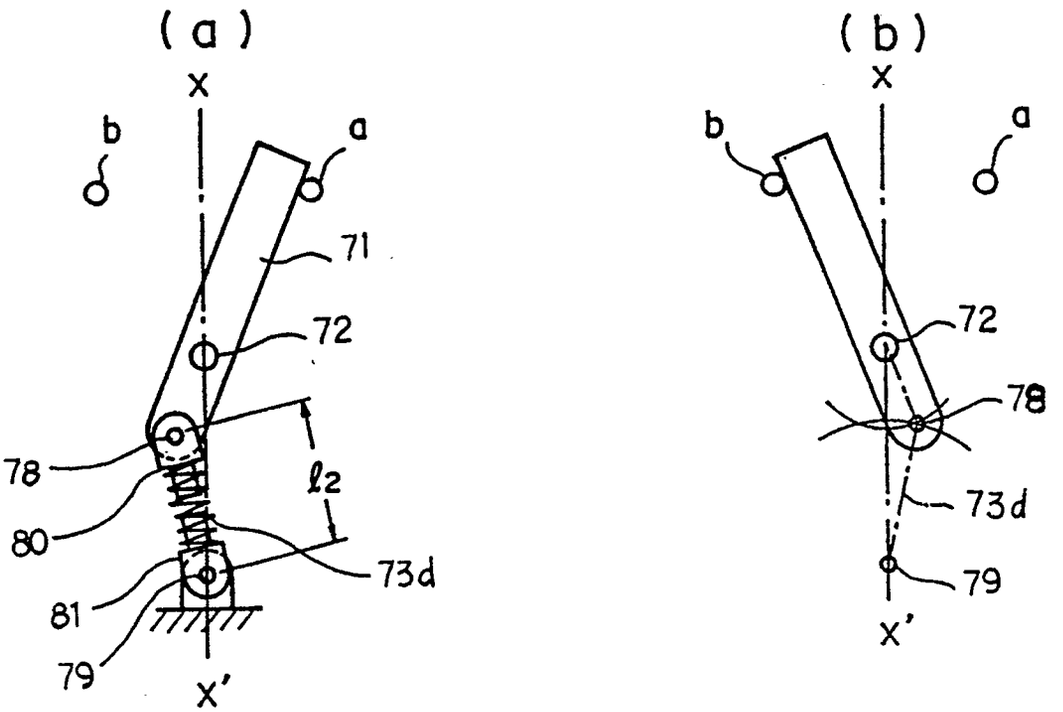
X
b
a
71
72
77
73c
X'
(b)
X
b
a
72
77
X'
73c

Fig. 20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X
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a
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72
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80
81
79
ℓ2
73d
X'
(b)
X
b
a
72
78
73d
79
X'

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 90303488.2

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 5)
A	DE - A - 1 708 177 (HABERL) * Fig. 1-6; claims 1-2 * --	1-3,5-7	E 05 B 65/12
A	DE - A - 2 107 588 (HABERL) * Fig. 1-3; claims 1-7 * --	1-3,5-7	
A	US - A - 1 627 752 (IMOLE) * Fig. 1-4; claim * --	1,2	
A	GB - A - 1 485 632 (ILLINOIS) * Fig. 1-2; claims 1-5 * --	1	
A	US - A - 3 476 425 (F. CHARTRAND) * Fig. 1-4; claims 1-16 * --	1-3,5-7	
A	DE - A - 802 046 (DAIMLER-BENZ) * Fig. 1-4; claims 1-5 * ----	1-3,5-7	

TECHNICAL FIELDS SEARCHED (Int Cl 5)

E 05 B
B 60 J
E 05 C
B 65 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	30-07-1990	CZASTKA

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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