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54 Device for opening the front hatch of washing machines.

57 The device comprises a body (1) defining an engagement seat (5) for a hatch closure hook (7), a slider element (6) slideable at said seat and adapted for locking said hook, a slider actuating control lever (15) remotely actuatable for releasing said hook, and means (3) for opening the hatch in relation to the stopping of the machine.

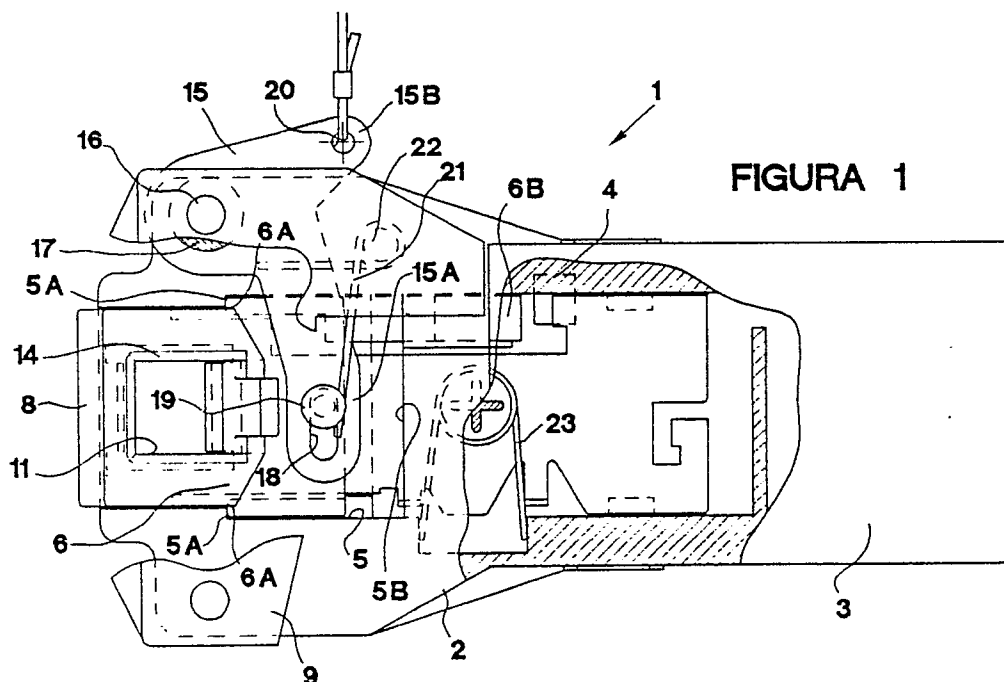


FIGURA 1

EP 0 296 510 A1

DEVICE FOR OPENING THE FRONT HATCH OF WASHING MACHINES

The present invention relates to a device for opening the front hatch of washing machines.

As is known, the hatch of washing machines is usually opened by means of a handle-like device. This device is also adapted to prevent the hatch from opening during the operating cycle of the machine and, vice versa, the operation of the machine while the hatch is open, as prescribed by safety rules.

Due to the usually low position of the hatch, its opening is uncomfortable since it forces the user to bend down. Devices have therefore been proposed which are capable of transferring the hatch opening control to a more adequate position, in particular by means of a pushbutton located in the control keyboard of the machine.

The pushbutton opening devices adopted are, however, not fully satisfactory, both due to the high effort required to operate them and due to their structural complexity.

The aim of the present invention is to eliminate the above described problem by providing a device which allows to easily open the front hatch of washing machines with a limited actuation force and with a remote control.

Within this aim, a further object of the invention is to provide an opening device which is simple in concept, compact, economically manufactured and reliable in use.

This aim and this object are achieved by a device for opening the front hatch of washing machines, characterized in that it comprises a body defining an engagement seat for a hatch closure hook, a slider element slideable at said seat and adapted for locking said hook, a slider actuating control lever, remotely controlled for releasing said hook, and means for opening the hatch in relation to the stopping of the machine.

Further characteristics and advantages of the invention will become apparent from the detailed description of a preferred embodiment of the device for opening the front hatch of washing machines, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a partially cutout and sectional side view of the device according to the invention in hatch opening position;

figure 2 is a similar view of figure 1 of the device in a closing position;

figure 3 is a longitudinal sectional view of the device in opening position;

figure 4 is a similar view of figure 3 of the device in closing position.

With reference to the figures, reference numeral 1 generally indicates the body of the hatch

opening device. The body 1 has a flattened portion 2 defined in front of a box-like portion 3 housing the electric controls of means for opening the hatch. Said opening means substantially comprise a pin 4 for locking said device.

Longitudinally to the flattened portion 2 of the body 1 there is a recess 5 constituting the seat for a slider element 6 adapted to engage a conventional hatch closure hook 7, shown in broken lines in figure 2.

The slider 6 has a flattened shape and, as described in greater detail hereinafter, is movable between an idle position and a release position. The idle position is defined by the abutment of the slider edge shoulders 6A on complementarily shaped shoulders 5A of the seat, and the release position is defined by the slider abutting against the bottom 5B of the recess.

The slider 6 furthermore has a longitudinal expansion 6B directed towards the box-like portion 3 and adapted to engage the pin 4. The hook 7, in the locking step, retracts a shaped plate 8 facing the slider 6 and adapted to operate a microswitch. The plate 8 is longitudinally and slideably mounted in the body 1, in an accommodation provided on the box-like portion 3 which extends in said sliding seat of the slider 6, so that said plate protrudes in front of the body 1.

The slider 6 is retained in the recess 5 by means of a cover 9 which is adapted to be fixed on the flattened portion 2 of the body 1. The cover 9 is centrally provided with an opening 10 which cooperates with a corresponding opening provided on the portion 2 to define the engagement seat of said hatch closure hook.

The slider 6 also has a central opening 11 which, in idle position, partially engages said engagement seat, so as to lock the hook 7. The opening 10 and 11 conveniently have beveled edges 10A, 11A for easing the insertion of the hook 7.

The opening 10 is surrounded by an enlarged border 12, on the outer face of the cover 9, while a groove 13 is provided on the inner face and acts as guide for a corresponding enlarged edge 14 of the opening 11 of the slider.

Between the flattened portion 2 of the body 1 and the cover 9, a control lever 15 is articulated and is remotely actuatable for releasing the hatch. The lever 15 is rotatable on a pivot 16, defined by the cover 9 and surrounded by an annular spacer 17 adapted to provide an interspace which defines the rotation plane of said lever.

On its own rotation plane, the lever has a pair of divergent arms 15A, 15B which are substantially

at a right angle to each other. The first arm 15A has, proximate to its end, a slot 18 in which there engages a pin 19 protruding from the slider 9, while the second arm 15B has a hole 20 for fastening a conventional traction element, conveniently connected to a pushbutton for opening the hatch arranged in an easily accessible position. It is also possible to connect the control lever to a pedal or the like.

The lever 15 is rotatable, in contrast with a spring 21 pivoted at pin 22 and acting on the pivot 19 of the slider, between the idle position shown in the figure and a release position.

The rotation of the control lever 15 determines the sliding of the slider 6, so as to cause the release of the hatch closure hook 7. During opening, the disengagement of the slider 6 from the hook 7 determines the return of the shaped plate 8 to its idle position as an effect of the thrust of a spring 23. This release is vice versa prevented if the pin 4 engages the expansion 6B of the slider, as intended during the operation of the machine.

It is apparent that the stroke of the described lever assembly is very limited, with the consequent advantage of having a compact device which also requires a very limited effort to be actuated. The device according to the invention is furthermore particularly simple in construction and assembly.

In the practical embodiment of the invention, the materials employed, as well as the shape and the dimensions, may be any according to the requirements.

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 scope of each element identified by way of example by such reference signs.

Claims

1. Device for opening the front hatch of washing machines, characterized in that it comprises a body (1) defining an engagement seat (5) for a hatch closure hook (7), a slider element (6) slideable at said seat and adapted for locking said hook, a slider actuating control lever (15) remotely controlled for releasing said hook, and means (3) for opening the hatch in relation to the stopping of the machine.

2. Device according to claim 1, characterized in that said control lever (15) is articulated to said body (1) and has a slot (18) at one end engaging a

pin (19) protruding from said slider (6), at the opposite end said lever being provided with a hole (20) for fastening a remote control traction element.

3. Device according to claim 1, characterized in that said body (1) has a flattened portion (2) which is longitudinally provided with a recess (5) constituting said sliding seat for said slider, said recess being closed by a cover (9), said control lever (15) being rotatable between said flattened portion and said cover.

4. Device according to claim 3, characterized in that said cover (9) has a central opening (10) which cooperates with a corresponding opening provided on said flattened portion so as to define said engagement seat of the hatch closure hook (7).

5. Device according to claim 1, characterized in that said slider (6) has a central opening (11) which in idle position partially engages said hook engagement seat, so as to lock said hook.

6. Device according to claim 1, characterized in that said slider has a longitudinal expansion which is adapted to engage said opening means.

7. Device according to claim 1, characterized in that it comprises a shaped plate (8) facing said slider (6) and slideably mounted, longitudinally to said body, in an accommodation which extends in said sliding seat of said slider so as to operate a microswitch of said opening means (3), said plate being retracted by said hook in locking the hatch and being returned to its idle position by spring means (23) in opening the hatch.

8. Device according to claim 1, characterized in that said control lever (15) is rotatable between an idle position and a release position in contrast with a spring (21).

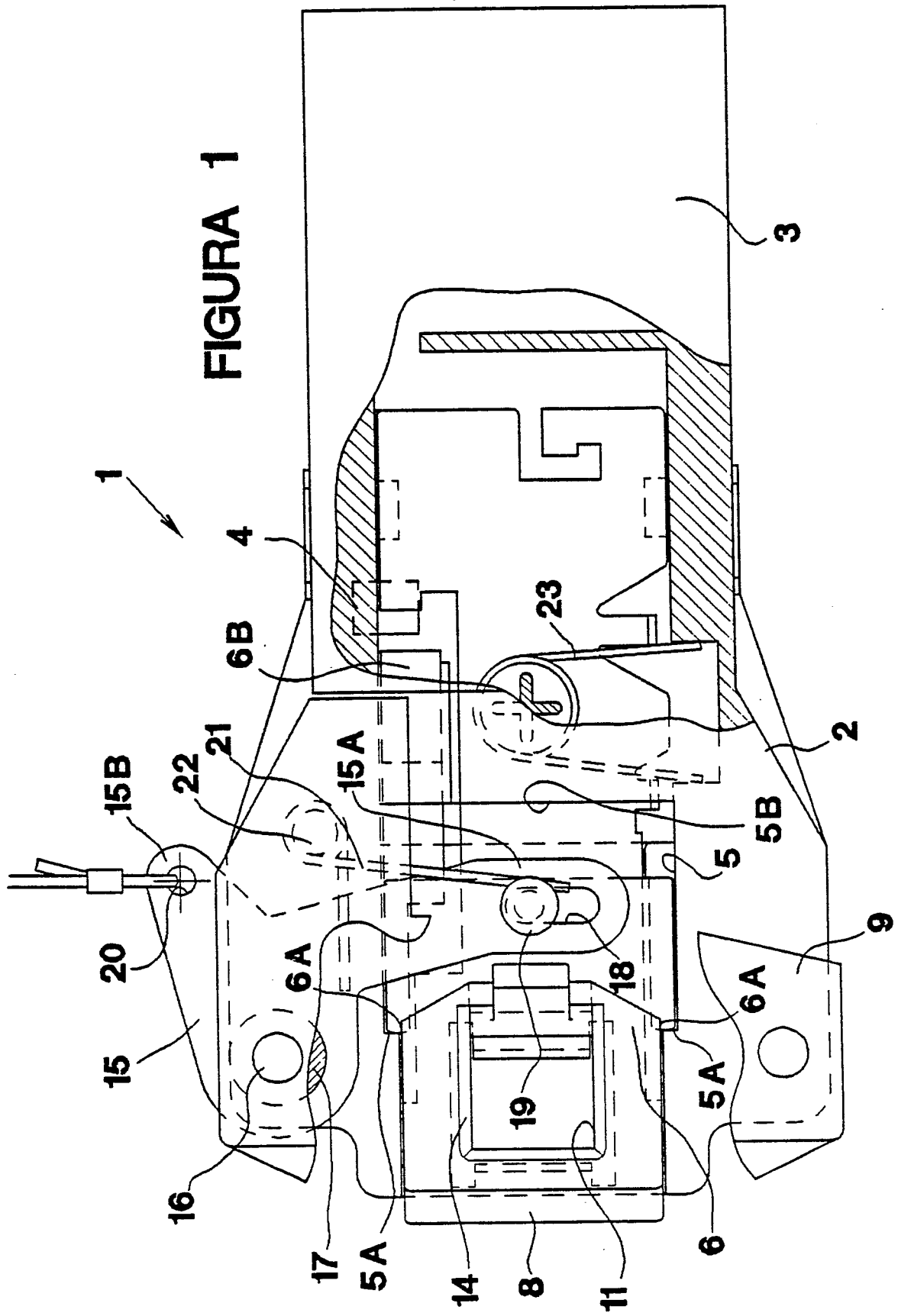
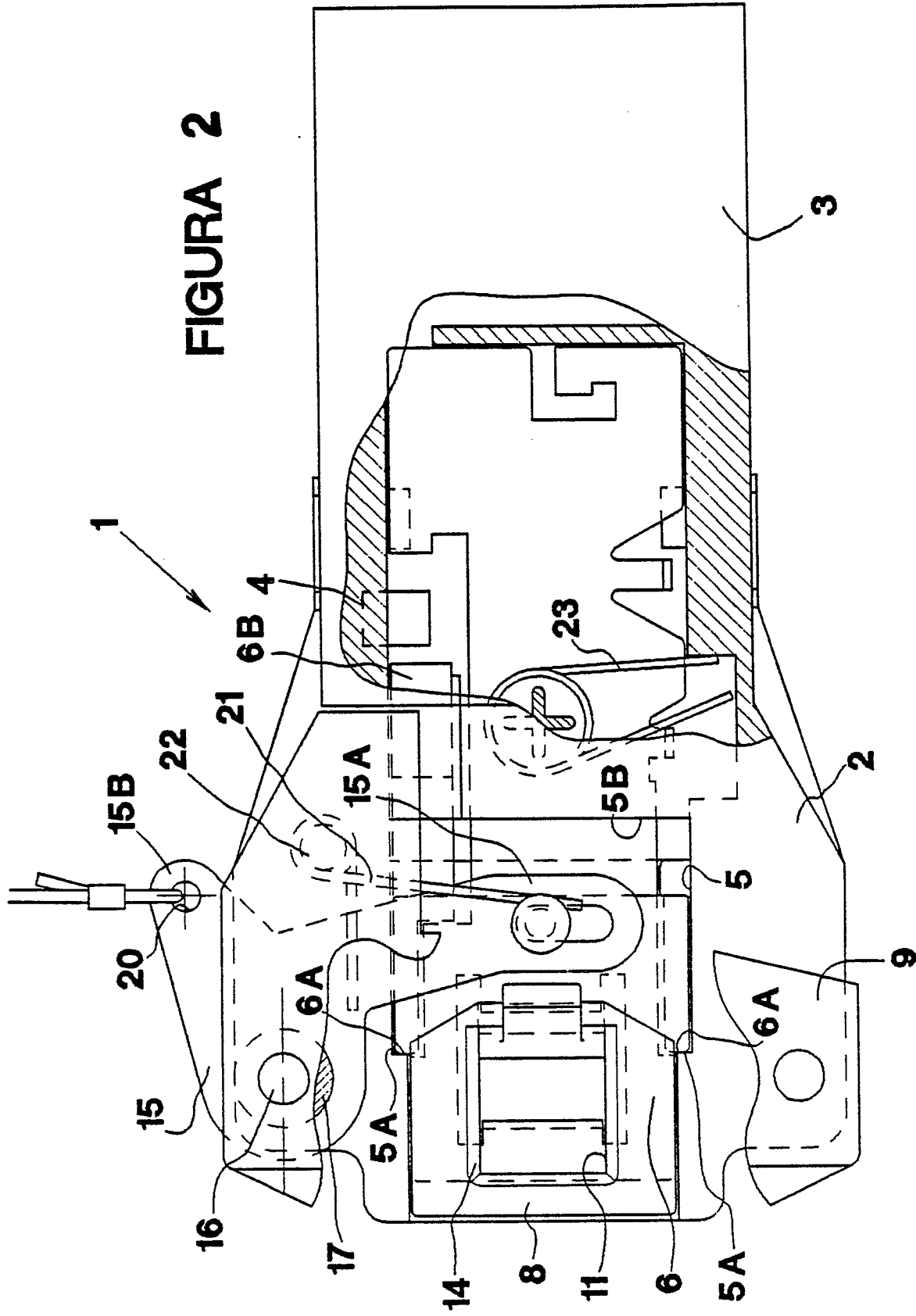
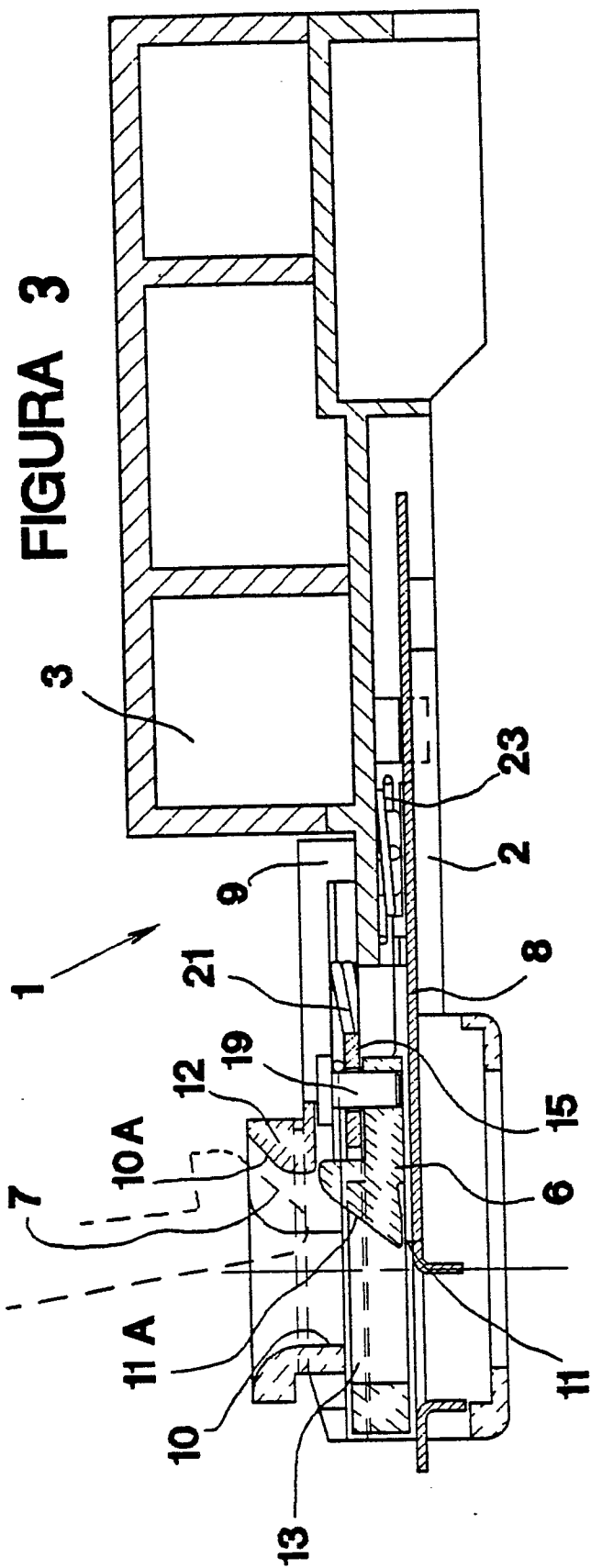
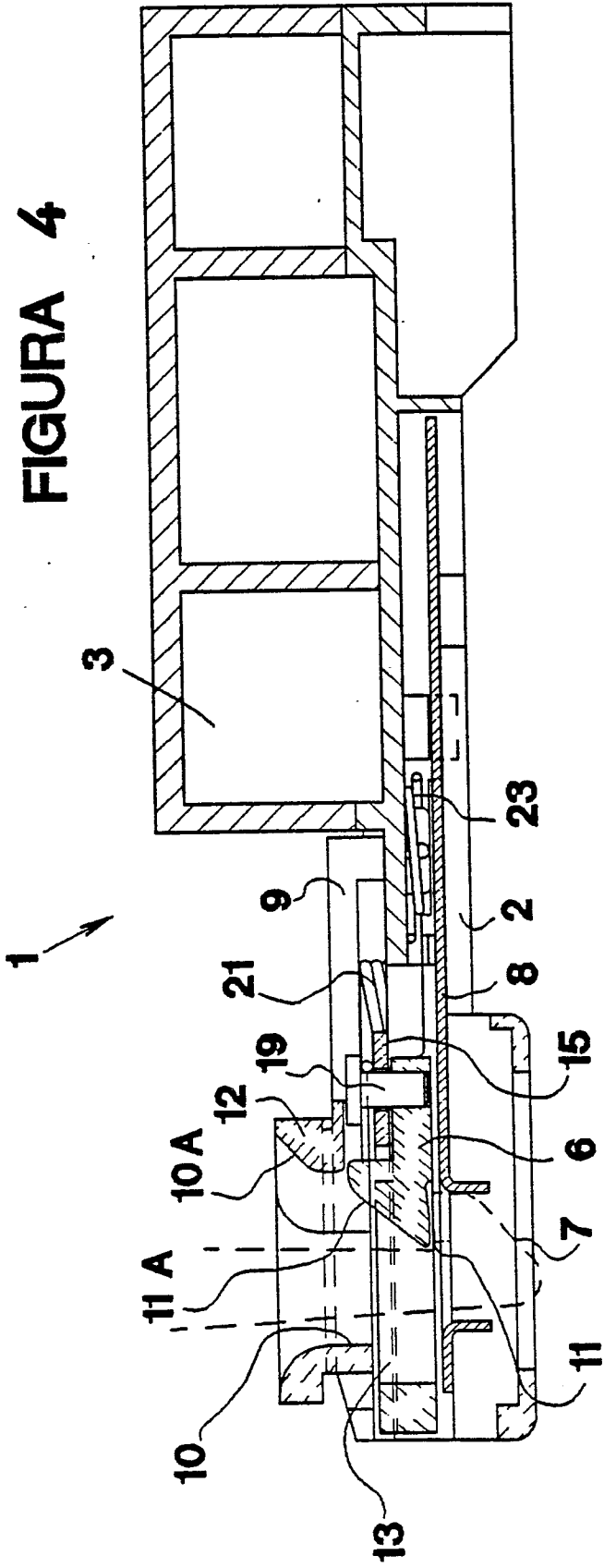


FIGURA 2









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. 4)												
A	FR-A-2 552 458 (INDESIT) * Claims; figures * ---	1,2,8	D 06 F 37/42												
A	GB-A-1 053 462 (TRIPLEX) * Page 2, lines 63-93; page 3, lines 24-42; figures 2,4-7 * ---	1,2,8													
A	GB-A-2 128 283 (TEXAS INSTRUMENTS) * Abstract; figure 2 * -----	1													
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)												
			D 06 F												
The present search report has been drawn up for all claims															
Place of search THE HAGUE		Date of completion of the search 27-09-1988	Examiner COURRIER, G. L. A.												
<table border="0"><tr><td>CATEGORY OF CITED DOCUMENTS</td><td>T : theory or principle underlying the invention</td></tr><tr><td>X : particularly relevant if taken alone</td><td>E : earlier patent document, but published on, or after the filing date</td></tr><tr><td>Y : particularly relevant if combined with another document of the same category</td><td>D : document cited in the application</td></tr><tr><td>A : technological background</td><td>L : document cited for other reasons</td></tr><tr><td>O : non-written disclosure</td><td>.....</td></tr><tr><td>P : intermediate document</td><td>& : member of the same patent family, corresponding document</td></tr></table>				CATEGORY OF CITED DOCUMENTS	T : theory or principle underlying the invention	X : particularly relevant if taken alone	E : earlier patent document, but published on, or after the filing date	Y : particularly relevant if combined with another document of the same category	D : document cited in the application	A : technological background	L : document cited for other reasons	O : non-written disclosure		P : intermediate document	& : member of the same patent family, corresponding document
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