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(54) Drum opening system for top-loading washing maschines and/or dryers

(57) The invention relates to an opening system (9) for the drum (6) of a top-loading washing machine (1) and/or dryer. A washing machine of this kind comprises a supporting and containing structure (2) having a cover (4) for providing access to a loading aperture (5) of the drum (6) located inside the supporting and containing structure (2), in which the drum (6) comprises one or more doors (8, 8') which can be moved between a closed position and an open position, thus delimiting an area of movement of the doors. The opening system (9) comprises releasable locking means (10, 11, 12, 18) for locking the doors (8, 8') in the closed position, stop means (13, 14) for locking the drum (6) in a stop position with respect to the supporting and containing structure (2), release means (15, 16) supported by the supporting and containing structure (2) for releasing the said releasable locking means (10, 11, 12, 18) in the stop position of the drum (6) and an operating element (17) for operating the release means (15, 16). The operating element is associated with the said supporting and containing structure (2) outside the area of movement of the doors, and the stop means (13, 14) can be actuated independently of the actuation of the release means (15, 16).

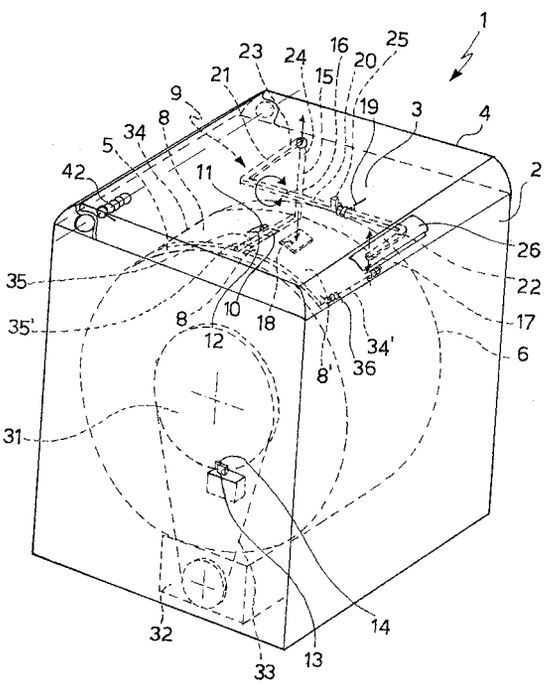

FIG. 1

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Description

[0001] The present invention relates to a drum opening system for top-loading washing machines and/or dryers. For the sake of simplicity, reference is made below to washing machines only, but clearly the opening system is equally suitable for use in top-loading dryers and washer-dryers.

[0002] A top-loading washing machine usually comprises a supporting and containing structure having a cover which provides access to a loading aperture of a drum for the laundry. The said drum is supported rotatably in a washing chamber located in the said supporting and containing structure.

[0003] The drum has one or more doors provided with suitable locking hooks to cover the loading aperture during the washing or drying cycle.

[0004] In order not to impede the operations of loading and removing the laundry, the drum is provided with elastic springs which push the doors, once the locking hooks have been released, into the open position, in which they do not interfere with the loading aperture.

[0005] In most prior art systems, the doors are closed and opened manually. In particular, when closing the doors, the user pushes them from the open position, against the force of the springs, into the closed position, and locks them there by means of the locking hooks. When opening the doors, the user manually releases the said locking hooks, after which the springs cause the doors to snap into the open position.

[0006] Whereas the closing movement of the doors takes place against the force of the springs and is therefore easily controlled and safe, the uncontrolled snapping open of the said doors can cause injury to the user's fingers and can be generally inconvenient during the use of the machine.

[0007] To overcome the aforesaid drawback, automatic opening systems have been proposed. An example of such a system is described in European patent application EP 1001068 A1, which proposes a drum with a single door and an extendable operating pin, associated with the support structure of the washing machine, which, in its extended configuration, interferes with the travel of a release lever associated with the rotating drum, and as a result of the motion of the rotating drum relative to the stationary pin, the pin operates the release lever, causing the door to open and simultaneously locking the drum in a suitable stop position for the loading and removal of laundry.

[0008] This automatic opening system only operates with a single door. Consequently, either the loading aperture is too small for convenient use, or the size of the door in its open configuration is excessive. This causes a risk of accidents due to the projection of the door beyond the profile of the washing machine housing.

[0009] Moreover, this automatic opening system requires a rotation of the drum in order to open the door, and it causes the door to open whenever the drum is stopped, for example even when it is only necessary to replenish the machine with detergent. This detracts from the safety and convenience of the use of the washing machine, and obliges the user to intervene manually in certain situations to release the door hook, thus once again exposing the user's hands to the risk of injury.

[0010] The principal object of the present invention is to propose a drum opening system for top-loading washing machines and/or dryers which eliminates the said risk of injury to the user's hands.

[0011] These and other objects are achieved by means of an opening system according to Claim 1.

[0012] To enable the invention and its advantages to be understood more clearly, a description is given below, by way of example and without restrictive intent, of some embodiments illustrated in the attached drawings, in which:

[0013] Figure 1 is a schematic perspective view of a washing machine having an opening system according to the invention;

[0014] Figure 2 is a sectional view of a washing machine having the opening system of Figure 1;

[0015] Figures 3a and 3b are front views of a detail of the opening system of Figure 1;

[0016] Figure 4 is a plan view of a further detail of the opening system of Figure 1;

[0017] Figure 5 is a plan view of a further detail of the opening system according to the invention.

[0018] With reference to Figure 1, a top-loading washing machine is indicated as a whole by the reference 1. The said washing machine 1 comprises a supporting and containing structure 2 having an upper access aperture 3 which can be closed by a cover 4, preferably hinged on the said supporting and containing structure 2. The cover 4 allows access through the said access aperture 3 to a loading aperture 5 of a drum 6 located in the supporting and containing structure 2. The drum 6 can be an essentially waterproof container, rotatably supported by the said supporting and containing structure 2, or, preferably, it is perforated and supported rotatably, advantageously but not necessarily about an essentially horizontal axis, in a wash chamber 7.

[0019] The drum 6 comprises one or more doors 8, 8' which can be moved between a closed position, in which the said doors 8 cover the loading aperture 5, and an open position, in which they free the said loading aperture 5, so that a zone of movement of the doors 8, 8' is delimited.

[0020] Advantageously, the said one or more doors 8, 8' are hinged on the drum 6 and open outwards, this movement zone being delimited by the path of the edges of the doors 8, 8' opposite the edges hinged on the drum 6. Alternatively, the doors are fixed slidably on the drum, and open in an essentially tangential or circumferential direction, this movement zone being delimited by the sliding paths of the whole doors.

[0021] According to the invention, the washing machine 1 is provided with a drum opening system, indi-

cated as a whole by the reference 9, which comprises:

- releasable locking means 10, 11, 12 for locking the said one or more doors 8, 8' in the closed position;
- stop means 13, 14 for locking the drum 6 in a stop position with respect to the supporting and containing structure 2 where the laundry can be conveniently loaded and removed, and, in particular, for locking the said loading aperture 5 in line with the access aperture 3;
- release means 15, 16 supported by the supporting and containing structure 2, and suitable for releasing the said releasable locking means 10, 11, 12 in the stop position of the drum 6, and, advantageously, with the drum 6 stationary, in which the aforesaid stop means 13, 14 can be operated independently of the operation of the release means 15, 16;
- a operating element 17 which operates the release means 15, 16, and which is associated with the supporting and containing structure 2 outside the movement zone of the doors 8, 8'.

[0022] In one embodiment, the said release means 15, 16 and, preferably, the said operating element 17 are positioned in the cover 4.

[0023] The release means 15, 16 advantageously comprise a pin 15 slidable between a rest position, outside the profile of the drum 6 with the door closed, and an operating position, in which the said pin 15 acts on the said releasable locking means 10, 11, 12 to release them. In particular, the said pin 15 is connected to the said cover 5 in a slidable way, preferably in an essentially vertical direction, so that in its operating position it moves an actuating element 18, particularly an actuating surface formed on one of the doors 8, 8' in a position suitable for releasing the releasable locking means 10, 11, 12.

[0024] In one embodiment, the release means 15, 16 also comprise a transmission element 16 for transmitting an actuation command from the actuating element 17 to the pin 15. The said transmission element 16, which is advantageously connected to the supporting and containing structure 2, and in particular to the cover 4, comprises a longitudinal shaft 20 having a first end with a first transverse lever 21 acting on the said pin 15, and a second end with a second transverse lever 22 forming the said operating element 17. Advantageously, the first transverse lever 21 is longer than the second transverse lever 23.

[0025] In one embodiment, the transmission element 16 is fixed to the cover 4 so that it is movable, and preferably rotatable, in particular about the longitudinal axis of the longitudinal shaft 20, between a rest configuration, in which the said first transverse lever 21 holds the said pin 15 in the rest position, and an operating configuration, in which the said first transverse lever 21 pushes and/or pulls the said pin 15 into the operating position. For this purpose, one end 23 of the transverse lever 21 can be made to bear freely on a corresponding end 24 of the pin 15, or, alternatively, the said lever 21 can be connected in an articulated way to the said pin 15 to allow the pin 15 to be moved by the transmission element 16, both into the operating position and into the rest position. Clearly, the connection of the transmission element 16 to the pin 15 provides the necessary play and relative movements to enable the rotary motion of the transmission element 16 to be converted into a longitudinal motion of the pin 15.

[0026] As an alternative to the transmission element 16, it is possible to provide flexible cable or electrical transmission elements acting on the pin 15, by means of suitable mechanisms or electrical actuators.

[0027] In one embodiment, return means 19 are also provided to hold the pin 15 in the rest position. Advantageously, the said return means 19 consist of a return spring 19 acting on the transmission element 16 to hold it in the rest configuration. In the embodiment shown in the figures, the said return spring 19 is an elastic torsion spring supported on the cover 4 and acting on a tooth 24 of the longitudinal shaft 20. Alternatively, or additionally, it is possible to provide a return spring acting directly on the pin 15.

[0028] The washing machine 1 is also provided with an element 26 for releasing the cover 4, positioned on the outer surface of the said supporting and containing structure 2, particularly on the cover 4 itself, preferably on an edge of the cover opposite the edge hinged to the supporting and containing structure 2. The release element 26 comprises an operating lever 26, connected rotatably to the said cover 4, and acting on hook means 27 of the cover 4, these hook means being capable of engaging with corresponding counter-hook means 43 of the supporting structure 2 to lock the cover 4 in a closed position.

[0029] Advantageously, the operating lever 26 is configured in such a way that the said hook means 27 can be released from the said counter-hook means 43 by lifting the operating lever 26 with respect to the cover 4.

[0030] In one embodiment, the operating element 17 is positioned in the aforesaid release element 26 of the cover 4 and, in a further development of the invention, the said operating element 17, particularly the said second transverse lever 22, is coupled to the said release element 26, and particularly to the operating lever 26, in such a way that the operating element 17 is operated simultaneously with the release of the cover 4 by the operation of the release element 26.

[0031] To additionally increase the ease of use, particularly where the operating element 17 and release element 26 are independent, the said operating element 17 can be positioned in a suitable recess 28, formed below the operating lever 26 to receive the user's hand.

[0032] Advantageously, the opening system 9 also comprises opposing means to prevent the operation of the release means 15, 16 during the washing and/or drying cycle.

[0033] In one embodiment, the said opposing means comprise an opposing element controlled by a control unit (not shown in the figures) in accordance with the washing and/or drying programme, for example an opposing pin whose position is adjustable by means of an electromagnet according to electrical signals sent from the said control unit, in which the said opposing element can bear against an opposing surface formed on the said release means 15, 16.

[0034] In another embodiment, the said opposing means comprise a first opposing surface 29 formed on the said operating element 17 or on the said transmission element 16, which can be opposed by a second opposing surface 30 formed on the said release element 26, particularly on the said operating lever 26, in which the said release element 26 can in turn be locked by a door stop device, which is known and therefore not described, controlled by the said control unit.

[0035] In the embodiment shown in Figure 4, the first opposing surface 29 consists of a transverse lever 44 of the transmission element 16, which is designed to bear against the said second opposing surface 30, preferably formed on the lower side of the operating lever 26.

[0036] The stop means 13, 14 provided to position the drum 6 in a suitable stop position for loading and removing laundry comprise an opposing element 13 which is adjustable in accordance with the washing and/or drying programme and can engage in a recess 14 formed in the said drum 6, or advantageously on a pulley 31 of the drum 6, located outside the wash chamber 7.

[0037] Advantageously, the said opposing element 13 is adjustable by means of an electromagnet which receives electrical signals from the said control unit. Alternatively, the said stop means can be provided by means of direct control, using the control unit, of the electric motor 32 which rotates the drum 6, for example by means of a belt transmission 33.

[0038] In one embodiment, the drum 6 has two doors 8, 8', each of which has a rear edge 34, 34', each hinged on a different one of two opposite edges of the said loading aperture 5 and a front edge 35, 35', in which the front edge 35' of a first door 8' has a hook 11 which can engage with a locking flange 12 of the front edge 35 of a second door 8. Both doors 8, 8' are also pushed permanently towards the open position by suitable elastic means, preferably torsion springs 36, acting between the drum 6 and the doors 8, 8' in such a way that the front edges 35, 35' of the doors 8, 8' tend to move away from each other, thus keeping the hook 11 bearing on the locking flange 12 to prevent the opening of the doors 8, 8'. If the first door 8' is pushed by the release means, particularly by the pin 15, against the action of the torsion springs 36, beyond the closed position, the front edges 35, 35' of the doors 8, 8' move towards each other, simultaneously moving the hook 10 away from the locking flange 12 to allow the doors 8, 8' to open.

[0039] Alternatively, the releasable locking means can comprise push button or lever mechanisms which can be released without any movement of the doors.

[0040] In one embodiment, the torsion springs 36 or other elastic means acting between the drum 6 and the doors 8, 8' are able to push the latter permanently towards the open position, and the cover 4 has at least one stop and guide surface 37, designed to control the movement of the doors 8, 8' to the open position during the opening of the cover 4.

[0041] Advantageously, the said stop and guide surface 37 is formed on a lower wall of a detergent container 38 located in the cover 4. To provide further benefits, the detergent container 38, and particularly the lower wall of the detergent container 38, comprises support and guide means 39 for the said release means 15, 16, particularly a guide 39 for the sliding of the said pin 15.

[0042] In a further embodiment, a detergent dispenser 40, which can be inserted in the said detergent container 38, is provided with a cut or slot 41 adjacent to the said release means, and in particular adjacent to the position of the pin 15, to enable the dispenser 40 to be inserted in the container 38 and removed from it despite the presence of the release means 16, 15.

[0043] Advantageously, the actuating element 18, in other words the actuation surface 18, has an extension and shape such that the engagement of the pin 15 is ensured even if the position of the pin 15 and that of the drum are not completely aligned with each other, for example as a result of variations in the loading of the drum. Preferably, therefore, the actuation surface 18 has a slightly hollow shape and an extension or diameter in the range from 20 mm to 60 mm, and preferably from 30 to 50 mm.

[0044] The operation of the opening system 9 according to the invention is described below.

[0045] During a washing cycle, the control unit of the washing machine activates the door stop device, which prevents the movement of the control lever 26 and consequently the opening of the cover 4. The transmission element 16 is held by the return spring 19 in its rest configuration, and, by means of the first transverse lever 21, holds the pin 15 in its rest position outside the profile of the rotating drum 6. The lever 44 of the transmission element 16 bears against the opposing surface 30 of the control lever 26, which is locked by the door stop device. During the washing cycle, therefore, it is impossible to open the cover 4 or to activate the release means 15, 16.

[0046] On completion of the washing cycle, the control unit switches off the motor 32 and transmits an electrical signal to the electromagnetic actuator which releases the opposing element 13, which has hitherto been held in a retracted position, and which now snaps, preferably with the support of a spring, into an extended position and engages with the recess 14 to stop the movement of the drum 6 and align it in the stop position which is suitable for loading and removing laundry. After the drum 6 has been positioned, the door stop device, controlled by an electrical signal from the control unit,

releases the latching system of the cover 4 and enables the control lever 26 to be operated. [0051]At this point, the user can release the cover 4 and simultaneously activate the operating element 17, using one hand only and keeping at a safe distance from the doors. As a result of this operation, the hook means 27 of the cover 4 are disengaged from the counter-hook means 43 of the supporting and containing structure 2, thus enabling the cover 4 to be opened. At the same time, the longitudinal shaft 20, operated by the transverse lever 22, is rotated, thus moving the pin 15, against the force of the return spring 19, from the rest position to the operating position. During its movement, the pin 15 presses against the actuation surface 18 to release the hook 10 from the locking flange 12, thus releasing the doors 8, 8', which, under the pressure of the torsion springs 36, bear against the stop and guide surface 37, by which they are temporarily stopped. During the subsequent opening of the cover 4, preferably assisted by elastic balancing means, particularly by a torsion spring 42, the said stop and guide surface 37 follows the doors 8, 8' along their path into the open position.

[0047] In one embodiment, the lever 17 and the handle 26 can be operated independently of each other, in such a way that the cover can be opened with the drum closed, and the drum door can be released with the cover closed. Additionally, if no detergent dispenser is associated with the cover, the guide 39 for the pin 15 is directly associated with the lower surface of the cover 4.

[0048] As clearly shown by the preceding description, the opening system 9 according to the invention has numerous advantages.

[0049] Manual operations by the user are carried out at a safe distance from the doors, and in particular outside their area of movement, thus eliminating any possible risk of injury to the hand.

[0050] The doors are opened in a controlled way, simultaneously with the opening of the top cover of the washing machine, but, as has been seen, the opening system 9 also makes it possible to open the cover only, with the drum closed, or to release the drum door while the cover remains closed.

[0051] The opening system 9 advantageously makes it possible to open the drum and to open the cover without opening the drum at the same time, for example if it is simply necessary to replenish the detergent in the detergent container.

[0052] Additionally, the drum stopping and positioning function is independent of the drum opening function, and in particular it is also independent of the washing programme or cycle, thus making the washing machine highly versatile and convenient in use.

[0053] The opening system according to the invention is also structurally simple, requires no seals for protection against moisture or wetting, and is particularly robust and reliable.

[0054] Since the opening system according to the invention operates without the use of any electrical or hydraulic/pneumatic power, it is particularly suitable for the hostile environment within a washing machine, which is characterized by high corrosiveness and large temperature variations, and consequently maintenance is also reduced to a minimum. The opening system according to the present invention also has very small overall dimensions, and, owing to the modular nature of the actuation and transmission means, in other words the pin 15 and the transmission element 16, whose dimensions can be variable, the opening system can easily be used for different types of washing machines of different sizes.

[0055] Finally, the opening system can be applied to existing washing machines and drums without troublesome adaptation operations and without increasing the overall dimensions of the cover with respect to those of known washing machines.

[0056] The opening system described up to this point with reference to top-loading washing machines, and all the advantages associated therewith, are equally applicable to top-loading dryers and washer-dryers.

[0057] Clearly, a person skilled in the art can, in order to meet contingent and specific requirements, modify and vary the opening system according to the present invention in additional ways, all of which lie within the scope of protection of the invention as defined by the following claims.

Claims

1. Opening system (9) for the drum (6) of a top-loading washing machine (1) and/or dryer, of the type comprising a supporting and containing structure (2) having a cover (4) for providing access to a loading aperture (5) of the drum (6) located inside the supporting and containing structure (2), in which the said drum (6) comprises one or more doors (8, 8') movable between a closed position, in which the said doors (8, 8') cover the said loading aperture (5), and an open position, in which the said doors (8, 8') free the said loading aperture (5), thus delimiting an area of movement of the doors, in which the said opening system (9) comprises

   - releasable locking means (10, 11, 12, 18) for locking the said one or more doors (8, 8') in the closed position;
   - stop means (13, 14) for locking the drum (6) in a stop position with respect to the supporting and containing structure (2);
   - release means (15, 16) supported by the said supporting and containing structure (2) and capable of releasing the said releasable locking means (10, 11, 12, 18) in the stop position of the drum (6);
   - an operating element (17) for actuating the said release means (15, 16) associated with the said

supporting and containing structure (2) outside the said area of movement of the doors, in which the said stop means (13, 14) can be actuated independently of the actuation of the said release means (15, 16).

2. Opening system (9) according to Claim 1, in which the said release means (15, 16) are positioned in the said cover (4).

3. Opening system (9) according to Claim 1 or 2, in which the said operating element (17) is positioned in the said cover (4).

4. Opening system (9) according to any one of the preceding claims, in which the said release means (15, 16) comprise a pin (15) which is slidable between a rest position, outside the profile of the drum (6) when the door is closed, and an operating position, in which the said pin (15) acts on the said releasable locking means (18) to release them.

5. Opening system (9) according to Claim 4, comprising elastic return means (19) for holding the said pin (15) in the said rest position.

6. Opening system (9) according to any one of the preceding claims, in which the said release means (15, 16) comprise a transmission element (16) comprising a longitudinal shaft (20) of which one end has a first transverse lever (21) acting on the said pin (15) and a second end has a second transverse lever (22) forming the said operating element (17).

7. Opening system (9) according to Claim 6, in which the said transmission element (16) is fixed to the said cover (4) so that it is rotatable between a rest configuration, in which the said first transverse lever (21) holds the said pin (15) in the rest position, and an operating configuration in which the first transverse lever (21) moves the pin (15) into the operating position, the said transmission element (16) being provided with a return spring (19) to hold it in the said rest configuration.

8. Opening system (9) according to Claim 7, in which the said return spring (19) is a torsion spring supported on the cover (4) and acting on the said longitudinal shaft (20).

9. Opening system (9) according to any one of the preceding claims, in which the said operating element (17) is positioned next to an element (26) for releasing the said cover (4).

10. Opening system (9) according to Claim 9, in which the said operating element (17) is coupled to the said release element (26) in such a way that the operating element (17) is operated simultaneously with the release of the cover (4) by means of the operation of the release element (26).

11. Opening system (9) according to Claim 9 or 10, in which the said release element (26) comprises an operating lever (26) connected rotatably to the said cover (4) and acting on hook means (27) of the cover (4) which can engage with corresponding counter-hook means (43) of the supporting and containing structure (2) to lock the cover (4) in a closed position, the said operating lever (26) being able to disengage the said hook means (27) from the said counter-hook means (43) when the operating lever (26) is lifted with respect to the cover.

12. Opening system (9) according to Claim 11, in which the said operating element (17) is positioned in a recess (28) for receiving the user's hand, the said recess (28) being formed under the operating lever (26).

13. Opening system 9 according to any one of the preceding claims, comprising opposing means (29, 30) to prevent the operation of the release means (15, 16) during the washing and/or drying cycle.

14. Opening system (9) according to Claim 13, in which the said opposing means (29, 30) comprise an opposing element which can be controlled by a control unit of the washing machine in accordance with the washing and/or drying programme, the said opposing element being capable of bearing against an opposing surface (29) formed on the said release means (15, 16).

15. Opening system (9) according to Claim 13 or 14, in which the said opposing means (29, 30) comprise a first opposing surface (29) which is formed on the said operating element (17) and which can be opposed by a second opposing surface (30) formed on the said release element (26) of the cover (4), in which the said release element (26) can be locked in turn by a door stop device controlled by the said control unit.

16. Opening system (9) according to any one of the preceding claims, in which the said stop means (13, 14) comprise an opposing element (13) controllable by the said control unit of the washing machine (1) in accordance with the washing and/or drying programme, the said opposing element (13) being capable of engaging with a recess (14) formed on a pulley (31) of the drum (6) to position the said drum (6) in the stop position.

17. Opening system (9) according to any one of the preceding claims, in which the said releasable locking

means (10, 11, 12, 18) comprise a hook (10) which can releasably engage with a locking flange (12).

18. Opening system (9) according to any one of the preceding claims, in which the said drum (6) comprises two doors (8, 8'), each of which has a rear edge (34, 34') each hinged on a different one of two opposite edges of the said loading aperture (5) and a front edge (35, 35'), in which the front edge (35') of one of the doors (8') has a hook (10) which can engage with a locking flange (12) of the front edge (35) of the other door (8), both doors (8, 8') being pushed permanently towards the open position by suitable elastic means (36) acting between the said drum (6) and the said doors (8, 8'), in such a way that the front edges (35, 35') of the doors (8, 8') tend to move away from each other, holding the said hook (10) against the said locking flange (12) to prevent the opening of the doors (8, 8') and, if one of the doors (8, 8') is pushed by the said release means (15), against the action of the said elastic means (36), beyond the closed position, the front edges (35, 35') of the doors tend to move towards each other, thus moving the hook (10) away from the locking flange (12) to allow the doors to open (8, 8').

19. Opening system (9) according to any one of the preceding claims, comprising elastic means (36) acting between the said drum (6) and the said one or more doors (8, 8') to push them permanently towards the open position, in which the said cover (4) has at least one stop and guide surface (37) for controlling the movement of the said doors (8, 8') into their open position during the opening of the cover (4).

20. Opening system (9) according to Claim 19, in which the said stop and guide surface (37) is formed on a lower wall of a detergent container (38) positioned in the said cover (4).

21. Opening system (9) according to Claim 20, in which the said lower wall of the said detergent container (38) comprises support and guide means (39) for the said release means (15, 16), and particularly for the said pin (15).

22. Opening system (9) according to Claim 20 or 21, comprising a detergent dispenser (40) which can be inserted in the said detergent container (38) and which has a slot (41) adjacent to the said release means (15, 16), and particularly adjacent to the pin (15).

23. Opening system (9) according to any one of the preceding claims, operable manually without the support of automatic actuation in the form of electric motors or hydraulic or pneumatic actuating systems, for example.

24. Top-loading washing machine (1) and/or dryer, comprising a supporting and containing structure (2) having a cover (4) for providing access to a loading aperture (5) of the drum (6) located inside the supporting and containing structure (2), in which the said drum (6) comprises one or more doors (8, 8') movable between a closed position, in which the said doors (8, 8') cover the said loading aperture (5), and an open position, in which the said doors (8, 8') free the said loading aperture (5), thus delimiting an area of movement of the doors, **characterized in that** it comprises an opening system (9) according to any one of the preceding claims.

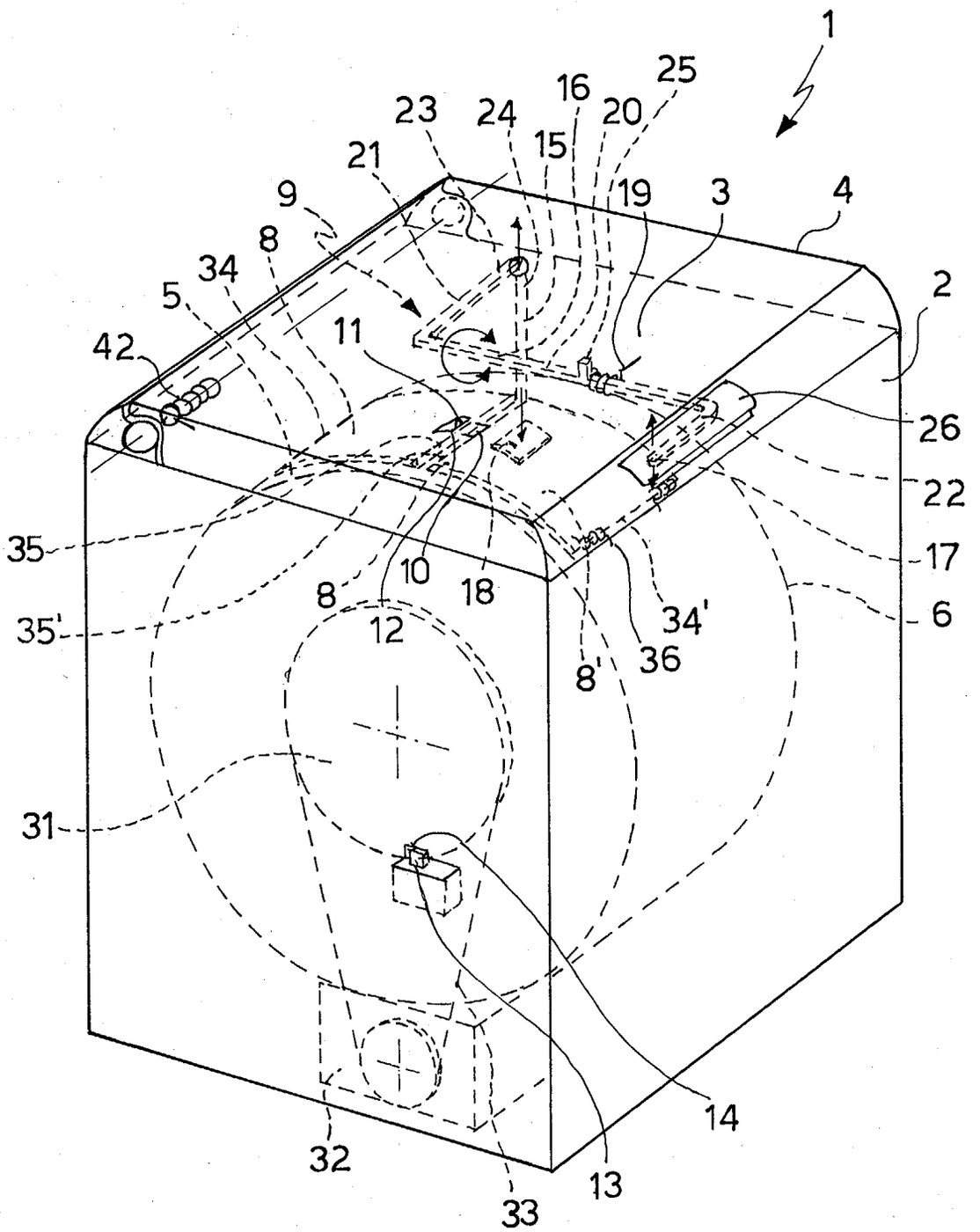
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FIG. 1

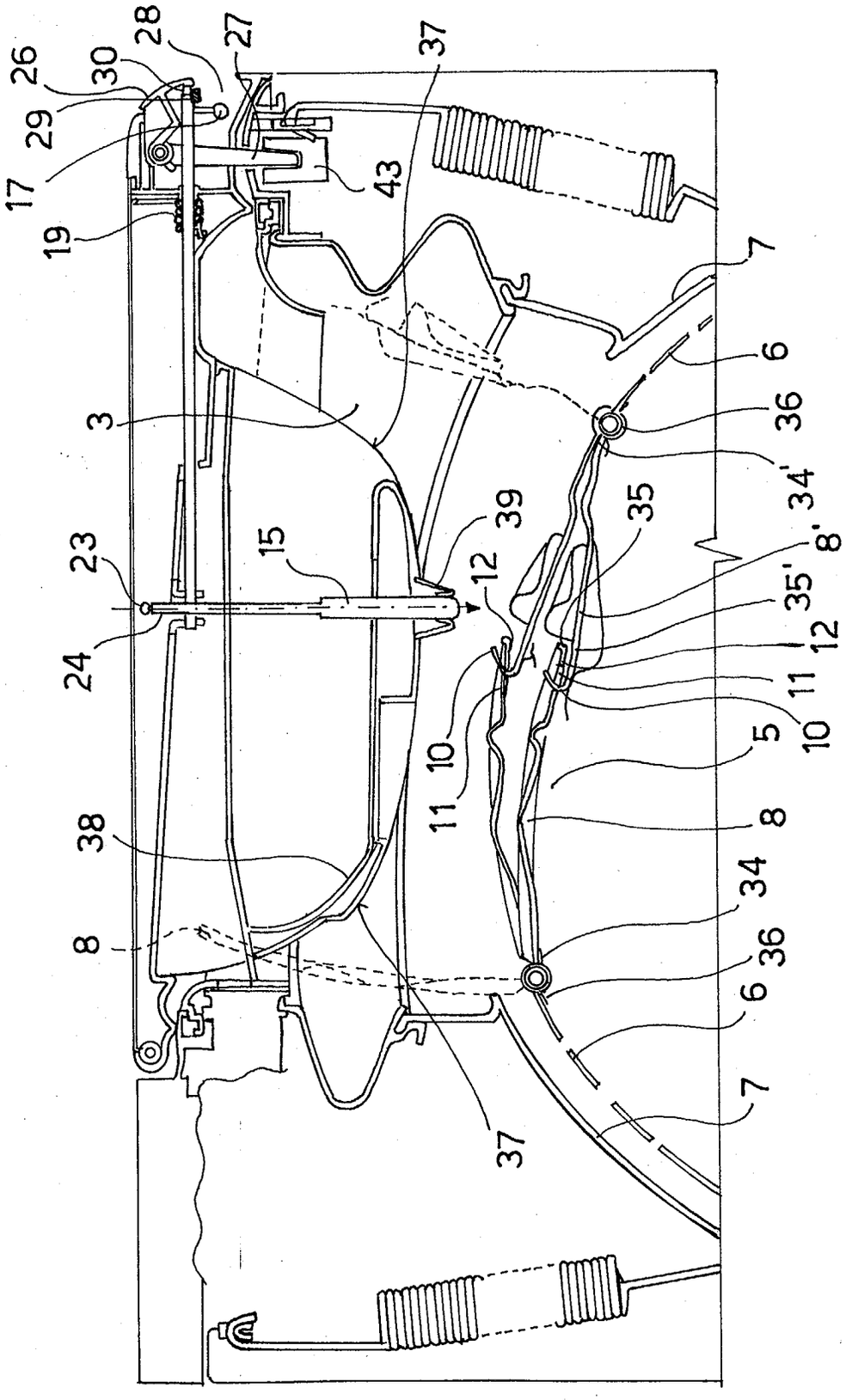
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FIG. 2

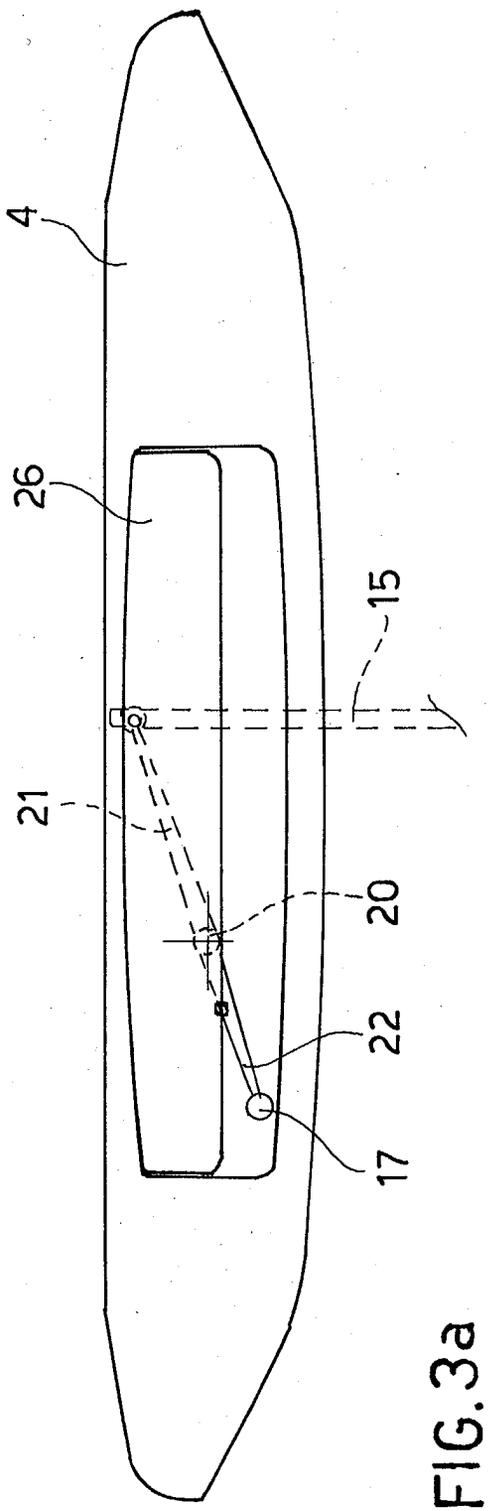

FIG.3a

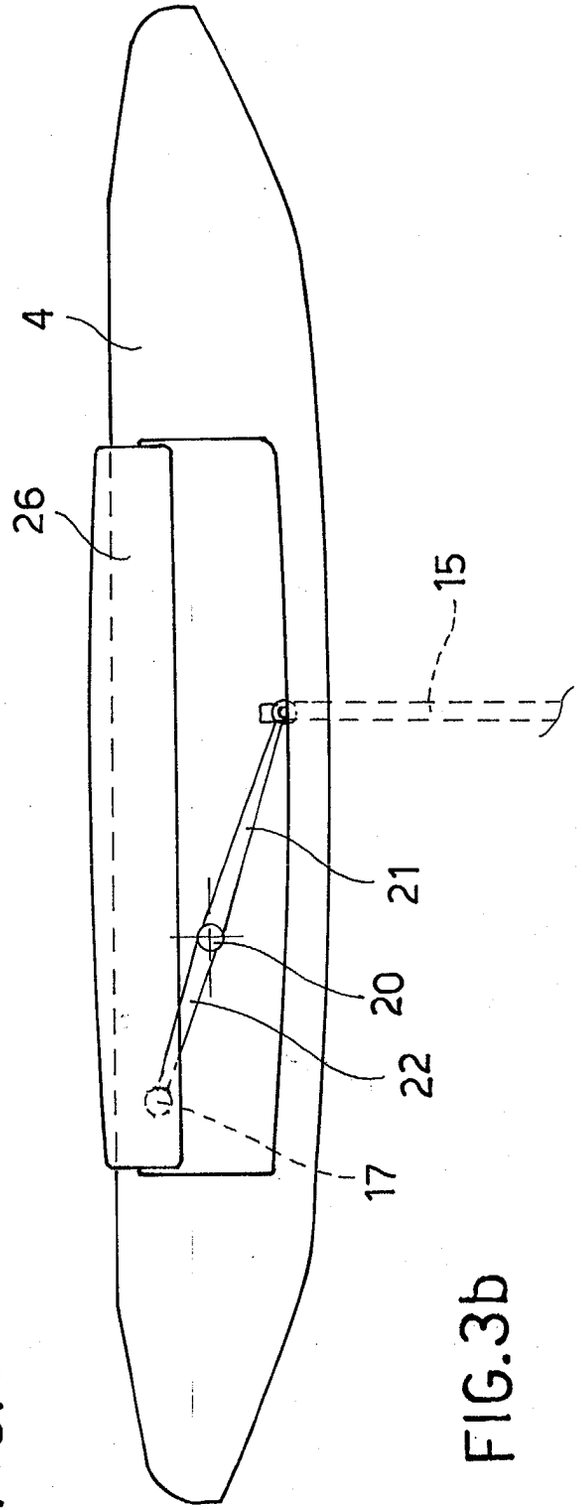

FIG.3b

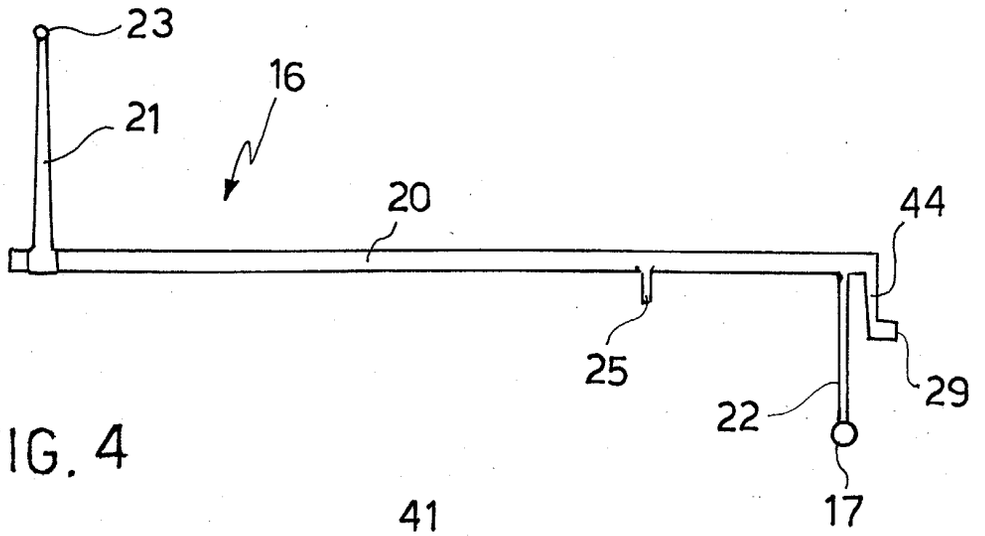

FIG. 4

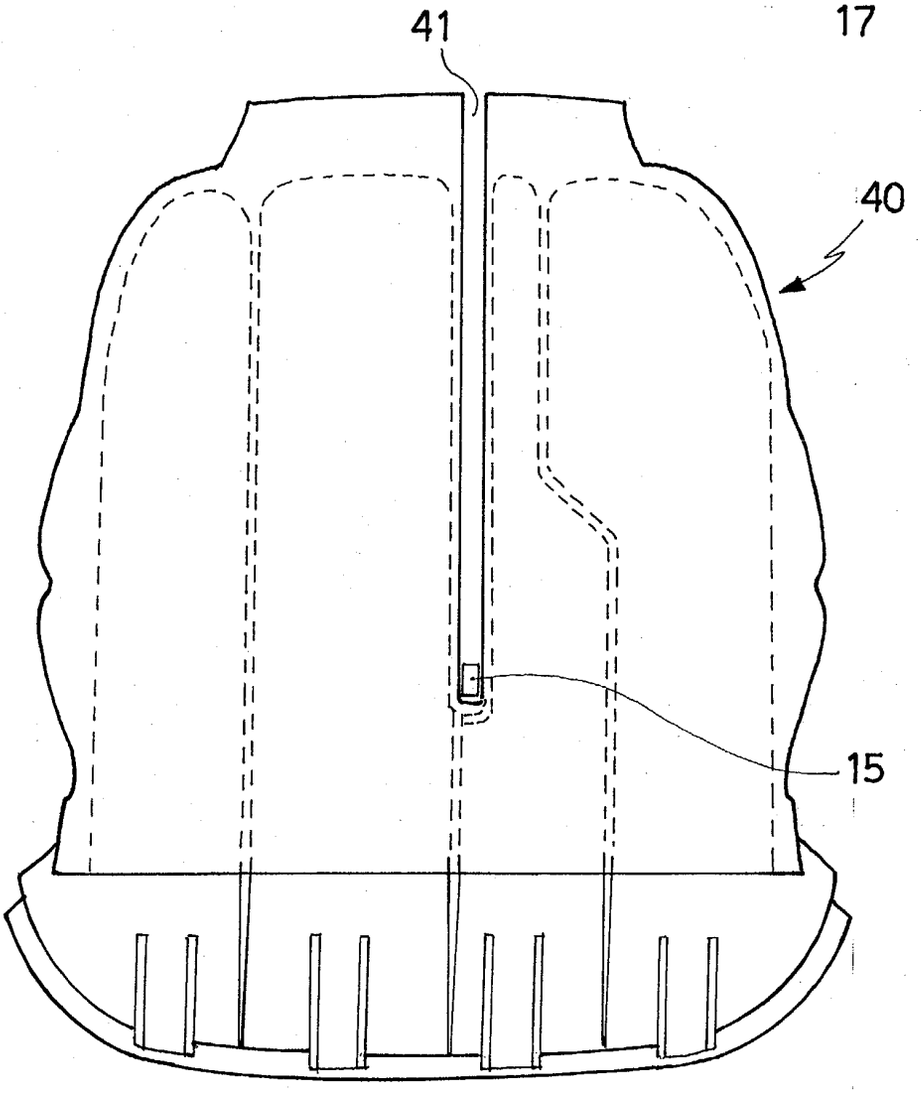

FIG. 5

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Application Number
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Place of search	Date of completion of the search	Examiner
THE HAGUE	16 April 2003	Debard, M

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