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# (54) Top-loading washing machine with lid having front control device

(57) Top-loading washing machine with: a horizontal-axis rotating drum contained inside a tub having an opening situated at the top, a hatch for closing/opening access to said drum, an external unit with a top lid (1) hinged in its rear zone, locking means (10) for engaging/disengaging the lid with/from the top surface (2) of the unit, external control means able to operate said locking means (10) so as to place them in the disengaged/engaged state, said external control means comprising a pushbutton element situated on a forward and top portion of said unit and preferably on the front side (4) of the unit. Said lid is provided with resilient means for raising it into the open position, if released, and with automatic braking means.

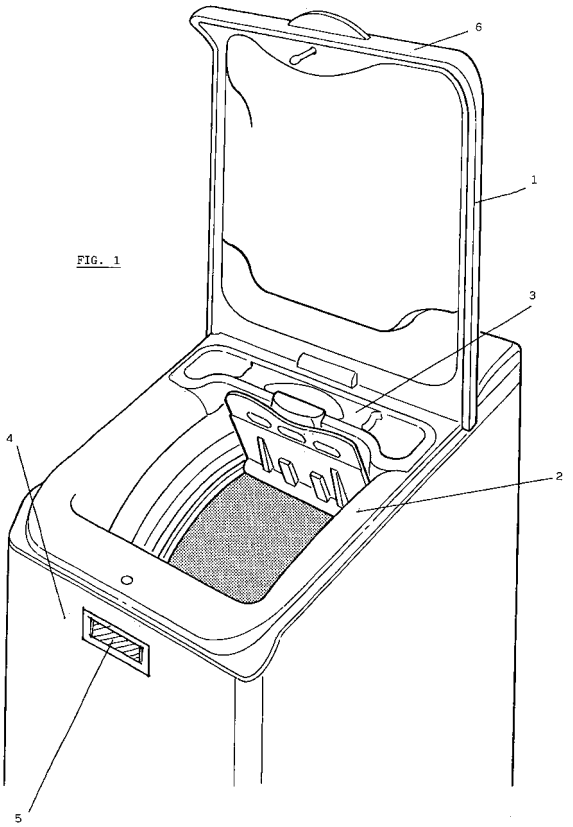


FIG. 1

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## Description

**[0001]** The invention relates to an improved type of washing machine or clothes drier of the domestic top-loading type.

**[0002]** Washing machines of the domestic top-loading type are known where the control device for opening the top door or lid is arranged generally in an upper or inclined portion of the upper part of the unit of the said machine.

**[0003]** In a domestic context the user approaching the machine in order to open it is often carrying the washing load or other objects and therefore has to free him/herself of these objects before the machine can be operated.

**[0004]** This necessity results in a number of operations which could be avoided if it were possible to operate the control device for opening the door without using one's hands.

**[0005]** From the patents JP 2002-315993 and JP 2002-315993, both in the name of Matsushita, and the patent JP 2002-011291 in the name of Hitachi it is known to arrange the control device to be operated manually for opening the top lid in an advanced but protected position in the zone of the front top edge of the unit of the machine; this solution prevents accidental activation of machine operation and accidental opening of the top hatch; although safe, nevertheless this type of machine obviously involves the use of at least one hand and therefore does not fulfil the object of the present patent.

**[0006]** From the patents JP-03-293000 in the name of Matsushita and the patents JP 2005-279179 and JP 2005-218662 in the name of Hitachi it is known, in a top-loading washing machine, to arrange the corresponding control panel in a position connected to one of the parts which form the top hatch and which must be folded together in order to allow access to the tub below.

**[0007]** This configuration therefore allows access to and operation of the control panel only when said hatch, i.e. said foldable parts thereof, is/are closed.

**[0008]** This constraint obviously improves the safety of the machine since it cannot be started if the top lid is still open.

**[0009]** However, in this case also, this feature means that operation of the associated control devices must be performed by means of one hand which performs a precise movement from the top downwards.

**[0010]** It would therefore be desirable, and it is the object of the present patent, to provide a top-loading washing machine or clothes drier provided with means for opening the top lid, which may be operated by the user also without using one hand and in particular which can also be reached easily by other parts of the user' s body and preferably by the hips of the said user.

**[0011]** A further object of the invention is to provide said control device in a position situated in the upper zone of the panel or front surface of the machine.

**[0012]** These objects are achieved with a particular type of top-loading washing machine or clothes drier provided with the means and characteristics described by means of a nonlimiting example and with reference to the accompanying drawings in which:

- Fig. 1 shows a simplified and perspective view of a top-loading washing machine or clothes drier;
- Fig. 2 shows a perspective and dynamic view of an improved embodiment of a machine according to the invention;
- Fig. 3 shows a view of a first detail of the machine according to Fig. 2;
- Fig. 4 shows a view of a second detail of the machine according to Fig. 2;
- Fig. 5 shows a simplified and perspective view, from the rear, of a fourth detail of Fig. 2, already assembled in the machine shown partially cut-away.

**[0013]** With reference to Fig. 1, a domestic top-loading washing machine or clothes drier according to the known art comprises a tub containing a rotating drum (not shown) inside which the washing load is introduced.

**[0014]** Said machine is composed externally of a parallelepiped unit, the top side of which is formed by a top lid 1 which is normally hinged in the rear zone 3 thereof and which closes the top surface of the machine body underneath, which terminates towards the top in a surface, usually an edge 2, which delimits from the top the hopper part which leads from the top into the said tub.

**[0015]** The unit has, towards the front, a vertical front side 4 inside which locking means (not shown) are fitted, said locking means being able to engage with corresponding engaging members situated underneath said lid.

**[0016]** Said locking and engaging means are used to lock the lid 1 against said edge 2 when said lid is lowered into the closing position, while mutual release thereof is performed by means of suitable members which can be operated manually and are arranged on the rear part of the top side of the machine or on any other part of the lid or in any case on the top part of the machine.

**[0017]** Although simple, the fact of positioning said control device for releasing the lid on any part directed towards the top of the machine, whether it be the lid itself or the part thereof not occupied by said lid, gives rise to the difficulty that the said control device must necessarily be operated manually; this obviously is not a major problem as regards the more general use of the machine.

**[0018]** However, in some circumstances which frequently arise, this results in a certain difficulty and inconvenience as regards operation: in fact often the user approaches the machine holding the garments to be washed in one hand or else they are contained inside a basket, bag, etc., which are in turn held in the hands.

**[0019]** In order to open the lid, therefore, the user must put down said container, often resting it on the ground, in order to free his/her hands and then obviously operate the control device releasing the lid, open manually the said lid and finally take hold again of the laundry container, often lifting it from the ground, in order to extract from

it the garments to be introduced into the drum.

**[0020]** In order to eliminate these troublesome and often tiring operations, in a top-loading washing machine according to the invention, the control means for opening the lid are generally not situated on the surface of the machine directed upwards, but consist of a simple pressure-operated part 5 which is fairly wide as shown in the figures and is arranged in the top_and front zone of the machine and therefore in a position which can be readily accessed by the user.

**[0021]** In particular, the position of this pressure-operated part is suitably chosen so that the user may operate it by simply pressing against it with a part of the body, typically by means of a side pressure of the hip, i.e. without releasing the load held in the hands.

**[0022]** With reference to Fig. 2, advantageously said pressure-operated part 5 is preferably arranged on the front portion 6 of the lid 1, both so as to avoid complications in the design of the unit and so that it is positioned at the correct height.

**[0023]** In this case, and with reference to Fig. 3, said pressure-operated part usually causes release of the engaging means 10 which are obviously mounted in a suitable and bottom zone of the said hatch 1.

**[0024]** With reference to Fig. 4, release of said locking means without using the hands is obviously pointless if the lid must then be raised manually; in order to overcome this problem, the machine is usually provided with resilient means, preferably a torsion bar 7, or also more than one thereof, obviously mounted between the lid itself and the body of the machine, in the lid hinging zone.

**[0025]** This therefore allows, upon operation of said pressure-operated part 5, the lid itself to be raised immediately and automatically.

**[0026]** However, it could easily happen that said automatic raising movement occurs too rapidly, in particular at the end of the travel movement, i.e. when said resilient means have developed all their extensive and lifting force, when in fact the lifting speed of the hatch 1 is maximum, and this could result in sudden stoppage of the hatch against any stopping part situated on the machine body.

**[0027]** In order to avoid this further drawback, said machine is therefore provided with braking means which permanently control the movement between said lid and the machine body.

**[0028]** Advantageously and with reference to Figures 4 and 5, said braking means substantially consists of a damping piston 9 which has two arms on which the thrust to be attenuated is applied and which must therefore function reactively, a first arm 9A being connected to the lid 1 and the second arm 9B being connected to the rear portion 11 of said top surface or top edge (2).

## Claims

**1.** Domestic top-loading washing machine comprising an external unit provided with:

- a top lid (1) positioned so as to close the top surface or the top edge (2) of said machine and hinged in the rear zone (3) thereof;
- and a front side (4);
- locking means (10) able to engage/disengage selectively into/from a position for closing said lid against said top surface (2);
- external control means able to operate said locking means so as to arrange the latter selectively in the disengaged/engaged state, **characterized in that** said external control means, comprise a pressure-operated part (5) situated on an upper portion of the front side (4) of said unit.

**2.** Machine according to the preamble of Claim 1, **characterized in that** said external control means comprise a pressure-operated part (5) situated on the front portion (6) of said top lid (1).

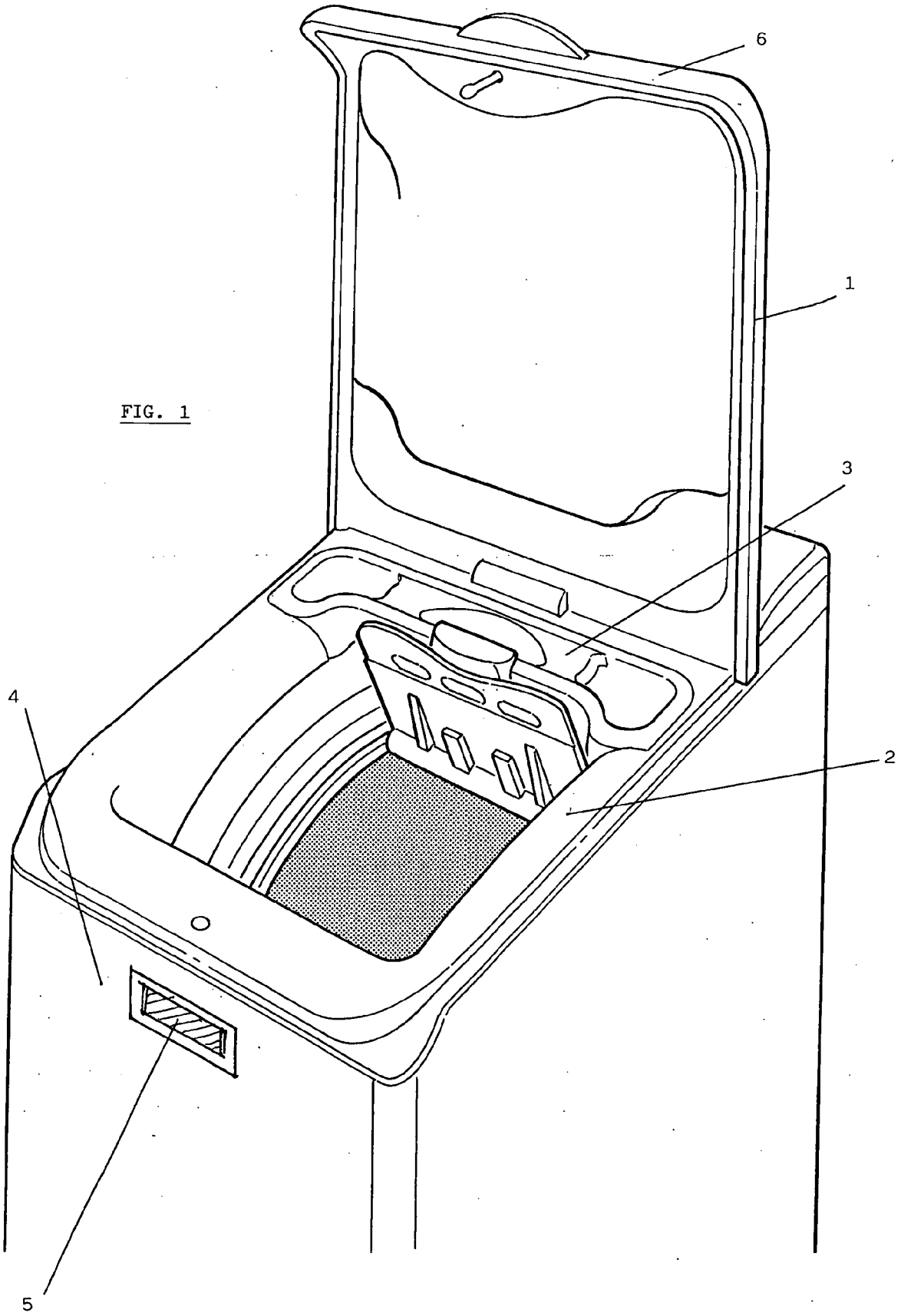
**3.** Machine according to Claim 1 or 2, **characterized in that** said top lid (1) is provided with resilient means able to raise said lid towards the open position, if released by said locking means.

**4.** Machine according to Claim 3, **characterized in that** said resilient means comprise at least one torsion bar (7) which is arranged in the top part of said machine in the hinging zone of said lid.

**5.** Machine according to Claim 3 or 4, **characterized in that** it must be provided with braking means able to control automatically the raising speed of said lid when it is released by said locking means and operated by said resilient means.

**6.** Machine according to Claim 5, **characterized in that** said braking means comprise a damping piston (9) mounted between said lid and a rear portion of said top surface or top edge (2).

FIG. 1



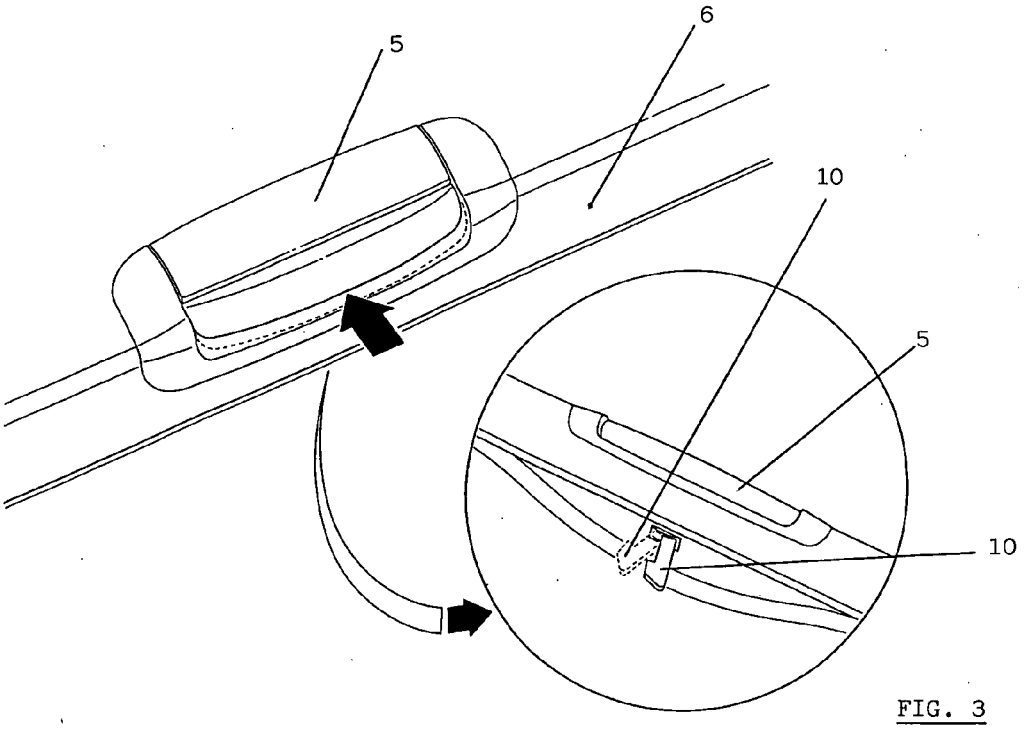



FIG. 3

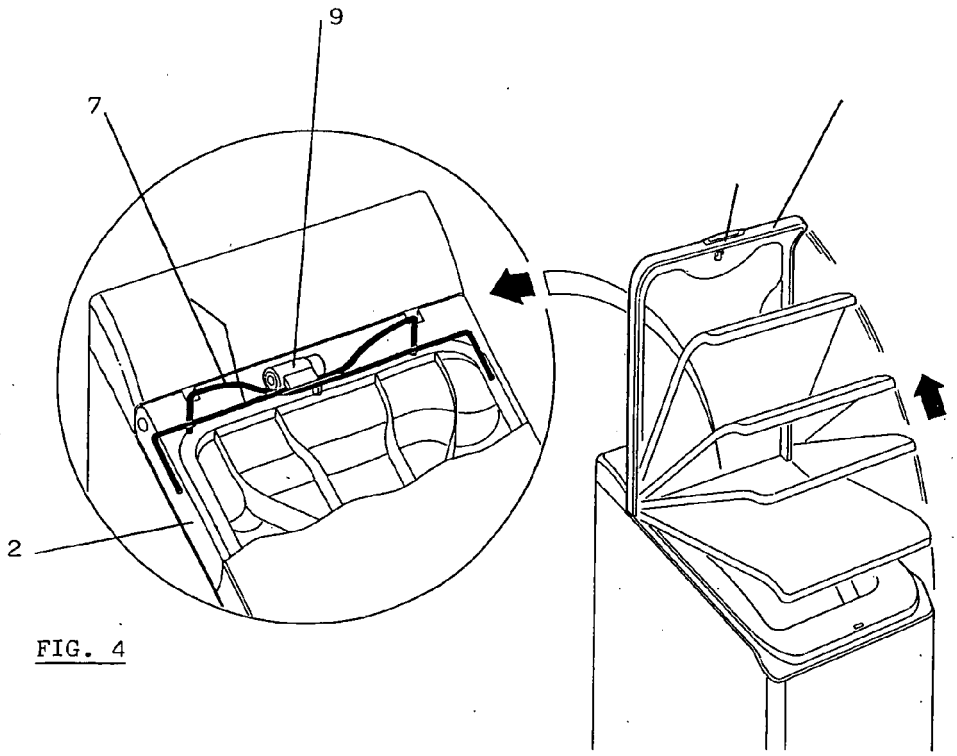
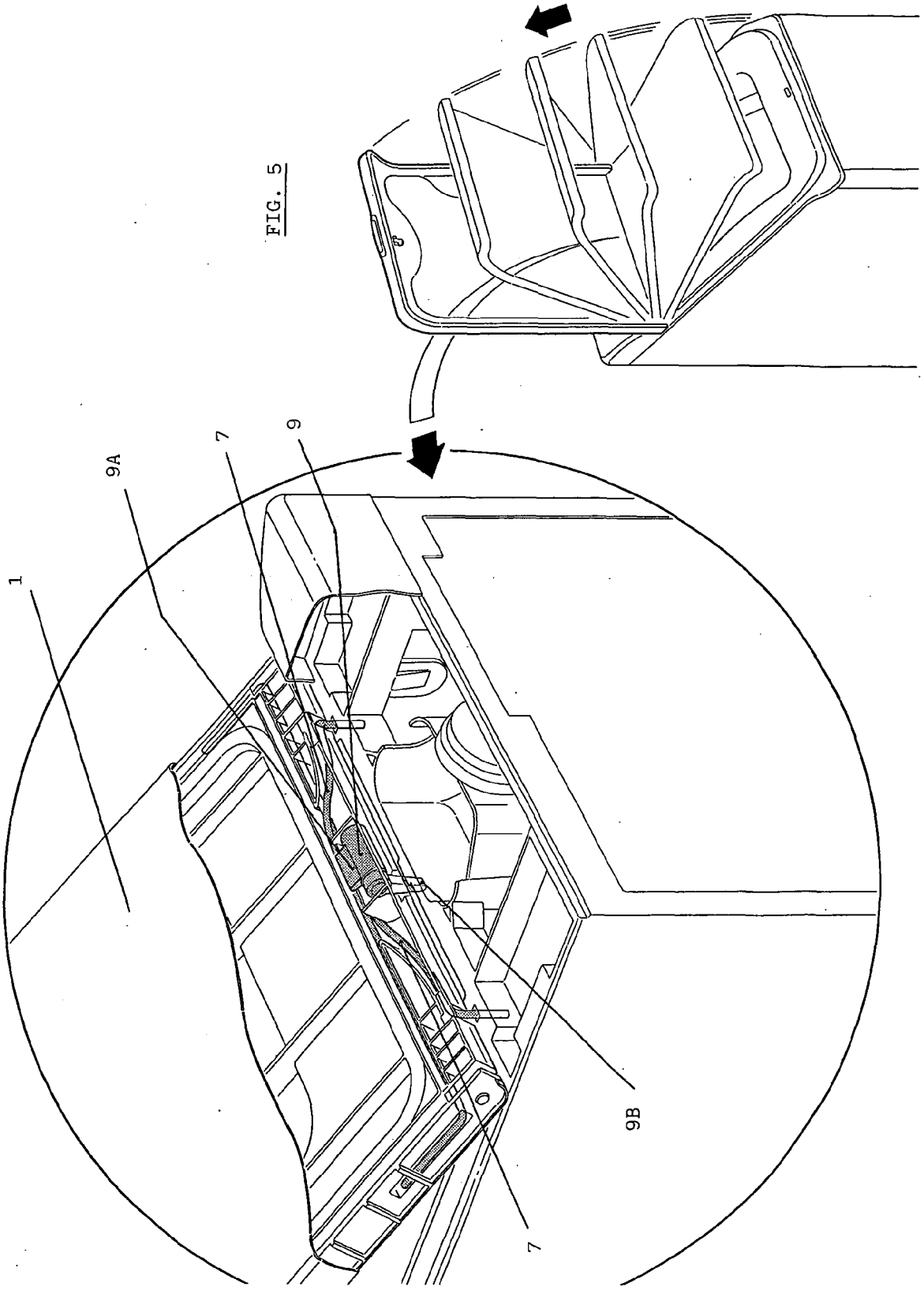



FIG. 4

FIG. 2

FIG. 5



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# EUROPEAN SEARCH REPORT

Application Number
EP 07 00 9532

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| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| Y | US 2002/109445 A1 (SEARS JEFFREY L [US]) 15 August 2002 (2002-08-15) * paragraph [0019]; figures * | 1,3,5 | INV. D06F37/28 D06F39/14 |
| Y | US 5 742 964 A (CHOI SSI CHOL [KR]) 28 April 1998 (1998-04-28) * column 3, line 3 - line 43; figure 1 * | 1 | |
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| A | US 3 520 568 A (WHITE FREDERICK M ET AL) 14 July 1970 (1970-07-14) * the whole document * | 1-6 | |
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| Y | EP 0 283 043 A2 (KUBOTA MED APPLIANCE SUPPLY [JP]) 21 September 1988 (1988-09-21) * column 3, line 29 - line 49; figures 3-8 * | 1 | TECHNICAL FIELDS SEARCHED (IPC) D06F E05B |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 24 August 2007 | DIAZ, M |

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