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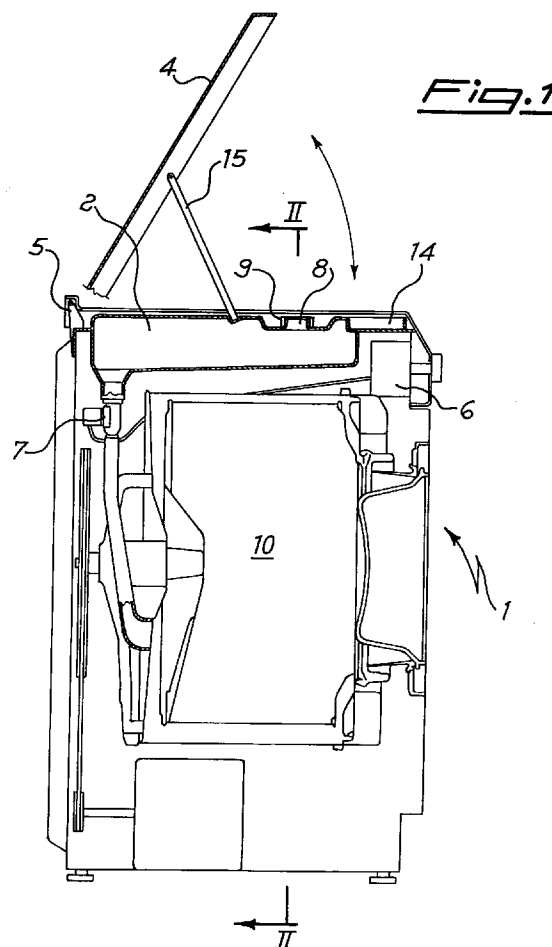
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**Container for liquid detergents and additives to be used in domestic washing machines and machines provided with said container.**

A container (2) for liquid detergents and additives may be used in domestic washing machines (1) or dishwashers being positioned inside these in their upper part, included between the tank (10) or washing volume and the top cover (4). Said container develops mainly horizontally, so that it makes the most of the area of the machine cross section to have a greater capacity with a not too great thickness while obstructing the access to the inner part of the machine (1). It is divided in several sections (2a,2b), each one with its loading port (8) and closing plug (9), as well as with an outlet port controlled by an electric valve or pump (7) controlled by a machine timer (6) for the inflow of the respective liquid in the washing area. The top cover will be preferably liftable for the loading of the different sections of the container (2) through the respective ports, for example being hinged on the rear side (5) of the machine itself or of the container.



This invention concerns a container for liquid detergents and additives to be used in domestic washers, and precisely washing machines and dishwashers, as well as machines provided with said container.

It is known that the loading of the detergent and of the additives in washing machines and dishwashers is presently carried out at each cycle using a special multi-section tank, located in the upper part of the machine, preferably made as a pull-out drawer. It is also known that the amount of detergent and additive which can be contained within said tank is limited to one washing cycle, and the loading of these products, usually in powder form, must be repeated at each washing cycle.

On the other hand industrial washers are known wherein the detergent and additive products are automatically used successively taking them from the respective containers through proper pumps. Nevertheless it appears not easy the solution to the problem of finding, inside a domestic washing machine or dishwasher, room enough to house a container, with separate sections for the different detergents and additives, whose volume is such as to assure the duration for several washing cycles, with no need to add other liquid.

The object of this invention is to solve this problem with no substantial modifications to the structure, now standardized, or the internal equipments of a domestic washing machine or dishwasher.

This object is achieved through a container whose shape develops mainly horizontally with small thickness, including one or more separate sections, each one with its own loading port provided with a closing plug, as well as with an outlet port for the inflow of the respective liquid product in the washing tank through an electric valve or pump, said container being positioned in the area included between the washing tank and the top cover of the washing machine.

According to the preferred embodiment of this invention, in the case of a non-built-in washing machine, the top cover is liftable being hinged on the rear side of the machine, possibly of the container itself, to get within reach of the loading ports, there being preferably provided a stop to keep said cover in the lifted position during the loading operation.

These and other objects, advantages and characteristics of the container according to this invention, as well as of the washing machine provided with it will appear more clearly from the following detailed description of its preferred embodiment, reported as non-limiting example, referring to the annexed drawings wherein :

Fig. 1 shows a schematic side view of a domestic washing machine according to this invention, from which a side panel of the covering has been removed to show the inside; and

Fig. 2 shows a cross sectional view taken along

the line II-II of fig.1.

In the drawings a domestic washing machine 1 is schematically represented which, according to this invention, is provided with a container 2 for liquid detergents or additives, flat-shaped and such as to take up, with a very small thickness, substantially the whole area included between the machine top cover 4 and the tank 10, in order to assure the greatest achievable capacity making the most of the room available in said area. The reference to a washing machine is obviously just an example and it could as well be the matter of a dishwasher with no substantial differences as far as the inventive aspect is concerned, the only difference being that in such a case with "tank" the dishwasher washing volume is meant.

As best shown in fig.2, the container 2 is divided in several sections and, as an example, two sections 2a and 2b (the latter of smaller volume) have been represented in the drawing, separated by a wall 3, for the detergent and the additive respectively. Obviously there may be more sections, if a greater number of additives is needed in the washing cycle. In any case each section will be provided with a loading port 8 and a relative closing cap 9 capable of preventing the evaporation of the corresponding liquid and its drying.

At the outlet of each section an electric valve or pump 7 is provided to load the liquid detergent or additives into the washing tank 10 through the ports 11 at the end of the ducts 12. As already known from industrial washing machines, the electric valves or, alternatively, the pumps 7 are controlled by a timer 6 which selects the product to let into the tank 10 for the different stages of the washing cycle and, from time to time, determines its quantity.

It should be noted that in non-built-in machines the container 2 may be made easily accessible from outside when the machine top cover 4 or "top" is considered as a liftable cover of the multiple container. Referring to fig.1 it is seen that the machine top cover 4 may be hinged in 5 on the rear side of said machine or of the container itself. A proper stop 15 is capable of keeping the cover 4 in the lifted position to make easier the loading of the sections with the relative product through the ports 8.

It should also be noted that the upper surface of the container 2, preferably manufactured from plastic material, for example by moulding, may present a cavity 14, obtained by moulding as well, suitable to serve as housing of the instruction booklet relative to the machine or of the washing cycles table and possibly of other accessories useful for the machine operation. Alternatively said accessories could be housed inside a pocket (not shown) obtained on the lower side of the top 4, which would be accessible by lifting the top itself.

It should finally be noted that, as important characteristic of the container according to this invention,

the latter will be preferably made so as to cover completely the upper part of the machine, thus making a barrier towards the internal parts of the latter being under voltage and/or moving, in order to avoid the contact with them by the user.

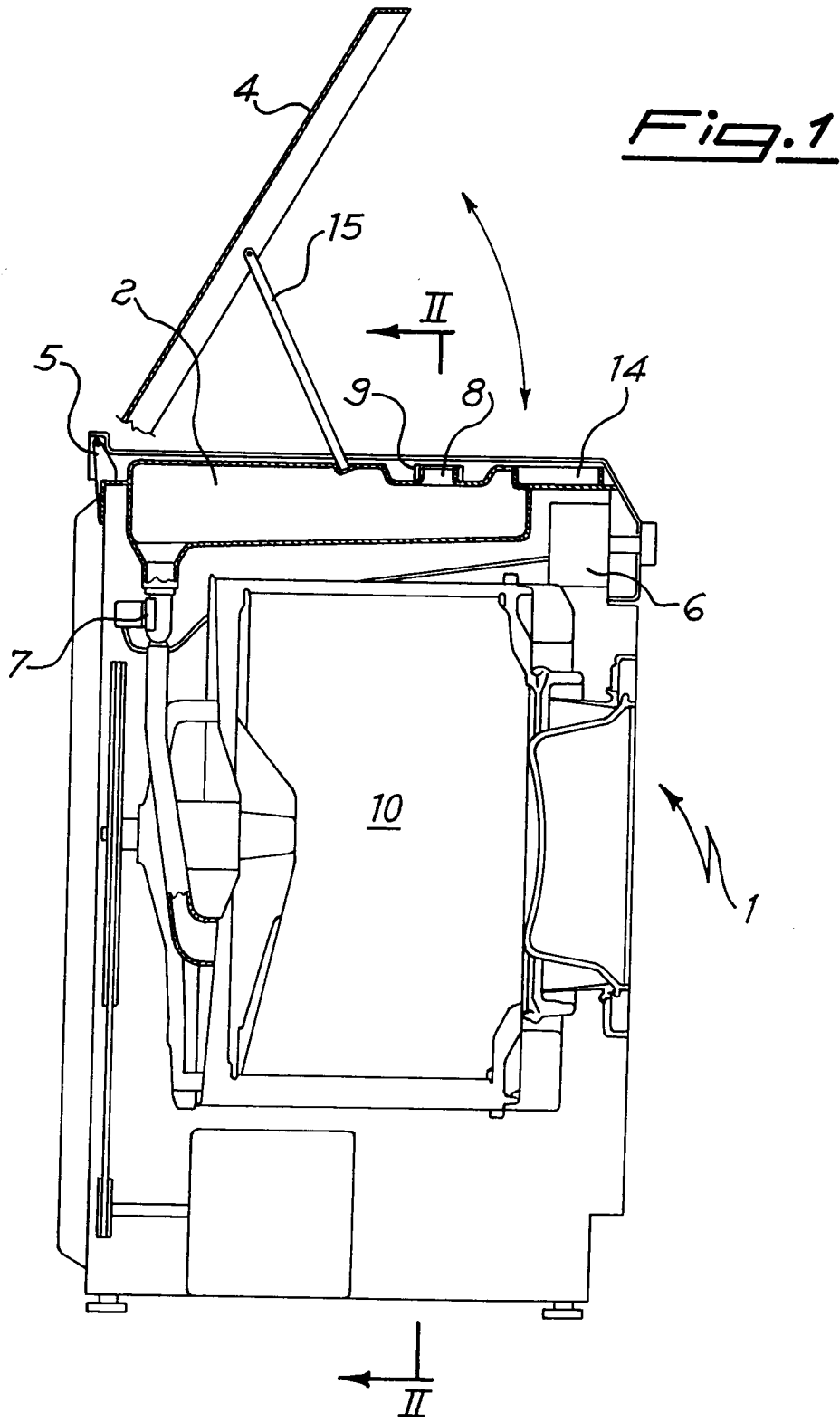
Possible additions and/or modifications may be produced by those skilled in the art to the above described and illustrated embodiment of the container according to this invention and of a washing machine provided with it without exceeding the scope of the invention. In particular though referring up to now to freestanding machines, the invention is easily adaptable to built-in washing machines or dishwashers, or integrated in a modular system, whose top is not liftable. In such a case the container according to the invention is located all the same between the tank (or washing volume) and the top panel with frontal loading instead of from above.

### Claims

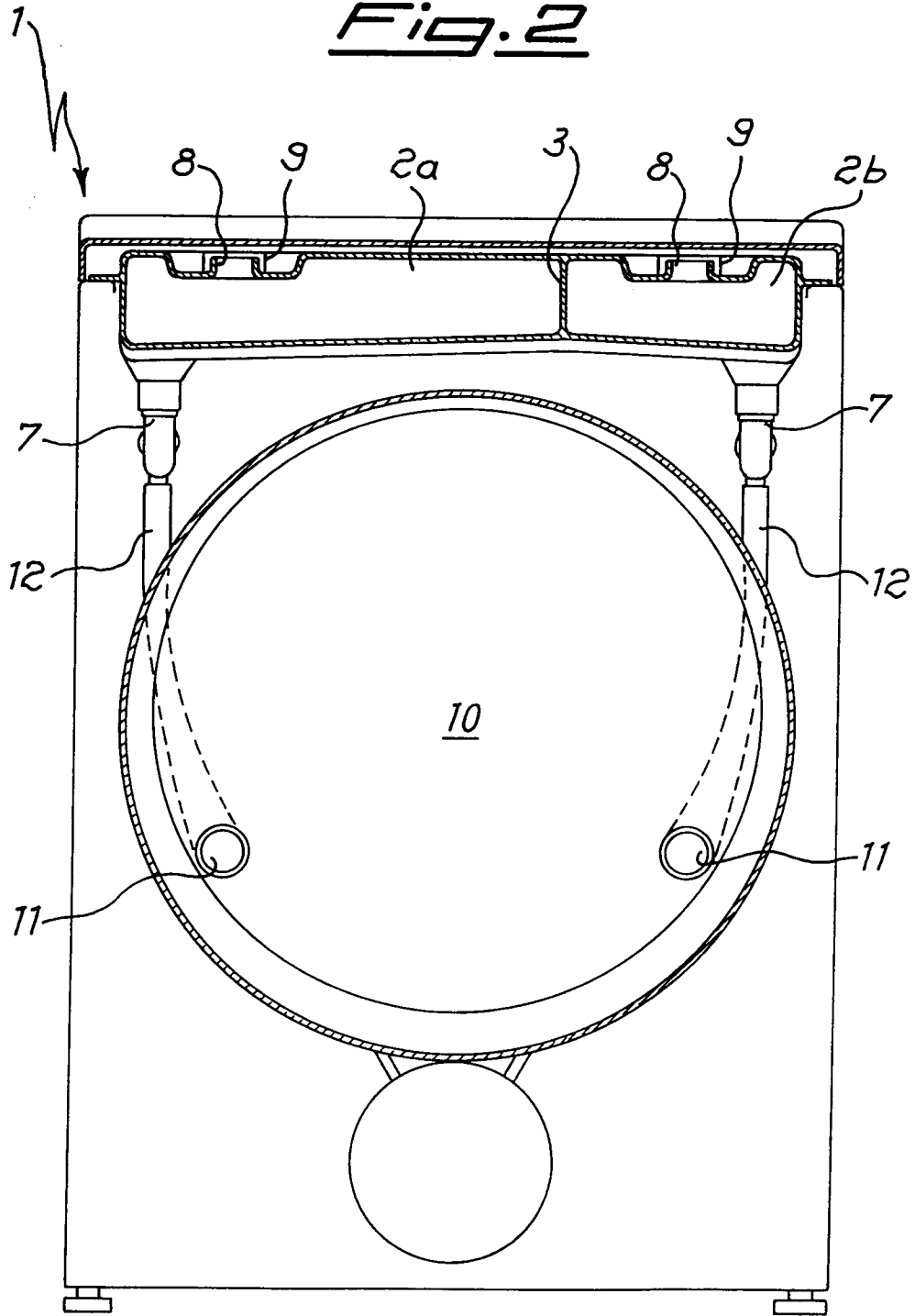
1. A container for liquid detergents and additives to be used in domestic washing machines (1), characterized in that it has a shape developing mainly horizontally with a small thickness, being positioned in an area included between the washing tank (10) or washing volume for a dishwasher, and a top cover (4) of the machine itself, said container (2) including one or more separate sections (2a,2b), each one with its own loading port (8) provided with a closing plug (9), as well as with an outlet port (11) for the inflow of the respective liquid product in said tank or washing volume (10) through an electric valve or pump (7). 25 30 35
2. A container according to claim 1, characterized in that it takes up completely the upper part of the machine (1) leaving no passages which could allow to come in touch with parts under voltage or moving. 40
3. A container according to claim 1 or 2, characterized in that it includes on its upper surface a cavity (14) suitable to serve as housing for one or more accessories such as instruction booklet, washing cycles table, etc. 45
4. A container for liquid detergents and additives substantially as above described and illustrated. 50
5. A domestic washing machine, including a container (2) according to one or more of the preceding claims, housed in the upper part of the machine (1), immediately below the top cover (4), characterized in that it includes also a timer (6) to control automatically said electric valves or pumps (7) for the inflow and the measuring of the

liquid products into the tank or washing volume (10).

6. A machine according to claim 5, characterized in that said top cover (4), serving as a cover for the container, may be lifted for the loading of the liquids through said ports (8). 5
7. A machine according to claim 6, characterized in that said top cover (4) is hinged in (5) on the rear side of the machine itself or of the container (2), stopping means (15) being provided to keep said top cover (4) in the lifted position during the loading of the container (2). 10 15
8. A machine according to claim 7, characterized in that said top cover (4) presents on the inwards looking side a pocket to house accessory items, useful during the washing. 20



*Fig. 2*





European Patent  
Office

EUROPEAN SEARCH REPORT

Application Number

EP 93 83 0023

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)
X	US-A-3 207 373 (DANNENMANN,P.) * the whole document *	1	D06F39/02 A47L15/44
Y	---	2	
Y	EP-A-0 128 073 (ESSWEIN,S.A.) * page 2, line 15 - page 4, line 17; claim 1; figures 1,2,4 *	2	
A	---	4,7	
A	FR-A-2 606 430 (BOSCH-SIEMENS HAUSGERÄTE GMBH) * the whole document *	1	
A	DE-A-1 503 761 (CONSTRUCTA-WERKE GMBH) * the whole document *	1	
A	US-A-2 699 886 (JAMES,JR.M.S.) -----		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D06F A47L
Place of search THE HAGUE		Date of completion of the search 14 MAY 1993	Examiner MUNZER E.
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone                      Y : particularly relevant if combined with another document of the same category                      A : technological background                      O : non-written disclosure                      P : intermediate document</p> <p>T : theory or principle underlying the invention                      E : earlier patent document, but published on, or after the filing date                      D : document cited in the application                      L : document cited for other reasons</p> <p>.....                      &amp; : member of the same patent family, corresponding document</p>			

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