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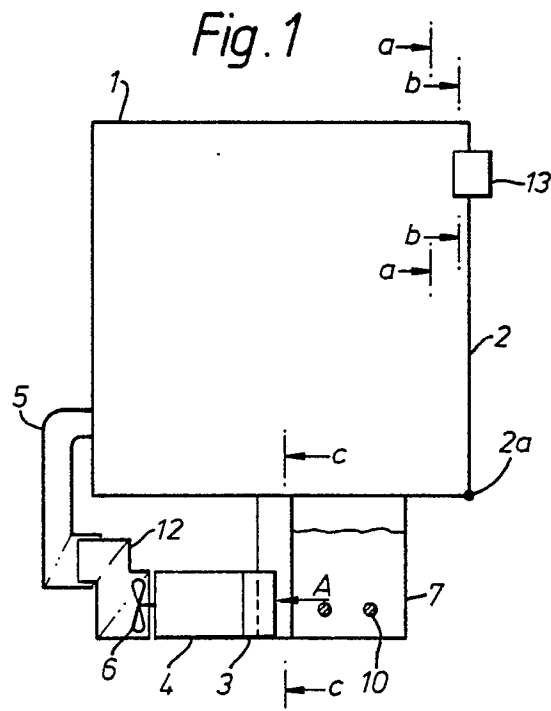
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54 **Dishwasher.**

57 In a dishwasher, the load in the tub (1) is dried, not by a radiant energy heater as hitherto, but by means of the cooling air drawn by fan over the pump motor (4), which enters the tub via duct (5) and leaves it via a vent in the soap dispenser (13).



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DISHWASHER

This invention relates to dishwashers.

Dishwashers generally employ a drying step after the washing and rinsing steps, wherein after the tub has been drained, the load of the dishwasher is heated by a radiant energy heater.

The invention provides a dishwasher comprising a pump for wash water, an electric motor for driving the pump, a fan driven by the electric motor for air cooling the motor, and ducting for carrying the cooling air into the tub of the dishwasher when the tub has drained.

The duct enables the machine to be simplified since there is no longer a need for a radiant energy heater. The dishwasher load can be cooled by running the motor after the tub has drained and relying on the air flow and the residual heat of the load after the hot washing operation, to dry the load.

Advantageously, the fan for the motor is arranged in an open end of the ducting, which preferably comprises two parts connected to allow air escape at the connection: this allows cooling air to be vented when the dishwasher is not in a drying mode.

A dishwasher constructed in accordance with the invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a schematic side view of the dishwasher with its cabinet removed;

Figure 1a is a section taken through lines a-a of Figure 1 on an enlarged scale;

Figure 1b is a section taken through lines b-b of Figure 1 on an enlarged scale;

Figure 1c is a section taken through the lines c-c of Figure 1 on an enlarged scale; and

Figure 2 is a plan view of the floor of the tub of the dishwasher.

The dishwasher comprises of an outer cabinet (not shown) containing a tub 1, the front wall 2 of which is pivotable about its bottom edge 2a to provide a door to give access to the tub. The dishes etc forming the load are placed in racks (not shown) in the tub. Water is sprayed over the dishes from jets (not shown) driven by a centrifugal pump 3 which is in turn powered by an electric motor 4.

Ducting consisting of duct 12 and duct 5 conveys cooling air from a fan 6 of the electric motor into the tub.

The floor of the tub has a sump 7 of plastic material recessed in it, from which the pump 3 derives its input. The pump is a centrifugal pump and draws water in in direction of the arrow A and delivers it to a shroud 8 of diverging volute cross

section which terminates in a vertical outlet section 9 (Figure 1c), which feeds plastics spray heads (not shown) containing outlet jets. A heater 10 is located in the lower part of the sump.

The electric motor 4 which drives the pump has a cooling fan 6 which draws air from the atmosphere past the motor into the circular duct 12 concentric with the motor.

A soap dispenser 13 is located in the upper part of the door 2 and has three compartments 13a, 13b, and 13c, which are selectively opened by means of a closure 14 which covers two only of the three compartments at any one time. Compartment 13a contains soap powder for a pre-wash, the compartment 13b contains soap powder for a main wash, and the compartment 13c has a vent at its rear surface which connects via a labyrinth in the dispenser with the atmosphere outside.

The duct 5 at one end connects into the rear of the tub and at the other end receives an end of the circular duct 12.

In operation, the door 2 is opened and dishes etc forming the load of the machine are inserted into baskets in the tub. Soap is inserted into the soap dispenser, and controls are operated to start the washing operation. The machine fills with water and heating element 10 is activated. The sector 14 uncovers the pre-wash compartment. When the water temperature is sufficient for the load to be adequately washed, the electric motor is operated and the pump drives hot water to the spray jets.

The fan on the motor directs the cooling air blast, which cools the motor, from the circular duct 12 into the duct 5, but the compartment 13c containing the vent is closed, and so the air spills out of the duct 12 both where it fits into the duct 5 and at its other, open, end. After the end of the pre-wash the sector 14 rotates to open the main wash compartment. As before, the spray jets dislodge the soap from the compartment 13b as well as spray the load itself.

When the main wash has been completed, the tub is emptied and re-filled with fresh water, which is heated in order to rinse the load. After the rinse, the tub again drains.

In previous dishwasher constructions, a heating element set into the floor of the tub surrounding the floor of the tub is then activated, and dries the dishes by radiant heat energy. In accordance with the invention, however, even though the tub has been drained the motor is kept running while the sector 14 is moved to uncover the compartment 13c containing the vent. Now that the vent is open, cooling air drawn through the duct 12 surrounding the fan is now directed through the duct 5 and into

the tub before venting to the atmosphere via the vent in the soap dispenser. It has been found that the cooling air forced through the tub, in conjunction with the residual heat of the load, is sufficient to dry the dishes.

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Among the advantages of the arrangement described is that the heating element can be chosen and fitted with a view only to heating water, and considerations of radiant heating can be ignored: in particular the heating element can be positioned in the sump totally immersed in water (thereby making for greater efficiency) and the sump itself can be of plastics material. Further, the spray head can also be defined by plastics material.

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Claims

1. A dishwasher comprising a pump for wash water, an electric motor for driving the pump, a fan driven by the electric motor for air cooling the motor, and ducting for carrying the cooling air into the tub of the dishwasher when the tub has drained.

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2. A dishwasher as claimed in claim 1, in which the fan for the motor is arranged in an open end of the ducting.

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3. A dishwasher as claimed in claim 1 or claim 2, in which the ducting is in two parts connected so as to allow air to escape at the connection.

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4. A dishwasher as claimed in any one of claims 1 to 3, in which a vent from the interior to the exterior of the dishwasher is arranged to open when the cooling air is ducted into the tub.

5. A dishwasher as claimed in claim 4, in which the vent is in a soap dispenser of the dishwasher.

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6. A dishwasher as claimed in any one of claims 1 to 5, in which a water heating element is positioned so that it is surrounded by water in use.

7. A dishwasher as claimed in claim 6, in which the heating element is positioned in a recess in the base of the dishwasher.

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8. A dishwasher as claimed in claim 7, in which the recess is defined by a member of plastics material.

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9. A dishwasher substantially as herein described with reference to the accompanying drawings.

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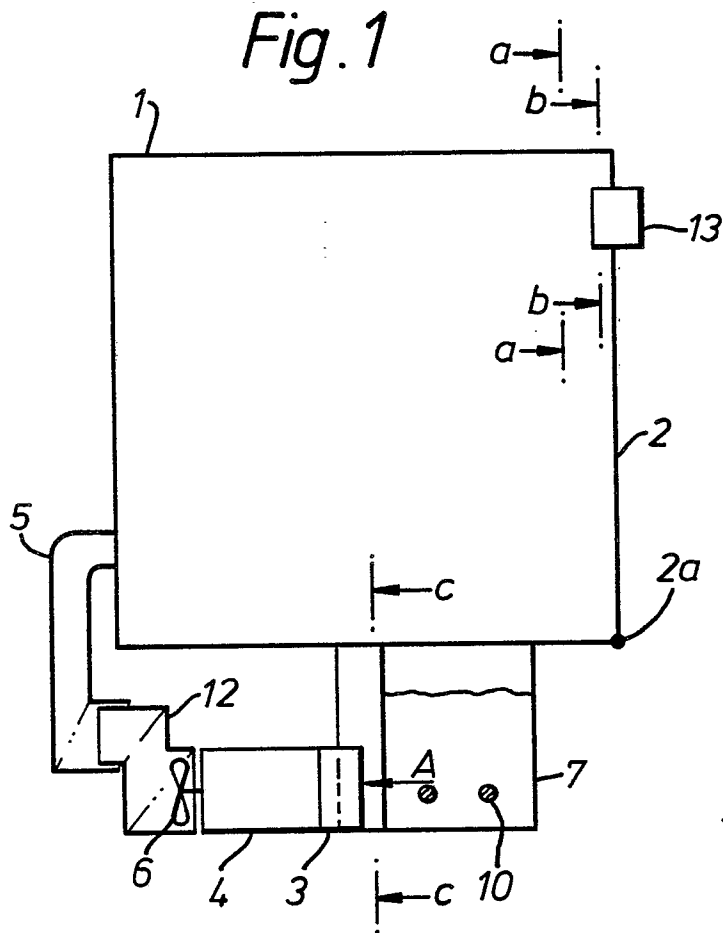


Fig. 1a

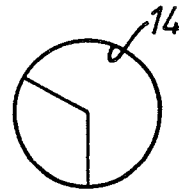


Fig. 1b

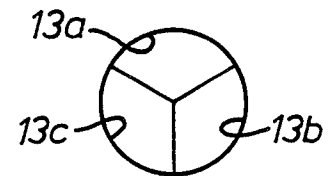


Fig. 1c

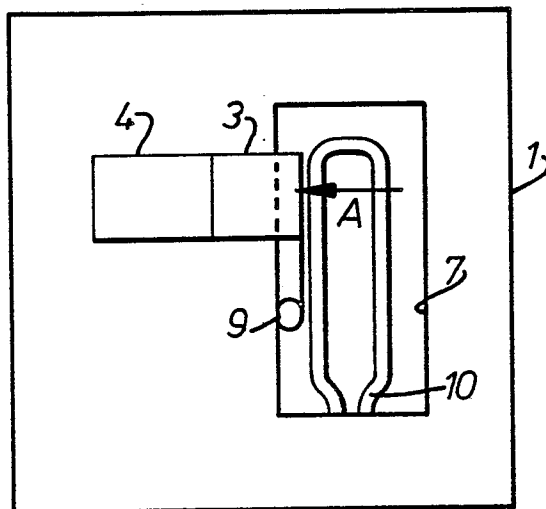
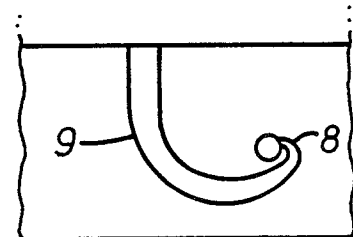


Fig. 2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 30 0639

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)
X	US-A-3241563 (BRADEN) * the whole document * ---	1-4, 6	A47L15/48
X	US-A-3126024 (JELLIES) * column 3, line 15 - line 48; figures 1-5 * ---	1, 2, 4	
X	US-A-3103227 (LONG) * column 4, line 8 - column 5, line 50; figures 1, 2 * ---	1, 4, 6, 7	
A	US-A-3130737 (JELLIES) * the whole document * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			A47L
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 MAY 89	Examiner SCHARTZ J.
CATEGORY OF CITED DOCUMENTS			
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		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 & : member of the same patent family, corresponding document	