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(54) Washing machine with a dispenser unit

(57) The present invention refers to a washing machine, such as a laundry washing machine or a dishwashing machine provided with an improved washing agent dispenser unit (1).

The washing machine according to the invention comprises a dispenser unit (1) which is provided with a plurality of compartments (2) adapted to receive a chemical agent and with at least one electric load (3), the washing machine is characterised by comprising an electrical circuit (4) adapted to wirelessly power said electric load (3).

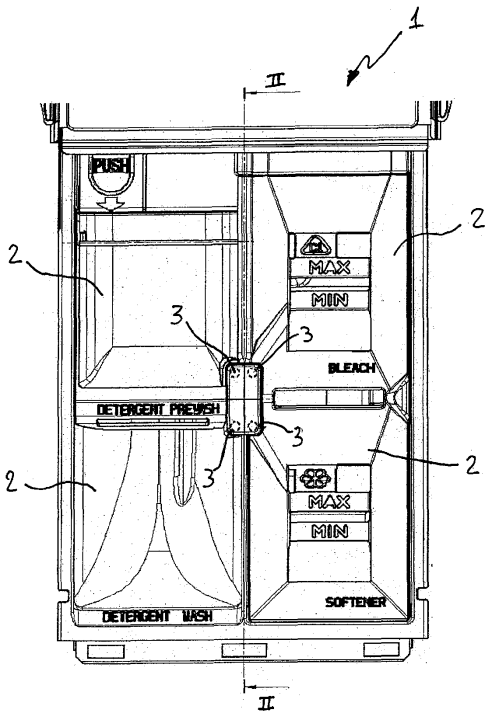


Fig. 1

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Description

[0001] The present invention refers to a washing machine, such as a laundry washing machine or a dishwashing machine provided with an improved washing agent dispenser unit.

[0002] Washing machines of known type are normally provided with a washing agent dispenser unit having a plurality of compartments adapted to receive soap or other chemical substances, like softener or bleach, for washing or treating the objects contained in the washing chamber of the machine.

[0003] Generally each of said compartments is dedicated to receive a specific kind of chemical agent to be introduced in the washing chamber therefore the user must be informed on which compartments must be filled depending on the washing program selected and the kind of treatment to be performed. Such information is provided to the user by means of operating instruction printed on an operating panel or directly on the compartments and further instructions are provided in the user guide supplied with the washing machine. Even if the user can find the information about the correct choice of the chemical agent compartment to be filled in a plurality of places inside and outside the machine, such information is frequently not read or overlooked by the user. This causes errors in the washing procedure and it is particularly frustrating for the user that is forced to repeat the washing program to obtain the desired result.

[0004] A partial solution to this problem can be found in the UK Patent Application No. GB 2 128 640 in which a program-controlled washing machine comprises a dispenser unit having at least one light source associated with each compartment in order to provide visible indications on which compartment of the dispenser must be filled with the appropriate chemical agent according to the selected washing program. The light sources are arranged to provide also indications on the quantity of chemical agent that must be supplied by the user in order to obtain good washing performance.

[0005] GB 2 128 640 is silent on how the light sources are powered. It is evident that a safety problem exists when electrical power must be supplied to an electrical load placed in a dispensing unit of a washing machine which is normally in contact with flushing water used to lead detergents/additives from the dispensing unit to the washing chamber.

[0006] A further problem to be solved is linked to the fact that the electrical energy shall be supplied to a dispensing unit that can be movable relative to the washing machine cabinet in order to allow the user to easily fill the chemical agent compartments. This is the case, in a laundry washing machine, of a dispenser in the form of a drawer.

[0007] The aim of the present invention is therefore to solve the noted problems and thus providing a washing machine in which a chemical agent dispensing unit is powered in a safe manner avoiding any risk of injury for the user.

[0008] Another object of the present invention is to provide a washing machine facilitating the user with respect to the selection of the correct dispensing compartment to be filled with a chemical agent and with respect to the right amount of said agent to be supplied in accordance with the selected washing program.

[0009] Still another purpose of the present invention is to provide a washing machine in which the electrical power is supplied in a reliable manner to a chemical agent dispenser that can be moved relative to the machine cabinet.

[0010] Advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objects and advantages of the invention may be realised and attained as particularly pointed out in the appended claims.

[0011] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate a possible embodiment of the invention and together with the description serve to explain the principles of the invention.

[0012] In the drawings:

[0013] Figure 1 shows a plan view of a dispensing unit provided with electric loads;

[0014] Figure 2 shows a sectional view taken along line II-II of the dispensing unit of figure 1;

[0015] Figure 3 shows a sectional view taken along line III-III of figure 2;

[0016] With reference to the figures, a dispenser unit 1 for a washing machine like a laundry washing machine, a clothes treating apparatus, a dishwasher and the like, comprises a plurality of compartments 2, each dedicated to receive a chemical agent useful for the washing/treating operations of objects to be washed or treated in a treating chamber provided in the washing machine. In figure 1 it is shown a dispenser unit particularly suitable for a laundry washing machine having a detergent wash and pre-wash compartments, a compartment for receiving a bleaching agent and one for receiving a softener. Naturally, other compartments may be provided on the dispensing unit according to the washing machine and the kind of treating programs that the machine can perform.

[0017] In order to facilitate the user in selecting the right compartment to be filled with a chemical agent in dependence on the selected treating program, one or more electric loads 3 are provided in the dispenser unit 1. Such electric loads 3 can consist preferably in light sources that project their light on the compartment to be filled according to the working program selected by the user. However also other signalling means like, for example, a buzzer or a vibrating means, can be used in the dispenser unit 1.

[0018] The electric loads 3 are wirelessly powered by an electrical circuit 4 shown in figures 2 and 3. Said circuit 4 comprises a primary circuit 5 having a first inductor 6 which is connected to a main power supply. The latter preferably comprises an oscillating circuit 11 able to provide the first inductor 6 with an alternate voltage at a pre-set frequency. The oscillating circuit 11 can be provided in a known manner in the washing machine electronics. The electrical circuit 4 further comprises a secondary circuit 7 electrically connected to the electric loads 3 and provided with a second inductor 8.

[0019] Electrical energy for activating the power consuming loads 3 is contactlessly transferred from the primary circuit 5 to the secondary circuit 7 by means of the first and second inductors 6, 8 when the latter are facing each other. In such condition said elements 6, 8 form a magnetic circuit interrupted by an air gap. Therefore the inductors 6, 8 form an electric transformer wherein the secondary circuit 7 is associated to the power consuming load 3.

[0020] Each inductor 6, 8 can comprise a ferromagnetic element having an electric coil wrapped around it. Since the interaction between the inductors 6, 8 is of a magnetic nature they can be placed encapsulated between walls or even embedded in a wall.

[0021] In figures 2 and 3 it is shown a first inductor 6 having a "U" shape and a second inductor 8 having an elliptic shape placed between the vertical arms of the "U" shaped inductor 6. Evidently, other forms for the inductors 6, 8 can be equivalently used provided that a they can be led to be facing each other.

[0022] The dispenser unit 1 can be of the kind comprising a stationary member 9, which is fixed to the washing machine body, and a second member 10 movable relatively to the stationary member 9. According to this embodiment, the primary circuit 5 is associated to the stationary member and the secondary circuit 7 is carried by the movable member 10. In particular, the second member 10 can be movable between a first position in which the first and the second inductor 6, 8 are facing each other and the electric load 3 is powered and a second position in which the inductors 6, 8 are spaced apart and no power supply is transferred to the electric load 3 from the primary circuit 5 through the secondary circuit 7.

[0023] The movable member 10 can be in the form of a drawer slidably mounted on the stationary member 9. This embodiment of the dispenser unit is particularly advantageous as detergent dispensing unit for a household laundry washing machine. According to this embodiment the electric loads 3 are powered only when the drawer is in an extracted position with respect to the washing machine cabinet. Such extracted position corresponds to the position in which the inductors 6, 8 are facing each other.

[0024] Conclusively it can be stated that a washing machine according to the invention can greatly reduce the possibility that the user makes errors in choosing the right dispenser unit compartment to be filled with a chemical agent. The washing machine disclosed herein also avoids the user to be presented with a large amount of information with reference to the use of the washing machine.

[0025] It is evident that the skilled man can apply the wireless power supply disclosed in the present invention for powering a generic electric load provided in a detergent dispenser of a washing machine. Such electric load can be in the form of any power consuming device, like, for example, sensor means for monitoring the quantity of chemical agent introduced in the dispenser by the user. The present invention can also be used for contactlessly powering a dosing screw provided in a cleaning agent dispensing unit of the kind including a compartment for storing a cleaning agent in powder form and a dosing device in the form of a screw that allows a dosed amount of cleaning agent to exit the compartment.

Claims

1. A washing machine comprising a dispenser unit (1) which is provided with a plurality of compartments (2) adapted to receive a chemical agent and with at least one electric load (3) **characterised by** comprising an electrical circuit (4) adapted to wirelessly power said electric load (3).

2. A washing machine according to claim 1 wherein said electrical circuit (4) comprises a primary circuit (5) connected to a main power supply and provided with a first inductor (6), the electrical circuit (4) further comprising a secondary circuit (7) connected to the electric load (3) and provided with a second inductor (8).

3. A washing machine according to claim 2 wherein said dispenser unit (1) comprises a first stationary member (9) carrying the primary circuit (5) and a second movable member (10) carrying the secondary circuit (7).

4. A washing machine according to claim 3 wherein said second member (10) is movable relative to the first stationary member (9) between a first position in which the first and the second inductor (6, 8) are facing each other and a second position in which the inductors (6, 8) are spaced apart.

5. A washing machine according to claim 3 or 4 wherein the second movable member (9) is a drawer.

6. A washing machine according to any preceding claim wherein the primary circuit (5) comprises an oscillating circuit (11) able to provide the first inductor (6) with an alternate voltage at a pre-set frequency.

7. A washing machine according to any preceding

claim wherein said electric load (3) comprises at least one light source.

8. A washing machine according to claim 7 wherein at least one light source is associated with each of said compartments (2) and is activatable in dependence on the selected washing machine program.

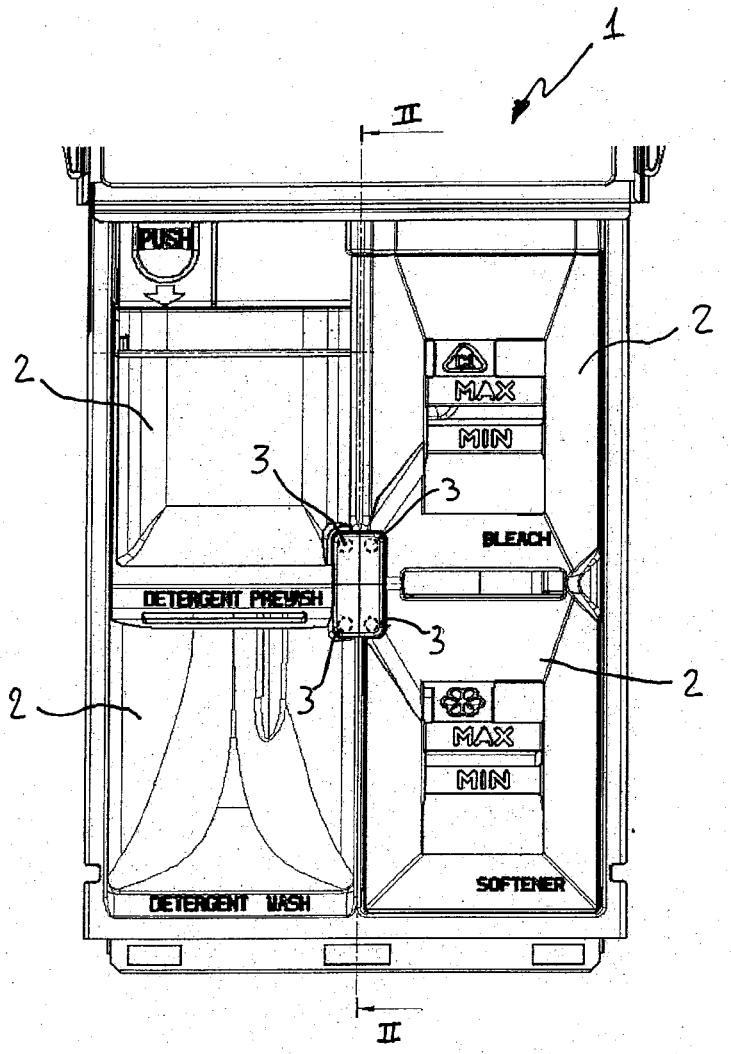

1
II
PUSH
2
2
MAX
MIN
3
3
BLEACH
DETERGENT PREWASH
3
2
2
3
MAX
MIN
DETERGENT WASH
SOFTENER
II

Fig. 1

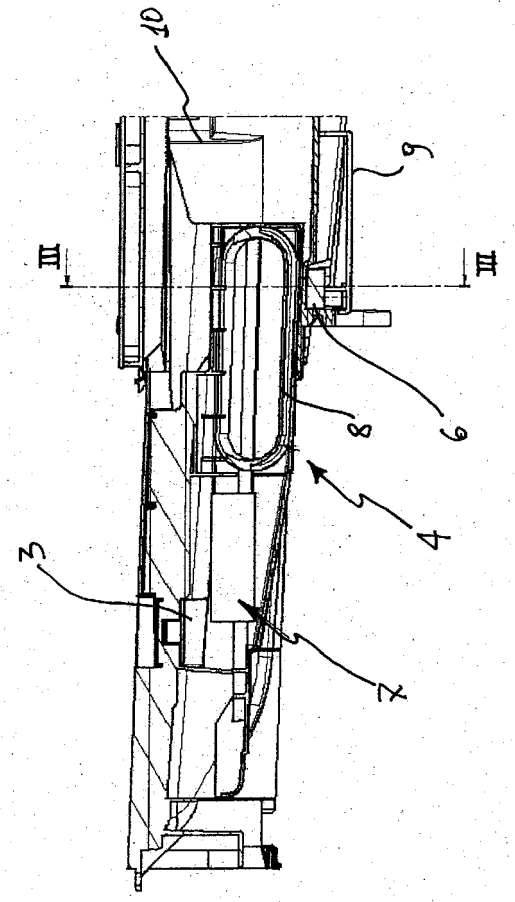


Fig. 2

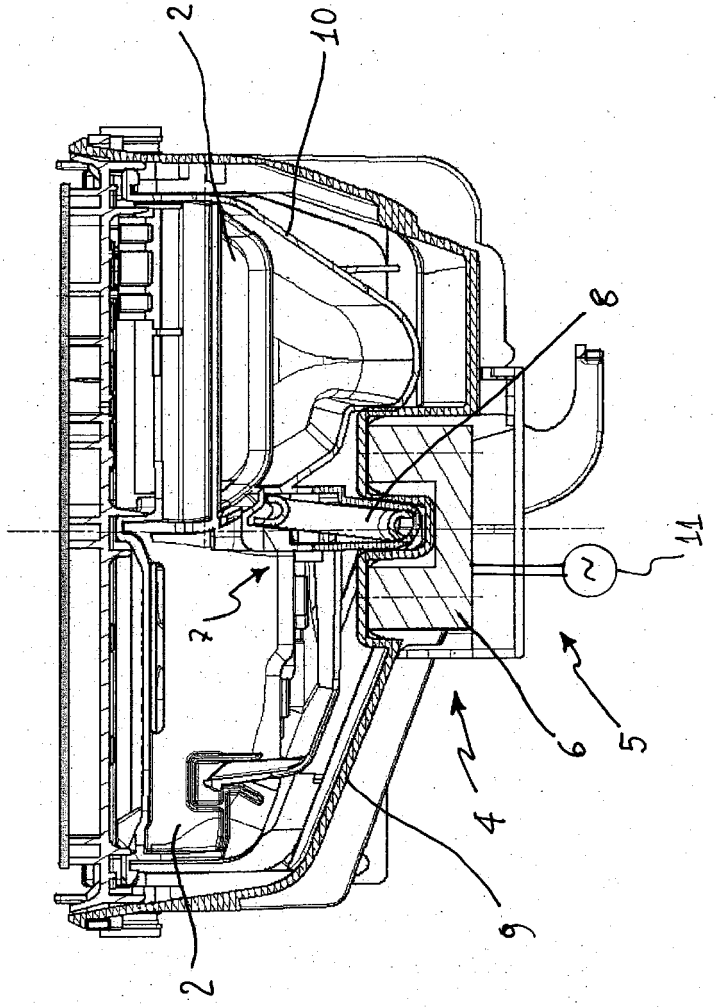


Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 06 11 3233

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	WO 2005/100673 A (BSH BOSCH UND SIEMENS HAUSGERAETE GMBH; ALBAYRAK, HASAN, GOEKCER; KNOP) 27 October 2005 (2005-10-27) * figure 3 *	1-8	INV. D06F39/02
Y,D	GB 2 128 640 A (* BOSCH-SIEMENS HAUSGERATE GMBH) 2 May 1984 (1984-05-02) * figures *	1-8	
A	EP 0 423 044 A (EATON S.A.M) 17 April 1991 (1991-04-17) * the whole document *	1-8	
A	EP 0 851 055 A (AEG HAUSGERAETE GMBH) 1 July 1998 (1998-07-01) * the whole document *	1-8	

TECHNICAL FIELDS SEARCHED (IPC)

D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 July 2006	DIAZ, M

CATEGORY OF CITED DOCUMENTS

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26-07-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005100673 A	27-10-2005	DE 102004018167 A1	24-11-2005
GB 2128640 A	02-05-1984	DE 3238540 A1	26-04-1984
		FR 2534605 A1	20-04-1984
		IT 1171727 B	10-06-1987
EP 0423044 A	17-04-1991	CA 2027154 A1	11-04-1991
		DE 69019666 D1	29-06-1995
		DE 69019666 T2	19-10-1995
		ES 2072412 T3	16-07-1995
		FR 2652831 A1	12-04-1991
EP 0851055 A	01-07-1998	DE 19652128 A1	18-06-1998

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 2128640 A **[0004] [0005]**