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(54) **Washing machine with visual washing agent level indicator**

(57) The present invention refers to a washing machine having visual means for indicating to a user the amount of washing agent to be introduced in the machine for performing washing operation.

The washing machine according to the invention comprises a drawer (1) slidably received within a housing (2) said drawer (1) having at least one compartment (4) adapted to receive an amount of a washing agent and further comprising visual indication means (5) for indicating the amount of washing agent (9) to be introduced for performing a washing operation. The washing machine is characterised in that said visual indication means (5) comprise at least one light means (6, 7) displaced so as to provide an indication of the compartment filling level that has to be reached by introducing said washing agent (9) within the compartment (4).

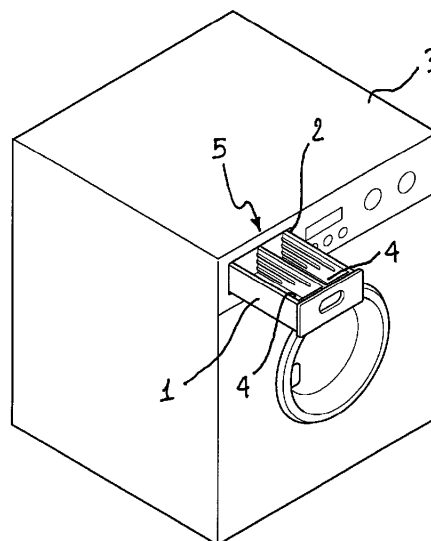


Fig. 1

Description

[0001] The present invention refers to a washing machine having visual means for indicating to a user the amount of washing agent to be introduced in the machine for performing washing operation.

[0002] It is known that all washing machines are sold with a users' manual in which the manufacturer provides general information regarding the amount of detergent to be used as a function of several parameters like quantity and kind of articles to be washed, degree of soiling, washing program, and the water hardness. In this way the user is overloaded with information that is not only difficult to be adapted to every day use of the washing appliance but it is also hard to be remembered every time the machine is used. In addition, even if such operating information is printed on the operating panel of the machine and therefore constantly visible during use of the washing appliance, the user often does not read such instructions or overlooks them.

[0003] As a partial solution to this problem it is known from the British Patent Application GB 2 128 640 to provide a washing machine detergent dispenser with light indication means giving instructions to the user about the amount and the compartment where the washing agent should be poured. Such kind of visual indication means are linked with the number of half-filled and full-filled beakers that the user is asked to put in a compartment of a detergent drawer.

[0004] A drawback of such kind of information consists in that the amount of washing agent really introduced in the machine by the user depends on the dimension of the beakers used. Such dimensions can be very different in function of the kind of washing agent used (liquid or powder) and in function of the washing agent manufacturer. As a consequence the result of the washing process cannot be ensured to be effective.

[0005] Therefore it would be desirable to facilitate the use of washing machines with respect to the addition of the washing agent providing the user with precise visual indications on the place where the washing agent has to be added and on the amount of washing agent sufficient for performing the washing operations.

[0006] The aim of the present invention is therefore to solve the noted problems and thus providing a washing machine having means informing the user on the amount of washing agent to be added in relation with typical washing parameters like the washing program, quantity and kind of articles to be washed, degree of soiling, water hardness, kind of detergent used and the like.

[0007] Another object of the present invention is to provide a washing machine in which the indication of the amount of washing agent to be added by the user is independent on the means used for pouring said agent in the machine.

[0008] Still another object of the present invention is to reduce possible errors made by the user when adding washing agent to the washing appliance.

[0009] Another object of the present invention is to provide a washing machine in which the appropriate amount of washing agent is indicated to the user with improved reliability.

[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 washing machine according to the invention comprising visual indication means.

[0014] Figure 2 shows a sectional view of visual indication means of figure 1.

[0015] With reference to the figures 1 and 2 a washing machine according to the invention comprises a washing agent dispenser of known type in the form of a drawer 1 slidably received within a housing 2 provided in the washing machine cabinet 3. Drawer 1 comprises one or more compartments 4 for receiving a washing agent such as a detergent or an additive as a softener or bleach. On the inner side of each compartment walls visual indication means 5 are provided for informing the user about the right amount of washing agent to be introduced within the compartment and about which compartment should be filled.

[0016] Visual indication means 5 are activated automatically by a control unit that controls all washing machine working operations. Said control unit receives data information like weight of articles to be washed, washing program and washing temperature chosen by the user, kind of articles to be washed, water hardness, and, for such combination of parameter, provides the user with a visible indication of the most appropriate amount of washing agent to be added. The indication informs also the user on which of the available compartments should be filled with the agent so as to reduce errors and simplifying the use of the washing machine.

[0017] Indication given by visual means 5 are in the form of filling levels that must be reached by pouring the washing agent within the compartment. In this way it is possible for the washing machine manufacturer to establish with precision the washing agent quantity to be introduced for effective washing operation being known the compartment volume.

[0018] As shown in figure 2, visual indication means 5 comprise light emitters 6, such as one or more light emitting diodes, and light guides 7 made, for example, as transparent channels embedded in the drawer 1 body.

Each light guide 7 has a funnel 8 and a portion 9 extending along the compartment 4 for receiving and diffusing light generated by the emitter 6.

[0019] According to the washing parameters acquired by a control unit, one of the light emitters 6 is turned on so as to provide light to a light guide 7 thereby indicating the most appropriate amount of washing agent and the compartment that must be filled. Such indication is provided visually when the user extracts the drawer 1 from its housing 2. In such position light emitters 6 face the corresponding light guides 7. When a light guide is illuminated the user is visually informed about the place where pouring a washing agent and about the compartment filling level that must be reached to have an effective articles washing. In figure 2 the light guide corresponding to a half-filled compartment volume is illuminated and the corresponding amount of washing agent 9 reaching the illuminated light guide 7 is shown.

[0020] The number of light emitters 6 and of light guides 7 depends on how many washing agent levels must be indicated within the compartments and also on the number of compartments the drawer is provided with.

[0021] In order to keep both the light emitters 6 both the light guides 7 clean, a first and a second wiper 10, 11 are provided respectively on the drawer 1 and on the washing machine cabinet 3. When the drawer 1 is extracted or inserted in housing 2, the wiper 10 associated to the drawer 1 wipes the light emitters 6 while the wiper 11 associated to the machine cabinet 3 wipes the light guides 7. Wipers 10, 11 can be made by rubber.

[0022] Conclusively it can be stated that a washing machine according to the invention greatly reduces the possibility that a user adds a wrong amount of washing agent in the machine for performing washing operation, waste of washing agent and the risk of damages to the articles to be washed are greatly reduced.

[0023] According to the invention the information about the appropriate amount of washing agent and the place where pouring it is given to the user in a more precise and reliable manner than how the prior art teaches.

light means (6, 7) comprise at least a light emitter (6) and at least a light guide (7) associated to the drawer (1) for receiving light from said emitter (6).

- 5 3. Washing machine according to claim 2 wherein said at least a light guide (7) comprises a funnel (8) and a portion extending along said at least one compartment (4).
- 10 4. Washing machine according to claim 2 or 3 wherein said light guide (7) is formed by a transparent channel embedded in the drawer (1).
- 15 5. Washing machine according to any claim 2 to 4 wherein said drawer (1) comprises a first wiper (10) for cleaning said light emitter (6).
- 20 6. Washing machine according to any claim 2 to 5 further comprising a second wiper (11) for cleaning said light guide (7).
- 25 7. Washing machine according to any preceding claim wherein said visual indication means (5) are activatable when said drawer (1) is extracted from the housing (2).
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Claims

1. Washing machine comprising a drawer (1) slidably received within a housing (2) said drawer (1) having at least one compartment (4) adapted to receive an amount of a washing agent (9) and further comprising visual indication means (5) for indicating the amount of washing agent (9) to be introduced for performing a washing operation **characterised in that** said visual indication means (5) comprise at least one light means (6, 7) displaced so as to provide an indication of the compartment filling level that has to be reached by introducing said washing agent (9) within the compartment (4).
2. Washing machine according to claim 1 wherein said

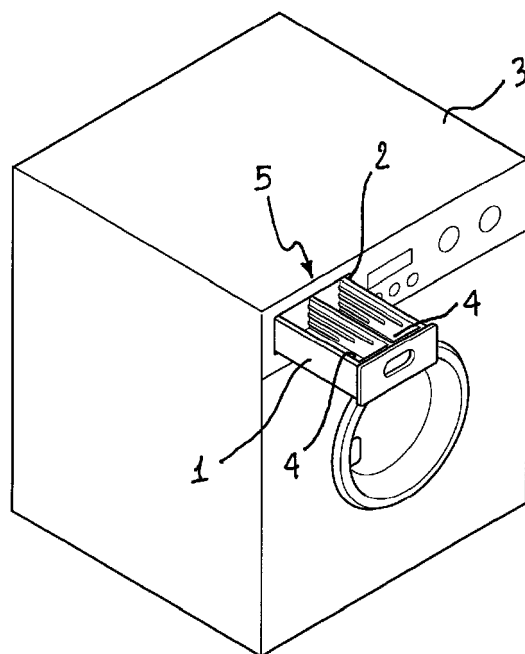


Fig. 1

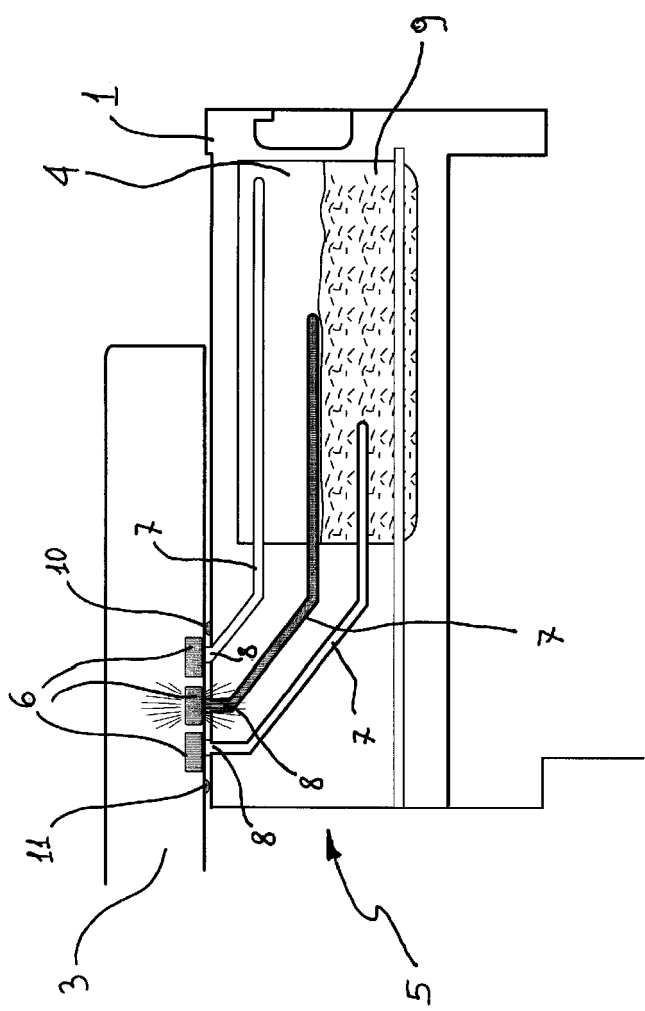


Fig. 2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 9597

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 197 41 023 A1 (MIELE & CIE [DE]) 25 March 1999 (1999-03-25) * column 1, lines 3-21 * * column 2, lines 23-32,50-55 * * column 3, lines 30-51,63-69 * * column 4, line 1 * * claim 3; figures 1,4 *	1,7	INV. D06F39/02 D06F39/00
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 November 2007	Examiner Weinberg, Ekkehard
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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