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(54) Flood-preventing device for dishwasher or washing machine

(57) A flood-preventing device for dishwasher, washing machine or the like includes a bottom tray (R) suitable to collect a possible water leak from any component of the machine, a float (F) in the tray (R) and a microswitch (M) which can be activated by the float (F) as soon as the water collected in the tray (R) causes the rising of the latter, the tray (R) having an internal dividing wall (W) which divides it into two regions (A, B) with the float (F) extending astride said dividing wall (W) so that it is raised by the water collected in either one of said regions (A, B). In this way the device has a shorter intervention time since the tray, while still covering the whole area of the machine, is divided into two regions and therefore the level for the activation of the microswitch is reached faster especially in case of filling of the smaller region. Furthermore there is the possibility for the repair technician to understand where the failure may be, depending on which portion of the tray has received the water.

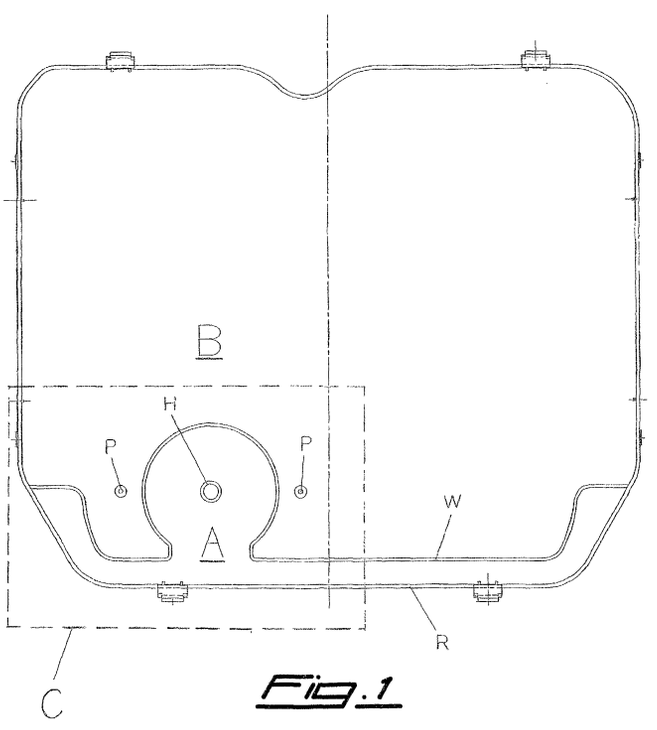

Fig.1

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Description

[0001] The present invention relates to washing machines or dishwashers provided with a flood-preventing device, and in particular a device of the type using a float as sensor element.

[0002] It is known that washing machines and dishwashers for domestic use are generally provided with a flood-preventing device having the function of stopping the entrance of water from the network in case of leak of some component of the machine, said device being substantially of either one of two types.

[0003] In a first type of device a pressure switch detects the pressure inside an air trap located in the sump on the tank bottom, and in a second type a float detects the presence of water in a tray located at the bottom of the machine, in which a possible leak is collected, and it rises thus activating a microswitch. In both cases the activation of the device causes the closing of the water inlet valve and usually also the activation of the drain pump, so as to prevent the risk of flooding.

[0004] Known float devices however have two drawbacks; a first drawback stems from the fact that such a device is not quick in detecting the leak because it requires that a certain amount of water is collected in the tray which is sufficient to raise the float until it touches the microswitch, and the tray has an area substantially equal to the area of the machine in order to prevent the outflow of water from the machine.

[0005] A second drawback is that such a device does not provide any indication about the type of failure which occurred in the machine, i.e. the repair technician has no possibility of understanding from where the water in the tray has come.

[0006] A further drawback, which is not strictly related to the operation of the device, is the difficulty in checking the correct operation thereof since the manufacturing and testing phases. In fact, the location of the float at the bottom of the machine makes its manual activation quite difficult once that the tray has been placed in position. Moreover, there is the risk that the float is damaged or moved while mounting the tray, so that it is made inoperative after a possible previous check.

[0007] The only type of check presently available consists of pouring water into the tray to simulate a leak. It is clear that such a procedure is unpractical and time-consuming, since the water must then be removed and drained out. Therefore this type of check is not carried out systematically on the production line but only on some sampled specimens.

[0008] Therefore the object of the present invention is to provide a flood-preventing device for a washing machine or dishwasher suitable to overcome the above-mentioned drawbacks.

[0009] This object is achieved by means of a device including a tray divided into two portions by a dividing wall, with the float arranged astride said wall. Other advantageous features are disclosed in the dependent claims.

[0010] Reference will be made hereafter specifically to a dishwasher, while being clear that what is said can be applied also to a washing machine or any other kind of similar machine.

[0011] A first advantage of the device according to the present invention is that of a shorter intervention time since the tray, while still covering the whole area of the machine, is divided into two regions, preferably a larger one and a smaller one, and therefore the level for the activation of the microswitch is reached faster especially in case of filling of the smaller region.

[0012] A second important advantage of this partition of the tray is the possibility for the repair technician to understand where the failure may be, depending on which portion of the tray has received the water.

[0013] Still another advantage of the present device is that of allowing a simple and safe way for a systematic check of the working thereof by means of a hole formed in the tray at the central portion of the float, said hole having obviously a rim higher than the tray rim. This results in a dramatic increase in the reliability of said device without requiring substantial modifications to achieve said further function, whereby the manufacturing costs and procedures remain substantially unchanged.

[0014] These and other advantages and characteristics of the device according to the present invention will be clear to those skilled in the art from the following detailed description of an embodiment thereof, with reference to the annexed drawings wherein:

Fig. 1 is a top plan view of the tray of the device according to the invention;
Fig.2 is an enlargement of frame C of Fig.1 showing in detail the further elements of the device; and
Fig.3 is a sectional view taken along line E-E of Fig. 2.

[0015] With reference to said figures there is seen that the device includes a tray R, to be arranged at the bottom of a dishwasher for example, in which there is internally formed a dividing wall W shaped so as to divide the tray into a smaller region A and a larger region B.

[0016] Region A is substantially Ω-shaped with an elongated "foot" on the right and in the center of the circular portion has a hole H with a raised rim higher than the tray rim, as previously mentioned.

[0017] Region B obviously has a shape complementary to region A, and has a pair of cylinders P symmetrically arranged with respect to said hole H. In these cylinders there are screwed screws S which secure a lid G on which there is mounted a microswitch M protected by a suitable cover N.

[0018] A float F of substantially rectangular shape is shaped so as to be arranged astride wall W, whereby a central portion (FA) of the float extends on the circular portion of region A and the lateral portions (FB) on the

adjacent portions of region B.

[0019] As clearly seen in Fig.3, the float has through holes to slip it on cylinders P so that it is retained by lid G, a bottom groove to receive the dividing wall W, as well as a central recess for hole H. The central portion FA of the float is raised and reaches close to microswitch M, lid G following the shape of the float.

[0020] Tray R is capable of collecting in region B a possible water leak from any hydraulic component of the machine, such as the washing pump, a duct, etc. whereas if the water overflows from the tank due to failure of the level pressure switch or for other causes (e.g. failure of a valve), the water will be conveyed to region A by a duct.

[0021] It is clear that in the first instance the activation of the device will take place thanks to the push on the lateral portions FB of the float and it will require more time than in the second instance, in which region A of the tray fills up quickly since it is much smaller than region B and the push on the float will occur in the central portion FA.

[0022] The presence of hole H formed in tray R, preferably at the center of the float, allows to check the working of the flood-preventing device by simply mechanically pushing upwards the float with any actuator or even a simple air jet. This type of check can easily be made automatic and carried out directly on the production line in a systematic manner, that is on 100% of the machines.

[0023] It is clear that the above-described and illustrated embodiment of the device according to the invention is just an example susceptible of various modifications. In particular, the shape of the dividing wall W may be somewhat changed, same as the blocking and guiding means for the float and the shape thereof, as long as the float is suitable to be arranged so that it is raised by the water flowing in any of the two regions of the tray.

[0024] Furthermore it is obvious that for a greater precision in the diagnosis of the failure there can be provided a partition of tray R into more than two regions by means of more dividing walls, as long as the inflow of water in any of these regions causes the activation of the device.

Claims

1. Flood-preventing device for dishwasher, washing machine or the like, including a bottom tray (R), suitable to collect a possible water leak from any component of the machine, a float (F) in said tray (R), and a microswitch (M) which can be activated by said float (F) as soon as the water collected in the tray (R) causes the rising thereof, **characterized in that** the tray (R) has at least one internal dividing wall (W) which divides it into at least two regions (A, B) and the float (F) extends astride said dividing wall (W) so that it is raised by the water collected in either one of said regions (A, B).

2. Device according to claim 1, **characterized in that** a first smaller region (A) is substantially Ω-shaped with an elongated "foot" and the float (F) is substantially rectangular with a central portion (FA) extending on the circular portion of said first region (A) and lateral portions (FB) extending on the adjacent portions of a second region (B).

3. Device according to claim 1 or 2, **characterized in that** the tray (R) has at the float (F) a hole (H) with a raised rim higher than the rim of the tray (R).

4. Dishwasher, washing machine or the like **characterized in that** it includes a flood-preventing device according to one or more of the preceding claims.

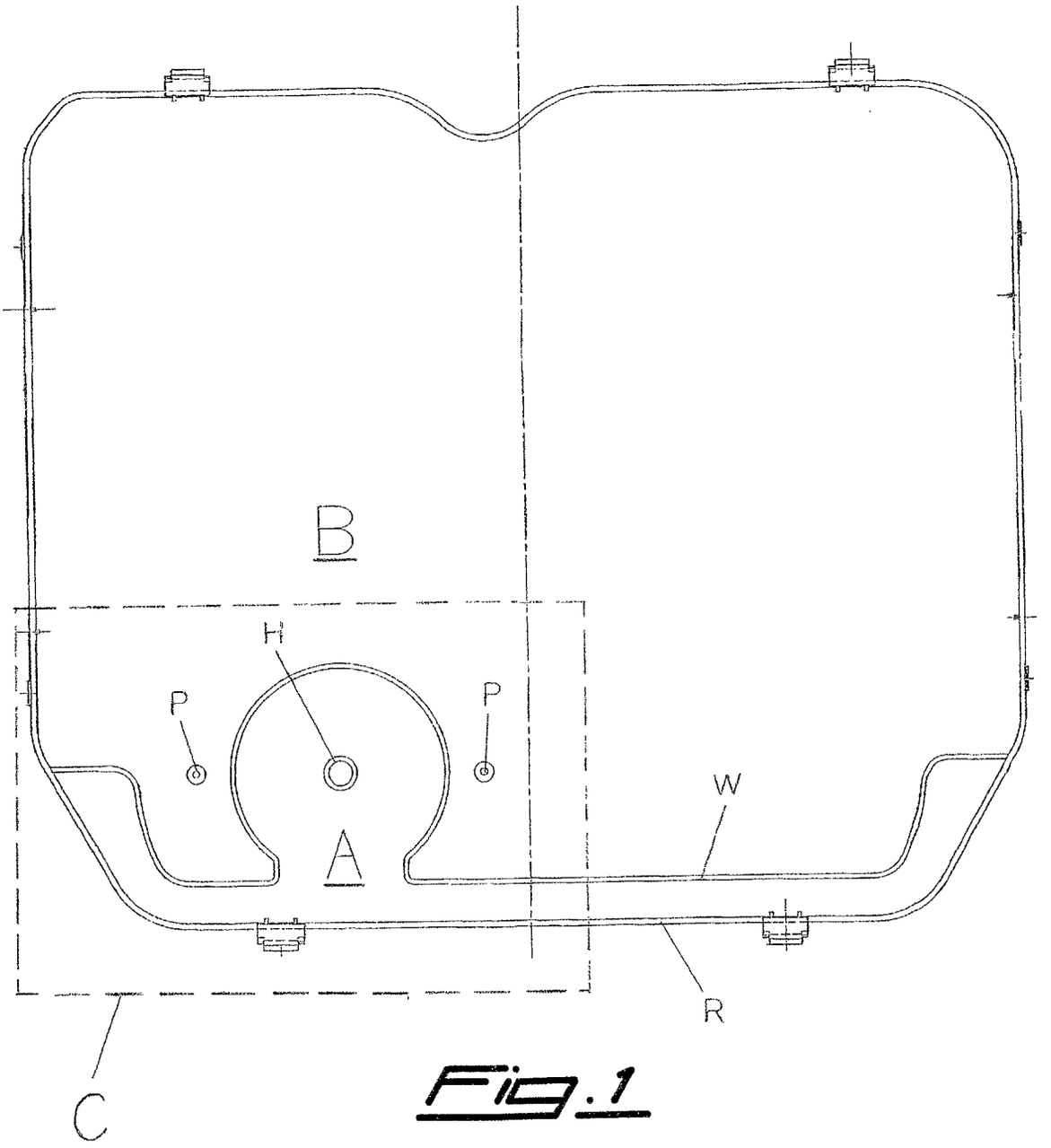

Fig.1

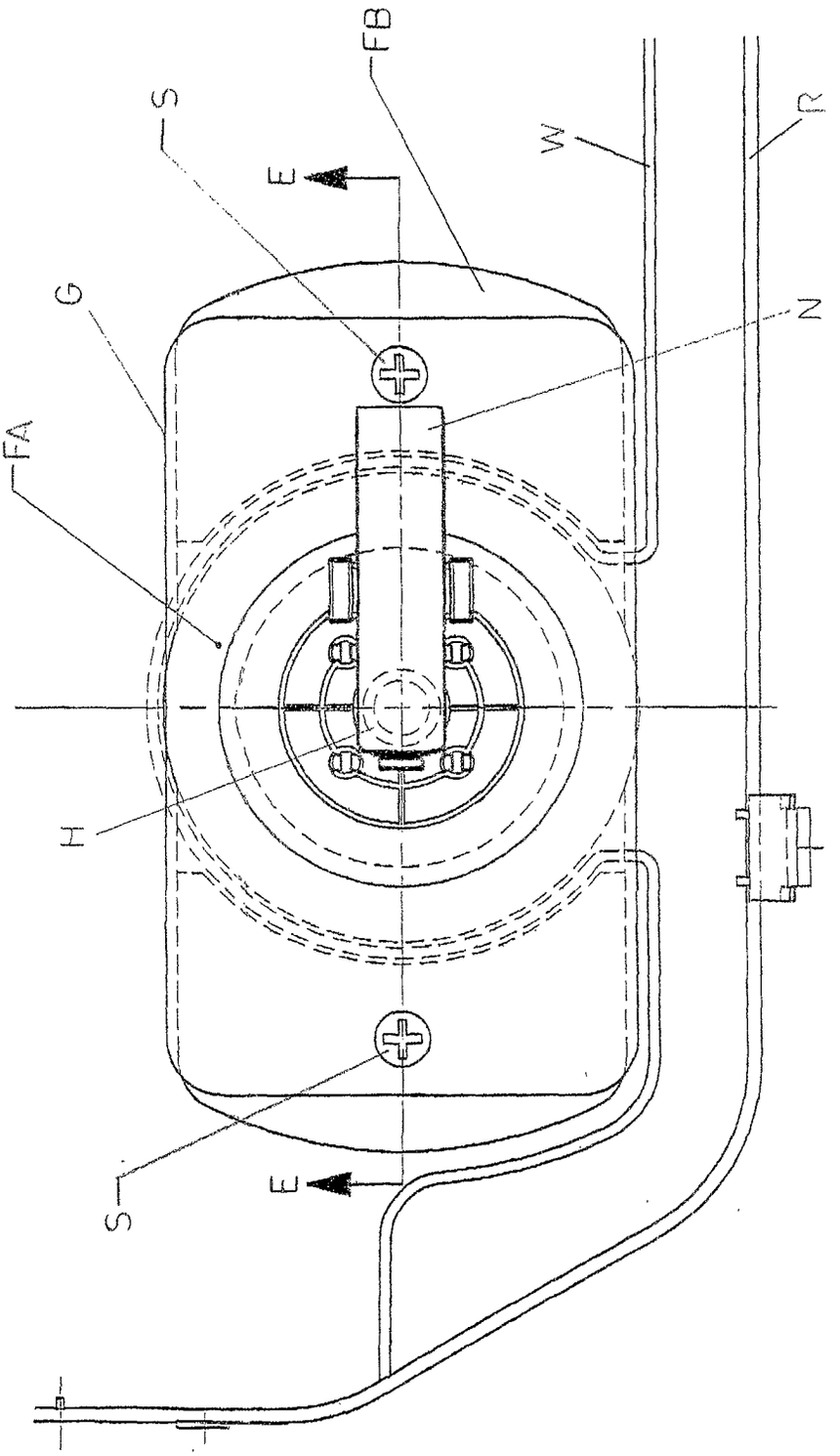

Fig.2

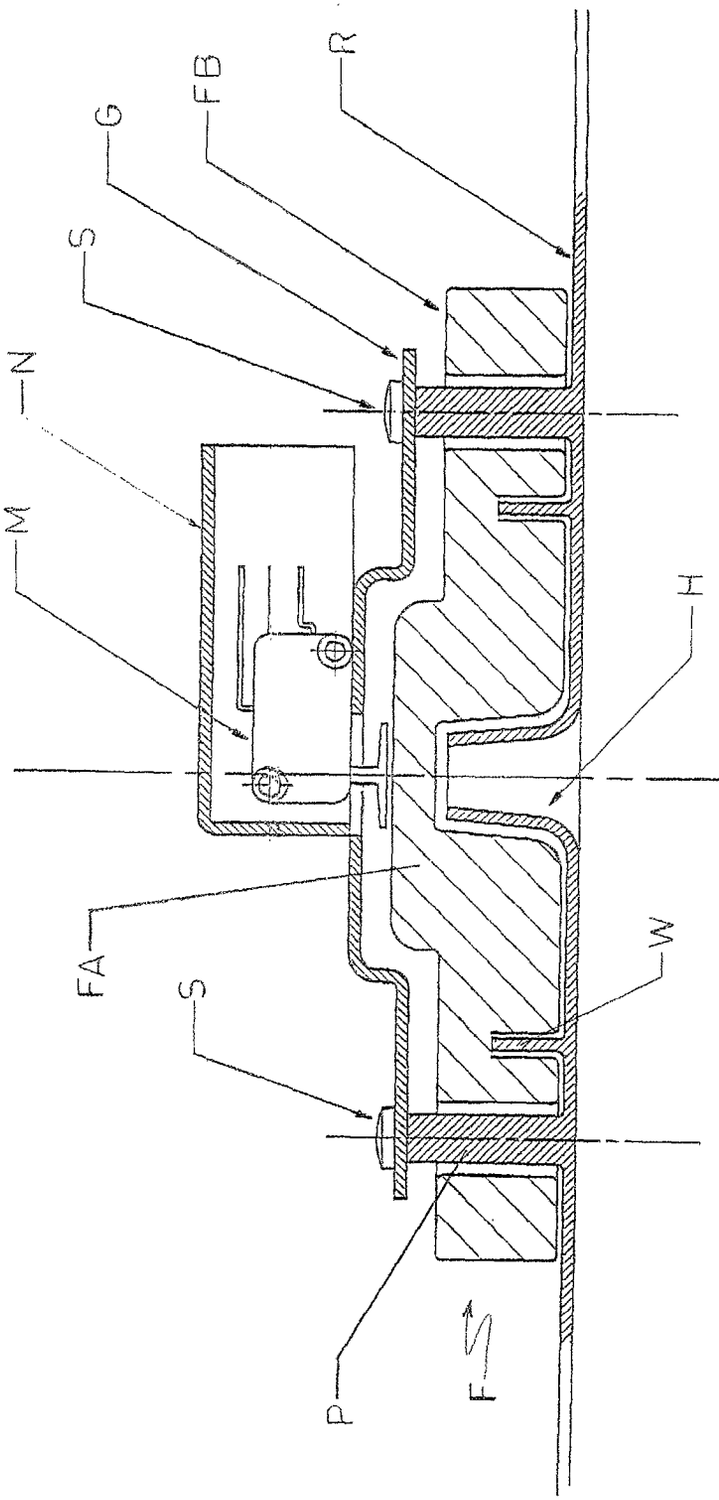

Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 02 42 5184

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.7)
A	DE 24 01 888 A (LICENTIA PATENT-VERWALTUNGS-GMBH) 17 July 1975 (1975-07-17) * claim 1; figures *	1	D06F39/08 A47L15/46

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

D06F
A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	12 August 2002	Courrier, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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E : earlier patent document, but published on, or after the filing date
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 02 42 5184

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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12-08-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 2401888 A	17-07-1975	DE 2401888 A1	17-07-1975

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