(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 401 734 A2**

# (12) EUROPEAN PATENT APPLICATION

(21) Application number: **90110581.7**

(51) Int. Cl.5: **D06F 37/30**

(22) Date of filing: **05.06.90**

(30) Priority: **09.06.89 IT 6747189**

(43) Date of publication of application:
**12.12.90 Bulletin 90/50**

(84) Designated Contracting States:
**DE ES FR GB**

(71) Applicant: **INDESIT S.r.l.**
**Via 1. Maggio, 8**
**I-10040 Rivalta (TO)(IT)**

(72) Inventor: **Schena, Giuseppe**
**Via S. Francesco di Sales**
**I-10064 Pinerolo (TO)(IT)**

## (54) Washing machine basket positioning device.

(57) The present invention refers to a device for positioning the basket of a top loading washing machine, comprising a washing cycles timer and means which allow the slow rotation of the basket and its stopping when the predefined position is reached. The positioning of the basket is done automatically at the end of a washing cycle.

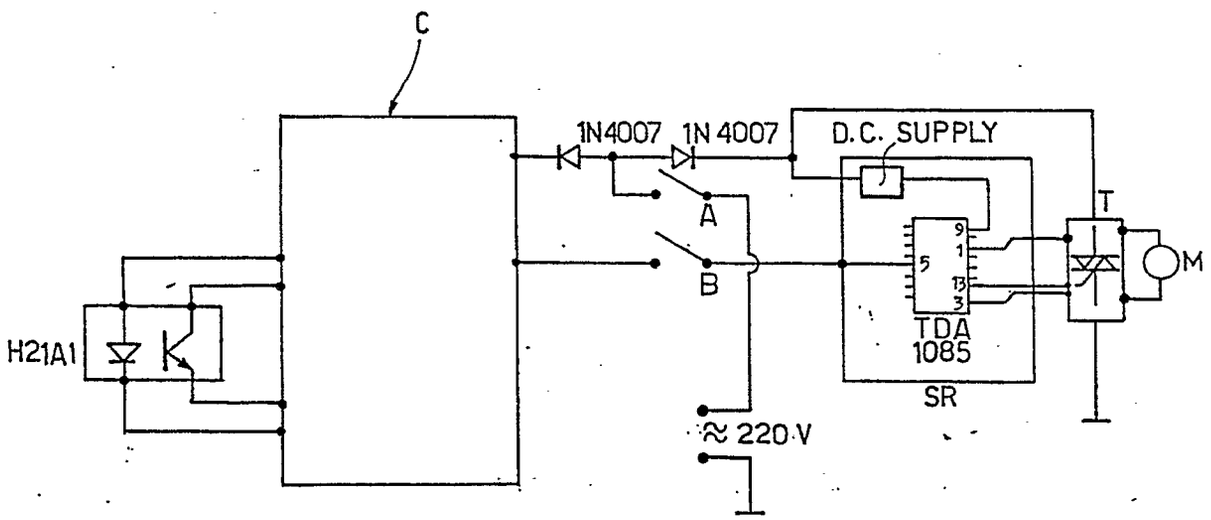


FIG. 1

EP 0 401 734 A2

# WASHING MACHINE BASKET POSITIONING DEVICE

The present invention refers to a device for the basket automatic positioning in a top loading washing machine.

Top loading washing machines have the problem that, at the end the washing or if the machine is stopped during the washing cycle for loading additional laundry to wash, it is necessary to position the basket so that its opening is accessible. This is done manually by the user but it is an awkward operation in that the weight is usually unevenly distributed causing the basket to resist rotation. To obviate this problem, the machine can be equipped with a device, such as a push-botton, for starting by hand a slow rotation of the basket; when the basket has reached the desired position, the button is released by the user. This solution requires that the user must be able to observe the basket movement; that means the basket must be turned with the lid open or the lid must be transparent.

In the first case there is a danger for the user, because the motor is left running with the lid open; in the second one the machine aesthetic is not good; furthermore a transparent lid is fragile, if made of glass, and easily scratched if made of plastic.

In any case, the operation requires the user attention, for releasing the button at the right time.

The basket positioning can also be realized using a device comprising a push-botton allowing the basket to rotate slowly, a circuit which stops the basket rotation when it reaches the desired position and a warning light advising that said position is reached. In this way the user can work with the lid closed and it can be not transparent. Nevertheless it is required the attention of the user on the advising warning light and he must keep the botton pressed until the warning light comes on; this is an awkward operation if the user hands are engaged, for instance to sustain a basin where collect the washed laundry.

The aim of the present invention is to oviate the described drawbacks.

For this reason it is the subject of the present invention a device for positioning the basket in a predefined position, suitable for top loading washing machines, of the type comprising a timer which controls the execution of the various washing cycles, means which allow the basket to rotate slowly, means for producing a stop signal when the basket has reached the predefined position and an electronic circuit sensitive to said stop signal for stopping the basket, characterized in that it comprises at least one electric contact operated by the timer, to achieve the basket positioning in the desired position at the end of at least one washing cycle.

The present invention will be clear from the following description of an embodiment given as a not limiting example and with reference to the annexed drawings, where:

- figure 1 shows a partial block diagram of the electric circuit of a dishwashing machine according to the invention;
- figure 2 shows the dial of a timer controlling the various washing cycles of a washing machine, preset for three independent washing cycles (respectively from 1 to X, from 7 to Y, from 13 to Z);
- figure 3 is a time diagram showing when the positioning device is enabled during a washing cycle.

In figure 1 there is shown with M the motor which drives the basket rotation; with T there is shown a Triac which controls the motor rotation speed; with SR there is indicated a speed control unit, which controls the rotation speed of motor M via said Triac T. The control unit SR comprises a supply circuit (DC SUPPLY) and a TDA 1085 integrated circuit by Motorola Semiconductors.

The supply voltage of the 220V A.C. mains is supplied to the two terminals indicated in the figure with 220 V.

With H21A1 there is indicated a photoelectric coupler by General Electric, comprising a phototransistor and a light-emitting diode.

With C there is indicated an electric module, sensitive to a stop signal coming from the coupler H21A1, which stops the washing machine basket movement. An electronic circuit similar to the one contained into said module C is described in the Italian Patent n. 1119477.

With A and B there are indicated two contacts operated by two cams being part of the timer controlling the various washing cycles, not shown in figure 1. When the cams enable the two said contacts, A connects an end of the mains to the anodes of two diodes 1N4007 while B connects pin 5 of TDA 1085 to the electric module C.

To said module C there is connected the catode of one of the two diodes 1N4007; on the contrary the catode of the other diode 1N4007 is connected both to the SR unit supply circuit, and to the Triac T.

The described circuit operates as follows.

The washing machine is equipped with a timer which controls the execution of the various washing cycles (the dial of said timer is shown in figure 2).

Said timer shows inside some cams which close the electric contacts controlling the various functions performed by the washing machine. In

the described device the timer includes two cams which are activated in the final stage of the washing cycle, for instance about 1.5 minutes before its end; supposing that the complete washing cycle is realized by 20 steps of the cams, for 18 of them they will be in the neutral position, at the 19th they will be enabled and at the 20th they will return in the neutral position.

At the activation of the two cams corresponds the closure of the two electric contacts A and B. Triac T, electronic module C and coupler H21A1 receive voltage via the diodes 1N4007; a current also is supplied to pin 5 of TDA 1085 and the motor starts to rotate slowly, and so the basket of the washing machine.

To the basket is mechanically coupled a cam with a nose section which, when the opening of the basket is at the top, intercepts the beam of light between the light-emitting diode and the phototransistor, which are parts of the photoelectric coupler H21A1. At this stage, the phototransistor is disabled producing a stop signal and the electronic module C, sensitive to said stop signal, stops the basket movement. Afterwards the two cams return in the neutral position, the two contacts A and open and the circuit is again in the initial operating conditions.

At this stage, consequently, the washing machine has ended the washing cycle and on the panel of the machine, in the timer dial (figure 2), the knob has reached the position X (or Y or Z, depending on the type of cycle selected at the start of the washing), corresponding to the 20th step of the two described cams. At this moment the basket is positioned towards the top, without that the user should control a warning light and press a button.

On the dial represented in figure 2 it is also possible to indicate the position (W) corresponding to the 19th step of the two cams which enable the contacts A and B of the device.In this way the user can position the basket with the opening at the top, independently of the stage of the washing cycle in which the machine was.

Supposing that, with the cycle already started, the user want to load additional laundry to wash, it is sufficient to switch the machine off through the general switch, to rotate the handle in the position W and switch on again, to introduce the additional laundry, switch off, turn the knob to the position corresponding to the stage of washing where the machine was before the interruption and switch on again definitively the machine through the general switch. It is obvious that the position corresponding to the 19th step of the two cams can be marked on the timer dial for all the eventual independent washing cycle that the machine can have (W, K and J of figure 2).

It is also obvious that many other changes can be made to the described device, without departing from the novelty principles inherent to the inventive idea.

## Claims

1. Device for positioning the basket in a predefined position, suitable for top loading washing machines, of the type comprising a timer which controls the execution of the various washing cycles, means (M, T, SR) which allow the basket to rotate slowly, means (H21A1) for producing a stop signal when the basket has reached the predefined position and an electronic circuit (C) sensitive to said stop signal for stopping the basket, characterized in that it comprise at least one electric contact (A) operated by the timer, to achieve the basket positioning in the desiredposition at the end of at least one washing cycle.

2. Device according to claim 1, characterized in that said electric contact (A) is one of the electric contacts of the timer which controls the various washing cycles.

3. Device according to one of the preceding claims, characterized in that it comprises a cam inside said timer which is enabled only in the final stage of the washing cycle and in such phase it determines the closure of the electric contact (A) which enables the working of the means (M, T, SR, H21A1, C) for achieving the basket positioning in the desired position.

4. Device according to one of the preceding claims, characterized in that said cam, besides enabling the contact (A) which achieves the positioning of the basket in the desired position, controls other functions of the machine.

5. Device according to claim 1, characterized in that it comprises two electric contacts (A, B) to obtain the positioning of the basket in the desired position, the first one (A) controlling the supply of the means (M, T, SR) which allow the basket to rotate and the electronic circuit sensitive to the stop signal, the second one (B) enabling the slow rotation of the basket.

6. Device according to claim 5, characterized in that the two electric contacts (A, B) are inside the timer which controls the various washing cycles.

7. Device according to the preceding claim, characterized in that the two electric contacts (A, B) are enabled by two cams being part of the timer which controls the various washing cycle.

8. Device according to the preceding claim, characterized in that said two cams, besides commanding the contacts (A, B) which achieve the positioning of the basket in the desired position, control other functions of the machine.

9. Device according to claim 1, characterized in that the timer shows at least one predetermined position (W), for which on the timer dial there is a mark (W) for the user which indicates the function of the basket automatic positioning in a predefined position and in that by selecting such position (W) said electric contact (A) is operated so to enable the means (M, T, SR, H21A1, C) for achieving said positioning.

10. Device according to claim 9, characterized in that there are provided means allowing the timer to be turned to said predetermined position (W) and to obtain the basket automatic positioning in a predefined position, whatever the washing cycle stage was.

11. Device according to claim 1, characterized in that, if the timer provides for more independent washing cycles (1-W, 7-Y, 13-Z), there are provided more predetermined positions (W, K, J), in whose correspondence said electric contact (A) is operated so to enable the means (M, Y, SR, H21A1, C) for achieving the basket automatic positioning in a predefined position.

12. Device according to claim 5, characterized in that, if the timer provides for more independent washing cycles (1-W, 7-Y, 13-Z), there are provided more predetermined positions (W, K, J), in whose correspondence the electric contacts (A, B) are operated so to enable the means (M, Y, SR, H21A1, C) for achieving the basket automatic positioning in a predefined position.

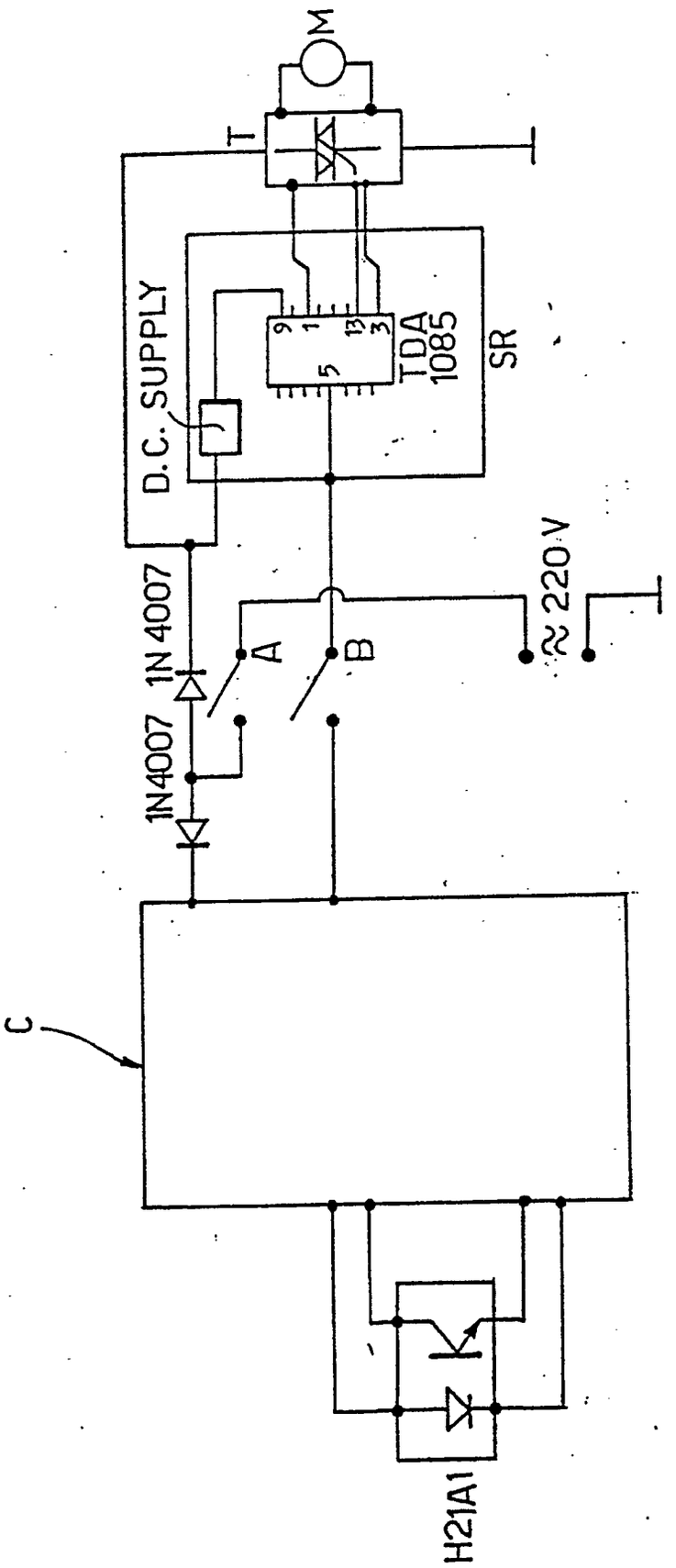


FIG. 1

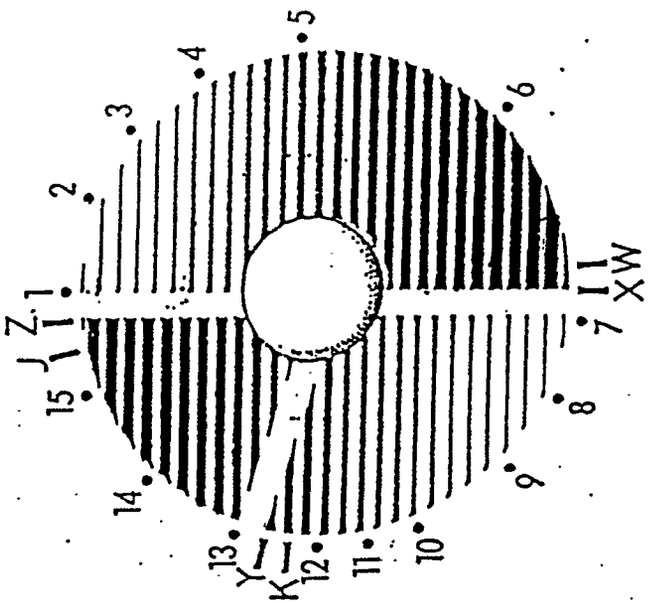
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Z
J
K
Y
XW

FIG. 2

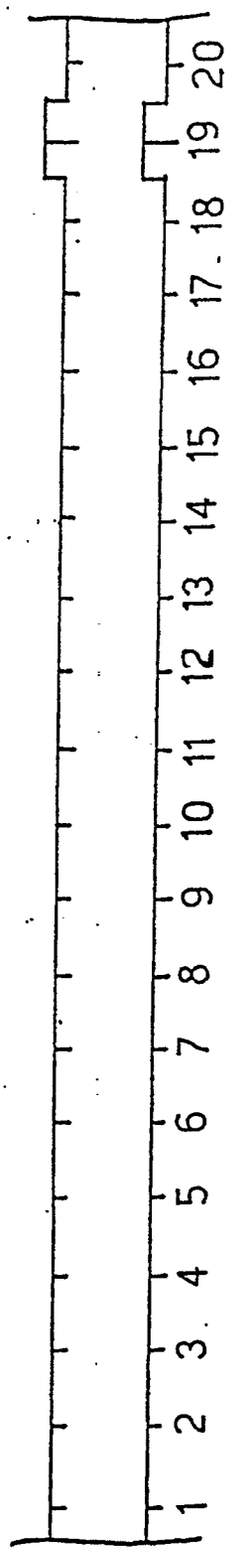
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

FIG. 3