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(54) **Circuit for an electric appliance**

(57) The present invention refers to a circuit for an electric appliance.

A circuit according to the invention comprises a control device (6) and a transformer (4) connected with electric current supply connectors (1, 2) for providing controlled functional units of the electric appliance with current, wherein a switch (5) on one of the electric current supply connectors (1, 2) can cut off the transformer (4) from the electric current supply connectors (1, 2). Said circuit being characterised in that said switch (5) is a monostable switch.

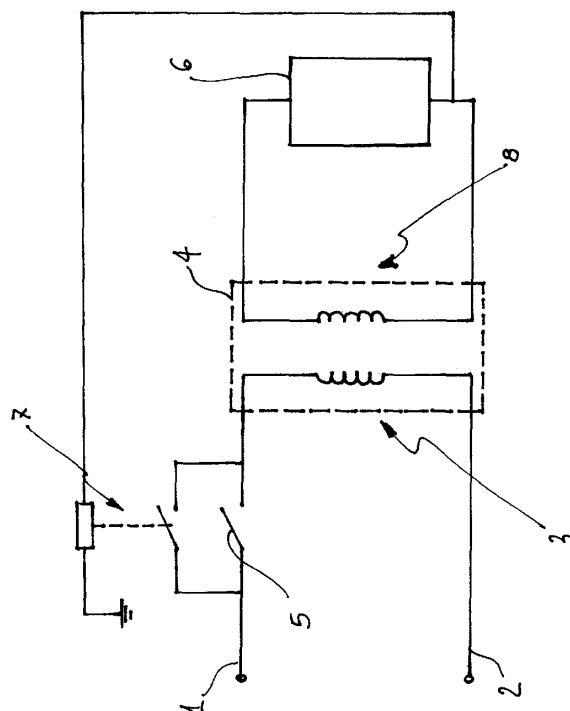


Fig. 1

Description

[0001] The present invention refers to a circuit for an electric appliance.

[0002] It is known that many electric appliances, for example household appliances, comprise electronic controls that supervise all the appliance operations. Such electronic controls must be maintained ready for being able to react to inputs. For this reason appliances are constantly powered with a stand-by electric current that is determined by the power use of the implemented electronic circuits and the losses of the power transformer.

[0003] Normally the power consumption due to the stand-by current is relatively low (about 1 Watt) but it can result in a considerable consumption in connection with a large number of electric appliances and with the number of hours each appliance is kept in a stand-by condition during its whole operative life.

[0004] The easiest solution to the problem of avoiding stand-by power consumption in an electric appliance consists in providing the appliance electronic circuit a main switch that allows the appliance to be powered only when the user turns said switch on.

[0005] Such solution is however disadvantageous because such switch not only requires the user to push it for activating the appliance but it also requires a further push to switch the power off. Therefore, for obtaining the minimum stand-by power consumption in an appliance having a main power switch, the user has not only to be able to reach the appliance when it has finished working but he/she has also to remember to turn the main switch off. However it is known that users often forget to switch the appliance off at the end of the machine operations leaving the appliance in a stand-by condition for a relatively long period thereby causing a waste of electrical energy.

[0006] A further solution to the problem of reducing an appliance stand-by power consumption is known from the American Patent No. US 7,045,917. Such Patent discloses a circuit arrangement for an electric appliance having a control device and a power supply unit connected to an electric current supply connector for providing controlled functional units of the electrical appliance with current. The electrical power supply connector is provided with a piezo switch that cuts off the power supply unit from the electric current supply connector. The piezo switch, which is open in a non-activated state, is connected with a power semiconductor circuit which, when the piezo switch is operated, connects the control device for activation with the electric power supply connector.

[0007] A drawback of the circuit arrangement described in US 7,045,917 consists in the presence of a semiconductor circuit that does not grant an absolute electrical isolation of the power supply unit from the electric current supply connector when the piezo switch is in an open state. This can cause an electrical current consumption even when the appliance is in a stand-by condition.

[0008] The aim of the present invention is therefore to solve the noted problems and thus providing a circuit for an electric appliance that eliminates the current consumption when the appliance is in a stand-by condition.

[0009] Another object of the present invention is to provide a circuit for an electric appliance that allows the latter to be promptly activated without the need of maintaining its electronic circuits constantly powered.

[0010] A further object of the invention is to simplify known circuit arrangement for electric appliances reducing the number of circuit components.

[0011] 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.

[0012] The accompanying drawing, which is included to provide a further understanding of the invention and is incorporated in and constitute a part of this specification, illustrates a possible embodiment of the invention and together with the description serve to explain the principles of the invention.

[0013] In the drawings:

[0014] Figure 1 shows schematically a circuit for an electric appliance according to the invention;

[0015] With reference to figure 1, the circuit according to the invention comprises a pair of connectors 1 and 2 powering a primary side 3 of a transformer 4. Said transformer 4 provides controlled functional units of an electrical appliance with current.

[0016] One of the connectors 1, 2, is provided with a switch 5 that allows the user to activate and cut off the primary side 3 of the transformer 4 from the connectors 1, 2.

[0017] A secondary side 8 of the transformer 4 is electrically connected to a control device 6 that supervises all the appliance operations including the supply of electrical current. A relay 7, arranged in parallel with the switch 5, is connected and activated by the control device 6 in order to by-pass the switch 5.

[0018] The switch 5 is a monostable switch, i.e. a switch having a single stable state and a unstable state that requires constant energy to sustain. The stable state is represented by the open position of the switch 5 while the unstable state consists in its closed position.

[0019] When the electrical appliance is not in use no electrical current passes through the circuit of figure 1. When a user wants to turn the electrical appliance on he/she has only to activate the switch 5 moving it from its stable position (open position) to its unstable position (closed position). In the short time the switch 5 is in the closed position the primary side 3 of the transformer 4 is powered and an electrical current flows in the secondary side 8 powering the control device 6. The control device 6 then, as feedback, activates the relay 7 that short-cir-

cuits the terminals of the switch 5 by-passing it before it moves from the unstable position to the stable position, i.e. before the electrical flow in the primary side 3 is interrupted.

[0020] After the intervention of the relay 7 a current supply to the primary side 3 is maintained and therefore the electrical appliance can work regularly. In order to cut off the transformer 4 and the control device 6 from the electric power supply connectors 1, 2, the control device 6 can activate again the relay 7 that interrupts the by-pass of the switch 5. Since the latter is in its stable position, i.e. in an open state, the power supply is interrupted.

[0021] The switch 5 can be in the form of a push button or, in case the electrical appliance has a door with a locking mechanism, as in case of a washing machine or an oven, such switch 5 can be integrated in the locking mechanism such that, when the user opens the appliance door acting on the locking means, the control device is activated and the electric appliance is brought in a "ready to be used" state. It is also possible to provide the switch 5 and the relay 7 integrated in a single electrical component that can be activated both manually by a user both mechanically and/or electronically by the feedback of the control device 6.

[0022] Conclusively it can be stated that the circuit according to the invention allows to eliminate any electrical power consumption in an appliance when the latter is switched off.

ing a door having a locking mechanism associated to said switch (5).

Claims

1. A circuit for an electric appliance having a control device (6) and a transformer (4) connected with electric current supply connectors (1, 2) for providing controlled functional units of the electric appliance with current, wherein a switch (5) on one of the electric current supply connectors (1, 2) can cut off a transformer (4) from the electric current supply connectors (1, 2), **characterised in that** said switch (5) is a monostable switch.
2. A circuit according to claim 1 **characterised by** comprising a relay (7) arranged in parallel with said switch (5).
3. A circuit according to claim 2 wherein said relay (7) is activated by the control device (6).
4. A circuit according to claim 2 or 3 wherein the relay (7) and the switch (5) are integrated in a single electrical component.
5. An electrical appliance comprising a circuit according to claim 1 to 4.
6. An electrical appliance according to claim 5 compris-

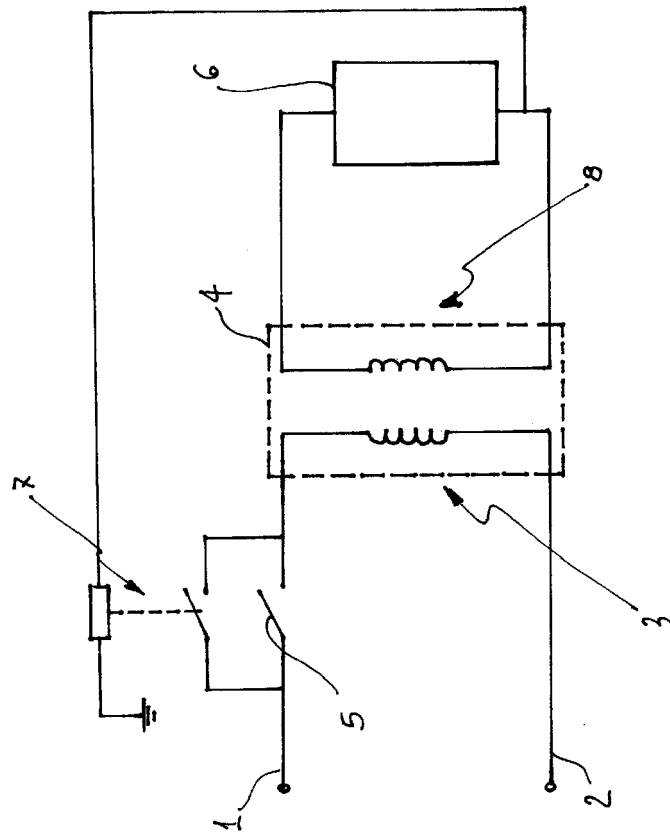


Fig. 1



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 11 5482

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Place of search		Date of completion of the search	Examiner
Munich		16 November 2006	Drabko, Jacek
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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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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