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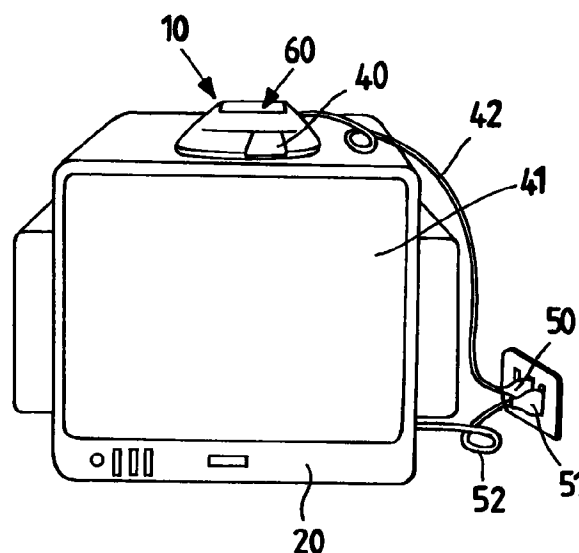
(54) **Lighting device of automatic switch-on and switch-off type**

(57) An electricity-operated device (10) for illuminating with suffused light the room in which a television set (20) is viewed.

The lamp (60) with which the device (10) is provided is designed and constructed to reduce viewing fatigue while viewing the television set (20).

It can be switched on and off manually or automatically, following activation and, respectively, deactivation of the television set (20).

Fig. 2



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Description

This invention relates to a lighting device of automatic switch-on and switch-off type.

Interior lighting devices and lamps of various types and shapes are known, for location on a television set, on large or small tables, on furniture or directly on the floor (standard lamps) to illuminate the environment in which a television set is viewed, this viewing being notably more pleasant in a slightly illuminated room.

In this respect, an indirect suffused light, formed to reduce viewing fatigue due to excessive contrast between the screen brightness and the darkness of the environment, results in clearer and more comfortable viewing of television programs compared with direct intense lighting.

However, lamps of the aforesaid type have to be controlled manually by the user while viewing the television set, in the sense that they have to be switched on by a switch located along the feed cable or by remote control, when the external light is insufficient to illuminate the environment or when the same external light creates annoying reflections and has to be shut out.

In the same manner they have to be switched off manually by the user on switching off the television set or when the external light is sufficient for viewing television programs (without causing annoyance).

An object of the present invention is to provide a lighting device with automatic switch-on which obviates the aforesaid drawbacks by enabling a lamp to be automatically switched on following the switching-on of the television set, and be automatically switched off when the television set itself is switched off.

A further object of the present invention is to provide a lighting device which allows the lamp to be manually switched on independently of the state of operation of the television set and which prevents automatic lamp switch-on when the illumination in the environment in which the television set is installed is sufficient.

A further object of the invention is to provide a lighting device of automatic switch-on and switch-off type which is of simple and economical construction, without having to use complicated techniques or costly raw materials.

These and further objects are attained by an lighting device of automatic switch-on and switch-off type in accordance with claim 1, to which reference should be made for brevity.

Advantageously the lighting device of the present invention is suitable for positioning on any television set and is simply connected to the 230 volt a.c. mains by a feed cable with a standard plug, with which it is provided.

It also comprises a lamp of low light intensity, which illuminates the environment in which it is located with indirect suffused light. The intensity, the spectrum and the radiation diagram of the lamp have been carefully chosen to illuminate the environment in which the televi-

sion set is located such as to achieve a reduction in viewing fatigue when viewing television programs.

Alternatively, the lighting device of the invention can be inserted into the television set, there being provided in the cabinet of the television set an aperture of geometrical dimensions substantially equal to or slightly greater than the geometrical dimensions of the device lamp, so that the light is emitted from the bottom upwards into the surrounding environment.

The lamp is switched on automatically following television set switch-on and is switched off automatically when the television set is switched off. Specifically, the lamp is switched on when the television set passes from the stand-by state (when the screen is off and the television set receives only digital signals from the remote controller) to the normal operating state (in which the screen is on and the television set operates normally to receive programs). The lamp is switched off automatically when the television set is switched to the stand-by state by the remote controller, or when the television set is switched off completely by the main switch, which in this manner suspends current delivery.

The lighting device is provided with a pushbutton for manual switch-on and switch-off, a very low intensity light for night illumination, and finally an environmental light sensor which prevents automatic lamp switch-on when the environment in which the television set is installed is sufficiently illuminated.

Further objects and advantages of the present invention will be apparent from the ensuing description and from the accompanying drawings, which are provided by way of non-limiting example and in which:

Figure 1 is a perspective view of a lighting device of automatic switch-on and switch-off type according to the present invention;

Figure 2 shows a possible method of positioning the lighting device of Figure 1 on a television set;

Figure 3 shows (by way of non-limiting example) a possible embodiment of a pick-up coil for the electromagnetic field which is generated by the deflection coils for the electronic beam propagated within the cathode ray tube;

Figure 4 is a block diagram of a lighting device of automatic switch-on and switch-off type according to the present invention, of inductive coupling type; Figure 5 shows the electrical schematic of a particular embodiment (by way of non-limiting example) of a lighting device according to the present invention, of inductive coupling type;

Figure 6 shows a multicore feed cable for a lighting device of the present invention, of absorbed current type, terminating in a block incorporating a plug and socket;

Figure 7 shows schematically a 50 Hz current transformer used in a lighting device of the present invention, of absorbed current type;

Figure 8 is a block diagram of a lighting device of the present invention, of absorbed current type;

Figure 9 is a block diagram of a lighting device of the present invention, of code reception type.

In the aforesaid figures, the reference numeral 10 indicates overall a lighting device of automatic switch-on and switch-off type according to the present invention, and 60 indicates at least one low or medium light-intensity lamp (possibly positionable in different seats, preferably on the rear of the device 10), which provides suffused light to illuminate the environment in which a television set 20 is located such as to reduce viewing fatigue when viewing television programs, by virtue of a carefully chosen intensity, emission spectrum and diffused electromagnetic radiation diagram.

The reference numeral 42 indicates a feed cable for the lighting device 10, enabling the device 10 to be connected to the 230 volt a.c. mains supply by the plug 50, 40 indicates a pushbutton for manually switching-on the lamp 60, and 90 indicates at least one seat in which a very low intensity light 90A can be located for night illumination. The seat 90 can be provided either on the front of the device 10 or on the rear, within the housing in which the lamp 60 is located. The said light 90A provides very low-level lighting to illuminate the darkness of the room in which the device 10 is installed, to allow movement within this room during the night if arriving from other poorly lit rooms, without having to switch on the main room light.

The reference numeral 70 indicates an environmental light sensor, which can be provided on the front of the device 10 in order to prevent automatic switch-on of the lamp 60 during the day, when the room in which the device 10 is installed is strongly illuminated.

The reference numeral 41 indicates the television screen, 52 indicates the feed cable of the television set 20 and 51 indicates the plug by which said television set 20 is connected to the electricity mains.

Figures 3, 4 and 5 relate to a lighting device 10 according to the present invention, of inductive coupling type. The device in question is provided with an electronic circuit which controls the switching-on and switching-off of the lamp 60 on the basis of information transmitted by an inductive sensor, such as a pick-up coil 11, possibly in the form of a printed circuit 32, which intercepts the electromagnetic field generated by the electronic beam deflection coils mounted on the cathode ray tube of the television set 20. By monitoring the cathode ray tube ignition, it is hence possible to distinguish the state of normal operation of the television set 20 from the stand-by state (in which the cathode ray tube is extinguished) and control the switching-on of the lamp 60.

With particular reference to the block diagrams of Figures 4, 8 and 9, the reference numerals 12, 112 indicate two amplification blocks for a determined frequency signal, each connected to an electronic threshold circuit for signal detection, 15, 115 indicate two signal logic processing circuits, 18, 118, 128 indicate three electronic driver circuit blocks for switching-

on and/or switching-off the lamp 60 and the night light 90A, and 13, 13A, 13B indicate three circuit blocks for powering the device 10.

Finally, 111 indicates a transformer block for 50 Hz frequency current, and 211 indicates an infrared receiver apparatus of known type.

The full lines on the block diagrams indicate the directions along which the digital and/or analog information travels between the various blocks, the arrows indicating the direction of this information.

The dashed lines on the block diagrams originate from the power circuit blocks 13, 13A, 13B and indicate the various blocks which are powered by the electricity mains supply.

With particular reference to Figures 6 and 7, the reference numeral 32A indicates a plug to be inserted into the electricity supply mains, 31 indicates a socket for receiving the plug 51 of the television set 20, 52D indicates one of the two supply wires of the television set 20, 52B indicates the other wire, and 42A indicates a multicore feed cable for the device 10.

The lighting device 10 of the present invention is provided with an electronic circuit controlling the switching-on and switching-off of the lamp 60 in relation to the switching on and off of the television set 20 and in relation to the illumination of the room in which the television set is located.

Said electronic circuit comprises an inductive sensor or a microcontroller, which are able to check whether the television set 20 is switched on or not.

An inductive sensor can hence be used to pick up the electromagnetic field generated by the electronic beam deflection coils, which are mounted on the cathode ray tube of the television set 20. By monitoring the switching-on of the cathode ray tube, the operating state of the television set can be distinguished from its stand-by state (when the cathode ray tube is deactivated) and in this manner to control the switching-on of the lamp 60 (device with television set switch-on sensor of inductive coupling type).

Likewise, an inductive sensor can be used in the electronic circuit controlling operation of the lamp 60, to measure the 50 Hz feed current to the television set 20 so as to automatically switch the lamp 60 on when the current consumption exceeds a predetermined threshold. In this respect, as the television set power consumption from the supply mains depends mainly on the power consumption of the cathode ray tube, it is easy to distinguish the operating state of the television set by monitoring the 50 Hz feed current (device with television set switch-on sensor based on the absorbed current of the television set).

Finally, the electronic control circuit for the lighting device 10 of the present invention can comprise a microcontroller which controls the switching-on and switching-off of the lamp 60 by analyzing the codes which the infrared remote controller of the television set 20 feeds to a receiver positioned on the television set, when the user activates or deactivates the cathode ray

tube.

In this case, the electronic circuit also comprises an infrared receiver which picks up the signal fed by the remote controller to the television set (device with television set switch-on sensor based on the reception of codes transmitted by the television set remote controller).

The operation of the said circuit arrangements will now be described in greater detail:

1) Device with television set switch-on sensor of inductive coupling type: in television sets the horizontal deflection coils are positioned to generate a magnetic field the flux lines of which are vertical. In this manner, by modulating the intensity of this magnetic field, the electronic pencil moves horizontally to determine line scanning.

The line scanning frequency is 15626 Hz in black/white or colour television sets, and 31250 Hz in colour television sets with frame scanning at 100 Hz. The magnetic field at line frequency is orientated vertically and hence can be picked up in optimum manner by a horizontal flat coil 11, possibly in the form of a printed circuit 32. Moreover, because of its shape and dimensions, the lighting device 10 of the present invention is well suited to house the flat pick-up coil 11.

It operates as follows: the coil 11, by coupling with the magnetic field at line frequency, provides a signal which is suitably amplified and sensed by an electronic threshold circuit 12. A logic signal is hence generated, which is processed by electronic logic processing circuits 15 to automatically switch-on the lamp 60 if the signal at line frequency is present, ie at the moment in which the cathode ray tube of the television set 20 is activated.

The pushbutton 40 of the lighting device 10 acts on the electronic logic processing circuits 15 to switch-on or switch-off the lamp 60 manually. Whatever the state of the lamp 60, the logic signal generated at the output of the amplifier and threshold sensor block 12 when the cathode ray tube is activated causes the lamp 60 to light via the electronic logic processing circuits 15, whereas when the cathode ray tube is deactivated the removal of the logic signal at the output of the amplifier and threshold sensor block 12 causes the lamp 60 to switch off.

When the detected radiation intensity exceeds a predetermined threshold, the environmental light sensor 70, if present, prevents via the electronic logic processing circuits 15 the automatic switch-on of the lamp 60. The night light 90A, if present, is switched on automatically when the lamp 60 is switched off and, vice versa, is extinguished when the lamp 60 is lit.

A practical embodiment of the described functions is represented by way of non-limiting example by the electrical schematic with bipolar transistors

of Figure 5. The inductive sensor (consisting of the flat coil 11) is tuned to line scanning frequency by the capacitor C4. This arrangement provides good selectivity, avoiding spurious activation of the lighting device 10 due for example to noise at 50 Hz or multiple frequencies thereof. The stage formed by the transistor Q1 amplifies the signal generated by the coil 11. The transistor Q2 and the capacitor C3 form a peak sensor. The transistors Q3 and Q4 form a threshold circuit with hysteresis. The transistor Q5 and the final triac diode TRC1 driver stage form the electronic control or driver circuit 18 for the lamp 60.

The transistors Q7 and Q8 together with the pushbutton 40 form a toggle flip-flop. The transistor Q6 is a differentiator which generates reset pulses for the flip-flop Q7, Q8. The circuit power is provided directly by the 230 volt a.c. supply mains by the capacitive drop across the capacitor C1, the diodes D1, D2, DZ1 (this latter being a zener diode) and the smoothing capacitor C2. The connection to the 230 volt a.c. electricity mains is made by the cable 42 provided with a plug 50, which is connected to the terminals L1 and L2.

When the television set is switched on with a line frequency signal present, if the peak value of this signal exceeds a predetermined threshold the transistor Q3 passes to its conduction state to inhibit the transistor Q5 via the diode D5 and hence switch on the triac diode TRC1.

When the television set is switched off, on cessation of the line frequency signal, the blocking of the transistor Q3 removes via D5 the inhibition of the transistor Q5, to generate via the diode D3 and the transistor Q6 a reset pulse for the flip-flop Q7, Q8 (which assumes the reset state with the transistor Q8 blocked and the transistor Q7 conducting). The direct consequence is switch-on of the transistor Q5 and hence blockage of the triac diode TRC1 and lamp 60 when the line frequency signal ceases.

Pressing the pushbutton 40 reverses the state of the flip-flop Q7, Q8. If the transistor Q8 is conducting, pressing the pushbutton 40 blocks it and, vice versa, if the transistor Q8 is blocked, pressing the pushbutton 40 causes it to conduct. The collector of the transistor Q8 controls the transistor Q5 by way of the diode D6, and hence the lamp 60 by way of the triac diode TRC1. When the television set 20 is switched off, the transistor Q3 is blocked and hence the pushbutton (40) completely controls the lighting of the lamp 60 by way of the transistors Q5 and Q8 and the diodes D6 and TRC1.

2) Device with television set switch-on sensor based on the current absorbed by the television set: the functions are analogous and the signal processing blocks are identical to the aforescribed device, with the exception of the sensor for detecting activation of the cathode ray tube and the relative amplifier and threshold sensing block 112. In

this case the current sensor is in the form of a 50 Hz current transformer 111, the primary winding of which is connected in series with one of the television set electrical feed wires 52B.

In this embodiment the lighting device 10 is provided with a multicore feed cable 42A which terminates in a block 55 incorporating a plug 32A and socket 31. The plug 32A is inserted into that domestic electricity mains socket which was previously connected to the television set 20, the plug 51 of the television set being connected to the socket 31 of the block 55. The block 55 is wired internally such that one of the two electrical feed wires 52D of the television set 20 is directly connected by the plug 32A to the socket 31, the other wire 52A, 52B passing in the form of a few turns through the primary winding of a 50 Hz current transformer 111.

The secondary winding of the current transformer 111 is connected to an electronic control circuit 118 comprising a 50Hz amplifier, the output of which drives a threshold sensing circuit which provides a logic signal corresponding to activation of the television set cathode ray tube.

The block 111 schematically indicates the 50 Hz current transformer (television set switch-on sensor). The 50Hz output signal from this block is amplified by the block 112, which comprises a threshold sensor, the threshold being chosen at a value greater than the current absorbed by the television set when in its stand-by state, but less than the current absorbed by the television set 20 with the cathode ray tube activated.

3) Device with television set switch-on sensor based on the reception of codes transmitted to the television set by the remote controller: the schematic and operation are analogous with those already analyzed. Specifically, in this case, the electronic circuit controlling the switch-on and switch-off of the lamp 60 comprises an infrared receiver 211 of multi-standard type, which intercepts the coded signals generated by the transmitter of the television set 20, demodulates them and presents the data in serial binary form at its output. A microcontroller 25 processes the received data by interpreting the commands transmitted by the remote controller and in particular distinguishing the television set switch-on codes (and generally all codes for selecting a reception channel) from the switch-off code. On detecting a switch-on code for the television set 20 the microcontroller 25 switches on the lamp 60, whereas when a television set switch-off code is detected the microcontroller 25 switches off the lamp 60. The microcontroller 25 also analyzes the logic output of the environmental light sensor 70, if present, and if necessary prevents automatic switch-on of the lamp 60 if the environmental light intensity exceeds a certain predetermined threshold. The night light 90A, if present, is switched on by the microcontroller 25

when the lamp 60 is switched off.

The characteristics of the lighting device of automatic switch-on and switch-off type according to the invention are apparent from the description, as are its resultant advantages.

These include:

- flexibility, simplicity and rapidity of operation, installation and wiring;
- versatility of use of the lighting device on existing television sets, without having to modify the system;
- reliability in terms of simplicity of use and convenience for the user;
- reduction in user fatigue while viewing a television program compared with the known art;
- low cost compared with the known art.

Finally, it is apparent that numerous further modifications can be made to the lighting device of automatic switch-on and switch-off type according to the present invention, without leaving the principles of novelty contained in the inventive idea, it also being apparent that in the practical implementation of the invention the materials, the shapes and dimensions of the illustrated details can be chosen at will according to requirements, and can be replaced by others technically equivalent.

For example the lighting device of the invention can be located within the television cabinet so that the light originating from the lamp diffuses into the surrounding environment, starting from the interior of the television set to the rear of the screen.

In this case either a single aperture or a series of slots must be provided in the television cabinet in correspondence with the direction of propagation of the light beam.

Claims

1. An electricity-operated lighting device (10) of automatic switch-on and switch-off type, connection to the electricity supply mains being made by a cable (42) provided with a standard plug (50), and comprising at least one lamp (60) illuminating with suffused light the room in which it is located, and at least one pushbutton (40) for possible manual switch-on and switch-off by the user, characterised in that said lamp (60) of the lighting device (10) is automatically switched on as a result of switching on at least one television set (20), this being connected to the same electricity supply mains and being located in the same room as said lighting device (10).
2. A lighting device as claimed in claim 1, characterised in that said lamp (60) is automatically switched off when said television set (20) is switched off or when said television set (20) is disconnected from said electricity supply mains.

3. A lighting device (10) as claimed in claim 1, characterised in that said lamp (60) is switched on automatically when said television set (20) passes from the stand-by state, in which the screen (41) is off and the television set (20) can receive only coded information from at least one signal transmitter means, to the normal operating state in which the screen (41) is on and the television set (20) is able to receive and present television programs. 5
4. A lighting device (10) as claimed in claim 2, characterised in that said lamp (60) is automatically switched off when said television set (20) is put into the stand-by state by at least one transmitter means for signals which are translated into coded information for the television set (20). 10
5. A lighting device (10) as claimed in claim 1, characterised by being incorporated into said television set (20). 15
6. A lighting device (10) as claimed in claim 1, characterised in that the intensity, the spectrum and the diagram of the electromagnetic radiation emitted by said lamp (60) are chosen such as to illuminate the room in which said television set (20) is located, in a manner which reduces user viewing fatigue while viewing television programs, compared with the known art. 20
7. A lighting device (10) as claimed in claim 1, characterised in that pressing said pushbutton (40) causes said lamp (60) to be switched on or off. 25
8. A lighting device (10) as claimed in claim 1, characterised by comprising at least one seat (90) into which there is inserted at least one very low intensity suffused light source (90A) for night illumination, to overcome the darkness of the room in which said lighting device (10) is installed. 30
9. A lighting device (10) as claimed in claim 8, characterised in that said seat (90) is provided in the front part of said lighting device (10) or in the housing for said lamp (60). 35
10. A lighting device (10) as claimed in claim 1, characterised in that said lamp (60) is located in the upper part of said lighting device (10) and/or in at least one of the side walls. 40
11. A lighting device (10) as claimed in claim 1, characterised by comprising at least one intensity sensor (70) for the light propagated within the room in which said lighting device (10) is installed, to prevent said lamp (60) being automatically switched on if the intensity of the light propagated within the room exceeds a predetermined threshold value. 45
12. A lighting device (10) as claimed in claim 1, characterised in that said lighting device (10) comprises an electronic circuit controlling the switching on and off of said lamp (60). 50
13. A lighting device (10) as claimed in claim 12, characterised in that said electronic circuit comprises at least one sensor (11) of inductive type, such as a horizontally extending flat coil, possibly formed as a printed circuit, which picks up the electromagnetic field generated by the electronic beam deflection coils mounted on the cathode ray tube of the television set (20). 55
14. A lighting device (10) as claimed in claim 13, characterised in that said inductive sensor (11) is coupled with the electromagnetic field generated by the deflection coils at the line scanning frequency of the television set (20), to provide a first logic signal which is amplified and sensed by an electronic threshold circuit (12), in such a manner as to generate at the output of said electronic threshold circuit (12) a second logic signal which is processed by logic processing circuits (15) to automatically switch on said lamp (60) via driver circuits (18) when a signal at line scanning frequency is present, and hence when the cathode ray tube of the television set (20) is activated.
15. A lighting device (10) as claimed in claim 14, characterised in that said pushbutton (40) acts on the logic processing circuits (15) to allow manual switch-on and/or switch-off of said lamp (60).
16. A lighting device (10) as claimed in claim 15, characterised in that the logic signal generated at the output of the threshold sensing circuit (12) on activation of the cathode ray tube of the television set (20) results in switch-on of said lamp (60) via said logic processing circuits (15), whereas on deactivation of the cathode ray tube the removal of the logic signal at the output of said threshold sensing circuit (12) results in switch-off of said lamp (60).
17. A lighting device (10) as claimed in claim 12, characterised in that said electronic circuit comprises at least one inductive sensor (111) which picks up the 50 Hz feed current of the television set (20) such as to automatically switch said lamp (60) on when the power consumption of the television set (20) from the electricity supply mains exceeds a predetermined threshold.
18. A lighting device (10) as claimed in claim 17, characterised in that said inductive sensor (111) is a current transformer, the primary winding of which is connected in series with at least one (52A) of the wires (52A, 52D) which power the television set (20).

19. A lighting device (10) as claimed in claim 18, characterized in that said lighting device (10) is provided with a multicore electricity feed cable which terminates with a block (55) comprising at least one plug (32A) and at least one socket (31). 5
20. A lighting device (10) as claimed in claim 19, characterized in that said plug (32A) can be inserted in a domestic electricity supply mains socket, the plug (51) of said television set (20) being connected to said socket (31) of the block (55). 10
21. A lighting device (10) as claimed in claim 19, characterized in that said block (55) is wired internally such that at least one (52D) of the electrical feed wires of the television set (20) is directly connected by said plug (32A) to said socket (31), the other wire (52B) passing through the primary winding of said 50 Hz current transformer (111). 15
22. A lighting device (10) as claimed in claim 21, characterized in that the secondary winding of said 50 Hz current transformer (111) is connected to an electronic control circuit (118) comprising at least one amplifier, the output of which drives a threshold circuit which provides the logic signal corresponding to activation of the cathode ray tube of the television set (20). 20 25
23. A lighting device (10) as claimed in claim 17, characterized in that said electronic circuit also comprises a current threshold sensing circuit (112), said threshold value being chosen greater than the current absorbed by said television set (20) when in its stand-by state but less than the current absorbed by the television set (20) when its cathode ray tube is activated. 30 35
24. A lighting device (10) as claimed in claim 12, characterized in that said electronic circuit comprises at least one microcontroller (25) which analyzes the codes fed by the infrared remote controller to the television set (20) when the user activates or deactivates the cathode ray tube, and at least one infrared receiver means (211) which intercepts the coded signals generated by said remote controller of the television set (20), demodulates them and presents the data in serial binary form at its output. 40 45
25. A lighting device (10) as claimed in claim 24, characterized in that said microcontroller (25) distinguishes the coded signals generated by the remote controller relative to the activation of the television set (20) from the coded signals relative to deactivation, and switches on said lamp (60) on identifying at least one coded signal relative to activation or to the selection of at least one reception channel, and switches off said lamp (60) on identifying at least one coded signal relative to deactivation. 50 55
26. A lighting device (10) as claimed in claim 25, characterized in that said microcontroller (25) analyzes the logic output of said environmental light sensor (70), prevents automatic switch-on of said lamp (60) if the light intensity exceeds a predetermined threshold and switches on the night light (90A) when said lamp (60) is switched off.
27. A lighting device (10) as claimed in claim 1, characterized by being located within the cabinet of said television set (20), said cabinet comprising at least one aperture positioned in correspondence with the direction of propagation of the electromagnetic radiation emitted by said lamp (60), such that said radiation is diffused within the room in which the television set (20) is located.

Fig.1

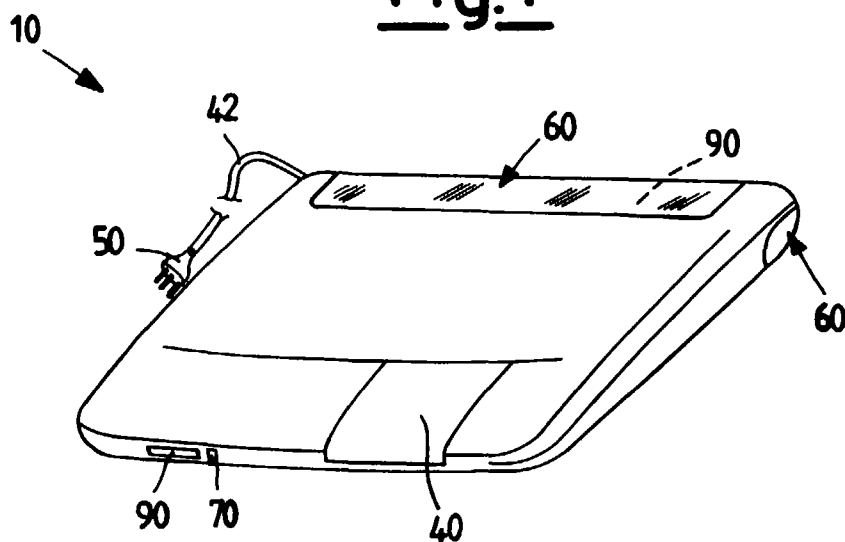


Fig.2

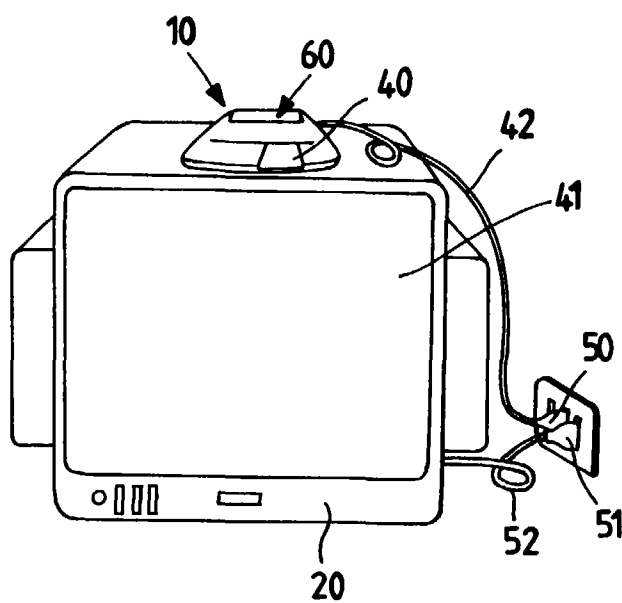


Fig.3

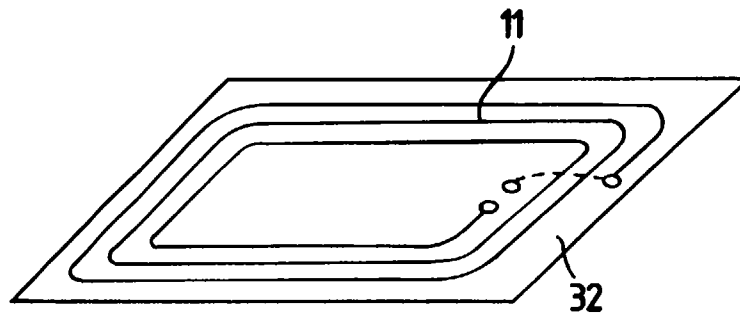


Fig.4

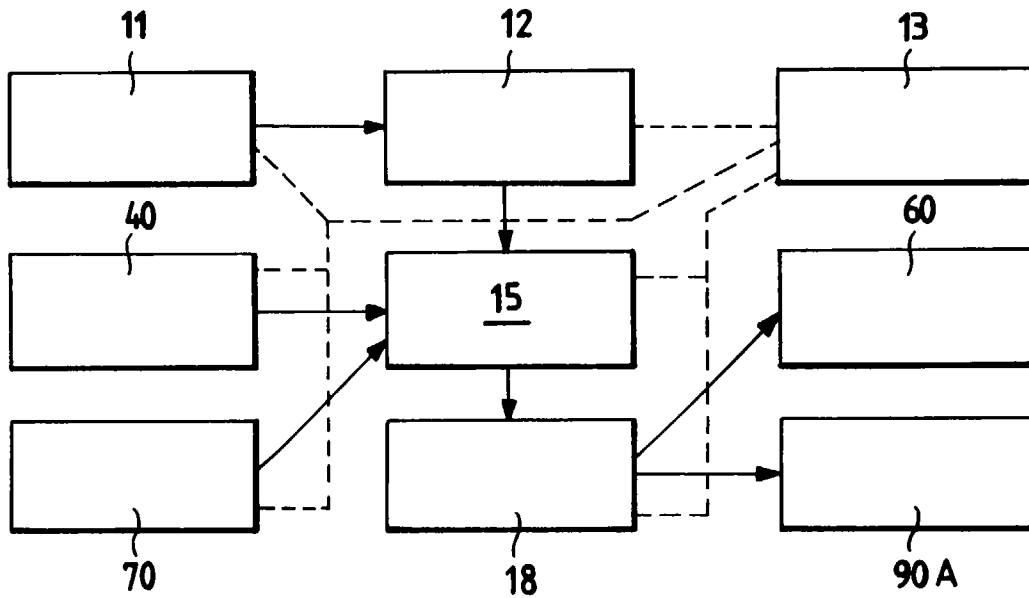


Fig. 5

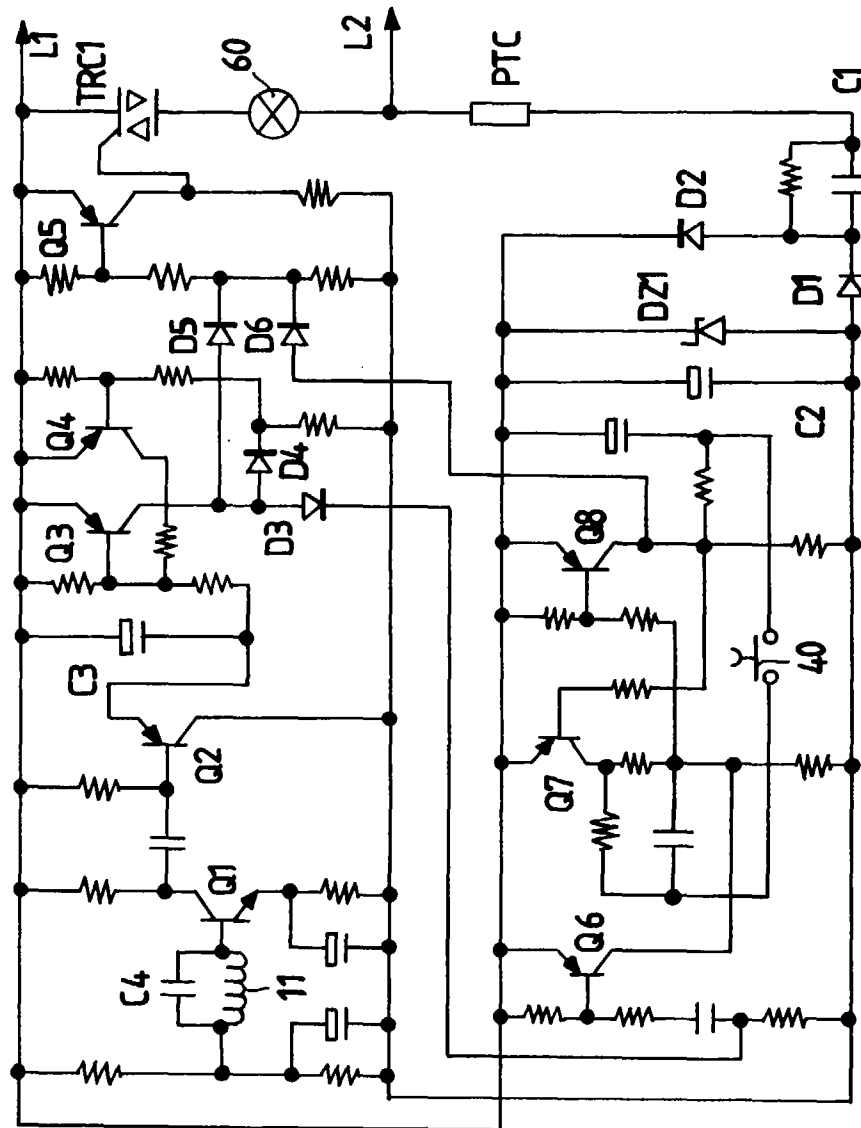


Fig.6

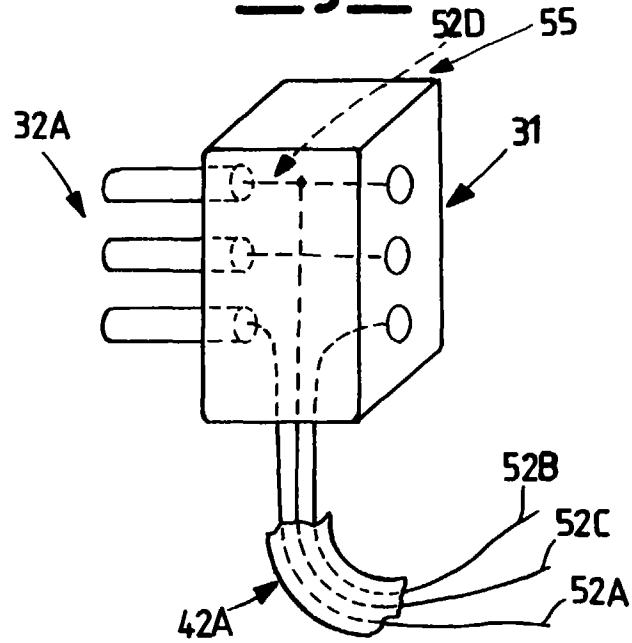


Fig.7

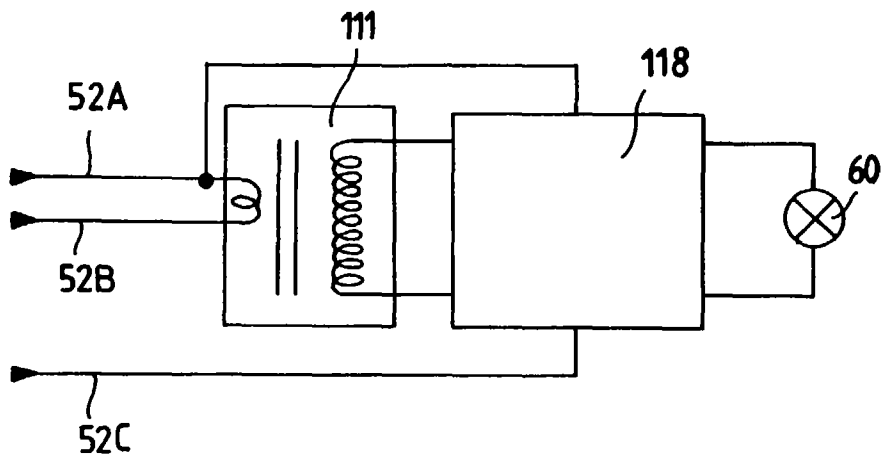


Fig.8

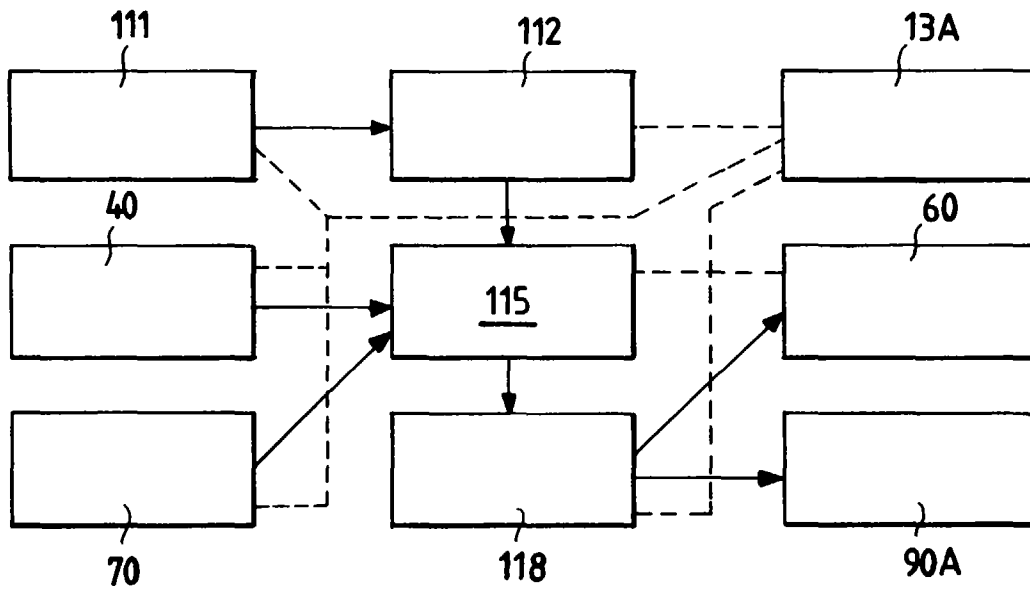
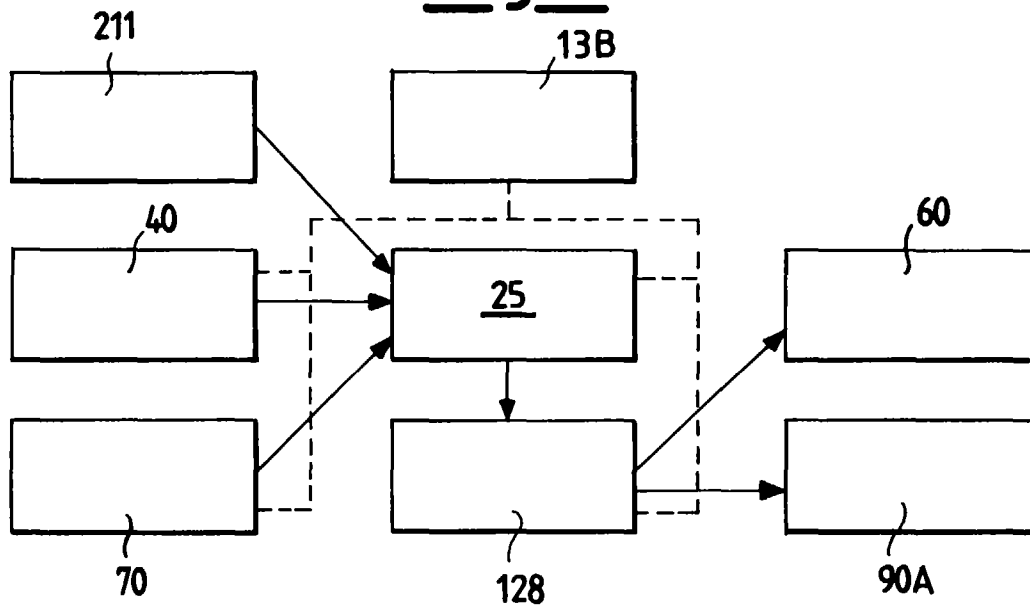


Fig.9





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 20 3162

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.6)
X	DE 36 29 593 A (OTT ELMAR DIPL ING) 5 March 1987 * column 1, line 43 - column 3, line 47; figures 1-5 *	1-4,6, 11,12, 17-23	H05B37/02
A	EP 0 573 932 A (SELECO SPA) 15 December 1993 ---	1,5,27	
A	DE 32 06 951 A (HANO HEINZ JOSEF) 15 September 1983 ---		
A	EP 0 091 885 A (FLORA ONOFRIO) 19 October 1983 ---		
A	CH 683 478 A (KNOBEL LICHTTECH) 15 March 1994 ---		
A	GB 2 238 896 A (SURE RIGHT WEBB LTD) 12 June 1991 -----		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6) H05B
Place of search THE HAGUE		Date of completion of the search 21 January 1997	Examiner Albertsson, E
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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