

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 0 696 811 A1

(12)

EUROPEAN PATENT APPLICATION

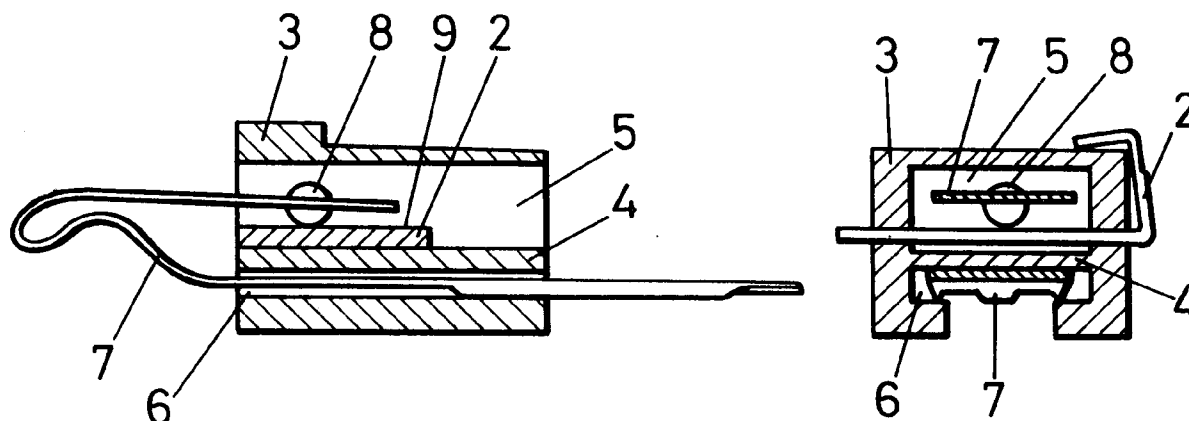
(43) Date of publication:

14.02.1996 Bulletin 1996/07(51) Int Cl.⁶: **H01H 37/76, H01H 9/10**(21) Application number: **95500119.3**(22) Date of filing: **10.08.1995**(84) Designated Contracting States:
DE FR IT PT(72) Inventor: **Ormaechea Laborda, Ignacio**
E-20600 Eibar (Guipuzcoa) (ES)(30) Priority: **12.08.1994 ES 9402202**(74) Representative: **Carpintero Lopez, Francisco**
E-28014 Madrid (ES)

(71) Applicant:

OFICINA DE INVESTIGACION AGRUPADA, S.A.
E-20600 Eibar (Guipuzcoa) (ES)**(54) Improved fuse fitted in the thermostat of a home electrical appliance**

(57) Such comprises a conducting strip (7) folded at the centre and welded at one end (7') to the terminal (2) whereas the other end (7'') is free to constitute a fast connection point. An insulating box (3) is provided to be used, internally divided by a wall (4) into two parallel channels (5) and (6) in order that both ends of the strip lie in each of the said channels. When an overload flows through such conducting strip (7), the weld (8) will melt and release the end (7') from the terminal (2), breaking the passage of current through the conducting strip (7) to the terminal (2).

**FIG.-3****EP 0 696 811 A1**

Description

OBJECT OF THE INVENTION

The present invention relates to a safety fuse for home electrical appliances of all kinds, fitted at one of the available thermostat terminals in order that when the thermostat stops working properly, either because the connections are welded together or the bimetallic strip is deformed or otherwise whatsoever, and the temperature of the appliance rises alarmingly, the conductor joined to the thermostat through the fuse will be broken off by fusion of the latter.

BACKGROUND OF THE INVENTION

In home electrical and appliances of any other kind whatsoever which require a safety thermal device, such device usually comprises a fuse mounted independently of the thermostat, i.e. connected to a terminal other than the thermostat terminals.

One such device, which is the least used and known as the minimet, is mounted inside an insulating ceramic box having a fixing plate. Devices of this kind work well but their high cost renders them rather unsuitable to be used in small appliances in which the end prices and hence profit margins are not very high.

The device that is currently used most is mounted inside a cylindrically-shaped metal cartridge. This device costs less than the above-mentioned device but is shorter-lived and is moreover inconvenient in that if not suitably insulated dielectric strength problems ensue.

Another disadvantage of the systems described above and currently used is how rapidly appliances using fuses of this kind age, and an improvement of this aspect would therefore be welcome.

The application of the system subject of the invention brings down the cost of the appliance and extends its life for it transmits the temperature at points that are far less critical than pure connection points.

DESCRIPTION OF THE INVENTION

The present invention lies in the use of a safety fuse mounted at one of the thermostat connections, which fuse comprises an insulating box and a conducting strip that is welded at one end to the connection by means of a material that melts at a suitable temperature, whereas the other end stays free and constitutes a fast connection.

The insulating box is made of a self-extinguishing material, is mounted directly on the thermostat terminal, and internally comprises two parallel channels that are respectively designed to house the two ends of the conducting strip. The upper channel houses the thermostat terminal and one of the ends of said strip, and thus for the two to be connected, the strip end is bent until it contacts the terminal and is then welded with a material hav-

ing a suitable melting point. On the other hand, the lower channel houses the other end of the strip, that passes through the said channel to leave its end free for connection to be made as appropriate to the terminal used.

The strip end welded to the thermostat terminal is therefore live, housed inside the insulating material box, and so when the weld is worn down by action of the heat the strips comes off the terminal and its end folds up to contact with the roof of the insulating plastic box, moving back to its initial position and hence breaking off the passage of current through it, ensuring that the appliance is switched off forthwith.

DESCRIPTION OF THE DRAWINGS

In order to provide a fuller description and contribute to the complete understanding of the characteristics of this invention, a set of drawings is attached to the specification which, while purely illustrative and not fully comprehensive, shows the following:

Figure 1.- Shows three views of a thermostat without the fuse subject of the invention.

Figure 2.- Shows three views of a thermostat with the fuse subject of the invention fitted.

Figure 3.- Shows two cross-sections of the fuse subject of the invention, where it can be seen with the contact made.

Figure 4.- Shows two cross-sections of the fuse subject of the invention, where it can be seen with the contact broken off.

PREFERRED EMBODIMENT OF THE INVENTION

With reference to the figures, the fuse subject of the invention is arranged at one of the thermostat terminals and comprises a conducting strip and an insulating member (3), forming a sort of hollow box, with a mid-wall (4) that defines two parallel channels inside the box (3), an upper (5) and a lower (6) channel, for the said strip to be housed.

This box (3) has a slot (9) designed to be fitted directly onto the terminal (2), the said terminal being arranged inside the upper channel (5) and slightly above the mid-wall (4), passing through the box (3) and ending (2) in an upwardly folded extension entwined about the box (3) locking it in such position.

The conducting strip (7) is arranged inside the box (3), folded, as shown in figure 3, to achieve a better spring effect between its ends, and thus it defines a short end (7') and a long end (7'') with longitudinal grooves to make up a fast coupling.

The long end (7'') of the strip (7) is housed in the lower channel (6) and passes through the same to leave its end free, thereby to allow an easy connection thereto.

On the other hand, the short end (7') of the strip (7) is arranged inside the upper channel (5) and locked to the terminal by means of a weld (8) having a suitable melting point, thereby allowing the passage of current

when the thermostat makes connection between terminal (1) and terminal (2).

When the intensity flowing through the terminal (2) is too high and the thermostat fails to break off the passage of current, the intensity flowing will melt the weld (8) and the strip (7) will be free from the joint holding it connected to the terminal (2) and will, due to the above-mentioned spring effect, have its short end (7') rise to touch the roof of the box (3), thereby being sufficiently separated from the terminal (2) to ensure that they are not connected again accidentally. 5 10

We feel that the description need not be extended any longer for any expert in the art to have grasped the full scope of the invention and the advantages it offers.

The materials, shape, size and layout of the elements may be altered provided that this entails no modification of the essential features of the invention. 15

The terms used to describe the invention herein should be taken to have a broad rather than a restrictive meaning. 20

Claims

1.- A fuse fitted in the thermostat of a home electrical appliance, essentially characterised in that one of the two connections, between which the thermostat is fitted, is provided with a conducting strip (7) folded at the centre and welded at one end (7') to the terminal (2), whereas the other end (7'') is free to constitute a fast connection point, the use of an insulating box (3) being moreover provided, which box is internally divided by a wall (4) into two parallel channels (5) and (6) such that the end (7'') of the strip (7) is housed in the lower channel (5) fully passing through the same, whereas the other end (7') is arranged inside the upper channel (6) and locked to the terminal (2) by welding (8) in order that when the connection between the strip (7) and the said terminal (2) is broken due to a strong intensity flowing and melting the weld (8), the end (7') will be released from the joint fixing it to the terminal (2) and rise upwardly, driven by a certain spring-like effect, until it contacts the roof of the box (3) to lie at a sufficient distance from the terminal (2) and avoid the passage of current between the two. 25 30 35 40 45

50

55

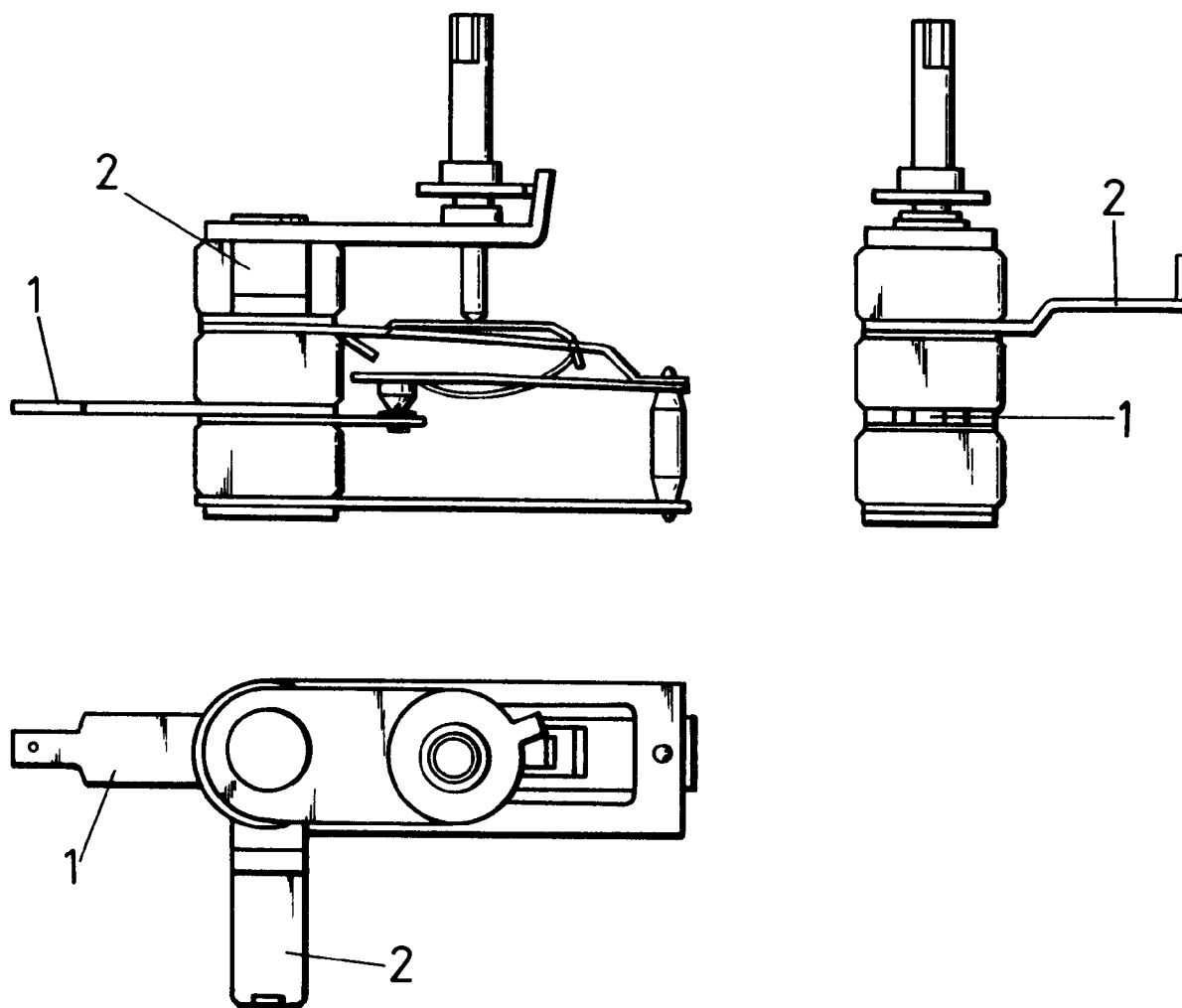


FIG.-1

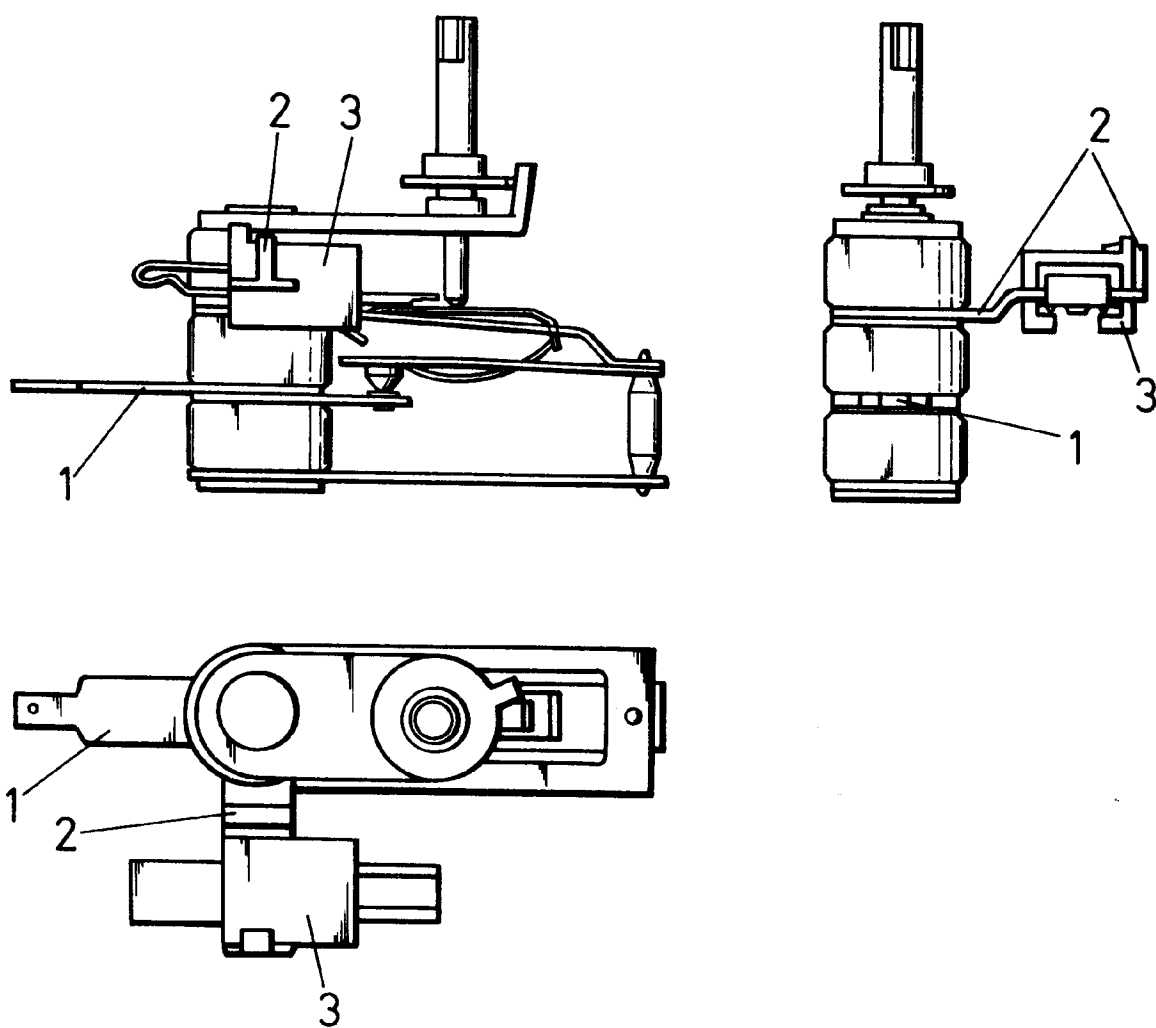


FIG.-2

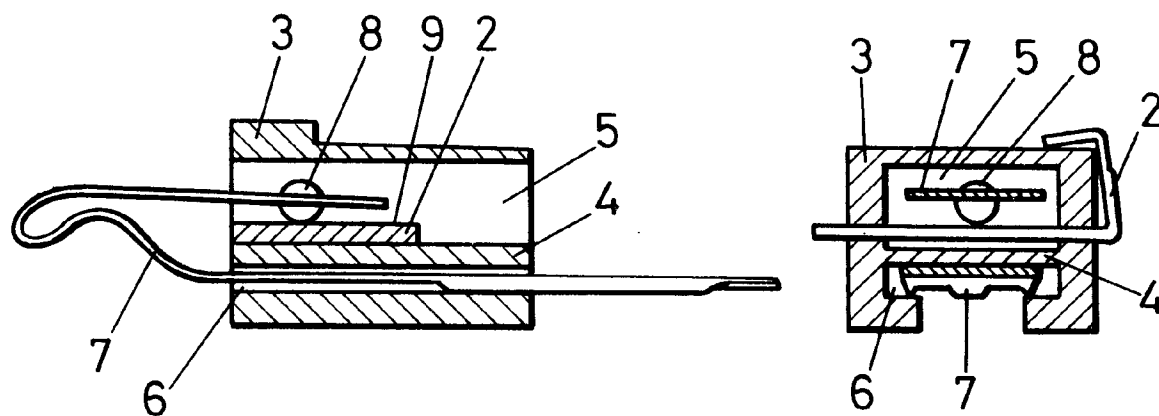


FIG.-3

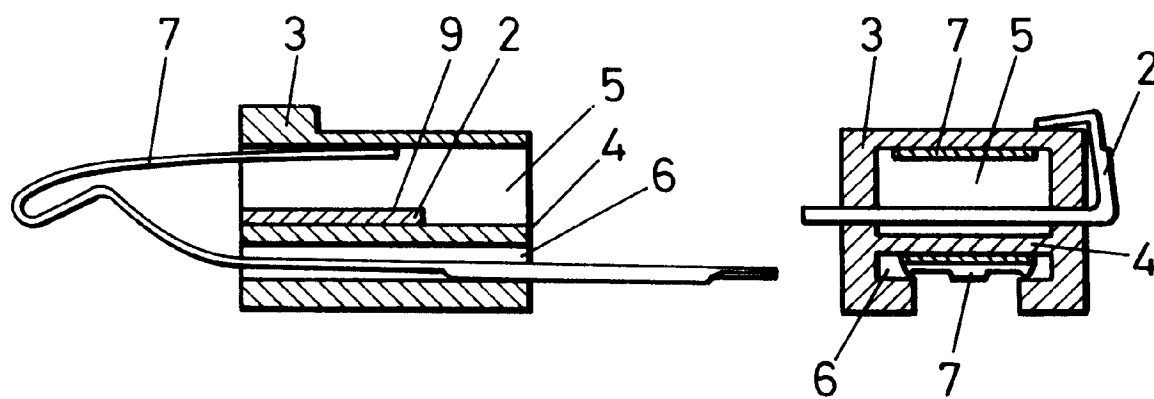


FIG.-4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 50 0119

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)
A	US-A-4 720 759 (TABELI) * column 2, line 12 - line 34; figures 1,4 * * column 3, line 32 - column 4, line 58 * ---	1	H01H37/76 H01H9/10
A	GB-A-1 540 088 (KENNETH E. BESWICK) * page 1, line 95 - page 2, line 13; figures * ---	1	
A	DE-A-23 39 674 (THERMOSTAT- UND SCHALTGERÄTEBAU) * column 2, paragraph 4 - column 3, paragraph 2; figures 1,2 * ---	1	
A	US-A-3 611 235 (ROSE) * column 1, line 41 - line 61; figure 1 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			H01H
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 27 October 1995	Examiner Nielsen, K
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			

EPO FORM 1503 01.92 (P04/01)