

Bimetallic timing mechanism

The invention relates to a bimetallic timing mechanism for electrically heated toasters in which a latchable bread carriage acts to switch the toaster on and off.

5 A bimetallic timing mechanism is known from German Patent No. 21 31 977 which comprises an electrically heated bimetallic component which switches off its own heating element via a switching lever on attaining a predetermined deflection and,
10 after bending back into its initial position, releases the locking of the bread carriage, thereby ending the toasting operation, and a regulator knob for adjusting the toasting time. In this timing mechanism the switching lever is latched behind a control
15 slide and the bimetallic component is pressed against the slide by spring force. In the first position of engagement the bimetallic component is heated by its heating element which is connected thereto. After a predetermined deflection, the bimetallic
20 component latches into a recess provided on the slide and the heating of the bimetallic component itself is switched off. In the course of cooling, the bimetallic component swings back into its original position and thereby moves the control slide, as
25 a result of which the slide releases the switching lever and releases the bread carriage. The manufacturing costs of this known bimetallic timer are very high since it consists of a large number of individual parts and, during automatic assembly, accurate
30 alignment of the individual parts is required at several points in order to match the manufacturing and assembly tolerances of the numerous components of the timing mechanism. Moreover, the calibration of the timer, i.e. its pre-setting after assembly,
35 presents considerable difficulties.

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Viewed from one aspect the invention provides a bimetallic timing mechanism for an electrically heated toaster in which a latchable bread carriage acts to switch the toaster on and off, comprising
5 a frame, a bimetallic component, a switching lever adapted to unlatch the bread carriage in response to deflection of the bimetallic component, mounting means on said frame of the timing mechanism, said
10 bimetallic component and said switching lever being mounted in freely movable manner on said mounting means, regulating means mounted to the frame for regulating the toasting time, and a compression spring arranged to hold the bimetallic component and the switching lever on the mounting means.
15 A bimetallic timer according to the invention may consist of few individual parts, be easy to assemble and able to be calibrated after assembly without any difficulty. In particular the compression spring enables the bimetallic component and the
20 switching lever to be mounted in freely movable manner on the mounting means e.g. a pivot pin without any additional fixing means. At the same time, the compression spring can press onto the bimetallic component and the switching lever with a predetermined
25 force and thereby can impart the necessary biasing to the bimetallic component and give the switching lever the correct switching position.

The regulating means may for example comprise a regulator knob in which case the compression
30 spring might be arranged to urge the regulator knob towards the frame of the timing mechanism with a constant pressure and thereby hold it in position. Preferably the compression spring is arranged at least partly inside the regulator knob
35 and substantially concentrically therewith.

The regulating means preferably includes means for adjusting the relative positions of the switching lever and the bimetallic component.

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Preferably an adjusting arm is arranged on the switching lever and is operatively connected to the regulating means, there being a calibration screw for pre-setting the adjusting arm. With
5 such an arrangement the travel of the switching lever and hence the desired toasting time can be preselected. A blocking lug may be provided on the switching lever to limit the adjustment of the lever relative to the frame so that it
10 would not be possible to make an adjustment which would prevent the toaster from being switched off.

A heating element for the bimetallic component may be slidably mounted on both sides of the
15 bimetallic component and be pressed against the bimetallic component by a spring clip for better heat transfer, so that the bimetallic component is able to deflect freely at any time. All the components of the bimetallic timer are preferably
20 connected to the housing of the timing mechanism without any additional securing elements such as screws, rivets, etc., thus simplifying the assembly of the timing mechanism substantially so that it can be automated.

25 Viewed from another aspect the invention provides a bimetallic timing mechanism for an electrically heated toaster in which a latchable bread carriage acts to switch the toaster on and off, comprising a frame, a bimetallic component,
30 electrical heating means for said component, means for switching off said heating means when said bimetallic component attains a predetermined deflection whereupon the component cools and returns to its original position, a switching
35 lever adapted to unlatch the bread carriage when said bimetallic component returns to its original position so as to switch the toaster off, a pin fixed to said frame of the timing mechanism, said

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bimetallic component and switching lever being mounted in freely movable manner on said pin, a regulator knob mounted to the frame for regulating the toasting time, and a compression spring arranged
5 at least partly inside said regulator knob and substantially concentrically therewith, said spring acting to hold the bimetallic component and the switching lever on the pin. Preferably the means for switching off the heating means for the bimetallic
10 component includes said switching lever.

An embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:-

Figure 1 shows diagrammatically the bimetallic
15 timing mechanism according to the invention in front elevation;

Figure 2 shows the bimetallic timing mechanism in plan view;

Figures 3a to 3c show various switching positions
20 of the timing mechanism in diagrammatic view.

The bimetallic timing mechanism shown consists of a frame 1 on which are mounted a pin 2 and a stop 3. A bimetallic component 4 and a switching lever 5 are mounted in freely movable manner on
25 the pin 2. Both parts are secured on the pin 2 by a regulator knob 6 with a compression spring 7 arranged therein. The regulator knob 6 is releasably mounted on the frame 1 by a snap-fit connection and the compression spring 7 is centred by the
30 pin 2. A bimetallic heating element 8 has oblong holes 9 and is loosely riveted to the bimetallic component 4. A spring clip 10 presses the heating element 8 against the bimetallic component 4 and thus ensures a good heat transfer. On the switching
35 lever 5 is provided a lug 11 which comes into force in the event of a wrong adjustment of an adjusting arm 12 and blocks the switching lever 5 against the frame 1.

With the aid of the timing mechanism the toasting time of a toaster is controlled. The operation of the timing mechanism is controlled. The operation of the timing mechanism is as follows.

5 The regulator knob 6 is mounted within the frame 1 of the timing mechanism, and is used together with cam 13 to reduce or increase the switching distance of the switching lever 5 and hence the deflection of the bimetallic component 4. Movement
10 of the cam 13 is transmitted to the switching lever 5 via the adjusting screw 14 on the adjusting arm 12 and in this way the desired toasting time for the bread is preselected. The bread carriage (not shown) with an engaging lever 15 mounted thereon
15 is moved downwards into the toasting position by means of an actuating knob (not shown). The engaging lever 15 is now latched down by the switching lever 5 and the free end of the switching lever 5 is restrained by the bimetallic component 4, as seen
20 in Fig. 3a. The free end of the bimetallic component 4 abuts on the frame 1, whilst in the region of the pin 2 the bimetallic component 4 abuts on the frame 1 only at its turning point 16 (Figs. 1, 2 and 3a). The circuits for the bimetallic heating
25 element 8 and for the heating element for the toasting chamber (not shown) are closed. The cold bimetallic component 4 and the toasting chamber are heated. The bimetallic component 4 deflects in the direction of the arrow shown in Figure 2 about the turning
30 point 16. As a result of the deflection, the bimetallic component 4 first engages the frame 1 in the region of the pin 2. As a result of this period of advance of the bimetallic component 4, i.e. the distance from the resting position until it
35 comes to abut on the frame 1, the temperature differences within the toasting chamber in a cold or preheated toaster are equalised. The bimetallic

component 4 then deflects further in the direction of the horizontal arrow of Fig. 3a and releases its connection with the switching lever 5 (Fig. 3b). The switching lever 5, no longer restrained by the bimetallic component 4, is caused to pivot about the pin 2 by a spring (not shown) acting on the engaging lever 15 until it is arrested by the stop 3. The bimetallic heating element 8 is at this time switched off whilst the toasting chamber is heated still further.

The bimetallic component 4 cools off and pivots back into its initial position, and in doing so it engages and displaces the switching lever 5 so that it is released from its arrested position in engagement with the stop 3 (Fig. 3c). The switching lever 5 then rotates further about the pin 2 and unlatches the engaging lever 15 of the bread carriage. The heating for the toasting chamber is then switched off and the bread carriage moves back upwards into its initial position in which the toasted slices of bread can be removed from the toasting chamber.

Modification to the specific embodiment and to any broad aspects thereof referred to or suggested herein may be apparent to those skilled in the art and the disclosure hereof is intended to encompass any such modifications.



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Claims

1. *A bimetallic timing mechanism for an electrically heated toaster in which a latchable bread carriage acts to switch the toaster on and off, comprising
5 a frame, a bimetallic component, a switching lever adapted to unlatch the bread carriage in response to deflection of the bimetallic component, mounting means on said frame of the timing mechanism, said bimetallic component and said switching lever being
10 mounted in freely movable manner on said mounting means, regulating means mounted to the frame for regulating the toasting time, and a compression spring arranged to hold the bimetallic component and the switching lever on the mounting means.
- 15 2. A mechanism as claimed in claim 1, wherein said regulating means includes means for adjusting the relative positions of said switching lever and said bimetallic component.
3. A mechanism as claimed in claim 1 or 2, wherein
20 said regulating means comprises a regulator knob.
4. A mechanism as claimed in claim 1, 2 or 3, wherein the mounting means comprises a pivot pin.
5. A mechanism as claimed in any preceding claim, wherein an adjusting arm is arranged on the switching
25 lever and is operatively connected to the regulating means, there being a calibration screw for pre-setting the adjusting arm.
6. A mechanism as claimed in any preceding claim, where a heating element for the bimetalic component
30 is mounted in freely movable manner thereon and is pressed thereagainst by a spring clip.
7. A bimetallic timing mechanism for an electrically heated toaster in which a latchable bread carriage acts to switch the toaster on and off, comprising
35 a frame, a bimetallic component, electrical heating means for said component, means for switching off said heating means when said bimetallic component



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- attains a predetermined deflection whereupon the component cools and returns to its original position, a switching lever adapted to unlatch the bread carriage when said bimetallic component returns
- 5 to its original position so as to switch the toaster off, a pin fixed to said frame of the timing mechanism, said bimetallic component and switching lever being mounted in freely movable manner on said pin, a regulator knob mounted to the frame for regulating
- 10 the toasting time, and a compression spring arranged at least partly inside said regulator knob and substantially concentrically therewith, said spring acting to hold the bimetallic component and the switching lever on the pin.
- 15 8. A bimetallic timing mechanism for an electrically heated toaster substantially as hereinbefore described with reference to the accompanying drawings.
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