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R. L. TWEEDALE

2,110,748

COOKING DEVICE

Original Filed Feb. 26, 1931

FIG. 1.

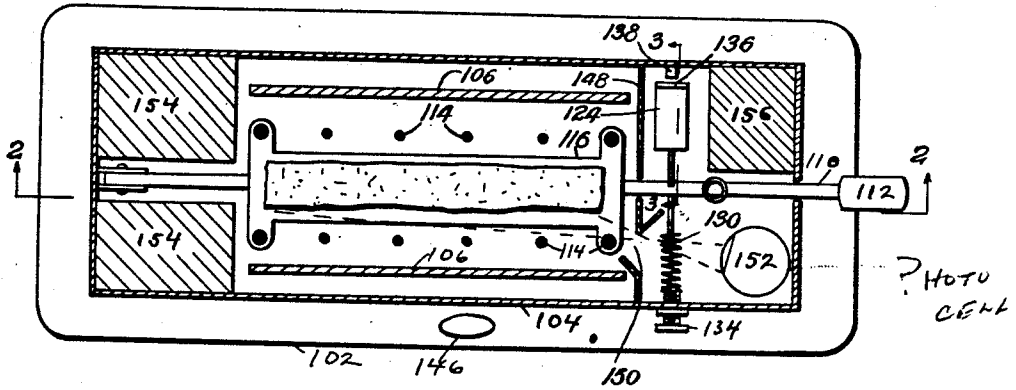


FIG. 2.

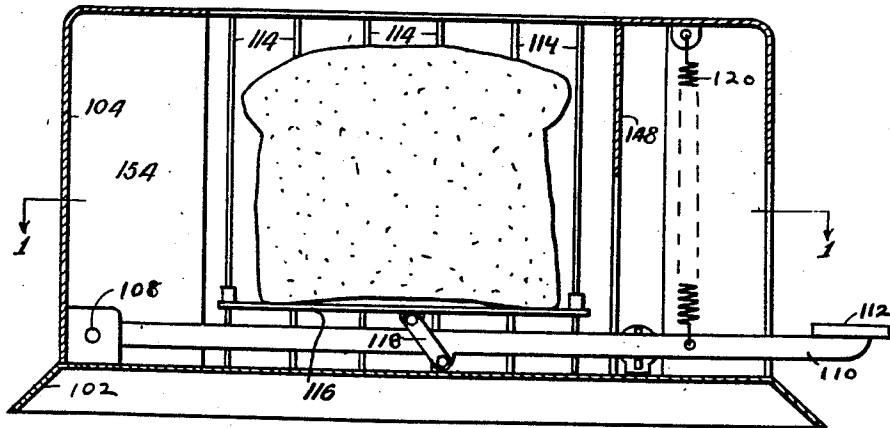
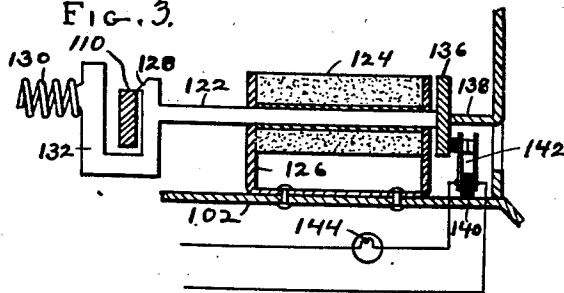


FIG. 3.



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COOKING DEVICE

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6 Claims. (Cl. 219—19)

This invention relates to cooking devices more particularly to the type in which means is provided to prevent over cooking.

Objects of the invention are: To provide an improved cooking device having means incorporated therein for sensing the occurrence of such conditions as indicate that cooking should be terminated;

To provide a cooking device having a translating device therein operable in response changing conditions within the food being cooked;

To provide a cooking device having means responsive to change in the amount of reflected light from the food for controlling a translating device;

To provide a generally improved cooking device for terminating the cooking period, or signalling that the cooking period should be terminated, dependent on the condition of the food itself rather than on an arbitrarily set time measuring device or an energy measuring device.

A specific embodiment of the invention is illustrated in the accompanying drawing, in which:

Figure 1 is a horizontal cross section of a toaster embodying a preferred form of the present invention on line 1—1 of Figure 2.

Figure 2 is a vertical cross section on line 2—2 of Figure 1, and

Figure 3 is a cross section on line 3—3 of Figure 1.

In the embodiment of the invention shown in the drawing there is disclosed an electric toaster in which the determination of the end of the toasting period depends on the color of the toast. A base 102 supports a housing 104 in which are mounted a pair of conventional electric heating elements 106. Pivoted at 108 is an arm 110 having a finger piece 112 at its opposite end. Between the heating elements 106 and at either side of the arm 110 are two rows of vertical rods 114 which form a grill to keep the bread properly spaced from the heating elements. Slidably mounted on the four outermost rods is a toast carrier 116. A link 118 pivoted to the toast carrier 116 and to the arm 110 enables the two to move up and down together. A spring 120 urges the arm 110 and toast carrier to their uppermost position. A latch bar 122 of non-magnetic material slides through the hollow core of an electro-magnet 124 mounted on the base 102 by a U-shaped bracket 126. The latch bar 122 has a nose 128 adapted to engage over the top of the arm 110 to hold it in depressed position. A spring 129 has one end abutting against

the U-shaped extension 132 of latch bar 122 and its other end abutting against an adjusting screw 134 mounted in the side of the housing 104. The opposite end of the latch bar 122 carries an armature 136 in operative relation to the electro-magnet 124. A stop 138 pressed out of the housing 104 limits the spring urged movement of latch bar 122 to just the amount necessary to completely free the arm 110. Mounted on an insulating block 140 is a pair of contacts 142 adapted to be closed when armature 136 is retracted and to be opened when armature 136 is attracted. The contacts 142 are connected to a signal light 144 mounted in the base 102 behind a glass window 146. An opaque screen 148 has a window 150 therein so arranged that it allows light reflected from the bread to fall on the light window of a photo-electric cell 152.

The photo-electric cell 152 may be connected in circuit in various ways well known in the art. Preferably it is connected to a power pack contained in the casings 154. This power pack may be similar to those used in radio receiving sets of the so called all-electric type and supplies a high potential direct current to the cell 152. A casing 156 contains a relay of the electronic type for amplifying the current passing the cell 152, the output of the relay goes directly to the magnet 124. It is obvious that the cell 152 may be connected in circuit in other ways depending on the sensitivity of the cell used, the type of current supply with which the toaster is designed to be used, etc. For example, if a very sensitive cell is used the relay 156 may be omitted and if the toaster is designed for operation from a suitable source of direct current the power pack 154 may also be omitted in which case the cell 152 and magnet 124 may be connected in series with the source of current for the heating elements 106.

In operation a slice of bread is placed in the holder 110 and the arm 110 is depressed. The light of the heating element 106 is reflected from the slice of bread to a fairly high degree because the bread is white, or if brown bread is used it is lighter in color than when fully toasted. This produces a relatively high energization of the magnet 124. While the arm 110 is still held depressed manually the screw 134 is adjusted to the point where the spring 130 just overcomes the attractive force of magnet 124. The screw is then backed off a small amount depending on the color of the finished toast which is desired. The magnet then attracts armature 136 moving latch bar 122 into latching position. The arm 110

110 will now remain in depressed position until the toast browns to a point where the light reflected therefrom is so far reduced that the magnet 124 is no longer able to hold armature 136 against the force of spring 130. When this occurs latch 128 is released and arm 110 is raised together with the carrier 116 and the slice of toast by the spring 120. Signal 144 is also lighted by closure of contacts 142. It will be seen that magnet 124 is able to hold the arm 110 down only as long as a certain amount of light is reflected from the toast depending on the setting of screw 134. Thus the toast is always thrown up when it reaches the desired color regardless of the relative freshness of the bread or the temperature of the heating elements.

The invention may be also embodied in a toaster in such a manner as to depend on reflected light from both sides of the toast. Thus the cell 152 may be so positioned as to receive light equally from both sides of the toast through separate windows such as 150 and provided with suitable reflectors to converge the light rays on the single cell. Alternatively two cells may be used, one on each side of the bread, the cells being connected in series or parallel to the relay 156 if such be used, or being connected to separate relays arranged to control the heating elements 106 separately. The latter arrangement presents the advantage that a slice of bread which is drier on one side than the other may be toasted to the same color on both sides.

It will be seen that a cooking device has been provided wherein the time at which cooking is to cease is determined by the occurrence of a certain predetermined condition of the food itself. Various modifications will suggest themselves to those skilled in the art and it is to be understood that the scope of the invention is limited by the scope of the appended claims, rather than by the specific embodiments illustrated and described as examples of devices embodying the invention.

I claim:

1. An electric toaster comprising in combination an electric heater, means for holding bread in a stationary position adjacent the heater to be toasted, a light-sensitive cell, a screen adapted to shield the cell from light rays emanating from the heater directly but to pass light rays reflected from the bread, and means controlled by the cell for moving the bread to a position remote from the heater.

2. An electric toaster comprising in combina-

tion an electric heater, means for holding bread in a stationary position adjacent the heater to be toasted, a light-sensitive cell, a screen adapted to shield the cell from light rays emanating from the heater directly but to pass light rays reflected from the bread, and means controlled by the cell for signalling the end of toasting.

3. In a domestic toasting device for table use for toasting at one operation a quantity of food having the characteristic that in its completely toasted state it has developed a permanent alteration in the surface color of the food which bears a definite relation in amount to the amount of toasting regardless of variations in toasting conditions, the combination of a frame, a heating element disposed in the frame, means for holding a quantity of food in a position to be toasted by the heating element, and means for signalling the end of the toasting operation including a device which is responsive solely to said color alteration of the food as it is being toasted and which is affected solely by said color alteration and a signal mechanism controlled by said device.

4. In a domestic toasting device for table use for toasting at one operation a quantity of food having the characteristic that in its completely toasted state it has developed a permanent alteration in the surface color of the food which bears a definite relation in amount to the amount of toasting regardless of variations in toasting conditions the combination of a frame, a heating element disposed in the frame, means for holding a quantity of food in a position to be toasted by the heating element, and means for terminating the toasting operation including a device which is responsive solely to said color alteration of the food as it is being toasted and which is affected solely by said color alteration, and mechanism for interrupting the toasting operation controlled by said second device.

5. In a bread toaster provided with a heating element, a light sensitive element responsive to the surface color of the bread being toasted, and means operated thereby for terminating the toasting of the bread slice when a predetermined surface color has been attained.

6. In a bread toaster provided with a heating element, a light sensitive element responsive to the surface color of the bread being toasted, and signaling means operated thereby when a predetermined surface color has been attained.

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