

April 12, 1938.

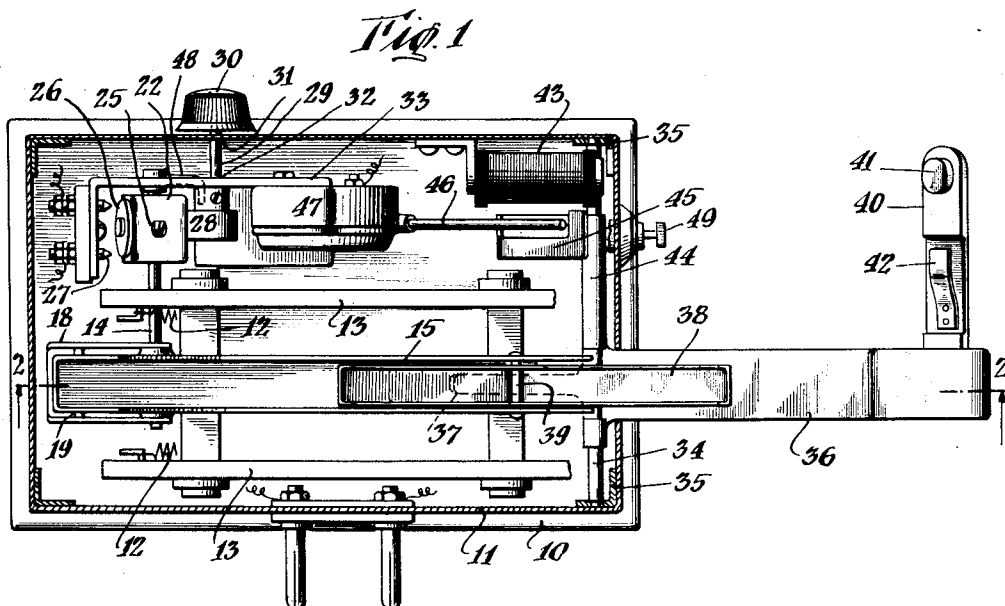
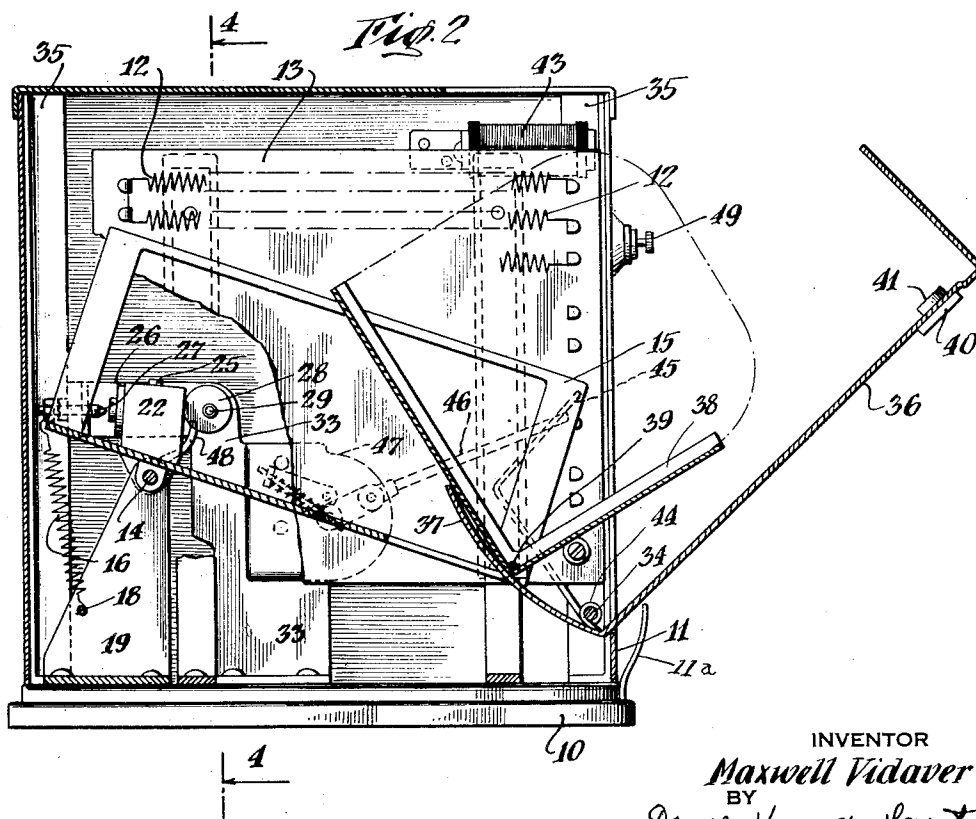
M. VIDAVER

2,114,000

ELECTRIC TOASTER

Filed Dec. 21, 1935

2 Sheets-Sheet 1



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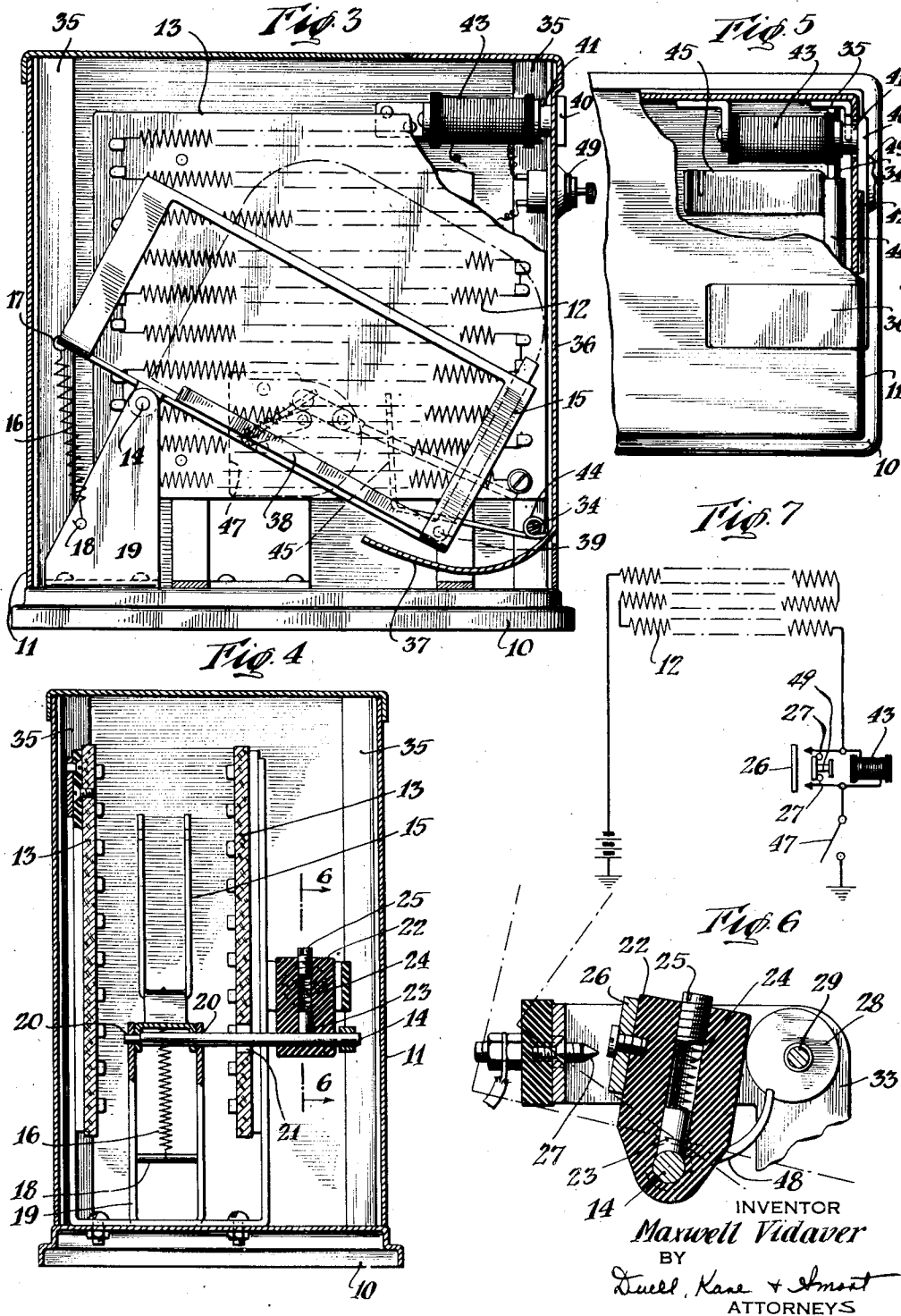
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,114,000

ELECTRIC TOASTER

Maxwell Vidaver, New York, N. Y.

Application December 21, 1935, Serial No. 55,499

11 Claims. (Cl. 219—19)

This invention relates to an improvement in heat transfer apparatus.

It is an object of the invention to provide such apparatus which is automatic in operation and in which the radiation of heat can be initiated and terminated, and the material to be treated ejected when the heating operation is completed.

Another object is that of providing a device in which the loss of weight of the material exposed to the heating element is utilized to set in operation the apparatus for ejecting the same and terminating the radiation of heat.

A further object is that of providing heat transfer apparatus in which various degrees of heat can be applied for varying periods of time at the will of the operator and at the same time each piece of material sequentially treated with the same setting of the apparatus will be identical with the one preceding or following it.

Still another object is that of providing a device of this type which will be entirely fool-proof and free from the dangers of overheating and burning which are common in most forms of heat transfer apparatus now in every-day use and in which it will be impossible for radiation of heat to occur in the device if unattended or in the absence of a piece of material in the heat transfer chamber.

With these and other objects in mind, reference is had to the attached sheets of drawings in which:

Fig. 1 is a top view of one embodiment of the invention in open position and with the cover plate removed to disclose the interior mechanism;

Fig. 2 is a side elevation in cross section taken through the lines 2—2 of Fig. 1;

Fig. 3 is a side elevation in cross section of the apparatus shown in Fig. 2, but in closed position, while

Fig. 4 is a rear elevation in cross section taken along the lines 4—4 of Fig. 2;

Fig. 5 is a fragmentary top view partially broken away to show a detail of the operating mechanism;

Fig. 6 is an enlarged cross section taken through the lines 6—6 of Fig. 4, and disclosing a further detail of the operating mechanism, and

Fig. 7 is a schematic diagram of one type of electrical circuit which may be utilized in connection with the invention.

Referring now to Figs. 1 through 6, numeral 10 represents the heat transfer or toaster base upon which is secured a conventional outer frame or shell 11. Both these members are preferably made of metal or other heat resistant material.

Positioned within said shell and likewise secured to said base are electric heat elements 12 which may be any of several well known forms and which are supported in the conventional manner upon asbestos or other insulating backing members 13. Positioned between said heat elements by means of a pivot shaft 14 is a material or toast receiving platform 15 in what may be termed the material receiving chamber.

As has been shown, the point of pivot is preferably to one side of center of the platform and the latter is held against too ready movement by means, for example, of a spring member 16 which is secured to the short end of the platform at 17 and at 18 to a stationary fitting 19 which is carried by the toaster base. This latter fitting additionally provides journals or bearing surfaces at 20 for the support of shaft 14. Shaft 14 is extended at one end and passes through the heat element and its support at 21, and thereafter through a block 22 which block is preferably of a fibrous or other insulating material and which is frictionally held to the shaft 14 in accordance with the embodiment illustrated by means of a contact shoe 23 which is spring pressed against the side surface of the shaft by spring 24 provided for this purpose, and which is held in position, for example, by means of a screw 25 or in any other desired manner. A metal strip 26 is secured to a side face of said block. In line therewith and contacting the same when the block is in certain positions are two electrical terminals or contact points 27.

Adjacent the face of said block which is opposite the contact strip 26 is a cam wheel 28 carried by a shaft 29 to the outer end of which is fastened a manipulating knob 30. This shaft passes through shell 11 at 31 and is additionally supported at 32 by a bracket 33 which is, in turn, fastened to the base of the toaster. Additionally supported by the shaft 34, which is pivoted to the toaster shell at 35, is a door or closure member 36, so weighted as to cause it to assume the open position shown in Fig. 2. Carried by said closure and extending within the toaster to a point beneath the platform 15 is an arm 37 which, as is shown in Fig. 2, contacts a toast ejector 38 which is pivotally secured to said platform as at 39 and causes said toast ejector to tilt outwardly when the closure is in open position. A further arm 40 is carried near the free end of said closure and this arm may be of iron, or have secured to its outer end an iron disk or strip as at 41. Additionally a strip spring element 42 can be provided on the inner surface of

said arm. Carried by the toaster shell in line with and cooperating with the iron disk 41 is an electromagnet 43 which when energized maintains the closure in closed position. Carried by the shaft 34 and fixedly secured for rotation therewith is a member 44 formed with an inwardly slotted bracket 45. Riding within the slot of said bracket is the arm 46 of a conventional type toggle switch 47 which is, in turn, secured to the support 33 afore referred to.

As will be seen with particular reference to Fig. 7, the heating element 12 is in series with the electro-magnet 43 and the toggle switch 47. Contact points 27 cooperate with the strip 26 to short out the electro-magnet when they are brought together. In operation, a piece of bread is placed upon the toast platform 15, causing the latter and the ejector strip 38 forming a part thereof to assume the position shown in Fig. 2. At this point the toggle switch arm 46 is in raised position and the switch 47 is disconnected so that no electric current is passing through the heating element or the electro-magnet. Closure 36 is then manually moved to its closed position, causing the toggle switch arm 46 to be lowered, which in turn turns on the electric current and causes a flow of electricity through the heating element and an energization of the electro-magnet 43. This, in turn, attracts the soft iron disk 41 to the magnet core and holds the closure in its closed position, all as shown in Fig. 3. After the closing of the closure with the accompanying downward travel of the arm 37, the toast platform 15 is free to pivot about the shaft 14, carrying the latter member to which it is fixedly secured with it. The tension of the spring 16 will cause the platform to ultimately reach a position of rest, which position will vary with the weight and thickness of the slice of bread used, but in all events will leave the platform suspended between the heating elements and arrested in its downward movement solely because of the resistance of the spring 16.

As the platform rotates under the weight of the slice of bread carrying with it the shaft 14, the frictionally held block 22 will likewise begin to rotate in the same direction as the shaft and will continue so to rotate until it contacts the eccentric or camming disk 28. In arranging the distance of travel of the block it is merely necessary that it travel a sufficient distance so that the points 27 are out of contact with the strip 26 and such distance can be pre-arranged so that it is less than the rotation of the shaft 14 under the lightest possible piece of bread. When the block 22 has been arrested by the cam 28, shaft 14 and the bread carrying platform continue to turn until the point of equilibrium heretofore discussed has been reached. The toasting operation will then continue with the platform in this position until the bread being toasted has lost sufficient weight due to the evaporation of moisture and other matter to cause the equilibrium of the platform to be upset, causing the latter to rotate in a counter-clockwise direction or rise, due to the pull of the spring 16. Such a rise of the bread carrying platform will, in turn, cause a counter-rotation of the shaft 14 and with it the frictionally held block 22. Such movement of the block 22 will bring the strip 26 to rest against the contact points 27 which will, in turn, cause a short circuiting and de-energization of the electro-magnet 43. This in turn will cause the top-heavy closure 36 assisted by the spring 42 to fall away from the toaster shell and assume the position

shown in Fig. 2 with the coincident throwing of the toggle switch arm 46 to its raised position and so turning off the electric current. The arm 37 will additionally press against the bottom of the toast ejector 38, causing the latter to position the toast as shown in the dotted lines in Fig. 2, and hold it in that position until it is removed by the user.

In originally setting the machine for the making of proper toast, it is only necessary to pre-arrange the distance of travel of the block 22 between the stop 28 and the contacts 27, so that sufficient loss of weight will have occurred during the travel from one position to the other to effect the toasting, or in the absence of this adjustment, tension of the spring 16 can be so regulated that a predetermined loss of weight is necessary to bring about the short circuiting of the electro-magnet, as described. By adjusting the manipulating knob 30, and presenting different faces of the cam disk 28 to the block 22 the distance of travel of the latter can be increased and in this way lighter or darker toast can be made at will. To insure a positive means for preventing operation of the device without a piece of toast in the toasting chamber, an arm 48 can be secured to the shaft 14 so as to rotate therewith, the free end of which will contact the block 22 and positively engage the latter against the contact points 27 when the toast carrying platform is empty and in raised position. At all other times this arm will drop down as the shaft rotates and be out of the way. Thus it is impossible for a child or other person to effect a turning on of the current or operation of the toaster in the absence of a piece of toast or bread on the platform, as the electro-magnet would be continually short circuited and would refuse to hold the closure in its natural position, the natural weight of the latter causing it to fall open whenever it is not manually held in place. In addition a supplementary short circuiting switch 49 can be provided to de-energize the electro-magnet should the primary short circuiting means refuse to function.

It is, of course, to be understood that any means responsive to the condition or change in the condition of the material within the heat transfer chamber, such as a light sensitive or photo electric cell, might be utilized to effect a short circuiting of the electro-magnet with its incidental shutting off of the electric current and ejection of the toast or that the last two named operations could be performed independent of the other.

Thus, among others, the several objects of the invention as specifically afore noted are achieved. It will additionally be understood that numerous changes in construction and rearrangement of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

Having thus fully described the invention, what is claimed is:

1. An article of the character described including a heating element, a chamber adjacent thereto, a material receiving platform pivotally supported within said chamber and independent of said heating element, a movable closure associated with said chamber, means for retaining said closure in closed position, and further means responsive to a downward movement of said platform for rendering said first named means operable.

2. An article of the character described, in-

cluding a heating element, a chamber adjacent thereto, a material receiving platform pivotally supported within said chamber and independent of said heating element, a movable closure associated with said chamber, means for retaining said closure in closed position, and further means responsive to a movement of said platform in a downward direction for rendering said first named means operable, a movement of said platform in the opposite direction rendering said first named means inoperable.

3. A heat transfer apparatus comprising a heating element, a chamber adjacent thereto, a material receiving platform pivotally supported within said chamber and independent of said heating element, a movable closure for said chamber, electromagnetic means for maintaining said closure in closed position, and means responsive to a downward movement of said platform for energizing said electromagnet.

4. A heat transfer apparatus comprising a heating element, a chamber adjacent thereto, a material receiving platform pivotally supported within said chamber and independent of said heating element, a movable closure for said chamber, electromagnetic means for maintaining said closure in closed position, and means responsive to an upward movement of said platform for de-energizing said electromagnet.

5. A heat transfer apparatus comprising a heating element, a chamber adjacent thereto, a material receiving platform pivotally supported within said chamber, a movable closure for said chamber, electromagnetic means for maintaining said closure in closed position, and means responsive to a movement of said platform in one direction for energizing said electromagnet and a movement of said platform in the opposite direction resulting in a deenergization of said electromagnetic means.

6. A heat transfer apparatus comprising a heating element, a chamber adjacent thereto, a pivotally mounted platform positioned within said chamber, a movable closure for said chamber, heat initiating means coupled to said closure and rendered operable by the closing thereof, and further means responsive to an upward movement of said platform for rendering said heat initiating means inoperable.

7. A heat transfer apparatus comprising a

heating element, a chamber adjacent thereto, a material receiving platform pivotally supported therein, material ejecting means positioned adjacent said platform, and means responsive to an upward movement of said platform for rendering said material ejecting means operable.

8. An apparatus of the character described including, in combination, a heating element, a chamber adjacent thereto, a material receiving platform pivotally supported in said chamber, heat initiating means connected to said heating element, material ejecting means mounted in said chamber adjacent said platform, and means responsive to an upward movement of the latter to render said heat initiating means inoperable and said material ejecting means operable.

9. A heat transfer apparatus including, in combination, a heating element, a chamber adjacent thereto, a platform pivotally supported within said chamber and responsive to fluctuations in weight of material placed thereon, a movable closure for said chamber, means for maintaining said closure in closed position, and further means responsive to a loss of weight of material on said platform for rendering said first named means inoperable.

10. A heat transfer apparatus comprising a heating element, a chamber adjacent thereto, a material receiving platform pivotally supported therein and responsive to fluctuations in weight of material placed thereon, material ejecting means mounted in said chamber adjacent said platform, means responsive to a predetermined loss of weight of material carried by said platform for rendering said ejecting means operative, and further means for varying said predetermined period aforementioned.

11. A heat transfer apparatus comprising a heating element, a chamber adjacent thereto, a platform pivotally mounted in said chamber and responsive to fluctuations in weight in material placed thereon, a movable closure for said chamber, means for holding said closure in closed position, further means responsive to a predetermined loss of weight of material placed on said platform for rendering said first named means inoperative, and manually operable means for additionally rendering said first named means inoperable.

MAXWELL VIDAVER.