

United States Patent

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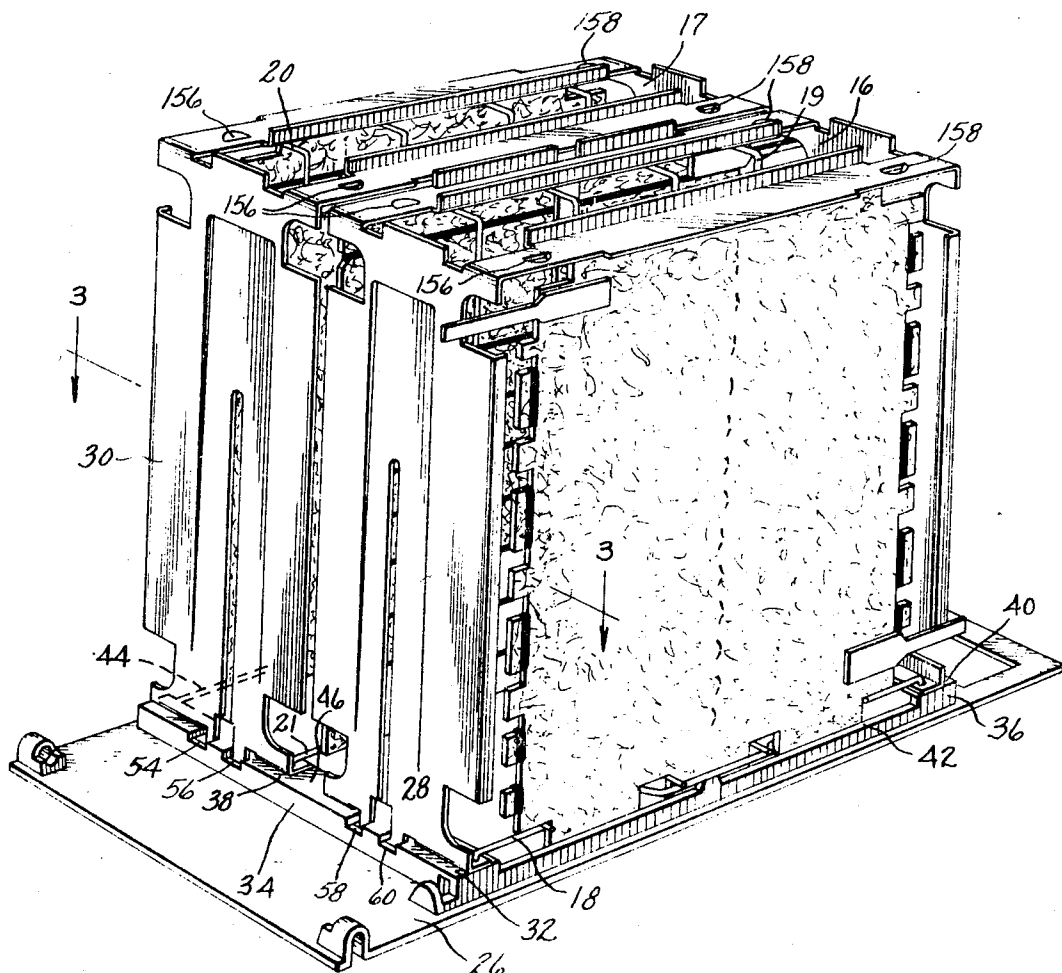
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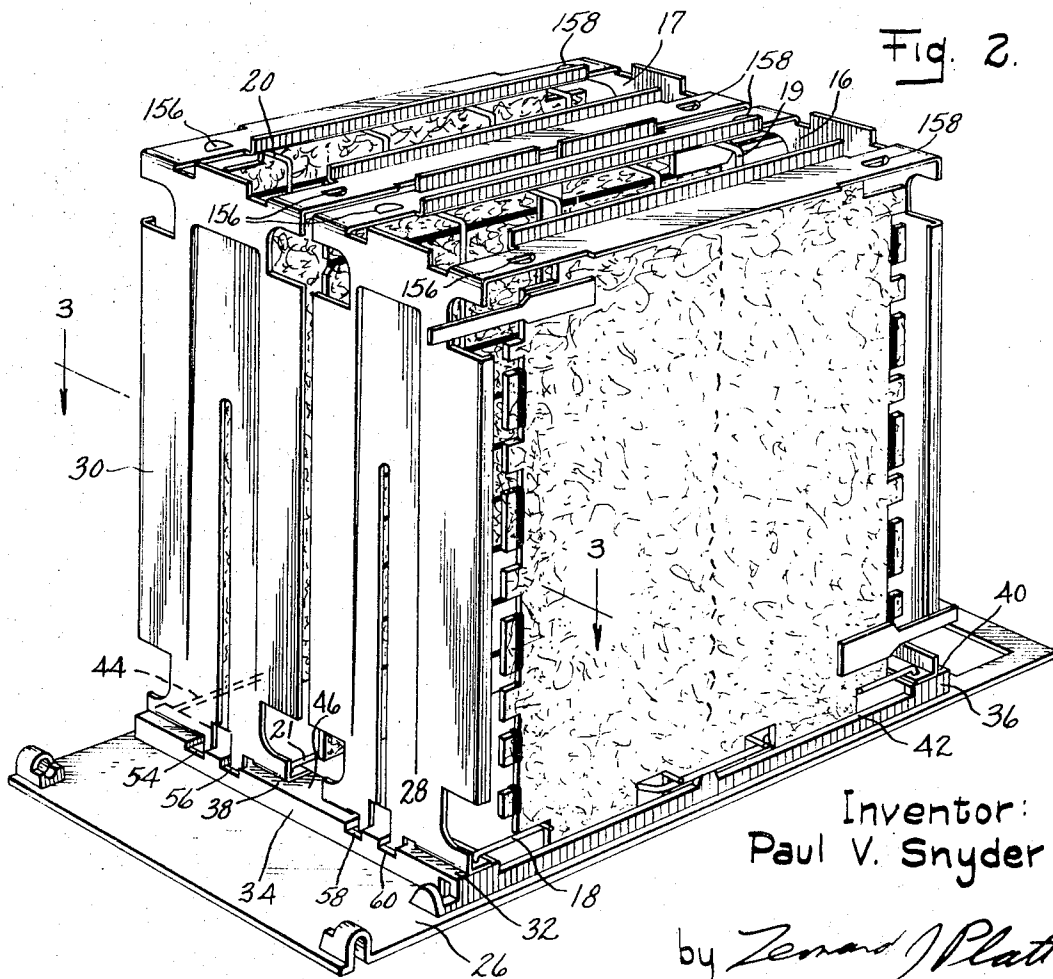
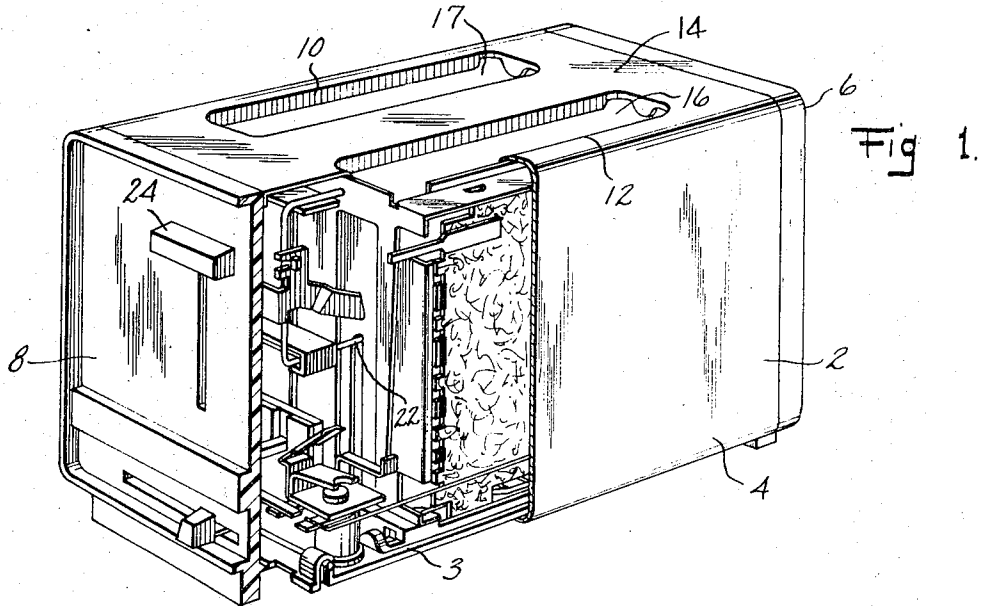
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[54] **ELECTRIC TOASTER CONSTRUCTION**
5 Claims, 6 Drawing Figs.

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H05b 3/06
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536-7; 99/385-9, 400-1-2, 399, 521;
248/27, 309, 361; 29/193.5; 174/50, 54, 52, 58,
35.5; 219/385-6, 402, 521

ABSTRACT: An electric toaster construction wherein a rigid base plate is provided with a plurality of slots and a relatively flexible heater frame is provided with a plurality of downwardly extending latch tabs so that the heater frame may be quickly and securely connected to the base plate by snapping the tabs on the heater frame into the slots on the base plate. A unique arrangement is also provided for connecting a bread guard to the heater frame.





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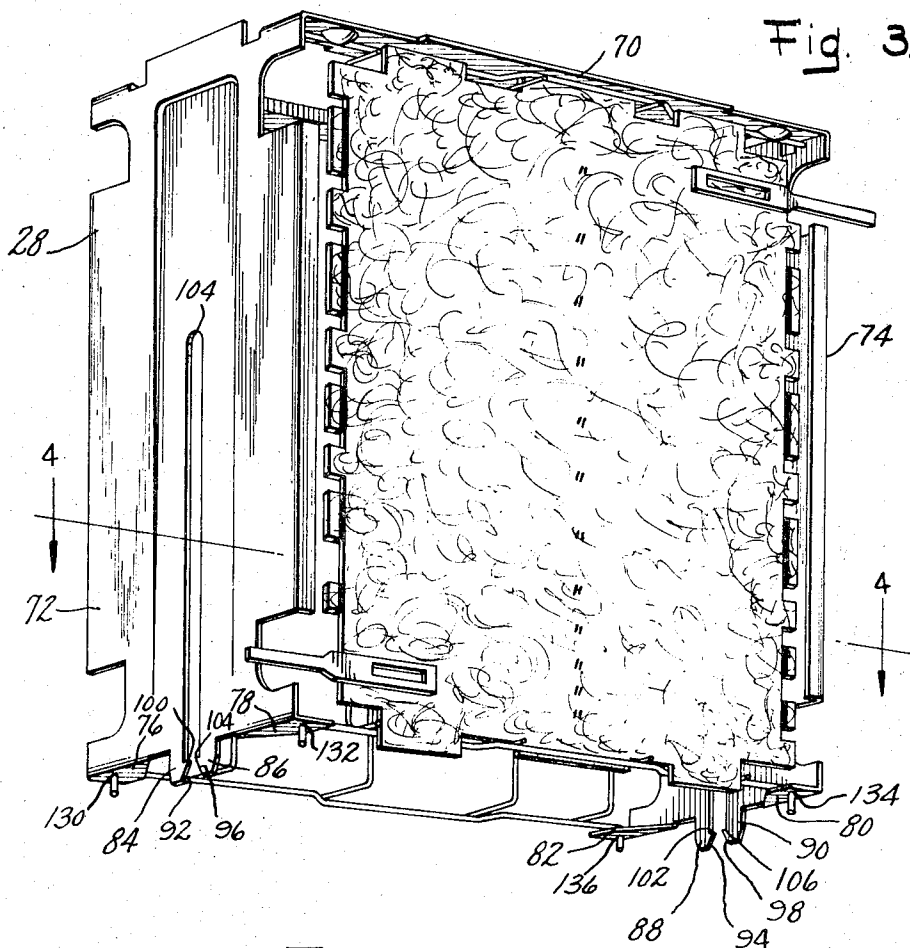
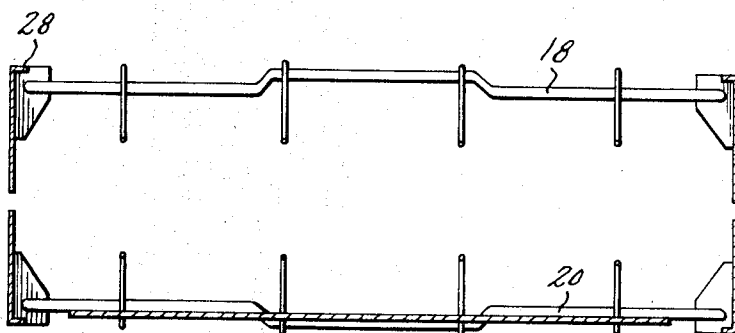


Fig. 4.



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Fig. 5.

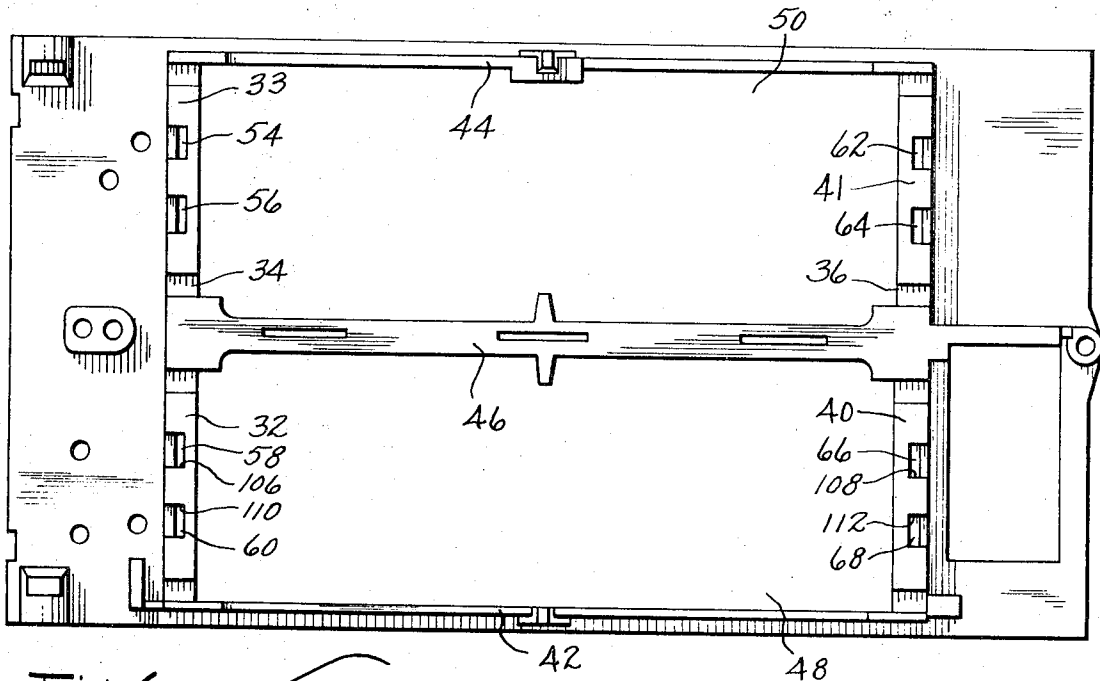
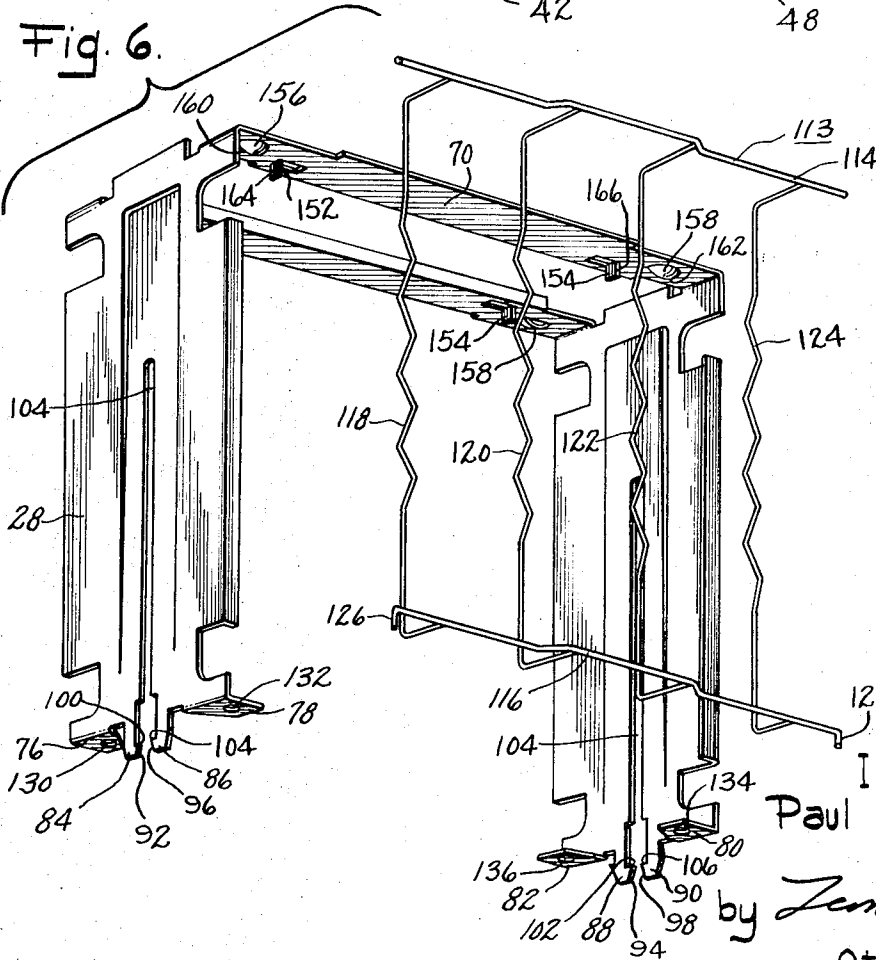


Fig. 6.



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ELECTRIC TOASTER CONSTRUCTION

BACKGROUND OF THE INVENTION

This invention relates to an electric toaster, and more particularly, to an improved compact, easily manufactured construction arrangement for an electric toaster.

Electric pop-up style toasters conventionally include sheet metal frames and casings for supporting bread guards, heater wires, toaster carriages and other components of the toaster. While these components have been constructed, sub-assembled and assembled in a number of different ways, it is especially desirable that they be sturdily constructed and securely assembled in an electric toaster. It is also desirable to provide an electric toaster which may be manufactured at relatively low cost. It is most important therefore to reduce to a minimum the number of parts required, the number of manufacturing operations to be performed on each part, and the number of operations required to assemble the parts to each other.

Accordingly, it is a primary object of this invention to provide an improved, low cost construction for an electric toaster having a minimum number of parts which may be easily manufactured and assembled to each other.

SUMMARY OF THE INVENTION

In accordance with one of the aspects of this invention, a rigid base plate is formed with a plurality of pairs of slots. A unique modular sheet metal heater frame sub-assembly conveniently supports the electric resistance heating elements for toasting a slice of bread, and bread guards for positioning a slice of bread while it is being toasted. The heater frame has a top wall and depending side walls. A pair of integrally formed latching tabs are positioned at the lower portions of each of the heater frame side walls. The tabs have cam surfaces and latching noses facing each other so that the heater frame may be quickly assembled to the base plate by simply pressing downwardly on the heater frame and snapping the latching tabs into the slots formed in the base plate. With this unique sub-assembly arrangement, the heater frame is connected to the base plate without the use of a single piece of fastening hardware. Furthermore, the assembly does not require any twisting or forming of tabs with tools. The entire construction is made by utilizing the rigid characteristics of the base plate and the spring characteristics of the heater frame.

It can also be appreciated that with this construction, the components necessary for toasting a single slice of bread, namely, the electric resistance wires and the bread guards have been previously assembled to the modular heater frame. Accordingly, single, two, three and four slice toasters may be manufactured using identical heater frame sub-assemblies. A four slice toaster would require four heater frame sub-assemblies while a two slice toaster would require two heater frame sub-assemblies.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and attendant advantages of the invention will be apparent from the following description taken in connection with the accompanying drawing in which:

FIG. 1 is a perspective view of an electric toaster construction embodying the invention partly broken away to show details of construction;

FIG. 2 is a perspective view of the electric toaster shown in FIG. 1 with the outer casing removed to show construction details;

FIG. 3 is a bottom and side perspective view of the unique heater frame sub-assembly shown in FIG. 1;

FIG. 4 is a cross sectional view of the heater frame sub-assembly taken substantially on the plane 4—4 of FIG. 3;

FIG. 5 is a top plan view of the base plate of the electric toaster illustrated in FIG. 1; and

FIG. 6 is a perspective view of a bread guard and heater frame in unattached positions.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing and first particularly to FIG. 1, there is shown an electric toaster 2 which includes an inner supporting structure 3, an outer cover 4 and spaced generally vertical end walls 6 and 8. Bread receiving slots 10 and 12 are formed in a top wall 14 of the outer casing.

Toasting chambers 16 and 17 are generally defined by opposed bread guard and heater card sub-assemblies 18—19 and 20—21, respectively, which guide and toast slices of bread or other food.

As shown in FIG. 1, a bread carrier 22 is movable vertically in the toasting chamber by means of an actuator lever 24, as is conventional in "pop-up" style toaster. It is to be understood that any of several conventional actuating and timing means may be used to actuate the bread carrier 22. Also, while I have illustrated in detail only a two-slice toaster, it is to be understood that a single, three, four or more slice toaster may utilize my improved construction to be more fully described hereinafter.

In accordance with my invention, a relatively rigid base plate 26 is provided for supporting one, two, three or more heater frame modules, and as shown in FIG. 2, the base plate 26 supports two heater frame modules 28 and 30. The base plate is preferably formed as a casting of aluminum or other suitable metal.

Referring now to FIGS. 2 and 5, there is shown a top plan view of the base plate casting 26. As illustrated, the base plate 26 includes a raised central portion 32 for supporting the heater frame modules 28 and 30. The raised central portion includes two side walls 34 and 36 having upper surfaces 33 and 40; respectively, upon which the heater frame modules 28 and 30 may be positioned. The rigid cast base plate 26 also includes integrally formed front and rear walls 42 and 44 for also supporting portions of the heater frame modules. A centrally positioned raised portion 46 divides the raised central portion into two enlarged openings 48 and 50. Conventionally, the enlarged openings 48 and 50 permit bread crumbs and other material to drop below the toasting chambers.

As shown in the embodiment of my invention illustrated in FIG. 5, four pairs of slots identified by reference numerals 54—56, 58—60, 62—64, and 66—68 are provided for receiving connecting portions of the heater frame modules 28 and 30 in a manner to be more fully described hereinafter.

In accordance with my invention, the improved toaster includes unique modular heater frame sub-assemblies 28 and 30. As shown more particularly in FIG. 3, each of the heater frames 28 and 30 include a top wall 70 and integrally formed depending side walls 72 and 74. The frames are preferably formed of sheet metal or other suitable flexible material which may be readily bent and formed to the desired shapes. As illustrated, inwardly formed bottom wall portions 76, 78, 80 and 82 are provided at the lower portions of the side walls for partially resting on the upper surfaces 32, 33, 40 and 41 of the cast base member 26; and, in a manner to be more fully described hereinafter, the bottom wall portions 76, 78, 80 and 82 also function as bread guard support tabs.

Pairs of latching tabs 84—86 and 88—90 are also formed at the lower portions of the side walls 72 and 74, respectively, for quickly and securely holding the heater frames 28 and 30 to the base member 26. As shown, tabs 84 and 88 have cam surfaces 92 and 94, respectively, which face corresponding cam surfaces 96 and 98 on tabs 86 and 90. Tabs 84 and 88 also have inwardly projecting noses or latches 100 and 102 which face inwardly projecting noses or latches 104 and 106 of tabs 86 and 90.

It can be appreciated that the cams and inwardly projecting latching noses may be readily formed in the heater frame sheet metal sub-assemblies 28 and 30 as they are being formed and stamped with other slots and tabs, and thus, these parts are very inexpensively achieved. In this connection, slots 104 may

be formed in the side walls 72 and 74 of the heater frame sub-assemblies at the same time that the tabs 84, 86, 88 and 90 are being formed. With reference to FIGS. 1 and 2, it can be seen that the slots 104 are required to receive the bread carrier 22. The tabs 84, 86, 88 and 90 are also uniquely related to the slots 104 in that the tabs have been designed to be spread apart and separated from each other as the heater frame 28 is attached to the cast base member 26 and therefore the slots 104 provide additional resiliency to the tabs to achieve this purpose.

With this construction, the heater frame sub-assembly modules 28 and 30 may be quickly and readily assembled to the base plate 26 by simply aligning tabs 84—86, and 88—90 with slots 58—60 and 66—68 formed in the base plate and snapping the heater frame into position. As the heater frame is pressed downwardly, cam surfaces 92, 94, 96 and 98 slide on the inside edges 106, 108, 110 and 112 of slots 58—60 and 66—68 until the latching noses 100, 104, 106 clear the lower surface of the base plate thereby permitting the tabs 84—86 and 88—90 to snap toward each other and engage the under side of the base plate 26. With this unique sub-assembly arrangement, it can be appreciated that the heater frame modules 28 and 30 are connected to the base plate 26 without the use of a single separate piece of fastening hardware. Furthermore, the assembly does not require any twisting or turning of hardware with tools. The entire construction is made by utilizing the rigid characteristics of the cast base plate 26 and the spring characteristics of the resilient sheet metal heater frame including the designed-in characteristics which are achieved by the uniquely shaped and positioned tabs 84, 86, 88, 90 and slots 104.

In accordance with my invention, the heater frame sub-assemblies 28 and 30 also uniquely and conveniently support bread guard and electric resistance wire heater card sub-assemblies 18—19 and 20—21 for positioning and toasting a slice of bread or other food. As shown more particularly in FIG. 6, a bread guard 113 for guiding a piece of bread while it is being toasted is formed of a plurality of wire members. As illustrated, the bread guard includes a top generally horizontal wire 114, a bottom generally horizontal wire 116, and a plurality of generally parallel vertical wires 118, 120, 122 and 124 connected at their opposite ends to the top and bottom horizontal wires 114 and 116. End portions 126 and 128 of the generally horizontal bottom wire 116 are bent downwardly so that the end portions 126 and 128 are vertically arranged generally parallel to the vertical bread guard wires 118, 120, 122 and 124 for a purpose to be more fully described hereinafter.

Each of the heater frames 28 and 30 are also uniquely shaped and formed during a stamping and forming operation for permitting the bread guards 113 to be quickly and readily assembled to them. As shown more particularly in FIGS. 3 and 6, apertures 130, 132, 134 and 136 are formed in the bottom walls of bread guard support tab portions 76, 78, 80 and 82, respectively, of the heater frames 28 and 32 for receiving the downwardly extending portions 126 and 128 of the bottom horizontal bread guard wires 116.

Latch tabs and stops are also integrally formed on the upper wall 70 of the heater frames 28 and 30 for connecting the upper horizontal wire 114 of the bread guards to the heater frames 28 and 30. As shown more particularly in FIG. 6, stop tabs 152 and 154 are integrally formed from the upper wall 70 of the heater frame and extend downwardly therefrom for cooperating with the inside surface of the top horizontal bread guard wire 114. Dished out one-quarter spherical latching tabs 156 and 158 extend downwardly from the upper wall 70 of the heater frame for cooperating with the rear surface of the top horizontal bread guard wire 114.

With reference to FIG. 6, it can be seen that the electric resistance wire heater card and bread guard assembly 18 may be quickly and securely connected to the heater frame 28. First, wire portions 126 and 128 are inserted into apertures 132 and 134, and then the bread guard 113 is pivoted toward the

heater frame thereby causing the upper surfaces of horizontal wire 114 to abut and slide on the one-quarter spherical cam surfaces 156 and 158. Continued inward movement of the bread guard 113, and particularly the upper horizontal wire 114, snaps the upper horizontal wire 114 into position between an inner surface 160 and 162 of the one-quarter spherical cam members 156 and 158 and an outwardly facing surface 164 and 166 of stop tabs 152 and 154. It can be appreciated that the bread guard 113 and electric resistance heater wire sub-assembly 18 is connected to the heater frame without the use of a single piece of fastening hardware. All of the connection parts are integrally formed on the heater frame 28 and bread guard 113 in simple bending and stamping operations. The assembly does not require any twisting or forming of tabs with tools after the bread guard has been placed in position on the heater frame, and the entire construction is made by utilizing the flexible and rigid characteristics of the uniquely shaped and positioned bread guard wires and heater frame.

From the foregoing description, it will be appreciated that my improved electric toaster construction includes a minimum number of relatively easily manufactured sub-assemblies. Accordingly, the bread guard and electric resistance wire card sub-assembly 18 may be quickly snapped into place on the modular heater frames 28 and 30 and then the modular heater frames may be readily snapped into place on the base plate 26. Thus, an exceedingly simple, yet sturdily constructed electric toaster has been achieved.

I claim:

1. An electric toaster construction comprising:

- a. a rigid base plate having a plurality of pairs of slots formed therein;
- b. a heater frame formed of thin flexible sheet metal defining a toasting chamber, said heater frame having a top wall and depending side walls, and an electric resistance wire for toasting positioned to transmit heat to said toasting chamber;
- c. a pair of latching tabs integrally formed at the lower portion of each of said side walls, said tabs being separated from each other, each of the tabs of one of said pair of tabs having a cam surface and an inwardly projecting latching nose facing the other one of said pair of tabs so that said heater frame may be quickly and securely fastened to said base plate by aligning said tabs with said slots and pressing downwardly on the heater frame so that the opposed camming surfaces acting against the inside edges of the slots separate the tabs until the latching noses clear the base plate thereby permitting the tabs to snap toward each other and engage the underside of the base plate; and
- d. an elongated slot formed in each of the side walls of said thin flexible sheet metal heater frame, said slot extending upwardly between each of said facing cam surfaces so that said tabs may be readily spread apart when they engage the edges of the slots in said base plate, said elongated slots extending upwardly approximately one-half of the height of said side walls.

2. An electric toaster construction as defined in claim 1 wherein inwardly extending bread guard support tabs are integrally formed at the lower portions of said side walls adjacent to said downwardly extending latch tabs, said bread guard support tabs being positioned outwardly from each of said pair of latching tabs.

3. An electric toaster as defined in claim 2 wherein each of said inwardly extending bread guard tabs includes an aperture, and a bread guard wire is positioned in each of said apertures.

4. An electric toaster construction comprising:

- a. a rigid base plate having a plurality of pairs of slots formed therein;
- b. a flexible sheet metal heater frame defining a toasting chamber, said heater frame having a top wall and depending side walls, and an electric resistance wire for toasting for transmitting heat to said toasting chamber;

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- c. inwardly extending bread guard support tabs integrally formed at the lower portions of each of said side walls, each of said inwardly extending bread guard tabs including an aperture;
- d. a pair of stop tabs extending downwardly from the top wall of said heater frame; 5
- e. a pair of latch tabs extending downwardly from the top wall of said heater frame, said tabs being separated from each other and being formed with said heater frame so that they may be resiliently moved away from each other, each of said latch tabs being positioned outwardly from a corresponding one of said stop tabs and each of said latch tabs including a downwardly extending cam surface; and 10
- f. a bread guard including a top and a bottom generally horizontal wire and a plurality of generally parallel vertical wires fixed at their opposite ends to said top and bottom horizontal wires, the end portions of said generally horizontal bottom wire being bent downwardly so that 15

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said end portions are vertically arranged generally parallel to the vertical bread guard wires whereby the downwardly extending portions of said bottom wire may be readily positioned within the apertures formed in the bread guard tabs of said heater frame, the bread guard may be pivoted inwardly so that the top generally horizontal wire abuts the cam surfaces of the latch tabs formed on the top wall of said heater frame, and the bread guard may be snapped into position so that the end portions of the generally horizontal upper wire are held between a downwardly extending latch tab and an adjacent downwardly extending stop tab.

5. An electric toaster construction as defined in claim 4 wherein said downwardly extending latch tabs are generally one-quarter spherical in shape and the cam surfaces are one-quarter spherical in shape.

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