United States Patent

[11] 3,615,706

[72] Inventor **Radcliffe Franklin Robinson**
Highland Park, N.J.

[21] Appl. No. **367,361**
[22] Filed **Apr. 14, 1964**
[45] Patented **Oct. 26, 1971**
[73] Assignee **Colgate-Palmolive Company**
New York, N.Y.

[54] **FOOD PACKAGE**
16 Claims, 9 Drawing Figs.

[52] **U.S. Cl.** ..... **99/171 H,** 53/29, 53/42, 99/174, 206/46 F, 220/64, 229/3.5 MF

[51] **Int. Cl.** **B65b 25/06,** B65d 5/46, B65d 5/56, B65d 5/62

[50] **Field of Search** ..... 99/171, 174; 206/46; 229/3.5, 3.5 MF, 5.5, 5.6, 43; 220/64, 67, 66

Primary Examiner—William T. Dixson, Jr.
Attorneys—Murray M. Grill, Herbert S. Sylvester, Thomas J. Corum and Ronald S. Cornell

ABSTRACT: A sealed package for holding, transporting, and heating food comprising a container of a size to fit in the slot of a toaster and formed of an electrically conductive material with a heat stable, nonconductive coating disposed on its exterior so that no conductive material or raw edges are exteriorly exposed.

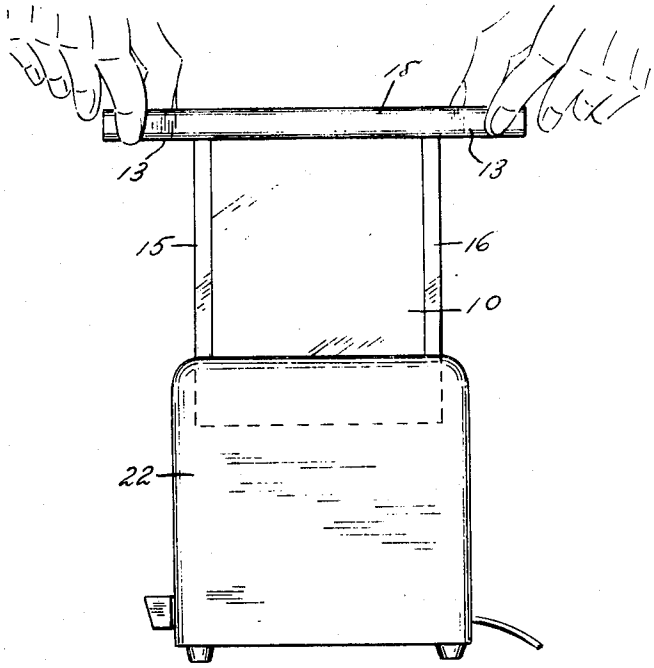


Fig. 1

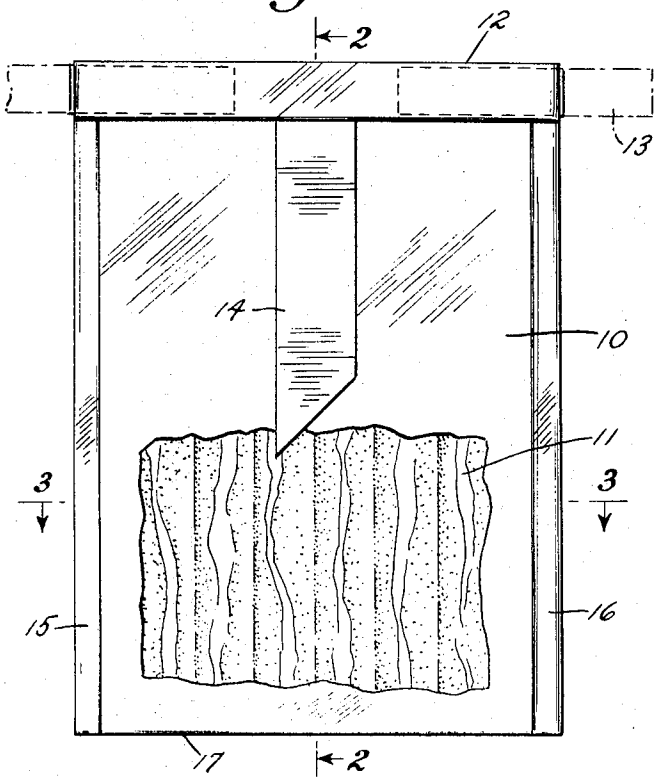
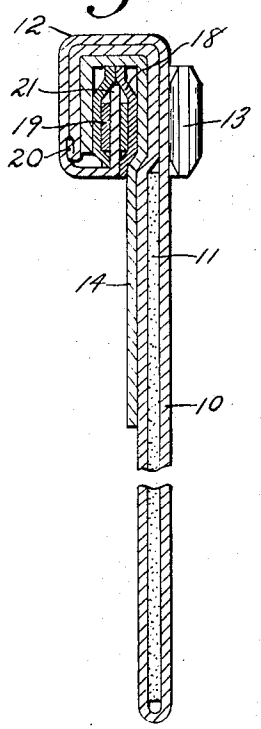


Fig. 2



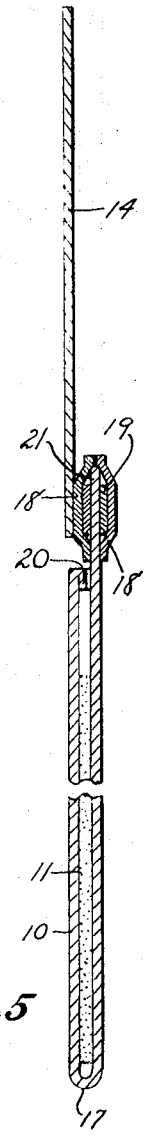


Fig. 5

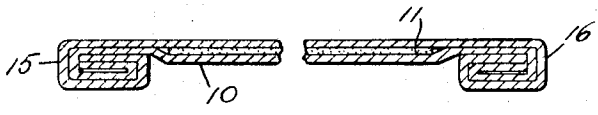
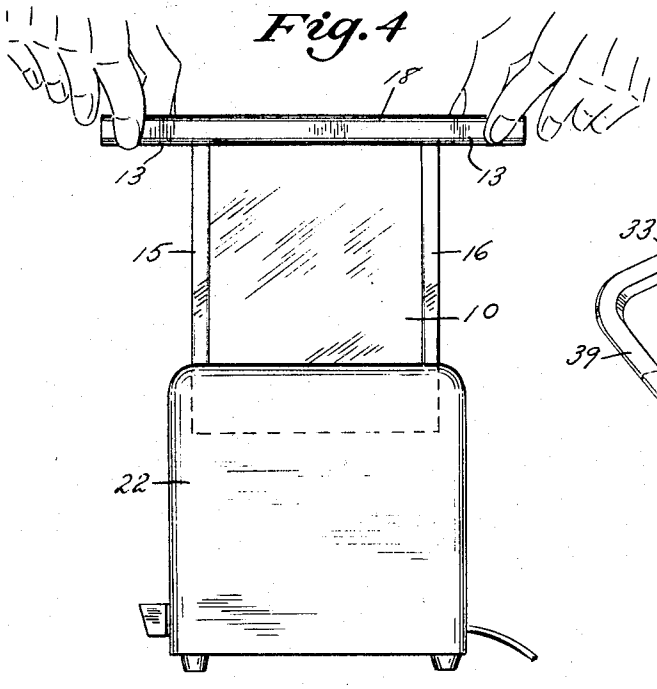


Fig. 3

Fig. 4



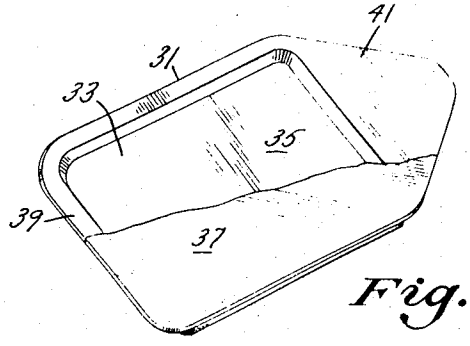


Fig. 6

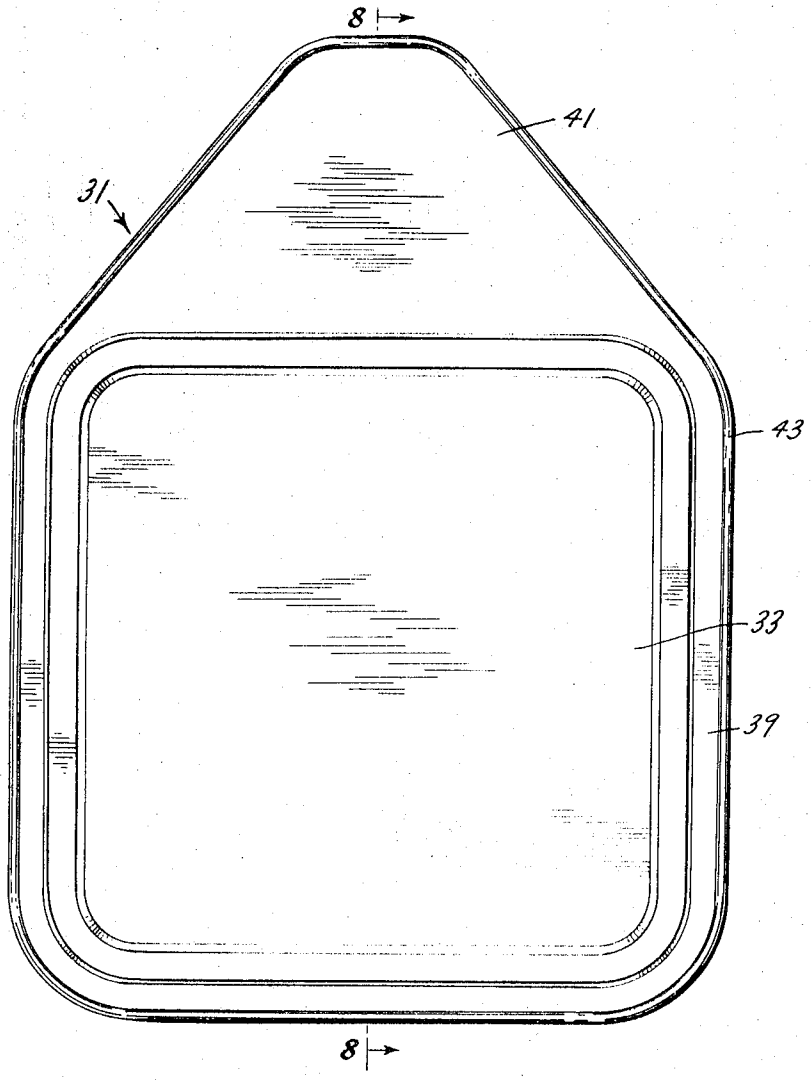


Fig. 7

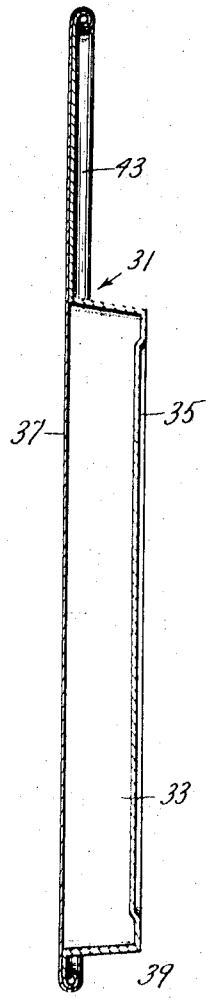


Fig. 8

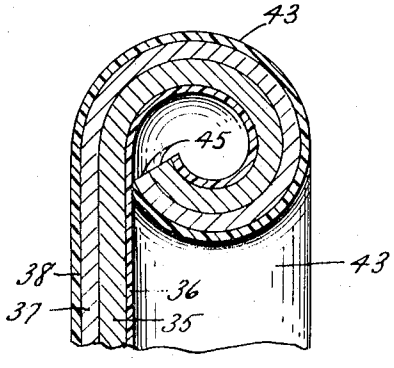


Fig. 9

FOOD PACKAGE

This invention generally relates to a sealed package containing a food item which comprises an electrically conductive container having a heat stable, dielectric coating completely covering the exterior of said container, and the edges of said package being rolled in such a fashion that the raw edges are not exteriorly exposed. Preferably, the sealed package will also include at least one electrically insulated handle. A particularly preferred package is a closed container having contents therein which comprises a metal foil pan having a bottom portion and upright side portions which define a receptacle for the contents and an opening therein, said pan having a dielectric coating composition coated on the entire exterior side thereof, a flat peripheral flange portion extending laterally outward from the side portion of the opening to define on the flange portion a flat surface area which extends beyond the side portions, a metal foil lid having a dielectric coating composition coated on the entire exterior side thereof, said lid closing the opening in said pan with its marginal portion adhesively sealed to the flat surface of said flange portion with their respective edges substantially coextensive and effecting a hermetical seal therebetween around the entire periphery thereof, and a rim at the peripheral portion of the flange portion which is separated from the side portions of the pan by the lateral extension of said flange portion, said rim defined by the respective hermetically sealed marginal edge portions of the cover and the pan being turned together back toward the sealed flange portion and marginal edge of the lid with the endmost marginal portion of the lid abutting against the under marginal edge portion of the flange portion the respective edges of the cover and pan completely enclosed within the turned-back marginal edge portions defining the said rim and interlocked to prevent relative movement therebetween, so that, as formed, the entire exterior surface of the container is covered with a dielectric coating composition.

Merchandising unit packages particularly adapted to contain precooked food products which can be heated while remaining within the package have been previously proposed. However, in the preparation of a self-contained package containing a heatable food adapted for use in the electric toaster cycle, it has been found that when an electrically conductive package is coated with a dielectric coating and contains an electrically insulated handle, an acceptable, safe, self-contained food package can be obtained, which can be employed in an electric toaster to provide quick yet nourishing and substantially complete meals.

The following drawings show two embodiments of the package of the invention which is adapted for insertion into a toaster while containing a food product such as bacon or a baconlike product. In the drawings:

FIG. 1 is a front elevational view of one embodiment of a package ready for heating in a toaster;

FIG. 2 is a vertical cross-sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is a horizontal cross-sectional view taken along line 3—3 of FIG. 1;

FIG. 4 illustrates the package of FIGS. 1–3 as it is being inserted into an automatic electric toaster;

FIG. 5 is a cross-sectional view taken along line 2—2 of FIG. 1 with the package shown open;

FIG. 6 is an isometric view of another embodiment of the package of the invention;

FIG. 7 is a bottom view of the embodiment of the package shown in FIG. 6;

FIG. 8 is a cross-sectional view taken on lines 8—8 of FIG. 7;

FIG. 9 is an enlarged cross-sectional view showing the rolled portion at the top of the package of FIG. 8.

Referring now to FIG. 1, a food such as bacon or baconlike slices 11 is inserted in an aluminum foil envelope 10 which is approximately 6 inches long and 4 inches wide. As shown, the bacon slices 11 can be approximately 4½ inches long, 1½ inches wide and 0.05 inches thick.

The package shown in FIGS. 1–5 may be formed by folding a sheet of aluminum foil at edge 17 and overlapping and pressure sealing the edges 15 and 16 after the edges 15, 16 are folded once towards the center of the package, and the edge produced thereby is again folded so that it is disposed under the second fold in the manner shown in FIG. 3 to form a pouch. The upper edge 12 of the aluminum toaster package is also folded successively towards the center of the package, and then pressure sealed. In this manner, the cut edges of the aluminum foil are not exteriorly exposed. This is of importance because when the surface of the aluminum is coated while in sheet form with a nonconductive material as set forth hereinafter, the edges of blanks subsequently cut therefrom are uncoated. Folding of the raw edges so that they are not exteriorly exposed is highly beneficial in that it provides both improved sealing action and safety characteristics.

In the embodiment of the invention shown in FIGS. 1—5, the aluminum package is provided with a pair of electrically nonconductive handles 13 shown in FIG. 2 in nonextended (folded back) form. The handles 13 extend laterally from the edges 15, 16 at the upper end 12 of the package 10 and are so positioned as to limit the depth of insertion of the package 10 into the toaster 22. The handles 13 are movable from an inoperative position, folded against the package, to an operative position whereupon the handles extend laterally of the package. The handles are forced from the inoperative position to the operative position by opening the package by pulling on tab 14 in a manner described below.

The handles 13 advantageously comprise (as shown in detail in FIG. 2) at least one stiffener 19, which can be formed of wood, heavy cardboard, a thermosetting plastic, or a similar stiff, preferably nonconductive, high-temperature resistant material arranged contiguous to the front and/or the back of the upper edge 21 of the rear panel of the aluminum foil envelope. Surrounding the upper edge 21 and the stiffener or stiffeners 19 is a suitable flexible nonconductive thermally insulating cover 18 which advantageously can be formed of glass cloth. Other suitable materials for the cover 18 are asbestos or electrician's tape. The cover 18 can advantageously have an adhesive backing so that the entire unit can be readily assembled by placing the stiffeners adjacent to the upper edge 21 of the package 10, affixing them in place by applying the tape, and pressing to seal the elements in place. The handles 13 perform the function of enabling the toaster package 10 to be removed from the toaster without burning the fingers, and, in addition, the handles 13 limit the depth of entry of the toaster package into the toaster.

The toaster package is also provided with a pull tab 14 to allow the package to be opened in a simple and facile manner. Tab 14 is placed against the front of the package 10 and is advantageously adhesively adhered to the glass insulating cover 18. The package is then folded to the position shown in FIG. 2 to form an upper edge 12 comprised of a series of successive folds which are pressure sealed whereby the tab 14 lies flat against the front of the package 10. The upper portion of pull tab 14 is confined beneath the pressure seal 12. In operation, the pull tab 14 is pulled in a direction substantially perpendicular to the plane of package 10 whereby said edge 12 is unfolded and the package is opened permitting removal of the contents 11 therefrom.

The upper edge of the front panel of toaster package 10 should be folded inwardly as shown at 20 in FIGS. 2 and 5 so that the sharp and electrically conductive edge thereof lies against the inner face of the front panel and is not exteriorly exposed. In this manner, the electrically nonconductive coating described below will effectively cover the entire exterior portion of the package.

In use, the pull tab 14 is operated to open the toaster package to the position shown in FIG. 5. The step of pulling tab 14 forces the handles 13 which are folded behind the package to snap outwardly into an operative position. Tab 14 can then be removed, and the toaster package inserted into a toaster in the manner shown in FIG. 4. After the toasting cycle

has been completed, the package can be immediately removed from the toaster by holding the handles **13** which are both electrically and thermally insulated. Upon opening the package the contents thereof are ready to eat.

As indicated, in its broadest aspect, the food package of this invention contemplates the use of an electrically nonconductive coating which will completely encompass all exteriorly disposed electrically conductive portions of the toaster package including any handles thereof. However, this invention also contemplates as a preferred feature the step of folding or rolling all edges of the package so that conductive edges are eliminated, and only nonconductive surfaces are exteriorly exposed.

As can be seen in FIG. **3**, the raw edges of the package have been folded in such a manner as to place them in an interior position where they cannot be contacted by a person holding the article. In accordance with a second embodiment of the invention shown in FIGS. **6—9**, the edges are rolled, instead of folded, to obtain the same effect. In either case, it is preferred to use a film-forming coating material which will not crack when folded or rolled, and which is resistant to the high temperatures (600° F. or higher) which can be found within the average toaster. The coating must also have a dielectric constant sufficiently high that even a thin film thereof will be capable of eliminating any possibility of conducting electricity. Preferably the dielectric constant should be at least 2.0. Many advantageous coatings can be used. These include an anodized coating, an electrically insulating varnish, a ceramic coating, water glass, or a silicone, epoxy, or other organic electrically insulating polymer. It is preferred, however, that the coating be a silicone compound which is spray coated over at least one side of the conductive packaging material and cured prior to formation of the package. Accordingly, a coating can be formed on aluminum foil thereby effectively insulating the aluminum foil from transfer of an electric current even when there is direct contact with a 110-volt source at temperatures of 600° F. The use of a silicone polymer coating is also advantageous in that it can be rolled or folded without cracking or separating.

Suitable silicone polymer coatings may be one of a number of thermosetting silicone agents which are known to the art. These silicones include the following:

1. Phenyl and methyl polysilane resins of the type described in U.S. Pat. No. 2,606,837 and in which there are from 1.2 to 2 phenyl and methyl radicals per silicone atom and from which 20 to 70 percent of the total phenyl and methyl radicals are phenyl radicals. The organopolysilanes of this type can be prepared in accordance with methods described in the patent herein referred to.

2. Alkylated high molecular siloxy polymers. These resins are polymers in which the polymer units are SiO_2, $RSi0_{1.5}$, R_2Si0 and $R_3Si0_{0.5}$ and where R represents a monovalent hydrocarbon radical which, as is known, may be of considerably diverse character. The hydrocarbon radicals may be alkyl, aryl, aralkyl or alkaryl radicals. The resins which are of utility for the present purpose are those which contain between 0.95 and 1.6 hydrocarbon radicals per silicon atom. Preferred resins are those in which the hydrocarbon radicals are alkyls containing less than 4 carbon atoms and phenyls and in which at least 40 percent of the siloxane units are of the type $RSi0_{1.5}$.

3. Silicone resins contain both polysilane and polysiloxane resins. In these resins, some of the silicon atoms in the molecules thereof are interconnected by silicon to silicon bonding and some of the silicon atoms are interconnected by silicon to oxygen bonding, the remaining valences of the silicon atoms being satisfied by phenyl and methyl radicals. These resins are high molecular weight polymers with an average composition of $(CH_3)\ a\ (C_6H_5)\ b\ SiO\ c$) in which $a+b$ has a value of from 1.4 to 2 inclusive, c has a positive value and $a+b+2c$ has a value of up to 3.5. Between 30 and 75 percent of the total phenyl and methyl radicals are phenyl radicals.

The coatings may be applied by spraying, brushing, dipping, or other suitable means. Any excess resin is removed, and the coated article is then dried and cured. The curing temperature is preferably 400°–500° F. for a period of about 1 hour.

It may be desirable to provide the electrically insulating or nonconductive coating materials with a suitable pigment such as titanium oxide or the like to impart a decorative effect to the package. Such a pigment, however, can also serve a useful function beyond mere decoration. The pigment-containing coating can also be used to control the absorption or reflection of the heat provided by the toaster, thereby regulating the degree of heating of the food product within the package.

The ability of a coating, with or without pigments, to reflect heat is important since many toasters employ a heat detector to determine the length of time which a food product should remain within the toaster. The use of a nonreflective surface in the vicinity of such detectors will diminish the possibility of the package being ejected too rapidly. For example, coatings having different colors and degrees of brightness can be used on the toaster package in proximity to these heat detectors to control the residence time of the food in the toaster as desired. It has been determined that the residence time of a normally highly reflective metallic package in a toaster of this type can be more than doubled by providing a surface which is dull in comparison to a metallic sheet in proximity to the heat detector. Preferably the surface of the toaster package in the vicinity of the heat detector will have a percentage reflectance of less than 20 to 25.

Advantageously, various colors and degrees of brightness can be chosen for different foods to obtain the correct residence time in the toaster for each different product, or, for the same food product, to obtain varying degrees of cooking. For example, bacon toaster packages can be color coded to enable a consumer to choose a bacon package which will give the desired degree of crispness. The various colors and degrees of brightness can be controlled to provide a series of packages which yield a product having a large number of gradations of crispness.

In the embodiment illustrated in FIGS. **6–9** there is provided a rigid toaster package **31** having a food containing portion **33**, which package corresponds substantially to the shape of a slice of bread. This package may be formed by stamping a heavy sheet of aluminum foil to form the bottom **35** of the package **31** and attaching thereto cover sheet **37** formed from a thinner sheet of aluminum. Each of these sheets **35**, **37** is provided with an exterior coating of a nonconductive material of the type described above. The sheets **35**, **37** extend beyond the food containing portion **33** and are brought together as a flange **39**. The edges of the flange **39** are rolled, as can be seen in detail in FIG. **9**, to provide a mechanical seal and to eliminate the conductive edges from the exterior of the package.

A handle for package **31** is formed by extending the flange **39** at one end thereof to form handle **41**. The raw edge **45** (FIG. **9**) of the conductive sheet material in the area of the handle **41**, is also provided with a rolled edge. The aluminum base sheet **35** having a dielectric coating **36** thereon is attached to the thinner aluminum cover sheet **37** which also has a dielectric coating **38** thereon. These sheets are rolled **43** so that the conductive edge **45** is not externally exposed. In this manner, there is provided a package having an exterior, heat stable, dielectric coating and the handle is completely electrically insulated.

In addition to the mechanical seal provided by the rolled edge **43**, it may be desirable to hermetically seal the package by using a suitable food-grade coating such as a vinyl chloride, vinyl acetate or similar type of film. By hermetically sealing the toaster package, the packaged product can be stored at ambient temperatures without the necessity of refrigeration or freezing and the product will remain crisp with no substantial change in the moisture content thereof. The use of a toaster package containing food that is not frozen is distinctly advantageous because the average food, if frozen, cannot be

adequately heated to ingestion temperatures by a single cycle of the toaster, whereas a toaster package which is initially at room temperature can readily be heated in one cycle thereof.

It has been found that upon storage, the salts present in many foods will cause pinholes in the aluminum package. The occurrences of pinholes can be eliminated by coating the entire inside surface of the toaster package with a suitable material. Advantageously, the interior coating may be one of the nonconductive materials described above as being suitable for an exterior coating. The interior coating may also be a vinyl compound such as vinyl acetate or vinyl chloride which, as indicated previously, may also be used as the hermetic seal.

The requirements of the interior film include the ability to form a continuous film without pinholes, and the coating material must be suitable for use with foods. A silicone coating is especially useful and simplifies the production of the toaster package since the same material can be coated on both sides of each aluminum sheet and only one curing period will be necessary. It is possible to use as the interior coating a material which is thermoplastic and would ordinarily soften at a temperature of 600° F. or below. While it would appear that such material would soften and adhere to the food, surprisingly, this does not, in practice, occur. Although no explanation has been proven for this surprising occurrence, it is believed that a major amount of the heat may be absorbed by the food product thus maintaining the thermoplastic material at a temperature below its melting point.

If desired, it is to be noted that flavoring or odor ingredients can be included as a separate entity along with the food product confined within the sealed package. These may, if desired, be of the type which volatilize during storage or are volatilized by the heat provided by the toaster or oven, thereby increasing the flavor or odor of the product or disseminating an odor into the room if the product is being heated in an open pack.

What is claimed is:

1. A sealed package containing a food item and of a size suitable for insertion into a toaster for heating said food therein, comprising a container formed of an electrically conductive sheet material said material having a dielectric coating on one side thereof, said coating having a dielectric constant of at least 2.0 and said dielectric coating being positioned on the exterior of said container, the edges of said container being doubled upon itself so that the raw edges of said sheet material are not exteriorly exposed, and at least one nonconductive handle integral with said container.

2. A package containing a food item and of a size suitable for insertion into a toaster for heating said food therein, which comprises an electrically conductive tray and an electrically conductive cover coextensive with said tray; said tray being formed from a thin metallic sheet which has been shaped to provide a recessed section having a bottom and side walls, and a flange which extends outwardly from said side walls; said flange being enlarged adjacent one side of said recessed section to provide a handle for said tray; the interior surface of said recessed section of said electrically conductive tray and the interior of said cover having thereon a substantially continuous coating to prevent the formation of pinholes in said electrically conductive container; said cover being hermetically sealed to said tray member; said tray member and said cover each having a heat stable dielectric coating disposed on the exterior surface thereof; said coating having a dielectric constant of at least 2.0; and the edges of said tray and cover being rolled to provide a mechanical seal for said package and to eliminate the raw edges thereof.

3. A package containing a food item and of a size suitable for insertion into a toaster for heating said food therein, which comprises an electrically conductive tray and an electrically conductive cover coextensive with said tray; said tray being formed from a thin metallic sheet which has been shaped to provide a recessed section having a bottom and side walls, and a flange which extends outwardly from said side walls, said flange being enlarged adjacent one side of said food containing section to provide a handle for said tray; said tray member and said cover each having a continuous heat stable dielectric coating disposed on the entire exterior surface thereof; said coating having a dielectric constant of at least 2.0; and the edges of said tray and cover being turned inwardly, towards said package, and outwardly to eliminate the raw edges thereof.

4. A package containing a food item and of a size suitable for insertion into a toaster for heating said food therein, which comprises an electrically conductive tray and an electrically conductive cover coextensive with said tray; said tray being formed from a thin metallic sheet which has been shaped to provide a recessed section having a bottom and side walls, and a flange which extends outwardly from said sidewalls said flange being enlarged adjacent one side of said recessed section to provide a handle for said tray; said cover being hermetically sealed to said tray member; said tray member and said cover each having a heat stable dielectric coating disposed on the exterior surface thereof; said coating having a dielectric constant of at least 2.0; and the edges of said tray and cover being rolled to provide a mechanical seal for said package and to eliminate the raw edges thereof.

5. A sealed package containing a food item and of a size suitable for insertion into a toaster for heating said food therein, which comprises an electrically conductive container having a heat stable dielectric coating substantially completely encompassing the exterior of said container, said coating having a dielectric constant of at least 2.0, a pair of electrically nonconductive handles secured to said package and adapted to extend to the sides thereof, said handles being adapted in their extended position to limit insertion of the package into an electric toaster, a pull tab attached to said package and adapted to open said package by pulling on said tab, and said handles being movable upon opening of said package by pulling on said tab from an inoperative position folded against the package to an operative position wherein the handles extend laterally of the package and the edges of said package being rolled or doubled in such a fashion that the raw edges are not exteriorly exposed.

6. A sealed package containing a food item and of a size suitable for insertion into a toaster for heating said food therein, comprising a container formed of an electrically conductive sheet material, said material having a dielectric coating on one side thereof and said sheet material being folded to position said dielectric coating on the exterior of said container, the edges of said container being folded in such a manner that the raw edges thereof are not exteriorly exposed, said coating having a dielectric constant of at least 2.0 and at least one nonconductive handle integral with said container.

7. A sealed package containing a food item which comprises an electrically conductive container having a heat stable, dielectric coating completely covering the exterior of said container, said coating having a dielectric constant of at least 2.0, and at least one electrically insulated handle, and the edges of said package being rolled or doubled in such a fashion that the raw edges are not exteriorly exposed.

8. A package as claimed in claim 7, in which said electrically conductive container is formed of a tray and a cover and said dielectric coating is disposed on the exterior of said tray and said cover.

9. A package as claimed in claim 8, in which the connection between the sides of the package is extended at one end to form a handle.

10. A package as claimed in claim 7 in which there is provided a coating which extends across the entire inside of the package.

11. A package as claimed in claim 1, in which a pair of handles is secured to said package and extend to the sides thereof, said handles being positioned to limit the depth of insertion of the package when inserted into an electric toaster, the handles being movable from an inoperative position folded against the package to an operative position wherein the handles extend laterally of the package.

12. A package as claimed in claim 11, in which there is additionally provided a pull tab attached to said package and adapted to open said package by pulling on said tab.

13. A package containing a food item and of a size suitable for insertion into an electric toaster for heating said food therein; said package comprising an electrically conductive base and an electrically conductive cover coextensive with said base; said base and said cover being formed from thin aluminum sheets; said base being formed with a recessed section which has a bottom and side walls, and a flange extending outwardly from said side walls; said flange being enlarged adjacent one side of the recessed section to provide a handle for said base; a heat stable, dielectric, substantially continuous coating covering both the interior and the exterior surfaces of said base and said cover comprising a polymerized thermosetting silicone resin selected from the group consisting of alkylated siloxy resins, phenyl and methyl substituted polysilanes, and polysiloxane-polysilane resins and having a dielectric constant of at least 2.0; and said cover being hermetically and mechanically sealed to said base, said hermetic seal comprising a heat sealed, thermoplastic polymer coating and said mechanical seal comprising a rolled edge.

14. A sealed package containing a food item which comprises an electrically conductive container having a heat stable, dielectric coating completely covering the exterior of said container and at least one electrically insulated handle, and the edges of said package being rolled in such a fashion that the raw edges are not exteriorly exposed.

15. A sealed package containing a food item which comprises an electrically conductive container having a heat stable, dielectric coating completely covering the exterior of said container, and the edges of said package being rolled in such a fashion that the raw edges are not exteriorly exposed.

16. A closed container having contents therein which comprises:

a. a metal foil pan having a bottom portion and upright side portions which define a receptacle for said contents and an opening therein, said pan having a dielectric coating composition coated on the entire exterior side thereof,

b. a flat peripheral flange portion extending laterally outward from the side portion at the opening to define on said flange portion a flat surface area which extends beyond the side portions,

c. a metal foil lid having a dielectric coating composition coated on the entire exterior side thereof, said lid closing the opening in said pan with its marginal portion adhesively sealed to the flat surface of said flange portion with their respective edges substantially coextensive and effecting a hermetical seal therebetween around the entire periphery thereof, and

d. a rim at the peripheral portion of said flange portion which is separated from the side portions of the pan by the lateral extension of said flange portion, said rim defined by the respective hermetically sealed marginal edge portions of said cover and sa65pan being turned together back toward the sealed flange portion and marginal edge of the lid with the endmost marginal portion of the lid abutting against the under marginal edge portion of the flange portion the respective edges of the cover and pan completely enclosed within the turned-back marginal edge portions defining the said rim and interlocked to prevent relative movement therebetween, so that as formed, the entire exterior surface of the container is covered with a dielectric coating composition.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,615,706 Dated October 26, 1971

Inventor(s) Radcliffe Franklin Robinson

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Insert the following statement as the first paragraph of the specification:

--This application is a continuation-in-part of co-pending application Serial No. 283,451, filed May 27, 1963, now abandoned.--

Signed and sealed this 10th day of October 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

)RM PO-1050 (10-69)

USCOMM-DC 60376-P69
U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334