BREAD REFRESHING METHOD

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References Cited
U.S. PATENT DOCUMENTS

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ABSTRACT

A method of refreshing a bread product by heating the bread product to a temperature between 2500° F. and 4500° F. The bread products are maintained at this temperature range for a period of 3 to 90 seconds.

3 Claims, 5 Drawing Sheets
FIG. 4

The cut fuzz specks of the product are toasted above XX. The product is not toasted below XX.
BREAD REFRESHING METHOD

SUMMARY OF THE INVENTION

This invention is concerned with the process and apparatus for refreshing bread products, particularly open face items such as sliced rolls, buns, muffins, and the like. An oven is provided that is capable of producing high intensity infrared radiation from a relatively high temperature source, in the range of 2500–4500 °F, using fast cycle methods. A bread product is placed in an oven at ambient and then exposed to the above mentioned infrared radiation for a period of 3 to 90 seconds as appropriate.

BACKGROUND OF THE INVENTION

As known by members of many households, there comes a time when bread products, such as rolls, buns, loaves, muffins and the like, lose their freshness and they may become hard or soggy. This produces a product that is often unsavory or unappetizing and is frequently discarded or used with a great deal of reticence. Although it is somewhat tolerable in a household, a commercial food serving business can find lack of freshness an economic drawback through the loss of customers.

Placing a bread product in a conventional heating or microwave oven does not refresh the bread product, but simply tends to produce a bread mass that is harder, hotter and oftentimes classified as inedible. By refreshing a bread product it is meant to partially restore the bread product to a state of freshness rendering the product more palatable. Clearly, such a process and apparatus for accomplishing the same would be both culinarily and financially desirable.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an oven in which the instant invention can be practiced;

FIG. 2 is a frontal, cross sectional view of the oven shown in FIG. 1 with the oven doors open;

FIG. 3 is a cross sectional view of the oven shown in FIG. 1 taken along the lines 3–3 of FIG. 2;

FIG. 4 shows a partially magnified, cross sectional view of a muffin that was treated in accordance with the instant invention; and

FIG. 5 is a chart of the electromagnetic spectrum comparing various wave lengths to those utilized in the instant invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

With reference to FIG. 1, an oven is shown generally at 10 in which the instant invention can be practiced. The oven 10 has a housing 11 that includes a panel, shown generally at 12. The panel 12 includes a time/temperature displays 14, 16 and time/temperature controls 18, 19. Cycle start switches 20, 21 and stop/cancel buttons 22, 23 are provided.

The housing 11 has dual openings 24, 25 that receive doors 26, 27, each door having an insulated lining 29 that is receivable within the openings. A hinge assembly 30 connects the door to the housing 11 so that each door pivots about the hinge assembly to be receivable within the opening 24. As the hinge assembly 30 can be of any standard construction and does not form part of the invention, it will not be described in detail. Each door 26, 27 has a handle 28 attached thereto whereby the pivoting of the doors 26, 27 can be facilitated.

Referring also to FIGS. 2 and 3, located within the housing 11 are an insulated floor 31, walls 32 and ceiling 33. The preferred insulation for the doors 26, 27 floor 32, walls 34, and ceiling 33 is rebonded fused silica foam which is a porous ceramic available as a commercial product from Cerndyne Thermo Materials, 3449 Church St., Scotdale, Ga. This rebonded fused silica foam, not only serves as an insulator but also as a reflector of the radiated energy employed in the instant invention. This special insulating/reflective material is a material that has a low maintenance cleaning characteristic as well as one that does not degrade and oxidize as other materials presently used in common oven construction. A tray 36 made of rebonded fused silica, in the form of a non-porous ceramic is provided and is also available from Cerndyne Thermo Materials, 3449 Church St. Scotdale, Ga. The tray 36 has a handle 38 on each end thereof as well as a raised separator 40 located intermediate to the handles and product nests 42. Shown supported by the tray 36 are two bread products 43 of a sliced, opened bagel with each half 43 of the bagel resting within its nest 42 of the tray.

Two pairs of laterally opposed support members 44 are secured to the ceiling 35 and each has openings 45 therein for receiving an end of a tungsten-halogen, infrared generation lamp 46. Each opening 45 has a mounting clip 47 and an electrical lead 48 extends from each end of the lamps 46 and connects to electrical lead 49 which connects the lead 48 to control circuit 50. This lamp is commercially available from among General Electric Lighting, Nela Park, 1975 Noble Road, Cleveland, Ohio 44112-6500; Phillips Lighting Co., 200 Franklin Square Drive, Somersett, N.J. 08875-6800; and OSRAM Sylvania Inc., Specialty Lamps, 18725 N. Union Street, Westfield, Ind. 46074. It will be appreciated that the structure of the electrical circuit is within the knowledge of one skilled in the art and since the circuit structure does not form part of the novelty of this invention, it will not be described in detail.

Located in the upper portion of the housing 13 along with the electrical control circuit 50 is a cooling fan assembly 56. The function of the fan assembly 56, is to cool the scale of the infrared generation lamps 46 for the purpose of extending their life. It is not implied that this fan assembly 56 is for the purpose of circulating air through the oven chamber or is to be used as a convector as that would prove detrimental to the goal of the instant invention.

It has been found that exposing stale bread products 42 to infrared radiation of controlled wave length emanating from a lamp 46 operating at a temperature chosen between 2500 F. (degrees Fahrenheit) and 4500 F. for a chosen period of 3 to 90 sec. in an oven 10 results in the bread products being rendered refreshed. By being refreshed is meant that after exposure to the high intensity infrared radiation for the chosen period, the bread products become more palatable and tasty than they were prior to being exposed to the energy field contemplated by the instant invention. When attempts were made to refresh bread products in a standard oven or microwave oven, the results sought were not achieved. In fact, the stale bread products took on a staler state. This is because such ovens are not capable of producing the same energy field required to practice the instant invention.

Chosen as a severe test for this processing system was a muffin that had been in a stale, hard state as a result of being ignored for weeks in a package of muffins that was partially consumed. One half of the muffin was put through the refreshment process, the other half was not processed, for control and comparison purposes. The muffin was placed on the left side of the tray 36 as seen in FIG. 3 with the oven
A number of bread products 43, including bagels and rolls, were refreshed as described above with similar results being achieved. It has been found that the temperature of the halogen lamps 46 should be between 2500 F. and 4500 F. for periods of between 3 sec. to 90 sec., the preferred temperature level will vary depending on the products exposed, i.e. as seen in FIG. 5, the wavelength of the peak flux rate is selected at a value between 1.2 and 3.4 microns as illustrated.

Important aspects of the oven 10 are the fast control of the infrared lamps and quick access to the interior of the oven so that the bread products can be exposed to precise energy doses and removed promptly. It is necessary that the energy input to the bread products 43 be stopped precisely otherwise at these high energy flux rates the bread products will overheat rapidly and completely lose their residual moisture or ultimately burn to a crisp. The reflective nature of the oven enclosure insulation 29, 32, 33 and 34 prevents the oven from overheating while directing the energy into the bread product itself.

Thus, although the invention that has been described as used to refresh stale bread products, it will be appreciated that the oven 10 can also be used for original baking and with fresh bread products if desired.

What is claimed is:
1. A method of refreshing bread products, comprising:
   a) placing a bread product in an oven having at least one heating element,
   b) setting the temperature of the heating elements between 2500 F. and 4500 F., and
   c) ceasing exposure of the bread product to the at least one heating element after a period of 3 sec. to 90 sec.
2. The method of claim 1 including the step of exposing the bread product to electromagnetic radiation in the wavelength range between 1.2 and 3.4 microns.
3. The method of claim 1 including the step of selecting said bread products from rolls, muffin, buns and bagels.

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