A method for making pizzas having a substantially permanent crispness wherein a particular bread crumb material is used to modify the pizza dough so as to accomplish that result, the said crumb material comprising Japanese-style bread crumbs milled to a particle size at least small enough to pass through the screen of a U.S. Standard #20 sieve, and the pizza dough being modified by having the small crumb particles embedded throughout the dough mass forming the pizza crust.
### FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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COMPOSITION AND METHOD FOR
PREPARING PIZZA DOUGH

Field of the Invention

This invention relates generally to composition and methods for treating baking dough and, more specifically, to a particular composition and method for preparing and baking pizza dough and other baking doughs. Use of my invention results in a crust which is crisp when initially baked, retains its crispness even when subsequently cooled and reheated, and helps prevent scorching of the crust or sticking of the crust during cooking.

Background of the Invention

A large and growing industry has developed around the preparation and serving of pizza as a food item. Preparation of a pizza typically requires forming a flattened crust made of a bakery dough containing major proportions of flour and water, kneaded, and rolled to shape. The crust forms the base to hold the cheese, sauce and other pizza toppings.

After the toppings are in place, the pizza is placed in an oven and baked until the dough is cooked thoroughly enough to form a firm crust while the toppings are cooked as well and the process must be timed to allow both crust and toppings to be fully cooked without burning one or the other. Some varieties of pizza are baked in shallow pans or trays, and the preparation of such pizzas often requires the use of oils, fats or other lubricants to prevent the crust from sticking once cooked. Use of such lubricants is undesirable because they are costly and require significant cleanup efforts.

During the baking process, pizzas must be monitored to make sure that the crust does not overcook or burn. This is often difficult to do when a commercial
oven contains numerous pizzas cooking simultaneously.

One major concern of pizza makers is achieving and maintaining crispness in the dough crust. Although pizza is generally served as a restaurant food item, pizzas are also very often taken home or delivered to the home for consumption. Leftover pizza is often refrigerated and reheated to be eaten later. I have found that the cooling and/or subsequent reheating of pizza causes the crust to lose whatever initial crispness it may have had. I have also found that the baking techniques required to produce a crust of considerable crispness may also dictate that the pizza be left in the oven longer than is provident, accentuating the risk of burning or overcooking the crust or the toppings. I have also found that the use of oils or fats contributes to the sogginess of crusts baked in trays or pans.

According, the need exists for a composition and method of preparing pizza dough which will reproducibly cook up into a crisp pizza crust and which will maintain its crispness through subsequent cooling and reheating. The need also exists for such a process to avoid added, time-consuming steps in the pizza-making process.

I am aware that others have utilized certain food additives in processes intended to modify the characteristics of products made from baking dough. Most are intended to prevent or limit the tendency of raw dough to stick to mixing implements and baking or cooking surfaces.

United States Patent 4,407,839 (Corbeil et al.) teaches and describes the use of dusting powders in general and, in particular, the use of salt in a dusting composition as an inhibitor to insect growth. United States Patent 1,499,080 (Short et al.) teaches a dusting powder comprising corn flour mixed with wheat flour. United States Patent 2,949,365 (Becker et al.) teaches the blending of edible fat and flour for use as an anti-stick baking compound.
In United States Patent 3,171,747 (Kessinger), the use of a starch-and-edible-oil mixture intended for use as a dusting powder is taught. United States Patent 3,317,323 (Lawrence) reaches a dusting compound used to allow the separation of segments of refrigerated biscuit dough. The compound includes edible oxidizing agent and rice flour. United States Patent 3,177,081 (Kleinschmidt et al.) teaches the use of tricalcium phosphate and white corn flour in a process for producing packaged refrigerated dough products.

United States Patent 2,012,506 (Griffith) teaches an edible dusting powder for doughnuts consisting of a grease-absorbing powder synthesized from starch grains, a sweetening agent and a grease impregnated into the grease-absorbant powder. U. S. Patent 2,144,371 (Griffith) is a variation of the foregoing dusting powder, teaching the use of a blend of edible fats to produce a dusting powder suitable for packaged doughnuts.

United States Patent 2,614,945 (Krisan) teaches and describes a dusting powder manufactured from starch treated to limit the hygroscopic tendencies of the starch. United States Patent 1,483,704 (Wilcox) teaches the application of fat in a finely-granulated form to baking dough for baking loaves of bread.

United States Patent 3,377,171 (Ryan et al.) teaches a dusting mixture made from starches to which vegetable oil, tricalcium phosphate and other oils and fats are added to modify the flow characteristics of the starch. United States Patent 2,739,896 (Block et al.) teaches a doughnut dusting composition utilizing blends of hydrated and anhydrous dextrose to achieve the desired flow characteristics for the dusting powder. United States Patent 2,793,123 (Haas) teaches a dusting powder for mass baking operations to produce bakery products such as bread loaves.
There are also known in the art various coating compositions used to create batter-like a crisp outer coating for cooked food. Exemplary of these are United States Patents 4,640,837 (Coleman et al.); 4,199,603 (Sortwell III); 4,496,601 (Rispoli et al.); and 4,518,618 (Hsia et al.), all of which teach various coating mixtures used to impart a crisp texture to non-fried foods, i.e., food cooked in a microwave oven or a conventional oven.

Also of interest is United States Patent 4,518,620 (Monagle et al.) which teaches and describes the use of a product known as Japanese-style bread crumbs to produce a breading batter for foods. Monagle et al. teach the use of such a batter for microwave cooking to produce a finished product with a crisp, crunchy coating otherwise obtainable only by frying or through the use of microwave baking accessories such as browning skillets or crisppers. Use of the Japanese-style bread crumbs described by Monagle et al. is the subject of United States Patent 4,068,009 (Rispoli et al.), assigned to General Foods Corporation. The bread crumbs in question consist essentially of wheat flour, yeast, and salt, and have an elongated porous and striated structure. Use of such bread crumbs in preparing food coatings is also described in the aforementioned United States Patent 4,496,601 (Rispoli et al.), along with other coating formulations (See Rispoli et al., Column 1, Lines 24 through 31).

Brief Description of the Invention

I have found that the Japanese-style bread crumbs described in the '009 Rispoli patent may be modified for use in non-batter form as a treatment for pizza dough and that the use of this treatment yields unexpected and surprising results in producing a pizza crust which is crisp, resists burning and sticking during normal commercial baking operations, and which may, when reheated, regain its original crispness.
Detailed Description of the Invention

The present invention consists principally of the product resulting from the milling of Japanese-style bread crumbs and the use of the resulting product in methods for the preparation of dough for baking pizza.

Japanese-style bread crumbs are purchased directly from Newly Weds Foods, Inc., Chicago, Illinois. In a preferred embodiment of the present invention, unmodified Japanese-style bread crumbs are prepared in accordance with the following procedures.

A charge of raw, unmodified Japanese-style bread crumbs is milled to produce a mix with selectable proportions of various granulations, with the granulations meeting preferred and selected U.S.S. sieve specifications as determined through use of a Ro-Tap testing sieve shaker manufactured by W. S. Tyler Corporation. Such formulations are prepared by grinding an initially relatively coarse charge of Japanese-style bread crumbs to contain particles within various size ranges forming specific product blends. The resulting blends will have particles in varying approximate size ranges, as shown in the following preferred embodiments:

Example 1

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<tr>
<th>U.S.S. Sieve</th>
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<tr>
<td>#8</td>
<td>2% - 8%</td>
</tr>
<tr>
<td>#14</td>
<td>28% - 42%</td>
</tr>
<tr>
<td>#20</td>
<td>28% - 42%</td>
</tr>
<tr>
<td>Smaller than</td>
<td></td>
</tr>
<tr>
<td>#20</td>
<td>18% - 32%</td>
</tr>
</tbody>
</table>

The formulation is prepared by milling an initial charge of Japanese-style bread crumbs to produce particles in various sizes, in the proportions and size ranges set forth above. The composition is analyzed by passing a portion of the charge successively through filter screens of increasingly fine mesh. For Example 1, the initial charge is passed through a U.S.S. #8 screen, with about 2% to about 8%, by weight of the original charge retained thereon. The remainder of the charge is then passed through a U.S.S. #14 screen, with about 28% to about 42% of the
initial charge retained thereon. The remaining charge is then passed through a U.S.S. #20 screen, with about 28% to about 42% of the initial charge retained thereon, and about 18% to about 32% of the initial charge passing therethrough.

**Example 2**

<table>
<thead>
<tr>
<th>U.S.S. Sieve #8</th>
<th>1% - 3%</th>
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<tbody>
<tr>
<td>U.S.S. Sieve #14</td>
<td>16% - 28%</td>
</tr>
<tr>
<td>U.S.S. Sieve #20</td>
<td>20% - 32%</td>
</tr>
<tr>
<td>Smaller than U.S.S. Sieve #20</td>
<td>44% - 56%</td>
</tr>
</tbody>
</table>

The charge of Example 2 is prepared and tested in the same fashion as that of Example 1. Standard U.S.S. sieve sizes are 2.38 mm. or 0.0937 in. for #8; 1.41 mm. or 0.0555 in. for #14; and 0.841 mm. or 0.0331 in. for #20.

The resulting formulations are utilized in the production of pizza in accordance with the following preferred procedures. Where pizza crusts are formed from individual dough balls, the dough is worked either by hand or through the use of a roller-type dough mill into the circular shape required for a pizza. Prior to the final shaping of the dough ball into the flat circular pizza base, the above-identified preferred formulations are sprinkled onto the ball and onto the work surface, and the granules in the formulation are pressed into the surface of the dough. Use of the formulations also helps prevent the dough from sticking to the dough mill rollers used to shape the dough balls into flat pizza crusts, reducing the need for dusting the dough with corn meal or flour and eliminating the mess that such dusting creates. When the dough has been formed into the final pizza base shape, granules of the above-identified formulation will be pressed into the dough throughout the upper and lower dough surfaces.

The present invention may also be used with pre-formed frozen pizza crusts by allowing the crusts to thaw at least partially, then sprinkling the crust lightly with a liquid such as water and thereafter applying
the present invention to the upper and lower surfaces of the pre-formed pizza crust.

Toppings are then applied to the pizza base in the ordinary manner. When baked, the resulting pizza has a crust crisper than if the crust had been prepared without the use of the present invention.

An unexpected beneficial result arising from the use of the present product is that pizza crusts prepared in the above-identified manner may be baked for a longer time without scorching, burning or sticking. I have confirmed this by having pizza prepared in connection with the foregoing steps, placing the pizza in a pizza oven and baking the pizza until the topping begins to burn or discolor. Pizzas prepared in this manner, when removed from the oven, exhibit little or no burning on the underside of the crust. Pizzas prepared in this manner may be monitored by viewing the toppings rather than the underside of the crust, for it is the crust which generally burns or scorches prior to the toppings.

Where "deep dish" pizzas are prepared in baking pans or trays with upstanding side walls, the present invention may be used instead of oils, greases or the like to lubricate the pan and prevent the pizza from sticking. Prior to putting the dough into the pan, 1 to 2 ounces of the present invention is sprinkled across the bottom thereof. The crust dough is then pressed into the pan.

While it is not fully understood how these results are obtained, it is believed that the Japanese-style bread crumbs used in the foregoing formulations act as heat absorbers and actually burst during the baking process to produce pores in the dough. This allows heat and air to permeate the crust rather than to concentrate along the crust at any given point sufficiently to cause the crust to burn or overcook, while creating a crisp texture to the pizza dough.
Another unexpected and beneficial result arising from the use of the foregoing formulation is the fact that when pizza prepared in accordance with the foregoing is allowed to cool and is then reheated, the crust regains its initial crispness. My experience in preparing pizzas in the more conventional methods presently in use is that once pizza has been allowed to cool and is thereafter reheated, the pizza crust does not become crisp.

Yet another unexpected and beneficial result is that the pizza crust, when first prepared, retains its crispness even as the pizza begins to cool. This characteristic of pizza prepared in this manner becomes more important when one considers that pizzas are often prepared and delivered to a customer's house, resulting in a certain amount of cooling between the time the pizza is removed from the oven and the time it is delivered. It is an advantage to have such pizzas arrive as crisp as if the customer had gone to the restaurant and consumed the pizza as it is served from the oven. Pizza that has been allowed to cool may, upon delivery, be reheated and the crust will regain whatever crispness it has lost as a result of the cooling process.

Use of the present invention may also be modified by the characteristics of the flour used. For example, I have found that for dough made with high-protein flours, best results are attained when the dough is cooked within 30 to 60 minutes of the use of my invention. For doughs made with low-protein flours, several hours can elapse and good results may still be attained.

The foregoing formulations may be incorporated as an ingredient during the manufacture of fresh pizza dough and the resulting dough mixture may thereafter be formed into dough balls or pizza crusts. I have found that fresh dough balls prepared in this manner may be frozen and thereafter thawed and used with the same results as if the ball had been used when fresh. I have also found that the quality of other baked items can be
enhanced by use of the present formulation to prevent burning and enhance the crispness of the resulting product. For example, I have prepared apple pies using the present invention in the crust dough, and found the texture of the cooked crust to be improved.

While the foregoing has presented certain specific embodiments of the present invention, it is to be understood that these embodiments have been presented by way of example only. It is expected that others skilled in the art will perceive differences which, while varying from the foregoing, do not depart from the spirit and scope of the invention as herein specified and claimed.
Claims

1. A composition for treating bakery dough, said composition comprising:
   a charge of bread crumbs, said bread crumbs consisting essentially of wheat flour, yeast and salt, having an elongated, porous and striated shape and structure,
   said bread crumbs milled to produce a blend of bread crumb particles in selected sizes and proportions of sizes.

2. The composition of Claim 1 wherein:
   from about 2% to about 8% of said charge is sized to be retained on a U.S.S. #8 screen;
   from about 28% to about 42% of said charge is sized to be retained on a U.S.S. #14 screen after said charge has been passed through said U.S.S. #8 screen;
   from about 28% to about 42% of said charge is sized to be retained on a U.S.S. #20 screen after said charge has been passed through said U.S.S. #8 and U.S.S. #14 screens; and
   from about 18% to about 32% of said charge is sized to be passed through said U.S.S. #20 screen.

3. The composition of Claim 2 wherein:
   5% of said charge is retained on said U.S.S. #8 screen;
   35% of said charge is retained on said U.S.S. #14 screen;
   35% of said charge is retained on said U.S.S. #20 screen; and
   25% of said charge passes through said U.S.S. #20 screen.
4. The composition of Claim 1 wherein:
   from about 1% to about 3% of said charge is sized to be retained on a U.S.S. #8 screen;
   from about 16% to about 28% of said charge is sized to be retained on a U.S.S. #14 screen after said charge has been passed through said U.S.S. #8 screen;
   from about 20% to about 32% of said charge is sized to be retained on a U.S.S. #20 screen after said charge has been passed through said U.S.S. #8 and U.S.S. #14 screens; and
   from about 44% to about 56% of said charge is sized to be passed through said U.S.S. #20 screen after said charge has been passed through said U.S.S. #8 and U.S.S. #14 screens.

5. The composition of Claim 4 wherein:
   2% of said charge is retained on said U.S.S. #8 screen;
   22% of said charge is retained on said U.S.S. #14 screen;
   26% of said charge is retained on said U.S.S. #20 screen; and
   50% of said charge passes through said U.S.S. #20 screen.

6. Method for crisping dough during cooking, said method comprising the steps of
   (a) preparing a charge of granulated bread crumbs having an elongated, porous and striated shape and structure, consisting essentially of wheat flour, yeast and salt, said composition blended to include selectable proportions of said bread crumbs ground to selected particle sizes;
   (b) applying said composition to said dough;
   (c) forming said dough into a baked item; and
   (d) cooking said item.
7. The method of Claim 6 wherein said proportions of said particle sizes are:
   from about 2% to about 8% of said charge is sized to be retained on a U.S.S. #8 screen;
   from about 28% to about 42% of said charge is sized to be retained on a U.S.S. #14 screen after said charge has been passed through said U.S.S. #8 screen;
   from about 28% to about 42% of said charge is sized to be retained on a U.S.S. #20 screen after said charge has been passed through said U.S.S. #8 and U.S.S. #14 screens; and
   from about 18% to about 32% of said charge is sized to be passed through said U.S.S. #20 screen.

8. The method of Claim 6 wherein said proportions of said particle sizes are:
   from about 1% to about 3% of said charge is retained on a U.S.S. #8 screen;
   from about 16% to about 28% of said charge is retained on a U.S.S. #14 screen after said charge has been passed through said U.S.S. #8 screen;
   from about 20% to about 32% of said charge is retained on a U.S.S. #20 screen after said charge has been passed through said U.S.S. #8 and U.S.S. #14 screens; and
   from about 44% to about 56% of said charge passes through said U.S.S. #20 screen after said charge has been passed through said U.S.S. #8 and U.S.S. #14 screens.

9. Method for crisping a pre-formed pizza crust during cooking, said method comprising the steps of:
   (a) preparing a charge of granulated, bread crumbs having an elongated, porous and striated shape and structure consisting essentially of wheat flour, yeast and salt, said composition blended to include selectable proportions of said bread crumbs ground to selected particle sizes;
   (b) applying said composition to said pizza crust; and
   (c) cooking said pizza crust.
10. The method of claim 9 including the following step performed between steps (a) and (b):
   (d) moistening said pizza crust.

11. A method of preparing a composition for crisping pizza crusts during the cooking of said crusts, said composition prepared from a charge of bread crumbs consisting essentially of wheat flour, salt and yeast, said bread crumbs having an elongated, porous and striated shape and structure, said method comprising the steps of:
   (a) milling said charge of bread crumbs to produce
   (i) a first proportion of said charge sized to be retained on a U.S.S. #8 sieve;
   (ii) a second proportion of said charge sized to be retained on a U.S.S. #14 sieve;
   (iii) a third proportion of said charge sized to be retained on a U.S.S. #20 sieve;
   (iv) a fourth proportion of said charge sized to pass through said U.S.S. #20 sieve; and
   (b) blending the proportions of step (a) together.

12. The method of Claim 11 wherein:
   said first proportion is from 2% to about 8% of said charge;
   said second proportion is from about 28% to about 42% of said charge;
   said third proportion is from about 28% to about 42% of said charge; and
   said fourth proportion is from about 18% to about 32% of said charge.
13. The method of claim 11 wherein:
   said first proportion is from about 1% to about 3%
of said charge;
   said second proportion is from about 16% to about
28% of said charge;
   said third proportion is from about 20% to about
32% of said charge;
   said fourth proportion is from about 44% to about
56% of said charge.

14. The method of Claim 11 wherein:
   said first proportion is 5% of said charge;
   said second proportion is 35% of said charge;
   said third proportion is 35% of said charge;
   said fourth proportion is 25% of said charge.

15. The method of claim 11 wherein:
   said first proportion is 2% of said charge;
   said second proportion is 22% of said charge;
   said third proportion is 26% of said charge;
   said fourth proportion is 50% of said charge;

16. Method for preventing dough from scorching or
   sticking during cooking, said method comprising the steps of:
   (a) preparing a composition from a charge of
   granulated bread crumbs, said bread crumbs consisting
   essentially of wheat flour, yeast and salt, and having an
   elongated, porous and striated shape and structure, said
   composition blended to include selectable proportions of
   said bread crumbs ground to selected particle sizes;
   (b) applying said composition to said dough;
   (c) shaping said dough into a baking item; and
   (d) cooking said dough.
17. The method of Claim 16 wherein said proportions of said particle sizes are:

from about 2% to about 8% of said charge is sized to be retained on a U.S.S. #8 screen;

from about 28% to about 42% of said charge is sized to be retained on a U.S.S. #14 screen after said charge has been passed through said U.S.S. #8 screen;

from about 28% to about 42% of said charge is sized to be retained on a U.S.S. #20 screen after said charge has been passed through said U.S.S. #8 and U.S.S. #14 screens; and

from about 18% to about 32% of said charge is sized to be passed through said U.S.S. #20 screen.

18. The method of Claim 16 wherein said proportions of said particle sizes are:

from about 1% to about 3% of said charge is sized to be retained on a U.S.S. #8 screen;

from about 16% to about 28% of said charge is sized to be retained on a U.S.S. #14 screen after said charge has been passed through said U.S.S. #8 screen;

from 20% to about 32% of said charge is sized to be retained on a U.S.S. #20 screen after said charge has been passed through said U.S.S. #8 and U.S.S. #14 screens; and

from about 44% to about 56% of said charge is sized to be passed through said U.S.S. #20 screen after said charge has been passed through said U.S.S. #8 and U.S.S. #14 screens.
19. Method for preventing the scorching or sticking of a pre-formed pizza crust during cooking, said method comprising the steps of:

(a) preparing a composition from a charge of granulated bread crumbs, said bread crumbs consisting essentially of wheat flour, yeast and salt, and having an elongated, porous and striated shape and structure, said composition blended to include selectable proportions of said bread crumbs ground to selected particle sizes;

(b) applying said composition to said pizza crust; and

(c) cooking said pizza crust.

20. The method of Claim 19 including the following step performed between steps (a) and (b):

(d) moistening said pizza crust.
**INTERNATIONAL SEARCH REPORT**

**I. CLASSIFICATION OF SUBJECT MATTER**

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC (4): A21D 13/00; A23P 1/08
US (C): 426/289; 293; 302; 549; 653

**II. FIELDS SEARCHED**

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Documentation Searched other than Minimum Documentation to the extent that such Documents are Included in the Fields Searched

**III. DOCUMENTS CONSIDERED TO BE RELEVANT**

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<td>1 2-5</td>
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<td>Y</td>
<td>US, A, 4,199,603 (SORTWELL) 22 April 1980, see entire document.</td>
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<td>US, A, 4,609,555 (BECHER ET AL) 02 September 1986, see entire document.</td>
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* Special categories of cited documents:
  - "A" document defining the general state of the art which is not considered to be of particular relevance
  - "E" earlier document but published on or after the International filing date
  - "I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  - "O" document referring to an oral disclosure, use, exhibition or other means
  - "P" document published prior to the international filing date but later than the priority date claimed

**IV. CERTIFICATION**

Date of the Actual Completion of the International Search: 01 September 1988
Date of Mailing of this International Search Report: 05 OCT 1988

International Searching Authority: MARY S. MINS

Signature of Authorized Officer: MARY S. MINS