United States Patent

Tobey et al.

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[54] PRE-SLICED MUFFIN AND PRE-SLICING APPARATUS

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[52] **U.S. Cl.** **146/98**, 146/73, 83/4, 99/86

[51] **Int. Cl.** **B26d 3/08**

[58] **Field of Search** ..... 146/73, 98, 28 R; 83/1, 4, 83/12

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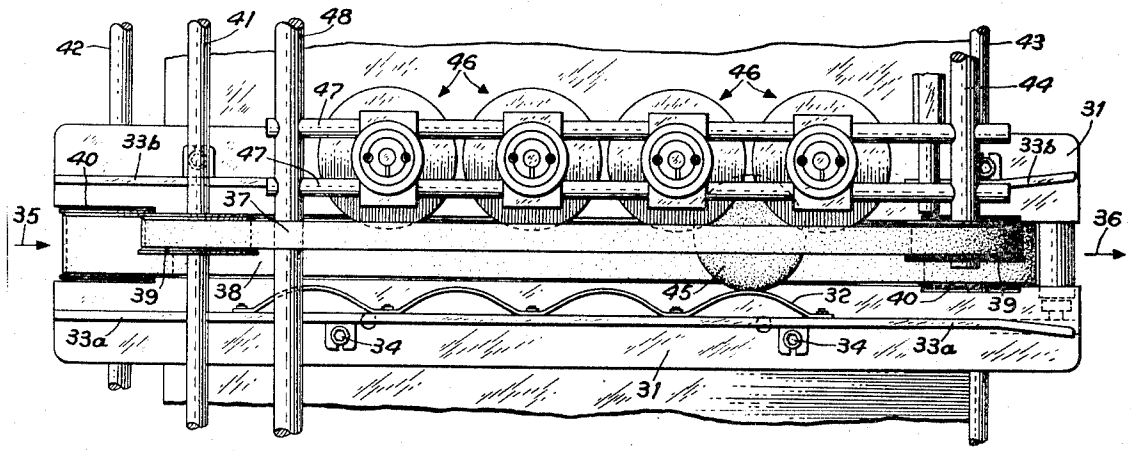
[57] **ABSTRACT**

The invention describes a pre-sliced English muffin having a knife edge peripheral cut made from the edge of the muffin radially inward a predetermined amount. The cut is positioned so that the top and bottom portions are approximately equal. The cutting facilitates the forking and subsequent separation of the top portion from the bottom portion of the muffin. The pre-sliced muffin is produced by slicing apparatus comprising an undulating guide and a plurality of series arranged rotating cutter disks spaced so that the muffin can be fed by suitable conveyor means into the apparatus. A first blade of the series makes a partial peripheral cut with the rotating blade and stationary guide cooperating to impart rotation to the muffin. Each successive rotating blade makes a partial peripheral cut to produce a finished muffin having a complete peripheral cut to a predetermined amount.

5 Claims, 5 Drawing Figures



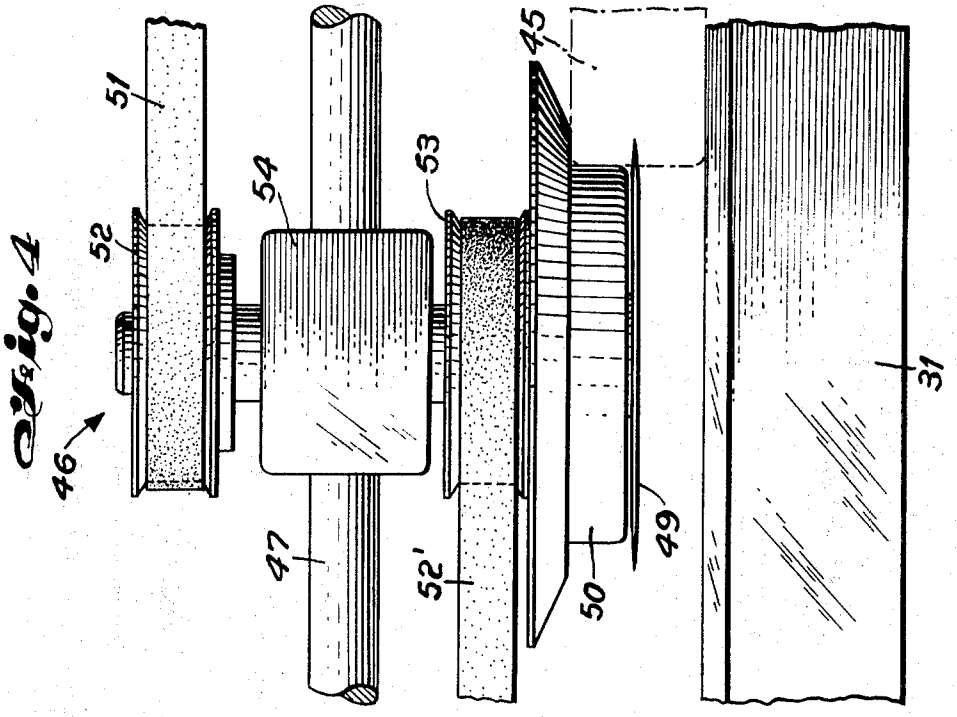


Fig. 4

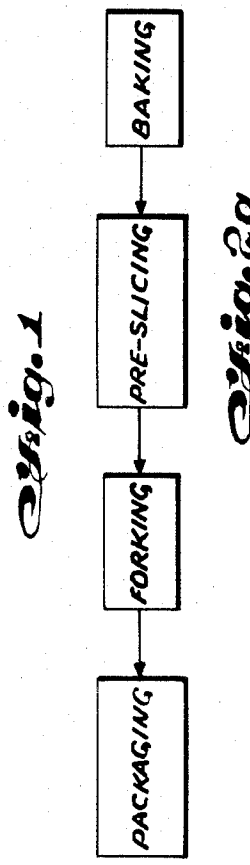


Fig. 1

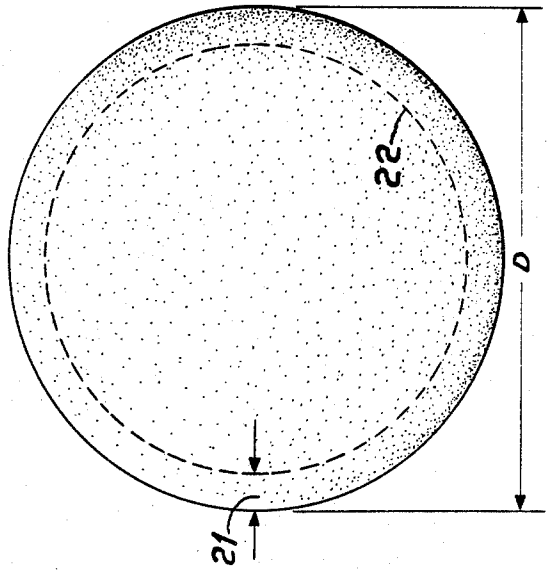


Fig. 2a

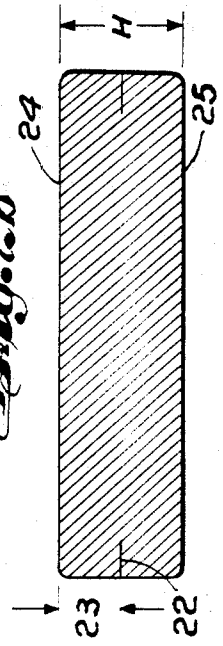


Fig. 2b

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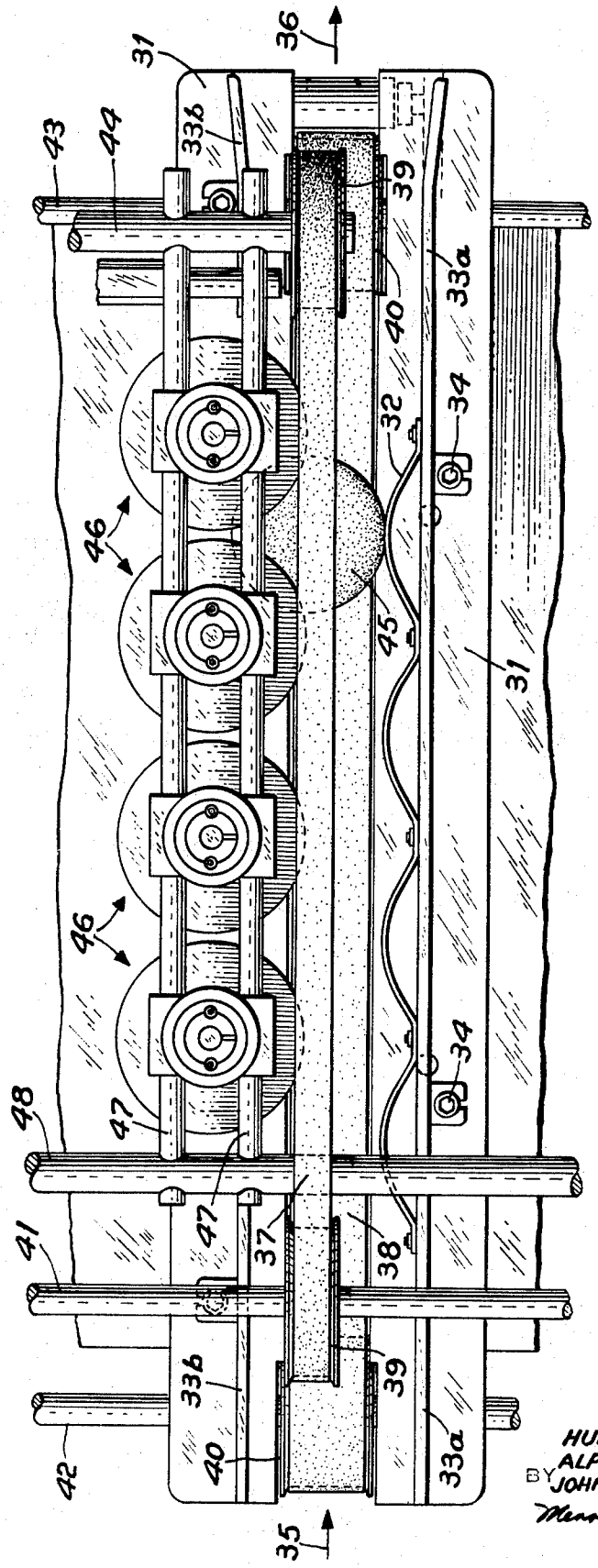

Fig. 3

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PRE-SLICED MUFFIN AND PRE-SLICING APPARATUS

BACKGROUND OF THE INVENTION

This invention generally relates to preparing English muffins, rolls and the like, and more particularly to a pre-sliced muffin and the like, and to apparatus for slicing the muffin.

According to the prior art, there has been a number of attempts to provide an English muffin which can be easily separated and have its center portion rough when pulled apart, thereby enhancing the flavor. However, the present products are either partially sliced or partially forked, such that in either case the halves are sealed together and do not easily tear apart leaving properly roughened surfaces. It should also be noted that fork splitting alone does not always provide two equal halves, and care must be taken to prevent either half from tearing across its diameter. But a sliced muffin which is also forked following the pre-slicing will produce a muffin which can be easily separated such that it leaves a properly roughened center area to enhance its flavor.

The apparatus must be able to handle a hot muffin and provide a continuous peripheral cut around the edge of the muffin and extending radially inward. It should be noted that in the prior art arrangements which include forking of the muffin, processing required more time for cooling, because trying to engage forks into the skin of the English muffin causes collapse of the muffin while hot because the skin is more rigid than the interior portions of the muffin. In some cases, depending on the muffin formula and baking procedure, fork splitting will collapse even a cooled muffin.

Therefore, there is a real need to provide an English muffin product which can overcome the limitations of processing which now exist, and to provide a pre-sliced muffin which can easily be separated by a consumer so that the inner surface portions of the muffin will be rough when pulled apart.

SUMMARY OF THE INVENTION

It is therefore an object of this invention to provide an English muffin product having a knife edge peripheral cut made from the edge of the muffin radially inward a predetermined amount.

Another object of this invention is to provide a method of preparing an English muffin having a peripheral cut and an uncut central zone which zone is forked after cutting of the peripheral edge of the muffin radially inward.

Still another object of this invention is to provide a slicing apparatus which can produce an English muffin having a knife edge continuous peripheral cut from the edge of the muffin radially inward a predetermined amount.

The slicing apparatus according to its broadest aspects comprises an undulating guide, a plurality of series arranged rotating cutter means juxtaposed said guide, a conveyor means to feed the English muffin product into the apparatus and a first cutter means of the series makes a partial peripheral cut with the rotating blade and guide cooperating to impart rotation to the muffin, whereby each successive rotating cutting blade of the series makes a partial peripheral cut to produce a finished muffin having a complete peripheral cut to the desired limited depth.

BRIEF DESCRIPTION OF THE DRAWING

Other objects and features of the invention will become more apparent and the invention more readily understood if reference is made to description of the embodiments in connection with the following drawings, in which:

FIG. 1 illustrates a method of producing a pre-sliced muffin according to the invention;

FIGS. 2A and 2B illustrate a pre-sliced muffin product according to the invention;

FIG. 3 illustrates a slicing apparatus according to the invention; and

FIG. 4 illustrates one of the plurality of series arranged rotating cutter means adapted for providing a peripheral cut.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 illustrates the method of preparing an English muffin product for easy separation of the top portion of the muffin from the bottom portion. The method comprises essentially baking the English muffin, pre-slicing as further described herein, forking the pre-sliced muffin and packaging the pre-sliced and forked muffin. This provides an English muffin which can be easily separated from the top and bottom portions and which has not been collapsed because of the slicing prior to the forking operation. Some of the known muffin forking mechanisms include sets of interdigitizing tines which pierce the center plane of the muffin so that the muffin can be pulled apart with central portion retaining a roughened texture.

Referring now to FIGS. 2A and 2B, there is shown, according to the invention, a typical English muffin product having a diameter D of approximately 4 inches and a height H of approximately 1 inch. The pre-slicing is inward a predetermined amount **21** which in a preferred embodiment is an amount equal to 3/16 to ⅜-inch. The cut **22** at a distance **23** is midway between the top and bottom portions so that approximately equal amounts remain when the top portion **24** is pulled apart from the bottom portion **25**. As described in connection with the method of FIG. **1**, the interdigitizing tines of the forking arrangements easily penetrate into the peripheral cut **22** so as not to effect the outer surface of the muffin, and this can be accomplished without the cooling time required by the prior art.

It should be noted that previously it was very difficult to insert the forking elements into the body of the muffin without collapsing and somewhat distorting its uniform shape. This limited some of its physical appeal and made it difficult to tear apart to provide the proper roughened central zone. In the preferred embodiment described, the inward radial cut of 3/16 to ⅜-inch leaves an uncut central zone which is then easily penetrated by the forking elements and which makes it easy to separate the top portion of the muffin from the bottom portion. This results in a muffin with a rough texture which greatly enhances its flavor.

Referring now to FIGS. **3** and **4**, slicing apparatus is provided which will make the complete peripheral cut to the predetermined depth. As shown, a support table **31** is provided having on one side an undulating guide **32** which is fixed to one of the side rail members **33** *a*, *b*. Fixing and adjusting means **34** attached to the rail **33***a* fixes the position of the undulating guide **32**. The oppositely positioned rail **33***b* completes the channel to guide the English muffins into the apparatus. The muffins are inserted in the direction indicated by the arrow **35** and exit in the direction of arrow **36**. To accomplish the transportation through the slicing apparatus there is provided a conveyor means comprising a top conveyor belt **37** and a bottom conveyor belt **38**. The top conveyor belt **37** is mounted by a pair of pulleys **39** at least one of which is driven. The bottom conveyor belt **38** is also mounted on a pair of pulleys **40** at least one of which is driven. The drive shafts are respectively **41**, **42** and the stationary mounting shafts are **43**, **44**. The conveyor belt arrangement feeds the English muffin **45** into and through the apparatus comprised of a plurality of series arranged rotating cutter means **46**. Means **46** are mounted by a pair of bar mounts **47**, cross bar **48** and mounting shaft **44**.

Each series arranged rotating cutter means **46** includes a rotating cutting blade **49** and a rotating cutting guide **50**. The drive for the blade is provided by a blade drive belt **51** and pulley **52**. The drive for the rotating guide **50** is provided by a drive guide belt **52** prime and pulley **53**. A mounting arrangement **54** is provided which mounts the rotating blade and guide on a central axis between the pair of mounting supports **47**.

As shown in the drawings, the muffin is moved along by the conveyor means and engages the rotating cutting guide **50**

while the rotating cutter blade **49** penetrates the muffin to make the partial peripheral cut. As the muffin moves through the apparatus, being propelled by the conveying means and rotary guide **50**, the linear speed being at least twice the speed of conveying belts **37** and **38**, the stationary undulating guide cooperates to maintain the rotation imparted by the rotating guide and blade to cause the partial peripheral cuts to be made in the muffin. After the first blade of the series makes its partial peripheral cut with the rotating guide and the undulating guide cooperating to impart the rotation, each successive rotating blade of the series makes another partial peripheral cut to produce a finished muffin having a complete peripheral cut to a limited and predetermined amount. Some adjustment of the undulating guide **32** and rail **33***a* can be by means **34**, and/or together with changing the diameter across rotary guide **50**, the depth of the peripheral cut can be varied and limited to a predetermined amount. It should be noted, by one skilled in the art, that changing the diameter of guide **50** will, together with movement of the rail toward the cutters, also increases the depth of cut into the movement. Making the table **31** adjustable is also possible.

In a preferred embodiment the conveying means comprises an upper and lower conveying belt and moves at a belt speed of approximately 186 ft. per minute. It was found that a rotating guide providing a linear speed of twice the conveyor speed and having a cutter speed of 2,300 R.P.M. produces the proper combination of rotation and slicing of the muffin.

According to the invention there has been described a method of preparing an English muffin for easy separation of the top portion of the muffin from the bottom portion comprising cutting the peripheral edge of the muffin radially inward to a predetermined depth of 3/16 to ⅜-inch prior to forking the uncut central zone. The apparatus for providing the complete peripheral cut to the partial depth comprises a stationary undulating guide with a plurality of series arranged rotating cutter disk means spaced from the undulating guide surface such that as the muffin is fed by suitable conveyor means into the apparatus, the first blade of the series makes a partial peripheral cut with the rotating means and the guide cooperating to impart rotation to the muffin. Each successive rotating cutting blade of the series makes a partial peripheral cut to produce a finished muffin having a complete peripheral cut a limited depth.

It should be understood that the foregoing description of a specific embodiment of this invention is made by way of example only and should not be considered as the limitation to the scope of the invention as set forth in the objects and features thereof and in the accompanying claims.

We claim:

1. Slicing apparatus comprising:

a guide having an undulating surface;

a plurality of series-arranged rotating cutter means juxtaposed said guide; and

conveyor means to feed a circular shaped product into the apparatus,

whereby, a first cutter means of the series makes a partial peripheral cut and cooperates with said guide surface to impart rotation to the product.

2. The apparatus of claim **1** wherein said plurality of series-arranged means include a plurality of series-arranged rotating cutting blades, such that each successive rotating cutting blade of the series makes a partial peripheral cut to produce a finished product having a complete peripheral cut to a predetermined depth.

3. Apparatus for providing a complete peripheral cut to a partial depth in a circular shaped bakery product comprising:

a plurality of series-arranged rotating cutting means;

a guide having an undulating surface spaced a predetermined distance from said rotating means to accommodate said product; and

conveying means adapted to feed said product between said rotating means and guide surface,

whereby, each successive rotating means makes a partial peripheral cut to produce finished bakery product having a complete peripheral cut to a predetermined partial depth.

4. Apparatus according to claim **3** wherein said plurality of rotating means includes:

a plurality of series-arranged rotating cutting blades, and

a plurality of series-arranged rotating guides,

one each said plurality of blades and guides cooperating to make a partial peripheral cut.

5. Apparatus according to claim **4** including means for adjusting said guide to change the predetermined distance of said guide surface from said rotating means to effect the depth of said peripheral cut.

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