Oct. 31, 1944. R. E. ELROD 2,361,615

BUN SLICER

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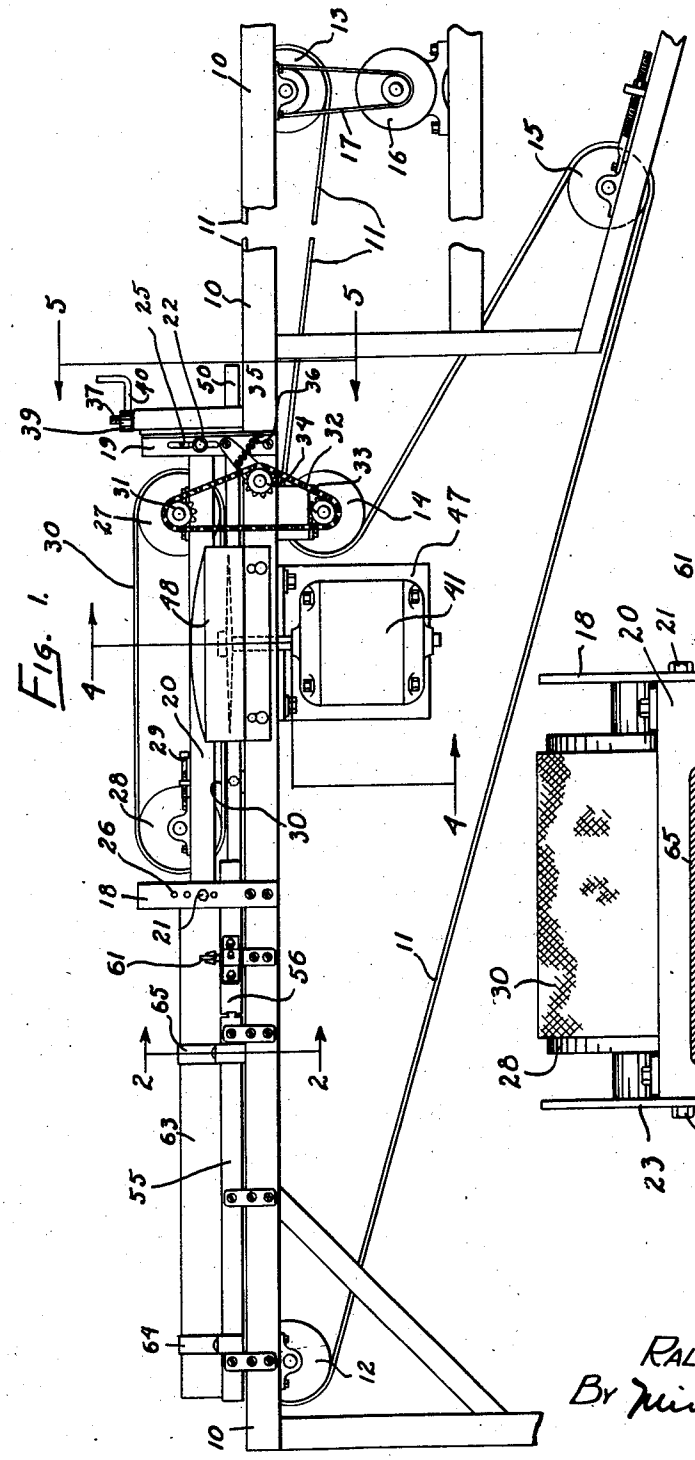


FIG. 1.

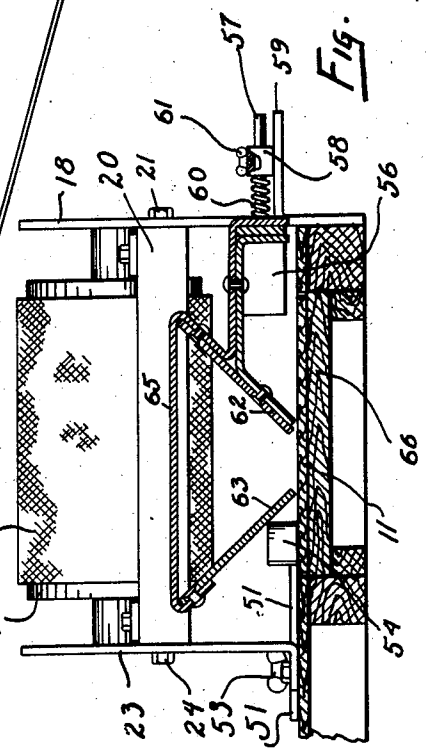


FIG. 2.

INVENTOR,
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BUN SLICER

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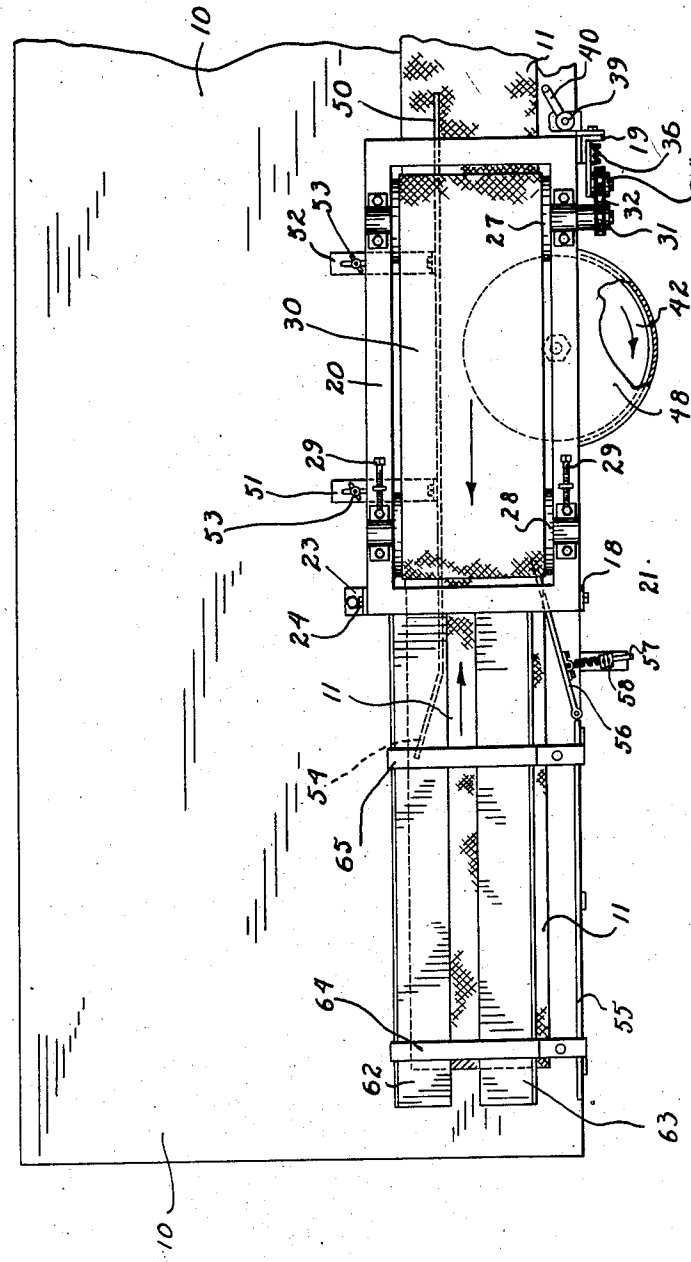


Fig. 3.

INVENTOR,
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BUN SLICER

Filed April 23, 1942 3 Sheets-Sheet 3

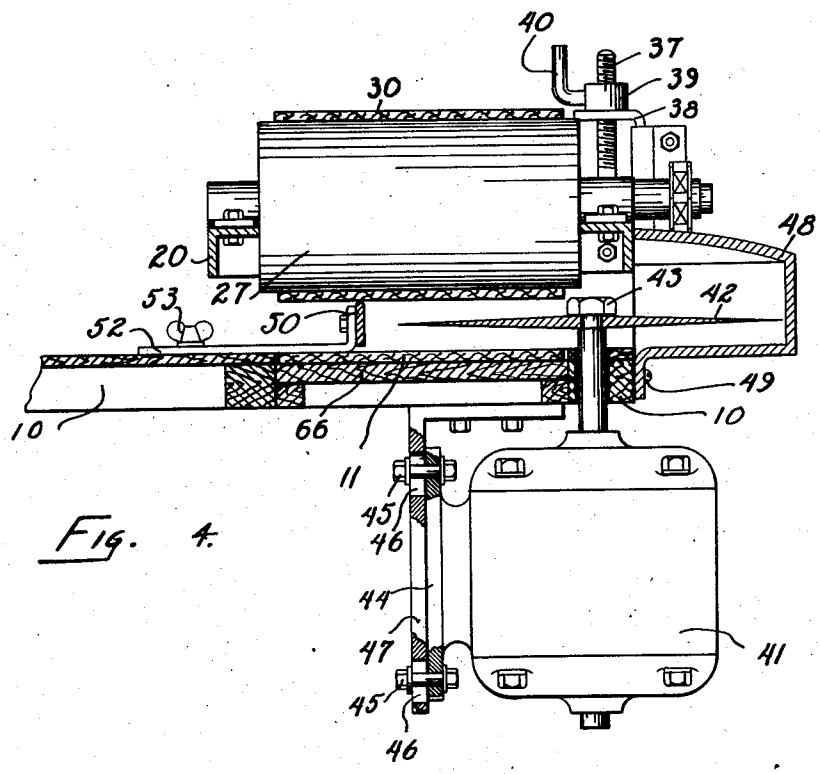


FIG. 4.

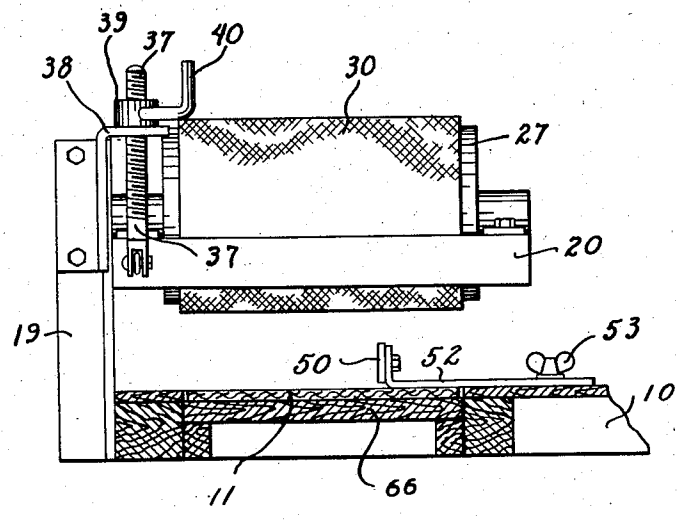


FIG. 5.

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Patented Oct. 31, 1944 2,361,615

UNITED STATES PATENT OFFICE

2,361,615

BUN SLICER

Ralph E. Elrod, Indianapolis, Ind., assignor to West Baking Company, Indianapolis, Ind., a corporation of Indiana

Application April 23, 1942, Serial No. 440,192

6 Claims. (Cl. 146—72)

This invention relates to means for slicing buns and has for a primary object the provision of a simple structure whereby buns or rolls may be sliced on a quantity production basis rapidly and uniformly and delivered ready for handling or packing, with the two sections of the bun (top and under sections) properly aligned, all with a straight smooth cut between the sections.

Another primary object of the invention is to provide means for regulating the depth of the cut in the bun whereby the uncut section may serve as a hinge between the top and bottom sections.

A further object of the invention is to provide means for slicing buns of different diameters, thicknesses, lengths and shapes, all by the same mechanism with a minimum amount of adjustment to accommodate that mechanism for such variations.

An important advantage of the invention is that the buns may be sliced and delivered from the slicing mechanism without displacement of the sections created by the slicing and, most importantly, without causing any permanent distortion of the bun itself.

These and many other objects and advantages of the invention will become apparent to those versed in the art by the following description of one particular form of the invention as illustrated in the accompanying drawings, in which

Fig. 1 is a view in side elevation of a structure embodying the invention;

Fig. 2, a view in vertical transverse section on a greatly enlarged scale on the line 2—2 in Fig. 1;

Fig. 3, a view in top plan;

Fig. 4, a view in vertical transverse section on a greatly enlarged scale on the line 4—4 in Fig. 1; and

Fig. 5, a view in vertical transverse section on the line 5—5 in Fig. 1.

Like characters of reference indicate like parts throughout the several views in the drawings.

A table 10 is provided along one side of which runs a conveying belt 11 with its upper side traveling in the direction indicated by the arrow, Fig. 3. This upper side of the belt 11 is preferably in the same plane as the plane of the top surface of the table 10. In order to secure this position of the belt 11, a pulley 12 is provided at the feeding end of the table 10 and a like pulley 13 is provided toward the delivery end of the table, these pulleys being mounted in the present instance to have their axes disposed transversely under the table 10 and to have sufficient diameter to carry the upper side of the belt 11 in the plane indicated. The belt 11 continues down around the pulley 13 and thence under the table 10 to pass around a pulley 14 from which the belt then travels around an idler pulley 15 and back up and around the pulley 12, all in a continuous manner. The belt 11 is driven in any suitable manner, such as by a motor 16 interconnected through any transmission device with the pulley 13, such as by the belt 17. In practice, a variable speed drive (not shown) would ordinarily be provided between the motor 16 and the pulley 13 in order that the desired rate of speed of the belt 11 could be obtained.

Spaced along the table 10 a distance from the feeding end thereof and secured along an edge of the table are a pair of standards 18 and 19, Figs. 1 and 2, the standard 18 in the present instance being a rectangular bar and the standard 19 being an angle iron. A rectangular frame 20, herein shown as made out of angle iron, is formed to be supported transversely across and above the belt 11 by these standards 18 and 19, a bolt 21 passing through the standard 18 and through a downturned leg of the frame 20, and a bolt 22 passing through the standard 19 and through the same leg of the frame 20, Fig. 1. A third standard 23 fixed to the table 10 extends upwardly therefrom and along the inner side of the frame 20 opposite the standard 18 and aids in supporting the frame by a bolt 24 extending through the standard 23 and into the frame 20. The bolts 21 and 24 are in a common axis about which the frame 20 may rock by the end adjacent the standard 19. This standard 19 is provided with a vertically disposed slot 25 through which the bolt 22 may pass as the frame 20 is rocked upwardly and downwardly on the bolts 21 and 24.

It is to be noted, as indicated in Fig. 1, that the standard 18 is provided with a series of holes 26 therethrough, through which the bolt 21 may be selectively passed in order to provide a variable spacing from the frame 20 from the top side of the belt 11. The standard 23 is similarly provided with holes through which the bolt 24 may be selectively passed.

Toward each end of the frame 20 and therewithin are mounted the belt pulleys 27 and 28, the frame 20 carrying bearings through which axles of these pulleys pass. Means is provided for variably spacing apart these pulleys 27 and 28, herein shown as consisting of the screws 29, one on each side, to abut bearing members. A continuous belt 30 is carried around these pulleys

27 and 28. On the axle of the pulley 27 is provided a sprocket 31 around which a chain 32 passes to extend around a sprocket 33 on the axle of the pulley 14, Fig. 1, whereby the pulley 27 and hence the belt 30 may be driven by the pulley 14 which is turned by the belt 11. Since the frame 20 is to be varied in position vertically in relation to the top of the belt 11, means is provided for this variation by inserting an idler sprocket 34 against one side of the chain 32 in order to take up the slack of that chain when the frame 20 is in a lower position. This sprocket 34 is carried upon a rockable arm 35, the arm 35 in the present instance being hinged to the standard 19, and a spring 36 is employed to pull the arm 35 in a direction urging the sprocket 34 against the chain to pull outwardly thereon and take up the slack. Should the frame 20 be raised from that position shown in Fig. 1, the arm 35 will swing upwardly in opposition to the pull of the spring 36 and hence allow the right-hand side of the chain 32 to approach a position parallel to the left-hand side of the chain.

In order to provide a means for ready lifting and lowering of the delivery end of the frame 20, a screw-threaded post 37, Fig. 5, is rockably secured by its lower end to the delivery end of the frame 20 and carried upwardly freely through a bracket 38 that is carried by the standard 19. A nut 39 screw-threadedly engages the post 37 on the top side of the bracket 38 and is provided with an arm 40 by means of which the nut 39 may be revolved around the post 37. The bolt 22 is adjusted to give sufficient freedom in the slot 25 to permit lifting of the frame 20 by the turning of the nut 39 and to permit lowering of the frame 20 by means of gravity when the nut 39 is turned in the reverse direction.

At one side of the table 10 and therebelow is mounted a motor 41 to have its shaft vertically disposed and extending upwardly to carry a circular cutting knife 42 thereon, herein shown as in the form of a disc fixed to the shaft by means of a nut 43, Fig. 4. In the form herein shown, the shaft of the motor 41 extends freely through a marginal portion of the table 10. The shaft of the motor 41 is thus brought into close proximity to the outer marginal edge of the conveyor belt 11. The diameter of the disc knife 42 is made to be sufficiently great so that the disc will extend a distance laterally across and above the belt 11 equal to at least the maximum depth of a cut to be made in any bun or roll designed for cutting. The disc knife 42 is provided with means for adjusting its elevation in reference to the belts 11 and 30, the knife, Fig. 4, being shown in approximately the central plane between those two belts. This adjusting means in the present showing is provided in the mounting of the motor 41. The motor 41 is provided with a base 44 through which extend the bolts 45, in turn extending through slots 46 provided in the motor support bracket 47 in such manner that by loosening the bolts 45, the motor 41 may be shifted vertically along the bracket 47 to position the disc knife 42 at the desired elevation. As indicated in Fig. 4, this bracket 47 is secured to the under side of the table 10.

Since the above indicated mounting of the motor 41 brings the shaft upwardly on the outer side of the belt 11, a substantial portion of the disc knife 42 will extend laterally beyond the table 10. Therefore a guard 48 is provided to encircle circumferentially around this outer portion of the knife 42 and also to cover over above and below. The guard 48 is secured to the table 10 by any suitable means, such as by screws 49 passing through a downturned leg of the guard and screw-threadedly engaging the table. Preferably the guard 48 is provided with enlarged openings from which extend slots in order that the guard may be readily removed to permit access to the knife 42 such as is required for removing the knife for sharpening or replacement. The screws 49 are spaced apart along the table 10 to permit the guard to be supported thereby after the heads of the screws have been entered through the holes, following which the guard is pushed down to have the slotted portions extending from those holes engage around the screws 49.

To regulate the depth of the cut into the bun or roll, an adjustable stop 50, herein shown as an elongated bar, is carried on two brackets 51 and 52, Fig. 3. These brackets 51 and 52 have outturned legs which rest on the top of the table 10, and through which legs bolts extend through slotted portions thereof to have thumb or wing nuts 53 engaged thereon, whereby the brackets may be pushed over or retracted from the belt 11, thereby providing an adjustably obtained spacing between that bar 50 and the disc knife 42, it being understood that the bar 50, while having a vertical dimension sufficient to permit it to be inserted under the under side of the top belt 30 and over the belt 11, this vertical dimension is sufficient to form a guiding surface against which the buns or rolls may slide along while being conveyed by the belts 11 and 30 during the cutting operation. The feeding end of the bar 50 is preferably provided with a wing 54 bent inwardly toward that margin of the belt farthest removed from the cutting edge of the knife 42 thereover, this wing being provided simply to direct buns or rolls carried on the belt 11 inwardly from the edge of the belt into proper cutting positions.

On the outer edge of the table 10 is provided a guard rail 55 as means to prevent accidental pushing of buns or rolls off of the edge of the table. The marginal portion of the table 10 between this guard rail 55 and the adjacent edge of the belt 11 is not of sufficient transverse area to arrest travel of any bun or roll that might be on the belt 11. At the delivery end of the guard 55 is mounted a wing guard 56, in the present showing, by being hinged thereto. This wing guard 56 may be swung over the belt 11 as means for directing buns or rolls back onto the belt 11 where such buns or rolls may have been overhanging that edge. Preferably this wing guard 56 carries means for adjustably fixing it in position. Such means consists essentially of a rod 57 hingedly secured to the outer side of the guard 56 and slidingly carried through a guide 58 in turn mounted on a fixed bracket 59 extending from the edge of the table 10. A spring 60 encircles the rod 57 between the guide 58 and the guard 56 as a means for normally tending to hold the guard 56 in a position to have its outer end over the belt 11. The guard 56 may, however, be fixed in position by means of a thumb screw 61 screw-threadedly entering the guide 58 to come into abutment with the rod 57 extending therethrough.

In the present showing, an attachment is shown in operating position to be used for slitting or slicing buns or rolls at an angle to the base or under side of the bun or roll. This, in many communities, is particularly desirable where the "foot long" bun is sold to use the elongated style of sausage or other filling.

This attachment consists essentially of an open

bottom V-trough mounted over the receiving end of the belt 11. In the present form, this attachment comprises a pair of angularly disposed side plates 62 and 63 tied together in fixed manner by the top straps 64 and 65 which in turn are carried down and outwardly to engage over the guard rail 55 in any suitable manner so as to support the members 62 and 63 over the belt 11 with a slight clearance thereunder. The side plates 62, 63 are each positioned, in the present showing, forty-five degrees from the vertical, giving a total included angle therebetween of ninety degrees. The lower edges of these plates 62, 63 are spaced apart a sufficient distance to permit the bun or roll placed therebetween to rest by an under edge against the belt 11 whereby the belt will pull the bun or roll along the plates until the bun or roll is engaged by the top belt 30.

While reference has been above made to the invention being adapted for use in slicing and cutting both buns and rolls, the term "bun" will be used hereinafter in a collective sense to include all types and forms of baking goods lending itself to the desired slicing operation. It is to be understood that this attachment is removed when it is desired that the goods be sliced parallel to the under side.

Assuming that the ordinary round bun is to be sliced, such buns are placed one after another on the receiving end of the belt 11 (left-hand end, Fig. 3) with the belt in movement and the above indicated attachment including the plates 62 and 63 removed. These buns in succession will be carried in the direction of the belt arrow toward the belt 30 between the bar 50 and the guard wing 56, the bar 50 having been previously adjusted in relation to the disc cutter 42 for the desired depth of cut. Immediately the bun is carried into contact with the belt 30, this belt, having been previously adjusted vertically, slightly compresses the bun from its top side against the belt 11. The belt 30 travels at approximately the same rate of speed as that of the belt 11. Since the cutter disc is traveling to have its periphery adjacent the bar 50 turning in the same direction as that of the travel of the belt 11, the bun carried between the belt 30 and the belt 11 will be tended to be carried laterally against the bar 50 but since the bun is lightly gripped between those two belts, there will be no throwing of the bun but only a gradual movement toward the bar 50 against which the edge of the bun will slide as the belts carry the bun on past the cutter 42 during the slicing operation. In most instances, there will be a space left between the bar 50 and the cutter 42, as indicated in Figs. 3 and 4, so that the bun is not sliced entirely through but a hinge portion is left. The sliced bun is carried on beyond the cutter 42 between the belts 30 and 11, from between which the bun emerges from under the belt 30 to be carried on by the belt 11 with the top and bottom sections of the bun remaining in substantially perfect alignment without having been displaced, one section in relation to the other, although the normal tendency of the cutter 42 would be to throw the bun sections on away from the cutter as the bun leaves that element. As the buns emerge from under the belt 30 and are carried on therebeyond by the belt 11, the operator may pick up the sliced buns and place them in suitable cartons or other devices for transporting the buns from place to place as may be desired.

It is to be noted that the spacing of the under side of the belt 30 from the top side of the belt 11 may be varied from the entrance between those belts to the delivery zone by adjustment of the elevation of the delivery end of the belt 30 through the nut 39. In other words, this belt 30 may have its under side slightly inclined to have a larger spacing at its entrance end from that at its delivery end in relation to the belt 11. Further it is to be noted that this belt 11 is supported throughout its length by a board or platform 66 thereunder so that, particularly under the belt 30, the belt 11 does not tend to be pushed downwardly but is held in substantial straight alignment thereunder. This board 66 is carried by the table 10 to have its top side depressed from the level of the top of the table 10 a sufficient distance to permit the top side of the belt 11 to be in substantially the plane of the top of the table 10.

By providing the means for sloping the belt 30, the bun may enter between the two belts with very slight pressure exerted on the bun therebetween and then be carried across and on beyond the cutter disc 42 while under a slightly greater pressure. It is to be pointed out, however, that this pressure on the bun must be limited in nature so that the bun will not be unduly compressed, otherwise when the pressure is relieved, the cut through the bun will appear as waved surfaces rather than having the cut surfaces in true planes. Also it is desired that the pressure be limited in order that the top browned surfaces of the buns be not crushed or left in a final distorted condition.

Now should a bun desired to be sliced at an angle from its side or upper surface, the attachment above described consisting essentially of the angularly disposed plates 62, 63 is placed into this trough-like attachment to have the under sides of the buns rest against the plate 62 to have the lower corners or edges thereof rest on the belt 11 to be conveyed along the plates thereby until the belt 30 may grip the bun between it and the under belt 11 whereupon the bun will be carried on through across the path of the cutter disc 42 without change in position. The bun will only right itself after it has been delivered from the delivery end of the belt 30.

While I have herein shown and described my invention in the one particular form, it is obvious that structural changes may be employed without departing from the spirit of the invention and I therefore do not desire to be limited to that precise form beyond the limitations as may be imposed by the following claims.

I claim:

1. In a baked goods slicer, a conveyor belt; a rotary cutter having a portion thereof extending over the belt; a pressure belt above said cutter and conveyor belt; and means for causing the pressure belt to travel in the same direction and substantially at the same speed as that of the conveyor belt; and an open bottom trough over said conveyor belt ahead of said pressure belt and said cutter; whereby baked goods such as buns may be placed in said trough to have a corner thereof extend through the trough bottom to rest on said conveyor belt to be moved along the trough thereby to carry the bun in its tilted position on under said pressure belt to be gripped thereby against the conveyor belt and carried on past said cutter while held in that tilted position.

2. In a baked goods slicer, a conveyor belt; a rotary cutter having a portion thereof extending over the belt; a pressure belt above said cutter

and conveyor belt; and means for causing the pressure belt to travel in the same direction and substantially at the same speed as that of the conveyor belt; and an open bottom trough over said conveyor belt ahead of said pressure belt and said cutter; whereby baked goods such as buns may be placed in said trough to have a corner thereof extend through the trough bottom to rest on said conveyor belt to be moved along the trough thereby to carry the bun in its tilted position on under said pressure belt to be gripped thereby against the conveyor belt and carried on past said cutter while held in that tilted position; said trough comprising a pair of plates forming the side walls thereof extending in the direction of travel of the belts and terminating immediately ahead of said pressure belt, said plates being fixed in position relative to both of said belts.

3. In a baked goods slicer, a conveyor belt; a rotary cutter having a portion thereof extending over the belt; a pressure belt above said cutter and conveyor belt; and means for causing the pressure belt to travel in the same direction and substantially at the same speed as that of the conveyor belt; and an open bottom trough over said conveyor belt ahead of said pressure belt and said cutter; whereby baked goods such as buns may be placed in said trough to have a corner thereof extend through the trough bottom to rest on said conveyor belt to be moved along the trough thereby to carry the bun in its tilted position on under said pressure belt to be gripped thereby against the conveyor belt and carried on past said cutter while held in that tilted position; said trough comprising a pair of plates forming the side walls thereof extending in the direction of travel of the belts and terminating immediately ahead of said pressure belt, said plates being fixed in position relative to both of said belts; a guard rail along one side of said conveyor belt; and means detachably supporting said trough from said rail.

4. In a baked goods slicer, a conveyor belt; a rotary cutter having a protion thereof extending over the belt; a pressure belt above said cutter and conveyor belt; and means for causing the pressure belt to travel in the same direction and substantially at the same speed as that of the conveyor belt; and an open bottom trough over said conveyor belt ahead of said pressure belt and said cutter; whereby baked goods such as buns may be placed in said trough to have a corner thereof extend through the trough bottom to rest on said conveyor belt to be moved along the trough thereby to carry the bun in its tilted position on under said pressure belt to be gripped thereby against the conveyor belt and carried on past said cutter while held in that tilted position; said trough comprising a pair of plates forming the side walls thereof extending in the direction of travel of the belts and terminating immediately ahead of said pressure belt, said plates being fixed in position relative to both of said belts; said trough being open from its upper side whereby the baked goods may be dropped therein to fall against the conveyor belt extending along the bottom thereof.

5. In a baked goods slicer, a pair of conveyor belts having juxtaposed flights with surfaces spaced to carry said goods compressibly therebetween and being movable in a common direction from an entrance position therebetween; a cutter extending between said flights; and a guide extending between said flights, said guide having a goods supporting surface laterally tilted in relation to the direction of travel of said flight surfaces to slope laterally across and toward the faces of said flights to said entrance position; whereby goods on said guide surface will be presented to said flights in laterally angularly disposed relation thereto and be carried on in that relation between said flights.

6. In a baked goods slicer, a pair of conveyor belts having juxtaposed flights with surfaces spaced to carry said goods compressibly therebetween and being movable in a common direction from an entrance position therebetween; a cutter extending between said flights; and a guide extending between said flights, said guide having a goods supporting surface laterally tilted in relation to the direction of travel of said flight surfaces to slope laterally across and toward the faces of said flights and to said entrance position; whereby goods on said guide surface will be presented against said flights in laterally angularly disposed relation thereto and be carried on in that relation between said flights; and said guide having a second surface extending to said entrance position, said second surface extending from the first surface across said one flight face to serve as a goods abutment to limit lateral travel of the goods from said first surface across said flights.

RALPH E. ELROD.