

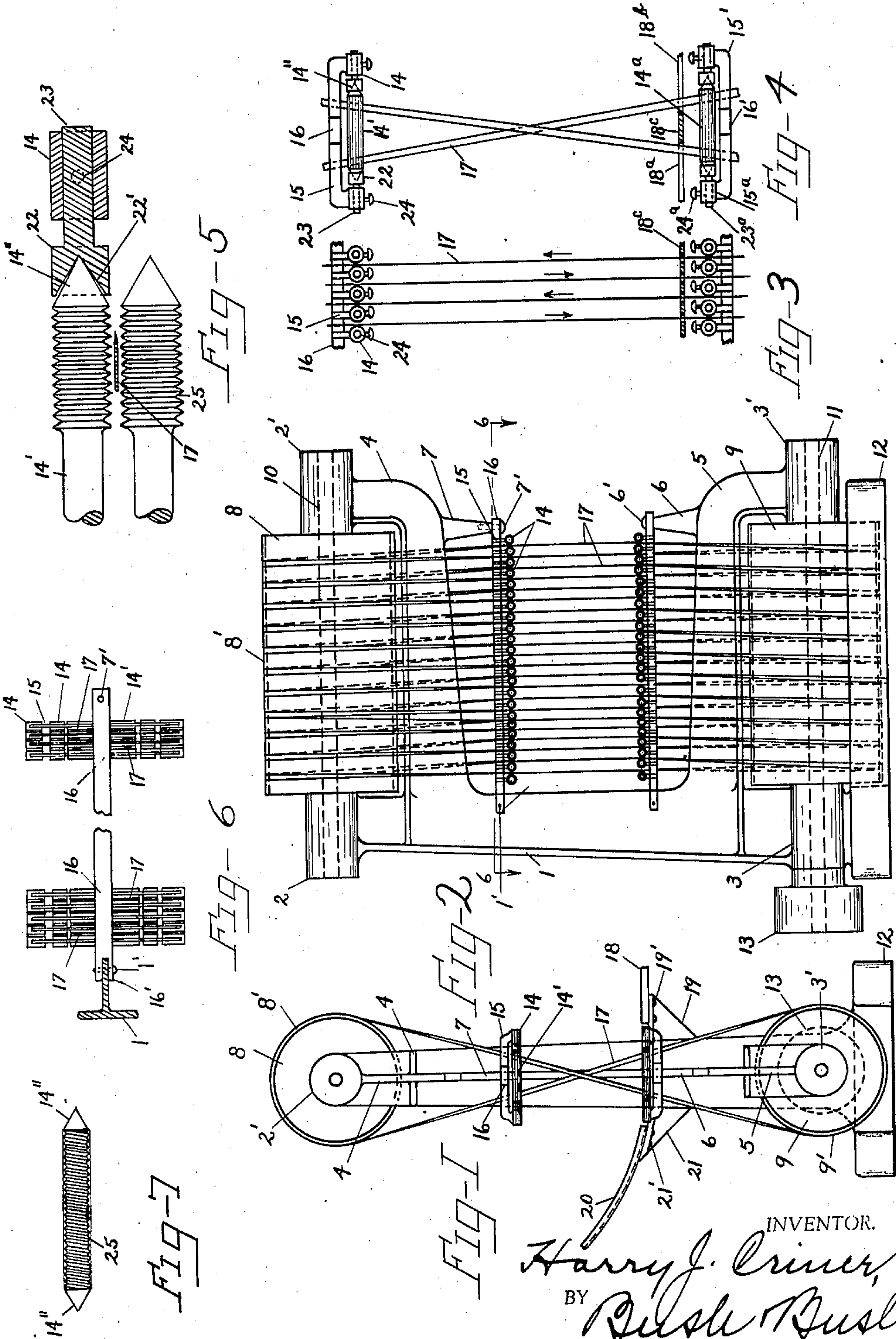
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SLICING MACHINE

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SLICING MACHINE

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My invention relates to improvements in slicing machines having endless-band blades, and the objects of my invention are:

1. To provide a simple slicing machine of the band-blade type having improved means for guiding the blades during the cutting process which will require minimum power for its operation and prevent any slap or backlash of the cutting blades;

2. To provide self-cleaning rotary guides which will act upon both ascending and descending sections of the blades simultaneously and which will assist in advancing the bread during the slicing operation.

I attain these objects by the means illustrated in the accompanying drawing, in which,—

Figure 1 is a side elevation of my machine from the right of Figure 2;

Figure 2 is a front elevation of my machine omitting the bread chute, 20;

Figure 3 is an enlarged detail of a portion of the guides and guide plates with the cutting blades passing between them;

Figure 4 is an enlarged detail of the guides and guide plates with crossed blades passing therethrough and showing a bread table spaced above the lower guides;

Figure 5 is an enlarged detail of a portion of a single pair of guide rolls showing the method of mounting them in their bearings and showing one of the bearings in section on the middle line;

Figure 6 is an enlarged sectional detail view of the upper guide support with a portion of the guides in place thereon;

Figure 7 is a detail showing an alternate form of threading or grooving on one of the guide rolls.

Similar numerals refer to similar parts throughout the several views.

My machine comprises a frame comprising a vertical column, 1, preferably T-shape in section, with feet, 12, preferably formed integral therewith and extending at right angles thereto, with arms, 4 and 5, also preferably T-shape in section extending outwardly from the column, 1, parallel to and above the feet, 12.

Integral with the column, 1, I form bearing bosses or hubs, 2 and 3, and at the outer ends of the arms, 4 and 5, I form corresponding bearing bosses, 2' and 3'.

In the bosses or hubs, 2 and 2', I mount the upper pulley shaft, 10, and in the bosses, 3 and 3', I mount the lower pulley shaft, 11, one end of which extends outwardly from the hub, 3, and carries a drive pulley, 13, splined or otherwise secured thereon.

Upon the upper shaft, 10, I mount a wide pulley or drum, 8, and upon the lower shaft, 11, I mount a corresponding drum with a wide pulley, 9. The pulley, 8, is provided with a resilient facing, 8', and a similar facing, 9', is mounted upon the pulley, 9.

Endless slicing blades, 17, are mounted upon the upper and lower drums, 8 and 9, in figure 8 form as shown in Figure 1, crossing midway between the pulleys. The blades, 17, are preferably made of very thin steel and may be of any desired width and thickness. I prefer to use a blade of approximately one-quarter of an inch in width and from fifteen to twenty one-thousandths of an inch in thickness, sharpened upon the front or left edge as shown in Figure 1.

In order to guide the cutting portion of the blades squarely at right angles to the drums while they are actively slicing the bread, it is necessary to either place the drums a considerable distance apart or else to provide guides which will bear against the blades above and below the loaves of bread being sliced to hold them in the proper position.

When stationary guides are utilized for that purpose, they cause sufficient friction to require considerable excess power over that which would be required for slicing alone and when grooved rotary guides are used, there is also some excess friction.

In order to reduce friction to a minimum, I have provided two series of guide rolls. The lower guide rolls, 14a, are composed of steel rods of a diameter approximately equalling the thickness of the desired slices of bread and the spacing of the slicing blades, and of a length sufficient to bear against both the front and rear cutting sections of a given blade at the points of contact. These guide rolls, 14a, are preferably made of steel hardened to extreme hardness and are coned to a point at each end. The guide rolls, 14a, are pivotally mounted in pivot pins, 23a, having heads, 22a, formed thereon with conical seats formed corresponding to the seat, 22', shown in Figure 5.

These pivot pins, 23a, are supported in bosses or hubs, 15a, formed upon the outer ends of arms, 15', and the arms, 15', are formed integral with a crossbar, 16', one end of which is united to the column, 1, and the opposite end of which is united by a bolt, 6', to a lug or shoulder, 6, formed upon the upper side of the arm, 5, near the outer end thereof.

Each guide roll, 14a, except the outside ones, bears against two sections of cutting blade which

contact the guide roll on opposite sides, one of which sections is moving upwardly and the other one moving downwardly.

For illustration, taking the lower guide rolls in Figure 2, commencing at the left, the first one would bear only against the outer section of the left blade, which we will assume is moving downwardly. The second guide roll at one end would bear against the downwardly moving section of the left blade and its opposite end would bear against the upwardly moving section of the same blade which would contact with it on the side opposite to the point of contact of the downwardly moving section. The third guide roll would contact at one end with the upwardly moving section of the left blade and at its opposite end with the downwardly moving section of the second blade, and so on throughout the series.

A corresponding series of guide rolls is mounted directly above the lower series at sufficient distance to permit a loaf of bread to pass through readily. The upper guide assembly comprises a crossbar, 16, mounted upon the column, 1, and a lug, 7, extending downwardly from the outer end of the arm, 4, the outer end of the crossbar being secured by a bolt or set screw, 7', and its inner end by a pivot or bolt, 1', with arms, 15, formed integral with the crossbar, 16, which extend to the front and rear of the crossbar, 16, in spaced relation, and have bosses, 14, formed upon the ends thereof which carry pivot pins, 23, adjustably secured therein by set screws, 24, the pivot pins being made with heads, 22, having cone-shaped seats, 22', formed therein in which the pointed or conical ends, 14'', of guide rolls, 14', are seated.

It will be noted that the seats, 22', are coned at a somewhat wider angle than the coned ends, 14'', of the rolls, 14'. This arrangement reduces the bearing surface to a minimum and it is obvious that the travel of the point of the cone in contact with the seat is but a very small fraction of the travel of the periphery of the roll, 14'. This fact, together with the glasslike hardness to which I harden both guide rolls, and the heads, 22, of the pivot pins, 23, reduces friction to a minimum and avoids the necessity for constant lubrication. In fact, if properly hardened, these rolls will run without any lubrication and in case lubrication is required, a minimum amount will suffice. This is an important feature as it is obvious that the bread must be kept from contact with any perceptible amount of lubricating fluid or material.

In order to facilitate the escape of bread crumbs from between the guide rolls, 14', I cut grooves, 25, in the periphery of the rolls, and a portion of the guide roll may be reduced in section as shown in Figure 5 to permit the crumbs to fall freely therefrom. Any desired means may be utilized to prevent the crumbs from working into the face of the pulley, 9.

In Figure 7 I have shown spiral threads, 25'', formed upon one of the rolls, 14', and the spiral threads will perform the positive function of assisting in carrying the bread forward during the slicing operation. In the form of groove and thread shown in Figure 5, the threads will cause a slight agitation of the bread which will have a tendency to assist its forward movement.

Brackets, 19 and 21, are bolted to the column, 1, and carry a discharge board, 18, and feed board, 20, respectively, which carry the bread from and to the slicing blades. The feed

board, 20, is preferably mounted so as to slope downwardly and feed the bread to the cutting blades by gravity, but may be either straight or curved as desired. When positive feeding means are utilized, an intermediate feed board or plate, 18c, may be mounted upon the frame a short distance above the lower guide rolls with fingers, 18a and 18b, extending to the front and rear thereof as shown in Figure 4. I prefer to utilize the guide rolls as supports for the bread while passing from the feed board to the discharge board.

In the operation of my device, the frame, pulley shafts and drums are first assembled and the cutting blades mounted thereon in the desired spaced location and crossing intermediate the drums as shown in Figure 1. The cross-bars, 16 and 16', are then mounted upon the frame with the arms, 15 and 15', extending to the front and rear between the successive sections of the blades or along the outer blade sections.

The guide rolls, 14a and 14', are then mounted in the heads, 22a and 22, of the pivot pins, 23a and 23, and the pivot pins adjustably locked in positions by the set screws, 24a and 24. The machine is then ready to operate and power may be applied to the pulley, 13, from any desired source.

As the drums are rotated, the alternate cutting sections of the cutting blades are driven in opposite directions and the cutting edges are applied to the bread as it is fed to the cutting blades along the chute or feed board, 20. As the bread passes onto the spirally grooved guide rolls, 14a, it is carried forward by the spiral grooves past the cutting blades and along the discharge board, 18.

When it is desired to change the gauge or spacing of the cutting blades and consequently the thickness of the slices to be cut, the guide assemblies are removed, the blades moved to the desired spacing on the drums and new guide assemblies having guide rolls of the proper size and properly spaced to conform to the gauge or thickness of slices desired, are mounted upon the machine as described above.

Care should be taken to make the hubs or bosses, 14, and 15a, a little smaller in diameter than the maximum diameter of the guide rolls, 14' and 14a, so as to facilitate the insertion of the arms, 15, between the cutting blades, 17, when assembling the machine.

I do not limit my claims to the precise forms shown in the drawing as it is obvious that various modifications thereof may be made without departing from the spirit of my invention.

I claim:

1. In a bread slicing machine of the endless-blade type, a frame, spaced blade supporting and driving means mounted thereon, a plurality of blades mounted upon said means in figure 8 form, a plurality of rotary guide rolls in alternation with the blades, mounted in a suitable support carried by the frame, each guide roll except the outermost being adapted to bear against and guide simultaneously an ascending section of a cutting blade and a descending section of cutting blade during the cutting action of the blades.

2. In a bread slicing machine of the endless-blade type, a frame, spaced blade supporting and driving means mounted thereon, a plurality of blades mounted upon said means in figure 8 form, a plurality of rotary guide rolls in alternation with the blades, mounted in a suitable support carried by the frame, each guide roll except the

outermost being adapted to bear against and guide simultaneously an ascending section of a cutting blade and a descending section of the same blade during the cutting action of the blades.

3. In a bread slicing machine, an upright frame, upper and lower pulleys revolvably mounted therein, a plurality of slicing blades mounted upon the pulleys and crossed midway between the pulleys with the crossed portions adapted to travel in opposite directions, and a plurality of rotary guide rolls in suitable supports mounted upon the frame and extending at right angles to the pulleys between the cutting blades in two series, one series being above and one series below the crossing point of the blades, and the guide rolls also being arranged in alternation with the blades and each roll being adapted to bear against and guide both an ascending and a descending section of cutting blade during their slicing action.

4. In a bread slicing machine, an upright frame, upper and lower pulleys revolvably mounted therein, a plurality of slicing blades mounted upon the pulleys and crossed midway between the pulleys with the crossed portions adapted to travel in opposite directions, and a plurality of rotary guide rolls in suitable supports mounted upon the frame and extending at right angles to the pulleys between the cutting blades in two parallel series, one series being above and one series below the crossing point of the blades, and the guide rolls also being arranged in alternation with the blades and each roll being adapted to guide both an ascending and a descending section of the blades during their slicing action.

5. In a bread slicing machine of the crossed endless-band type having a pair of spaced multiple band pulleys removably mounted therein carrying a plurality of crossed band blades, a plurality of narrow cylindrical rotary guide rolls of sufficient length to simultaneously contact and guide ascending and descending sections of the cutting blades at a point between the crossing point of said blades and one of the pulleys upon which said blades are mounted, and means to support said guide rolls in alternation and in contact with the blades at the point described and at right angles to the pulleys, said guide rolls being formed with spiral threads on their peripheries adapted to carry forward the bread while being sliced.

6. In a bread slicing machine of the crossed endless-band type having a pair of spaced multiple band pulleys removably mounted therein carrying a plurality of crossed band blades, a guide assembly comprising a crossbar mounted parallel with and between the pulleys and having spaced arms united to the crossbar and extending on both sides thereof at right angles, pivot pins adjustably mounted in the outer ends of the arms, guide rolls mounted in the respective pairs of pivot pins adapted to guide the blades and to support the bread during the slicing operation.

7. In a bread slicing machine of the endless-band type, the combination with blade supports and driving means, of a plurality of band blades mounted thereon in crossed relation, a bread chute adapted to carry bread to the slicing blades, a discharge table adapted to receive the sliced bread from the slicing blades, a plurality of rotary guide rods extending longitudinally of the machine and arranged in alternation with the blades at the level of the feed chute and dis-

charge table and adapted to support the bread while being sliced and to guide the blades during their slicing action.

8. In a bread slicing machine of the endless-band type, the combination with blade supports and driving means, of a plurality of band blades mounted thereon in crossed relation, a bread chute adapted to carry bread to the slicing blades, a discharge table adapted to receive the sliced bread from the slicing blades, a plurality of threaded rotary guide rods extending longitudinally of the machine and arranged in alternation with the blades at the level of the feed chute and discharge table and adapted to support and carry forward the bread while being sliced and to guide the blades during their slicing action.

9. In a bread slicing machine having endless crossed band blades mounted upon spaced pulleys, a guide roll and guide roll support, comprising a bearing support, a pair of spaced bearing blocks adjustably mounted therein each carrying a conical seat, a narrow cylindrical guide roll with coned ends rotatably seated in the conical seats, said guide roll being of sufficient length to simultaneously contact and guide an ascending and a descending section of cutting blade at points approximately midway between the crossing point of the blades and one of the pulleys upon which said blades are mounted.

10. In a bread slicing machine having endless crossed band blades mounted upon spaced pulleys, a guide roll and guide roll support, comprising a bearing support, a pair of spaced bearing blocks adjustably mounted therein each carrying a conical seat, a narrow cylindrical guide roll with coned ends rotatably seated in the conical seats, said guide roll being of sufficient length to simultaneously contact and guide an ascending and a descending section of cutting blade at points approximately midway between the crossing point of the blades and one of the pulleys upon which said blades are mounted, said guide roll having spiral threads formed on its periphery adapted to carry the bread forward during the slicing thereof.

11. In a bread slicing machine having endless crossed band blades mounted upon spaced pulleys, a guide roll and guide roll support, comprising a bearing support, a pair of spaced bearing blocks adjustably mounted therein a narrow cylindrical guide roll rotatably seated in the bearing blocks, said guide roll being of sufficient length to simultaneously contact and guide an ascending and a descending section of cutting blade at points approximately midway between the crossing point of the blades and one of the pulleys upon which said blades are mounted.

12. In a bread slicing machine having endless crossed band blades mounted upon spaced pulleys, a guide roll and guide roll support, comprising a bearing support, a pair of spaced bearing blocks adjustably mounted therein each carrying a conical seat, a narrow cylindrical guide roll with coned ends rotatably seated in the bearing blocks, said guide roll being of sufficient length to simultaneously contact and guide an ascending and a descending section of cutting blade at points approximately midway between the crossing point of the blades and one of the pulleys upon which said blades are mounted, said guide roll having spiral threads formed on its periphery adapted to carry the bread forward during the slicing thereof.

13. In a bread slicing machine having endless crossed band blades mounted upon spaced pul-

leys, a guide roll and guide roll support, comprising a bearing support, a pair of spaced bearing blocks adjustably mounted therein each carrying a conical seat, a narrow cylindrical guide roll with coned ends rotatably seated in the conical seats, said guide roll being of sufficient length to simultaneously contact and guide an ascending and a descending section of cutting blade at points distanced from the crossing point of the blade approximately equal to one-half the height of a loaf or bread.

14. In a bread slicing machine, a support, blades as cutting elements carried by the support and arranged in two opposed series, a guide roll assembly comprising a crossbar, a plurality of spaced pairs of opposed arms united thereto at right angles to the crossbar, bearings formed in the outer ends of the arms, guide rolls revolvably mounted in the pairs of bearings respectively in alternation with the cutting blades, each

guide roll except the outermost being adapted to bear against and guide simultaneously an ascending and a descending cutting element during the cutting action thereof, and means for driving the cutting blades.

15. In a bread slicing machine of the crossed endless-band type having a pair of spaced multiple band pulleys removably mounted therein carrying a plurality of crossed band blades, a guide and bread supporting assembly comprising a crossbar mounted parallel with and between the pulleys and having spaced arms united to the crossbar and extending at right angles therefrom, a series of guide rolls rotatably mounted upon the spaced arms in alternation with the blades adapted to contact and guide the blades adjacent thereto respectively and to support the bread during the slicing operation.

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