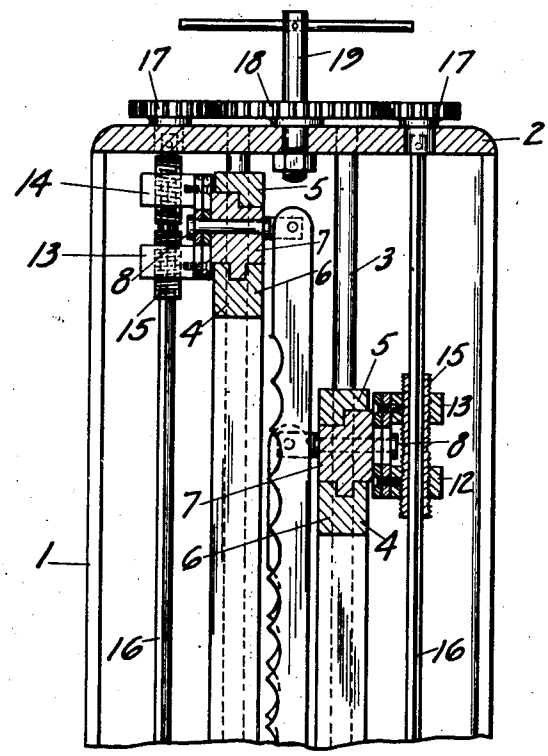
Dec. 3, 1935. T. K. WALMA 2,023,362

ADJUSTABLE KNIFE FRAME FOR BREAD SLICING MACHINES

Filed June 11, 1934 2 Sheets-Sheet 1



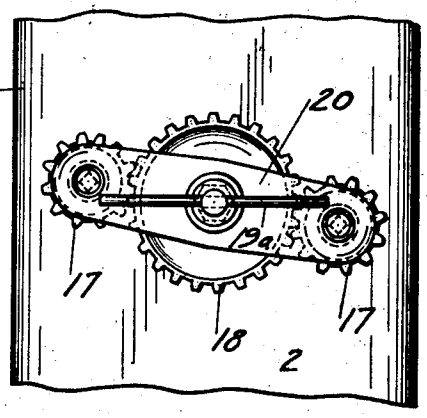


FIG-4

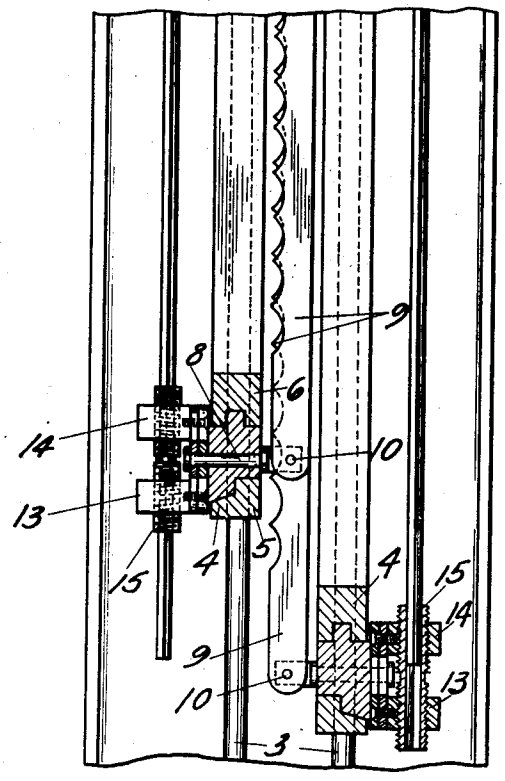


FIG-1

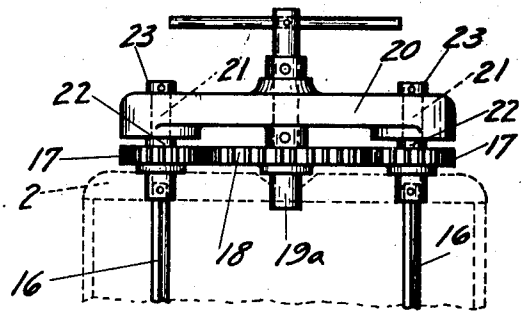


FIG-5

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ADJUSTABLE KNIFE FRAME FOR BREAD SLICING MACHINES

Filed June 11, 1934 2 Sheets-Sheet 2

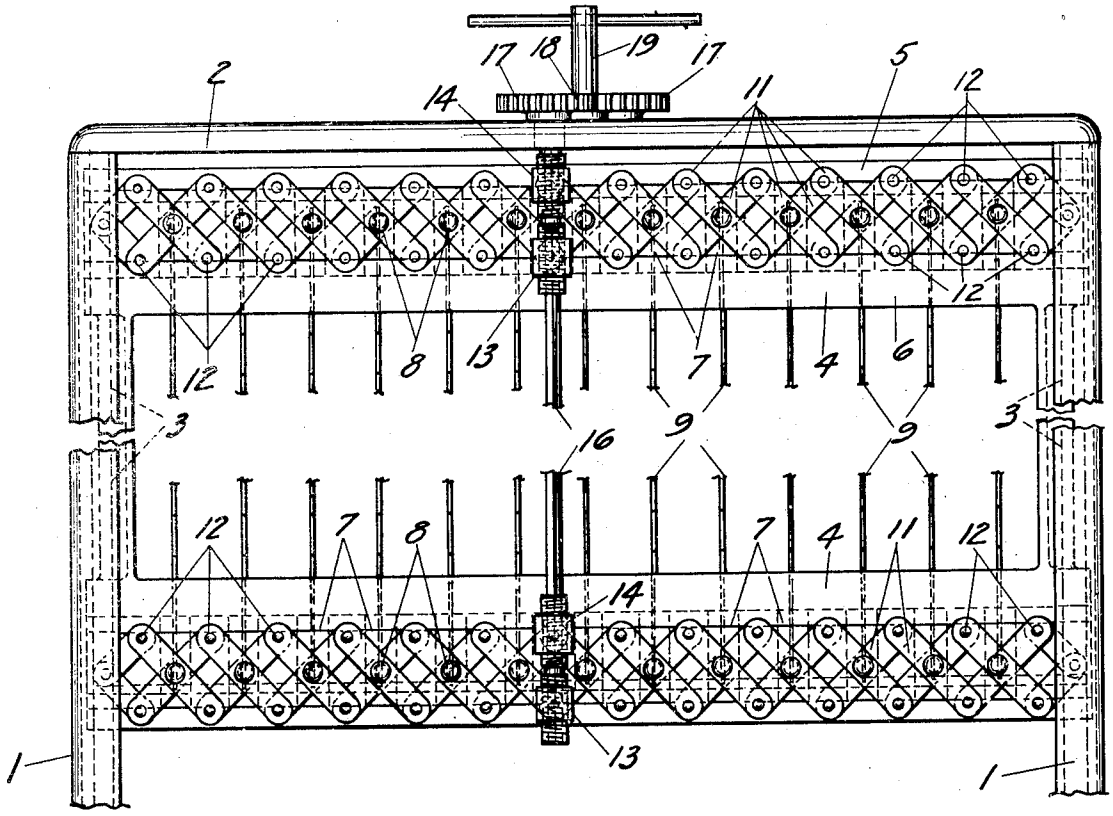


FIG-2

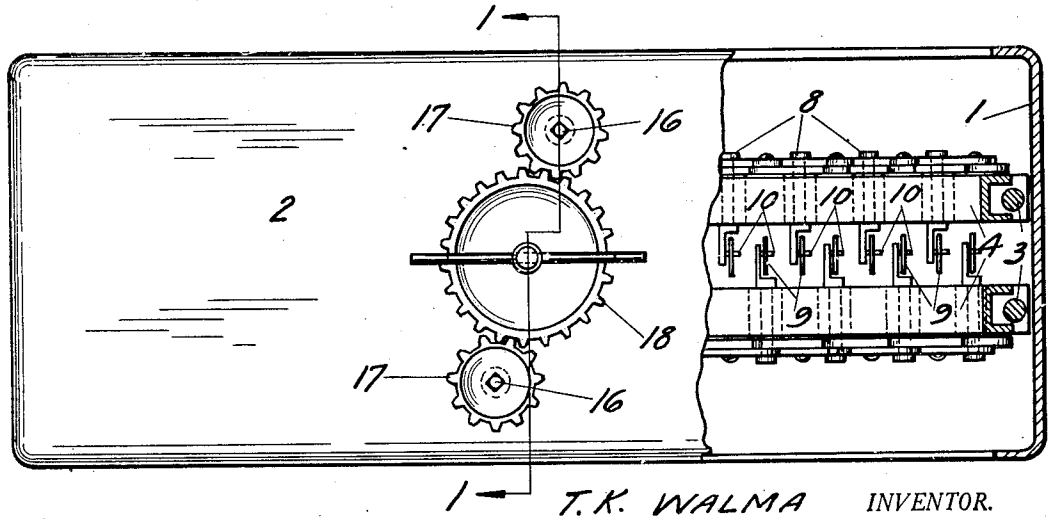


FIG-3

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Patented Dec. 3, 1935 2,023,362

UNITED STATES PATENT OFFICE

2,023,362

ADJUSTABLE KNIFE FRAME FOR BREAD-SLICING MACHINES

Theodore K. Walma, Iowa City, Iowa

Application June 11, 1934, Serial No. 730,037

12 Claims. (Cl. 146—153)

The present invention relates to that type of machines known as bread-slicing machines and more particularly to means for adjusting the spacing of the blades without removing from the machine the frames which carry the blades.

Among the objects of this invention are to provide means for ready adjustment of the spacing of the blades in a bread-slicing machine; to provide means for adjusting the spacing of the blades of a bread-slicing machine without removing the blade-carrying frames from the machine; to provide mechanism for simultaneously adjusting the spacing of all of the blades of a bread-slicing machine; to provide means for easy adjustment, at both ends, of both sets of blades of a bread-slicing machine, the adjustment being made simultaneously for all of the blades; and such further objects, advantages and capabilities as will hereafter appear and as are inherent in the construction disclosed herein. My invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings and, while I have shown therein what is now considered the preferred embodiment of this invention, I desire the same to be understood as illustrative only and not to be interpreted in a limiting sense.

In the drawings annexed hereto and forming a part hereof,

Fig. 1 shows a vertical section of a bread-slicing machine embodying my invention, the same being partly broken away;

Fig. 2 is a fragmentary elevation of one side of a machine embodying my invention, one set of blades being omitted for the sake of clearness;

Fig. 3 is a plan view, partly broken away, of a machine embodying this invention;

Fig. 4 is a plan view and Fig. 5 an elevation, both fragmentary, of a modification of the structure shown in Figs. 1, 2 and 3.

Reference will now be made in greater detail to the annexed drawings for a more complete description of this invention. In a structure of the character indicated, the blades or knives are generally carried in two groups by two frames spaced a short distance apart and supported in a frame comprising end pieces 1 and a top 2. Within the ends of the main blade-supporting frame are located guide rods 3 upon which the blade-carrying frames 4 are mounted and slidable. These blade-supports comprise upper and lower rails and end members, secured together to form a rigid support. The upper and lower rails comprise a plurality of grooved parts 5 and 6, between which are mounted, slidably, the blocks 7. These blocks 7 are shown in Fig. 2 as spaced apart a sufficient distance to permit longitudinal movement between the grooved rails 5 and 6. Passing through the blocks 7 are shouldered pins or bolts 8 which have their heads cut away on one side to permit the knives or blades 9 to be substantially in line with the axes of the pins. Projecting laterally from the face of each pin, where cut away, is a pin or lug 10 which enters the hole formed in the end of a blade and by means of which the blade is to be supported. The cutting edges of the blades are all directed toward the same side of the frame, that is, toward the side of the frame through which the loaf of bread enters.

It is obvious from Fig. 1 that the blades or knives 9 are separated into two groups carried by the corresponding similar blade-supporting frames. It will be noted that the two knife or blade-supporting frames are faced in opposite directions so as to bring the blades themselves into alignment, thus enabling all of the blades to cut simultaneously. The blades 9, as has been indicated, are supported by the pins 8 which pass through the blocks 7. These pins 8 also pass through the cross-levers 11 and serve as pivots about which these levers turn. At their ends, the levers are interconnected by the pivot means 12, thus forming a lazy-tongs arrangement by means of which the blocks 7 are interconnected and caused to move longitudinally of the grooved members 5 and 6. Since the pivots are all equally spaced, expansion or contraction of the lazy-tongs results in the spacing of the blades being maintained uniform throughout and at both ends, provided the upper and lower lazy-tongs are simultaneously actuated at the same rate.

Extension or contraction of the lazy-tongs is accomplished by means of the mechanism which will now be described. Posts 13 and 14 are fixed to the lower and upper ends, respectively, of the levers 11, approximately midway of the length of the frames. These posts are connected to the levers by the respective pivot members 12, shown in Fig. 1 as being screwed into the inner ends of the posts 13 and 14. These posts have oppositely threaded openings therein for the reception of sleeves 15 threaded correspondingly at their opposite end portions. This is shown clearly in Fig. 1. These sleeves 15 have angular shaped openings therethrough, preferably square, for the reception of a correspondingly shaped rod or rods 16. Therefore, when the rods 16 are rotated about their axes, they similarly rotate the sleeves 15, causing the posts 13 and 14 to approach toward or recede from each other, respectively.

This causes contraction or expansion of the lazy-tongs and spreading or bringing together of the blades or knives. If the pivot joints are made sufficiently accurate, there will be no noticeable lag in the operation of the lazy-tongs. However, if it is found that the joints wear so that the spacing ceases to be accurate, resilient means may be added to draw or otherwise force the ends of the lazy-tongs toward each other so as to always take up any slack which there may be. This will result in keeping the blades uniformly spaced.

It will of course be understood that for a loaf of bread to be able to pass through the frame it will be necessary to get the rods 16 out of the way. In order to accomplish this, the squared portion of the rods is made of uniform dimensions so that it may slide through the sleeves 15 to be completely removed therefrom. To the upper ends of the rods or shafts 16 are secured gears 17 and these mesh with a gear 18 carried by the key 19 which, as is clearly shown in Fig. 1, is more or less permanently mounted in the upper frame member 2. Clearly, this key must be rotatable in the frame member 2 and be rigidly secured to gear 18 in order, when turned, to transmit rotary motion to the gears 17. When the blades 9 have been adjusted to the required spacing, the gears 17 and connected rods 16 are pulled out and laid aside until again needed for adjusting the blade spacing. It is obvious that the rod 16 must pass into both the upper and lower sleeves 15 when any adjustment is made, or else the blades will not be maintained in proper parallelism. The pins or posts 8 may, if desired, be permanently secured in place but it is believed preferable to have a screw extend into the hollow screw-threaded end of the post upon which the levers are mounted. These levers might be secured in place by having an end of posts 8 screw-threaded and having a nut threaded thereon. Any of these or any equivalent mode of securing the levers in place on the posts 8 should be understood as being contemplated and should be regarded as coming within the scope of this invention.

In the structure shown in Figs. 4 and 5, posts, or the like, 21 rise from the gears 17 and pass through openings in the cross arm 20 through which the key 19a passes. Various structures equivalent to that shown in these two figures may be used, the essential feature of this structure being that, by pulling upwardly on the key 19a, all of the parts represented by solid lines in Fig. 5 can be lifted from place as a unit and laid aside until again needed. Then, when it is desired to readjust the blade spacing, this is picked up as a unit and the lower or free ends of the rods 16 are inserted into the appropriate openings in the top frame member 2 and the structure is lowered until the rods 16 enter both the upper and lower sets of sleeves 15 and the lower end of the key 19a enters the opening provided therefor in the upper plate 2. The parts are then adjusted and ready for use and the blades may be adjusted by turning the key 19a. This construction is considered preferable to that shown in Fig. 1 since there is but a single unit to be handled and the three gears are always in mesh. There is no trouble hunting around to make these gears come into mesh as they are always in that condition.

In the structure shown in Fig. 5, the posts rising from the gears 17 may be regarded as having angular portions passing through similarly shaped openings in the gears 17 so as to furnish a positive drive between the gears and the shafts 16. Above the gears 17 are parts 22 which may be regarded as spacing washers, spacing the gears from the cross-head 20. On the upper ends of the posts 21 are secured the means 23 whereby these posts and the gears 17 are kept assembled with the cross-head 20. These members 23 may be secured to the posts 21 by being pinned thereto, having screw-threaded connection therewith, or in any other suitable manner. The operation of this device is believed to be fully described in connection with the description of the structure and further description thereof is therefore omitted.

It will of course be understood that the specific description of structure set forth above may be departed from without departing from the spirit of this invention as set forth in this specification and the appended claims.

Having now described my invention, I claim:

1. Blade-adjusting means for a bread-slicing machine of the type having a plurality of substantially parallel blades arranged in groups, the blades of which alternate with each other, and frames to support the respective groups, comprising units arranged in pairs for the respective blades, the pairs being arranged in and movable longitudinally of the said frames, and means connecting said units for simultaneous movement longitudinally of the frames, there being in each frame an upper set of units and a lower set of units, the four sets of units being interconnected for substantially uniform and simultaneous movement to maintain substantially uniform spacing of the blades.

2. A structure as defined by claim 1 in which the blade-adjusting means comprises gearing interconnecting the units of the two frames so that they will operate simultaneously.

3. A structure as defined by claim 1 in which the interconnecting means for the units of the respective frames comprises lazy-tongs mechanisms and the interconnecting means for the lazy-tongs mechanisms of each frame comprises a shaft.

4. In a bread-slicing machine, a pair of blade-supporting and actuating frames, each comprising pairs of upper and lower guiding rails, blade-supporting units mounted between and slidable longitudinally of said pairs of rails, lazy-tongs connecting means for the units carried by the respective pairs of guiding rails to cause them to move relatively to each other and maintain a substantially uniform spacing, operating means to cause the connecting means for the upper and lower sets of units to move simultaneously, and connecting means for the operating means of the respective frames to cause simultaneous operation of said operating means and units, said last mentioned connecting means comprising a set of gears.

5. A structure as defined by claim 4 in which a pair of shafts connects the upper and lower lazy-tongs mechanisms of the two frames to cause simultaneous and uniform movement of all of the blade-supporting units whereby to maintain uniform spacing of the blades.

6. A bread-slicing machine comprising a supporting frame and two blade frames, each comprising upper and lower frame members and other members connecting the upper and lower members and holding them spaced a certain distance apart, slidable units held by the upper frame members and by the lower frame mem-

bers, blade-supporting means connected to the slidable units and projecting laterally therefrom to support cutting blades in alternated arrangement, alternate blades being carried by one frame and the other alternate blades being carried by the other frame, and gears located approximately centrally of the top of the supporting frame for causing simultaneous sliding of the said units so as to uniformly increase or decrease the distance between said units with any relative sliding thereof, the slidable units of one blade frame being interposed between those of the other blade frame.

7. In a bread-slicing machine of the type using independent, substantially parallel blades, a pair of blade-holding frames having upper and lower frame members, each of which comprises a pair of vertically spaced, substantially parallel rails, relatively movable blade-holding units between the rails of each pair and slidable longitudinal thereof, a lazy-tongs mechanism connecting the blade-holding units of each frame and adapted, when actuated, to maintain a substantially uniform spacing of said units, the blade-holding units of one frame being interposed between those of the other frame so as to alternate the blades of one frame with those of the other frame, and the blades being located entirely outside of both frames.

8. In a bread-slicing machine of the type having a plurality of substantially parallel slicing blades arranged in two inter-related groups, cutting simultaneously in substantially the same plane, but in opposite directions, blade-supporting frames for the two groups, each frame comprising upper and lower blade-holding units for each blade and guide rails between which the units are slidable, the units being adjustable longitudinally of their respective frames, simultaneously and uniformly.

9. In a bread-slicing machine of the type having a plurality of substantially parallel slicing blades arranged in two groups in which the blades of the respective groups are alternated and interpositioned, blade-supporting frames for the two groups, each frame carrying upper and lower blade-holding units for each blade, the units being adjustable longitudinally of their respective frames, simultaneously and uniformly, and each set of blade-holding units being positioned and slidable between a pair of substantially parallel guide rails, one arranged above the other.

10. A structure as defined by claim 9, said structure having means for adjusting the units, said means comprising gearing located approximately above the middle blades of the two groups and interconnecting all of said units to cause substantially simultaneous and uniform motion thereof.

11. In a bread-slicing machine, a pair of blade-supporting and actuating frames, each comprising pairs of vertically spaced guiding rails, blade-supporting units mountable between and slidable longitudinally of said pairs of rails, connecting means for said units to cause them to move relatively to each other and maintain a substantially uniform spacing, operating means to cause the connecting means for the upper and lower sets of units to move simultaneously, said operating means, during adjustment of the blade-supporting units, occupying positions normally within the path traversed by loaves of bread but being removed therefrom after adjustment of said units and prior to any slicing operation, and connecting means for the operating means of the respective frames to cause simultaneous operation of said operating means and units, said connecting means for the operating means being unconnected with the moving frames during the slicing operation.

12. A structure as defined by claim 11 in which the last named connecting means comprises a set of intermeshing gears whereby simultaneous motion of the blade-supporting units is caused in the two frames.

THEODORE K. WALMA.