Dec. 27, 1960 H. E. BOITSCHA ET AL 2,966,015

MULTIPLE BLADE SHARPENER

Original Filed March 18, 1958 5 Sheets-Sheet 1

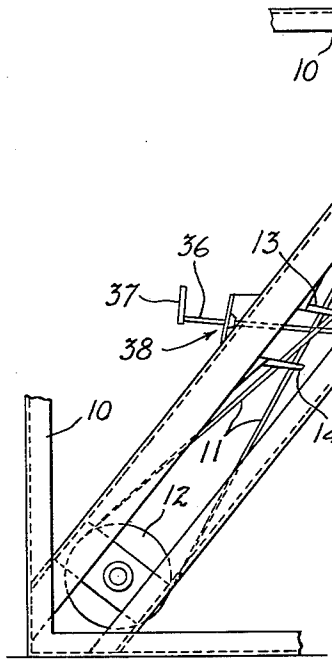


Fig. 1

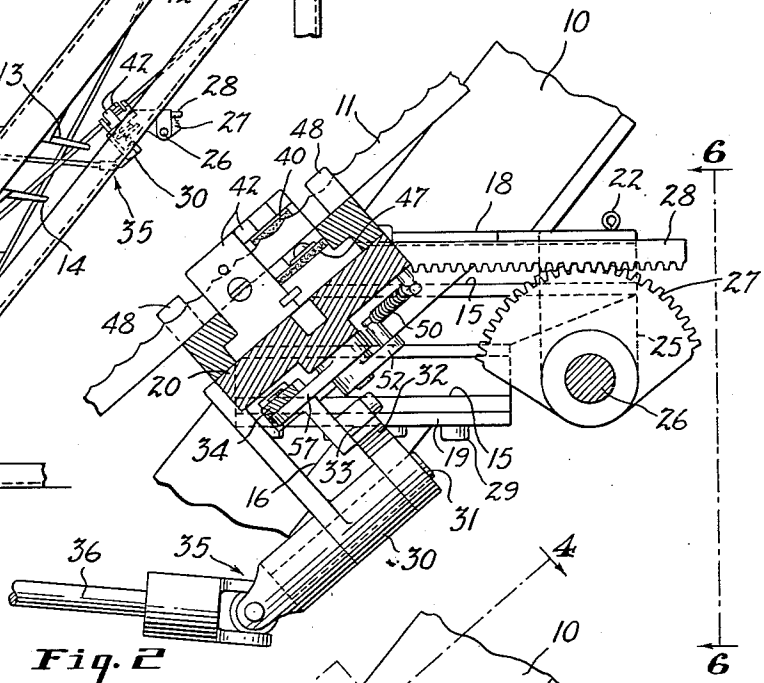


Fig. 2

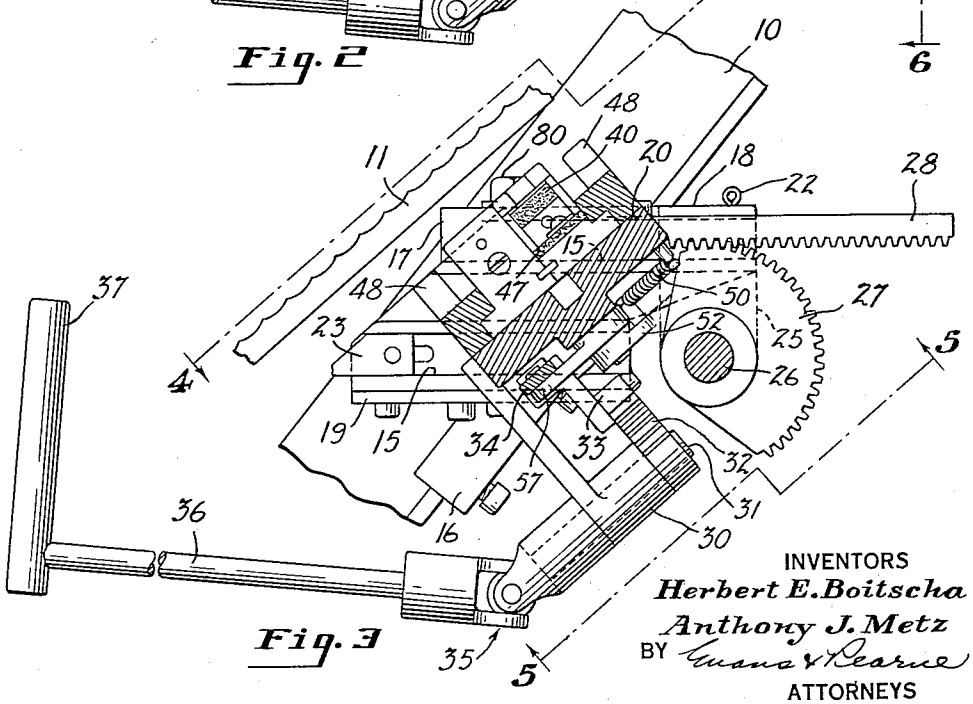


Fig. 3

INVENTORS
Herbert E. Boitscha
Anthony J. Metz
BY Evans & Pearne
ATTORNEYS

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MULTIPLE BLADE SHARPENER

Original Filed March 18, 1958 5 Sheets-Sheet 2

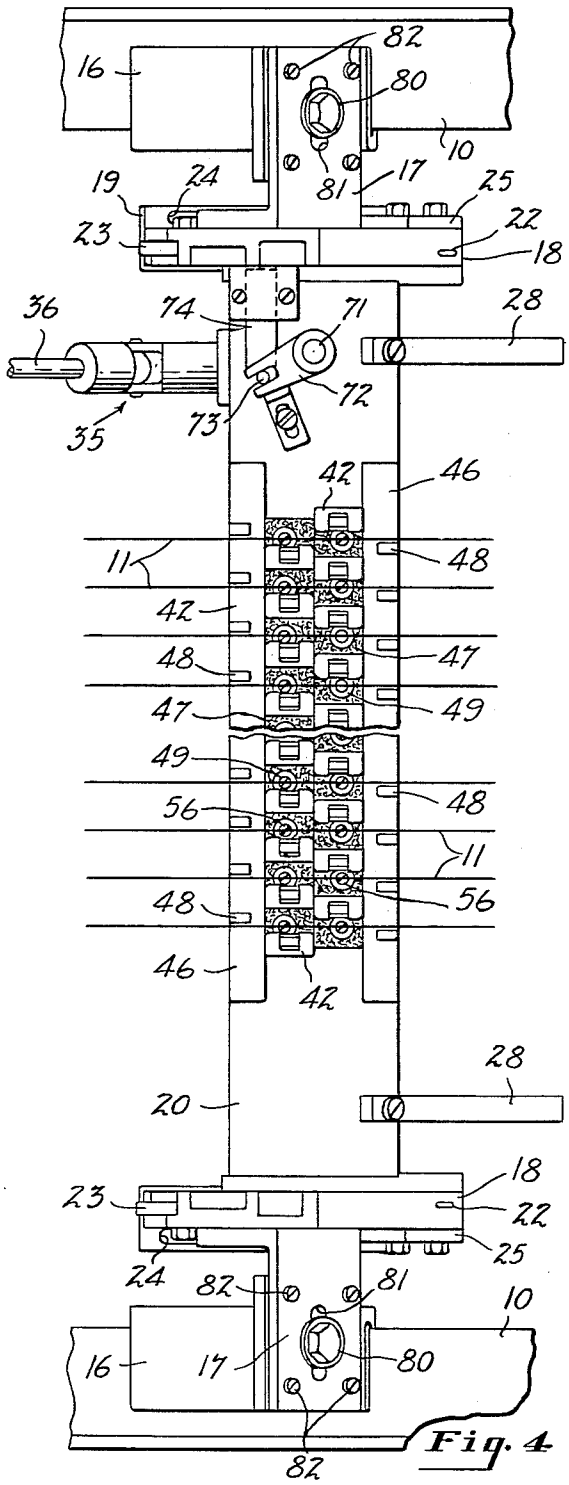


Fig. 4

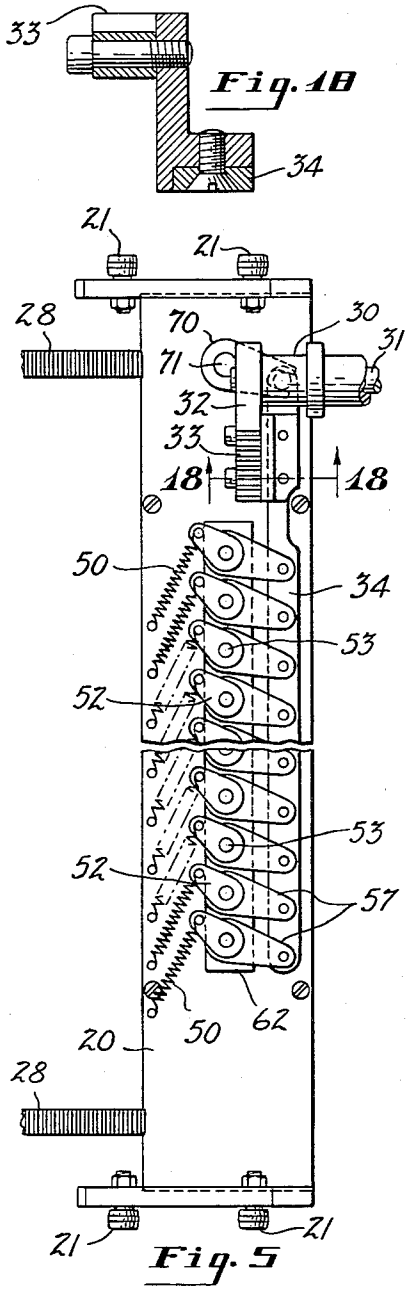


Fig. 1B

Fig. 5

INVENTORS
Herbert E. Boitscha
Anthony J. Metz
BY Evans & Pearne
ATTORNEYS

Dec. 27, 1960 H. E. BOITSCHA ET AL 2,966,015

MULTIPLE BLADE SHARPENER

Original Filed March 18, 1958 5 Sheets-Sheet 3

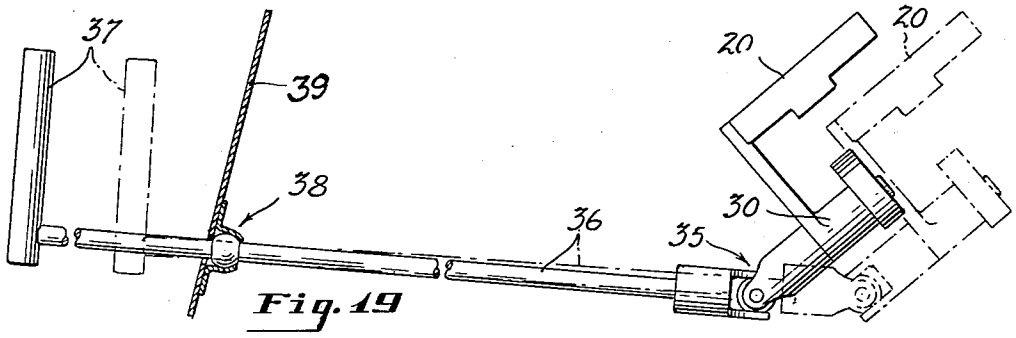


Fig. 19

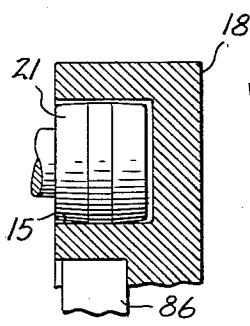


Fig. 20

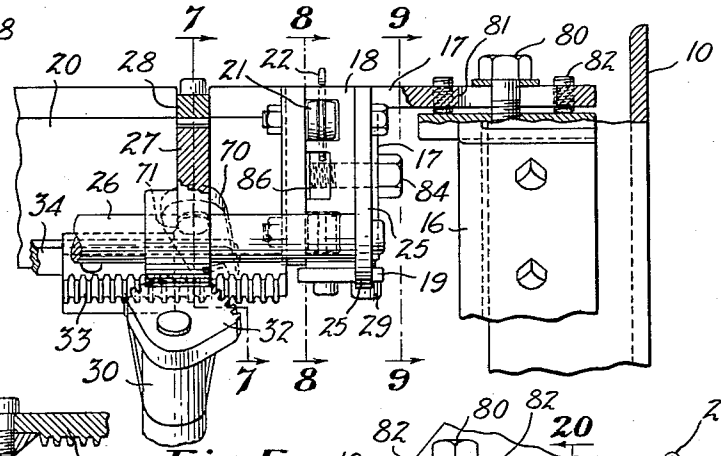


Fig. 6

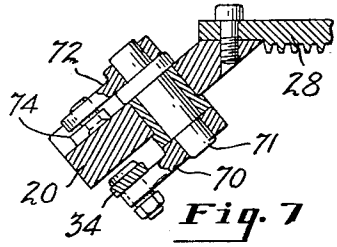


Fig. 7

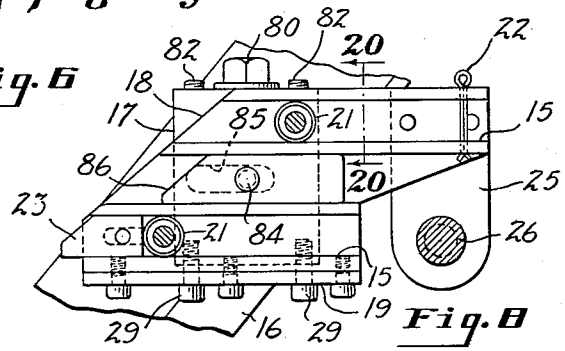


Fig. 8

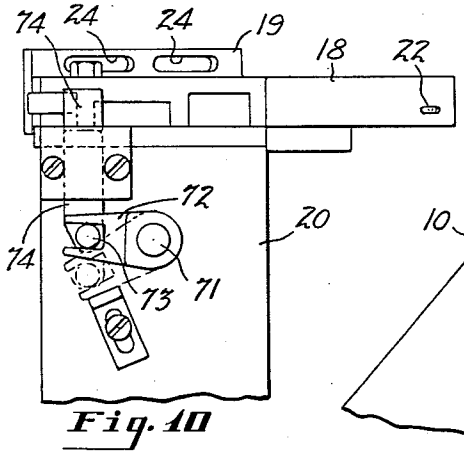


Fig. 10

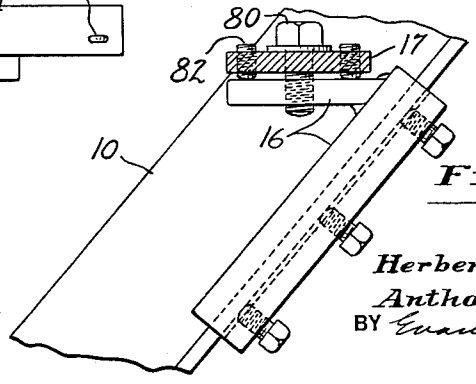


Fig. 9

INVENTORS
Herbert E. Boitscha
Anthony J. Metz
BY Evans & Pearne
ATTORNEYS

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MULTIPLE BLADE SHARPENER

Original Filed March 18, 1958 5 Sheets-Sheet 4

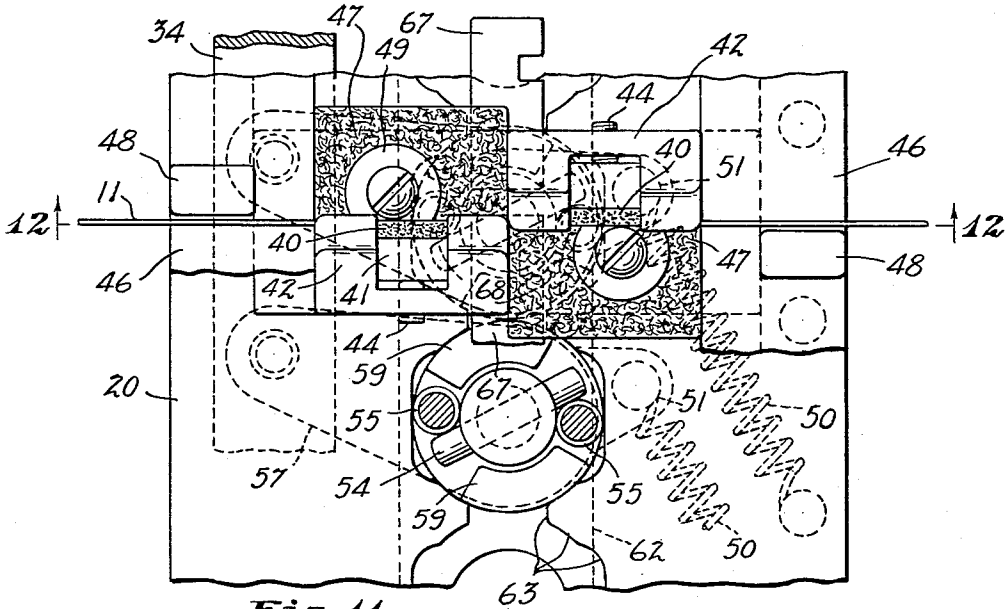


Fig. 11

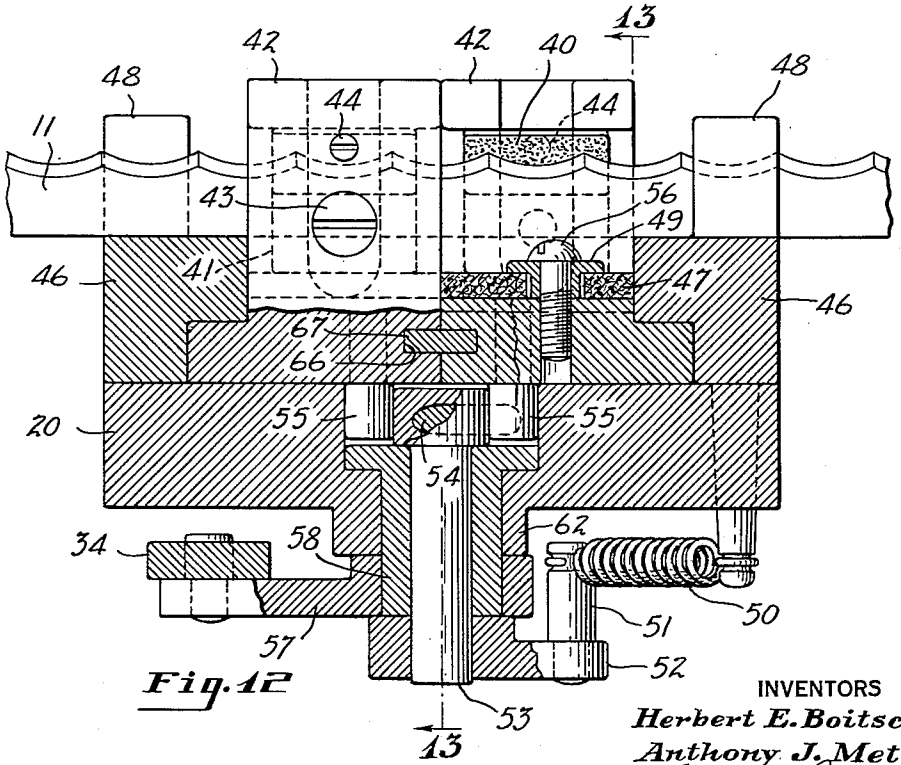


Fig. 12

INVENTORS
Herbert E. Boitscha
Anthony J. Metz
BY Evans & Kearne
ATTORNEYS

Dec. 27, 1960 H. E. BOITSCHA ET AL 2,966,015

MULTIPLE BLADE SHARPENER

Original Filed March 18, 1958 5 Sheets-Sheet 5

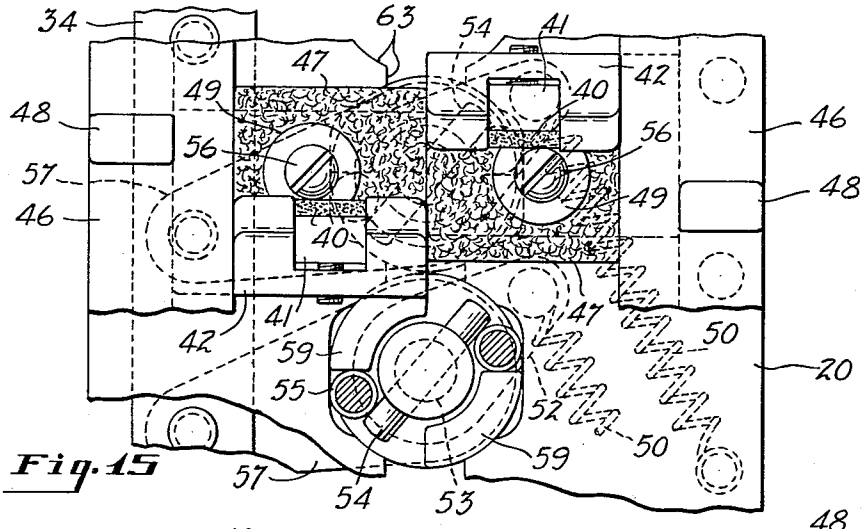


Fig. 15

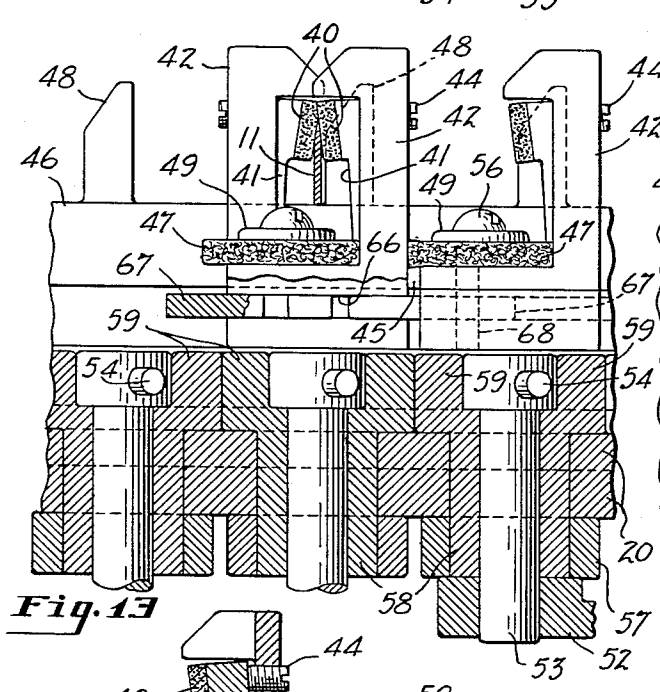


Fig. 13

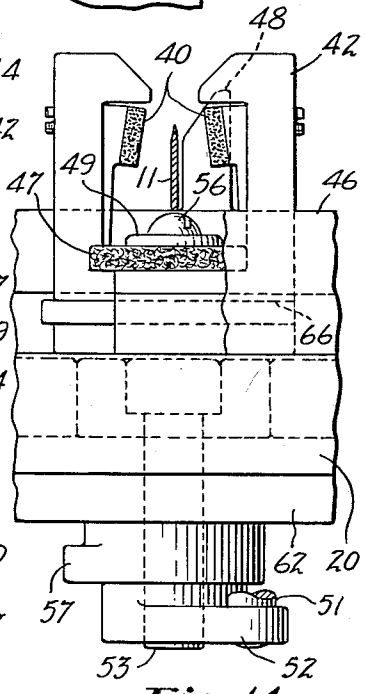


Fig. 14

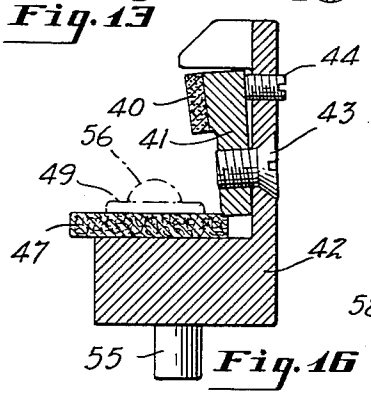


Fig. 16

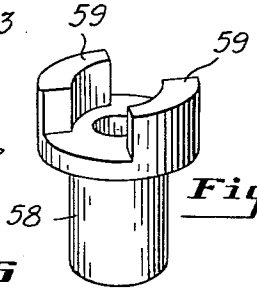


Fig. 17

INVENTORS
Herbert E. Boitscha
Anthony J. Metz
BY Evans & Pearne
ATTORNEYS

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2,966,015

MULTIPLE BLADE SHARPENER

Herbert E. Boitscha, Bettendorf, and Anthony J. Metz, Davenport, Iowa, assignors to Bettendorf Bakery Equipment Co., Bettendorf, Iowa, a corporation of Iowa

Continuation of abondoned application Ser. No. 722,242, Mar. 18, 1958. This application Nov. 24, 1958, Ser. No. 776,119

10 Claims. (Cl. 51—246)

This invention relates to means for grinding endless slicer blades which are in place in a bread slicing machine.

This application is a continuation of application Serial No. 722,242, filed March 18, 1958.

Endless band blade bread slicing machines are commonly provided with vertically spaced pulleys over which the band blades run and between which the runs of each of the band blades cross. Intermediate the pulleys, one or more transverse rows of blade guides are provided for holding the band blades in parallel planes and equally spaced apart in the slicing zone. Usually two vertically spaced rows of blade guides are provided, one above and the other below a slicing zone, so that the blades are held parallel and against relative lateral movements while passing through the bread. After a machine has been in use for some time, the blades may be of different widths due to various degrees of wear and different times of replacement of the individual blades.

It has previously been proposed to provide a sharpener having sharpening blocks which are positively but floatingly positioned to accurately sharpen the blades in a slicer machine and to sharpen such blades to a uniform angle despite variations in blade width and without excessive abrasion and unnecessary removal of material from relatively wide blades.

The object of the present invention is to provide a sharpener by the use of which all the blade bands of an array may be simultaneously sharpened to a uniform angle even though they are not of uniform width. This requires that the sharpeners for all the blocks be engageable and disengageable together but that, while engaged, they be independently governed in their action by the varying character of their associated blades. Furthermore, since the blade bands are spaced relatively closely together (corresponding reaches of the bands are usually spaced apart a distance equal to double the thickness of the bread slices to be cut) only a relatively restricted space is available in which to provide each individually governed but collectively responsive sharpener for each blade band. The present invention meets these requirements.

The above and other objects and advantages of the invention will become more fully apparent from the following description, by way of example, of a presently prefererd embodiment of the invention. In the accompanying drawings:

Figure 1 is a fragmentary side elevation of a bread slicing machine showing the present example of the invention in association with the frame and blade bands of a bread slicing machine.

Figure 2 is an enlarged cross-sectional view of the sharpener apparatus shown in Figure 1.

Figure 3 is a view similar to Figure 2 but showing the sharpener base in a different position.

Figure 4 is a view taken approximately from the plane of line 4—4 in Figure 3.

Figure 5 is a view taken approximately from the plane of line 5—5 in Figure 3.

Figure 6 is a view taken approximately from the plane of line 6—6 in Figure 2.

Figure 7 is a view taken approximately from the plane of line 7—7 in Figure 6.

Figure 8 is a view taken approximately from the plane of line 8—8 in Figure 6.

Figure 9 is a view taken approximately from the plane of line 9—9 in Figure 6.

Figure 10 is a fragmentary view of some of the assembled elements as seen near the top end portion of Figure 4, showing the latch in engaged position.

Figure 11 is a fragmentary view on an enlarged scale partially broken away, showing sharpener blocks and mounting means and activating means therefor. This view is a detail of the central portion of Figure 4.

Figure 12 is a view taken approximately from the plane line 12—12 in Figure 11.

Figure 13 is a view taken approximately from the plane of line 13—13 in Figure 12.

Figure 14 is a view similar to Figure 13 but showing the sharpener blocks disengaged from their associated blades. Figure 14 is not broken away and cross-sectioned as extensively as Figure 13.

Figure 15 is a view similar to Figure 11 but showing the sharpener blocks disengaged from their associated blade.

Figure 16 is a cross-sectional view of one of the sharpener blocks and its associated mounting means.

Figure 17 is a perspective view showing an element of the actuating means associated with each pair of sharpener blocks in the particular apparatus illustrated.

Figure 18 is a detail cross-section taken from the plane of line 18—18 in Figure 5, the sharpener base proper being omitted.

Figure 19 is a view similar to Figures 2 and 3 but on a smaller scale, some elements having been omitted and others added, and alternative positions of the sharpener base being shown.

Figure 20 is a detail view taken from the plane of line 20—20 in Figure 8, certain elements being omitted.

In the following description of the illustrated embodiment of the invention, the various parts will be designated by reference numerals, and, in many instances, the figures in which those parts may be most conveniently found or clearly seen will be designated parenthetically. For example, when reference is made to "upper and lower spaced pulleys **12** (1)," the part or parts in question are indicated by the reference numeral **12** in the drawings and may be most conveniently found or clearly seen in Figure 1.

The illustrated example of the invention may be employed in a blade slicing machine having upper and lower spaced pulleys **12** (1) which are supported by suitable frame members **10** (1–4, 6, 9). The array of crossed band blades **11** (1–4, 11–14) associated with the machine are straightened and guided on each side of the cutting zone by suitable blade guides **13** and **14** (1) which are located above and below the cutting zone, all as is conventional.

According to the invention, blade sharpening apparatus may be provided on the output side of the array and above the cutting zone, as shown in Figure 1. The illustrated form of the invention includes upper and lower guide tracks **15** (2, 3, 8, 20) on a plate **18** (6, 8, 10, 20) fixed to opposite frame members **10** by brackets **16** and **17** (6, 8, 9) and a bracket **19** (6, 8, 10) which is bolted to the underside of the element **18** and is provided with slots **24** (4, 10) which receive bolts **29** (6, 8) which are threaded into the underside of the bracket **17**. Extending between the opposite pairs of tracks **15** is a base member **20** (2–7, 10–15, 19) which has rollers **21** (5, 6, 8, 20) which are received in the tracks **15**. The base

member 20 is prevented from running out of the back end of the tracks by a cotter pin 22 (4, 6, 8, 10) which may be removed when it is desired to take out the entire unit for repair or replacement. The base member is prevented from running out of the forward end of the tracks 15 and limited in its forward movement by the adjustable stop 23 (4, 8) which is positioned at the forward end of one of the lower tracks.

The brackets 16 and 17 are joined by the single bolt 80 (3, 4, 6, 8, 9) which is threaded in the top flange of the bracket 16 and is received in the slot 81 (4, 6) in the top flange of the bracket 17. Four transit screws 82 are also threaded in the top flange of the bracket 16. The screws 82 bear against the top face of the top flange of the bracket 16.

The bracket 17 and the plate 18 are joined by the single bolt 84 (6, 8) which is received in the slot 85 (8) formed in the plate 18 and is threaded into the bearing plate 86 (6, 8, 20) which is adapted to be positioned adjustably between and along the length of the proximate flanges of the grooves 15.

It will be understood that the above description of the mounting of the apparatus applies to each side thereof, the mounting brackets and associated elements being duplicated in identical or similar form at each side of the apparatus, i.e., at each end of the base member 20. At each such end, the bolts 80 and 84 are at right angles to each other and a universal adjustment of the position of the tracks 15 and of the limiting positions of the base member 20 may be effected within adequately wide ranges.

Bushing ears 25 (4, 6, 8) which are bolted to and depend from the plate 18 receive a shaft 26 (2, 3, 6, 8) to which are keyed a pair of gear segments 27 (2, 3, 6) located toward opposite sides of the slicer machine. A pair of corresponding racks 28 (2–7) are fixed to the base plate 20 and mesh with the gear segments 27. The gears 27 and racks 28 coact to make both ends of the base plate 20 travel together to prevent jamming when this plate is translated along the tracks 15.

Fixed to the plate 20 is a bushing 30 (1–3, 6, 19) which receives a shaft 31 to which is fixed a gear segment 32 which engages a rack 33 (2, 3, 5, 6, 18) carried on a control bar 34 (2, 3, 5–7, 11, 12, 15, 18) which is adapted to shift along the length of the base plate 20. The shaft 31 is connected through a universal joint 35 (1–4, 19) and rod 36 to a handle 37 (1, 3, 19). The rod 36 may be slidable through the ball of a ball and socket bearing 38 (1, 19) supported on a housing wall or the like 39. It will be seen that the rod 36 may be installed to the operator's side of the bread slicer between the end of the array of band blades and the adjacent side frame 10, as shown in Figure 4, so that the handle 37 may be located on and operated from the front end of the machine. The handle may be drawn in and out to translate the base plate 20 bodily along the tracks 15 and the handle may be twisted to shift the control bar lengthwise.

Located along the base plate 20 and therefore across the array of band blades 11 are a plurality of pairs of abrasive sharpening blocks 40 (13, 14, 16). Each sharpener block 40 may comprise diamond grit (preferably of the size of the order of from 46–200 grain) embedded in a suitable binder, such as a metal matrix, the diamond and binder being formed as pads fixed to a steel foundation 41. Each of the members 40, 41 is fixed to a backing member 42 by a machine screw 43 which is in threaded engagement with the member 41, and the head of the screw has a loose fit with the countersink in the backing member 42 so that the screw 43 and member 41 may have a slight angular movement relative to the backing member. The other end of each of the members 41 is positioned by set screw 44. The angle of the blade engaging surface of each pad or block 40 may be adjusted by loosening the associated screw 43, adjusting the associated set screw 44 and then retightening the screw 43. As best seen in Figures 13 and 14, the blade engaging surfaces of the pad 40 face each other in offset relationship and slide towards each other at a shallow angle. This angle may be adjusted by changing the angle of the blade engaging surfaces of each pad 40 by manipulation of the screws 43 and 44 as described above.

The bases of the members 42 are slidably received for rectilinear movement along the face of the base plate 20. Each associated pair is constrained between its mate and a guide track member 46 (12), two of such members being bolted to the opposite sides of the base plate 20. Extending from the top of the guide track members are guide fingers 48 (11–13), a pair of such fingers being associated with each pair of sharpener blocks 40. The fingers 48 are adapted to engage and guide the band blades 11 when the apparatus is in operative association with the band blades.

Each pair of mmebers 42 and the sharpener blocks associated therewith are urged toward each other by spring means. This spring means includes a spring 50 (5, 11, 12, 15), a lug 51 (12, 14), a crank arm 52 (5, 12–14), a shaft 53 and pins 54 (11–13, 15) fixed in a boss at the top of the shaft 53. Depending from each of the members 42 is a lug 55 (11, 12, 15). It will be seen that the pins 54 and shaft 53 and associated parts constitute a spring loaded oscillatable linkage that is in driving engagement with each of the sharpener block mounting means through the lugs 55 and that such engagement as to each of the two associated sharpening block mounting means is at locations which are on opposite sides of the axis of oscillation of such oscillatable linkage.

Also provided in connection with each pair of sharpener blocks is means for overcoming the above described spring means and for urging the pairs of blocks away from each other. This means includes a lever 57 (5, 11, 12, 15) which is actuated by the control bar 34 and a lug member including a sleeve 58 (12, 13, 17) and lugs 59. This linkage will be seen to constitute a second oscillatable linkage drivingly engageable with each of its associated block mounting means through the lugs 55 and which are therefore drivingly engageable with the associated block mounting means at locations which are on opposite sides of the axis of oscillation of such second oscillatable linkage, such engageability of the second oscillatable linkage being in opposition to the above-discussed spring-loaded first oscillatable linkage.

The oscillatable linkages are supported in assembled position within the base block 20, the increased depth of section afforded by the flange 62 (12) affording a good bearing support for the shaft 53 and sleeve 58. The upper portion of the base block 20 is bored and reamed to form the cut-outs 63 (11, 15) in which the various inter-engageable lugs and pins are located. The associated pairs of members 42 may be grooved as at 66 near the lower edges of their facing sides to receive keying members 67 (11–13). One of each of the associated pairs of members 42 may be provided with a pin 68 (11, 13) and the associated member 67 may have a corresponding notch to hold the member 67 in association with its pair of blocks. These members 67 are provided in order to more positively hold the sliding blocks in assembled relation.

When the handle 37 is gripped from the front of the machine and twisted clockwise, the bar 34 is advanced downwardly (as viewed in Figures 5, 11 and 15) so that the parts associated with each pair of sharpening blocks move to the position shown in Figures 14 and 15. When the handle 37 is twisted counterclockwise (with reference to the aspect of the apparatus as viewed from the front of the machine), the bar 34 moves in the opposite direction to the position shown in Figures 11 and 13, and in this position the lugs or lifter members 59 have moved so far in a clockwise direction (with reference to the aspect of the apparatus as viewed in Figures 11 and 15)

that they can no longer be followed by the depending lugs 55 which are fixed to the associated pair of sliding block mounting members 42 because travel of these lugs 55 is limited by engagement of the associated sharpening blocks with the blade as shown in Figure 13. Since each pair of sharpener blocks has its own individual spring-loaded means including the spring 50 and associated elements 51—54, the amount of spring-urged travel of the associated pair of lugs 55 is independent of that of any other lugs associated with any other pair of sharpener blocks and is limited only by engagement of the lugs 55 with the associated blade 11. Accordingly, varying blade widths may be accommodated by each of the pairs of sharpener blocks.

In the position shown in Figure 15, the lugs or lifter members 59 have been moved in the counterclockwise direction by downward movement of the bar 34 as seen in that figure. In the position shown, the lugs 59, acting through the lugs 55 against the pin 54, cause this pin 54 and its associated linkage including the shaft 53 to be forced backwardly against the tension of the associated spring 50. The resultant shifting of the lugs 55 causes the associated pair of sharpener block mounting means 42 and the sharpener blocks associated therewith to back off from each other as illustrated in Figure 14.

Since travel of each associated pair of lugs 55 and each corresponding pair of sharpener blocks is independent of that of any other pair, adjacent members 42 in each of the left and right files of members 42 as seen in Figure 4 will vary in their spacing from each other. In other words, the size of the gaps 45 (13) will vary. To protect the mechanism from fouling by bread crumbs and the like, these gaps should be covered but they must be covered in such a way as to accommodate variation in their width. This is accomplished by providing felt pads 47 (11–16) which are received on flanged sleeves 49 which in turn are held down by screws 56. The flanged sleeves 49 prevent crushing of the felt pads as by overtightening of the screws 56. The felt retaining arrangement is best illustrated in Figure 12 and abutment of a pad against a neighboring member 42 is best illustrated in Figure 13.

The parts are preferably arranged so that the elements cannot be moved into blade engaging sharpening position shown in Figures 11 and 13 unless the base has been moved forwardly along the tracks 15 into its proper operative association with the array of blade bands 11, that is, into the position shown in Figure 2 and in solid lines in Figure 19 as distinguished from the position shown in Figure 3 and in phantom lines in Figure 19. To this end there is provided an interlock linkage at the end of the control bar 34. The interlock linkage comprises a crank 70 (5–7), shaft 71 (4, 5, 7, 10), yoke crank 72 and the lugs 73 on the latch bar 74 (4, 10). The arrangement is such that the latch bar is prevented by interference with the plate 18 and the sides of the integral cam tracks 15 from being extended unless and until the whole assembly carried by the base plate 20 is shifted to the position shown in Figure 2 in which it is in operative association with the array of band blades 11. This insures that the pairs of sharpening blocks 40 cannot be in the position shown in Figure 13 but must be in the position shown in Figure 14 unless and until the sharpener is moved up into surrounding relationship with the blades 11 as shown in Figure 2. According, it is not possible for the sharpener assembly to be forced against the rear of the blades while the sharpening elements are closed together, thereby possibly causing serious damage or injury.

The apparatus is normally stored in the position shown in Figure 3. When the grinder is to be used, the operator pulls the handle 37 toward him as he stands at the front side of the bread slicer. This moves the apparatus from the position shown in Figure 3 to the position shown in Figure 2 and therefore establishes it in operative association with the array of the band blades 11 of the bread slicing machine. As the apparatus reaches the position shown in Figure 2, the latch 74 becomes free to extend allowing counterclockwise turning of the handle 37. This turning may be initiated by the spring tension of the springs 50 but it will be completed by manipulation of the handle 37 by the operator in order to fully rotate the pair of lugs 59 out of any motion-confining engagement with each pair of lugs 55. Each pair of sharpening blocks 40 is thereby free to be urged by its associated spring 50 to engage its associated blade 11 and to sharpen it at the pre-selected sharpening angle regardless of the width of the particular blade 11. During sharpening the operator is prevented from inadvertently forcing the blades 11 so far rearward that one of them might be caused to be excessively strained. This is accomplished by the engagement of the latch 74 over the front side of the plate 18 as shown in Figure 10. When sharpening is completed the operator turns the handle 37 in a clockwise direction against the tension of the springs 50 thereby moving the lugs 59 from the position shown in Figure 11 to the position shown in Figure 15. This lifts the pairs of blocks 40 off the blades 11 from the position shown in Figure 13 to the position shown in Figure 14. It also releases the latch 74. The operator then pushes inwardly on the handle 37 causing the whole assembly to move from the position shown in Figure 2 to the storage position shown in Figure 3.

The invention is not limited to the provision of all of the details described above. The scope of the invention is described in the following claims.

What is claimed is:

1. A grinder for endless blade bands of a bread slicing machine comprising a sharpener base, a plurality of pairs of abrasive sharpener blocks on said base facing each other in offset relationship with their blade-engaging surfaces slanting towards each other at a shallow angle, blade engaging and guiding means associated with each of said pairs of sharpener blocks, means mounting each of said pairs of sharpener blocks for rectilinear sliding backing-off movement away from each other and for opposite movement toward each other, spring means urging each of said pairs of sharpener blocks toward each other and including in association with each pair of sharpener blocks an independently spring-loaded oscillatable linkage in driving engagement with each of its associated block mounting means at locations which are on opposite sides of the axis of oscillation of said oscillatable linkage, means for overcoming said spring means and urging each of said pairs of blocks away from each other, and means for mounting said base in position for operative association with the band blades of the bread slicing machine with which it is used.

2. A grinder for endless blade bands of a bread slicing machine comprising a sharpener base, a plurality of pairs of abrasive sharpener blocks on said base facing each other in offset relationship with their blade-engaging surfaces slanting towards each other at a shallow angle, blade engaging and guiding means associated with each of said pairs of sharpener blocks, means mounting each of said pairs of sharpener blocks for rectilinear sliding backing-off movement away from each other and for opposite movement toward each other, spring means urging each of said pairs of sharpener blocks toward each other, means for overcoming said spring means and urging each of said pairs of blocks away from each other and including in association with each pair of sharpener blocks an oscillatable linkage drivingly engageable with each of its associated block mounting means at locations which are on opposite sides of the axis of oscillation of said oscillatable linkage and such engageability of said oscillatable linkage being in opposition to said spring means, and means for mounting said base in position for operative association with the band blades of the bread slicing machine with which it is used.

3. A grinder for endless blade bands of a bread slicing machine comprising a sharpener base, a plurality of pairs of abrasive sharpener blocks on said base facing each other in offset relationship with their blade-engaging surfaces slanting towards each other at a shallow angle, blade engaging and guiding means associated with each of said pairs of sharpener blocks, means mounting each of said pairs of sharpener blocks for rectilinear sliding backing-off movement away from each other and for opposite movement toward each other, spring means urging each of said pairs of sharpener blocks toward each other and including in association with each pair of sharpener blocks an independently spring-loaded first oscillatable linkage in driving engagement with each of its associated block mounting means at locations which are on opposite sides of the axis of oscillation of said oscillatable linkage, means for overcoming said spring means and urging each of said pairs of blocks away from each other and including in association with each pair of sharpener blocks a second oscillatable linkage drivingly engageable with each of its associated block mounting means at locations which are on opposite sides of the axis of oscillation of said second oscillatable linkage and such engageability of said second oscillatable linkage being in opposition to said spring-loaded first oscillatable linkage, and means for mounting said base in position for operative association with the band blades of the bread slicing machine with which it is used.

4. A grinder for a transverse array of endless blade bands of a bread slicing machine comprising a sharpener base extending transversely across the machine apposite the array of blade bands, a plurality of pairs of abrasive sharpener blocks on said base and facing each other in offset relationship with their blade-engaging surfaces slanting towards each other at a shallow angle, blade engaging and guiding means associated with each of said pairs of sharpener blocks, means mounting each of said pairs of sharpener blocks for rectilinear sliding backing-off movement away from each other and for opposite movement toward each other, spring means urging each of said pairs of sharpener blocks toward each other and including in association with each pair of sharpener blocks an independently spring-loaded oscillatable linkage in driving engagement with each of its associated block mounting means at locations which are on opposite sides of the axis of oscillation of said oscillatable linkage, means for overcoming said spring means and urging each of said pairs of blocks away from each other, and mounting means for said base including means supporting said base for simultaneous movement of all said pairs of blocks into and out of operative association with the array of blade bands of the bread slicing machine with which it is used.

5. A grinder for a transverse array of endless blade bands of a bread slicing machine comprising a sharpener base extending transversely across the machine apposite the array of blade bands, a plurality of pairs of abrasive sharpener blocks on said base and facing each other in offset relationship with their blade-engaging surfaces slanting towards each other at a shallow angle, blade engaging and guiding means associated with each of said pairs of sharpener blocks, means mounting each of said pairs of sharpener blocks for rectilinear sliding backing-off movement away from each other and for opposite movement toward each other, spring means urging each of said pairs of sharpener blocks toward each other, means for overcoming said spring means and urging each of said pairs of blocks away from each other and including in association with each pair of sharpener blocks an oscillatable linkage drivingly engageable with each of its associated block mounting means at locations which are on opposite sides of the axis of oscillation of said oscillatable linkage and such engageability of said oscillatable linkage being in opposition to said spring means, and mounting means for said base including means supporting said base for simultaneous movement of all said pairs of blocks into and out of operative association with the array of blade bands of the bread slicing machine with which it is used.

6. A grinder for a transverse array of endless blade bands of a bread slicing machine comprising a sharpener base extending transversely across the machine apposite the array of blade bands, a plurality of pairs of abrasive sharpener blocks on said base and facing each other in offset relationship with their blade-engaging surfaces slanting towards each other at a shallow angle, blade engaging and guiding means associated with each of said pairs of sharpener blocks, means mounting each of said pairs of sharpener blocks for rectilinear sliding backing-off movement away from each other and for opposite movement toward each other, spring means urging each of said pairs of sharpener blocks toward each other and including in association with each pair of sharpener blocks an independently spring-loaded first oscillatable linkage in driving engagement with each of its associated block mounting means at locations which are on opposite sides of the axis of oscillation of said oscillatable linkage, means for overcoming said spring means and urging each of said pairs of blocks away from each other and including in association with each pair of sharpener blocks a second oscillatable linkage drivingly engageable with each of its associated block mounting means at locations which are on opposite sides of the axis of oscillation of said second oscillatable linkage and such engageability of said second oscillatable linkage being in opposition to said spring-loaded first oscillatable linkage, and mounting means for said base including means supporting said base for simultaneous movement of all said pairs of blocks into and out of operative association with the array of blade bands of the bread slicing machine with which it is used.

7. A grinder for a transverse array of endless blade bands of a bread slicing machine comprising a sharpener base extending transversely across the machine apposite the array of blade bands, a plurality of pairs of abrasive sharpener blocks on said base and facing each other in offset relationship with their blade-engaging surfaces slanting towards each other at a shallow angle, blade engaging and guiding means associated with each of said pairs of sharpener blocks, means mounting each of said pairs of sharpener blocks for rectilinear sliding backing-off movement away from each other and for opposite movement toward each other, spring means urging each of said pairs of sharpener blocks toward each other, means for overcoming said spring means and urging each of said pairs of blocks away from each other, and mounting means for said base including means supporting said base for simultaneous movement of all said pairs of blocks into and out of operative association with the array of blade bands of the bread slicing machine with which it is used.

8. A grinder for endless blade bands of a bread slicing machine comprising a sharpener base, a pair of abrasive sharpener blocks on said base facing each other in offset relationship with their blade-engaging surfaces slanting towards each other at a shallow angle, blade engaging and guiding means, means mounting said sharpener blocks for rectilinear sliding backing-off movement away from each other and for opposite movement toward each other, spring means urging each of said pairs of sharpener blocks toward each other and including a spring-loaded oscillatable linkage in driving engagement with each block mounting means of said pair of sharpening blocks at locations which are on opposite sides of the axis of oscillation of said oscillatable linkage, means for overcoming said spring means and urging said pair of blocks away from each other, and means for mounting said base in position for operative association with the blade bands of the bread slicing machine with which it is used.

9. A grinder for endless blade bands of a bread slicing

machine comprising a sharpener base, a pair of abrasive sharpener blocks on said base facing each other in offset relationship with their blade-engaging surfaces slanting towards each other at a shallow angle, blade engaging and guiding means, means mounting said sharpener blocks for rectilinear sliding backing-off movement away from each other and for opposite movement toward each other, spring means urging each of said pairs of sharpener blocks toward each other, means for overcoming said spring means and urging said pair of blocks away from each other and including an oscillatable linkage drivingly engageable with each block mounting means of said pair of sharpening blocks at locations which are on opposite sides of the axis of oscillation of said oscillatable linkage and such engageability of said oscillatable linkage being in opposition to said spring means, and means for mounting said base in position for operative association with the blade bands of the bread slicing machine with which it is used.

10. A grinder for endless blade bands of a bread slicing machine comprising a sharpener base, a pair of abrasive sharpener blocks on said base facing each other in offset relationship with their blade-engaging surfaces slanting towards each other at a shallow angle, blade engaging and guiding means, means mounting said sharpener blocks for rectilinear sliding backing-off movement away

from each other and for opposite movement toward each other, spring means urging each of said pairs of sharpener blocks toward each other, and including a spring-loaded first oscillatable linkage in driving engagement with each block mounting means of said pair of sharpening blocks at locations which are on opposite sides of the axis of oscillation of said first oscillatable linkage, means for overcoming said spring means and urging said pair of blocks away from each other and including a second oscillatable linkage drivingly engageable with each block mounting means of said pair of sharpening blocks at locations which are on opposite sides of the axis of oscillation of said second oscillatable linkage and such engageability of said second oscillatable linkage being in opposition to said spring-loaded first oscillatable linkage, and means for mounting said base in position for operative association with the blade bands of the bread slicing machine with which it is used.

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