MULTIPLE-BLADE HONE

John Hansen, 710 River Drive, Bettendorf, Iowa

Filed Dec. 30, 1957, Ser. No. 705,900

21 Claims. (Cl. 51—246)

This invention relates to a honing apparatus and more particularly to such apparatus as applied to slicer machines of the type having a plurality of parallel slicer blades operative in unison as a multiple set. The honing means provided according to this invention is especially adapted to endless-band type bread slicers in which typical construction involves a pair of parallel rotatable drums about which a plurality of slicer bands are trained in figure-eight fashion so that the portions of the bands in crossed relation establish a bread-slicing zone through which successive loaves of bread are passed. It has heretofore been established that honing of the blades in said desirably, at least up to the point when it becomes necessary to remove the blades for regrinding at the factory, and various honing devices have heretofore been devised and used with varying degrees of success. Some of these prior devices operate on the principle of honing both sides of each band individually adjacent to the slicing zone where the band portions are constrained by appropriate guides to travel in planes generally normal to the axes of rotation of the band-carrying drums. This type of individual honing process withdraws the machine from normal operation for a long period and the devices themselves are relatively complicated and expensive. Since they operate in the slicing zone, they must be removed when the machine performs cleaning and maintenance operations or in pairs on a few bands at a time, one on one side of the few bands and the other on the opposite side. However, as the honing traverses the bands, the bands are allowed to spring up behind the hone, with the result that damage to the cutting edges often occurs. Further, the honing of relatively few bands at a time, even though the honing set is ultimately honed, is cumbersome and time-consuming.

According to the present invention, the foregoing and other disadvantages are eliminated by an improved honing apparatus embodying such features as hone means capable of honing all bands or blades of the set simultaneously, hone means operating in dual fashion to hone both sides of all bands at once, power means for driving the hone means, improved mounting means for a plurality of coaxial hones as a unitary structure, provision for movement of the hone means in a rectilinear path so that honing is properly performed, timer means for controlling the duration of the honing operation, reversibility of the honing operation to accommodate reversal of the positions of the bands on the drums, adaptability of the apparatus to existing machines, and such other features and objects as will appear from the present disclosure of preferred embodiments of the invention in the ensuing description and accompanying sheets of drawings, the several figures of which are described immediately below.

FIG. 1 is a plan, partly in section, of a slicer equipped with one form of honing apparatus embodying the invention.

FIG. 2 is a section on the line 2—2 of FIG. 1.

FIG. 3 is a schematic view of a typical band and drum arrangement, showing the crossed band.

FIG. 4 is a fragmentary view, partly in section, showing a modified form of drive for the apparatus.

FIG. 5 is a similar view and shows a manual drive for the apparatus.

FIG. 6 is an enlarged section on the line 6—6 of FIG. 2.

FIG. 7 is a section on the line 7—7 of FIG. 6.

FIG. 8 is a section on the line 8—8 of FIG. 6.

FIG. 9 is an enlarged section on the line 9—9 of FIG. 6.

FIG. 10 is a section on the line 10—10 of FIG. 9.

FIG. 11 is an enlarged section on the line 11—11 of FIG. 7.

FIG. 12 is an enlarged section on the line 12—12 of FIG. 7.

FIG. 13 is a section like FIG. 12 but showing a modified form of hone mounting means.

The slicer machine shown in FIGS. 1, 2 and 3 may be taken as typical of commercially known machines and only so much thereof is illustrated and described as is deemed necessary to orient the construction and use of the invention. The numeral 20 designates in general the body or frame means of the machine in which upper and lower, or rear and front, relatively wide parallel drums 22 and 24 are journaled to carry a plurality of slicer blades 26, herein the form of endless bands trained about the drums and crossed in figure-eight fashion to afford a slicing zone 28 to which loaves of bread are fed over means such as a table 30. These details as such are relatively unimportant and could be other than as depicted. One or both of the drums is driven by any suitable power source which also drives means, not shown, for feeding loaves to the slicing zone. For present purposes a chain-driven shaft 32 is chosen as representative of a power source or power take-off.

The several blades are axially spaced apart substantially throughout the width or axial dimension of the drum and in typical machines the number of blades will reach eighteen or twenty or even more, depending upon loaf length and number of slices desired. Portions of the drum 22 and intervening bands are omitted in the interests of presenting the views on a reasonable scale but the presence of a typical number of bands will be assumed. Since the bands or blades are trained about the drums, they travel in unison as a multiple set.

The frame 20 comprises generally an enclosure for the slicer, being open in course of operation for obvious purposes, and, to the extent material here, has opposite parallel upright side walls or panels 34 and 36 and at transverse rear wall 38. The honing apparatus, indicated in its entirety at 40, is mounted on the frame means via the side walls, for example, in such position as to lend itself to honing the bands in situ in zones preferably spaced from the slicing zone 28 so as not to require removal of the apparatus during normal operation of the slicer.

The side wall 34 may be formed in such manner as to accommodate or achieve a box-like mounting means 42, effecting by sheet structure and frame members as desired to afford an enclosure for the driving parts of the apparatus, at least from the exterior of the slicer. These frame and mounting parts will be clear from the drawings without detailed description, since the specific mounting components do not limit the invention. Suffice it to note that this means 42 provides for the rigid mounting of a base 44 having upper and lower bearings 46 thereon for mounting the proximate ends of upper and lower transverse shafts 48. The opposite ends of these shafts are journaled in bearings 50 that are removably mounted, as by bolts or other fasteners 52, on suitable frame members 54 at the opposite wall or panel 36. Removability of the bearings 50 is afforded for facilitating removal of the bands and reversal thereof as to position so as to equalize wear on the band guides (not shown) in the slicing zone. Removal and reversal of the bands is a conventional procedure and mention is made of it here to point up the removability of the bearings 50 and the reversibility of operation of the honing apparatus, as will be described below. Normally, a portion of the panel 36 is in the form of a door or other
movable element to afford access to the interior of the machine but here again details are of minor significance.

The bearings 46 and 50 mount the respective shafts 48 for both rocking about and reciprocation along the respective transverse axes afforded by the bearings, and the shafts thus serve as parts of hone means 56 operative on portions of the bands 26. The upper hone means operates on the outer sides of the bands as the bands pass under the drum 22 and the lower hone means operates on the inner sides of the bands as they pass under the drum. Since the duality of the apparatus in the respect just noted will be obvious from the foregoing and from FIG. 2, further description will be devoted to the details of one hone means, it being understood that the two are alike and are preferably operated in unison.

The slicer bands shown are of a conventional type having scalloped cutting edges 58 and the set of bands is mounted on the drums 22 and 24 with all cutting edges facing in the same axial direction as respect the drums (toward the wall 36 in FIG. 1). When the bands are removed and reversed for reasons pointed out above, the cutting edges will face in the opposite direction. This will of course still present the cutting edges in the same fashion at the slicing zone, but the lateral bias in the bands because of the direction of twist will be in the opposite direction. Periodic reversal of the bands serves to equalize wear on the band guides, as is well known.

The direction in which the cutting edges 58 face in the area adjacent to the drum 22 becomes important in the honing operation, since it is preferable that the honing means first contact the bands and then be moved transversely of the bands in the direction of the cutting edge and then be disengaged from the bands for transverse reversal and so forth. Accordingly, the honing apparatus includes mechanism for causing the honing means to travel in a rectilinear path involving band engagement, traversing, band disengagement and reverse traversing as aforesaid. Traversing is desirable to prevent the bands from wearing grooves in the hone 60 comprising parts of the hone means 56. In FIG. 12, a typical hone-to-blade relationship is illustrated, the arrow A indicating the direction of movement of the hone while in contact with the bands 26 so as to move toward and past the band cutting edges 58. (See also FIG. 1.) The bands in this area are slightly tilted because of the twist therein.

As best seen in FIGS. 7 and 12, the hone 60 is formed in a number, being cylindrical and arranged in coaxial end-to-end relationship in a generally tubular carrier 62 which has a C-shaped section to present an open side or elongated slot 64 to the bands and through which slot contiguous peripheral portions of the hone project for engagement with the bands. The O.D. of the hone approximately equals the I.D. of the carrier and the carrier is preferably originally a cylindrical tube cut away as shown to form the slot 64, whereby to expose portions of the hone in such manner that the carrier itself never contacts the bands. Since hone are commercially produced in relatively short lengths for purposes of economy and easy individual replacement, the novel carrier construction enables the exploitation of this circumstance. These hones are normally on the order of six inches in length and multiples thereof may be used up to six, seven, eight, etc., depending upon the width of the set of bands. And this points up another feature of novelty; viz, the length of the assembled hone means is such as to span the entire set of bands for simultaneous contact therewith to hone all at once. Further, the length of the hone means plus the relationship of reciprocation thereof during the honing operation is such that individual bands cannot snap up behind the hone means to damage cutting edges. In this respect, the ends of the hones are axially interfitted to eliminate gaps therebetweent so that the length of the component hone means is uninterrupted.

One arrangement is shown in FIGS. 7 and 12, wherein each hone has at one end an axial frusto-conical projection 66 and at its other end an axial frusto-conical recess 68. These are arranged, when the hones are assembled, so that the hone means 56 are engaged by the bands 26 over the projection 66 on one band while the recess 68 in its neighbor so as to establish axial interlocking means. One end of the carrier 62 is closed to provide a fixed abutment 70 and the other end carries releasable compression means, here a cap screw 72 threaded into said carrier end and having a lock nut 74. When the assembly with 56 is mounted in the carrier 62, the bands are locked in place in the carrier. The screw can of course be loosened to enable removal of one or more hones and also to enable turning of the hones about their common axis to equalize wear.

A modified form of hone mounting and interlock means is shown in FIG. 13, wherein hones 60a, generally like the hones 60, have radial end faces 61 abutting each other and bored or drilled axially at 63 to receive an axial pin or key 65. In either case, the interlock maintains alignment of the hones and the joints between ends of adjacent hones are such that there are no gaps into which the bands might snap up to damage their cutting edges.

Each hone means carrier 62 is mounted on the respective cross shaft 58 by a plurality of arms or arm means 76, the shaft-proximate ends of which have split clamp devices 78 for affixation to the associated hone means. Thereby, the arm means and shafts move in unison through rocking and reciprocating phases. The clamp devices enable adjustment of the arms relative to the shaft as well as facilitating assembly and disassembly.

For the purpose of developing the necessary rocking and axial shifting of the shafts 48, the hones 44 mounted at 80 and 82 a driving shaft 84 normal to the shafts 48 and having keyed thereto upper and lower cams 86 respectively engaging proximate end portions of the shafts 48 so that when the shaft 84 is rotated the shafts 48 move in unison in one axial direction. The shafts 48 of course carry the hone means 56 therewith. At this point, it becomes necessary to note the manner in which each shaft 48 is carried in its bearing 46, and reference is had to FIGS. 6 and 7. As shown there, each shaft 48 is axially slidably received by, but turns with, a sleeve 88, via a key 90, and this sleeve is rockable in the bearing 46, having a rigid thereon a pair of yoke arms 92 provided with followers or tappets 94 which ride on the surface of an additional cam 96. There are of course two cams 96, one for each shaft 48, and the sleeve-yoke-follower structure in both cases is preferably identical, or at least symmetrical.

The shaft 48 has a cam 98 (FIG. 9) slightly larger than the associated key 90 to afford a loss-motion device between the shafts 48 and the sleeves 88, for purposes to presently appear. The tappets or followers 94 may be adjustable, as shown at 100.

Biasing means, here in the form of a combined compression and torsion spring 102, is interposed between each endmost arm 76 and its proximate bearing 50 and has tangs or projections 104 and 106 respectively engaging these related components to impose a slight angular influence on the hone means in a clockwise direction as seen in FIG. 2 so as to impose a measured honing pressure on the bands. The compressive force in the springs 102 is such as to urge the shafts 48 toward the wall 34. In other words, with the bands 26 positioned as shown, the hones 86 drive the shafts 48 in the direction of the arrow A and the springs 102 reverse the axial movement. The nature of the cams 96 is such that they positively rock the shafts 48 in opposite directions to raise and lower the hone means from and to the bands, subject to the slight amount of lost-motion afforded at 90—98, which is taken up by the torsional forces in the springs 102.

In general, the shaft 84 is rotated to drive the hones 86 and 96 to achieve the rectilinear travel of the hone means, each end of which starts in a starting position disengaged from the bands and axially shifted by the spring 102 positioned to the arrow A. In this starting position, the hones 86
are 180° from the FIG. 7 position and the cams 96 are 180° from the FIG. 10 position. Looking now at FIG. 10, and noting the arrow B, the cam 96 is turned in the direction indicated by the arrow and moved down and into contact with the bands. Simultaneously the cams 86 turn to shift the shafts 48 and the hone means outwardly while the hone continues to engage the bands, because of the dwell at 105 on the cams 96; and the springs 102 are loaded in compression. The function of the axially reversed, rotatable, cam means located at the end of the outward stroke (180° of the cams 86 to achieve the position of FIG. 7) the cams 96 have also traveled 180° and are ready to lift the hones by reversing the angular direction of the shafts 48 just as the shafts are reversed axially, and this raised position is retained on the reverse stroke because the high spot 110 on each cam 96 is concentric with the shaft 84. As the cam 86 turn again through 180° to their starting positions (opposite to FIG. 7) the compressively loaded springs axially reverse the shafts and return the hone means to their starting positions with the hones clear of the bands.

FIG. 1 and 2 show power drive for the shaft 84 as being derived from the power take-off 32 of the slicer machine. For this purpose, the shaft 84 has keyed thereto a worm wheel 112 in constant mesh with a worm 114 that is fixed to an input shaft 116. A sheave or pulley 118 is keyed to the input shaft, and a belt 122 is trained around the sheave and sheave 120 keyed to a clutch shaft 124 coaxial with the power take-off 32 and selectively connectable to and disconnectable from the latter via a suitable clutch 126 under control of an appropriate shifter 128. Hence, the honing apparatus may be driven or idled at will. When the bands are reversed to point their cutting edges in the opposite direction, reversal of the rectilinear movement can be achieved by crossing the belt 122.

A second form of power drive is shown in FIG. 4. Here, a reversible electric motor 130, for example, is connected through a suitable reduction gear box 132 to the worm wheel 112. The worm shaft 134 is displaced 90° as respects the shaft 116 in FIGS. 1 and 2, but this is a minor detail peculiar to the illustrated embodiment. Variations will immediately suggest themselves to those versed in the art. The position is under control of a conventional start-stop-reverse switch 136 which may be appropriately wired to the motor 130, or otherwise arranged, through a timer 138 for controlling the duration of the cyclic operation of the honing apparatus. Reversibility of the motor 130 accommodates reversal of the honing path when the band positions are reversed. The locations of the switch and/or timer may of course be varied to suit particular machines, etc.

FIG. 5 shows a manual drive modification in which the worm or input shaft 116 is equipped with a crank 140, for example, in lieu of the sheave 118. The crank can of course be turned in either direction, but in order that reverse turning be prevented at improper times, the shaft 84 has keyed thereto at its lower end a ratchet gear 142 with which a pawl 144 cooperates. When either power drive (FIGS. 1, 2; FIG. 4) is used, the pawl is retained in a suitable detent means 146.

When band position dictates rotation of the shaft 84 in a certain direction, the pawl 144 is turned to one side of center to permit proper rotation while preventing inadvertent reverse rotation.

From the foregoing, it will be seen that a novel, efficient and relatively low-cost honing apparatus has been provided and one that may be readily adapted to existing slicer machines. Efficiency and ease of operation are assured by either of two forms of power drive or by manual means, with appropriate safeguards and controls. Features not categorically enumerated will readily occur to those versed in the art, as will variations of and enlargements on the embodiments disclosed, all of which may be achieved without departure from the spirit and scope of the invention.

What is claimed is:

1. Honing apparatus for a slicing machine having a support and a plurality of parallel slicer blades movable in unison as a multiple set, comprising: bearing means on the support an axis transverse to the blades; arm means including a shaft carried by the bearing means for rocking about and reciprocation along said axis; hone means mounted on the arm means and including an abrasive blade-honing device lying generally in parallelism with said axis and of such length as to span the entire set of blades; and guided and controlled mechanism including first cam means for rocking the shaft and second cam means for incurring axial movement of the shaft, said two cam means being timed to effect rocking and reciprocation of the arm means and shaft to cause the hone means device to move in a rectilinear path first into engagement with the entire set of blades, next transversely of the set of blades while in engagement therewith so as to traverse said set of blades, next out of engagement with the set of blades, and thence transversely in the opposite direction while out of engagement with said set of blades.

2. The invention defined in claim 1, in which the second cam means is operative to positively drive the shaft axially while the hone means is in engagement with the blades; and biasing means opposes the shaft so driven and operates to return the shaft axially in the opposite direction while the hone means is out of engagement with the blades.

3. The invention defined in claim 2, in which the biasing means is also operative angularly in one direction so as to urge the arm means in such direction as to increase the pressure of the hone means on the blades, and the arm means and shaft includes an angular loss-motion device enabling limited angular movement of the arm means relative to the shaft under the angular influence of said biasing means.

4. Honing apparatus for a slicing machine having a support, a power source and a plurality of parallel slicer blades movable in unison as a multiple set, comprising: bearing means on the support an axis transverse to the blades; arm means carried by the bearing means for rocking about and reciprocation along said axis; hone means mounted on the arm means and including an abrasive blade-honing device lying generally in parallelism with said axis and of such length as to span the entire set of blades; and guided and controlled mechanism including first cam means for rocking the shaft and second cam means for incurring axial movement of the shaft, said two cam means being timed to effect rocking and reciprocation of the arm means and shaft to cause the hone means device to move in a rectilinear path first into engagement with the entire set of blades, next transversely of the set of blades while in engagement therewith so as to traverse said set of blades, next out of engagement with the set of blades and thence transversely in the opposite direction while out of engagement with said set of blades; and drive means connecting said mechanism to the power source.

5. The invention defined in claim 4, in which said drive means is reversible so as to reverse the directions of the arm means in said line.

6. Honing apparatus for a slicing machine having a support, a power source and a plurality of parallel slicer blades movable in unison as a multiple set, comprising: bearing means on the support an axis transverse to the blades; arm means carried by the bearing means for rocking about and reciprocation along said axis; hone means mounted on the arm means and including an abrasive blade-honing device lying generally in parallelism with said axis; and guided and controlled mechanism including means for rocking and means for reciprocating the arm means to cause the hone means device to move in a rectilinear path first into engagement with the entire set of blades, next transversely of the set of blades while in engagement therewith so as to traverse said set of blades, next out of engagement with the set of blades and hence transversely in the opposite direction while out of engagement with said set of blades; and drive means connecting said mechanism to the power source.

7. The invention defined in claim 6, in which the biasing means is also operative angularly in one direction so as to urge the arm means in such direction as to increase the pressure of the hone means on the blades, and the arm means and shaft includes an angular loss-motion device enabling limited angular movement of the arm means relative to the shaft under the angular influence of said biasing means.
ment with said set of blades; and drive means connecting said mechanism to the power source.

7. Honing apparatus for a slicing machine having a support and a plurality of parallel slicer blades movable in unison as a multiple set, comprising: hone means including an abrasive blade-honing device positionable transverse to the blades and of such length as to span a plurality of blades; and means mounting the hone means for guided and controlled movement toward and into engagement with said plurality of blades and for reverse movement and also for movement out of contact with the set of blades, said hone means comprising an elongated carrier transverse to the blades and of C-shaped section to presenting an elongated slot toward the blades, and a plurality of coaxial cylindrical end-to-end hone carryed by and interiorly of the carrier and having continuous peripheral portions exposed through said slot for engagement with the blades, said slot being of lesser width than the diameter of a hone so as to confine the hone against radial loss from said carrier.

8. The invention defined in claim 7, including: axial interlock means between one end of each hone and its neighbor for preventing displacement of the hone out of alignment.

9. The invention defined in claim 8, in which: each interlock means comprises an axial projection on one hone and a conforming axial recess on the neighboring hone and receiving said projection.

10. The invention defined in claim 8, in which: each hone has a radial end face abutting the end face of its neighbor, and the interlock means comprises an axial bore in each end face and a coaxial lock pin received in neighboring bores and traversing the associated plane of abutment.

11. The invention defined in claim 7, in which: the carrier has abutment means at one end abutted by the last hone adjacent to said end, and releasable compression means is mounted at the opposite end and engaging the proximate hone to apply axial compressive forces endwise to and for retaining the hone.

12. Honing apparatus for a slicing machine having a support, a power source and a plurality of parallel slicer blades movable in unison as a multiple set, comprising: hone means including an abrasive blade-honing device positionable transverse to the blades and of such length as to span the entire set of blades; means mounting the hone means for movement toward and into engagement with the entire set of blades and for reverse movement away from and out of contact with the entire set of blades; means for guiding and controlling the hone means to parallelism of said movements; and drive means controlling the hone means to the power source for causing the power source to move the hone means into and out of engagement with the set of blades.

13. Honing apparatus of the class described, comprising: a base; a first shaft journaled on the base; a second shaft normal to the first shaft and having an end portion spaced from said first shaft; bearing means on the base and mounting the second shaft for rocking and for axial movement; hone means carried by the second shaft; a first cam fixed to the first shaft and engaging said second shaft end portion so as to shift said second shaft axially upon rotation of the first shaft; a second cam fixed to the first shaft; follower means riding the second cam and connected to the second shaft for rocking said second shaft upon rotation of the first shaft; and means for rotating the first shaft.

14. The invention defined in claim 13, including: a third shaft parallel to the second shaft and spaced therefrom along the axis of the first shaft and having an end portion spaced from said first shaft; second bearing means on the base and mounting the third shaft for rocking and for axial movement; second hone means carried by the third shaft; a third cam like the first cam and fixed to the first shaft and engaging the third shaft end portion for shifting said third shaft axially in unison with the second shaft upon rotation of the first shaft; a fourth cam like the second cam and fixed to the first shaft; and second follower means riding the fourth cam and connected to the third shaft for rocking said third shaft in unison with the second shaft upon rotation of the first shaft.

15. Honing apparatus for a slicing machine having a support and a number of parallel blades movable in unison as a multiple set, comprising: hone means positioned adjacent to the blades and including an abrasive blade-honing device transverse to the blades and of such length as to span a plurality of blades; means mounting the hone means for support for movement into and out of engagement with said plurality of blades; a power source; drive means connecting the power source to the hone means for driving the hone means into and out of engagement with the plurality of blades in successive cycles; and timer means for regulating the duration of operation of the power means.

16. Honing apparatus for a slicing machine having a support and a number of parallel blades movable in unison as a multiple set, comprising: hone means positioned adjacent to the blades and including an abrasive blade-honing device transverse to the blades and of such length as to span a plurality of blades; means mounting the hone means on the support for cyclic travel to move first toward and into engagement with said plurality of blades, then transversely across the blades, then away from and out of engagement with the plurality of blades and then transversely in the opposite direction; a power source; cyclical drive means interconnecting said source and the hone means for driving the hone means in successive cycles; and timer means for regulating the duration of operation of the power means.

17. Honing apparatus for a slicing machine having a support and a number of parallel blades movable in unison as a multiple set, comprising: hone means positioned adjacent to the blades and including an abrasive blade-honing device transverse to the blades and of such length as to span a plurality of blades; means mounting the hone means on the support for movement into and out of engagement with said plurality of blades; a power source; drive means connecting the power source to the hone means for driving the hone means into and out of engagement with the plurality of blades in successive cycles; and means for starting, stopping and reversing the power means.

18. Honing apparatus for a slicing machine having a support and a plurality of parallel slicer blades movable in unison as a multiple set, comprising: bearing means on the support on an axis transverse to the blades; arm means carried by the bearing means for rocking about said axis and reciprocation along said axis; hone means mounted on the arm means and including an abrasive blade-honing device lying generally in parallelism with said axis and of such length as to span at least a pair of adjacent blades; and guiding and controlled mechanism including means for rocking and means for reciprocating the arm means to cause the hone means to move in a rectilinear path, said mechanism including positive drive means to cause the hone means to move first into engagement with at least said pair of blades, next transversely of at least said pair of blades while in engagement therewith so as to traverse said blades, next out of engagement with at least said pair of blades, and said mechanism further including spring means loaded by the aforesaid movement of the hone means and operative subsequent to said movement to cause the hone means to move thence transversely in the opposite direction while out of engagement with at least said pair of blades.

19. Honing apparatus of the class described, comprising: a base; a first shaft journaled on the base; a second shaft having an end portion proximate to the first shaft; bearing means on the base and mounting the second shaft for rocking and for axial movement; hone means carried by said second shaft; first drive means driven by the first
2,997,824

21. Honing apparatus for a slicing machine having first and second spaced apart elongated supports, a pair of slicer band drums between the supports and spaced apart lengthwise of the supports on axes normal to the supports and a plurality of parallel slicer bands trained about the drums and crossed intermediate the drums in figure-eight fashion in a slicing zone and operative to move in unison as a multiple set so that each band has opposite runs twisted from a flatwise condition at the drums to a condition generally normal to the drums in the slicing zone, said apparatus comprising: hone means positioned transversely of the supports and including an abrasive honing device transverse to and spanning the entire set of bands in relatively close proximity to one of the drums and relatively remote from the slicing zone so as to perform a honing operation on at least one run of each band of said set in an area in which said run is in its generally flatwise condition and has its cutting edge directed laterally of the run; means mounting the hone means on the machine for movement into and out of engagement with the set of bands; and means for moving the hone means.

References Cited in the file of this patent

UNITED STATES PATENTS

2,498,938  Bentley -------------- Feb. 28, 1950
2,537,512  Crissey ------------- Jan. 9, 1951
2,541,829  Peddicord ---------- Feb. 13, 1951
2,768,486  Jones et al. -------- Oct. 30, 1956

9 shaft and engaging said second shaft portion so as to shift said second shaft axially upon rotation of the first shaft; second drive means driven by the first shaft and engaging the second shaft for rocking said second shaft upon rotation of the first shaft about the same axis; and means for rotating the first shaft to rock and to move said second shaft in sequence.

20. Honing apparatus for a slicing machine having first and second spaced apart elongated supports, a pair of slicer band drums between the supports and spaced apart lengthwise of the supports on axes normal to the supports and a plurality of parallel slicer bands trained about the drums and arranged in figure-eight fashion to cross intermediate the drums in a slicing zone and operative to move in unison as a multiple set, said apparatus comprising: first bearing means on the first support on an axis parallel to the drum axes and adjacent to one drum; second bearing means adjacent to the other support and generally transversely aligned with the first bearing means; hone carrier means extending between and supported by said first and second bearing means within the area bounded by said one drum the crossing of the bands and the band portions between said one drum and the slicing zone; hone means mounted on said carrier means and of such length as to traverse a plurality of bands for simultaneously honing the plurality of bands in said area; and means detachably mounting the second bearing means on said second support to enable removal of the bands from the drums without removing the hone means and hone carrier means.