

Dec. 19, 1933.

C. F. M. VAN BERKEL

1,939,740

SHARPENER FOR SLICING MACHINES

Filed June 25, 1930

2 Sheets-Sheet 1

Fig. 1

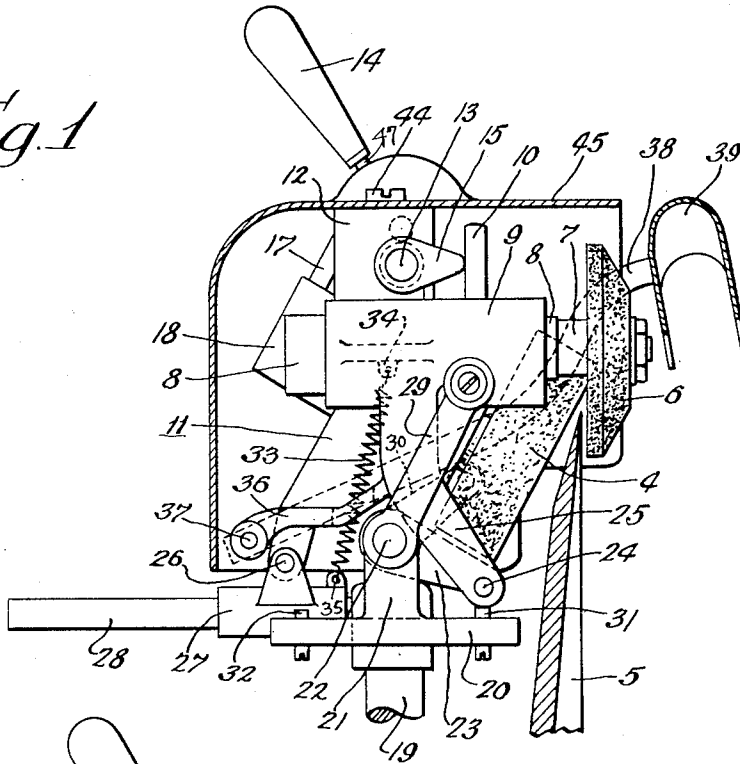
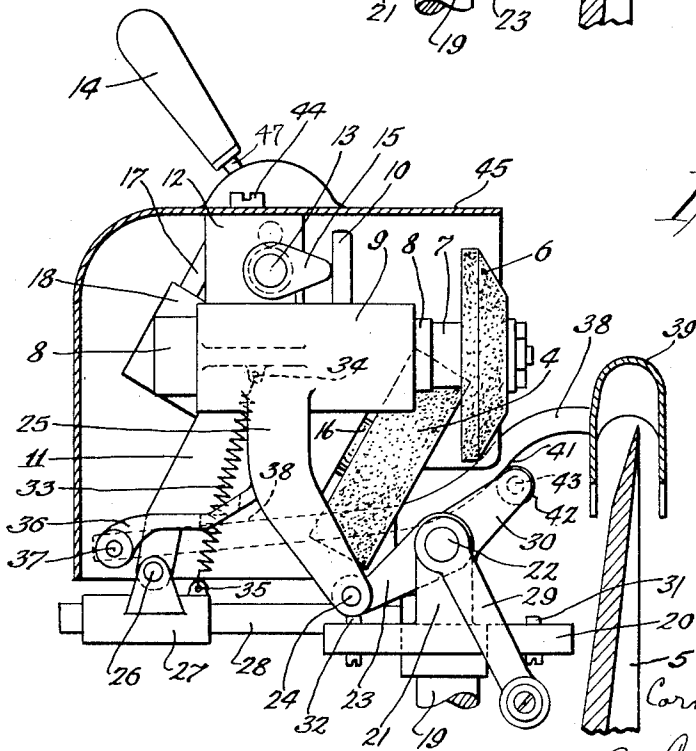


Fig. 2



Inventor  
Cornelis F. M. van Berkel,  
By Chas. M. Nissen,  
Atty

Dec. 19, 1933.

C. F. M. VAN BERKEL

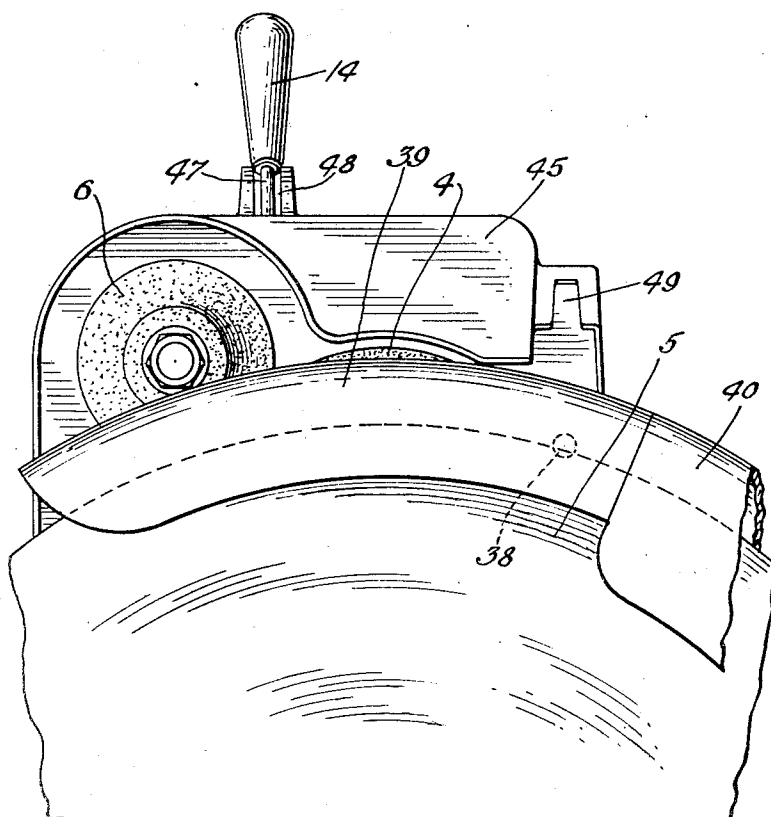
1,939,740

SHARPENER FOR SLICING MACHINES

Filed June 25, 1930

2 Sheets-Sheet 2

*Fig. 3*



*Inventor:*  
Cornelis F. M. van Berkel,  
By Ches. M. Nissen,  
*Atty.*

# UNITED STATES PATENT OFFICE

1,939,740

## SHARPENER FOR SLICING MACHINES

Cornelis Franciscus Maria van Berkel, Wassenaar, Netherlands, assignor to U. S. Slicing Machine Company, La Porte, Ind., a corporation of Indiana

Application June 25, 1930, Serial No. 463,788, and in Great Britain June 28, 1929

20 Claims. (Cl. 51—248)

My invention relates to slicing machines of the type having a rotary circular knife with which are associated a sharpening device and a guard, and one of the objects of the invention is the provision of improved and efficient means for moving the sharpening device into and out of operative relation with such rotary circular knife.

Another object of the invention is the provision of means for moving a section of the knife guard away from the knife when the sharpener is moved into its operative position and return such section to its guarding position when the sharpener is moved to inoperative position.

A further object of the invention is the provision of a supplementary knife guard and means for moving it away from the knife when a sharpening device is to be applied thereto.

Another object of the invention is the provision of a supplementary knife guard, combined with a sharpening device to effect automatic displacement of the supplementary knife guard when the sharpening device is moved to its operative position and automatically replacing said supplementary knife guard in its normal position when said sharpening device is moved to its inoperative position.

More particularly it is the object of the present invention to provide a supplementary knife guard in association with a sharpening device having grinding elements, combined with means for displacing the guard from the knife when the sharpening device is moved into operative position, such means embodying an actuator for effecting such displacement and such movement by a single stroke separately and independently of the means for controlling the engagement of the grinding elements with the knife.

Other objects of the invention will appear hereinafter, the novel features and combinations being set forth in the appended claims.

Although my invention is particularly adapted to the type of sharpening device illustrated in the accompanying drawings, it should be understood that it may have a general adaptation to sharpening devices of various types having one or two rotary grinding wheels which can be moved at will into and out of contact with the knife edge. Such sharpening devices for the rotary circular knives of slicing machines usually comprise a sharpening or grinding element comprising an abrasive wheel which is adapted to grind the bevel on one side of the knife edge. The sharpening device may also include a burr-removing grinding element comprising a second abrasive wheel which is adapted

to be moved at will into engagement with the other side of the knife edge. The sharpening elements are mounted on a support which may be moved into an operative position relative to the knife or into an inoperative position spaced from the knife. When occupying their operative positions the grinding wheels may be moved axially into engagement with the knife.

In the accompanying drawings—

Fig. 1 is a sectional elevation of such a knife sharpening device with my improvements adapted thereto;

Fig. 2 is a sectional elevation similar to that shown in Fig. 1, but showing the sharpening device in its inoperative position; and

Fig. 3 is an elevational view looking from the right toward the left at the structure shown in Fig. 2, but with the protecting cover complete.

In Figs. 1 and 2 the sharpening element is the grinding wheel 4 which is adapted to engage the bevel edge of the rotary slicing machine knife 5. The burr-removing element is the finishing grinding wheel 6 adapted to engage the opposite side of the knife edge. The grinding wheel 6 is connected to a shaft 7 rotatably mounted in the sleeve 8 and the latter is slidable axially in the bearing 9. A radial pin 10 projects through the bearing 9 and is connected to the sleeve 8 to move therewith.

The bearing 9 is mounted on the support 11. On top of the bearing 9 is secured a standard 12 in which is journaled the transverse shaft 13 to one end of which is connected the operating lever 14 and to the other end of which is secured the cam 15. When the lever 14 is in the position shown in Fig. 1 the cam 15 engages the pin 10 to move the grinding wheel 6 out of engagement with the knife 5. When the lever 14 is moved in a clockwise direction as viewed in Fig. 1, the cam 15 releases the pin 10 and a spring will move the grinding wheel 6 into engagement with the knife 5 in the usual manner.

The sharpening element 4 secured to a shaft 16 which is rotatably mounted in a sleeve to which is connected a pin 17 similar to the pin 10, and such sleeve slides axially in the bearing 18 corresponding to the bearing 9. Another cam on the shaft 13 similar to the cam 15 engages the pin 17 to move the sharpening element 4 out of engagement with the knife 5 when the lever 14 is moved to the position shown in Fig. 1. Such cam releases the pin 17 and permits a spring to move the grinding element 4 into engagement with the knife 5 when the lever 14 is moved to its right-hand position from that shown in Fig. 1.

Secured to an appropriate part of the slicing machine frame is a vertical pillar 19 on top of which is a platform 20. Projecting upwardly from the platform 20 is a pair of spaced-apart standards 21, in the upper ends of which is journaled the shaft 22. This shaft is secured to the crank arm 23, the outer end of which is pivoted at 24 to the lower ends of a pair of spaced-apart depending legs 25 which are secured rigidly to the frame 11.

The rear lower end of the frame 11 is pivoted at 26 to the slide block 27 which is located on the rod 28, the latter being secured rigidly to the platform 20.

Also secured to the shaft 22 is an actuating handle 29. This handle is therefore secured rigidly to the crank arm 23. It will thus be seen that when the control handle 29 is moved in a clockwise direction from its position shown in Fig. 2 to its position shown in Fig. 1, the crank 23 will likewise be moved in a clockwise direction from its position shown in Fig. 2 to its position shown in Fig. 1. This will cause the pivot 24 to move in a clockwise direction, but the sharpening device as a whole will first move in an anti-clockwise direction on the pivot 26 and such movement will be followed by a clockwise movement of the sharpening device. The slide block 27 will be moved toward the left initially from the position shown in Fig. 2 when the control lever handle 29 is moved clockwise and this sliding movement of the slide block 27 toward the left will be followed by a sliding movement along the rod 28 toward the right to the position shown in Fig. 1. In other words, by moving the control handle 29 in a clockwise direction from its position shown in Fig. 2, the grinding wheels 4 and 6 will be swung upwardly to a position where the grinding wheel 6 will be able to clear the knife edge and then move down to the opposite side thereof to the position shown in Fig. 1 without touching the knife edge. The structure therefore enables a single movement of the control handle 29 to move the sharpening device from its inoperative position shown in Fig. 2 to its operative position shown in Fig. 1. After reaching this operative position shown in Fig. 1, the sharpening device may be operated by rotating the slicing machine knife 5 and then moving the lever 14 to release the grinding wheel 4 for engagement with the bevel edge of the knife, which may be followed by the release of the burr-removing grinding wheel 6 to finish the sharpening operation, whereupon the lever 14 will be moved back to its position shown in Fig. 1. Then by moving the control handle 29 in an anti-clockwise direction from its position shown in Fig. 1 to its position shown in Fig. 2, the sharpening device as a whole will be swung on its pivot 26 to first lift the grinding wheel 6 upwardly to clear the knife edge.

The movement of the sharpening device from its operative position in Fig. 1 to its inoperative position shown in Fig. 2, will therefore cause the sharpening device to be first moved in an anti-clockwise direction along an upwardly extending arc and then in a clockwise direction along a downwardly extending arc.

Also in position to be engaged by the crank 23, is an adjustable stop 31 which may be a screw extending upwardly through the platform 20. A similar adjustable stop or abutment in the form of a screw is shown extending through the rear portion of the platform 20 at 32. The range of movement which can be imparted to the sharp-

ening device by means of the handle 29 is therefore limited by the adjustable stops 31 and 32 on the platform 20, these stops co-acting with and supporting the outer end of the arm 23 in the extreme positions thereof. It can readily be seen by referring to Fig. 1 that by adjusting the screw 31 the elevation of the grinding wheel 6 relative to the knife edge may be regulated.

In order to hold the sharpening device firmly in its operative and inoperative positions, a spring 33 is connected between an anchorage 34 on the frame 11 and the forward end of the slide block 27 at 35 spaced from the pivot 26 in position to tend to pull the sharpening device as a whole in a clockwise direction on the pivot 26. The action of this spring 33 is to firmly press the crank arm 23 against one or the other of the stops or abutments 31, 32 so as to prevent play or vibration.

On the frame 11 is a bracket 36 to which is pivoted at 37 the rear end of a lever 38. The pivot 26 may be obtained by means of a shaft secured to the lever 38 and journaled in the bracket 36. This lever 38 carries at its free end an arcuate section 39 of the knife guard, the main section being shown at 40 in Fig. 3. The knife guard section 39 is arcuate in elevation as shown in Fig. 3 and is U-shaped in cross-section as shown in Figs. 1 and 2, and it is so mounted on the forward or outer end of the lever 38 as to normally register with and form a supplement to the main knife guard section 40 which is intended to be arranged to surround the rear portion of the circular knife.

The lever 38 is so shaped as to provide an arcuate cam surface at 41 on its lower side in position to engage the roller 42 which is pivoted at 43 to the outer end of the arm 30, the latter being secured rigidly to one of the standards 21 so as to serve as a stationary support and so that the roller 42 will have a fixed axis of rotation.

The construction and arrangement is such that when the sharpening device is in its inoperative position shown in Fig. 2, the supplementary knife guard section 39 will register with the main knife guard section 40 as shown in Fig. 3 and be in position to guard the knife edge when the sharpening device is in its inoperative position. The space for operation of the sharpening device will therefore be occupied by the supplementary knife guard when the sharpening device is in its inoperative position.

When the control lever 29 is moved in a clockwise direction from its position shown in Fig. 2 to its position shown in Fig. 1, the pivot 37 will be moved with the frame 11 toward the knife 5 while the bracket 30 remains stationary. Therefore the lever 38 will be swung in an anti-clockwise direction on its pivot 37 while being moved bodily from its position shown in Fig. 2 to its position shown in Fig. 1. In other words, the shifting of the sharpening device from its inoperative position to its operative position will cause the cam surface 41 on the under side of the lever 38 to rotate the roller 42 on its fixed axis 43, and this roller because of the stationary bracket 30 will effect the lifting of the supplemental guard section 39 upwardly away from the circular knife edge and thus provide ample space for operation of the grinding wheels in their operative positions shown in Fig. 1. When the sharpening device is returned to its inoperative position, the supplemental guard section 39 will be automatically lowered back into its position shown in Figs. 2 and 3 in registry with the main guard section 40.

By means of a screw 44 a cover 45 may be se-

cured to the standard 12 on top of the frame 11. The lever 47 to which the handle 14 is connected may project through a slot 48 in the top of the cover 45 as shown in Fig. 3. The contour of the cover 45 may be arranged as shown in Fig. 3, and the right-hand end thereof may be provided with a slot 49 for receiving and guiding the lever 38 when the latter is in its upper position as shown in Fig. 1.

Fig. 3 shows the slot 49 in a vertical plane which passes through the point where the free end of the lever 38 is connected to the supplemental guard section 39. The guide slot 49 assures the proper positioning of the lever 38 for engagement with the roller 42 and also for movement to its position shown in Fig. 3 in registry with the main guard section 40.

From the foregoing it will be seen that whenever the lever 14 of the sharpening device is in the position shown in Figs. 1 and 2, a single movement of a single lever will effect movement of the sharpening device from its operative position to its inoperative position, or vice versa, and that whenever such sharpening device is thus moved the supplemental guard will be automatically moved to its desired position either in registry with the main guard section 40 as shown in Fig. 3, or to its position shown in Fig. 2 when the sharpening operation is to be performed.

Obviously those skilled in the art may make various changes in the details and arrangement of parts without departing from the spirit and scope of the invention as defined by the claims hereto appended and I wish therefore not to be restricted to the precise construction herein disclosed.

Having thus fully disclosed an embodiment of my invention, what I desire to secure by Letters Patent of the United States is:

1. In a slicing machine, the combination with a knife, of a stationary support, a fixed guide extending therefrom in a direction substantially perpendicularly away from the cutting plane of said knife, a slide block on said guide, a sharpener pivoted to said slide block and comprising a frame and a sharpening element adapted to occupy an operative sharpening position on the opposite side of said cutting plane from said guide, a knife guard pivoted to said frame and movable bodily therewith, means for shifting the sharpener from its inoperative position to its operative position and back again by swinging said sharpener on its pivot and sliding said block along said guide to move said element clear of the knife and into and out of operative position, and means operatively connected to said stationary support and cooperating with said guard for effecting movement of said guard away from said knife when said sharpener is moved into operative position and back into guarding relation with the knife when said sharpener is moved into inoperative position.

2. In a slicing machine, the combination with a sharpener mounted for movement in a direction substantially perpendicular to the plane of the knife to be sharpened, of a supplemental knife guard, a lever for supporting said knife guard and connected to said sharpener to move bodily therewith, said lever being arranged in a plane substantially perpendicular to said plane and having a cam surface on one side thereof, and means for engaging said cam surface to effect lifting of the supplemental guard away from its guarding position when the sharpener is moved into operative position.

3. In a slicing machine having a rotary circular knife, of a sharpener comprising a sharpening grinding wheel adapted to engage the bevel edge of such rotary circular knife and a burr-removing grinding wheel adapted to engage the opposite knife edge, means comprising a manual lever for controlling the engagement of said grinding wheels with said knife edge, means for mounting said sharpener for pivotal and bodily movement in upright planes extending transversely of the knife and parallel to the axis of rotation thereof, and means for moving the sharpener from its operative position relative to the knife to its inoperative position by first swinging the sharpener in an anti-clockwise direction to lift the burr-removing grinder clear of the knife edge and then moving the sharpener as a whole away from the knife while moving the grinders in a clockwise direction.

4. In a slicing machine, the combination with a sharpening device comprising a pair of sharpening elements, of a support, a pivotal and slidable connection between said sharpening device and said support, a supplemental guard movable bodily with said sharpening device and pivoted with respect to said sharpening device, means for moving said sharpening device from its inoperative position in which both sharpening elements are on one side of the cutting plane of the knife to be sharpened, to an operative position in which said grinding elements lie on opposite sides of the cutting edge of said knife by swinging said sharpening device on its pivot to move one of said elements clear of said knife to permit the same to pass the cutting plane thereof and also sliding the same along said support to move said last element past the cutting plane of said knife, and means actuated during the movement of said clamping device toward operative position for effecting movement of said supplemental guard away from its guarding position when said sharpening device is moved to its operative position.

5. In a slicing machine, the combination with a sharpening device comprising a pair of sharpening elements, of a support, a pivotal and slidable connection between said sharpening device and said support constructed to compel pivotal and slidable movement of said sharpening device in a plane substantially perpendicular to the cutting plane of the knife to be sharpened, a pivoted supplemental guard, means for moving said sharpening device from its inoperative position in which both sharpening elements are on one side of the cutting plane of the knife to be sharpened, to an operative position in which said grinding elements lie on opposite sides of the cutting edge of said knife by swinging said sharpening device on its pivot to move one of said elements clear of said knife to permit the same to pass the cutting plane thereof and also sliding the same along said support to move said last element past the cutting plane of said knife, and means actuated during the movement of said clamping device toward operative position for effecting movement of said supplemental guard away from its guarding position when said sharpening device is moved to its operative position.

6. In a slicing machine, the combination with a sharpening device comprising a pair of sharpening elements, of a support, a pivotal and slidable connection between said sharpening device and said support constructed to compel pivotal and slidable movement of said sharpening device in a plane substantially perpendicular to the cutting plane of the knife to be sharpened, a sup-

plemental guard, means for moving said sharpening device from its inoperative position in which both sharpening elements are on one side of the cutting plane of the knife to be sharpened, to an operative position in which said grinding elements lie on opposite sides of the cutting edge of said knife by swinging said sharpening device on its pivot to move one of said elements clear of said knife to permit the same to pass the cutting plane thereof and also sliding the same along said support to move said last element past the cutting plane of said knife, and means actuated during the movement of said clamping device toward operative position for effecting movement of said supplemental guard away from its guarding position when said sharpening device is moved to its operative position.

7. In a slicing machine, the combination with a sharpener comprising a pair of sharpening elements adapted to engage the opposite sides of the cutting edge of a slicing knife, of a movable support for said elements guided for movement sufficiently free to permit said support to be moved manually by direct application of manual pressure thereto, means for shifting the position of said support comprising a crank pivotally mounted on a fixed axis, limit stops for said crank on opposite sides of a fixed plane extending through and embracing said axis for determining the operative and inoperative positions of said elements, and a spring for holding said crank against either limit stop on one side or the other of said plane when said crank is moved to either of said positions to position and hold said sharpening elements either in operative position on opposite sides of the cutting edge of said knife or to an inoperative position entirely to one side of the cutting edge of said knife regardless of the position at which the crank is released.

8. In a slicing machine, the combination with a sharpening unit having a pair of sharpening elements, a guard movable into guarding position over the edge of said knife and into an inoperative position away from said knife edge to permit the sharpening unit to be moved into operative position, with said sharpening elements arranged on opposite sides of the cutting edge of said knife, said sharpening unit having an inoperative position entirely to one side of the cutting plane of said knife, means for moving said sharpening unit into and out of operative position in a general direction substantially perpendicular to the cutting plane of said knife, and means for simultaneously moving said guard out of and into operative position respectively so that said guard is operative when said sharpening unit is in inoperative position and is inoperative when said sharpening unit is in operative position.

9. In a device for sharpening the edges of slicing knives, the combination with a pair of sharpening elements having operative positions on opposite sides of the cutting edge of said knife and inoperative positions to one side of the cutting plane of said knife, of means for moving said sharpening elements from operative to inoperative position in a direction substantially perpendicular to said knife, comprising a pivoted member for moving said sharpening elements through an arcuate path into and out of operative position to cause the element which must pass said cutting plane to clear the knife, a guard for guarding the edge of said knife when said sharpening elements are in inoperative position, and cam means for moving said guard out of operative position as said

sharpening elements move into operative position.  
10. In a sharpener for slicing machine knives, the combination with a sharpening unit, comprising a pair of sharpening elements, said elements having an inoperative position entirely to one side of the cutting plane of said knife and movable in a general direction substantially perpendicular to said cutting plane to bring said elements into operative positions on opposite sides of said knife to sharpen the cutting edge thereof, a guard extending over the cutting edge of said knife when said sharpening unit is arranged in inoperative position and having a portion thereof to one side of the cutting plane of said knife arranged between the sharpening elements of said sharpening unit and said knife to protect said sharpening elements from grease and foreign matter thrown by said knife during a slicing operation, and means for moving said guard out of operative position as said sharpening unit is moved into operative position.

11. In a sharpening device for slicing machine knives, the combination with a sharpening element having an inoperative position to one side of the cutting plane of said knife and movable in a direction substantially parallel to the axis of rotation of said knife to bring said sharpening elements into operative position, a movable guard arranged over the cutting edge of said knife with a portion thereof arranged between said sharpening element and said knife to protect said sharpening element from foreign matter and grease thrown by said knife during a slicing operation, and means for automatically moving said guard out of operative position over said knife and out from a position between said sharpening element and knife as said sharpening element is moved into engagement with said knife.

12. In a sharpening device for slicing machines, the combination with a stationary support adjacent the cutting plane of the knife to be sharpened, a guide carried by said support, a bearing slidably mounted on said guide, a sharpening unit comprising a pair of sharpening elements and mounted for bodily movement with said bearing as the same is guided by said guide, said guide extending in a direction at a substantial angle to the cutting plane of said knife, a crank pivoted on said stationary support, an operative connection between said crank and said sharpening unit, an extensible connection between said bearing and said sharpening unit to permit said sharpening unit to move away from said bearing, and means for rotating said crank to move said sharpening unit away from said bearing and simultaneously move said bearing toward the cutting plane of said knife, the continued rotation of said crank bringing the sharpening elements of said sharpening unit on opposite sides of said knife.

13. In a sharpening device for slicing machines, the combination with a stationary support adjacent the cutting plane of the knife to be sharpened, a guide carried by said support, a bearing slidably mounted on said guide, a sharpening unit comprising a pair of sharpening elements and mounted for bodily movement with said bearing as the same is guided by said guide, said guide extending in a direction at a substantial angle to the cutting plane of said knife, a crank pivoted on said stationary support, an operative connection between said crank and said sharpening unit, an extensible connection between said bearing and said sharpening unit to permit said

80

85

90

95

100

105

110

115

120

125

130

135

140

145

150

sharpening unit to move away from said bearing, means for rotating said crank to move said sharpening unit away from said bearing and simultaneously move said bearing toward the cutting plane of said knife, the continued rotation of said crank bringing the sharpening elements of said sharpening unit on opposite sides of said knife, a guard mounted for movement into and out of operative position over the cutting edge of said knife, and means for moving said guard automatically out of its operative position as said sharpening unit is moved into an inoperative position.

14. In a sharpening device for slicing machines, the combination with a stationary support adjacent the cutting plane of the knife to be sharpened, a guide carried by said support, a bearing slidably mounted on said guide, a sharpening unit comprising a pair of sharpening elements and mounted for bodily movement with said bearing as the same is guided by said guide, said guide extending in a direction at a substantial angle to the cutting plane of said knife, a crank pivoted on said stationary support, an operative connection between said crank and said sharpening unit, an extensible connection between said bearing and said sharpening unit to permit said sharpening unit to move away from said bearing, means for rotating said crank to move said sharpening unit away from said bearing and simultaneously move said bearing toward the cutting plane of said knife, the continued rotation of said crank bringing the sharpening elements of said sharpening unit on opposite sides of said knife, a guard bodily movable with said sharpening unit and also movably mounted thereon, a cam for moving said guard with respect to said sharpening unit as said sharpening unit is moved to and from an operative position to thereby move said guard to an inoperative position as said sharpening unit moves to an operative position.

15. In a slicing machine, the combination with a knife, of a support located to one side of the cutting plane of said knife, a sharpening device having a sharpening element to be positioned on the opposite side of said knife from said support when said element is in operative position, and a position on the same side as said support when in inoperative position, a slidable connection between said support and sharpening device for guiding said sharpening device in a direction at a substantial angle to the cutting plane of said knife during its movement to and from said cutting plane, and a pivoted connection between said support and sharpening device for swinging the sharpener in a direction to move said element clear of the edge of said knife as the sharpening device moves into operative position, and for thereafter moving said sharpening device to bring said element into operative position adjacent said knife edge on the side of said cutting plane away from said support.

16. In a slicing machine, the combination with a knife, of a support located to one side of the cutting plane of said knife, a sharpening device having a sharpening element to be positioned on the opposite side of said knife from said support when said element is in operative position, and a position on the same side as said support when in inoperative position, a slidable connection between said support and sharpening device for guiding said sharpening device in a direction at a substantial angle to the cutting plane of said knife during its movement to and from said cut-

ting plane, a pivoted connection between said support and sharpening device for swinging the sharpener in a direction to move said element clear of the edge of said knife as the sharpening device moves into operative position and for thereafter moving said sharpening device to bring said element into operative position adjacent said knife edge on the side of said cutting plane away from said support, and a guard movable to and from said guarding position over the edge of said knife at the sharpening position automatically controlled in its movement to and from operative position by said sharpening device as the same moves respectively from and to its operative position.

17. In a slicing machine, the combination with a knife, of a support located to one side of the cutting plane of said knife, a sharpening device having a sharpening element to be positioned on the opposite side of said knife from said support when said element is in operative position, and a position on the same side as said support when in inoperative position, a slidable connection between said support and sharpening device for guiding said sharpening device in a direction at a substantial angle to the cutting plane of said knife during its movement to and from said cutting plane, a pivoted connection between said support and sharpening device for swinging the sharpener in a direction to move said element clear of the edge of said knife as the sharpening device moves into operative position and for thereafter moving said sharpening device to bring said element into operative position adjacent said knife edge on the side of said cutting plane away from said support, and a guard movable to and from said guarding position over the edge of said knife at the sharpening position automatically controlled in its movement to and from operative position by said sharpening device as the same moves respectively from and to its operative position, said guard having portions thereof lying on opposite sides of the slicing knife when said guard is in operative position and movable first in the general direction of the cutting plane of said knife to clear the same as it moves to an inoperative position.

18. In a slicing machine, the combination with a knife, of a stationary support, an anti-friction roller mounted to rotate on a fixed axis on said support, a sharpened shiftable along said support from operative position to one side of the cutting plane of said knife to an inoperative position adjacent said knife and vice-versa, a supplemental guard for guarding the knife at the sharpening position, and a pivoted lever for supporting said supplemental guard and having a cam surface thereon in position to engage said anti-friction roller as said sharpener moves to operative position to thereby cause said supplemental guard to move away from its guarding position when said sharpener is moved to operative position.

19. In a slicing machine, the combination with a knife, of a supplemental knife guard for guarding the knife at the sharpening position thereof, a sharpener carrier movable toward and from the knife of the slicing machine at a substantial angle to the cutting plane of said knife, a rod for supporting said knife guard and connected to said frame to move bodily therewith and having relative movement with respect thereto, and means positioned in the path of movement of said rod as said sharpening device moves to operative position for engaging said rod to move the same

80

85

90

95

100

105

110

115

120

125

130

135

140

145

150

relative to said frame to thereby move said supplemental guard away from the knife when said frame is moved toward said knife.

20. In a device for sharpening the edges of the slicing knives, the combination with a pair of sharpening elements adapted to have operative positions on opposite sides of the cutting edge of the slicing knife and inoperative positions on one side of the cutting plane thereof, of means for moving said sharpening elements from operative to inoperative positions comprising a pivoted member for moving said sharpening elements through an arcuate path into and out of operative position to cause the element which must pass

said cutting plane to clear said knife, a pivoted guard bodily movable with said sharpening elements for guarding the edge of said knife when said sharpening elements are in inoperative position, a stationary element, and a cam member carried by said guard and engaging said stationary element as said sharpening elements move to either operative or inoperative position whereby said guard is actuated to move the guard to inoperative or operative position as said sharpening elements move to operative and inoperative positions respectively.

CORNELIS FRANCISCUS

MARIA VAN BERKEL.

15

80

85

90

20

95

25

100

30

105

35

110

40

115

45

120

50

125

55

130

60

135

65

140

70

145

75

150