April 24, 1928. 1,667,502

G. WEISS

PAVING MACHINE

Filed Dec. 13, 1924 3 Sheets-Sheet 1

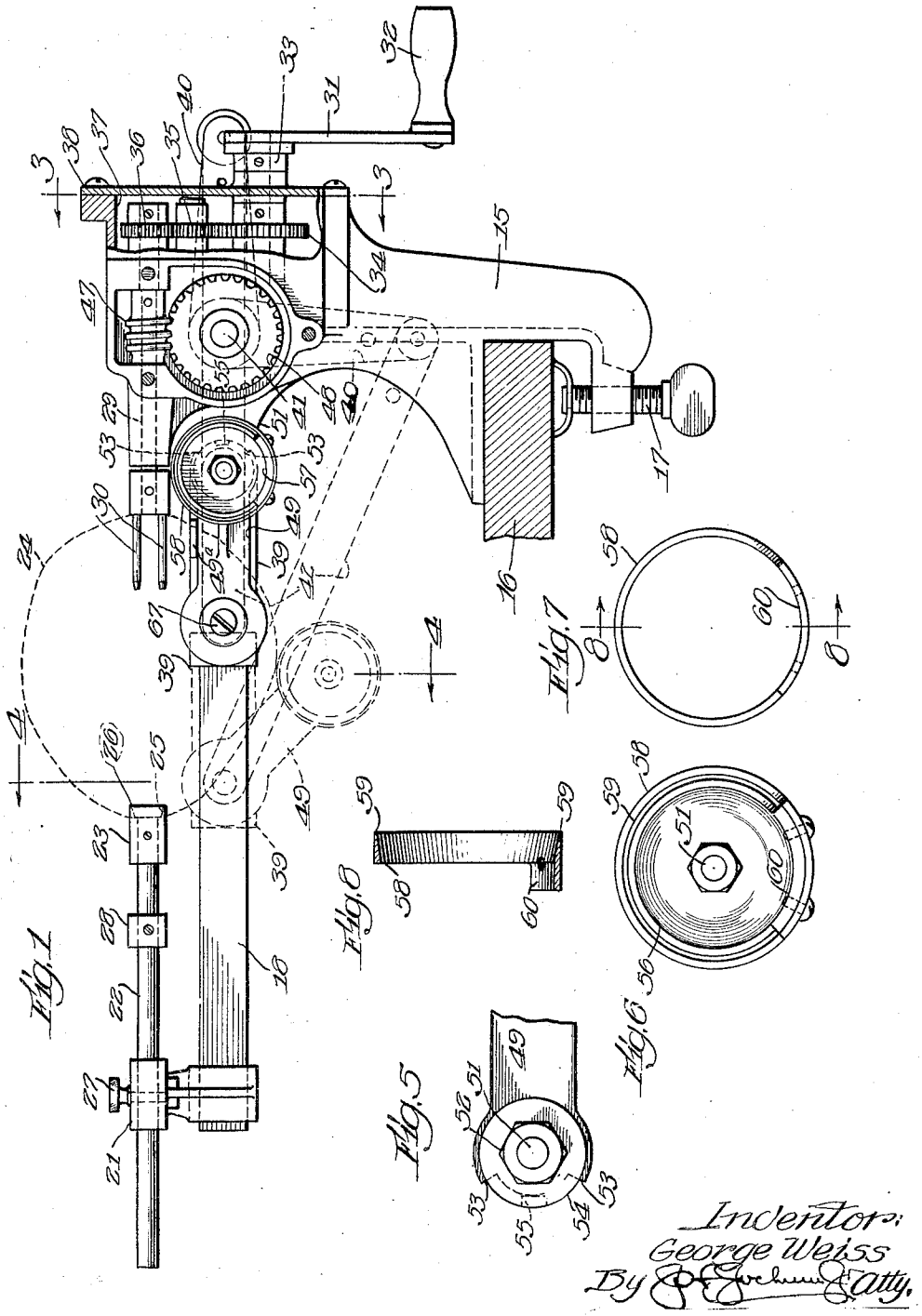


Fig. 1

Fig. 7

Fig. 8

Fig. 6

Fig. 5

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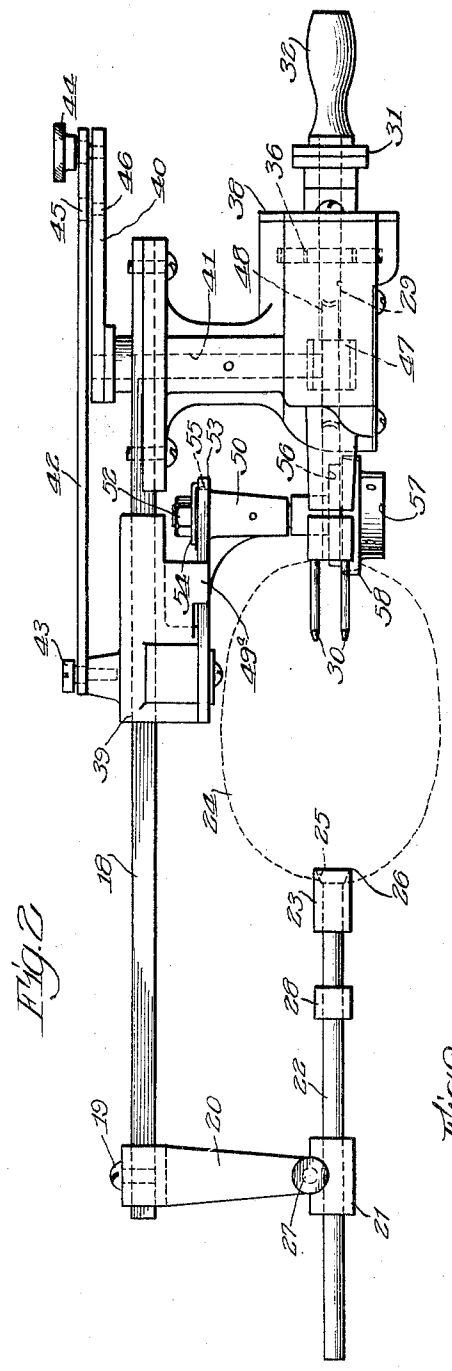


Fig. 2

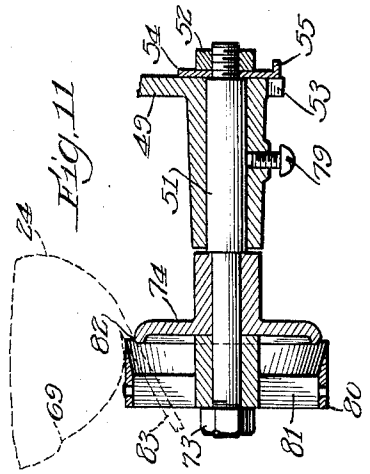


Fig. 11

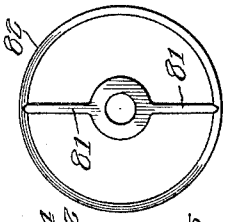


Fig. 12

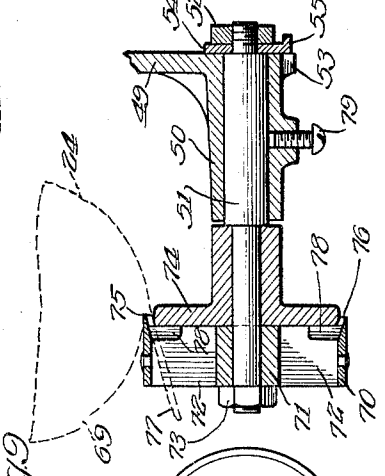


Fig. 9

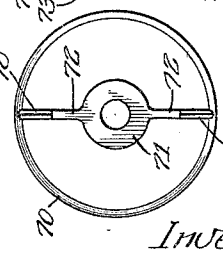


Fig. 10

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PAVING MACHINE

Filed Dec. 13, 1924 3 Sheets-Sheet 3

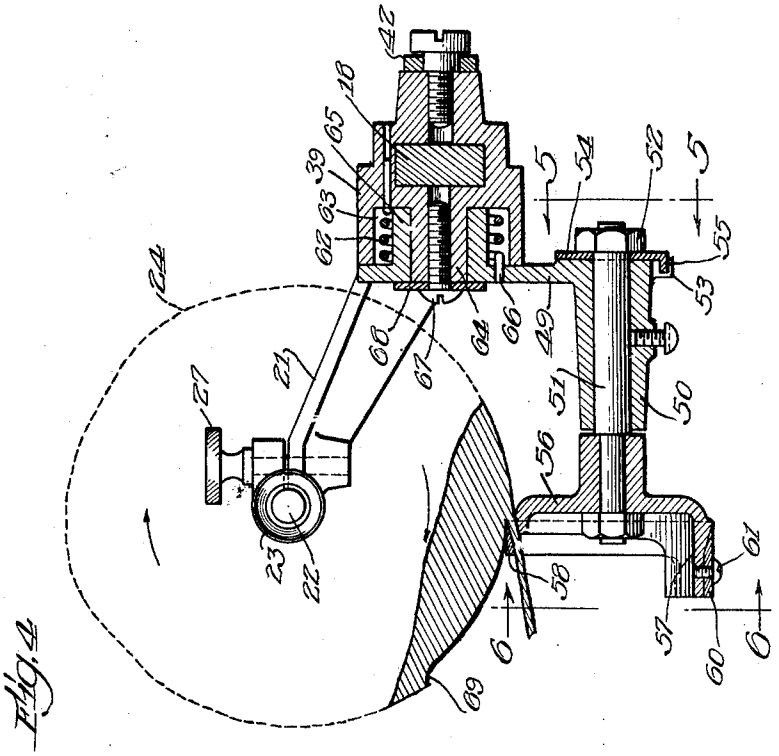


Fig. 4

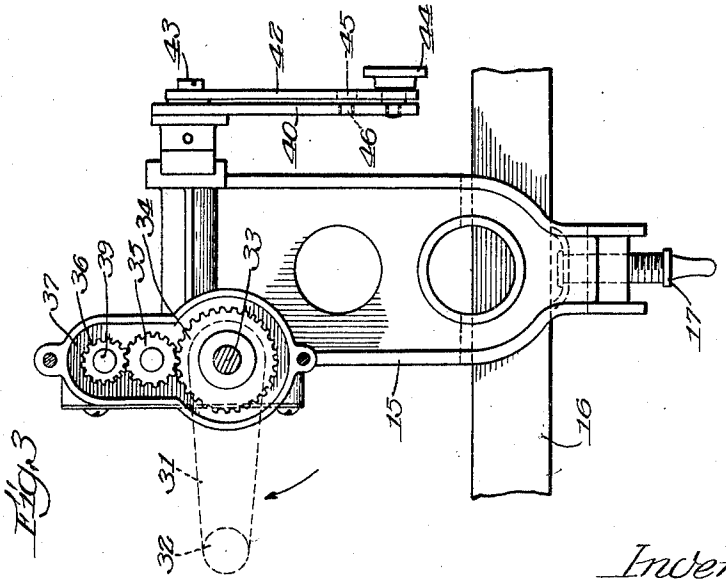


Fig. 3

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Patented Apr. 24, 1928. 1,667,502

UNITED STATES PATENT OFFICE.

GEORGE WEISS, OF CHICAGO, ILLINOIS.

PARING MACHINE.

Application filed December 13, 1924. Serial No. 755,685.

This invention relates to improvements in paring machines, particularly adapted for paring fruits and vegetables, and one of the objects of the invention is to provide an improved machine of this character which will be of a simple and durable construction and efficient in operation, and which will expeditiously remove or pare the skin from the article without injury to the article.

A further object is to provide an improved machine of this character including a knife or cutter adapted to be bodily reciprocated during the paring operation, and improved means for causing the cutter to follow the contour of the article, and at the same time prevent the cutter from unduly cutting into the article at the commencement of its paring operation when the cutter starts to bodily move in either direction.

A further object is to provide an improved machine of this character having means for rotating the article and improved means for bodily reciprocating the cutter and for causing the cutter to be bodily moved at a slower rate of speed as the cutter approaches and operates upon the ends of the article.

A further object is to provide in a machine of this character an improved cutter mounted to be pivotally moved about its axis by the contact of the article therewith, and improved means for locking or restraining the cutter against such pivotal movement.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which

Figure 1 is a side elevation of a machine of this character constructed in accordance with the principles of this invention, and with parts broken away.

Figure 2 is a top plan view of Figure 1.

Figure 3 is a view as taken on line 3—3, Figure 1.

Figure 4 is a sectional view as taken on line 4—4, Figure 1, showing the parts in the position indicated in dotted lines in Figure 1.

Figure 5 is a view taken on line 5—5, Figure 4.

Figure 6 is a view of the cutter taken on line 6—6, Figure 4.

Figure 7 is a front elevation of the cutter.

Figure 8 is a sectional view taken on line 8—8, Figure 7.

Figure 9 is a view in section of another form of cutter showing its mounting.

Figure 10 is an elevation of the cutter as taken from the cutting edge.

Figure 11 is a view similar to Figure 9 of another form of cutter.

Figure 12 is a front elevation of the cutter as taken from the cutting edge.

Referring more particularly to the drawings the numeral 15 designates a suitable supporting bracket which is adapted to be secured to a support 16 by a suitable clamping screw 17. Connected with the bracket 15 is an arm 18 of any desired size and configuration but is preferably angular in cross section, and adjustably secured to the arm 18 in any suitable manner, such as by means of a fastening screw 19, is a bracket 20 which carries a bearing 21 in which a bar or rod 22 is slidably mounted. This bar or rod carries on one end thereof a member 23 which is adapted to impale the article 24 and the member 23 is recessed as at 25 to form a sharp edge 26 adapted to enter the article. This form of holding device will more securely hold the article and at the same time will permit the article to be rotated thereabout in a manner to be set forth.

The bearing 21 is preferably of the split type and a screw 27 is provided for causing the bearing to clamp the rod 22 to hold the latter in its adjusted position.

A collar 28 may be provided on the rod adapted to be gripped by the operator to facilitate the adjustment of the rod.

Rotatably mounted upon the bracket 15 and in suitable bearings, is a shaft 29, the axis of which is co-incident with the axis of the bar or rod 22. Carried by the end of the shaft 29 and connected thereto for rotation therewith in any suitable manner are prongs or impalement pins 30, which are preferably spaced laterally from each other and are adapted to enter the article to co-operate with the member 23 for supporting the article. These members 30 being spaced laterally from each other also operate to axially rotate the article 24 when the shaft 29 is rotated.

The rotation of the shaft 29 may be accomplished in any suitable manner, but preferably through the medium of a crank or arm 31 having a handle 32. The crank 31 is connected with a shaft 33 to which is secured a gear 34. This gear 34 meshes with an idle gear 35 and the idle gear in turn meshes with a gear 36 connected with the shaft 29, for rotation therewith.

The gears 34, 35 and 36 are preferably arranged within a chamber 37 formed in the bracket 15 or an extension thereof, and a covering plate 38 may be removably secured in position to enclose the gears and also permit of ready access thereto, when desired.

Slidably mounted upon the arm 18 is a cutter carrier 39 in the form of a carriage and through which carrier the arm 18 passes, the carrier being provided with an opening conforming in contour to the cross section of the arm 19. This prevents the carrier from axially rotating upon the arm 18 and will maintain the carrier in a proper position.

The carrier is adapted to be reciprocated upon the arm 18 in any suitable manner but preferably through the medium of a crank arm 40 which is connected with a shaft 41 journaled in a suitable bearing in the bracket 15, the axis of the shaft being transverse to the axis of the shaft 29.

A link 42 is pivotally connected as at 43 with the carrier 39 and the other end of the link is pivotally connected by means of a suitable fastening device 44 with the crank arm 40. The link 44 may be provided with additional openings 45, and the crank arm 40 may also be provided with additional openings 46, through the medium of which additional openings the link may be connected at different points with the crank arm 40 so as to vary the throw or recipocating movement imparted to the carrier 39 when the shaft 41 and crank arm 40 are rotated.

Motion may be imparted to the shaft 41 in any suitable manner but preferably from the shaft 29 through the medium of a worm 47 which meshes with a worm gear 48 carried by the shaft 41, so that when the crank 31 is rotated to rotate the gear 34, motion will be simultaneously imparted to the shafts 29 and 41 to rotate the article 24 and at the same time reciprocate the cutter carrier 39.

A cutter support 49 is pivotally connected by one end to the carrier 39 and at its other end is provided with a bearing 50 in which a shaft 51 is removably mounted for free rotation through the medium of a nut or collar 52 which is removably connected with one end of the shaft. The support 49 is preferably provided with spaced stops 53 (see particularly Figure 5) for limiting the oscillating or pivotal movement of the shaft 51. This is accomplished preferably through the medium of a washer 54 provided with a laterally projecting lug 55. The washer is interposed between the support 49 and the nut 52, so that the projection 55 will stand in the space between the stops 53, and the stops are spaced from each other a sufficient distance to permit of a limited oscillating or pivotal movement of the support 49.

Carried by the shaft 51 is a gauge 56 having a shouldered portion 57 projecting laterally therefrom and to which shouldered portion an annular cutter 58 is secured.

The cutter is preferably provided with a substantially wide periphery one edge of which is shaped to form a cutting edge 59, and projecting beyond the other edge is an extension 60 which is adapted to extend beneath the shouldered portion 57 of the guard 56, and by means of which extension 60 and the shouldered portion the cutter may be removably secured to the guard by means of suitable fastening devices 61.

The external diameter of the gauge 56 is somewhat less than the internal diameter of the cutter so as to form a space or passageway between the cutting edge of the cutter and the gauge 56 to extend about the cutter to the point at which the cutter is secured to the gauge.

With this construction it will be manifest that the cutter will be mounted in the bearing 50 for free pivotal movement and this pivotal movement will be limited by the stops 53 engaging the projection 55 on the washer 54. During the operation of the machine and when the cutter is held in contact with the article, and as the article is rotated, a rotary or pivotal movement will be imparted to the cutter so as to start the paring operation and thereby prevent injury to the article being operated upon. As the cutter is reciprocated by the cutter carrier the cutter will be moved about its pivot or axis in one direction as the cutter commences to operate at one end of the article and will be held in this position until the cutter passes out of engagement with the opposite end of the article. At this time and as the direction of movement of the carrier 39 is reversed to bodily move the cutter in the opposite direction, the contact of the article with the periphery of the cutter will rotate the cutter about its axis in the opposite direction or until it is arrested in this movement by other of the stops 53.

The cutter is preferably positioned so that it will operate upon the bottom portion of the article when the article is held in the machine, and any suitable means may be provided which tends normally to hold the cutter against the article. This is accomplished by moving the cutter support 49 about its point of pivotal connection with the carrier 39. Suitable means for accomplishing this result embodies a spring 62 which is arranged within a chamber 63 in

the carrier 39 and which chamber encompasses a hub portion 64. The end of the support 49 is provided with a laterally projecting tubular portion 65, which extends into the chamber 63 and encompasses the hub 64. One end of the spring 62 is secured as at 66 to the support 49 and the other end of the spring is anchored in any suitable manner to the carrier 39. A portion of the support 49 forms a closure for the chamber 63 and the support may be held against displacement in any suitable manner such as by means of a fastening screw 67 which passes through a washer 68 into the hub 64. The washer 68 serves as a means for assisting in holding the support in position.

The support is adapted to be freely rotated about the hub 64 and the stress of the spring 62 is such that it will tend normally to move the cutter in a direction toward the axis of rotation of the article and will yieldingly hold the cutter in engagement with the article when in use, and against the stop 49ª when not in use.

It is thought that the operation of this machine will be clearly understood from the foregoing, but briefly stated it is as follows. The article 24 is first placed in position in the machine by shifting the bar 22 longitudinally and then adjusting it so that the edge 26 of the member 23 will cut into the article and the prongs 30 will impale the article.

In inserting the article it is preferable that the carrier 39 be at the limit of its reciprocating movement in one direction or the other. In this position the spring 62 will hold the cutter in the position shown in full lines in Figure 1, so that the support 49 will engage the stop 49ª.

The crank arm 31 is then rotated by the handle 32 and this will rotate the article and at the same time advance the carrier 39 from the full line position to the dotted line position shown in Figure 1. By reason of the yieldable support 49 the cutter will be gradually brought into contact with the article. That is to say as the carrier 39 is advanced the cutter will not "gouge" into the article because when the cutter contacts with the article it will be rotated with the article and at the same time the support 49 will be depressed by the article, causing the cutter to gradually cut into the skin as at 69 (see particularly Figure 4), and follow the surface of the article as the carrier is advanced, the spring yieldingly holding the cutter in contact with the article. As the cutter approaches the other end of the article the spring 62 will cause it to continue to follow the article. This will complete the paring of the article and the carrier together with the cutter will be at the limit of its movement. A new article may be then inserted in the machine and as the carrier returns the cutter will be moved about its axis in the opposite direction so as to gradually cut into the skin upon the return movement. Upon each forward or backward movement of the carrier an article will be completely pared.

As the skin is removed it will pass through the opening between the cutter and the guard 56.

By reason of the crank 40 and the link connection 42 a different speed of movement will be given to the carrier 39 as the cutter approaches and is operating upon the ends of the article, causing the cutter to gradually enter the skin so as not to injure the article.

By reason of the crank 40 and the link 42 a different speed of advance movement will be given to the carrier 39, on account of the nature of the crank movement, producing an advance movement of gradual increase to a maximum and decrease to a minimum.

In Figures 9 and 10 there is shown another form of cutter 70 which is of an annular configuration and is mounted in the bearing 50 for free and unlimited rotation therein and is so constructed that it will be supported by its axis through the medium of a hub 71 radiating from which are arms 72 which hold the cutter. The shaft 51 passes through the hub 71 and the cutter is secured thereto by means of a nut 73 which forces one end of the hub 71 against the guard 74 and co-operates therewith to clamp the cutter. The cutting edge 75 of the cutter terminates adjacent and is spaced from the periphery of the gauge 74 so as to form a complete annular space 76 about the guard 74 and through which space the paring 77 passes. Portions of the arms 72 adjacent the cutting edge 75 of the cutter and the periphery of the guard 74 are shaped to form cutting edges 78 by means of which the parings 77 may be cut or broken up as they are removed from the article.

When it is desired to permit the cutter 72 to have a complete free rotation, the washer 54 is removed from the position shown in Figure 4 and is reversed to the position shown in Figure 9, that is so that the projecting lug 55 will not stand between the stops 53.

A screw 79 may be provided for locking the cutter against rotation.

In the form of the invention shown in Figure 11, the cutter 80 and the mounting therefor are similar to the form shown in Figure 9, with the exception that the edges of the arms 81 are spaced for a considerable distance from the cutting edge 82 of the cutter so that the paring 83 as it is being cut and passes through the space between the periphery of the guard 74 and the cutting edge of the cutter, will not be broken up but will be deflected by the arms 81.

While the preferred forms of the invention have been herein shown and described it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A paring machine including means for holding the article, a bodily and freely reciprocable cutter, means common to the said holding means and the said cutter for rotating the article and for reciprocating the cutter while the direction of operation of the said reciprocating means remains constant, and means for varying the extent of reciprocating movement of the cutter by the second said means.

2. A paring machine including means for holding the article, a cutter, means mounting the cutter for bodily and freely reciprocating movement and for pivotal movement about two different axes, means for reciprocating the cutter, the last said means including an actuator, means operating in unison with the reciprocation of the cutter for rotating the article while the direction of operation of the said actuator remains constant, and means for varying at will the extent of reciprocation of the cutter by the said actuator.

3. A paring machine including means for holding the article, a cutter carrier, a cutter mounted upon the carrier for bodily pivotal movement on an axis transverse to the axis of rotation of the article, means for reciprocating the cutter carrier, and means operatively related to the last recited means for rotating the article simultaneously with the reciprocation of the cutter carrier, the said cutter carrier reciprocating means including a crank, a link pivotally connected at one end with the cutter carrier and means adjustably connecting the other end of the said link with the said crank.

4. A paring machine including means for holding the article, a bodily and freely reciprocable cutter, means for rotating the article, and means including an actuator for reciprocating the cutter while the direction of operation of the said actuator remains constant, the last recited means including mechanism for causing the speed of reciprocation of the said cutter to be varied as the cutter approaches and operates upon the longitudinal extremities of the article while the speed of operation of the said actuator remains constant, the last said means also including means whereby the extent of movement of the cutter by the said actuator may be varied at will.

5. A paring machine including means for holding the article, a reciprocable cutter carrier, means for rotating the article, an arm pivotally connected with the cutter carrier for movement on an axis transverse to the axis of rotation of the article, a cutter pivotally mounted upon the said arm, means operatively related to the article rotating means for reciprocating the cutter carrier, yielding means tending normally to move the said arm about its pivot to hold the said cutter in contact with the article, and means for limiting the movement of the said cutter about its point of pivotal connection with the said arm.

6. A paring machine including means for holding the article, a reciprocable cutter carrier, means for rotating the article, an arm pivotally connected with the said carrier for free movement in directions toward and away from the axis of rotation of the article, a cutter mounted upon the arm for free pivotal movement with respect thereto, means for securing the cutter against pivotal movement with respect to the said arm, and means tending normally to hold the cutter against the article when the said carrier is reciprocated.

7. A paring machine including means for holding the article, a freely reciprocable cutter carrier, means for rotating the article, an arm pivotally connected with the cutter carrier for movement on an axis transverse to the axis of rotation of the article, a cutter pivotally mounted upon the said arm, means operatively related to the article rotating means for reciprocating the cutter carrier, and yielding means tending normally to move the said arm about its pivot to hold the said cutter in contact with the article, the said carrier reciprocating means including a crank arm, a link pivotally connected by one end with the said carrier and means adjustably and pivotally connecting the other end of the link with the said crank arm.

8. A paring machine including means for holding the article, a freely reciprocable cutter carrier, means for rotating the article, an arm pivotally connected with the cutter carrier for movement on an axis transverse to the axis of rotation of the article, a cutter pivotally mounted upon the said arm, means operatively related to the article rotating means for reciprocating the cutter carrier, and yielding means tending normally to move the said arm about its pivot to hold the said cutter in contact with the article, the said carrier reciprocating means including a crank arm and a link connection between the said crank arm and the said carrier.

9. A paring machine including means for holding the article, means for rotating the article holding means, a freely reciprocable cutter carrier, a crank operatively connected with the said carrier and responsive in its movement to the actuation of the second

recited means for reciprocating the said carrier, a cutter support mounted upon the said carrier for movement therewith and with respect thereto, a cutter mounted upon the said support for movement therewith and for free movement with respect thereto, and means for causing the cutter to engage and automatically follow the shape of the article as the article is rotated and the said carrier is reciprocated.

10. A paring machine including means for holding the article, means for rotating the article holding means, a reciprocable cutter carrier, a crank operatively connected with the said carrier and responsive in its movement to the actuation of the second recited means for reciprocating the said carrier, a cutter support mounted upon the said carrier for movement therewith and with respect thereto, a cutter mounted upon the said support for movement therewith and for free movement with respect thereto, and yielding means for causing the cutter to engage and automatically follow the shape of the article as the article is rotated and the said carrier is reciprocated, the said cutter being moved with respect to the said support by the article.

11. A paring machine including means for holding the article, a reciprocable cutter carrier, means for rotating the article, an arm pivotally connected with the cutter carrier for movement on an axis transverse to the axis of rotation of the article, a cutter pivotally mounted upon the said arms, means operatively related to the article rotating means for reciprocating the cutter carrier, the last recited means including an actuator and yielding means tending normally to move the said arm about its pivot to hold the said cutter in contact with the article, the cutter carrier reciprocating means including mechanism for causing the speed of reciprocation of the said carrier to be varied as the cutter approaches and operates upon the longitudinal extremities of the article, while the speed of operation of the said actuator remains constant.

12. For use in a paring machine an annular cutter, one edge of the periphery thereof being shaped to form a cutting edge, means mounting the cutter for free pivotal movement about its axis, and means for controlling such pivotal movement.

13. For use in a paring machine an annular cutter, one edge of the periphery thereof being shaped to form a cutting edge, means mounting the cutter for free pivotal movement about its axis, means for limiting such pivotal movement of the cutter, and means for securing the cutter against such pivotal movement.

14. For use in a paring machine an annular cutter element, said element having an extended periphery, one edge of the said periphery being shaped to form a cutting edge, and additional cutting edges within the said element.

15. For use in a paring machine an annular cutter element, said element having an extended periphery, one edge of the said periphery being shaped to form a cutting edge, and additional cutting edges within the said element and disposed transverse to the first recited cutting edge.

16. A paring machine including a pivotally mounted member, a cutter carried thereby for movement with respect thereto, and means for limiting the pivotal movement of the cutter with respect to the arm, the said means adapted to be rendered inactive to permit of free and pivotal movement of the cutter beyond the limits of the first recited pivotal movement of the cutter with respect to the arm.

17. A paring machine including a pivotally mounted member, a cutter carried thereby for movement with respect thereto and means for limiting the pivotal movement of the cutter with respect to the arm, the said means adapted to be rendered inactive to permit of free and pivotal movement of the cutter beyond the limits of the first recited pivotal movement of the cutter with respect to the arm, the last recited means including a reversible controlling member.

In testimony whereof I have signed my name to this specification, on this 9th day of December, A. D. 1924.

GEORGE WEISS.