

March 26, 1935.

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1,995,694

ONION SNIPPER

Filed Dec. 7, 1932

3 Sheets-Sheet 1

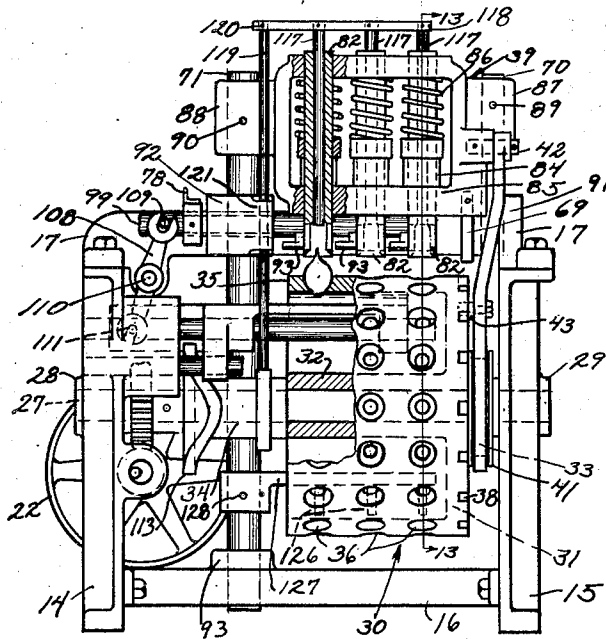


FIG. 1

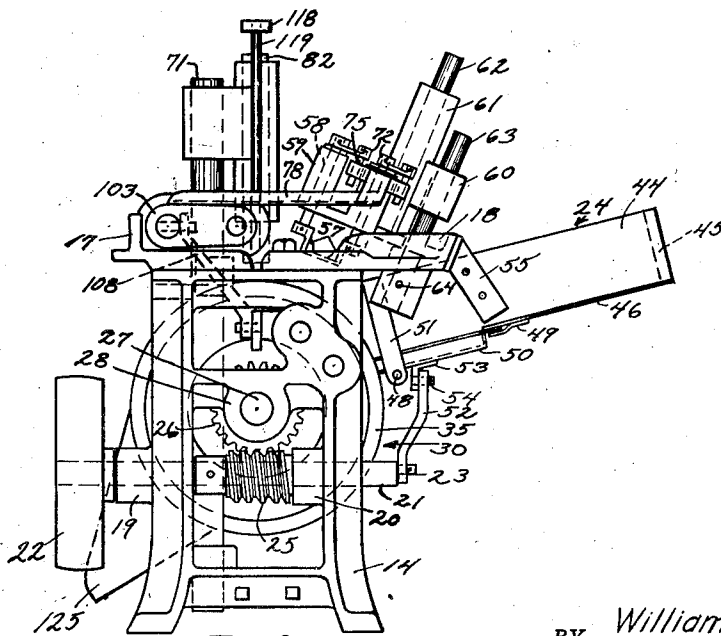


FIG. 2

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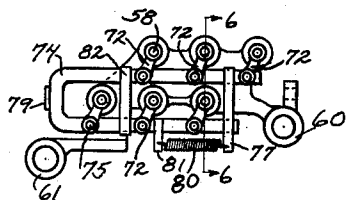


FIG. 3

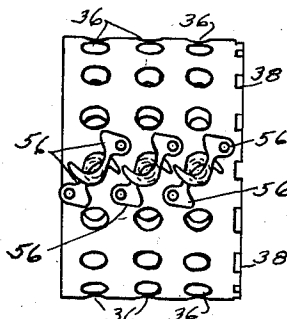


FIG. 4

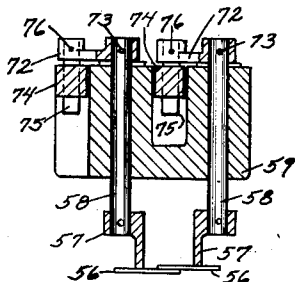


FIG. 6

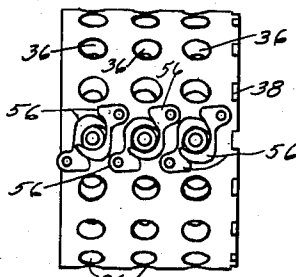


FIG. 5

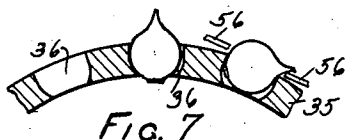


FIG. 7

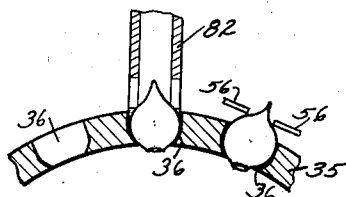


FIG. 8

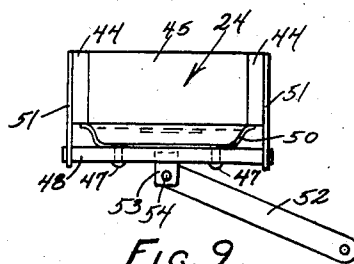


FIG. 9

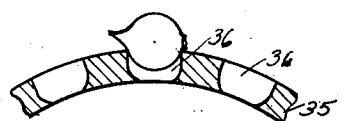


FIG. 15

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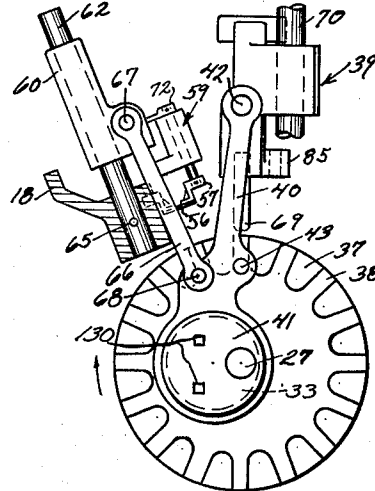
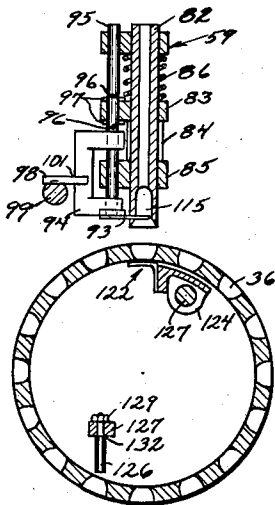
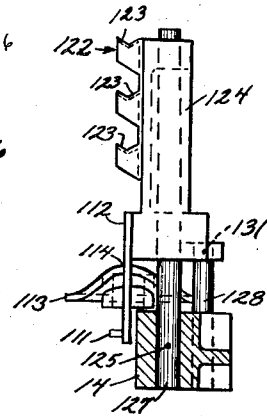
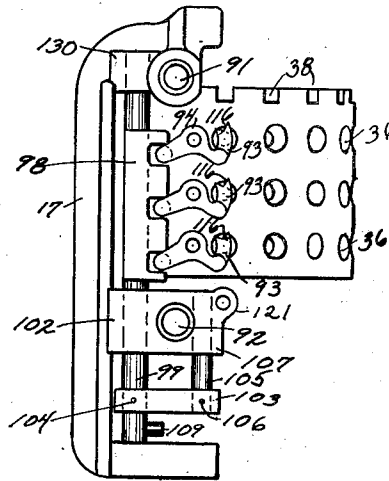
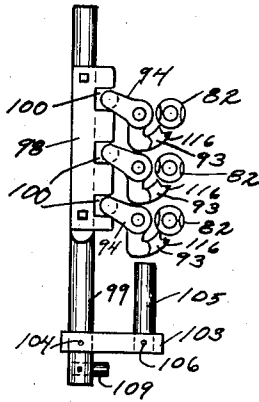
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3 Sheets-Sheet 3



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ONION SNIPPER

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Application December 7, 1932, Serial No. 646,057

14 Claims. (Cl. 146—83)

The present invention relates to an apparatus for snipping or shearing tops and roots from onions.

The objects of the invention include:—

5 A simple and efficient machine, entirely automatic in its operation, of the class described to snip tops and roots from onions.

A feeding hopper to automatically feed onions into a revolving drum containing recessed pockets adapted to receive such onions.

Means for intermittently actuating a drum and positioning pockets in said drum.

Means for alining tops and roots of onions in drum pockets so that their tops and roots are in radial alinement with the axis of the drum, a position in which they may be most favorably acted upon by a snipping means.

Means for operating reciprocating knives to simultaneously snip the tops and roots from onions in drum pockets.

A means to eject onions from pockets in a drum into a discharge chute after the tops and roots have been removed by the snipping means.

These objects are attained by the mechanism illustrated in the accompanying drawings embodying one form of the invention, and in which:

Figure 1 is a front elevation of a machine embodying the invention with the means for positioning onions in the drum pockets thereof removed;

Figure 2 is a side elevation of the complete machine shown in Figure 1;

Figure 3 is a plan view of the mechanism used for operating the onion positioning means;

Figures 4 and 5 are diagrammatic views showing the fingers of the onion positioning mechanism in both open and closed positions;

Figure 6 is a sectional view of the onion positioning apparatus taken on the line 6—6 of Figure 3 looking in the direction indicated by arrows;

Figures 7 and 8 are diagrammatic views illustrating the manner in which the fingers of the positioning mechanism aline the onions in the drum pockets;

Figure 9 is an end elevation of the automatic feeding hopper;

Figures 10 and 11 are plan views of the upper reciprocating knives and their operating mechanism in two positions;

Figure 12 is a plan view of the lower reciprocating knives and their operating mechanism;

Figure 13 is a sectional view of the machine taken on the line 13—13, Figure 1, in the direction indicated by arrows;

Figure 14 is an end elevation of the drum op-

erating and onion grasping and centering means; and

Figure 15 is a partial section of the onion carrying drum, illustrating the shape of the onion pockets.

Similar numerals refer to similar parts throughout the several views and in the description of the invention which follows.

Two legs or standards, 14 and 15, and transverse members 16, 17, and 18, are bolted together or otherwise joined (Figures 1 and 2), to constitute a framework for the machine. The leg or side member 14 has two alined bearings 19 and 20 (Figure 2) formed therein. Therein is journaled a drive shaft 21 extending outwardly beyond both of said bearings. A drive pulley 22 is secured to one end of shaft 21.

At the opposite end of shaft 21 is a pin 23 secured in an eccentric manner to provide a reciprocating movement for a portion of the hereinafter described automatic feeding hopper 24. Also pinned to the same shaft 21 is a worm 25 in meshing relation with a worm gear 26 secured to a transverse shaft 27 journaled in bearings 28 and 29 formed in the legs 14 and 15.

Loosely mounted on shaft 27 is a drum or cylinder 30 open at one end and closed at the other by means of a wall 31. Integral with and extending inwardly from wall 31 is a long hub 32 providing a bearing for the said drum 30. The drum 30 is held against lengthwise movement along shaft 27 by hubs on eccentric 33 and cam 34.

The circumferential wall 35 of the drum 30 is provided with a plurality of circular openings or pockets 36 disposed in longitudinal rows. The pockets 36 are formed with enlarged openings at their outer ends and smaller openings at their inner portions. The outer portion of the pockets are adapted to receive the body of the onion but the inner portion is of a somewhat smaller diameter allowing only a small portion of the onion to project through the circumferential drum wall 35.

Referring to Figure 15, it can be seen that since the outer openings of the pockets 36 are only large enough to admit the body of the onion that unless the root or top of the onion enters the pocket first the onion cannot enter the pocket. Figures 7 and 8 illustrate onions that have entered pockets 36, root first.

Extending outwardly around the circumference of wall 31 on the drum 30 are a plurality of projections 37 (Figure 14) so shaped as to form slots 38, corresponding in number to the longitudinal

rows of pockets 36 on the surface of the drum and also in longitudinal alinement with said rows of pockets. An eccentric lever 40 is secured at one end to the eccentric 33 which is pinned to shaft 27, by means of a plate 41, said plate being fastened by cap screws 130 to the eccentric 33.

The said lever 40 is also pivotally secured to cross head 39 by a pin 42. The intermittent revolving action of the drum is produced by the pin 43 secured to the eccentric arm 40 engaging successively with the slots 38 as the said eccentric arm reciprocates in an upward and downward motion due to the action of the eccentric 33.

The automatic feed hopper 24, Figures 2 and 9, consists of two sections, one portion stationary and the other reciprocating. The stationary portion is made up of two parallel longitudinally disposed side members 44, transverse end member 45, and the bottom member 50. The latter is secured at one end by the rivets 47 to the shaft 48 and at the other end by the member 49 so formed as to produce a transverse groove in conjunction with member 46 to which it is secured.

The shaft 48 is reciprocally mounted in the oppositely disposed straps 51 secured to the side members 44. The reciprocation of the bottom member 46 is attained by means of the connecting arm 52 pivotally secured at one end to the pin 23 eccentrically mounted upon the extended end of shaft 21, and pivotally connected to the angle 53 by means of pin 54, said angle 53 being in turn secured to the bottom member 50. The hopper 24 is held in an inclined position by two oppositely disposed brackets 55 secured to side members 44 and bolted to the transverse member 18.

To be most favorably acted upon by the cutting or shearing means, the onions in the pockets 36 should be centered in the said pockets with the top and root portion of the onion in radial alinement with the axis of the drum as illustrated in Figure 8. This centering and alining is accomplished by means of a plurality of semi-circular fingers 56, Figures 4 and 5, operating in pairs, one end of each said finger being mounted in such manner as to revolve about oppositely disposed axes, forming between them as one passes over the other elliptical openings of varying dimensions depending upon the angle of rotation of said fingers about the oppositely disposed axes.

The fingers 56 are secured in any conventional manner to brackets 57, Figure 6, which in turn are pinned to a shaft 58 journaled in a crosshead 59. The crosshead 59 is provided with integral sleeves 60 and 61, Figures 2, 3 and 14, which are adapted to slide upon guides 62 and 63, Figure 2, secured to the transverse frame member 18 by means of pins 64 and 65. The crosshead 59 is reciprocated by the connecting arm 66, Figure 14, pivotally connected at one end to said crosshead by the pin 67 and pivotally connected at the other to eccentric strap 40 by means of a pin 68.

The guides 62 and 63 are parallel to radial lines passing through the center of the pockets 36 when said line is at an angle equal to the angular spacing of said pockets along the circumference of the drum 30, from a vertical line passing through the axis of said drum. A square guide pin 69 (Figure 14) which is fastened near the outer end of the reciprocating crosshead 39, engages with the slots 38 formed on the end wall 31 of the drum 30. The lower end of said guide pin 69 is slightly tapered to allow the guide pin to enter the slots 38 in case of a slight misalinement of said slots with the guide pin.

Since the slots 38 are in longitudinal alinement

with the rows of pockets 36, the centers of said pockets at the top of the drum are in vertical alinement with the axis of the drum 30 when the guide pin 69 is engaged with the slots 38. Therefore, since the top row of pockets 36 are in vertical alinement with the axis of the drum, axial lines through the centers of the pockets in the row next in rotation to the said top row are inclined at the same angle as are the guides 62 and 63, so that as the crosshead 59 is reciprocated in an upward or downward motion, the centering fingers 56 are always in a plane at right angles to the axial lines passing through the center of said rows of pockets.

When the centering fingers 56 are lowered next to the surface of the drum, they are in open position as shown in Figures 5 and 7. While the drum is held in a stationary position by the guide pin 69, the fingers 56 are rotated toward each other by the shafts 58 diminishing the size of the opening between them as shown in Figure 4. Therefore, as the fingers 56 close in, they align the top and root of the onion as shown in Figure 8, the shafts 58 moving upwardly in the cross-head 59 as the opening between said fingers becomes smaller.

The crosshead 59 is then raised by connecting arm 66, the drum 30 revolved until the next row of pockets is in alinement with the guide pin 69, and the above cycle of operation is repeated. The shafts 58 are rotated by lever arms 72 secured to said shaft by pins 73 which in turn are operated by a reciprocating member 74 by means of pins 75 rotatably mounted in said reciprocating members and secured to lever arms 72 by pins 76.

The pins 75 are also mounted in the reciprocating member 74 in such manner as to allow said pins to raise in conjunction with the shafts 58. The straps 77 and 82 secured to the crosshead 59 hold the reciprocating member 74 in position while it is being reciprocated by means of the hereinafter described reciprocating angle 78 (Figure 2) engaging with the lug 79 welded or otherwise secured to one end of said reciprocating member, and the tension spring 80, Figure 3, secured at one end to strap 77 and at the other to strap 81 welded or riveted to said reciprocating member 74.

Before the onions in the top row of drum pockets 36 are acted upon by the cutting or snipping mechanism, the onions are grasped and held in position by the sleeves 82 (Figures 1, 8 and 13) which are reciprocally mounted in the crosshead 39 held in position by the collars 83 secured to said sleeves by set screws, said collars bearing against sleeves 84 resting upon the integral lower member 85 of the crosshead 39. The collars 83 are held in position against sleeves 84 by the compression spring 86, an arrangement whereby the sleeves 82 may be retarded when the crosshead 39 is lowered, to prevent crushing the onions in pockets 36 but allowing enough pressure to hold the onion firmly in position.

The shafts 70 and 71 are secured in the integral sleeves 87 and 88 of the crosshead 39 (Figure 1) by means of pins 89 and 90, and reciprocally mounted in bearings 91 and 92 in the upper transverse frame member 17 (Figure 11) and the bearing 93 formed in the lower transverse frame member 16. The crosshead 39 is reciprocated by means of the heretofore described eccentric lever 40 secured to said crosshead by pin 42.

The upper cutting or snipping means consists

of a plurality of flat semi-circular knives 93, Figures 1, 10 and 13, riveted or otherwise attached to brackets 94, said brackets being pinned to the shafts 95, rotatably mounted in the crosshead 39 and collars 83 (Figure 13), and held in position by pins 96 and washers 97. The knives are operated by means of plate 98 (Figures 10, 11 and 13) bolted to reciprocating shaft 99, slots 100 in said plate 98 engaging with the rounded portions of the brackets 94 at the point 101 (Figure 13).

Reciprocating shaft 99 (Figure 11) is mounted in the bearings 130 and 102 formed in the transverse frame member 17. To prevent said shaft 99 from rotating, a connecting member 103 secured by pins 104 and 106 couples said shaft with a short shaft 105 reciprocally mounted in bearing 107 formed in the frame member 17. The aforementioned reciprocating member 78 is secured to the member 103. The shaft 99 is reciprocated by the lever 108 (Figure 1) pivotally mounted upon the pin 110 secured to the frame member 17, the slotted end of said lever engaging with the pin 109 secured in shaft 99.

The oscillation of said lever arm 108 to produce reciprocating motion for shaft 99 is accomplished by the engagement of the slot in the extended portion of arm 108 with the pin 111 (Figures 1 and 12) secured to plate 112 reciprocated by the cam 113 meshing with said plate at the point 114. The knives 93 travel in an arcuate path entering the sleeves 82 through openings 115 (Figure 13) the V-shaped cutting edges at 116 shearing off the portion of the onion protruding into said openings 115.

To clear said openings 115 of sheared portions of onions and to prevent onions from lodging in sleeves 82, plungers 117 (Figure 1) reciprocally mounted in the sleeve 82 have been provided, said plungers being pinned to a crossbar 118. The crossbar 118 is reciprocated by the cam 34 through a rod 119 fastened to said crossbar by pin 120, said rod 119 being reciprocally mounted in the frame member 17 at 121.

The lower shears or knives 122 (Figures 12 and 13) are of angular section having V-shaped cutting edges at points 123, said knives 122 being bolted or otherwise secured to holder member 124. The knife holder member 124 is reciprocally mounted upon a shaft 127 extending inwardly from the leg or standard 14, and secured to said leg by pin 125. To prevent the said holder from rotating, another short shaft 128 extending outwardly and parallel to shaft 127 is secured to a lug on the lower portion of one end of said holder by a pin 131, said shaft 128 also being reciprocally mounted in the leg 14.

The knives 122 are reciprocated by the cam 113 which meshes with a slot in the plate 112 at point 114, said plate being bolted to the knife holder 124.

When the onions have been acted upon by the cutting and snipping means, they remain in the pockets 36 until said pockets pass below the horizontal center of the drum 30 allowing the onions to release themselves. When released, they fall upon a conventional discharge chute 125 (Figure 2) at one side of said drum and bolted or otherwise fastened to the legs or standards 14 and 15, the onions being discharged from said chute into any suitable receptacle.

In event that any of the onions become lodged in the pockets 36 they are released by a plurality of ejector pins 126 (Figures 1 and 13) fastened to a crosshead 127 extending inwardly from the lower end of the reciprocating shaft 71 and

secured thereto by a pin 128. The ejector pins 126 correspond in number to the number of pockets 36 in each longitudinal row of pockets on the drum 30 and are raised and lowered by the action of the reciprocating shaft 71. Said pins 126 eject any onions that are lodged in the longitudinal row of pockets positioned beneath the said ejector pins. The ejector pins 126 are held secured in the crosshead 127 by means of a nut 129 in threaded engagement with one end of said pin and the shoulder on said pin at the point 132 (Figure 13).

The onions, when placed in the inclined hopper 24, roll toward the drum 30 and are agitated back and forth in the reciprocating portion of said hopper until the onions enter the pockets 36 in the said drum. Since the diameter of the outer end of the pockets is equal to the body of the onions, the onions must enter the pockets either root or top portion first. Generally the root portion enters first because the roots do not extend out from the body of the onion as do the tops. As the drum is intermittently revolved by the action of pin 43 engaging with the drum slots 38, said pin being reciprocated by the eccentric strap 40 because of the action of eccentric 33, empty rows of pockets are presented to the feeding hopper to be filled with onions.

The pulley wheel 22 pinned to shaft 21 furnishes the means to apply power to said machine. The worm 25 pinned to shaft 21 rotated by the pulley 22 meshes with the worm gear 26 attached to the shaft 27, thus providing the means to rotate said shaft 27 upon which the heretofore mentioned eccentric 33 is attached. The loaded pockets 36 pass onto the centering fingers 56, the drum revolving in the direction indicated in Figure 14.

When the onions are positioned beneath said centering fingers 56, the crosshead 59 is moved downward by the connecting member 66 until said fingers come in contact with the surface of the drum 30. The reciprocating angle 78 then pushes against the lug 79 secured to the reciprocating member 74 operating the arms 72, thus causing the fingers 56 to close in as shown in Figure 4.

Referring to Figures 4, 5, 7 and 8, it can be seen that as the size of the elliptical opening between the fingers 56 diminishes, the said fingers come in contact with the top or root portion of the onion protruding beyond the outer edge of the pocket 36. The said fingers bear against the protruding portion of the onion and are forced upward as they close in due to the conical shape of the end of the onion and because the pressure of said fingers against the sides of the onion is not great enough to grasp said onion.

This operation aligns the onions in the pockets 36 in such manner that the top and root portions of said onions are in alinement with a radial line passing through the center of said pockets. The centering mechanism is then raised by the connecting members 66 and the fingers again opened by the action of the spring 80 on the reciprocating member.

The onions then move onto the cutting means at the top of said drum. The pockets at the top of the drum are positioned directly beneath the sleeves 82 by the guide pin 69 engaging with the said slots 38 in the drum 30. The said guide pin secured in crosshead 39 is in longitudinal alinement with the row of sleeves 82 thus providing positive alinement for the said sleeves and the drum pockets.

When thus alined, the sleeves 82 are lowered upon the onion by the action of the connecting member 66 secured to eccentric strap 40 upon the crosshead 39. The onions are held firmly in pockets 36, the pressure upon said onions being regulated by the tension in springs 85. The upper and lower knives 93 and 122 are then simultaneously operated by the reciprocating action of shafts 99 and 127, respectively, and are reciprocated by the action of cam 113 pinned to the shaft 27. After the onions have been snipped by the said knives, the sleeves 82 are raised by crosshead 39, the drum revolved until the next row of pockets is alined with said sleeves and then the above mentioned operation cycle is again repeated.

While the sleeves 82 are raised, the plungers 117 eject the snipped portion of the onion or even an onion that might become lodged in the sleeves 82 and then are raised up into sleeves 82 out of operating position. The crosshead 118 is reciprocated by the rod 119 acted upon by the cam 34 secured to the shaft 27. The onions remain in the pockets until they have passed the horizontal center of the drum when said pockets are inverted due to the revolution of said drum, releasing the onions in said pockets.

The released onions dropping from said pockets are caught by the discharge chute 125 from which they are directed into any suitable receptacle. In event any of the snipped onions become lodged in said pockets, they are ejected by the ejector pins 126 on the crossbar 127, said crossbar being reciprocated by the shaft 71.

What is claimed as new and is desired to be secured by Letters Patent of the United States is:

1. In an onion snipping apparatus, a drum rotatable upon a horizontal axis and having a pocket opening to both the internal and external periphery thereof, means for intermittently rotating said drum, and cutting instrumentalities upon the outside and upon the inside of said drum and operable when said drum is stationary to concurrently shear opposed sections of an onion while contained in said pocket.

2. In combination, a carrier having a pocket to receive an individual onion, means for alining a selected axis of the onion with the radius of said pocket after disposition therein, and knives at opposite sides of said pocket for shearing sections from the onion after alinement.

3. In combination, a drum having pockets to receive individual objects possessing a longitudinal axis, means in association with said drum and adapted to operate upon such objects whereby to aline the longitudinal axes of the objects with the radius of said drum subsequently to disposition in said pockets, means for holding the object in said pocket after alinement, and shearing means operable upon said object while so held.

4. In combination, a drum having pockets to receive individual objects possessing a longitudinal axis, means in association with said drum and adapted to operate upon an object subsequent to disposition in one of said pockets whereby to aline the axis of the object with the radius of said drum, means for engaging said object to maintain the alined position thereof, and shearing means about the exterior periphery and other shearing means about the interior periphery of said drum operable simultaneously upon the object while in such alinement in said pocket.

5. In a device for topping onions, a drum having pockets extending therethrough to receive such onions, means for arranging the onions with their longitudinal axes radially of said drum after disposition in said pockets, knives adjacent the exterior periphery, and other knives adjacent the interior periphery of said drums for shearing opposite ends of the alined onions.

6. In combination, a drum having pockets therein, means guiding articles into said pockets, means operating subsequently to the disposition of the articles in such pockets for positioning such articles with their longitudinal axes coinciding with the radius of the drum, shearing means within and without the drum for operating upon articles in said pockets, and means for discharging from the pockets articles after they have been acted upon by said knives.

7. In combination, a drum having alined pockets, means for loading articles into said pockets, means for disposing such articles in the pockets in axial alinement with the radius of the drum, means for holding the articles in each of said pockets, shearing means operable within and operable without said drum for shearing opposed sections of said articles, means for ejecting the sheared articles from the pockets, and means for ejecting refuse from said holding means.

8. In combination, a drum having alined pockets, means for loading said pockets, means for disposing articles loaded into said pockets in axial alinement with the radius of the drum, means for holding articles in said pockets, shearing means operable within and other means operable without said drum for shearing opposed sections from said articles, means for ejecting sheared articles from the pockets, and means for ejecting refuse from said holding means.

9. In a device for snipping onions, a member having onion-holding pockets opening to either side thereof, stations about said member, means for advancing said holding member intermittently to successively present said pockets at said stations, means for depositing onions in said pockets at the first of said stations, means at the second of said stations for arranging the deposited onions with their principal axes extending perpendicularly through said pockets, and means at either side of said member and at the third of said stations for shearing portions of such onions projecting from said pockets.

10. In a device for snipping onions, a rotatable drum having pockets opening to the internal and external periphery thereof, stations about said drum, means for rotating said drum for the successive registration of said pockets with said stations, means at the first of said stations for depositing the onions in the pockets, means at the second of said stations for arranging the deposited onions with their principal axes radially of the drum, and means at the third of said stations for simultaneously snipping opposed ends of the onions.

11. In an onion topping device, an intermittently movable cylindrical drum having pockets each to receive an individual onion, means mounted for movement to and from a position adjacent the periphery of said drum for shearing sections of onions in said pockets and movable alternately with the movement of said drum, and means for imparting movement to said drum and said shearing means.

12. In an onion snipping device, an intermittently movable cylindrical drum rotating on a horizontal axis and having pockets, each of said

pockets being adapted to receive a single onion, shearing instrumentalities mounted for movement radially of said drum to and from a position adjacent the periphery thereof and adapted to shear portions from said onion in said pockets while in a position adjacent said drum, and means for moving said instrumentalities alternately with respect to the movement of said drum.

13. In an onion snipping device, an onion holding member having pockets, means for feeding onions into said pockets, means operable after the onions are in said pockets for orientating

such onions with their principal axes approximating the axes of said pockets, and shearing means at opposite sides of said holding member and adapted to shear portions from the opposite ends of the orientated onions.

14. In combination, a drum having peripheral pockets, means for depositing objects in said pockets, means for orientating the deposited objects with their principal axes radially of said drum, and means for shearing simultaneously the opposite ends of such objects after orientation.

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