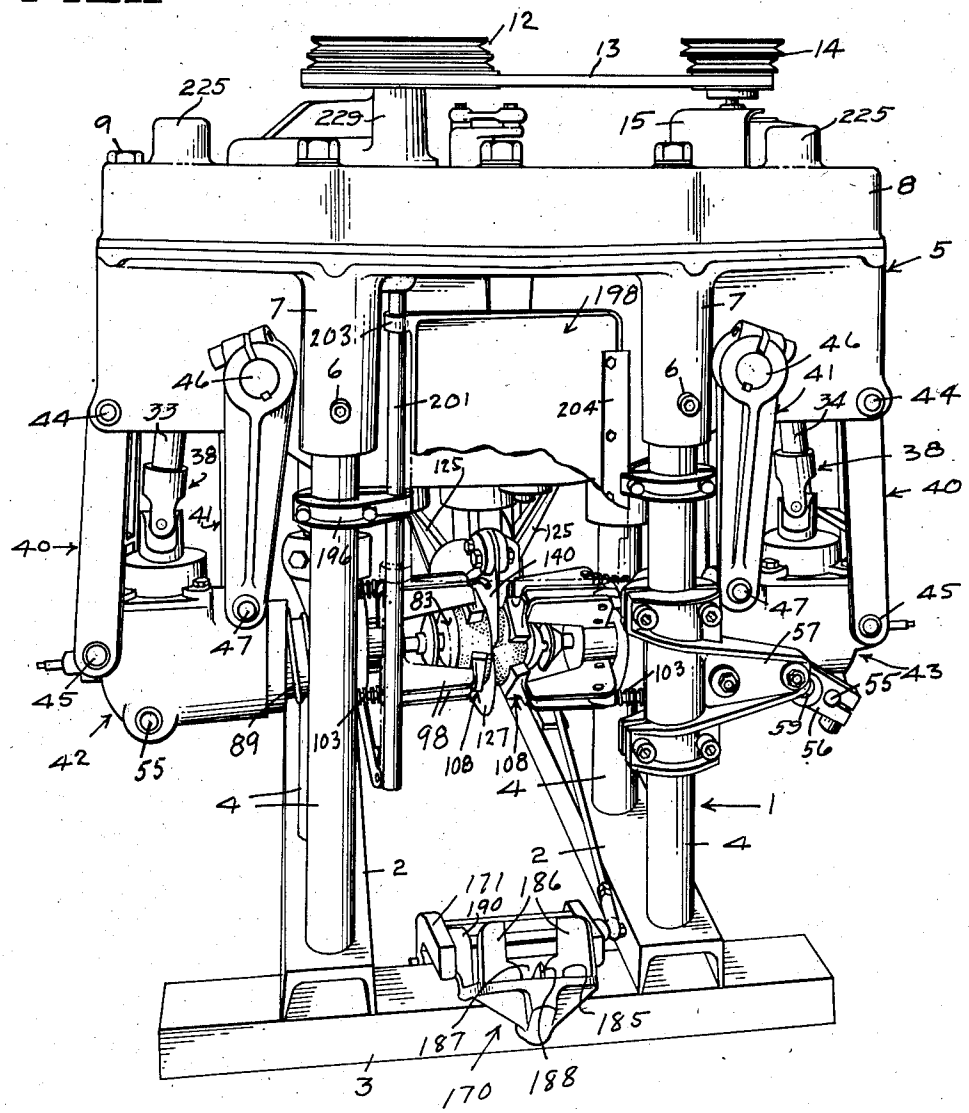
March 11, 1958 J. PERRELLI ET AL 2,826,227

DRUPE PITTING MACHINE

Filed Aug. 16, 1954 6 Sheets-Sheet 1

FIG. 1



INVENTORS
JOSEPH PERRELLI
THOMAS B. KEESLING
BY
Boykin, Mobley & Wood
ATTORNEYS

March 11, 1958 J. PERRELLI ET AL 2,826,227

DRUPE PITTING MACHINE

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FIG_2

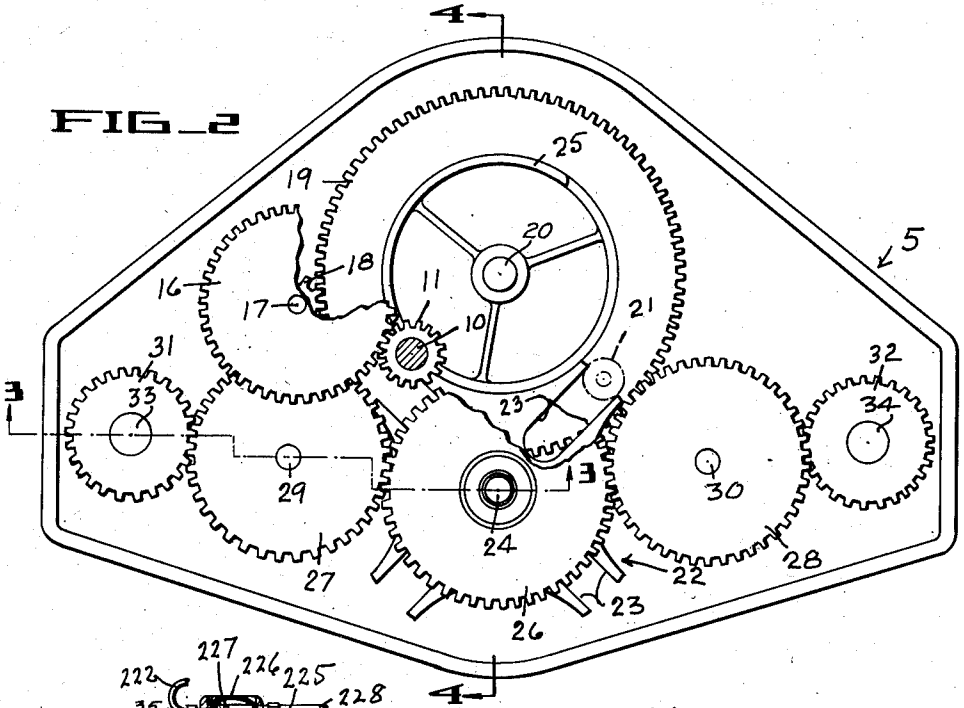


FIG_3

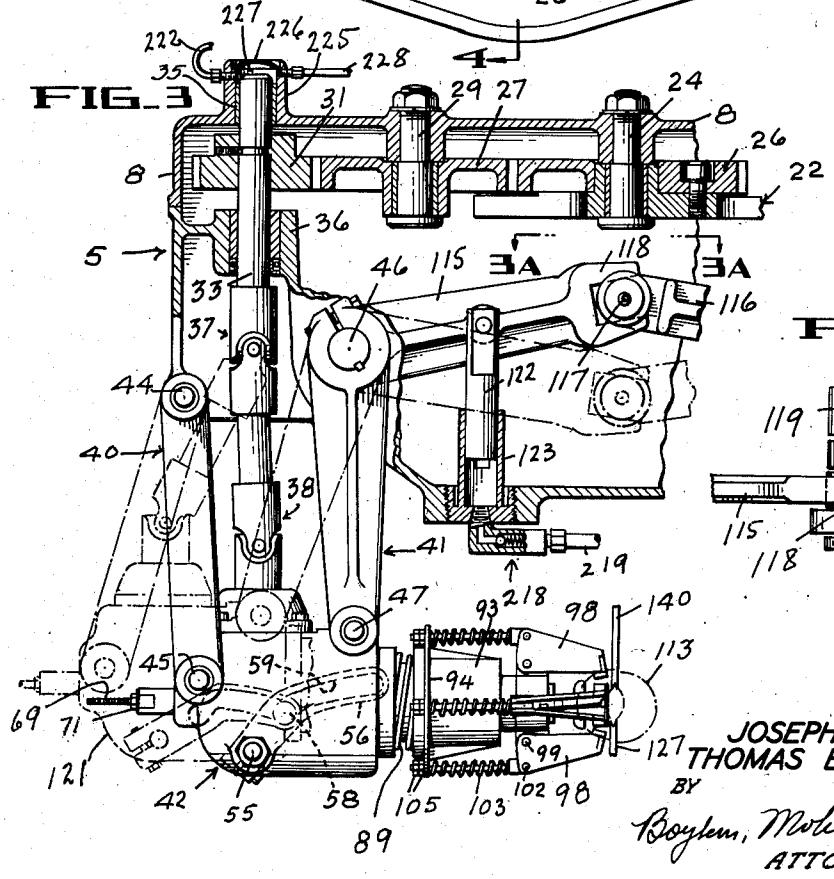
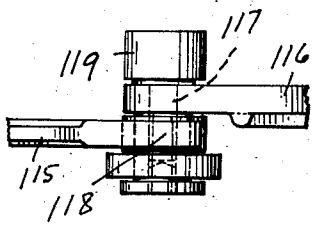


FIG_3A



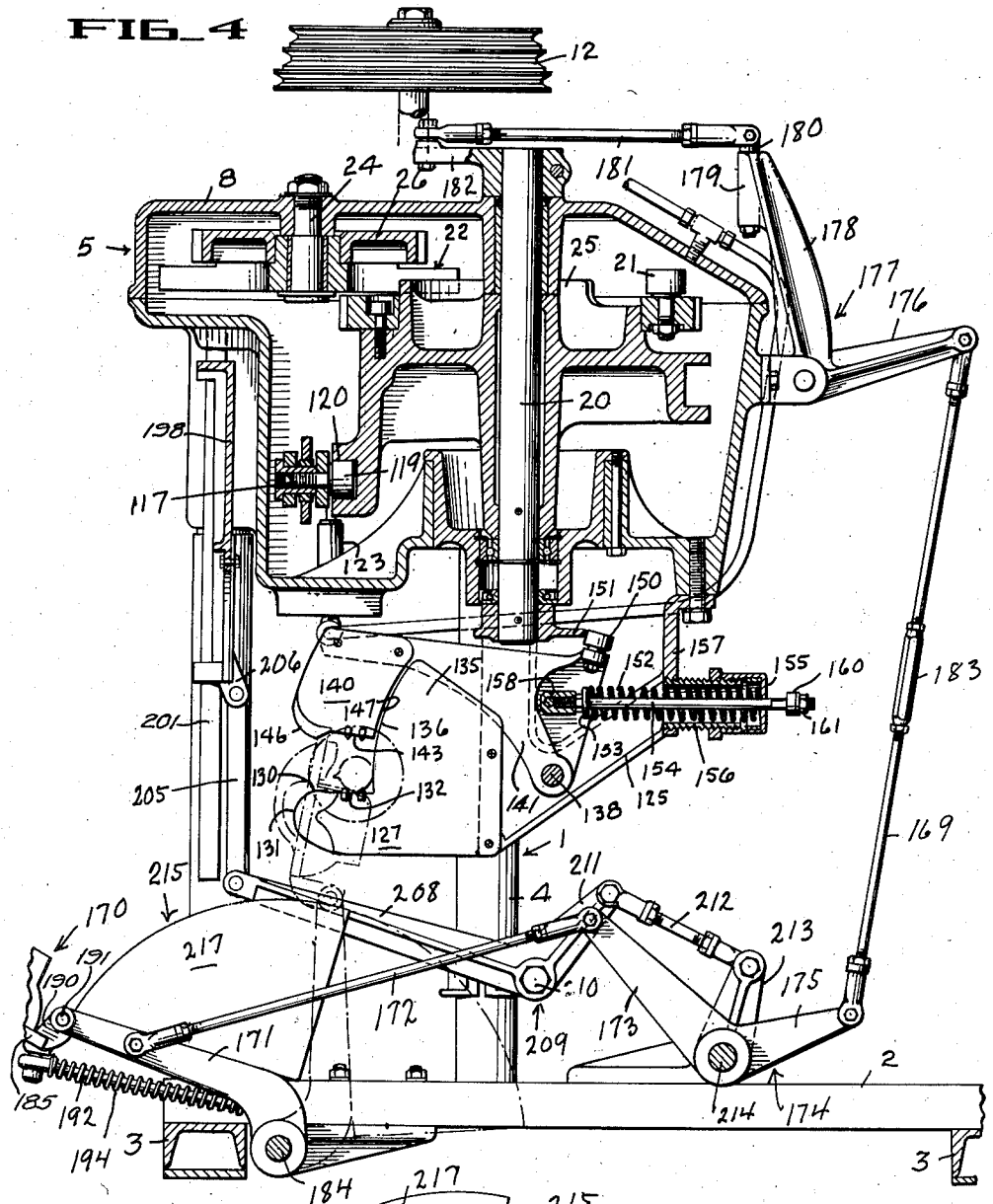
INVENTORS
JOSEPH PERRELLI
THOMAS B. KEESLING
BY
Boylem, Mobley & Wood
ATTORNEYS

March 11, 1958 J. PERRELLI ET AL 2,826,227

DRUPE PITTING MACHINE

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FIG_4



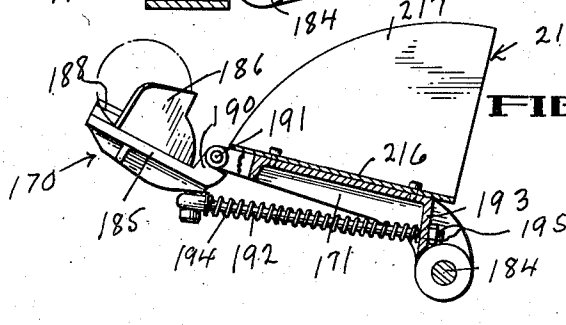


FIG_11

INVENTORS
JOSEPH PERRELLI
THOMAS B. KEESLING
BY
Boyken, Mohler & Wood
ATTORNEYS

March 11, 1958 J. PERRELLI ET AL 2,826,227

DRUPE PITTING MACHINE

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FIG. 5

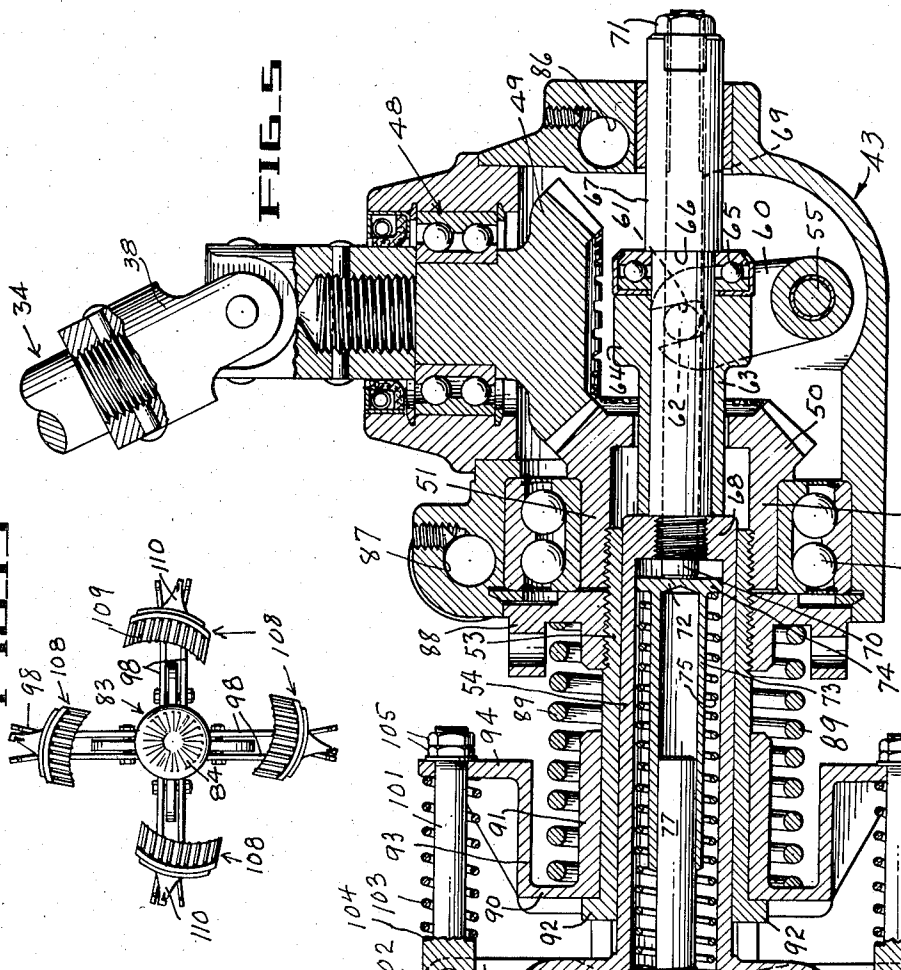
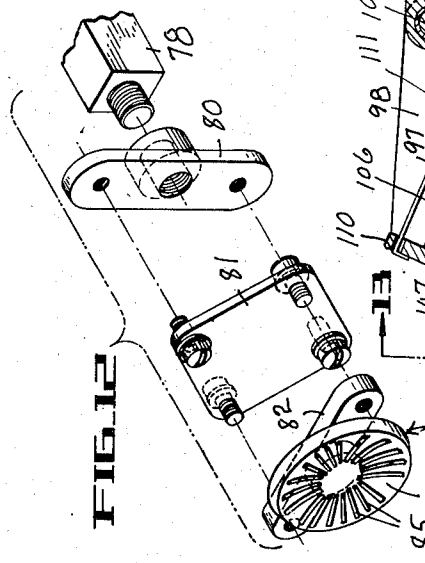


FIG. 13

FIG. 12



INVENTORS
JOSEPH PERRELLI
THOMAS B. KEESLING
BY
Boykin, Mobley & Wood
ATTORNEYS

March 11, 1958 J. PERRELLI ET AL 2,826,227

DRUPE PITTING MACHINE

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FIG_6

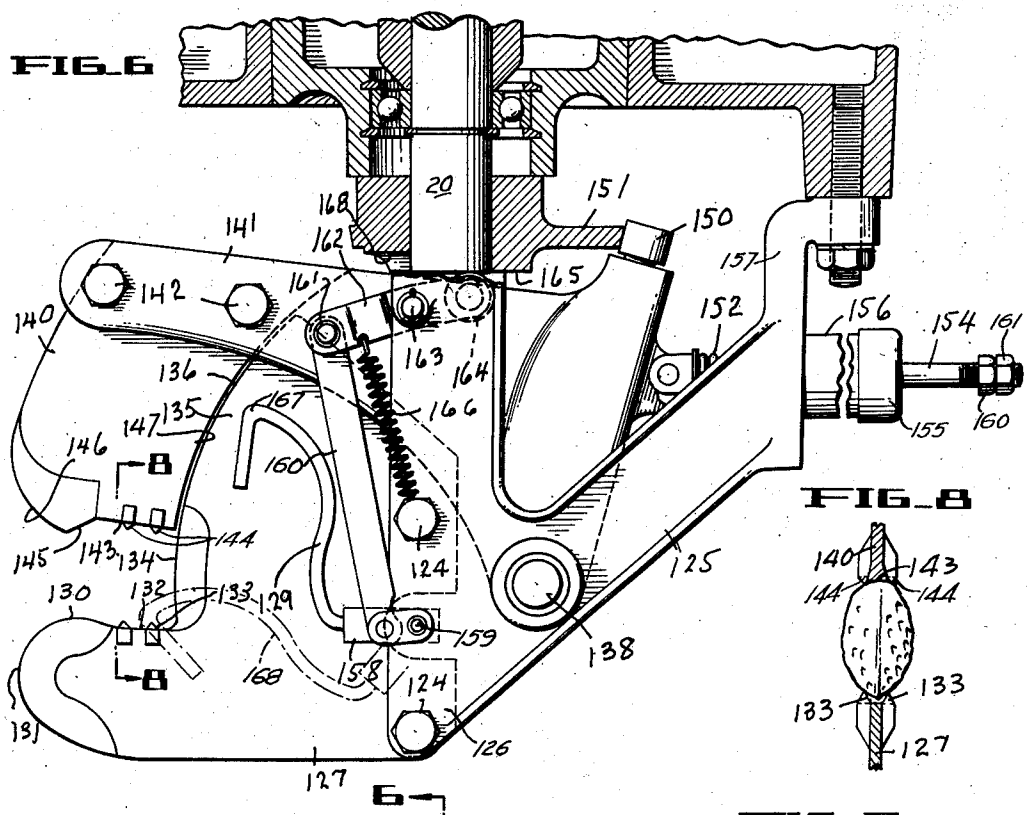
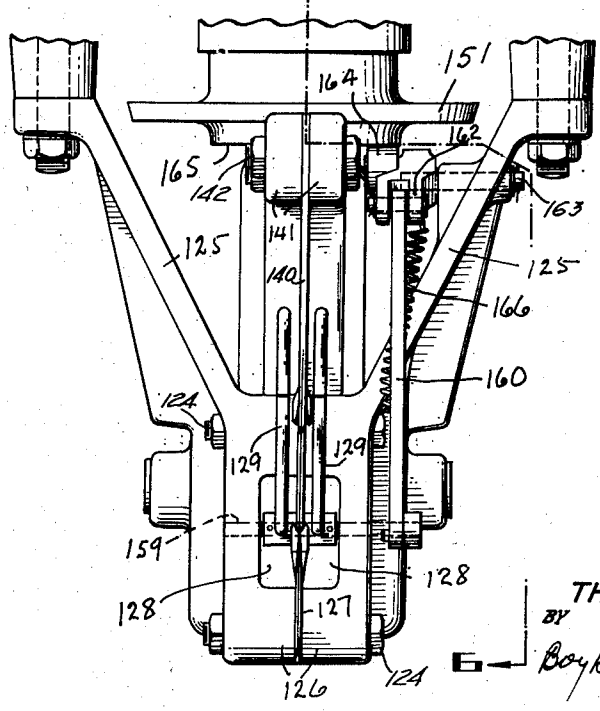


FIG_8

6

FIG_7



6

INVENTORS
JOSEPH PERRELLI
THOMAS B. KEESLING
BY
Boyken, Mohler & Wood
ATTORNEYS

March 11, 1958 J. PERRELLI ET AL 2,826,227

DRUPE PITTING MACHINE

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FIG_9

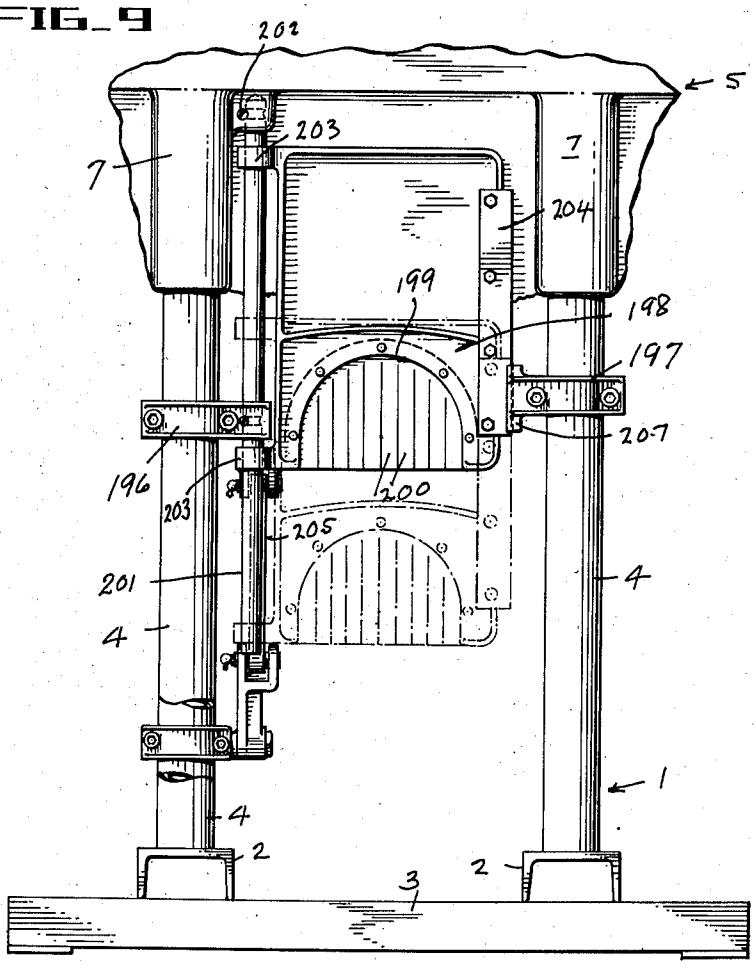
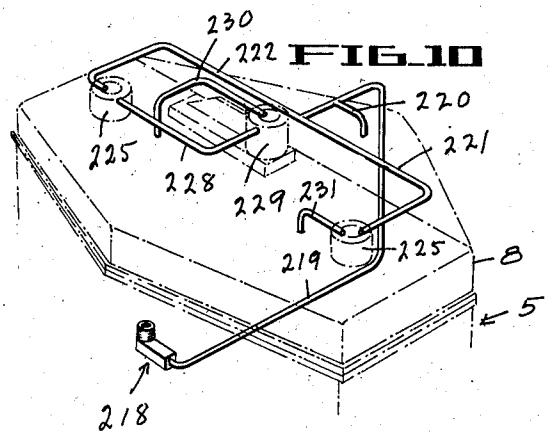


FIG_10



INVENTORS
JOSEPH PERRELLI
THOMAS B. KEESLING
BY
Boyken, Mohler & Wood
ATTORNEYS

United States Patent Office 2,826,227 Patented Mar. 11, 1958

2,826,227

DRUPE PITTING MACHINE

Joseph Perrelli, Richmond, and Thomas B. Keesling, Los Gatos, Calif., assignors to Filper Corporation

Application August 16, 1954, Serial No. 450,036

12 Claims. (Cl. 146—28)

This invention relates to a machine for pitting drupes.

One of the objects of the invention is the provision of improvements in the machine as disclosed in United States Letters Patent No. 2,664,127, issued December 29, 1953, to Joseph Perrelli.

Another of the objects of the invention is the provision of a pitting machine of the same general type that is disclosed in said patent, but which machine is more compact and simplified with the various parts readily accessible for examination and replacement yet having many of said parts enclosed within housings.

An additional object of the invention is the provision of a pitting machine that is extremely rugged, relatively silent in operation as compared with conventional pitting machines that employ pitting knives, and which machine is capable of passing peaches having split pits without causing difficulty and which machine may be operated as rapidly as fruit to be pitted can be fed thereto.

Other objects of the invention are; the provision of improved means for holding the pits of fruit from which the halves of the flesh or meat of the fruit are sheared; the provision of improved means for moving peach gripping members into and out of gripping relation to the fruit; the provision of a simple system for actuating the various elements of the machine in accurate sequence or at the proper time; and the provision of means for protecting the operator against injury and against being splashed by juice from the fruit during the actual pitting operation.

Other objects and advantages will appear in the description and in the drawings.

Fig. 1 is a perspective view of a machine with the drupe gripping means in position gripping the halves of a drupe, and with the protective curtain removed to show parts of the machine that would otherwise be hidden by the curtain.

Fig. 2 is a plan view of the gear and cam housing with the cover removed and with certain parts broken away and in cross section.

Fig. 3 is a fragmentary sectional view as seen from line 3—3 of Fig. 2.

Fig. 3*a* is a fragmentary elevational view of a portion of the machine as seen from line 3*a*—3*a* of Fig. 3.

Fig. 4 is a part sectional, part elevational view as seen from line 4—4 of Fig. 2, but with the drupe gripping devices removed in order to clearly show the pit gripping device, the latter being shown in full line out of drupe gripping relationship, and the feed device shown in full line in drupe receiving position.

Fig. 5 is an enlarged sectional view of one of the drupe gripping mechanisms with the drupe gripping members in open position and before moving into drupe engaging position.

Fig. 6 is an enlarged fragmentary part elevational and part sectional view taken along line 6—6 of Fig. 7 showing the pit gripping blades in open position before movement to pit gripping relation.

Fig. 7 is a front elevational view of the portion of the machine shown in section in Fig. 6.

Fig. 8 is a fragmentary sectional view of the upper and lower pit gripping members as seen from line 8—8 of Fig. 6 but in pit gripping relation with a pit, the meat of the fruit being omitted.

Fig. 9 is a fragmentary front elevational view of the protective curtain with the supporting posts of the machine shown in full line and with the curtain shown in lowered position in dot-dash line.

Fig. 10 is a semi-diagrammatic view of the oiling system that connects with the pumps shown in Fig. 3.

Fig. 11 is a full side view of feed device that is broken away from Fig. 4.

Fig. 12 is an exploded perspective view of the central drupe engaging device.

Fig. 13 is a front elevational view of the drupe gripping devices as seen from line 13—13 of Fig. 5.

The machine disclosed in the drawings comprises a frame, generally designated 1, and which frame includes parallel spaced base members 2 (Fig. 1) rigidly held by cross members 3 (Figs. 1, 4), and parallel vertical posts 4 that are rigidly secured at their lower ends to the base members 2.

Gear housing

A housing, generally designated 5 is supported on the upper ends of posts 4 and may be removably secured to said posts by any suitable means, such as screws 6 (Fig. 1) that extend through the walls of downwardly opening bosses 7 formed in the walls of housing 5, and into which bosses the upper ends of the posts 4 extend.

The housing 5 includes a cover 8 (Fig. 1) that is removably secured to the lower portion of the housing by any suitable means, such as stud bolts 9, and a vertical shaft 10 (Fig. 2) rotatably extends through and is supported by the housing cover 8. This shaft 10 has a pinion 11 secured thereto within the housing.

On the upper end of shaft 10 and above the housing cover 8, is a cone pulley 12 (Fig. 1) that is connected by a belt 13 with a second cone pulley 14, the latter being driven by a motor 15 with which it is connected.

The teeth of pinion 11 are in mesh with the teeth of a gear 16 (Fig. 2) that is on a vertical shaft 17, and a pinion 18 also on shaft 17 has its teeth in mesh with the teeth of a large gear 19. Gear 19 is on a shaft 20 and is part of a Geneva drive assembly in that said gear carries a roller or cam follower 21 that is adapted to intermittently rotate a Geneva spider 22 by successively entering each of the four radially extending slots 23 of said spider. A conventional arcuately extending locking piece 25 is rigid with gear 19 to prevent movement of the spider when the latter is not being driven by the follower 21.

From the above it will be seen that with each full revolution of gear 19 the spider 22 and the shaft 24 to which the spider is secured will be rotated a quarter turn.

A gear 26 is secured on shaft 24 within housing 5, and the teeth of this gear are in mesh with the teeth of gears 27, 28 the latter being at substantially opposite sides of the gear 26 and being respectively on shafts 29, 30 that are carried by the cover 8, and which gears 27, 28 are idler gears.

The teeth of gears 27, 28 are in mesh with the teeth of pinions 31, 32 respectively, the latter being secured to shafts 33, 34 respectively.

The upper ends of shafts 33, 34 are rotatable in bearings 35 (Fig. 3) in cover 8, and they each extend downwardly through a bearing 36 (Fig. 3) that is rigid with the housing.

Inasmuch as the shafts 33, 34 are the same (Fig. 2)

and are in operative engagement with elements having the same structure and having a similar manner of operation a description relative to the elements driven by and connected with shaft 33 will be described in detail and the same numbers will be used where there is no occasion to distinguish between the structures.

Actuating means for drupe grippers

Shafts 33, 34 each include a pair of universal joints or couplings 37, 38 disposed below the bearing 36. Also, below bearings 36 are two pairs of generally vertically extending arms, the arms of one pair being designated 40, and the arms of the other pair being designated 41 (Fig. 1).

The arms 40, and arms 41 are horizontally spaced apart at their lower ends to be at opposite sides of an angle housing. The angle housing at the left side of the machine as seen in Fig. 1 is numbered 42, and the angle housing at the right side being numbered 43.

The arms 40 may be rigidly secured together, and arms 41 may also be rigidly secured together, the means for securement being any suitable means such as a web, hence the fact that arms 40 are described as being a pair, as are arms 41, does not necessarily mean that the arms of each pair must be separable.

A horizontal pivot or shaft 44 pivotally connects the upper ends of the pairs of arms 40 with the housing 5, and a horizontal pivot 45 connects the lower ends of said arms 40 with each of the angle housings 42, 43.

A horizontal shaft 46 is rotatably supported in a bearing carried by housing 5 and the upper ends of arms 41 are secured to said shaft, while a horizontal pivot 47 connects the lower ends of arms 41 to each angle housing.

Below the lowermost universal coupling 38 in shafts 33, 34, said shafts respectively extend into each angle housing 42, 43 (Fig. 5) through a bearing 48 (Fig. 5) secured in each housing. A bevel gear 49 is secured to the lower end of each shaft 33, 34 within each housing 42, 43, each such bevel gear having its teeth in mesh with the teeth of a bevel gear 50 that is at right angles thereto. Each such gear 50 has a hub 51 that is supported in a bearing 52.

The hub 51 of each gear 50 is threadedly secured to one end of a hollow shaft 53 that, in turn, is splined onto an inner tubular shaft 54 so that shaft 54 may move axially relative to the shaft 53 but will rotate with shaft 53 when the latter is rotated.

As seen in Figs. 1 and 3, a horizontal shaft 55 is journalled for rotation in each angle housing, and one end of each shaft 55 projects laterally from said housing and is secured to an arm 56 (Fig. 3). The arm on the left hand housing 42 as seen in Fig. 1 is behind the housing, while the arm on the right hand housing is in front of the housing and can be seen (Fig. 1).

A bracket 57 is secured to one of the posts 4 at each side of the housing as seen in Fig. 1 and each bracket carries a pin 58 (Fig. 3) that extends into a slot 59 in each arm 56.

The mechanism for swinging the housings 42, 43 toward and away from each other on the arms 40, 41 will be later described, but it will be plainly seen that said arms 40, 41 are adapted to support said housings for so swinging while maintaining a driving connection between shafts 33, 34, and the bevel gears 49 that are in said housings. The dot-dash lines in Fig. 3 indicate housing 42 at the extremity of its outward swing, while in full line said housing is at the inner end of its swing.

In the case of housing 43 the same swinging occurs. In Fig. 5 the housing 43 is indicated at the outer end of its swing, or at least near the outer end, while the full line positions of the angle housing 42 in Fig. 3 shows it at the inner end of its swing.

Within each housing 42, 43 and secured on shaft 55 are a pair of connected arms 60 each having a clevis or outwardly opening recess 61 in their outer ends in which are outwardly projecting pins 62 that are secured to a tubular extension 63 of the inner tubular shaft 54, which extension is coaxial with said shaft 54 and is separate from shaft 54. The pins 62 are actually carried by an enlarged head 64 of extension 63, and the end of said head that is remote from the inner shaft 54 engages a thrust bearing 65 that, in turn is disposed between said head and a shoulder 66 that is formed on a tubular member 67 extending through the extension 63 for threaded securement at one end in the head 68 of inner tubular shaft 54.

Axially extending through the inner tubular member 67 is an adjusting screw 69 that has a long shank 70 extending into the inner tubular shaft 54 at the inner end of said screw, while the outer end of the latter is threaded into the outer end of said inner tubular member 67 to permit axial adjustment of the screw upon its rotation. The outer end of screw 69 projects from the outer end of member 67 and carries a nut 71 for adjusting the screw axially and for holding it in adjusted position. This outer end of said screw projects from each angle housing to permit axial adjustment of each screw from outside each housing.

The inner end of the shank 70 of each screw 69 abuts against the head 72 at one end of a tubular element 73 that is within the inner tubular shaft 54.

A radially outwardly projecting flange 74 on head 72 is engaged by one end of a helical spring 75 surrounding the element 73. Said spring reacts between said flange 74 and a radially outwardly projecting flange 76 on a shaft 77 that slidably extends into the open end of the element 73. A square extension 78 on shaft 77 extends from flange 76 outwardly of the inner end of the inner tubular shaft 54, and through a nut 79 that is threaded into the inner end of shaft 54. The flange 76 abuts said nut 79, said flange being yieldably urged thereagainst by spring 75.

The projecting end 78 of shaft 77 carries a radially elongated head 80 (Fig. 12) having a rectangular resilient member 81 secured at two of its diagonally opposite corners to the outer ends of the head 80. The other two diagonally opposite corners of member 81 are secured to the ends of an elongated bar 82 that has a circular drupe engaging plate 83 thereon at a point intermediate the ends of bar 82, and the laterally facing outer side of plate 83 is covered with a pad 84 of relatively soft rubber formed with a concave surface that, in turn, is formed with radially extending ridges 85 to provide an anti-friction surface that engages the drupe to be pitted.

The openings 86, 87 shown in Fig. 5 as being formed in housing 43 are for the lower pivots 45, 47 for arms 40, 41 and set screws, as indicated in Fig. 5 are provided for holding said pivots.

Secured to and extending around the end of the hollow shaft 53 that is adjacent to the angle housing is an annular member 88 that abuts the inner race of ball bearing 52, and against which one end of helical spring 89 reacts.

Spring 89 is coaxial with the hollow shaft 53 and the end thereof that is remote from the member 88 reacts against a radially outwardly extending flange 90 that is on one end of a sleeve 91, and which sleeve surrounds the hollow shaft 53. The sleeve 91 is slidable on said hollow shaft 53 and is yieldably held spaced from member 88 and against a flange 92 on the end of said hollow shaft 53 by spring 89.

Integral with the outer edge of flange 90 of sleeve 91 is a cylindrical extension 93 that overlies sleeve 91 in coaxial spaced relation to the latter, and the end of this extension that is remote from flange 90 is formed with a radially outwardly projecting flange 94.

The end of the inner tubular shaft 54 that projects from housing 43 also projects outwardly of the hollow shaft 53 and the end so projecting is formed with four equally spaced radially outwardly projecting ears 95, each being apertured substantially along a line tangential with a

circle coaxial with the axis of said shaft **54**, and each ear also being formed with a projection **96** projecting generally axially relative to said shaft **54** in a direction outwardly of the latter and away from housing **43**.

An elongated tubular bearing **97** is pivotally secured to each of the ears **95** by means of a pair of spaced opposed extensions **98** between which each bearing **97** and each of said ears is secured. A pivot **99** extends through the aperture in each ear and through said extensions.

Each of the aforesaid extensions **98** is generally triangular in outline, and bearing **97** is at one corner, pivot **99** at another corner.

Disposed between each opposed pair of extensions **98** radially outwardly of each pivot **99** is one end of a bar **101** which end is pivoted to each pair of said extensions by a pivot **102**, and the other end of each bar **101** slidably extends through an opening in flange **94**. A helical spring **103** around each bar **101** reacts between a shoulder **104** on each bar and the flange **94**, and nuts **105** on the end of each bar are held against said flange by each spring **103**. It is to be noted that these nuts also enable adjusting the tension on each spring **103** and also the angular relationship between the arms **98** and the axis of the shaft **54**.

Rotatable in each tubular bearing **97** is a cylindrical elongated shank **106** provided with a head **107** having an arcuately extending drupe gripping member **108** rigid therewith. Each member **108** is elongated and curved longitudinally to generally follow a circle concentric with the axis of the shaft **54** when in drupe engaging position and a rubber or similar relatively soft facing **109** is on each member for engaging the fruit when the members are swung generally radially inwardly about the axis of each pivot **99**.

The said drupe gripping members are offset radially inwardly from the tubular bearings, and each head **107** has an extension **110** projecting from the side of the shank opposite member **108** that is engaged by the outer end of a wire spring **111** that has its opposite end secured to one of each pair of arms **98**. This spring functions to yieldably hold each member **108** so that a corresponding end of each member will be slightly closer to the axis of the shaft **54** than the other end (Fig. 13). Inasmuch as the shaft **54** and the arms **98** including members **108** will be caused to rotate in one direction about the axis of the shaft **54**, as will later be explained, the end of each member **108** that is closest to said axis will be the trailing end. One of the extensions **98** provides a stop for each extension **110**, as seen in Fig. 13.

From the description, so far, it will be seen that any relative axial movement between the inner tubular shaft **54** and the sleeve **91** will result in the drupe gripping members **108** being simultaneously swung about arcs having pivots **99** as their centers. If arms **60** that are in each of the angle housings **42**, **43** are caused to swing in a direction away from the peach engaging plate **83**, this will result in the drupe engaging members being swung toward the axis of hollow shaft **54** until resistance, such as would be offered by a peach, is encountered, and then the spring **89** will become effective to produce a spring and yieldable grip by the drupe gripping members on the peach.

Referring to Fig. 3 the angle housing **42** is shown in full line with the drupe gripping members in gripping engagement with one-half of a peach **113**. This movement of the members **108** has been caused by movement of arm **56** under the influence of the stationary pin **58** when the arms **40**, **41** were swung inwardly toward the medial vertical plane of the machine. In the dot-dash line position of the arms **40**, **41** and housing **42**, in Fig. 3, the latter has been swung away from said medial plane with the result that arms **56**, under the influence of pin **58** in slot **59** in said arm, has caused the arm **60** (Fig. 5) to move to a position relieving any tension on springs **89**, **103** that may have been caused by the drupe, and also positively moving the hollow shaft **54** in a direction with the ears **95** thereon leading. The pin **58** has an action similar to that of a cam follower with the sides of slot **59** being the cam surfaces in effecting movement of the arms **60**. However, the arrangement is such that the drupe gripping members do not close onto a drupe until they are almost at the very end of the inward swing of arms **40**, **41**, and they quickly open as soon as the latter start to move outwardly.

The means for causing the housings **42**, **43** to swing toward and away from the medial vertical plane of the machine includes an arm **115** (Fig. 3) that is secured to one shaft **46** and an arm **116** that is secured to the other shaft **46**.

These arms **115**, **116** extend toward each other from the shafts **46** and arm **116** is connected with a shaft **117** that carries a bearing that is disposed in an outwardly opening slot or fork **118** in the outer end of arms **115** (Fig. 3). Upon up and down movement of the shaft **117**, it will be apparent that the arms **115**, **116** will have a similar up and down swinging movement of their outer ends that will result in arms **41** carrying the angle housings at their lower ends away from each other when the adjacent ends of arms **115**, **116** are moved downwardly, and in carrying said housings toward each other when the outer adjacent ends of arms **115**, **116** are swung upwardly.

Shaft **117** also has a cam follower **119** thereon (Fig. 3*a*), which follower is disposed in a radially outwardly opening cam track **120** (Fig. 4) that is formed on a cam that is secured to shaft **20** concentric therewith. This track has a low dwell point and a high dwell point, and the transition from the high dwell point in which the drupe gripping members are in tight gripping relation to a drupe to the low dwell point is accomplished in one part turn of shaft **20**, while the transition back to the dot-dash line position **121** (Fig. 3) of housing **42** with the jaws of the fruit gripping members wide open takes place during another part revolution of the shaft **20**.

In connection with the arms **115**, **116** it should be noted (Fig. 3) that the piston **122** of an oil pump is pivotally secured to arm **115** which piston reciprocates in a cylinder **123** in the oil pan of the housing **5** to pump oil to the shafts and gears in the housing **5**.

It may be here noted that the central drupe engaging pads **84** (one being at each of the opposite sides of the vertical medial plane of the machine) yieldably engage the opposite outwardly facing sides of a drupe that is gripped by members **108**. This yieldable pressure is under the influence of spring **75** and it normally occurs just before the members **108** are in full gripping engagement with the halves of the drupe.

The pit gripper mechanism

Rigidly secured to the housing **5** are a pair of downwardly and forwardly convergently extending arms **125** (Figs. 1, 7). The "forward" side of the machine is the side seen in Fig. 1, and this is the side nearest to which the Geneva spider **22** (Fig. 2) is located.

The forward ends of arms **125** are formed with blade engaging projections **126** (Fig. 7) extending toward each other, and which projections have flat opposed faces adapted to engage opposite sides of a lower drupe engaging blade **127** (Fig. 6). Bolts **124** extend through said projections **126** and through said blade for firmly securing the lower blade stationary, and said projections have oppositely opening recesses **128** (Fig. 7) formed on their adjacent sides to permit pit engaging elements **129** to extend through the recesses to opposite sides of said blade **127**, as will later be described more in detail.

The blade **127** projects forwardly of the forward ends of arms **125** and is formed with an upwardly directed cutting edge **130** and with a forwardly directed cutting edge **131**, which upwardly directed edge **130** terminates at its rear end in a widened anvil portion **132** formed

with several pairs of spaced upwardly directed teeth 133 (Fig. 6) in which the teeth of each pair are at opposite sides of the plane of the blade (Fig. 8) so that the pit (Fig. 8) of a drupe positioned over said blade and anvil will also be automatically slid to a position between said teeth and on said anvil when the drupe pit is pushed downwardly, even though the plane of the suture of the drupe may be slightly at one side or the other of the plane of the blade. Also said teeth will engage the pit.

At the rear end of the anvil 132 the blade 127 extends upwardly to provide a forwardly directed cutting edge 134, that is above the level of edges 130, 131, and said blade then continues upwardly as at 135.

The forward edge 134 and the edge 136 of the blade that is in upwardly continuation of the edge 134 are preferably convexly curved in linear direction about the axis of a pivot 138 that extends through arms 125 at a point slightly rearwardly of the forward lower end portions of arms 125

This pivot 138 supports an upper blade 140 for swinging about said pivot.

Carried by pivot 138 is a blade holder 141 that comprises a pair of upwardly and forwardly directed clamping arms between which blade 140 is held by bolts 142. The said arms are on opposite sides of the portion 135 of the lower blade, so that said portion 135 may function as a guide for preventing any possible movement of the upper blade out of the plane of the lower blade.

The lower edge of blade 140 is formed with an anvil 143 that corresponds with anvil 132 and comprises a flat downwardly facing edge in substantially opposed relation to the flat portion of the lower anvil. Anvil 143 is provided with similar teeth 144.

Forwardly of anvil 143 the lower edge of the blade 140 extends downwardly, as at 145, to a sharpened edge 146 that is directed downwardly and forwardly.

The rear edge 147 of blade 140 has the same arcuate curvature of the forward edge of portion 135 of the lower blade and is close to the latter.

The upper blade holder 141 carries a cam follower 150 in the form of a rotatable roller, that is adapted to be held against a cam track 151 that, in turn, is secured to the lower end of shaft 20. A spring 152 (Fig. 4) reacting between a flange 153 on a central rod 154 and the cap 155 of a recess into which said spring extends functions to yieldably hold the cam follower 150 against said cam track 151.

The cap 155 is on a cylinder 156 that is rigidly secured by a bracket 157 to housing 5, and the end of rod 154 that is adjacent to flange 153 extends into a socket 158 that is pivoted to the blade holder 141. The end of the rod opposite to the flange 153 slidably extends through an aperture in cap 155 and is provided with a stop 160 and nut 161 at the end that projects from the cap.

The cam 151 has a high side and when the shaft 20 is rotated so that the high side of said cam is in engagement with the cam follower 150, the upper blade 140 will move to its uppermost position so that blades 127, 140 will be ready for the positioning of a drupe between them with its pit between the teeth. When the shaft 20 is rotated so that the low side of the cam is in engagement with the cam follower, the blade 141 will be swung downwardly under the tension of spring 152 so as to tightly grip the pit of the drupe between the teeth, and to also substantially fully bisect the flesh of the drupe. Only spring tension is depended upon in this instance to grip the pit of the drupe and to drive the blade 140.

Inasmuch as the movement of the blade 140 is caused by rotation of the shaft 20 the cam 151 is so arranged as to move the blade 140 into gripping engagement with the pit (in connection with blade 127) just before the drupe gripping members 108 are rotated by the action of cam follower 21 engaging a slot 23 in Geneva spider 22 and thereby rotating shafts 24, 29 and 30, 33 and 34, and 54.

The part turn of the shaft 20 that causes the high side of cam 151 to move into engagement with the follower 150 may occur substantially as soon as the drupe gripping members 108 have ceased their rotation, since the halves of the drupe will then have been completely severed from the pit.

The elements 129 that were previously mentioned as being disposed at opposite sides of the plane of said blades 127, 140 are shown extending arcuately upwardly and forwardly from a rod holder 158 that is spaced substantially rearwardly of the cutting edges of blade 127 and at about the level of the anvil 132. This holder is mounted on a horizontal shaft 159 that, in turn is supported at the forward ends of arms 125 for rotation.

A link 160 is pivotally connected at its lower end with a crank arm on shaft 159 and extends upwardly for pivotal connection at 161 with the forward end of a generally horizontally extending arm 162. The arm 162, in turn, is pivoted to the upper portion of the forward end of one of the arms 125 (Fig. 7) by a pivot 163, and which pivot 163 is intermediate the opposite ends of arm 162. The rear end of arm 162 carries a cam follower 164 (Fig. 6) that is held against a cam track 165 that, in turn, is formed on the lower side of the hub of cam 151. A spring 166 connecting the arm 162 with one of said arms 125 yieldably holds the cam 164 against track 165.

The forward upper ends of the pit engaging rods 129 are normally in the position shown in Fig. 6 when a drupe is engaged by the drupe engaging members 108, and until the latter are out of engagement with the drupe.

As soon as the low side 168 of the cam track 165 is in engagement with the follower, the holder 158 will swing down to move the outer ends of rods 129 downwardly. The forward, upper ends of rods 129 are bent back to form a knuckle 167 which acts to "butt" the pit from teeth 133 upon such downward movement of rod 129 to the dot-dash position 168 (Fig. 6).

It is obvious, of course, that the pit will not normally stick to the upper blade, but if it should, the action of rods 129 will insure removing it from said upper blade.

Feed mechanism

The means for feeding individual whole drupes to the blades 127, 140 comprises a holder generally designated 170 (Fig. 1).

This holder is carried by the outer ends of a pair of rigidly opposed connected, similar arms 171 (Figs. 1, 4), and a connecting rod 172 is pivotally connected at one end to one of said arms 171 and at the other end to the outer end of one arm 173 of a crank that is generally designated 174. The other arm 175 of crank 174 is pivotally connected to one end of a rod 169 and the pivot for crank 174 is carried by base 2. The other end of rod 169 is pivotally connected to the outer end of one arm 176 of a crank that is generally designated 177. The crank 177 is pivotally supported on a bracket secured to housing 5, and the other arm 178 of said crank carries a bearing 179 having a rotatable vertical pin 180 therein.

The upper end of pin 180 is pivotally connected with one end of a horizontally extending rod 181, the other end of which is pivotally connected with the outer end of a crank arm 182 that, in turn, is secured to the upper end of shaft 20.

Both rods 172 and 169 are longitudinally adjustable, the ends of rod 172 being threaded into sockets that are apertured for the pivots that respectively connect the ends of the rods to arms 171, 173 and a turnbuckle 183 may be on rod 169.

Upon rotation of the shaft 20 in one complete turn, the fruit holder 170 will be swung to the blades 127, 140 and back again to loading position seen in Figs. 1 and 6.

The holder 170 when in a position to receive a drupe, has a slightly tilted back plate 185 (Fig. 11) and rearwardly and upwardly horizontally spaced projecting

plates **186** (Fig. 1) that are also disposed convergently from their upper edges toward their lower edges so as to substantially define the slanted sides of a V-shaped support (lacking the apex) when the holder is swung upwardly so that the plates **186** are substantially horizontal. The space or slot **187** between the lower convergent edges of plates **186** permits the plates to be swung to positions at opposite sides of the blade **127**, and centrally between the two plates **186** is a short impaling blade **188** that projects from the plate **185**.

Plates **185**, **186** are rigid relative to each other and have a pair of ears **190** through which a pivot **191** (Fig. 4) extends for connecting said holder with the outer ends of arms **171**.

A rod **192** (Fig. 11) is connected with the rear side of the back plate **185** and slidably extends through a web **193** that is rigid with arms **171** at a point adjacent to a pivot **184** about the axis of which the arms **171** swing. A helical spring **194** surrounds rod **192**. A nut **195** on the end of the rod that projects from web **193** prevents the holder from swinging about pivot **191** toward the blades **127**, **140** when the arms **171** carry the holder toward said blades, and spring **194** yieldably holds said holder against movement in the opposite direction. However, in the event of sufficient resistance against the holder at the end of a feed stroke, the holder will be able to swing against the resistance of spring **194**. Such resistance could occur in the event of an oversized peach or pit.

From the foregoing it will be seen that a peach or drupe fed onto the pit holding blades will be substantially bisected by such blades to the pit, and thereafter the operation of the drupe gripping members will shear the halves from the held pit.

Protective curtain

Figs. 4, 9 most clearly show this feature of the invention, in which a pair of bracket arms **196**, **197** (Fig. 9) are secured to the vertical forward two posts **4** of the machine. Between these two brackets and vertically reciprocable relative thereto, is a frame **198** having an arcuately downwardly opening recess **199** in its lower edge. Depending from the frame to close said recess are a plurality of substantially adjoining flexible, parallel, strips **200**.

A second vertical post **201** is rigidly held by bracket **196** and by a screw **202** at upper end of said post, relative to the bracket **196** and to the post carrying said bracket.

The frame **198** has a pair of apertured guide members **203** through which post **201** extends, said members **203** being slidable on the said post. A vertical guide plate **204** is secured to frame **198** opposite to post **201**, and an edge of this plate is vertically slidable in a guide member **207** that is rigid with bracket **197**.

A link **205** (Fig. 4) is pivotally connected at one end with a projection **206** that is rigid with frame **198**, and the other end of said link is pivotally connected with the outer end of an arm **208** of a crank generally designated **209**. This crank is horizontally pivoted at **210**. The other arm **211** of crank **209** is pivotally connected by an adjustable connecting rod **212** with the outer end of an arm **213** that, in turn is secured to rotatably supported shaft **214** to which crank arm **174** is also secured. Thus upon rotation of shaft **214** under the influence of the rotation of shaft **20**, the crank **209** will be actuated to move the curtain of strips **200** up and down. This movement is so arranged that the curtain will be up when a drupe is fed onto the pit holding blades, but as soon as the pit is held by the blades and when the gripping members **108** revolve to shear the fruit halves from the pit, the curtain will be down and it will stay down until another drupe is placed on the holder.

By this means, any juice that may tend to be thrown outwardly by the force of the blades or the gripping members, will strike the curtain. Also, this curtain is a safety device since it is a flexible barrier between the blades and the carrier, and will tend to prevent an operator from attempting to place a drupe on the holder when the holder is so close to the barrier as to be dangerous. Normally there is ample time for a skilled operator to place a fruit on the holder while the holder is stationary.

Other features

As seen in Figs. 4, 11 (and omitted from Fig. 1 for clarity of the structure) the arms **171** of the feed device carry a generally U-shaped chute **215**, having a bottom **216** that is against said arms and that extends between them, and upstanding opposed sides **217**. This chute receives the pit and drupe halves after they are released from the blades and drupe gripping members, and when the arms **171** swing forwardly in a feeding operation the said halves and pit are dumped onto a conveyor (not shown).

In Fig. 10 is a diagram of the oiling system is shown, in which oil from the housing **5** is pumped by the pump **122**, **123** (Fig. 3) past a check valve **218** (Fig. 10) through a pipe **219** to branch pipes **220**, **221**, **222** that respectively feed oil to the shaft **20** and to the bearings **35** for shafts **33**, **34**. It will be noted that the bearings **35** are in bosses **225** (Fig. 3) that extend above the top of cover **8**, and the branch pipes **221**, **222** open into these bosses above the upper ends of shafts **33**, **34** and below a cap **226** in the upper end of each boss. Thus an oil chamber **227** is above each shaft **33**, **34**. A pipe line **228** communicates between the chamber **227** of one boss **225** and a similar boss **229** into which the upper end of shaft **10** extends. Thus oil from chamber **227** will be passed to a similar chamber in the upper end of boss **229**. A pipe **230** extends from such chamber through the top of cover **8** to deliver oil to shaft **17** and gear **27**, while a pipe **231** extends from the other boss **225** (with which line **221** connects) into the housing to deliver oil to shaft **30** and gear **28**. Oil in the housing and delivered onto the gears adequately lubricates the moving parts within the housing.

While the operation of the machine is believed to be clear, a brief resume of this operation may be helpful.

The operator places a drupe on the holder **170**, and such drupe is preferably positioned with its suture in a vertical plane that is substantially the medial vertical plane of the machine in which the pit holding blades **127**, **140** are positioned. The impaling blade **188** in the holder will hold the drupe in the holder and will also partially bisect the flesh of the drupe at one end thereof, which is usually the stem end.

The holder **170** then swings upwardly and to between the blades **127**, **140** and to a position in which the end of the drupe opposite the impaling blade **188** will be substantially cut to the pit by the forwardly directed cutting edge **134** of the upward extension **135** of lower blade **127**, and at substantially the same time that the drupe is so delivered to between blades **127**, **140**, the blade **140** will swing down to tightly grip the pit between the teeth on the upper and lower blades.

If the pit is lower than the anvil **132** on the lower blade when the holder carries the drupe between the blades, the curved forward edge **131** of the lower blade will automatically elevate the pit and guide it onto the anvil.

If the pit is at a level above the level of the lower anvil when the drupe is delivered to the blades the downwardly swinging upper blade will automatically move the pit downwardly onto the lower anvil.

Immediately upon withdrawal of the holder the drupe gripping members **108** and the drupe pressing element or pad **84** will be moved into gripping and pressing engagement with the drupe halves.

In this connection it should be noted that the angularity of the drupe gripping members **108** relative to a circle

about the axis of revolution of said members will cause these members to independently seat themselves on the drupe in conformance to any irregularity in the surfaces that are so gripped. Thus they will not necessarily be circumferentially aligned with a circle.

It should also be noted that the lengths of the drupe gripping members are such that the minimum diameter drupes will be tightly gripped by the members **108**. In other words, these members **108** may be quite close together at their ends after the smallest diameter fruit is gripped, but they will not be in engagement with each other so as to impair their gripping efficiency.

In a normal or average diameter drupe, and in larger drupes, the ends of the gripping members will be spaced apart, and this spacing is beneficial since it permits a slight bulge between the adjacent ends of the gripping members, thus giving the members a firm grip on the drupe.

The engagement between the drupe halves and the members **108** is substantially at the maximum diameter of the drupe, or relatively close to the opposite sides of the pit gripping blades.

As soon as this grip on the drupe is established (the pit being already tightly gripped) the drupe gripping members at opposite sides of the blades are oppositely and rapidly rotated about a common axis extending substantially centrally through the drupe. This degree of rotation may vary, but it must be sufficient to cleanly and fully separate the drupe halves from the pit. A half rotation has been found to be satisfactory, for each drupe gripping member.

This rotation, combined with the pressure of the central plates **83** against the drupes (and which central plates rotate with the drupe gripping members) and with the pressure of the drupe gripping members **108** on the halves, will cleanly shear the drupes from the pits leaving the pinkish or brownish flavor bearing cells that are next to the pit with the fruit halves. This is with clingstone drupes such as peaches.

As soon as the twisting of the halves from the pit is completed, the drupe gripping members open and withdraw and the central plates **83** also withdraw, permitting the halves and the pit to fall onto the dumping chute **215**, and this cycle is then repeated until the machine is stopped.

In the case of clingstone peaches, it has been found that the flavor bearing cells close to if not in actual adherance to the pit and the juice from said cells, have heretofore been lost where the pitting has been done by means of saws and pitting knives. By the present machine these cells and juice are saved. It has also been found that all of the meat from clingstone peaches will be saved by the present machine, whereas approximately 10% and more, by weight, was lost by pitters that separate the pit from the fruit by means of knives.

The radially inward and axial pressure on the peach halves, coupled with the quick rotation of the halves to shear them from their pits tends to fracture some of the cells to tenderize the fruit causing it to have much the same physical characteristics of freestone peaches.

The quick action rotation of the fruit halves has been mentioned. The rapidity of the twisting action, immediately after the drupe gripping members have been moved into firm engagement with the drupe halves, is important and by the mechanism shown the rotation of the drupe halves oppositely is simultaneous and at exactly the same rate of speed since the movement of a single means, in this case the Geneva spider, actuates both of the sets of drupe gripping members.

We claim:

1. A drupe pitting machine comprising; a main housing having a medial vertical plane, generally vertically extending arms swingably depending from said housing for movement of their lower ends toward and away from a point in said plane, drupe supporting means in said plane and between said lower ends arranged and adapted for supporting a drupe at said point, drupe gripping means carried by the lower ends of said arms movable therewith generally axially of an axis extending through said point normal to said plane and into gripping relation with the outer surfaces of the halves of a drupe held at said point, means for rotating said drupe gripping means including two pairs of angularly extending gear connected drive shafts one of each of which is connected with each of said drupe gripping means and is actuatable for rotating said drupe gripping means about said axis when said drupe gripping means are in engagement with said halves, the other shaft of each pair thereof extending into said housing and depending therefrom and being swingable with said arms and means within said housing connected with the other shaft of each pair for actuating said one shaft of each pair for rotation, a pair of angle housings respectively enclosing the gear connected ends of each pair of said shafts and securing said ends in gear connected relationship, and the said other shaft of each pair including a universal joint.

2. A drupe pitting machine comprising; a main housing having a medial vertical plane, generally vertically extending arms swingably depending from said housing for movement of their lower ends toward and away from a point in said plane, drupe supporting means in said plane and between said lower ends arranged and adapted for supporting a drupe at said point, drupe gripping means carried by the lower ends of said arms movable therewith generally axially of an axis extending through said point normal to said plane and into gripping relation with the outer surfaces of the halves of a drupe held at said point, means for rotating said drupe gripping means including two pairs of angularly extending gear connected drive shafts one of each of which is connected with each of said drupe gripping means and is actuatable for rotating said drupe gripping means about said axis when said drupe gripping means are in engagement with said halves, the other shaft of each pair thereof extending into said housing and depending therefrom and being swingable with said arms and means within said housing connected with the other shaft of each pair for actuating said one shaft of each pair for rotation, a pair of angle housings respectively enclosing the gear connected ends of each pair of said shafts and securing said ends in gear connected relationship, and the said other shaft of each pair including a universal joint, said vertically extending arms including a spaced pair of each side of said plane pivotally connected at their lower ends with said angle housings, the spacing between the arms of each pair being in a direction away from said plane.

3. A drupe pitting machine comprising; a main housing having a medial vertical plane, generally vertically extending arms swingably depending from said housing for movement of their lower ends toward and away from a point in said plane, drupe supporting means in said plane and between said lower ends arranged and adapted for supporting a drupe at said point, drupe gripping means carried by the lower ends of said arms movable therewith generally axially of an axis extending through said point normal to said plane and into gripping relation with the outer surfaces of the halves of a drupe held at said point, means for rotating said drupe gripping means including two pairs of angularly extending gear connected drive shafts one of each of which is connected with each of said drupe gripping means and is actuatable for rotating said drupe gripping means about said axis when said drupe gripping means are in engagement with said halves, the other shaft of each pair thereof extending into said housing and depending therefrom and being swingable with said arms and means within said housing connected with the other shaft of each pair for actuating said one shaft of each pair for rotation, said drupe gripping means being disposed below said housing, means supporting said housing elevated above a base, and a

curtain supported on said housing for movement to and from a vertically extending shielding position extending across said plane at one side of said point.

4. A drupe pitting machine comprising; a support having a medial vertical plane, a pair of arms swingably depending from said support at opposite sides of said plane for movement of their lower ends toward and away from a fixed point in said plane, pit gripping means disposed in said plane and between said lower ends actuatable for movement into holding relation with the pit within a drupe positioned at said point for holding the pit of a drupe and for supporting such drupe by its pit at said point with its halves at opposite sides of said plane, means connected with said pit gripping means for actuating the latter for said movement, drupe gripping means carried by said arms for movement therewith toward and away from said point including members actuatable for movement into gripping relation with said halves, and means connected with said members for actuating them for said movement and means connected with said pit gripping means and with said drupe gripping means for rotating said pit gripping means and said drupe gripping means relative to each other when they are in pit gripping and drupe gripping relationship respectively.

5. In a drupe pitting machine; a pair of pit gripping blades disposed in one plane and provided with generally opposed pit gripping edges, means connected with one blade of said pair for holding said one blade stationary, means connected with the other blade of said pair supporting said other blade for swinging said other blade and its pit gripping edge about an axis normal to said plane toward and away from the pit gripping edge of said one blade for gripping the pit of a whole drupe between said pit gripping edges when said other blade is swung toward said one blade, means connected with said other blade for so moving said other blade toward said one blade, said last mentioned means including a spring in operative relation to said other blade for yieldably urging said other blade toward said pit to enable a yieldable engagement between said other blade and such pit, the pit gripping edge of said one blade being formed with an outwardly opening recess directed generally toward the pit gripping edge of said other blade for holding the edge of a pit therein and the pit gripping edge of said other blade being relatively thick, guide means respectively connected with said pair of blades in coacting relation therewith for holding said other blade in the plane of said one blade upon swinging of said other blade, said guide means including adjacent curved edges on the blades of said pair concentric with said axis and arms on said other blade swingable about said axis and positioned at each side of a portion of said one blade.

6. In a pitter for drupes, a pair of housings each supporting a right angle drive mechanism including a vertically extending drive shaft and a horizontally extending driven shaft with said driven shafts coaxial and extending toward each other, means connected with said drive shafts for simultaneously rotating said drive shafts in opposite directions whereby said driven shafts will be rotated oppositely, supporting means supporting said drive mechanisms for swinging of said drive mechanisms toward and away from each other with the axes of said driven shafts substantially coaxial during such swinging, means operatively connected with said drive mechanisms for so swinging them, drupe gripping means connected with said mechanisms for movement therewith toward and away from a vertical plane midway between said mechanisms, spaced pit gripping means positioned between said drupe gripping means movable in said plane into engagement with the pit of a drupe bisected in said plane, means connected with said pit gripping means for moving the latter into said engagement means connecting said driven shafts with said drupe gripping means for rotating the latter about said axis and relative to said pit gripping means when said pit gripping means is in pit engaging relationship.

7. In a pitter for drupes, a pair of housings each supporting a right angle drive mechanism including a vertically extending drive shaft and a horizontally extending driven shaft with said driven shafts coaxial and extending toward each other, means connected with said drive shafts for simultaneously rotating said drive shafts in opposite directions whereby said driven shafts will be rotated oppositely, supporting means supporting said drive mechanisms for swinging of said drive mechanisms toward and away from each other with the axes of said driven shafts substantially coaxial during such swinging, means operatively connected with said drive mechanisms for so swinging them, drupe gripping means connected with said mechanisms for movement therewith toward and away from a vertical plane midway between said mechanisms, spaced pit gripping means positioned between said drupe gripping means movable in said plane into engagement with the pit of a drupe bisected in said plane, means connected with said pit gripping means for moving the latter into said engagement means connecting said driven shafts with said drupe gripping means for rotating the latter about said axis and relative to said pit gripping means when said pit gripping means is in pit engaging relationship, said drupe gripping means being elements equally spaced about said axis and means supporting said elements so spaced and for movement toward and away from the axis, a stationary frame, means operatively connected with said elements and with said frame actuated for moving said elements toward said axis by movement of said drupe gripping means toward said plane.

8. A drupe pitting machine comprising: a main housing, vertically extending arms depending from said housing, horizontal pivots suspending said arms at their upper ends from said housing for swinging their lower ends toward and away from each other about the axes of said pivots, opposedly positioned drupe gripping means carried by said arms at their lower ends and supported for movement into gripping relation with opposite outer surfaces of a drupe that may be positioned between them when said lower ends are swung toward each other, means on said lower ends supporting said drupe gripping means for rotation about a common axis horizontally extending through substantially the center of the pit within such drupe when said drupe gripping means are in drupe gripping position, pit gripping means supported by said housing in a position between said drupe gripping means for movement into pit gripping engagement with such pit for holding said pit stationary when said drupe gripping means are in said drupe gripping position, and means within said housing respectively connected with said arms for swinging them toward and away from each other and connected with said drupe gripping means for rotating the latter about said axis and connected with said pit gripping means for moving them into pit gripping relation when said drupe gripping means are moved to said drupe gripping position.

9. A drupe pitting machine comprising: a main housing, arms equally spaced at opposite sides of a predetermined plane extending through said housing, pivots carried by said housing supporting said arms for swinging one of the ends of the latter toward and away from a predetermined point in said plane, drupe feeding means adapted to carry a drupe and supported for movement in said plane to and from said point for delivering a drupe to said point, a pair of drupe gripping means respectively carried by said one of the ends of said arms at each of the opposite sides of said plane for movement with said one of the ends of said arms to and from said point and into and out of gripping relation with the opposite sides of a drupe delivered to said point, means carried by said housing and connected with said drupe gripping means for rotating the latter when said drupe gripping means is in drupe gripping relation, pit gripping means supported between said one of the ends of said arms in said plane and at said point movable into and out of pit

gripping relation with the pit of a drupe delivered to said point, arm actuating means connected with said arms for swinging said one of their ends, feed actuating means connected with said drupe feeding means for effecting said movement of the latter, means connected with said pit gripping means for actuating said pit gripping means, a single continuously rotatable shaft carried by said housing, and separate means on said single shaft connected with said arm actuating means and with said feed actuating means and with means for actuating the pit gripping means for effecting the operation of each of said actuating means.

10. A pitting machine for pitting drupes comprising: a pair of spaced substantially axially aligned shafts, separate means supporting each of said shafts for rotation and for movement therewith, spaced opposed drupe engaging means respectively on the adjacent ends of said shafts for rotation therewith and for engaging the opposite sides of a drupe adapted to be positioned therebetween when said shafts are moved toward each other, spaced substantially parallel arms pivotally connected at one of their corresponding ends to each of said separate means, a support and means pivotally connecting the other corresponding ends of said arms to said support for swinging said separate means and the drupe engaging means carried thereby toward each other for engagement of said drupe engaging means with said opposite sides of such drupe and for holding said shafts substantially aligned during said swinging, means connected with said shafts for rotating them when said drupe engaging means are moved toward each other and into said engagement with such drupe, and means positioned between said drupe engaging means for engaging and for holding the pit of a drupe and for supporting such drupe for engagement by said drupe engaging means.

11. A clingstone drupe pitting machine comprising: a support, a pair of corresponding arms swingably connected at one of their ends to said support for swinging of their opposite ends toward and away from a point midway between said opposite ends about axis respectively extending through said one of their ends, pit engaging means on said support positioned between said opposite ends actuatable for movement into holding engagement with the edges of the pit of a drupe with the flesh of the drupe adhered to said pit, means connected with said pit engaging means for actuating the latter for said movement, drupe engaging means on the lower ends of said arms respectively movable into engagement with the outer surface of the flesh of said drupe upon movement of said opposite ends of said arms, means connected with said drupe engaging means for effecting said movement of the latter, and means on said support connected with said drupe and pit engaging means for causing relative rotation between them about an axis extending through said flesh and said pit for twisting said flesh from said pit when said drupe engaging means is in drupe engaging relation and means connected with said drupe engaging means for holding it substantially coaxial relative to said axis during movement of said drupe engaging means toward a drupe at said point.

12. In a drupe pitter having spaced opposed drupe gripping means supported for movement into and out of gripping engagement with the opposite halves of a drupe in a position between them, a pair of spaced substantially coplanar blades having spaced opposed pit engaging edges, means supporting one blade of said pair in a location with its pit engaging edge in engagement with one side of the pit of a drupe in said position of the latter between said drupe gripping means, means supporting the other blade of said pair thereof for oscillatory movement of its pit gripping edge about an axis perpendicular to the plane in which said blades are disposed into and out of firm but yieldable engagement with the other side of such pit, yieldable means operatively connected with said other blade for yieldably holding it in firm engagement with such pit, means connected with said other blade for so oscillating the latter, and for holding said other blade in its firm engagement with said pit when said drupe gripping means are in gripping relation to said halves, and means connected with said drupe gripping means for rotating the latter relative to said pit engaging blades when the latter are in firm pit engaging relationship.

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