Feb. 26, 1963 M. K. BUCHNER ETAL 3,078,889

PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

Filed June 25, 1958 19 Sheets-Sheet 1

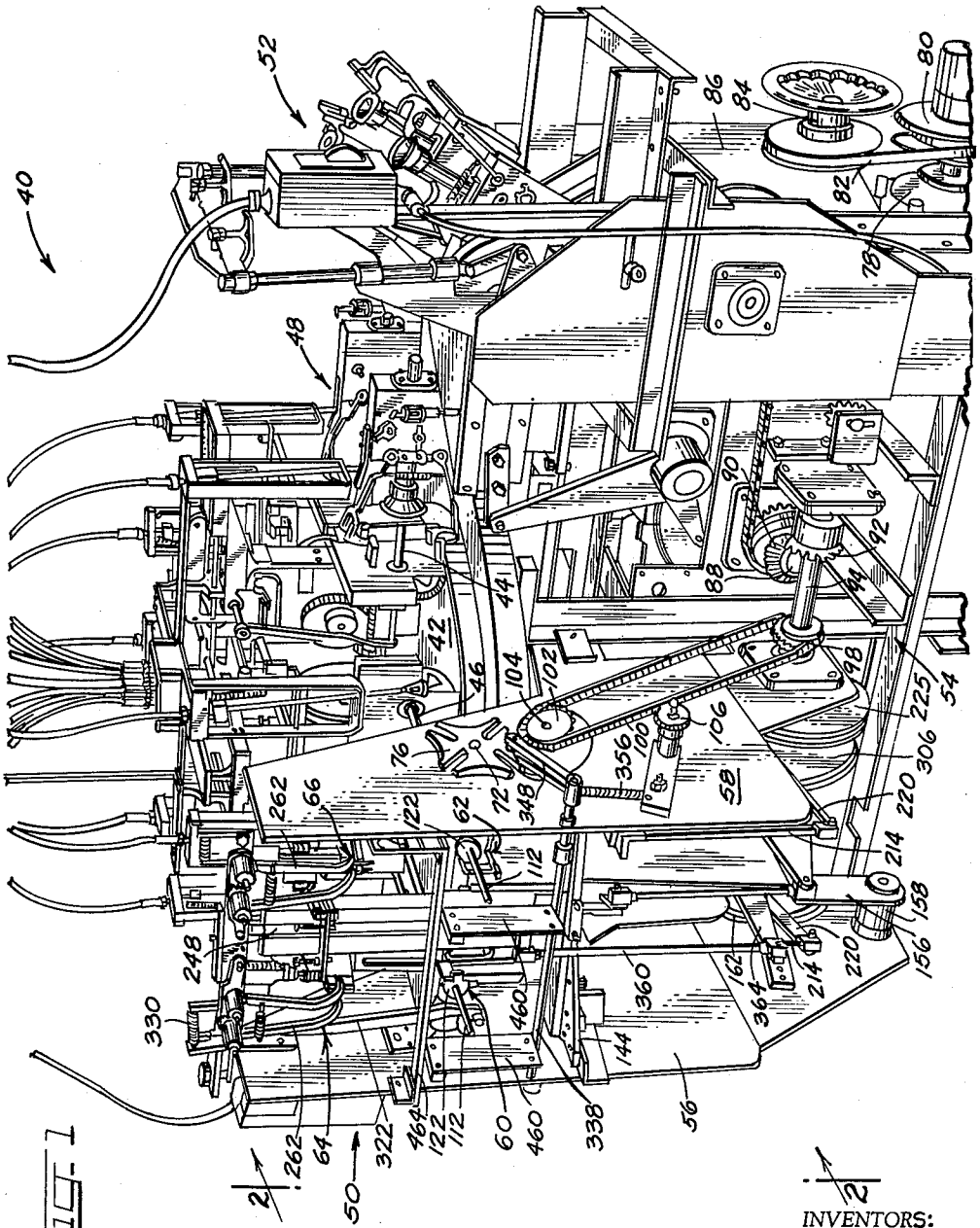

FIG. 1

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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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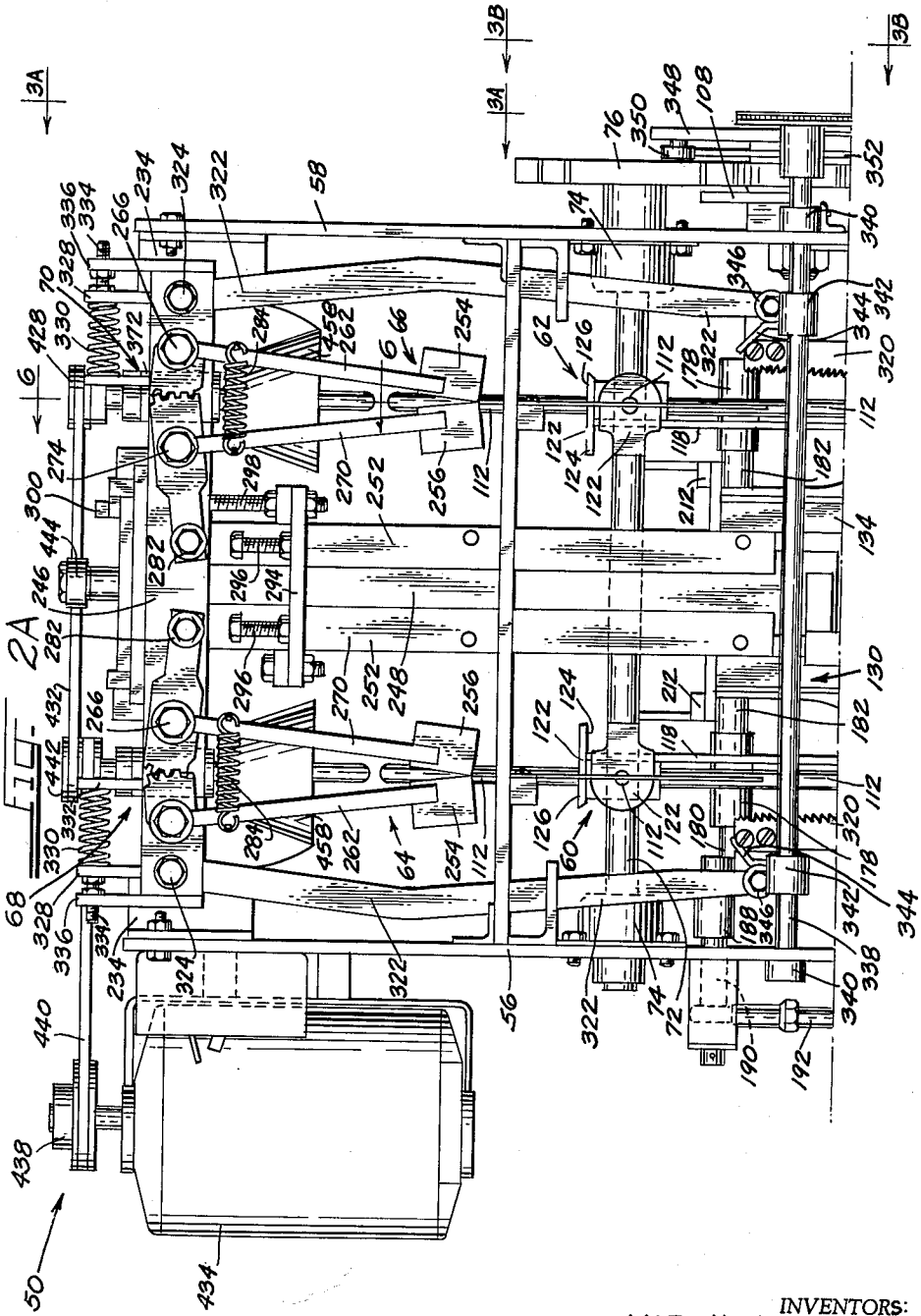

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Feb. 26, 1963 M. K. BUCHNER ETAL 3,078,889

PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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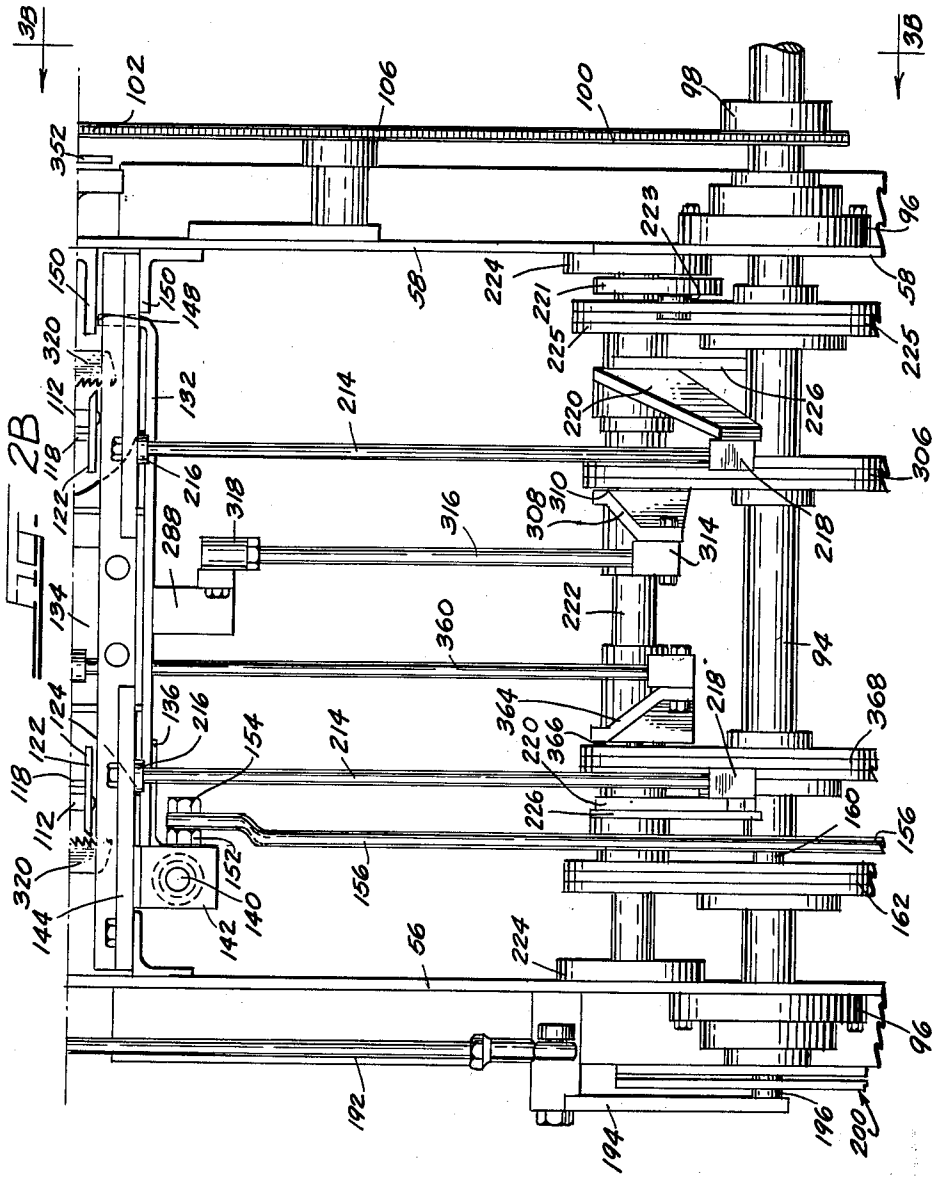

FIG. 2B

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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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FIG. 4

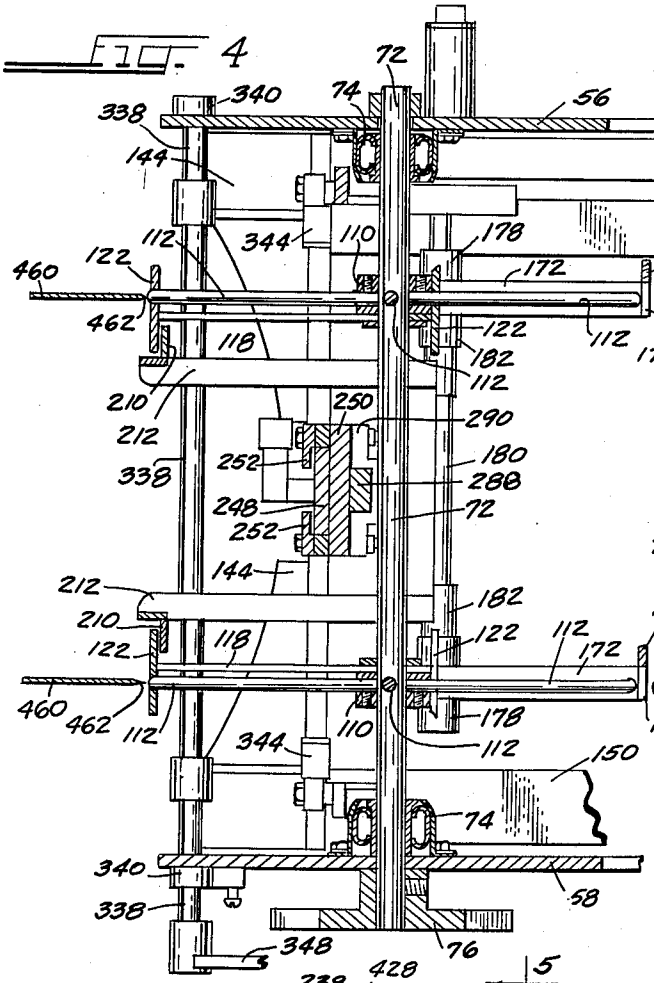


FIG. 6

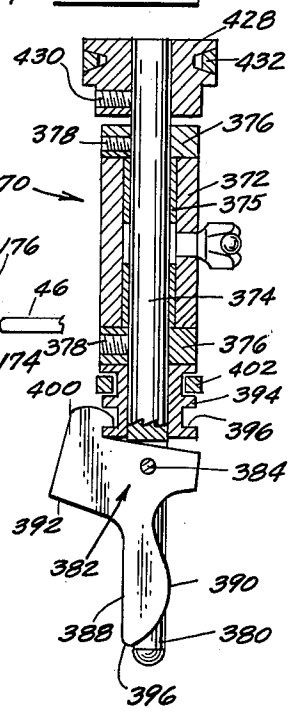
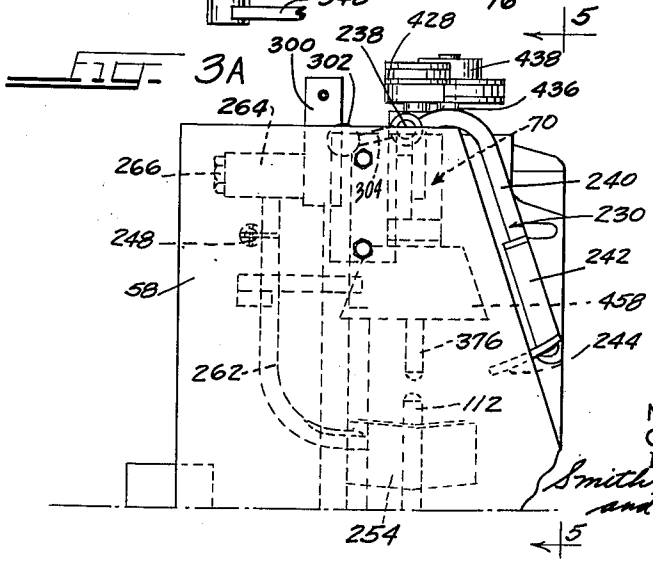


FIG. 3A



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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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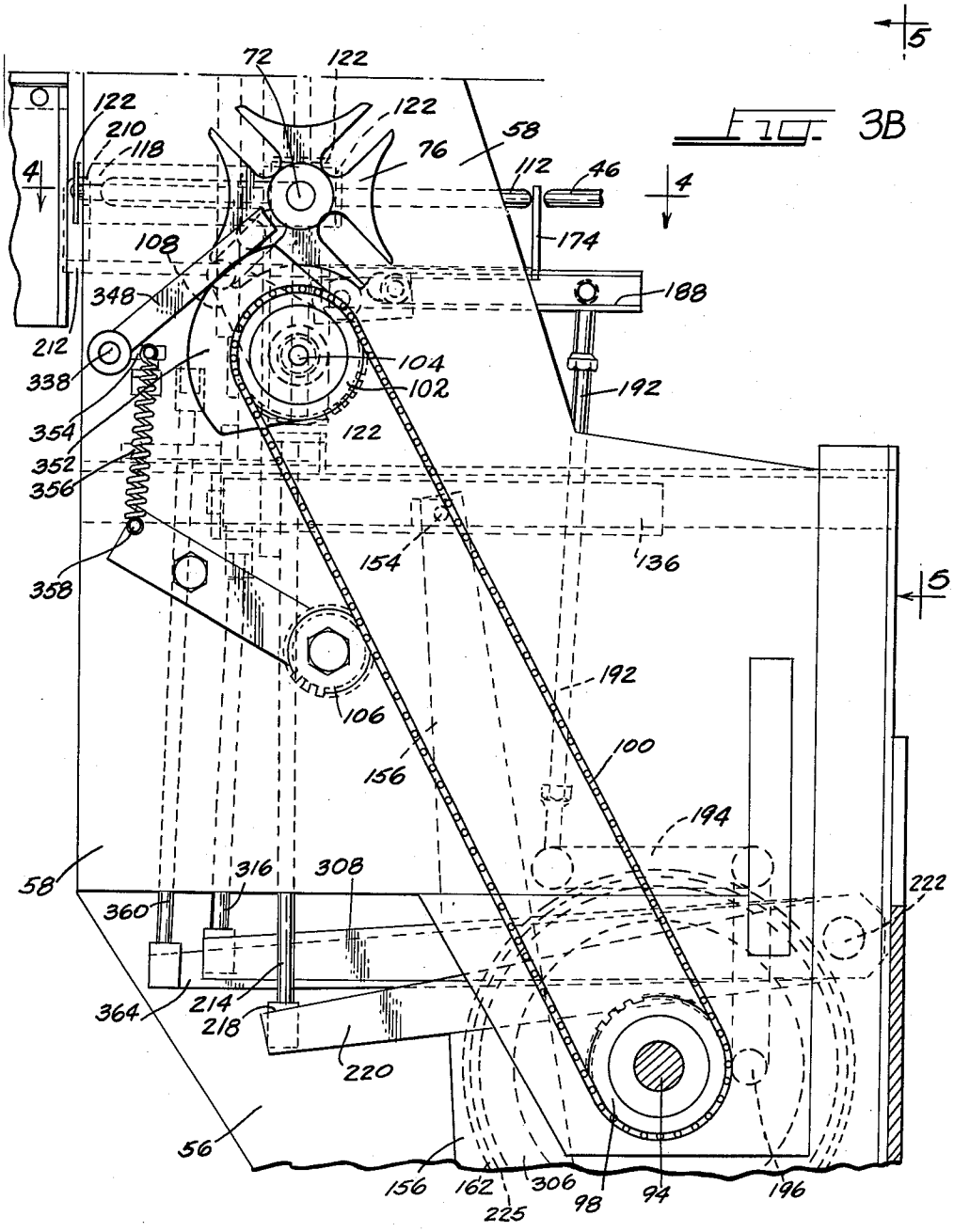

Fig. 3B

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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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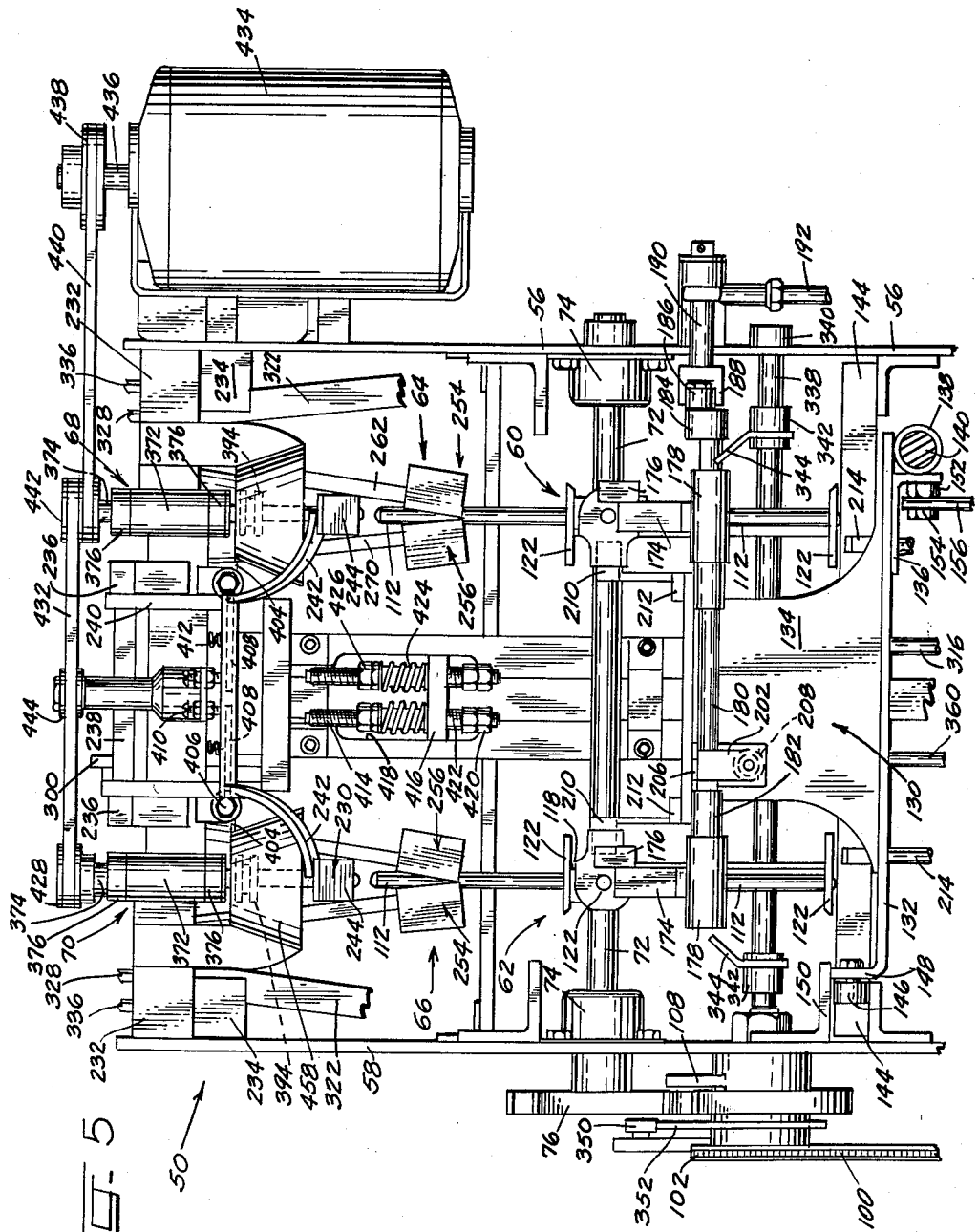

FIG. 5

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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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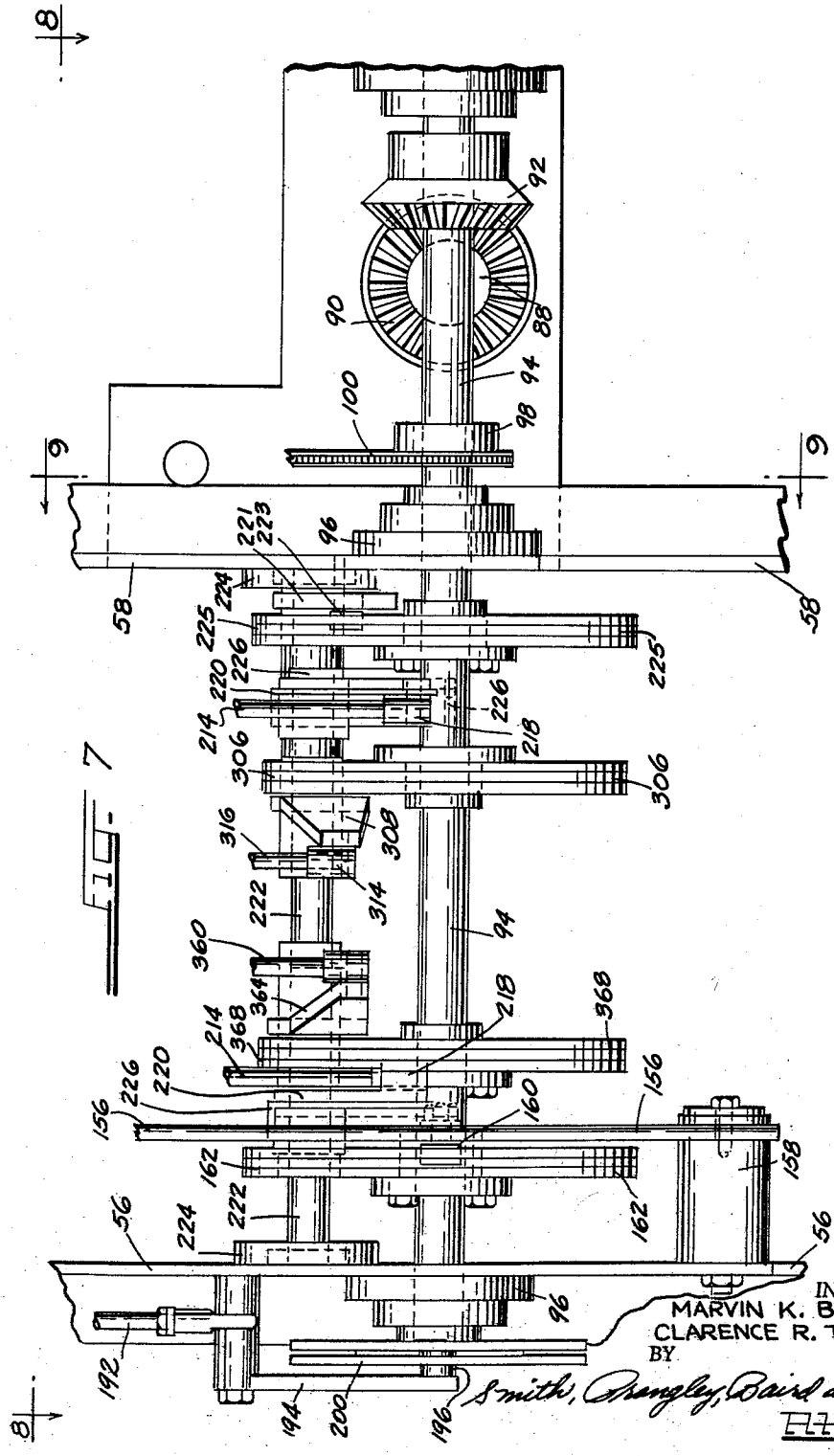

FIG. 7

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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

Filed June 25, 1958 19 Sheets-Sheet 8

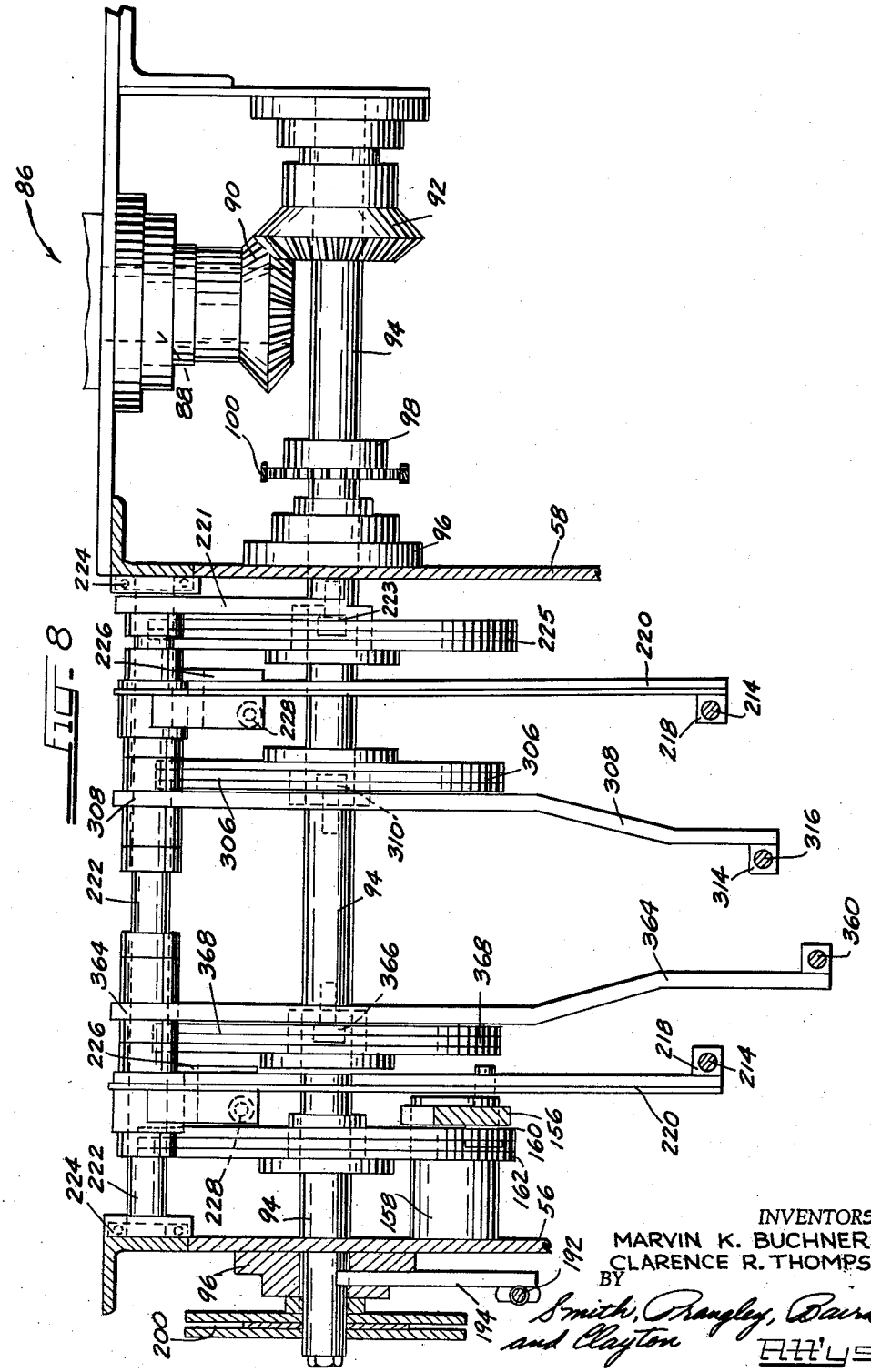

FIG. 8

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Feb. 26, 1963 M. K. BUCHNER ETAL 3,078,889

PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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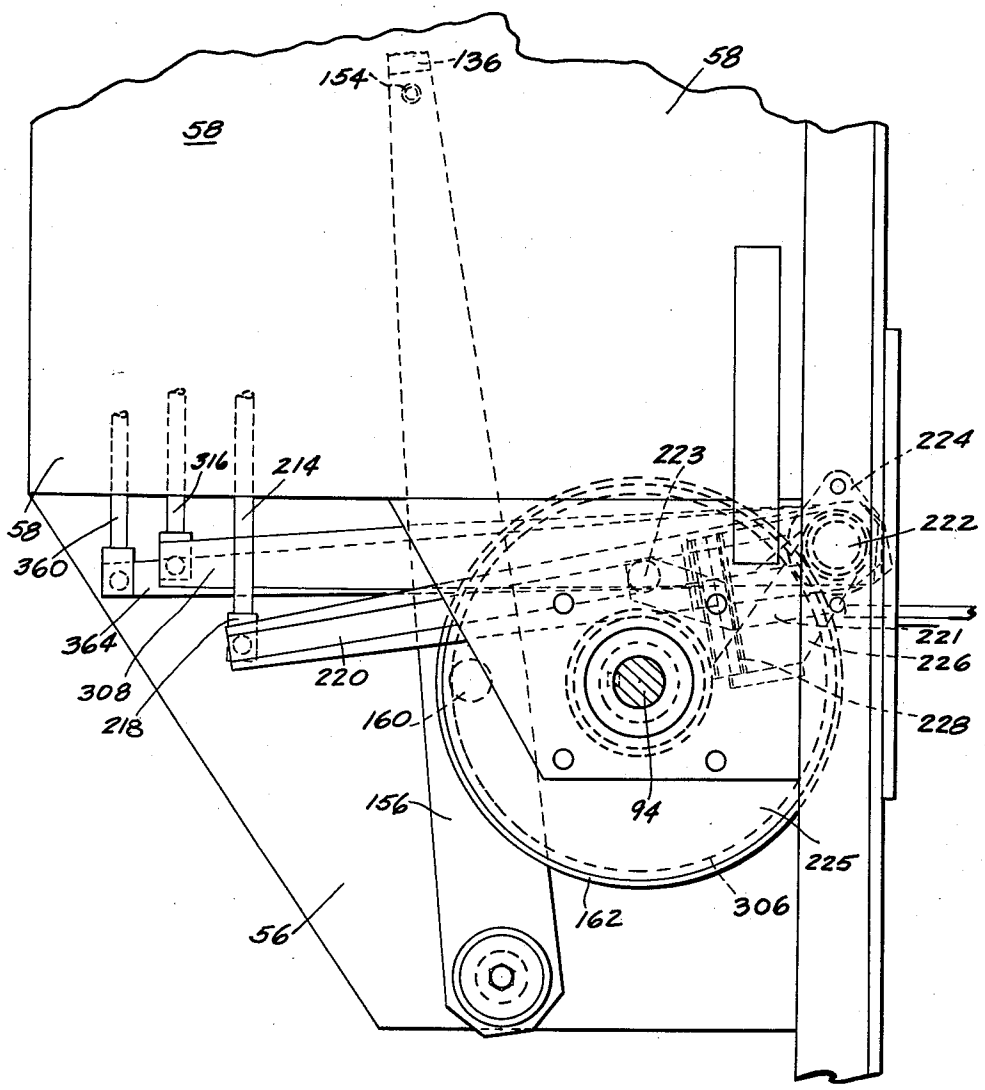
FIG. 9



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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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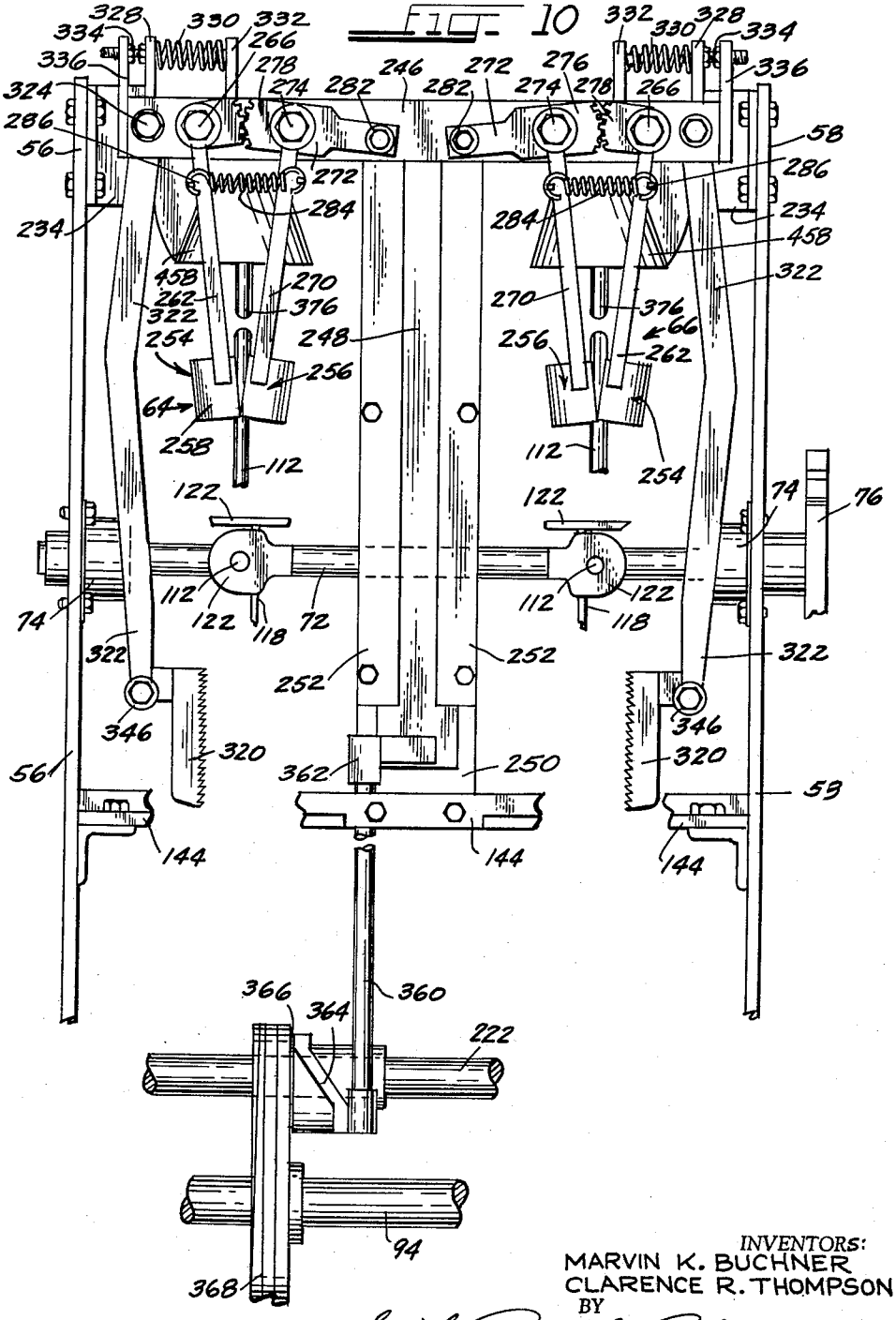
FIG. 10



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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

Filed June 25, 1958 19 Sheets-Sheet 11

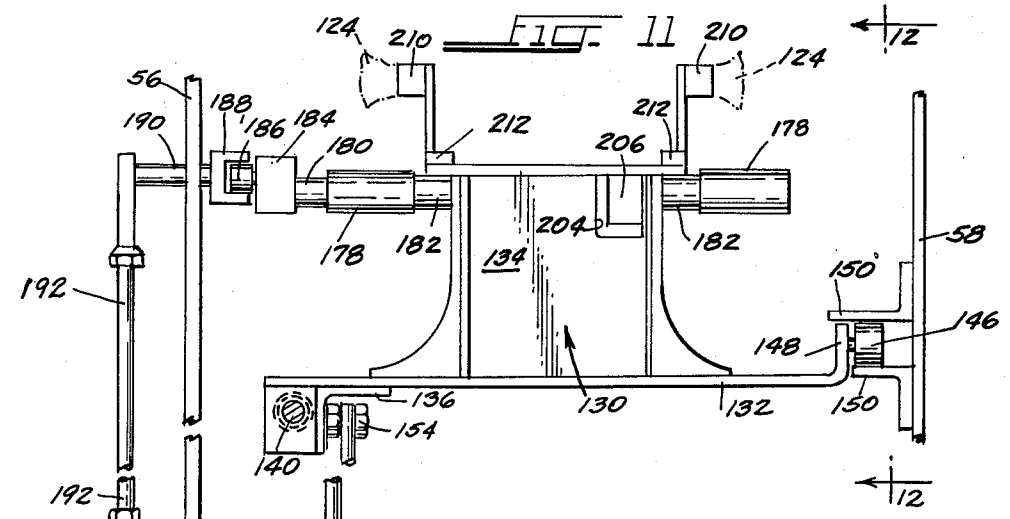

FIG. 11

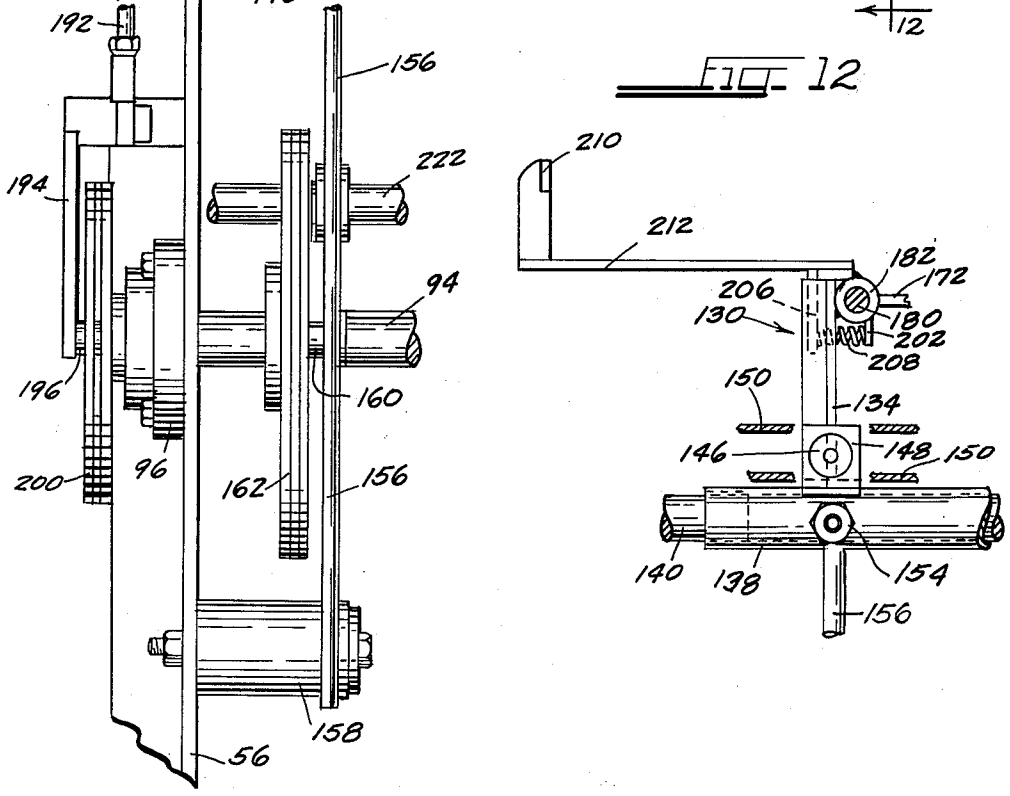

FIG. 12

INVENTORS:
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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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FIG. 13

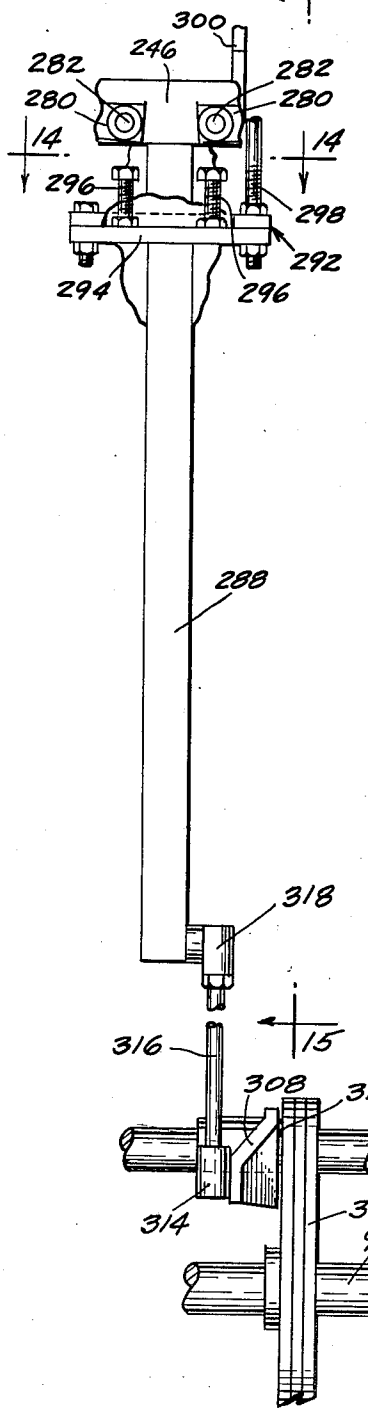


FIG. 14

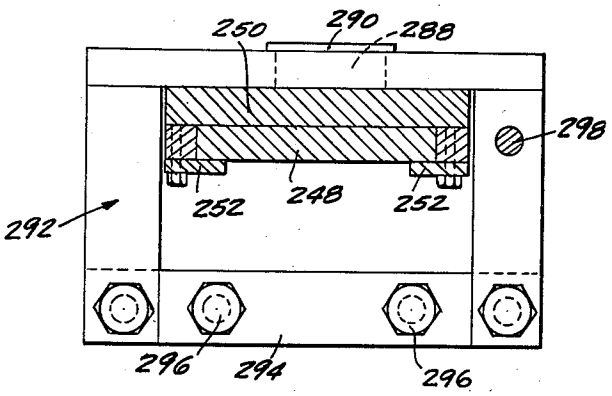
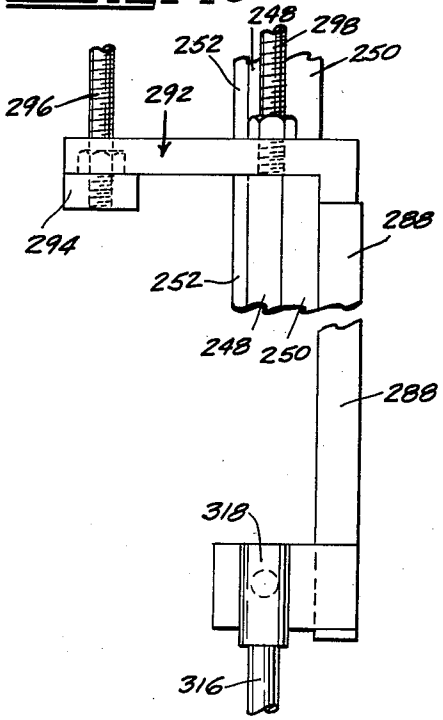


FIG. 15



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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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FIG. 16

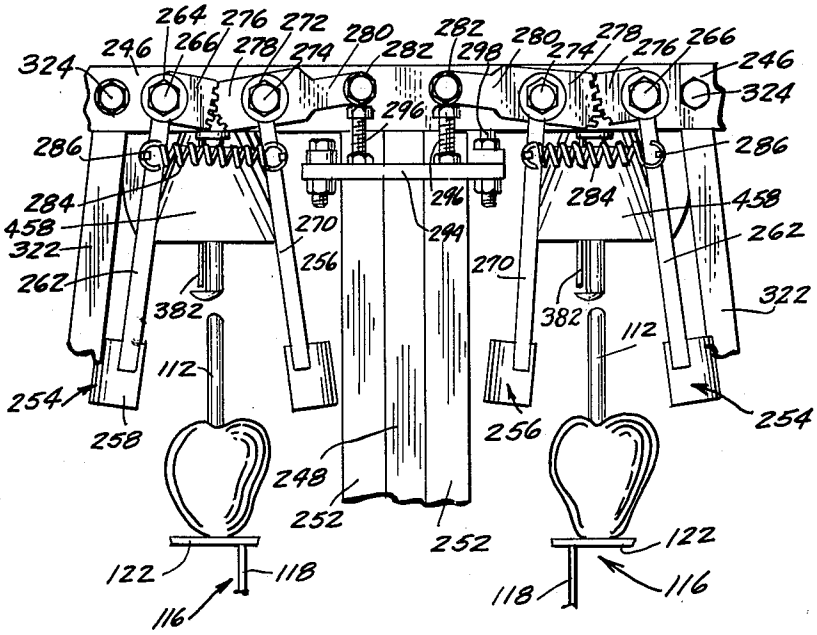
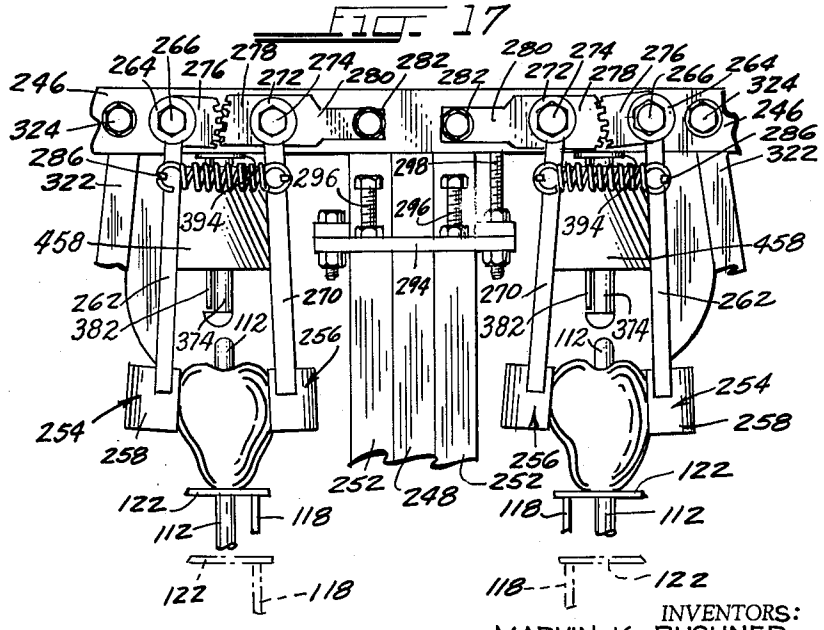


FIG. 17



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Feb. 26, 1963 M. K. BUCHNER ETAL 3,078,889

PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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FIG. 18

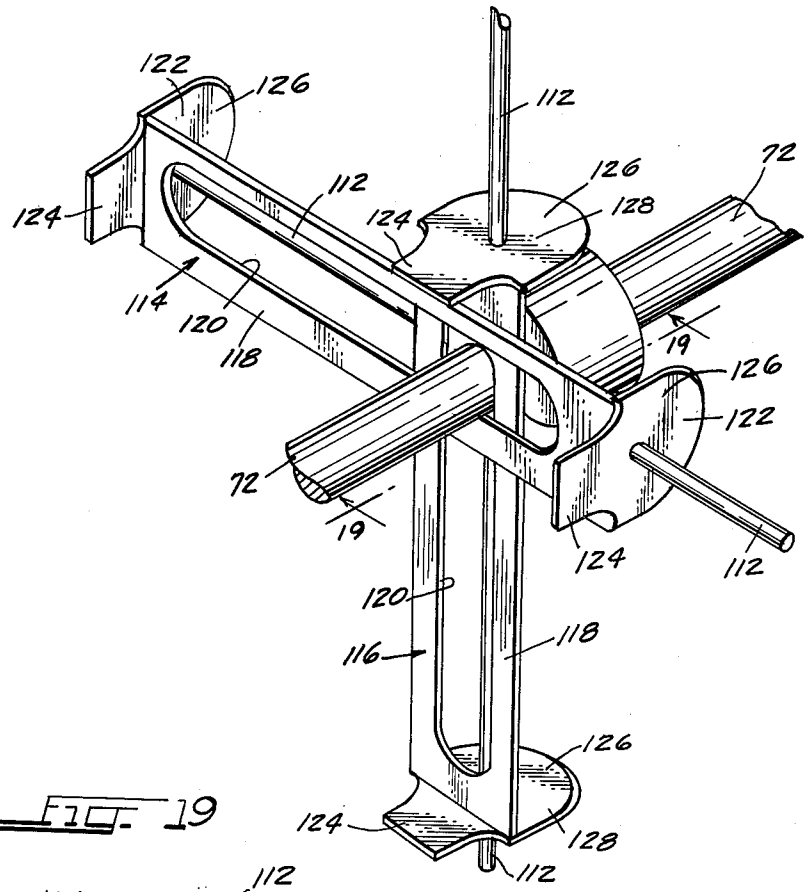
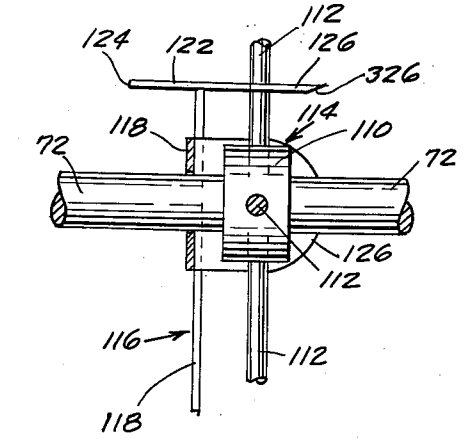


FIG. 19



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Feb. 26, 1963 M. K. BUCHNER ETAL 3,078,889

PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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FIG. 20

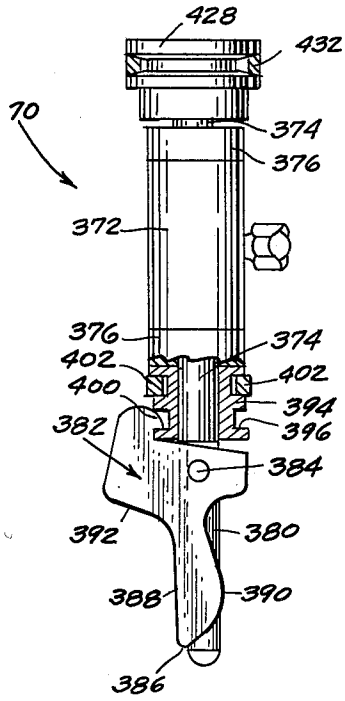


FIG. 21

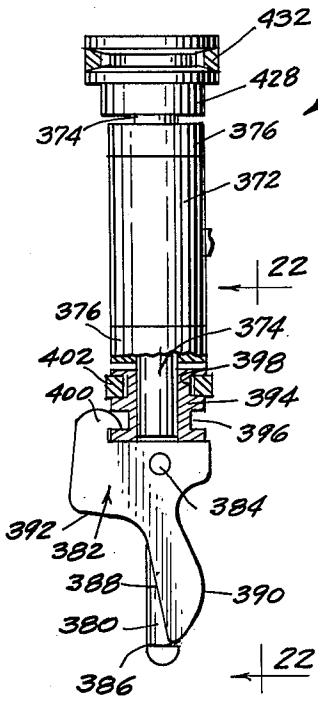


FIG. 22

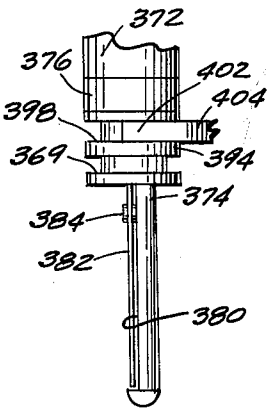
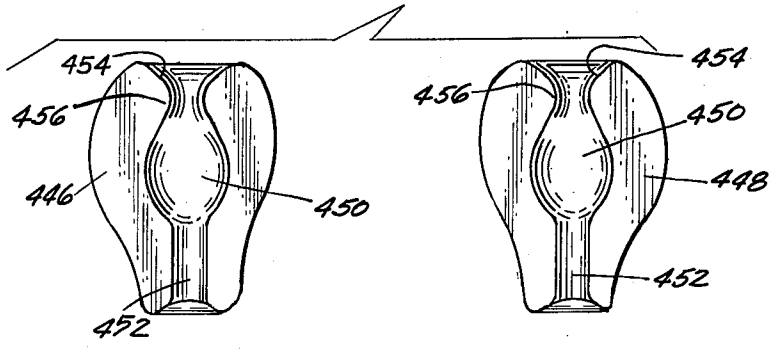


FIG. 29



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Feb. 26, 1963 M. K. BUCHNER ETAL 3,078,889

PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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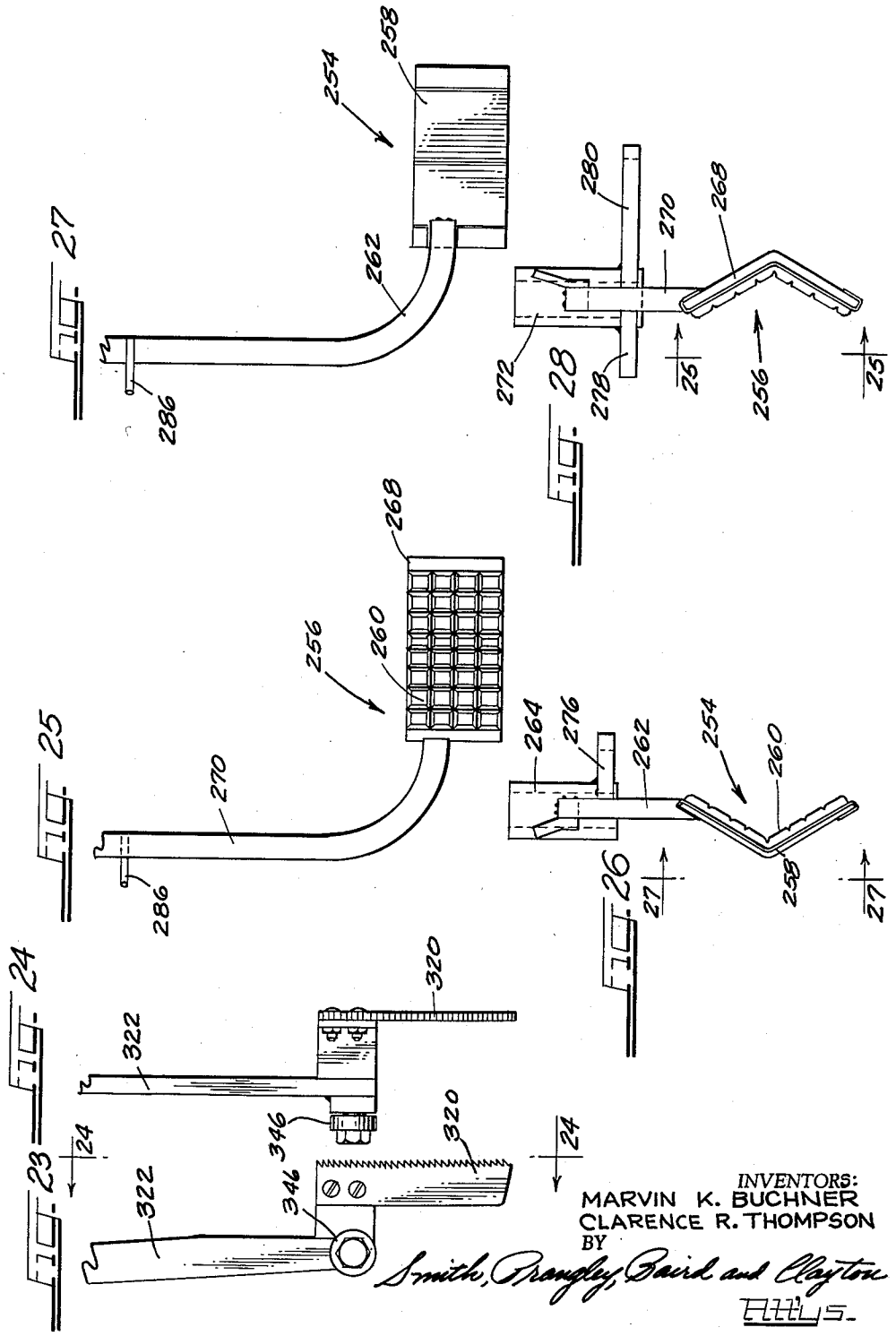

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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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FIG. 30

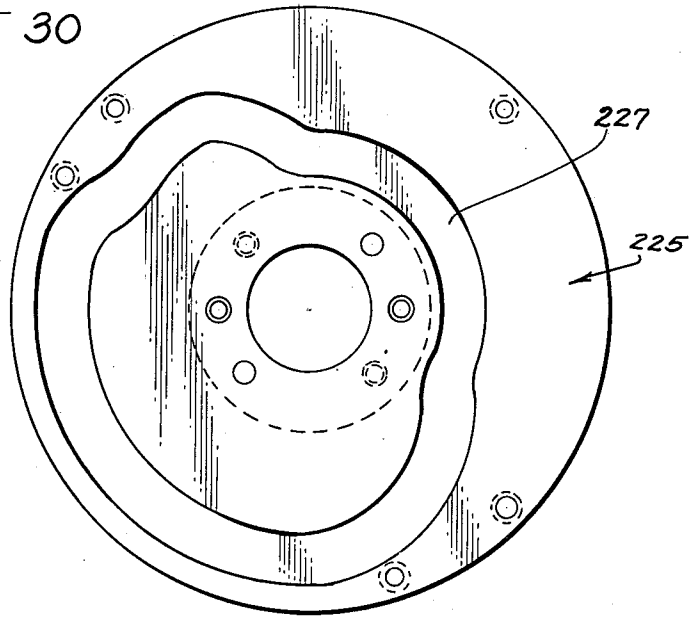
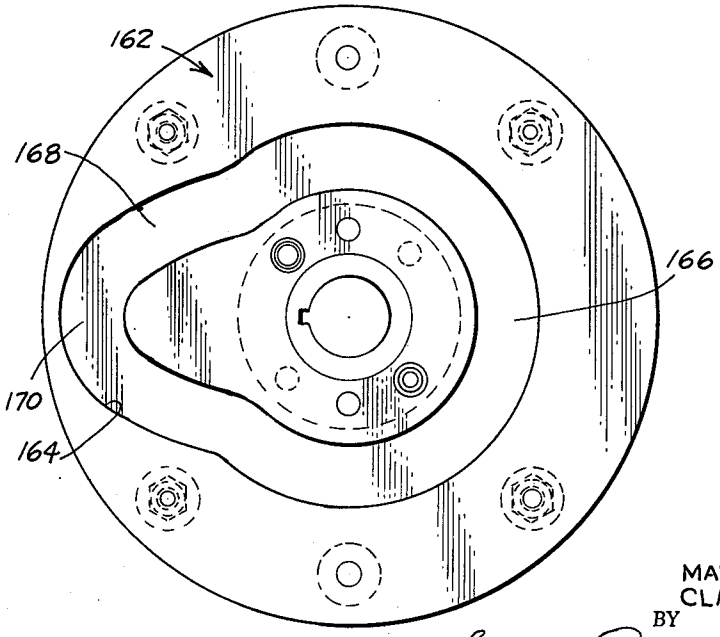


FIG. 31



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Feb. 26, 1963 M. K. BUCHNER ETAL 3,078,889

PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

Filed June 25, 1958 19 Sheets-Sheet 18

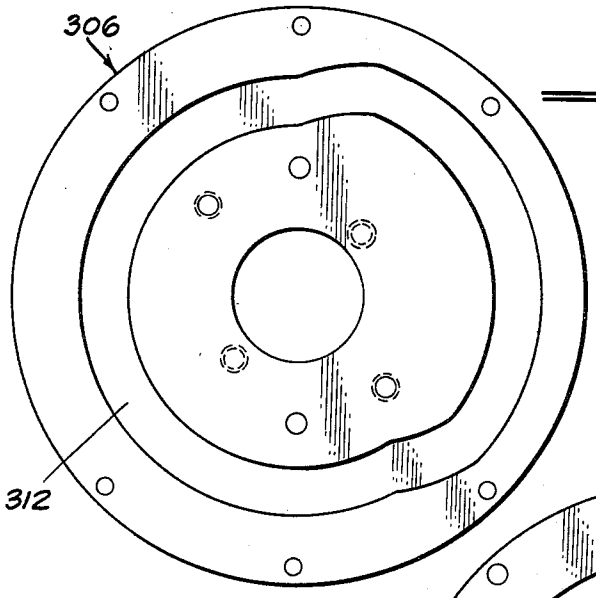

FIG. 32

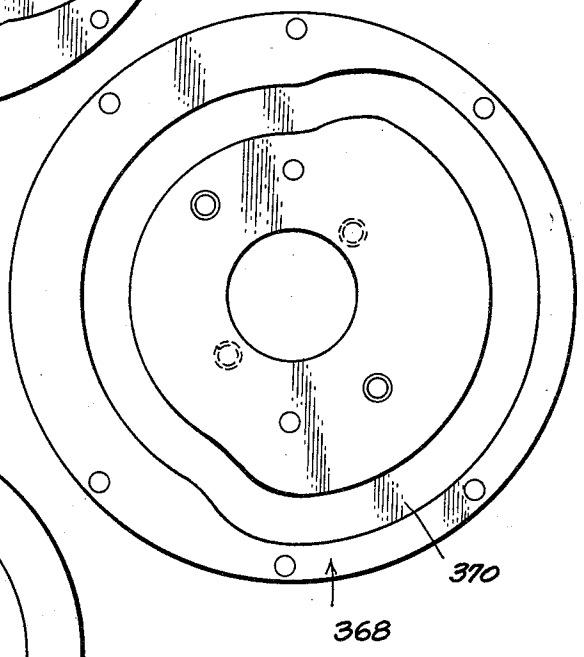

FIG. 33

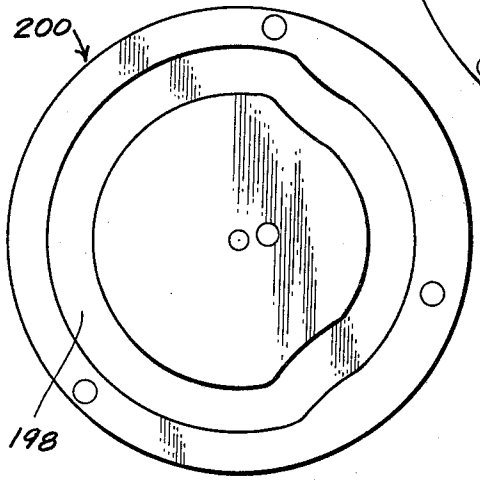

FIG. 34

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PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

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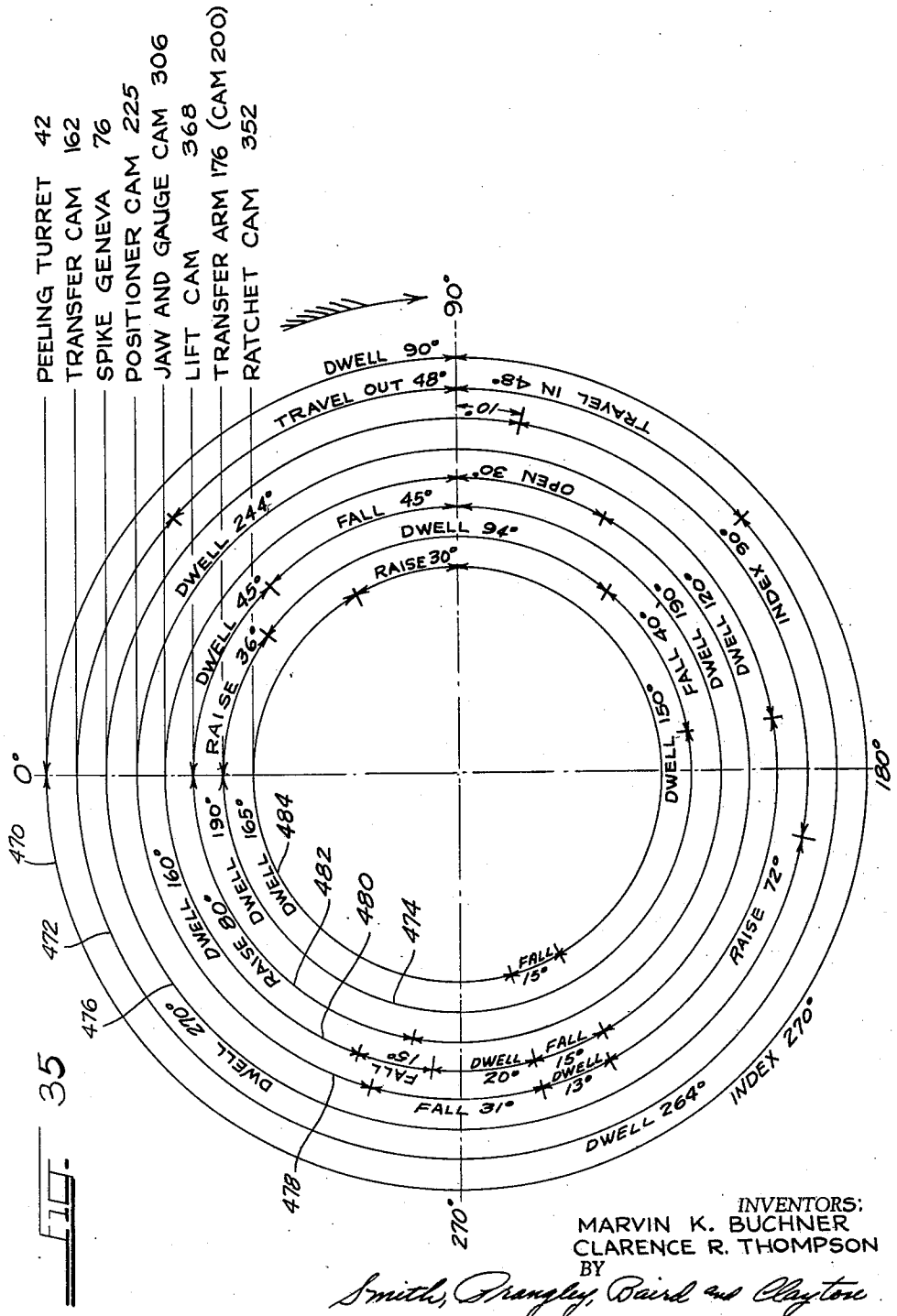

FIG. 35

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United States Patent Office

3,078,889

Patented Feb. 26, 1963

3,078,889

PEAR FEEDING, SEED CELLING AND SPLITTING MACHINE

Marvin K. Buchner and Clarence R. Thompson, Olympia, Wash., assignors, by mesne assignments, to FMC Corporation, a corporation of Delaware

Filed June 25, 1958, Ser. No. 744,538
29 Claims. (Cl. 146—42)

This invention relates to a pear preparation machine and more particularly to a machine for feeding pears to a seed celling station, an improved seed celling mechanism, pear halving mechanism and processed fruit discharging mechanism.

In the fruit canning industry today it is desirable that fruit preparation machines meet certain demands which are brought about by the economic forces and trends in the industry. In the case of pear preparation machines, the machine must meet certain basic requirements among others in respect to (1) the cost of manufacture of the machine and the expense of maintenance, (2) the quality of the prepared fruit produced by the machine, and (3) the ratio of the tonnage output of processed fruit from the machine to the tonnage input of untreated fruit to the machine.

High speed pear processing machines provided heretofore have often sacrificed quality of the prepared fruit in an effort to obtain higher rates of production and a higher ratio of tonnage output of fruit from the machine to the tonnage input of fruit to the machine. In seed celling apparatus, for example, a cylindrical plug including the seed cell has been cut from the fruit since this provides a convenient and rapid manner of seed celling. Such seed celling processes, however, provide a fruit which is less desirable from the standpoint of appearance of the prepared fruit, particularly when halved. It is desirable to produce seed celled pear halves which have a "bridge" between the seed cell cavity and the blossom end of the fruit, i.e., the seed cell cavity has a greater diameter than the diameter of the passage connecting the blossom end of the fruit and the seed cell cavity. Prior high speed machines which have provided the bridge whereby to enhance the appearance of the fruit have been complicated in structure, difficult to maintain and operate, and inherently slow in operation.

In addition to improving the appearance of the prepared fruit, the provision of a bridge between the seed cell cavity and the blossom end of the fruit results in an increase in the ratio of the tonnage output of fruit from the machine to the tonnage input of fruit to the machine. This increased yield of prepared fruit is important economically.

Certain pear preparation machines heretofore which have been designed to provide a good appearance of fruit and a high yield have required that the pears fed thereto be closely graded as to size and shape. The grading of the pears adds another element of cost and requires additional machinery and manpower. It is desirable that the pear preparation machine and particularly the seed celling section thereof be capable of receiving and treating ungraded pears. This is particularly desirable and advantageous when the other portions of the fruit preparation machine such as the coring section, peeling section and bobbing section are capable of handling ungraded fruit. An example of such a machine is that shown in

the co-pending application of Marvin K. Buchner and Clarence R. Thompson, Serial No. 732,555, filed May 2, 1958, now U.S. Patent No. 2,953,236 granted September 20, 1960.

Accordingly, it is an important object of the present invention to provide an improved seed celling mechanism for pear preparation machines.

More specifically, it is an object of the invention to provide an improved seed celling mechanism for pear preparation machines which will provide a bridge between the seed cell cavity and the blossom end of the fruit whereby to improve the appearance of the prepared fruit halves and to increase the yield of prepared fruit from the machine.

Another object of the invention is to provide an improved seed celling machanism for fruit preparation machines of the type set forth which can adequately seed cell ungraded fruit.

Still another object of the invention is to provide an improved feeding and transfer mechanism to take peeled fruit from a peeling spindle and transfer it to a seed celling mechanism.

In connection with the foregoing object it is another object of the invention to provide a feed mechanism which can feed ungraded fruit from the peeling spindles to the seed celling mechanism and accurately position the fruit with respect to the operative portions of the seed celling mechanism regardless of the size and shape of the fruit.

Yet another object of the invention is to provide a seed celling mechanism of the type set forth which operates rapidly to produce fruit that is attractive and clean in appearance while producing high yields of prepared fruit.

A further object of the invention is to provide an improved discharge mechanism to discharge fruit from the seed celling mechanism.

In conjunction with the foregoing object it is another object of the invention to provide structure for halving the fruit during discharge thereof from the seed celling mechanism.

These and other objects and advantages of the invention will be better understood from the following description when taken in conjunction with the accompanying drawings. In the drawings wherein like reference numerals have been utilized to designate like parts throughout:

FIGURE 1 is a perspective view with certain portions broken away of a fruit preparation machine of the type which handles ungraded fruit and includes therein a fruit feeding mechanism, a seed celling mechanism and a fruit discharge and halving mechanism made in accordance with and embodying the principles of the present invention;

FIGURES 2A and 2B taken together comprise an elevational view on an enlarged scale of the discharge end of the machine of FIGURE 1 and showing particularly the seed celling mechanism thereof substantially as seen in the direction of the arrows along the line 2—2 of FIGURE 1;

FIGURE 3A is a side elevational view of the upper portion of the seed celling mechanism of the machine of FIGURE 1 substantially as seen in the direction of the arrows along the line 3A—3A of FIGURE 2A;

FIGURE 3B is a side elevational view with certain portions broken away of the side of the seed celling mechanism of FIGS. 2A and 2B substantially as seen in the direction of the arrows along the line 3B—3B thereof;

FIGURE 4 is a view in horizontal section through the drive for the fruit transfer spikes and the fruit positioning slide mechanism substantially as seen in the direction of the arrows along the line 4—4 of FIG. 3B;

FIGURE 5 is a rear elevational view, partly in section and with certain portions broken away, of the upper end of the seed celling mechanism substantially as seen in the direction of the arrows along the line 5—5 of FIGURES 3A and 3B;

FIGURE 6 is an enlarged view in vertical section through the seed celling knife and a portion of the drive therefor substantially as seen in the direction of the arrows along the line 6—6 of FIGURE 2A;

FIGURE 7 is a fragmentary view on an enlarged scale of the cam and lifter mechanism shown at the bottom of FIGURE 2B and showing additional portions of the drive mechanism therefor;

FIGURE 8 is a view in horizontal section through the cam and lifter mechanism of FIGURE 7 substantially as seen in the direction of the arrows along the line 8—8 thereof;

FIGURE 9 is an enlarged side elevational view of the lower portion of the seed celling mechanism substantially as seen in the direction of the arrows along the line 9—9 of FIGURE 7 and showing particularly a portion of the drive therefor;

FIGURE 10 is an enlarged view with certain portions broken away of the pear feeding mechanism illustrated in FIGURE 2A of the drawings and showing particularly the drive for raising and lowering the clamping jaws;

FIGURE 11 is an enlarged partly schematic view with certain portions broken away of the carriage which actuates the pear positioning slides and showing particularly the drive therefor;

FIGURE 12 is a view in vertical section through the carriage of FIGURE 11 substantially as seen in the direction of the arrows along the line 12—12 thereof;

FIGURE 13 is an enlarged fragmentary view showing the drive mechanism for the clamping jaw actuators;

FIGURE 14 is an enlarged view in horizontal section through the slide structure of FIGURE 13 substantially as seen in the direction of the arrows along the line 14—14 thereof;

FIGURE 15 is an enlarged side elevational view with certain portions broken away of the slide structure of FIGURE 13 substantially as seen in the direction of the arrows along the line 15—15 thereof;

FIGURE 16 is an enlarged view, partly diagrammatic, showing the mechanism to feed the pears from the transfer spikes into the clamping jaws, the pears being shown in the position prior to movement thereof upwardly along the transfer spikes;

FIGURE 17 is a view similar to FIGURE 16 showing the parts in the position assumed after the pear is in position between the clamping jaws;

FIGURE 18 is an enlarged perspective view with certain portions broken away of the pear positioning slides and the relation thereof to the transfer spikes;

FIGURE 19 is a view in vertical section on a reduced scale through the assembly of FIGURE 18, substantially as seen in the direction of the arrows along the line 19—19 thereof;

FIGURES 20 and 21 are enlarged side elevational views with certain parts broken away of the seed celling mechanism and drive mechanism therefor, the parts being shown in the retracted position of FIGURE 20 and in the extended or cutting position in FIGURE 21;

FIGURE 22 is a side view of the lower portion of the seed celling assembly of FIGURE 21 substantially as seen in the direction of the arrows along the line 22—22 of FIGURE 21;

FIGURE 23 is an enlarged side elevational view of the positioning ratchet forming a part of the fruit positioning mechanism of this invention;

FIGURE 24 is a side view of the ratchet of FIGURE 23 substantially as seen in the direction of the arrows along the line 24—24 thereof;

FIGURE 25 is an enlarged elevational view of one of the clamping jaws forming a part of the fruit transfer mechanism of the present invention;

FIGURE 26 is an enlarged plan view of the other jaw forming a part of the fruit transfer mechanism;

FIGURE 27 is a view of the non-clamping surface of the transfer jaw of FIGURE 26;

FIGURE 28 is a plan view of the jaw of FIGURE 25;

FIGURE 29 is a view of pear halves treated in accordance with the present invention;

FIGURES 30 through 34, inclusive, are enlarged views of the cam tracks which control the operation of the various portions of the machine; and

FIGURE 35 is a timing diagram for the machine showing the sequence of operation of the various parts thereof.

In FIGURES 1 to 3 of the drawings there is shown a seed celling machine or mechanism and associated pear feeding and transfer mechanism embodying the principles of the present invention. The seed celling mechanism has been shown in association with a pear preparation or processing machine 40 disclosed in the co-pending application of Clarence R. Thompson and Marvin K. Buchner, Serial No. 691,818, filed October 23, 1957, now U.S. Patent No. 2,989,997 granted June 27, 1961 and further disclosure in the co-pending application of Marvin K. Buchner and Clarence R. Thompson, Serial No. 732,555 filed May 2, 1958, now U.S. Patent No. 2,953,236 granted September 20, 1960. The machine 40 includes a horizontal turret 42 rotating on a vertical axis as is shown in said application Serial No. 691,818 and carrying a plurality of pairs of peeling spindles or stemming tubes 44 and 46 successively presented, by the intermittent rotation of the turret 42, to a pear receiving station located to the right in FIGURE 1 of the drawings. At the receiving station, generally designated by the numeral 48, two pears are simultaneously impaled upon the peeling spindles or stemming tubes 44 and 46 and are thereafter peeled and bobbed as the turret 42 is successively indexed through the various stations thereof. The peeled and bobbed pears are then presented to the last station of the turret 42 where they are transferred to the seed celling mechanism, generally designated by the numeral 50, which is the subject matter of the present invention.

The pears are fed by a pear feeder mechanism positioned adjacent to the pear receiving station 48, the pear feeding mechanism being generally designated by the numeral 52. The details of the pear feeding mechanism 52 are fully set forth in co-pending application Serial No. 732,555, now U.S. Patent No. 2,953,236.

All of the above described parts of the machine 40 are mounted upon a frame generally designated by the numeral 54. The frame 54 includes a pair of upstanding parallel side plates 56 and 58 which have a configuration best seen in FIGURES 3A–3B of the drawings. The side plates 56 and 58 support substantially all of the operating parts of the seed celling mechanism 50. Mounted upon the side plates 56 and 58 are two spaced apart transfer spike assemblies 60 and 62, two pairs of transfer jaws 64 and 66, and two seed celling assemblies 68 and 70, FIGURES 2A–2B, together with the drive mechanism therefor.

Referring again to FIGURE 1 of the drawings, it will be seen that the transfer spike assemblies 60 and 62 are mounted so that when the spikes thereof are disposed horizontally, they are in general alignment with the spindles 44 and 46 on the turret 42. In the machine 40, the turret 42 is indexed through four positions by means of a Geneva mechanism (not shown) driven from the main drive motor to be described hereafter. The pears to be treated are placed on the spindles 44 and 46 at the receiving station 48, the turret 42 is then indexed through the next two stations to the fourth station, dur-

ing which time the pears on the spindles 44 and 46 are peeled and bobbed. When the turret 42 is in the fourth station, the spindles 44 and 46 are in general alignment with the transfer assemblies 60 and 62. It is the function of the transfer assemblies 60 and 62 to receive the peeled and bobbed pears from the spindles 44 and 46 at a receiving station and to transfer the pears to the transfer jaws 64 and 66. The transfer jaws 64 and 66 then move the pears to a seed celling station so that the seed celling assemblies 68 and 70 can act thereon to effect seed celling. The transfer spike assemblies 60 and 62 then receive the seed celled pears from the transfer jaws 64 and 66 and carry the pears to a discharge station.

The details of structure of the transfer spike assemblies 60 and 62 can be best seen in FIGURES 2A, 4 and 5 of the drawings. Since the transfer assemblies 60 and 62 are substantially identical in construction, like reference numerals will be utilized where appropriate to designate like parts throughout. The assemblies 60 and 62 are mounted upon a shaft 72 which is disposed horizontally and is journaled in flanged cartridges 74 mounted on the side plates 56 and 58. The right hand end of the shaft 72 as viewed in FIGURE 2A carries a Geneva gear 76 which is shaped and arranged to give four distinct movements to the shaft 72 (see FIG. 3B for a plan view of the Geneva gear 76). The Geneva gear 76 is driven from the main drive motor 78 which is mounted on the machine frame 54 to the right as viewed in FIG. 1. The motor 78 through a pulley 80 and a belt 82 drives the input shaft 84 of a suitable speed reducer, as disclosed in our application Serial No. 732,555, now U.S. Patent No. 2,953,236, mounted behind cover plate 86. One of theoutputs of the speed reducer appears on a shaft 88 (see FIG. 8 also) which drives a pair of miter gears 90 and 92. The miter gear 92 is fixedly mounted on a shaft 94 which extends through the side plates 56 and 58 and is mounted thereon by means of flanged cartridges 96. Mounted on the shaft 94 is a sprocket 98 driving a chain 100. The chain 100 extends upwardly and drives a sprocket 102 (see FIGS. 1, 3B and 5) mounted on a stub shaft 104 which is journaled in a housing mounted on the side plate 58. A tensioning sprocket 106 is also provided (see FIG. 1).

The Geneva gear 76 is indexed through quarter turns by movement of a Geneva crank 108 fixedly attached to the shaft 104 and driven thereby at the proper cycle rate from the main drive motor 78.

The details of construction of the transfer spike assembly 60 can be best seen from FIGS. 18 and 19 of the drawings wherein it will be seen that the shaft 72 carries a hub 110 fixedly attached thereto. The hub 110 has extending outwardly therefrom a plurality of transfer spikes 112, four spikes being shown disposed 90° apart. Each of the spikes 112 is disposed normal to the axis of the shaft 72 and in such a manner that when the shaft 72 is in the dwell position of the Geneva gear 76, one of the spikes 112 will be in alignment with the peeling spindle on the turret 42 adjacent thereto (see FIG. 3B). Positioned on one pair of aligned spikes 112 is a first positioning slide 114. A second positioning slide 116 is mounted on the other pair of aligned spikes 112. Each of positioning slides includes a plate 118 having an elongated aperture 120 formed therein to receive the shaft 72. Mounted on opposite ends of the plate 114 and disposed perpendicular thereto are plates 122 providing opposite lugs 124 and 126. Similar plates 128 are mounted on opposite ends of plate 116. The plates 128 also provide opposite lugs 124 and 126, all of the lugs 126 being apertured to receive the spikes 112. The lugs 126 on the slide 116 have the apertures therein disposed at different relative positions than the apertures in lugs 126 of slide 114 so that the slides can be juxtaposed as indicated in the drawings.

After rotation of a spike 90° to a vertical position extending upwardly from the shaft 72, the positioning slides 114 and 116 are then utilized to move the peeled and bobbed pear upwardly to a predetermined position in relationship to the clamping jaws 64 and 66 and together with the clamping jaws move the pear onto the seed celling assembly. Thereafter upon completion of the seed celling operation and rotation of that spike to a horizontal position extending outwardly from the seed celling mechanism 50, the slides 114 and 116 are utilized to transfer the seed celled pear off of the spike 112 and into a fruit discharge trough (not shown).

The necessary horizontal movement of the slides 114 and 116 is accomplished by means of a carriage generally designated by the numeral 130 (see particularly FIGURES 5, 11 and 12 of the drawings). The transfer carriage 130 includes a transversely extending plate 132 to which is welded a transverse upstanding plate 134. One end of the plate 132 carries a bracket 136 having welded thereto a tube 138 adapted to receive a shaft 140 therethrough. The shaft 140 is suitably mounted on the plate 56 by means of a bracket 142 which is in turn mounted on a frame member 144 which is supported on the side plates 56 and 58. The shaft 140 together with the tube 138 provides a sliding support for the carriage 130. The other side of the carriage 130 is supported by a roller 146 mounted on a flange 148 formed on the plate 132. The roller 146 is received between a pair of vertically spaced track members 150 that are suitably secured to the side plate 58. The roller 146 serves to support the other side of the carriage 130.

Horizontal reciprocation of the carriage 130 is derived from the cam shaft 94 (see FIGURE 11) by means of suitable linkage. More specifically, the bracket 136 is provided with a nut 152 which receives a stud 154 that pivotally connects the upper end of a lever 156 thereto. The lower end of the lever 156 is pivoted on a stud 158, FIGURE 7, which is fixedly attached to the inner surface of the side plate 56. A cam follower 160 is rotatably mounted on the lever 156 in position to engage in the cam track of a transfer cam 162 (see also FIGURE 8). The transfer cam 162 is mounted for rotation with the shaft 94 whereby to be driven in synchronism with the other operating parts of the machine. The shape of the cam track 164 in the transfer cam 162 can be best seen in FIGURE 31 of the drawings. The transfer cam 162 is made up by uniting plates suitably spaced apart with the cam track 164 defined by adjacent spaced apart edges of one set of plates. The portion 166 of the cam track 164 corresponds to a positioning of the carriage 130 to the inner position, i.e., to the right as viewed in FIGURE 3B of the drawings. Movement of the carriage outwardly or to the left as viewed in FIGURE 3B occurs when the cam follower 160 engages in the portion 168 of the cam track, the point 170 on the cam track corresponding to the outermost position of the carriage 130.

Movement of the peeled and bobbed pears from the peeling spindles 44 and 46 onto one pair of the spikes 112 is accomplished by means of levers 172. The construction of the levers 172 can be best seen from FIGURE 4 of the drawings. Referring to this figure it will be seen that the levers 172 have upwardly extending portions 174 to which are fixed laterally displaced pear engaging transfer arms 176 which are each adapted to engage behind the butt end of a pear when the carriage 130 is in the full inward position. The outer ends of the lever 172 are provided with enlarged cylindrical bosses 178 which are fixedly secured to a transversely extending shaft 180 mounted on the carriage 130. More specifically, the carriage 130 has a pair of cylindrical bosses 182 fixedly attached to the plate 134 through which extends the shaft 180 for pivotal movement. The right hand end of the shaft 180 as viewed in FIGURE 5 has affixed thereto a yoke lever 184 carrying on the end thereof a roller 186. The roller 186 is disposed within a track 188 which is pivoted on the plate 56 at the forward end thereof, i.e., the left hand end as viewed in FIGURE 3B. The other end of the track 188 has an outwardly extending rod 190

attached thereto which is pivotally connected to the upper end of a vertically extending control rod 192. The lower end of the control rod 192 is connected to the end of one leg of an L-shaped lever 194. Lever 194 is pivoted on a stud bolt secured to the side plate 56 and the other leg carries a cam roller 196 (see FIGURE 2B). The cam roller 196 engages in the track 198 of a control cam 200 mounted on the end of the cam shaft 94. The details of the formation of the cam track 198 can be best seen from FIGURE 34 of the drawings. The illustrated configuration of the cam track 198 is effective to move the control rod 192 upwardly and downwardly in a manner such that the pear transfer arms 176 on the ends of the levers 172 are moved upwardly and downwardly at the proper times in order to permit the arms 176 to be positioned behind the blossom end of peeled and bobbed pears. Means is provided to take up the play in the above described linkage. More specifically, a spring lever 202 is fixedly mounted on the shaft 180. There is provided in the carriage 130 an aperture 204 (see FIGURES 11 and 12) behind which is provided a plate 206. A compression spring 208 is provided between the lever 202 and the plate 206 to take up any play in the linkage controlling the levers 172.

The above described mechanism when properly operated in timed relationship with the other portions of the machine serves to move the pear engaging transfer arms 176 inwardly to a position behind the butt end of a pear on the peeling spindles 44 and 46. This is accomplished by moving the track 188 downwardly whereby to lower the fruit engaging arms 176 while the linkage 130 is moved inwardly so that the arms 176 can be positioned behind the pear. Subsequent movement of the carriage outwardly transfers the peeled and bobbed pear from the peeling spindle to one of the transfer spikes 112.

The outward movement of the carriage 130 in addition to moving a peeled and bobbed pear from the peeling spindles 44 and 46 onto the aligned spikes 112, also serves to discharge the seed celled pears from the other horizontally aligned and outwardly directed spikes 112. To this end the carriage 130 is provided with another pair of outwardly directed plates 210 (see particularly FIGURES 11 and 12) which are mounted on arms 212 extending forwardly from the vertical carriage plate 134. The plates 210 are adapted to engage an end plate 122 of one of the positioning slides 114 and 116 (see FIG. 4). Accordingly, when the carriage 130 is moved outwardly, the associated or outwardly directed pusher plate 122 engages the stem end of a seed celled pear and discharges the pear from the associated spike 112, the parts in FIGURE 4 being shown in the discharge position.

After the peeled and bobbed pears have been positioned on the inwardly directed horizontal spikes 112 by means of the proper movement of the carriage 130, the Geneva gear 76 is indexed a quarter turn in a direction to move those spikes to an upwardly directed position. This places the butt end of the pear upwardly and toward the transfer jaw assemblies 64 and 66. It is now desired to move the pears upwardly to a predetermined position regardless of the size of the pear, the pears processed by the present machine preferably being ungraded. The desired vertical movement of the pears is achieved by means of control rods 214. The upper ends of the control rods 214 engage the lugs 124 on the lower end plates 122 of the positioner slides 114 and 116. The control rods 124 extend downwardly through the frame plate 144 which contains guides 216 therefor (see FIG. 2B). The lower ends of the rods 214 are connected to rod ends 218 which are in turn connected to the ends of levers 220. The other ends of the levers 220 are journaled on a transversely extending shaft 222 which is journaled in bearings 224 on the side plates 56 and 58. Keyed to the shaft 222 is a pair of levers 226. A rod and spring 228 interconnect the levers 220 and 226 so that the lever 226 can continue rotation with the shaft 222 although the lever 220 has stopped. By this arrangement the shaft 222 can be rotated in a clockwise direction as viewed in FIG. 9 and will cary with it the lever 220 whereby to push a pear upwardly along the associated spike 112. When the pear reaches the desired position, the lever 220 can stop rotation even though the lever 226 continues to rotate due to the spring connection between the levers 220 and 226.

Mechanism is provided to rotate the shaft 222 on its bearings 224 whereby to move the levers 220 at the desired time and in the proper amount. To this end a lever 221 is fixedly attached to the shaft 222 and carries on the outer end thereof a cam follower 223. The cam follower 223 engages a positioner cam 225 mounted on the cam shaft 94 and driven thereby. Referring more specifically to FIGURE 30 of the drawings, there is shown the positioner cam 225 having a cam track 227 formed therein to receive and guide the cam follower 223. The cam track 227 is suitably shaped to move the shaft 222 through the lever 221 at the proper time and in the proper amount.

Means is provided to gauge the position of the upper or butt end of the pear so that the butt ends of all pears regardless of size are positioned at the same point. To this end a gauge or stop 230 is provided above the vertically and upwardly extending spikes 112 (see FIGS. 3A and 5). The gauge 230 is mounted on a spindle bracket 232 which is in turn mounted on brackets 234 bolted to the side plates 56 and 58 adjacent to the upper ends thereof. A pair of bearings 236 is fastened to the inner side of the bracket 232 extending upwardly therefrom. The bearings 236 journal a horizontally extending shaft 238 forming a part of the gauge 230. Extending downwardly from the shaft 238 are members 240 which are disposed between the seed celling assemblies 68 and 70. Affixed to the lower end of the members 240 are outwardly extending curved arms 242 which carry on the outer ends thereof gauge plates 244. The gauge plates 244 are positioned such that they will contact the upper or butt end of a pear being moved upwardly along the associated spike 112. As soon as the butt end of the pear contacts the gauge plate 244, the spring connection between the levers 220 and 226 described above will permit the pear to stop upward movement although the drive for the lever 226 continues. As a result, the butt ends of all pears will be positioned at the same level regardless of the size of the pear. Means is provided to move the gauge plate 244 out of the path of the pears so that the transfer jaws 64 and 66 can move the pears upward into engagement with the seed celling apparatus 68 and 70. This gauge plate shifting means will be described later in conjunction with the slide carrying the transfer jaw assemblies 64 and 66.

After the peeled and bobbed pear has been properly positioned vertically along the spikes 112, the pears are clamped between the transfer jaws of the transfer mechanisms 64 and 66 for subsequent movement upwardly into contact with the seed celling assemblies 68 and 70. The clamping jaws are mounted upon a movable slide which includes a cross bar 246 (see FIGS. 2A, 10, 16 and 17). The cross bar 246 is mounted on the upper end of a slide 248. The slide 248 is confined within a channel defined by a vertically extending member 250 (see FIG. 4) and a pair of keepers 252 bolted to the member 250 and having portions extending inwardly to confine the slide 248. The member 250 extends between the member 144 and the bracket 232 and is disposed transversely approximately equidistantly from the side plates 56 and 58. By this structure the slide 248 is mounted for vertical reciprocation.

Mounted on the cross arm 246 are two pairs of clamping jaws 254 and 256. The clamping jaw 254 has a clamping plate 258 which has a grooved or waffle shaped clamping surface 260 (see FIG. 26). A plan view of the clamping plate 258 is angle shaped as may be best seen in FIG. 26. Attached thereto and extending up-

wardly therefrom is a support arm 262 which is connected to a bearing portion 264. The bearing portion 264 has a cylindrical aperture therethrough to receive a bolt 266 (FIGS. 2A and 10) which mounts the clamping jaw 254 on the cross bar 246. The clamping jaw 256 has a similar waffle face on the side disposed toward the pear and is in general formed like the clamping jaw 254. More specifically, the jaw 256 includes a clamping plate 268 supported by an arm 270 connected to a bearing member 272. The bearing member 272 receives a bolt 274 therethrough pivotally to mount the jaw 256 on the cross bar 246.

Means is provided to insure that the clamping jaws 254 and 256 are moved simultaneously whereby to give a smooth clamping action. To this end the bearing members 264 and 272 are provided with inwardly directed gear segments 276 and 278 having meshing gear teeth formed thereon. The bearing member 272 in addition has an arm 280 extending outwardly therefrom toward the slide 248 and carries on the outer end an abutment roller 282 which when contacted by a suitable operator serves to pivot the arm 280 about the bolt 274 whereby to move the jaws 254 and 256 toward and away from each other. A spring 284 is provided normally to move the jaws toward the closed position as illustrated in FIGS. 10 and 17 of the drawings, the spring 284 being supported by pins 286 mounted on the arms 262 and 270 (see particularly FIGS. 25 and 27).

Means is provided to open the jaws 254 and 256 and also to remove the gauge plates 244 out of the path of the pears on the spindles 112. The mechanism to accomplish this is best illustrated in FIGURES 4, 13, 14 and 15 of the drawings. There is provided on the rear of the member 250 a vertically extending slide 288 (see particularly FIG. 4) which is held thereon by brackets 290. Connected to the upper end of the slide 288 is a forwardly extending frame 292 which is substantially square in shape (see FIG. 14) and extends forwardly and around the member 250 and the slide 248 whereby to provide a cross bar 294 in the front thereof. There is mounted on the cross bar 294 a pair of abutment screws 296 which are adjustable with respect to the bar 294. The screws 296 are in position to contact the rollers 282 on the arms 280 of the brackets which carry the clamping jaws 254 and 256. Upward movement of the abutment screws 296 causes them to contact the rollers 282 and to move the jaws 254 and 256 outwardly away from each other to the position illustrated in FIGURE 16 of the drawings.

There is also mounted on the frame 292 an upwardly extending bolt 298 which carries on the upper end thereof a U-shaped bracket 300 (see FIGS. 2A, 3A, 5 and 13). The bracket 300 is adapted to receive a roller 302 in the U-shaped notch therein. The roller 302 is carried by an arm 304 which is fixedly attached to the frame 240 for the gauge 230. Upward movement of the slide 288 forces the roller 302 upwardly whereby to pivot the gauge 230 in a clockwise direction as viewed in FIGURE 3A to the gauging position. A spring (not shown) normally urges the gauge 230 toward the gauging position.

The desired vertical movement of the slide 288 is obtained from a jaw and gauge cam 306 mounted on the cam shaft 94 (see FIG. 13). A lever 308 is pivoted on the shaft 222 and carries a cam follower 310 engaging in the cam track 312 (see FIG. 32 of the drawings). The outer end of the lever 308 is connected by a connector 314 to the lower end of a control rod 316. The control rod 316 extends upwardly and is connected to the lower end of the slide 288 by means of a connector 318. The shape of the cam track 312 with the cam 306 (see FIG. 32) is such that the slide 288 is moved upwardly and downwardly at the proper times and in the proper amount.

Means is provided to hold the positioning slides 114 and 116 in the upper gauged position after contact of the butt end of the pear with the gauge plate 244. To this end a pair of of toothed ratchets 320 has been provided (see FIGS. 2A, 2B, and 10). Each of the ratchets 320 is mounted on the lower end of an elongated lever 322 which is pivoted at the upper end on the movable cross bar 246 by means of a bolt 324. The teeth of the ratchet 320 are adapted to engage the outwardly facing lugs 126 on the end plates 122 of the positioning slides 114 and 116. To this end each lug 126 carries a beveled edge 326 (see FIG. 19). As a lug 126 is moved upwardly past the teeth of a ratchet 320, the edge 326 contacts successive teeth of the ratchet 320. Means is provided to urge the ratchet 320 into engagement with the edge 326. To this end the lever 322 carries an upstanding arm 328 which is contacted by a spring 330 under compression. The other end of the spring 330 is supported by a bracket 332 mounted on the cross car 246. An adjustable stop in the form of a screw 334 mounted on a bracket 336 on the cross bar 246 is provided to adjust the innermost position of the ratchet 320. By the above described construction a lug 126 is firmly engaged by each ratchet 320 at the uppermost position thereof and held in that position whereby to aid in supporting the fruit while the jaws 254 and 256 clamp the fruit and during seed celling thereof.

It is desired after completion of seed celling of the pear to release the ratchets 320 whereby to permit the positioning slides to fall to the lower position. To this end a ratchet release mechanism has been provided (see particularly FIG. 2A of the drawings). A shaft 338 is journaled in bearings 340 on the side plates 56 and 58. Intermediate the side plates 56 and 58 the shaft 338 is provided with a pair of collars 342 having fingers 344 extending outwardly therefrom. The fingers 344 are positioned so that they can contact rollers 346 on the lower ends of the ratchet levers 322 in certain positions thereof. The fingers 344 can thereby control the position of the ratchets 320, this being brought about by the fact that the fingers 344 are bent inwardly at the outer ends thereof. The position of the fingers 344 is controlled by a mechanism best illustrated in FIGURES 2A, 3B, 4 and 5 of the drawings. To the right hand end of the shaft 338 as viewed in FIGURE 2A there is fixedly secured an arm 348. A cam follower roller 350 is mounted on the outer end of the arm 348. The roller 350 contacts a cam 352 mounted on the hub of the sprocket 102 (see also FIG. 5). The arm 348 also has connected thereto a second arm 354 (see FIG. 3B) to which is connected one end of a spring 356, the other end of the spring 356 being attached to a fixed point 358. Spring 356 is under tension and continually urges the cam follower 350 against the cam 352. Accordingly, the pivoting of the shaft 338 and the movement of the fingers 344 is controlled at the cycle rate.

After the pears have been properly positioned and the ratchet 320 engages the positioning slide 114 or 116, the jaws 254 and 256 are closed to clamp the pear as has been described above. After closing of the jaws 254 and 256, the gauge 230 is retracted from its position above the butt end of the pear. It is next desired to raise the jaws 254 and 256 and the positioning slide 114 or 116 in engagement with the ratchet 320 carrying the pear therewith to bring it into contact with the seed celling mechanism 68 or 70. To this end the slide 248 has the lower end thereof connected to a control rod 360 (see particularly FIG. 10) by means of a connector 362. The lower end of the control rod 360 is connected to the outer end of a lever 364 which is pivotally mounted upon shaft 222. The lever 364 carries a cam follower 366 engaging in the cam track of a control cam 368 mounted on the cam shaft 94. The construction of the cam 368 can be best seen in FIGURE 33 of the drawings. The cam track 370 of the cam 368 is shaped such that it will give the proper vertical reciprocation to the slide 248 in timed relationship with the other operated parts of the machine.

Upward movement of the slide 248 carries with it the pears gripped between the jaws 254 and 256 and supported under the stem end by a positioning slide 114 or

116. This movement of the pears brings the butt ends thereof upwardly into engagement with the seed celling mechanisms 68 and 70. The construction of the seed celling mechanisms 68 and 70 will now be described in detail, the description of the seed celling mechanism 70 only being given since the seed celling mechanisms are substantially identical to each other. The seed celling mechanism 70 is connected to the bracket 232 in the position best illustrated in FIGURE 5 of the drawings. More specifically, the bracket 232 has suitably secured thereto a pair of bosses 372, FIGURES 6, 20 and 21, which have vertically extending cylindrical apertures therein. Disposed within the boss 372 is a vertically extending spindle 374 surrounded by a bearing sleeve 375. A pair of collars 376 secure the spindle 374 against vertical movement within the boss 372, the collars 376 being held thereon by set screws 378. The lower end of the spindle 374 extends beyond the collar 376 and has a cutout or flat portion 380 therein (see particularly FIGS. 21 and 22). Mounted in the cutout portion 380 is a seed celling blade 382, the blade 382 being pivoted to the spindle 374 by means of a pin 384. The lower end of the blade 382 comes to a rounded point as at 386 and a substantially straight edge 388 extends upwardly therefrom. A curved cutting edge 390 extends upwardly in the other direction from the point 386 and has the shape which it is desired to impart to the seed cell cavity in the finished fruit. The straight edge 388 joins with a laterally extending cutting edge 392 which is adapted to cut away any peel which may remain in the blossom or butt end of the pear.

When the blade 382 is in the position illustrated in FIGURE 20 of the drawing, its dimensions are such that it can be readily inserted through the opening in the pear which was made by the peeling spindle and by the spikes 112 described above. As the blade 382 is pivoted about the pin 384 in a counterclockwise direction as viewed in FIGURES 20 and 21, the cutting edge 390 is moved outwardly whereby to increase the volume generated when the blade 382 is rotated about the axis of the spindle 374. This desired movement of the blade 382 is obtained by means of a collar 394 mounted on the spindle 374 between the blade 382 and the retaining collar 376. The collar 394 has a pair of grooves 396 and 398 formed therearound. The groove 396 is adapted to receive a tang or hook 400 formed integral with the seed celling blade 382. The groove 398 is adapted to receive the forked ends 402 of a positioning lever 404 (see FIG. 5 also). The collar 394 is free to move vertically along the spindle 374. Since the hook 400 is displaced radially from the pivot pin 384, vertical movement of the hook 400 serves to pivot the blade 382 about the pin 384. The position of the hook 400 is in turn controlled by the position of the collar 394. Accordingly, a suitable positioning of the collar 394 will effectively control the position of the outer cavity forming cutting edge 390 of the blade 382.

The desired vertical position of the collar 394 and the subsequent desired position of the blade edge 390 is obtained by moving the lever 404. The lever 404 is pivoted by a bolt 406 on the bracket 232 and has an outwardly extending arm 408 formed integral therewith (see FIG. 5). Upward movement of the arm 408 serves to lower the collar 394 and to move the cutting edge 390 outwardly. The maximum outward movement of the cutting edge 390 is controlled by an adjusting screw 410 also mounted on the bracket 232 and in position to contact the arm 408. A spring 412 normally holds the arm 408 in the lower or clockwise position as viewed in FIGURE 5 whereby to hold the collar 394 upwardly and to move the blade 382 to the retraced position illustrated in FIGURE 20 of the drawings.

The necessary and desired upper or counterclockwise movement of the arm 408 whereby to move the knife edge 390 outwardly is obtained by an abutment screw 414 which is carried by the slide 248. More specifically, the slide 248 has a member 416 mounted thereon having supporting arms extending through suitable apertures 418 in the member 250. The screw 414 has attached to the lower end thereof adjusting and clamping nuts 420 which are spaced from the member 416 by sleeve washers 422. A spring 424 extends between the member 416 and a pair of adjusting and clamping nuts 426 toward the upper end of the abutment screws 414. The spring 424 is under compression whereby to urge the abutment screw 414 upwardly.

From the above it will be seen that upward movement of the slide 248 will be effective to move the abutment screw 414 into contact with the arm 408. This will serve to move the arm 408 upwardly against the action of the spring 412 until the arm 408 contacts the adjusting screw 410. This movement of the arm 408 will serve to pivot the blade 382 in a counterclockwise direction as viewed in FIGURES 20 and 21 whereby to shift the blade and particularly the cutting edge 390 thereof to a cavity forming position. The springs 424 will permit the slide 248 to continue upward movement even if the arms 408 are against the adjusting screws 410. Accordingly, seed cell cavities of uniform size and shape can be readily formed. In addition if some obstruction is encountered such that the blade 382 cannot be moved to its outermost position, the springs 424 will permit continued upward movement of the slide 248 without injury to the various parts.

Cutting is achieved by the blade 382 being rotated by rotating the spindle 374. To this end the spindle 374 is provided on the upper end thereof with a pulley 428 held thereon by a set screw 430. A belt 432 engages the pulley 428 whereby to give driving movement thereto.

The belt 432 is driven by an auxiliary electric motor 434 mounted on the side plate 56 (see FIGS. 2A and 5). The shaft 436 of the motor 434 carries a pulley 438 which drives a belt 440, the belt 440 engages a double pulley 442 mounted on the spindle of the seed celling assembly 68, the pulley 442 corresponding to the pulley 428 of the seed celling assembly 70. The pulley 442 also engages the belt 432 whereby to drive the belt 432 and to drive the spindle of the seed celling mechanism 70. A tensioning pulley 444 also is mounted on the bracket 232 and engages the belt 432. The above described mechanism continually rotates the spindles 374 whereby the seed celling blade 382 is also continuously rotated.

The fruit produced by the seed celling mechanism 68 and 70 is attractive in appearance. A diagrammatic illustration of the appearance of the seed cell cavity in pear halves treated in accordance with the present invention is illustrated in FIGURE 29. The pear halves are generally designated by the numerals 446 and 448 and each has a seed cell cavity 450. A core opening 452 is formed at the stem end as a result of the stemming and peeling spindle and the transfer spikes 112 passing therethrough. The blossom end of the fruit has a curved and clean surface 454 which is formed by the cutting edge 392 on the blade 382. This insures that all of the peel is removed from the blossom end and also gives a uniform appearance thereto. The seed cell cavity 450 has a substantially greater maximum transverse diameter than the blossom opening 454. This results in the formation of a "bridge" 456 which is highly desirable particularly when preparing pear halves as illustrated. The preservation of the bridge 456 also increases the yield of fruit from the machine.

The seed celling operation performed by the blade 382 in effect pulps and scrapes material within the volume defined by the rotating blade 382. In order to prevent the pulped material from spattering over the rest of the machine, suitable frusto-conical shields 458, FIGURE 5, have been provided about the lower ends of the spindles 374 and the seed celling blade 382. The shields 458 are suitably affixed to the stationary bracket 232 as may be best seen in FIGURE 5 of the drawings.

The clamping jaws 254 and 256 firmly clamp the pear during the seed celling operation whereby to insure that

there is relative movement between the seed celling blade 382 and the pear. After the seed celling operation, the slide 248 moves downwardly whereby to permit the springs 412 to return the arm 408 to the lower position (see FIGURE 5). This serves to lift the collar 394 (see FIGS. 20 and 21) from the position illustrated in FIGURE 21 to that shown in FIGURE 20. The positioning slides 114 and 116 are then released and permitted to fall away from the pears under the influence of gravity. Continued downward movement of the slide 248 serves to move the seed celled pear from the coring spindle 374 and to replace it on the vertically upstanding transfer spike 112. When the pear is firmly positioned on the spike 112, the slide 286 is raised whereby to cause the abutment screws 296 to engage the rollers 280 (see FIG. 2A). This causes the jaws 254 and 256 to be moved outwardly to the position illustrated in FIGURE 16 of the drawings whereby to release the pear.

Thereafter the shaft 72 is indexed by means of the Geneva gear 76 through a 90° angle whereby to move the spike 112 with the seed celled pear thereon outwardly to a horizontal position. Subsequently, the carriage 130 is moved outwardly and the pusher plate 210 engages the end plate 122 on the positioning slide. This will move the positioning slide from the retracted position to the position illustrated in FIGURE 4 of the drawings. The plate 122 in so moving will contact the neck of the pear and will push it off of the spike 112.

In certain instances it will be desirable to halve the pear as it is removed from the spike 112. In such cases a splitting blade 460 having a sharpened edge 462 is disposed toward each spike 112 (see FIGS. 1 and 4 of the drawings) and provided with a sharpened edge 462 positioned only a short distance away from the end of the spike 112. The blade 460 will split the whole pear into two halves as illustrated in FIGURE 29 of the drawings. Preferably the blades 460 are supported from a bar 464, FIGURE 1, extending between the side plates 56 and 58.

Suitable troughs (not shown) may be provided to receive pears as they are pushed from the spikes 112. In those cases in which it is desired that the pears be whole, two troughs may be provided in which case also the blades 460 are removed. When it is desired to have pear halves, a two part-cylindrical trough may be provided beneath each blade 460, a trough being provided on each side thereof to receive the pear halves and to guide them to a desired delivery point.

A complete cycle of operation of the seed celling mechanism 50 will now be described with special attention to the timing diagram of FIGURE 35. At the beginning of operation there will be no pears upon any of the spikes 112. Pears will be fed into the feeding station 48 (see FIG. 1) from the feeding mechanism 52 whereby to place a pear on each of the spindles 44 and 46. The turret 42 is thereafter indexed during which time the pears are peeled and bobbed. The turret 42 then arrives at the seed ceiling or fourth position thereof. This corresponds to the 0° position (the top center position) on the timing diagram of FIGURE 35 and on the timing circle 470 for the peeling turret 42. At this point on the timing diagram, the carriage 130 and the associated transfer arms 176 are in the inner position and have been there for approximately 220° and will stay there for another 42° as indicated by the timing circle 472 of the transfer cam 162 which controls movement of the carriage 130. The transfer arms 176 are also in the lowered position due to the position of the cam 200 and have been in that position for 190° as is indicated by the timing circle 474. The spike Geneva 76 is positioned so that a pair of spikes is disposed horizontally and a pair of spikes vertically. These parts have been in this position for 170° as is indicated by the timing circle 476 for the spike Geneva 76. The vertical positioning cam 225 is in a dwell period and has been in such a position for approximately 75° of the timing cycle as is indicated by the timing circle 478. The clamping jaw and gauge cam 306 which controls the operation of the gauge 230 and the clamping jaws 254—256 is in a position such as to hold the jaws closed and to leave the gauge 230 in the gauging position. The jaws 254–256 and the gauge 230 have been in these positions for approximately 70° as can be ascertained from the timing circle 480. The lift cam 368 controlling the lifting of the slide 248 and the parts attached thereto including the clamping jaw assemblies 62 and 64 has just been raised to the upper position and is in the upper position at 0° on the timing diagram as can be best seen from the timing circle 482. The ratchet cam 352 is in the dwell position and has been in that position for approximately 105° and will continue in that position for another 60° as is best ascertained from the timing circle 484.

The peeling turret 42 remains in a dwell position for 90° of the timing diagram 35 after the turret has been stopped at 0° on the diagram. During this dwell period of the turret 42, the peeled and bobbed pears on the spindles 44 and 46 are transferred to the spikes which are in alignment therewith (see FIG. 4 of the drawings). It will be noted that the turret 42 indexes only ¼ of the way around the periphery thereof during a complete cycle of the timing diagram of FIGURE 35. In other words, the turret 42 will make one complete revolution while the parts illustrated on the timing diagram of FIGURE 35 go through four complete 360° cycles. A proper interrelation between the turret 42 and the parts controlled as indicated by the timing diagram in FIGURE 35 is achieved because of the common drive from the motor 78 (see FIGURE 1) and the suitable interconnecting gearing.

Immediately after the turret 42 is stopped at the 0° position on the timing diagram 35, the cam 200 (see FIGS. 2B, 7 and 8 on the left hand side thereof) immediately begins to raise the shaft 192 whereby to tilt the track 188 (see particularly FIGS. 7 and 11) whereby to pivot the transfer arms 176 upwardly to engage behind the butt end of a peeled and bobbed pear on one of the spindles of the turret 42. This raising operation continues for approximately 36° as is indicated by the timing circle 474 of FIGURE 35. Approximately 6° later the transfer cam 162 which controls the positioning of the carriage 130 (see FIGS. 7, 8 and 11 of the drawings) arrives at a position such as to begin pivoting of the arm 156 outwardly to move the carriage 130 outwardly or to the left as viewed in FIGURES 4 and 12. This movement of the carriage 130 also moves the transfer arms 176 in a horizontal direction whereby the arms 176 engage the butt ends of the pears on the peeling spindles and pushes them from the spindles onto the aligned spikes 112. The forward or outward travel of the carriage 130 terminates after 48° travel and at the 90° point on the timing diagram of FIGURE 35 as indicated on the timing cycle 472.

Meanwhile the lift cam 368 at the 45° point on the timing diagram moves to a position such that the parts controlled thereby start to fall. Referring specifically to FIGURE 10 of the drawings, the arm 364 begins to fall whereby to lower the control rod 360 and thereby lower the slide 248. This serves to lower the clamping jaw assemblies 64 and 66 and the associated ratchet arms 322. This lowering continues for 45° or until the 90° point is reached on the timing diagram at which time the slide 248 and the attached parts are in the fully lowered position.

During the lowering of the slide 248 carrying the ratchet levers 322, the ratchet cam 352 (see FIGURE 3B of the drawings) at the 60° point on the timing diagram comes to a point such as to pivot the arm 348 in a direction to raise the control fingers 344 out of a position to engage the ratchets 320. The fingers 344 are in the fully retracted position at the 90° point on the

timing diagram and at the time that the ratchets 320 are in the fully lowered position.

As soon as the carriage 130 has been moved to the full outward position by the mechanism of FIGURE 11 and particularly by means of the transfer cam 162 whereby to seat the peeled and bobbed pear on the spikes 112, the cam 162 immediately begins to move the carriage 130 inwardly by pivoting the lever 156 in a clockwise direction as viewed in FIGURES 3B and 9 to place the carriage in the full inward position. This inward travel of the carriage 130 continues for approximately 48° of the timing diagram of FIGURE 35 and terminates at the 138° point on the timing diagram. Before the carriage 130 reaches the innermost position and approximately at the 130° point on the timing diagram the cam 200 moves the transfer arms 176 downwardly, the downward movement of the arms 176 being completed at approximately the 170° on the timing diagram. The carriage 130 remains in the innermost position for a dwell period of 264° or until the timing diagram has gone back through 0° and arrived at the 42° point at which time the carriage 130 begins its outward travel. This therefore completes the description of the movement of the carriage 130 and of the timing circle 472.

Simultaneously with the beginning of the inward movement of the carriage 130, the peeling turret 42 is started to rotate at the 90° point on the timing diagram and continues to move during the succeeding 270° of operation of the timing diagram and stops again at the 0° point. This therefore completes the description of the operation of the peeling turret 42 and the timing circle 470.

At the 90° point on the timing diagram the slide 288 controlling the jaws 254—256 and the gauge 230 begins its upward travel (see FIGURE 13). This travel is outlined on the control circle 480. The cam 306 rotates to lift the arm 308 which drives the control rod 316 upwardly. The control rod 316 in turn drives the slide 288 upwardly. Adjacent to the uppermost limit of the travel of the slide 280, the abutment screws 296 contact the rollers 282 controlling the jaws 254 and 256 whereby to cause the jaws to open against the action of the springs 284. The bolt 298 also carries the bracket 300 upwardly whereby to move the gauge 230 into the gauging position, i.e., positioned above the upper ends of the spikes 112. The jaws 254—256 and the gauge 230 are now in a position to limit the upward movements of the pears on the vertically and upwardly extending spikes 112 so that all pears, regardless of length, are positioned with their butt ends at the same level. This upward movement of the slide 288 occupies approximately 30° of the timing diagram and terminates at the 120° point. Meanwhile the slide 248 is being held stationary by the lift cam 368 and will be held stationary during the receiving of the pears within the clamping jaws and until approximately the 280° on the timing diagram.

At the 100° point on the timing diagram the spike Geneva 76 operates to rotate the spikes 90° whereby to move the spikes carrying the freshly peeled and bobbed pears from a horizontal position to a vertically and upwardly directed position. This indexing movement occurs during the next 90° operation of the timing diagram and ends in the 190° point on the timing diagram as can be determined from the timing cycle 476. During this indexing of the spikes 112, the carriage 130 completes its rearward travel as explained above, the arms 176 are lowered, the jaws 254—256 are opened and the gauge 230 placed in position.

Approximately 20° before the completion of the indexing of the spikes 112 to place the freshly peeled and bobbed pears in the upper vertical position, and at the 170° point on the timing diagram as indicated on the timing cycle 478, the positioner cam 225 operates to begin upward movement of the control rods 214 which serve to move the pears upwardly for engagement by the jaws 254—256. Referring more specifically to FIGURES 2B, 5 and 18 of the drawings, the control cam 225 engages the roller 223 on the lever 221 whereby to rotate the shaft 222 in a clockwise direction as viewed in FIGURES 3B and 9. The levers 226 affixed to the shaft 222 are also rotated in the clockwise direction. These levers acting through the spring connection 228 also rotate the levers 220 in a clockwise direction. This serves to raise the control rods 214 into engagement with the plates 122 and particularly the lugs 124 thereof. This contact with the lugs occurs approximately concurrently with the termination of the indexing of the spikes 112 at the 190° point on the timing diagram of FIGURE 35.

In the meantime the fingers 344 have been out of engagement with the rollers 346. Accordingly, the upward movement of the positioning slides 116 is controlled so that there can be no retrograde downward movement thereof.

Continued upward movement of the control rods 214 pushes the positioning slides 114 and 116 upwardly and into engagement with the stem end of the pears (see FIGURE 16). Further upward movement of the positioning slides 114 and 116 moves the pears between the clamping jaws 254—256. The upward movement of the positioning slides 116 terminates at a point slightly past the 240° point on the timing diagram. The pears are now in a position to be grasped by the clamping jaws 254 and 256. The ratchets 320 engaging the bevelled edges 326 of the lugs 126 on the lower plates 122 serve to hold the pears in the upward adjusted position.

The gauge 230 serves uniformly to position the upper butt ends of the pears at the same point regardless of the size of the pear. In order to accomplish this, the spring connection 228 has been provided between the levers 220 and 226 as has been described before.

Shortly before the pears reach the uppermost position, the slide 288 (see FIGURE 13) begins downward movement under the control of the jaw and gauge cam 306. As soon as the pears stop their upward movement, they are grasped by the jaws 254 and 256 to be firmly held thereby. The slide 288 falls for 15° at the end of which the pears are firmly clamped. At approximately the 255° point on the timing diagram of FIGURE 35, the positioner cam 225 moves the control rods 214 downwardly for a period of 31°. During the latter portion of the downward movement of the control rods 214, the slide 288 continues its downward movement under the influence of the cam 306 for an additional 15° whereby to remove the gauge 230 from above the properly positioned pears within the transfer jaws 254—256.

The slide 248 is now raised upwardly to carry the clamping jaw assemblies 64 and 66 with the pears therein and the positioning slides 114 and 116 carried by ratchets 320 and levers 322 upwardly toward the seed celling assemblies 68 and 70. This upward movement of the slide 248 continues for 80° and ends at the 0° point on the timing diagram.

The seed celling blades 382 (see FIGS. 6 and 20 to 22) are continuously rotated by the motor 434 (see FIGS. 2A and 5). When the parts are first urged upwardly, the blades 382 are in the retracted position as indicated in FIGURE 20. Continued upward movement of the slide 248 serves to move the abutment screws 414 into engagement with the arms 408 whereby to cause the collar 394 to move downwardly. This rotates the seed celling blade 382 to the position illustrated in FIGURE 21 whereby to cause the cutting of an enlarged cavity 450 in the pear. A major portion of the seed celling is actually accomplished after the 0° point on the timing diagram and for approximately 45° thereafter. Accordingly, the seed celling occurs at the beginning of the next or second cycle of the timing diagram of FIGURE 35. After 45° of the second cycle of operation, the slide 248 pro-

ceeds to move downwardly whereby to permit the springs 412 to move the lever arm 408 in a direction to lift the collar 394. This retracts the seed celling blade 382 to the position illustrated in FIGURE 20. This permits withdrawal of the pear from the blade 382 while retaining the bridge 456. While the pear is in the uppermost position, the cutting edge 392 scrapes the area 454 around the butt end to remove all peel therefrom.

At the 255° point on the timing diagram in FIGURE 35, the ratchet fingers 344 are moved in a direction such that they will engage the rollers 346 when the arms 322 are lowered. Accordingly, the fingers 344 are in operative position to disengage the ratchets 320 when the slide 248 begins its downward movement at the 45° point on the second cycle of operation. Release of the ratchets 320 by means of the fingers 344 permits the positioning slides 114 and 116 to fall under the urging of gravity to the lower position. At the 60° point on the second cycle of operation, the ratchet cam 352 acts to move the fingers 344 out of engagement with the rollers 316, this action being completed at the 90° point. This places the ratchets 320 again in a position to engage the positioner slides 114 and 116 for the next cycle of operation.

At the 90° point of operation of the second cycle the clamping jaws 254—256 are opened by actuation of the slide 288 by means of the cam 306 to permit the pears, which have been placed on the spikes 112 by the jaws 254—256, to be moved by the spikes 112 during rotation of the spikes beginning at the 100° point on the second cycle of operation.

It is to be understood that during the first 90° of the second cycle of operation, a new set of pears has been placed on a free set of spikes 112 and the operation on this second set of pears proceeds as described above with regard to the first set of pears.

Nothing occurs with respect to the first set of pears during the remainder of the second cycle of operation after the completing of the indexing of the spikes 112 by means of the Geneva 76. This indexing of the spikes 112 places the first set of pears in a horizontal position extending outwardly from the machine. It is to be noted that the plates 210 on the carriage 130 are positioned behind the plates 122 on the positioning slides 114—116 and that the carriage is in the inward position before the first set of pears is indexed to the outwardly extending position.

During the third cycle of operation, the outward travel of the carriage 130 caused by the transfer cam 162 pushes the first set of pears off of the spikes 112. More specifically, the outward travel of the carriage 130 beginning at the 42° point during the third cycle of operation pushes the plates 212 against the plates 122. The plates 122 in turn engage the neck end of the pear and push the pear outwardly and off of the spike 112. If the halving plate 460 has been provided, the pears will be halved as has been described above.

The set of spikes 112 on which the first set of pears were positioned is idle during the fourth cycle of operation, during which cycle of operation they are indexed beginning at the 100° point and terminating at the 190° point to arrive at a horizontal position directed toward the peeling turret 42. This set of spikes is then in readiness to receive freshly peeled and bobbed pears from the turret 42 at the beginning of the fifth cycle of operation of the diagram of FIGURE 35. It is to be understood that during the second, third, and fourth cycles of operation, successive sets of pears are loaded on successive sets of spikes 112 and the pears are subjected to the same treatment described above with respect to the first set of pears.

It will be seen that there has been provided a pear preparation machine and particularly a seed celling mechanism which fulfills all of the objects and advantages set forth above. Although one preferred form of the invention has been shown in the drawings and described for purposes of illustration, it is to be understood that various changes and modification can be therein without departing from the spirit and scope of the invention. Accordingly, the invention is to be limited only as set forth in the following claims.

We claim:

1. In a pear preparation machine haing a holder for whole pears thereon, the combination comprising a seed celling member mounted adjacent to the pear holder and mounted for rotation about a predetermined axis, means continually to rotate said seed celling member about said axis, a pear transfer mechanism to transfer a whole pear from the pear holder into engagement with said seed celling member, means including said pear transfer mechanism for aligning the stem axis of the whole pear in a predetermined direction and in alignment with the axis of said seed celling member, said pear transferring mechanism moving the whole pear into engagement with said seed celling member to seed cell the whole pear and thereafter to transfer the whole pear to a discharge station, and means to discharge the seed celled whole pear from said transfer mechanism.

2. In a pear preparation machine having a holder for whole pears thereon, the combination comprising a seed celling member mounted adjacent to the pear holder and having an axis of operation about which said seed celling member cuts a symmetrical cavity in a pear in engagement therewith, drive mechanism to rotate said seed celling member about said axis of operation, pear transfer mechanism to transfer a whole pear from the pear holder into engagement with said seed celling member and to hold the whole pear against rotation during engagement with said seed celling member, gauge mechanism to position the butt end of the whole pear in a predetermined position with respect to said seed celling member, means including said pear transfer mechanism to align the stem axis of the whole pear with said operating axis, said pear transfer mechanism after seed celling of the whole pear transferring the whole pear to a discharge station, and means to discharge the seed celled whole pear from said transfer mechanism.

3. In a pear preparation machine having a holder aligning the stem axis of whole pears in a predetermined direction, the combination comprising a seed celling member mounted adjacent to the pear holder and having an axis of operation disposed at an angle with respect to the axis of a pear on the holder, pear transfer mechanism to receive whole pears from the holder and to align the stem axis of the pear with said operating axis and to move the aligned pear into engagement with said seed celling member to seed cell the whole pear and thereafter to transfer the whole pear to a discharge station, and means to discharge the seed celled whole pear from said pear transfer mechanism.

4. In a pear preparation machine having a holder aligning the stem axis of whole pears in a predetermined direction, the combination comprising a seed celling member mounted adjacent to the pear holder and having an axis of operation disposed at an angle with respect to the axis of a pear on the holder, pear transfer mechanism to transfer a whole pear from the pear holder into engagement with said seed celling member, means including said pear transfer mechanism to receive a whole pear from the pear holder and to align the stem axis of the whole pear with said operating axis of said seed celling member, gauge mechanism to position the butt end of an aligned whole pear in a predetermined position with respect to said seed celling member, means to cause relative rotation between said seed celling member and the pear, said pear transfer mechanism after seed celling of the whole pear transferring the whole pear to a discharge station, and means to discharge the seed celled whole pear from said transfer mechanism.

5. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, the combination comprising a spike mounted for move-

ment to a position in alignment with said spindle, means to move a pear from said spindle onto said spike to support said pear thereon along the stem axis thereof, a seed celling member mounted adjacent to said spike, means to move said spike to a position adjacent to said seed celling member, pear transfer mechanism to transfer said pear along said spike into engagement with said seed celling member to seed cell the whole pear and thereafter to move said pear onto said spike, and means to move said spike from a position in alignment with said spindle to a position adjacent to said seed celling member and thereafter to a discharge station.

6. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, a seed celling mechanism including a spike, means to move said spike to a pear receiving station in alignment with the spindle and to a seed celling station and to a discharge station, means operative to move a pear from the spindle onto said spike when said spike is in alignment therewith to support the pear along the stem axis thereof, a seed celling member mounted at said seed celling station, transfer mechanism operative when said spike is in said seed celling station to transfer the pear along said spike into engagement with said seed celling member to seed cell the whole pear, and discharge mechanism to remove the pear from said spike when said spike is at said discharge station.

7. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, a seed celling mechanism including a spike, means to move said spike to a station in alignment with the spindle and to a seed celling station and to a discharge station, means operative to move a pear from the spindle onto said spike when said spike is in alignment therewith to support the pear along the stem axis thereof, a seed celling member mounted at said seed celling station, gauge mechanism to position the butt end of a pear at a predetermined position with respect to said seed celling station, transfer mechanism to move a pear from said predetermined position a predetermined distance onto said seed celling member to seed cell the whole pear, and pear discharge mechanism to remove the pear from said spike when said spike is at said discharge station.

8. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, a seed celling mechanism including a spike, means to move said spike to a pear receiving station in alignment with the spindle and to a seed celling station and to a discharge station, a carriage mounted adjacent to said spike and movable to a first position toward the spindle and to a second position toward said spike when said spike is in the pear receiving station, an arm mounted on said carriage and adapted to engage a pear on the spindle when said carriage is in the first position and thereafter to move the pear from the spindle onto said aligned spike upon movement of the carriage to the second position, a seed celling member mounted at said seed celling station, transfer mechanism operative when said spike is in said seed celling station to transfer the pear along said spike into engagement with said seed celling member to seed cell the whole pear, and discharge mechanism to remove the pear from said spike when said spike is at said discharge station.

9. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, a seed celling mechanism including a spike, means to move said spike to a pear receiving station in alignment with the spindle and to a seed celling station and to a discharge station, a carriage mounted adjacent to said spike and movable to a first position toward the spindle and to a second position toward said spike when said spike is in the pear receiving station, an arm mounted on said carriage and adapted to engage a pear on the spindle when said carriage is in the first position and thereafter to move the pear from the spindle onto said aligned spike upon movement of the carriage to the second position, a slide mounted on said spike and shiftable therealong to move pears on said spike, a seed celling member mounted at said seed celling station, transfer mechanism including said slide operative when said spike is in said seed celling station to transfer the pear along said spike into engagement with said seed celling member to seed cell the whole pear, and a second arm mounted on said carriage and engageable with said slide when said spike is in the discharge station so that movement of said carriage to the second position causes movement of said slide to discharge the pear from said spike.

10. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, a seed celling mechanism including a spike, means to move said spike to a pear receiving station in alignment with the spindle and to a seed celling station and to a discharge station, a carriage mounted adjacent to said spike and movable to a first position toward the spindle and to a second position toward said spike when said spike is in the pear receiving station, an arm pivotally mounted on said carriage and disposed toward the spindle, control mechanism to pivot said arm downwardly out of engagement with a pear on the spindle as said carriage is moved to the first position and effective thereafter to pivot said arm upwardly to engage a pear on the spindle, movement of said carriage to the second position causing said arm to move a pear from the spindle onto said spike, a seed celling member mounted at said seed celling station, transfer mechanism operative when said spike is in said seed celling station to transfer the pear along said spike into engagement with said seed celling member to seed cell the whole pear, and discharge mechanism to remove the pear from said spike when said spike is at said discharge station.

11. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, a seed celling mechanism including a spike, means to move said spike to a pear receiving station in alignment with the spindle and to a seed celling station and to a discharge station, means operative to move a pear from the spindle onto said spike when said spike is in the pear receiving station to support the pear along the stem axis thereof, a seed celling member mounted at said seed celling station, a pair of jaws mounted to engage a pear on said spike when said spike is in said seed celling station, drive mechanism to move said jaws toward said seed celling member to place the pear in engagement with said seed celling member to seed cell the whole pear and thereafter to place the seed celled pear on said spike, and discharge mechanism to remove the pear from said spike when said spike is at said discharge station.

12. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, a seed celling mechanism including a spike, means to move said spike to a pear receiving station in alignment with the spindle and to a seed celling station and to a discharge station, means operative to move a pear from the spindle onto said spike when said spike is in alignment therewith to support the pear along the stem axis thereof, a seed celling member mounted at said seed celling station, a pair of clamping jaws mounted adjacent to said spike to engage and grip a pear thereon when said spike is in the seed celling station, pear shifting mechanism to shift a pear along said spike to a predetermined position relative to said clamping jaws, control mechanism to close said clamping jaws about a pear, drive mechanism to move said clamping jaws toward the seed celling mechanism to effect seed celling of the pear and thereafter to move the pear onto said spike, said control mechanism thereafter opening said clamping jaws to release the pear, and discharge mechanism to remove the pear from said spike when said spike is at said discharge station.

13. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis there-

of, a seed celling mechanism including a spike, means to move said spike to a station in alignment with the spindle and to a seed celling station and to a discharge station, means operative to move a pear from the spindle onto said spike when said spike is in alignment therewith to support the pear along the stem axis thereof, a seed celling member mounted at said seed celling station, a pair of clamping jaws mounted adjacent to said spike in the seed celling station, pear shifting mechanism to shift a pear along said spike, gauge mechanism to position one end of a pear in a predetermined position relative to said clamping jaws, drive mechanism to move said clamping jaws to place the pear in engagement with said seed celling mechanism and thereafter to place the seed celled pear on said spike, and discharge mechanism to remove the pear from said spike when said spike is at said discharge station.

14. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, a seed celling mechanism including a spike, means to move said spike to a station in alignment with the spindle and to a seed celling station and to a discharge station, means operative to move a pear from the spindle onto said spike when said spike is in alignment therewith to support the pear along the stem axis thereof, a seed celling member mounted at said seed celling station, a pair of clamping jaws mounted adjacent to said spike in the seed celling station, a slide mounted on said spike to shift a pear therealong to a predetermined position relative to said clamping jaws, slide engaging mechanism to engage said slide and to hold said slide in fixed relationship to said clamping jaws for movement therewith, drive mechanism to move said clamping jaws and said slide to carry the pear into engagement with said seed celling mechanism to effect seed celling of the pear and thereafter to place the pear on said spike, and discharge mechanism to remove the pear from said spike when said spike is at said discharge station.

15. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, a seed celling mechanism including a spike, means to move said spike to a station in alignment with the spindle and to a seed celling station and to a discharge station, means operative to move a pear from the spindle onto said spike when said spike is in alignment therewith to support the pear along the stem axis thereof, a seed celling member mounted at said seed celling station, a pair of clamping jaws mounted adjacent to said spike in the seed celling station to engage and grip a pear thereon, a slide mounted on said spike to shift a pear therealong, a gauge mechanism to position one end of a pear in a predetermined position relative to said clamping jaws, slide engaging mechanism to hold said slide in a position corresponding to the predetermined position of a pear and to move said slide with said clamping jaws, drive mechanism to move said clamping jaws and said slide to place the pear into engagement with the seed celling mechanism to effect seed celling of the pear and thereafter to place the pear on said spike, and discharge mechanism to remove the pear from said spike when said spike is at said discharge station.

16. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, the combination comprising a mounting member having four spikes mounted thereon and extending outwardly therefrom with said spikes arranged in pairs disposed in axial alignment, means to move each of said spikes sequentially to a pear receiving station in alignment with the spindle and to a seed celling station and to a discharge station, means operative to move a pear from the spindle onto the one of said spikes in alignment therewith to support the pear along the stem axis thereof, a seed celling member mounted at said seed celling station, gauge mechansim to position the butt end of a pear at a predetermined position with respect to said seed celling member when said one of said spikes is in said seed celling station, transfer mechanism to move a pear from said predetermined postion a predetermined distance onto said seed celling member to seed cell the whole pear, and pear discharge mechanism to move the pear from said one of said spikes when in said discharge station.

17. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, the combination comprising a mounting member having four spikes mounted thereon and extending outwardly therefrom with said spikes arranged in pairs disposed in axial alignment, means to move each of said spikes sequentially to a pear receiving station in alignment with the spindle and to a seed celling station and to a discharge station, means operative to move a pear from the spindle onto the one of said spikes in alignment therewith to support the pear along the stem axis thereof, a seed celling member mounted at said seed celling station, a double acting slide mounted on each aligned pair of spikes to move pears therealong, means to move each slide when the associated spike is in said seed celling station to shift the pear into a predetermined position, transfer mechanism to move a pear from said predetermined position a predetermined distance onto said seed celling member to seed cell the whole pear, and pear discharge mechanism to move the pear from said one of said spikes when in said discharge station.

18. In a pear preparation machine having a spindle for holding whole pears thereon along the stem axis thereof, the combination comprising a mounting member having four spikes mounted thereon and extending outwardly therefrom with said spikes arranged in pairs disposed in axial alignment, means to move each of said spikes sequentially to a pear receiving station in alignment with the spindle and to a seed celling station and to a discharge station, means operative to move a pear from the spindle onto the one of said spikes in alignment therewith to support the pear along the stem axis thereof, a seed celling member mounted at said seed celling station, a double acting slide mounted on each aligned pair of spikes to move pears therealong, means to move each slide when the associated spike is in said seed celling station to shift the pear into a predetermined position, a pair of clamping jaws mounted adjacent to the predetermined position to engage and grip a pear therein, slide engaging mechanism to engage said slide for shiftable movement with said clamping jaws, drive mechanism to move said clamping jaws and said slide toward said seed celling member to effect seed celling of the pear and thereafter into engagement with said spike, and pear discharge mechanism to move the pear from said one of said spikes when in said discharge station.

19. In a pear preparation machine, a seed celling assembly comprising a spindle mounted for rotation about the axis thereof, means to rotate said spindle, a blade pivotally mounted on said spindle adjacent to one end thereof, said blade being shaped to extend into the stem aperture of a pear, a first cutting edge formed on one side of said blade and extending to the free end thereof to seed cell a pear in engagement therewith, a second cutting edge formed on the other side of said blade and spaced from the free end thereof to cut the pear about the blossom end thereof on the outer surface thereof, and means to pivot said blade and to move said first cutting edge from a first position disposed adjacent to the periphery of said spindle to a second position disposed outwardly therefrom to seed cell a pear disposed around said spindle and to move said second cutting edge into engagement with the surface of the pear adjacent to the blossom end thereof.

20. In a pear preparation machine, a seed celling assembly comprising a spindle mounted for rotation about the axis thereof, means to rotate said spindle, a blade pivotally mounted on said spindle adjacent to one end thereof, said blade being shaped to extend into the stem

aperture of a pear, a first cutting edge formed on one side of said blade and extending to the free end thereof to seed cell a pear in engagement therewith, a second cutting edge formed on the other side of said blade and spaced from the free end thereof to cut the pear about the blossom end thereof on the outer surface thereof, a collar mounted on said spindle adjacent to said blade, a hook formed on said blade and engaging said collar and means to shift said collar along said spindle to pivot said blade and to move said first cutting edge from a first position disposed adjacent to the periphery of said spindle to a second position disposed outwardly therefrom to seed cell a pear disposed around said spindle and to move said second cutting edge into engagement with the surface of the pear adjacent to the blossom end thereof.

21. In a fruit preparation machine, the combination comprising a support, a pair of elongated impaling members mounted on said support and extending outwardly therefrom in opposite directions and in general axial alignment, and a slide mounted for shiftable movement in a direction parallel to the longitudinal axis of said impaling members and having portions adapted to engage a pear positioned on said impaling members to shift a pear therealong, movement of said slide in one direction pushing a pear from one of said impaling members and permitting the other of said impaling members to receive a pear thereon.

22. In a pear preparation machine, the combination comprising a shiftable support, a pair of spikes mounted on said support and extending outwardly therefrom in opposite directions and in general axial alignment, a slide mounted adjacent to said spikes for movement in a direction parallel to the axis of said spikes, and a pear engaging plate mounted on each end of said slide and extending transversely to the axis of said spikes and receiving a spike through an aperture therein, movement of said slide in one direction causing engagement of one of said plates with a pear on one of said spikes to push the pear from said one spike and movement of said slide in the other direction causing engagement of said other plate with a pear positioned on the other spike to push the pear from said other spike.

23. In a pear preparation machine, the combination comprising an impaling member adapted to receive a pear thereon along the stem axis of the pear, a slide mounted adjacent to said impaling member and shiftatble therealong, and a halving blade mounted adjacent to the outer end of said impaling member whereby movement of said slide pushes a pear from said impaling member and onto said halving blade to halve the pear as it is discharged from said impaling member.

24. In a pear preparation machine, the combination comprising a shiftable support, a pair of spikes mounted on said support and extending outwardly therefrom in opposite directions and in general axial alignment, a slide mounted adjacent to said spikes for movement in a direction parallel to the axis of said spikes, a pear engaging plate mounted on each end of said slide and extending transversely to the axis of said spikes and receiving a spike through an aperture therein, a halving blade mounted adjacent to said support and spaced outwardly therefrom a distance to place the cutting edge thereof at a point spaced from the outer end of a spike, and means to shift said supporting member alternately to bring said spikes into alignment with said halving blade whereby movement of said slide pushes a pear from the spike adjacent to said halving blade onto said halving blade to halve the pear.

25. In a pear preparation machine having a seed celling mechanism, the combination comprising an impaling member adapted to receive and support a whole pear along the stem axis thereof, said impaling member being positioned below and directed toward the seed celling mechanism, a pair of clamping jaws mounted adjacent to said impaling member to engage and grip a pear thereon, and drive mechanism to move said clamping jaws upwardly toward said seed celling mechanism to move a pear therebetween into engagement with said seed celling mechanism to effect seed celling of the pear and thereafter to move the pear downwardly upon said impaling member.

26. In a pear preparation machine having an impaling member to support a whole pear along the axis thereof and a seed celling mechanism spaced therefrom, a combination comprising a pair of clamping jaws mounted adjacent to the impaling member to engage and grip a pear thereon, drive mechanism to move said clamping jaws from a position adjacent to the impaling member to a position to engage the pear with the seed celling mechanism to effect seed celling of the pear, said drive mechanism thereafter moving said clamping jaws toward the impaling member to impale the seed celled pear thereon, and control means thereafter to open said clamping jaws to release the pear therebetween.

27. In a pear preparation machine having an impaling member to support a whole pear along the axis thereof and a seed celling mechanism spaced therefrom, the combination comprising a pair of clamping jaws mounted adjacent to the impaling member to engage and grip a pear thereon, pear shifting mechanism to shift a pear along the impaling member to a predetermined position relative to said clamping jaws, control mechanism to close said clamping jaws about a pear, and drive mechanism to move said clamping jaws toward the seed celling mechanism to move a pear therebetween into engagement with the seed celling mechanism to effect seed celling of the pear, said drive mechanism thereafter moving the pear out of engagement with the seed celling mechanism and into engagement with the impaling member, said control mechanism thereafter opening said clamping jaws to release the pear therebetween.

28. In a pear preparation machine having an impaling member to support a whole pear along the axis thereof and a seed celling mechanism spaced therefrom, the combination comprising a pair of clamping jaws mounted adjacent to the impaling member to engage and grip a pear thereon, pear shifting mechanism to shift a pear along the impaling member, gauge mechanism to position the butt end of a pear in a predetermined position relative to said clamping jaws, control mechanism to close said clamping jaws about a pear and to remove said gauge mechanism from the path of a pear, and drive mechanism to move said clamping jaws toward the seed celling mechanism to move a pear therebetween into engagement with the seed celling mechanism to effect seed celling of the pear, said drive mechanism thereafter moving the pear out of engagement with the seed celling mechanism and into engagement with the impaling member, said control mechanism thereafter opening said clamping jaws to release the pear therebetween.

29. In a pear preparation machine, an impaling member to support a whole pear along the axis thereof, a seed celling mechanism spaced from said impaling member, a slide mounted on said impaling member for shifting a pear therealong, a pair of clamping jaws mounted adjacent to said impaling member to engage and grip a pear adjacent the outer end thereof, first drive mechanism to drive said slide to shift a pear along said impaling member to a predetermined position relative to said clamping position, engaging mechanism to hold said slide in a position to maintain the pear in said predetermined position, control mechanism to close said clamping jaws about a pear, drive mechanism to move said clamping jaws toward said seed celling mechanism to move a pear therebetween into engagement with said seed celling mechanism to effect seed celling of the pear, said control mechanism including means to disengage said engaging means from said slide, said drive mechanism thereafter moving the pear out of engagement with said seed celling mechanism

and into engagement with said impaling member, said control mechanism thereafter opening said clamping jaws to release the pear therebetween.

References Cited in the file of this patent

UNITED STATES PATENTS

19,402 Alcott ..... Feb. 23, 1858
2,056,413 Thompson et al. ..... Oct. 6, 1936
2,070,311 Pease ..... Feb. 9, 1937
2,187,075 Coons ..... Jan. 16, 1940
2,343,098 Thompson ..... Feb. 29, 1944
2,447,640 Dunn ..... Aug. 24, 1948
2,502,797 Luhdorff et al. ..... Apr. 4, 1950
2,835,371 Davis ..... May 20, 1958