

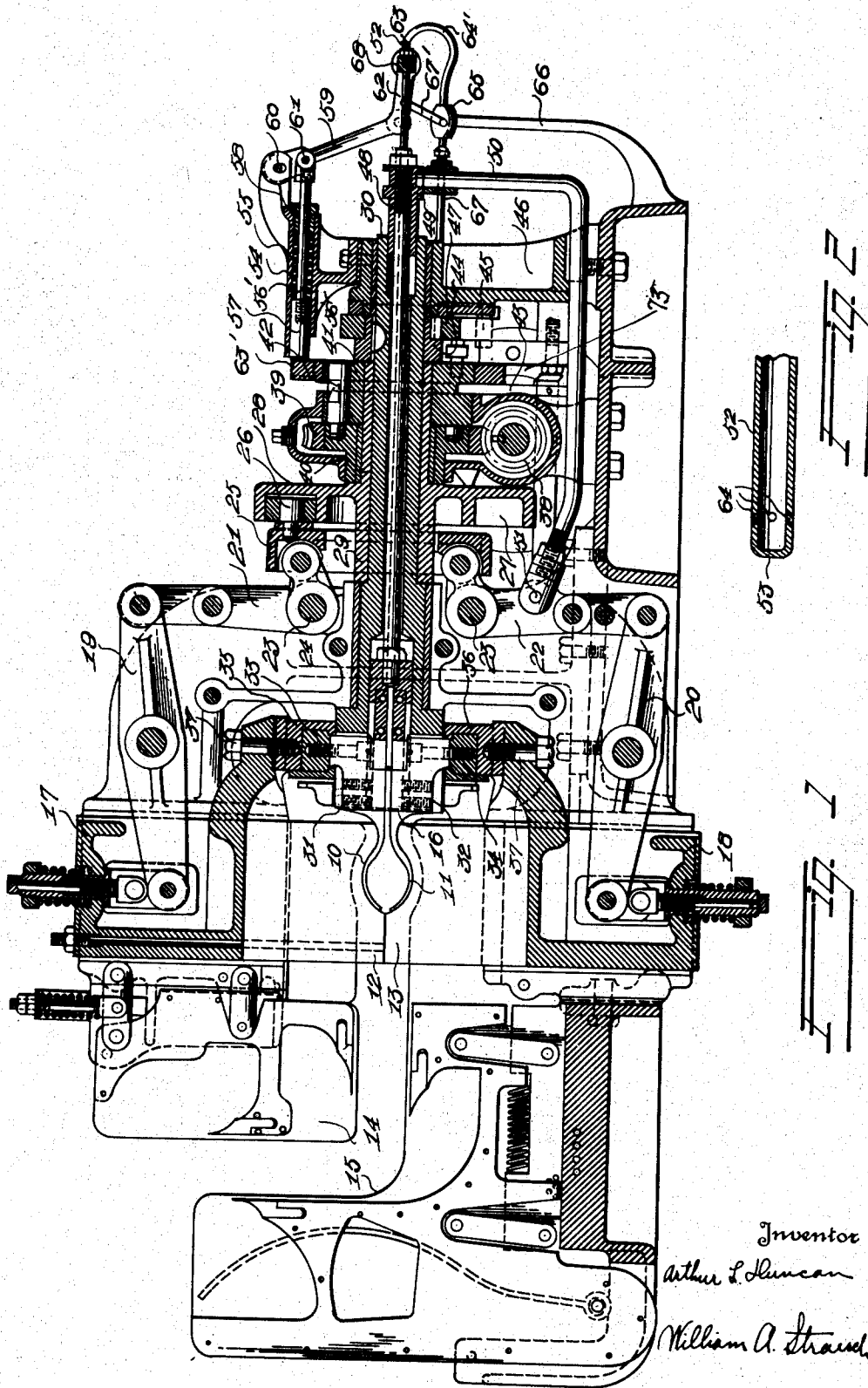
Dec. 16, 1930.

A. L. DUNCAN
FRUIT PITTING MACHINE

1,785,009

Filed Oct. 24, 1927

2 Sheets-Sheet 1



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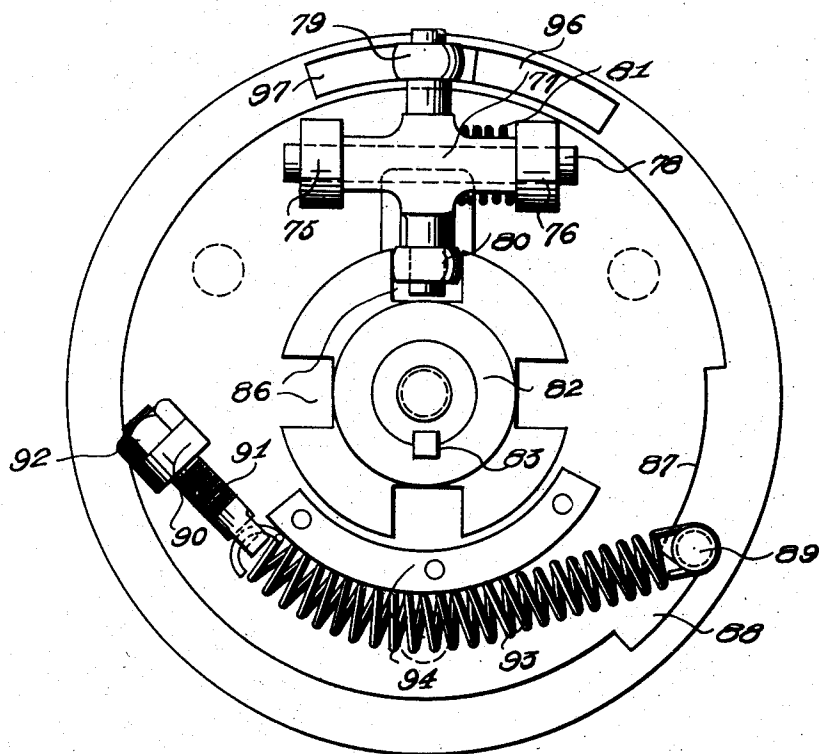
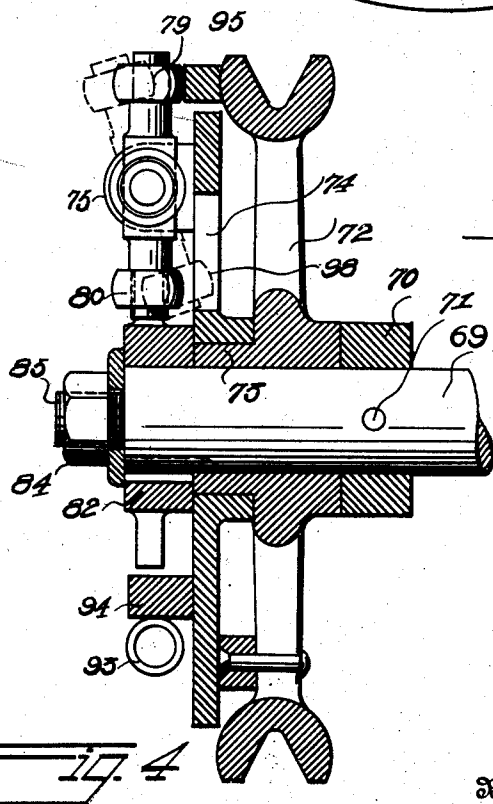
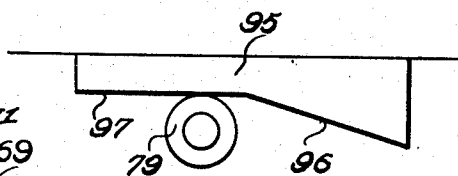
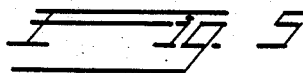
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2 Sheets-Sheet 2



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FRUIT-PITTING MACHINE

Application filed October 24, 1927. Serial No. 228,352.

This invention relates to pitting or coring machines embodying drive mechanisms especially designed to prevent the breaking of the pitting knives, and presents an improvement on the machines shown in my applications, Serial Nos. 191,334 and 209,448. While the present invention relates particularly to machines of the character disclosed in said applications it is to be understood that the invention is capable of use with machines of other types.

In the peach pitting machines of the applications just referred to, difficulty has been experienced due to the breaking of the pitting knives. Such breakage was due to several causes. In the first place, though the knives were made of steel, that had a certain degree of resilience, occasionally peaches were encountered so green, and consequently so hard, that the knives were sprung out in shape in forcing them through the fruit. Such bent knives were caught in the pocket formed by the jaws of the machine and broken. Again in other cases abnormal pits were encountered including hard shelves that extended beyond the radius of the knives and engaged the knives causing them to snap off in some instances.

A primary object of my present invention accordingly is to provide a driving mechanism for pitting machines which causes the knives to be yieldably forced through the fruit, and which at the same time automatically causes the machine to stop if resistance exceeding a predetermined amount is encountered by the knives.

Another object of the invention is to provide a drive mechanism for pitting machines that is simple in construction, unlikely to get out of order, and in which adjustment of the degree of pressure to which the knives may be subjected can be readily made so that breakage of the knives may be easily prevented.

A further object of the invention is to provide a peach pitting machine embodying means to flush the knives and adjacent parts, the flushing means being so arranged that it will be automatically controlled by the movement of the pit ejecting device, so that

the flushing fluid will be applied in properly timed relation to the other operations of the machine.

Still further objects will appear as a description of the invention proceeds with reference to the accompanying drawings in which:

Figure 1 is a longitudinal sectional view of the machine.

Figure 2 is a longitudinal section of the pit ejecting tube on an enlarged scale.

Figure 3 is an end elevation of the improved driving mechanism.

Figure 4 is a central vertical section of the parts shown in Figure 3.

Figure 5 is a detail of the cam for releasing the drive mechanism when a resistance exceeding a predetermined limit is encountered.

In the drawings like reference characters indicate like parts throughout the several views.

The invention is shown as applied to the peach pitting machine described in copending application Serial No. 191,334, filed May 14, 1927. As described in detail in said application, the machine comprises a pair of curved pitting knives 10 and 11, a pair of holding jaws 12 and 13, and spaced blades 14 and 15 providing a path between them for the pit of the peach. Blades 14 and 15 form a circumferential recess in the flesh of the fruit surrounding the sharp edge of the pit, and guide the fruit into position between the jaws 12 and 13 and the knives 10 and 11 that are normally open to receive the pit. A retractable gauge 16 determines the extent of movement of the pit and stops it in proper position between the pitting knives. If desired, the fruit can be moved manually to the end of the vertical branch of the angular path between blades 14 and 15, and mechanically operated cups may then engage the fruit and move it through the horizontal branch of said path after the manner disclosed in my patent, Reissue #16,259, granted Feb. 9, 1926.

The jaws 12 and 13 and the knives 10 and 11 are carried in slides 17 and 18 that are reciprocated toward and from each other by levers 19 and 20 that are connected to the slides at one end and linked at their other ends to

one arm of bell crank levers 21 and 22 pivoted at 23 to the frame 24 of the machine. The other arms of levers 21 and 22 are linked together by a member 25 for unitary movement. Member 25 has a cam roller 26 secured thereto that rides in a cam groove 27 of a cam 28 carried by a sleeve 29 that rotatably surrounds the main shaft 30 of the machine. The cam groove is formed so that the jaws and knives are open and closed to embrace and center the pit at proper intervals.

Knives 10 and 11 are, however, rotatable bodily with respect to the jaws 12 and 13. To effect their rotation at the proper time the heads 31 of said knives are set in furcations 32 of main shaft 30, said heads being slidable in said furcations to permit their movement with jaws 12 and 13. The heads 31 of said knives are connected to the slides 17 and 18 by projections 33 and 34, that slide in curved guides 35 and 36 bolted to said slides by bolts 37. Said guides may be circular or oval, as may be desired, to determine the course of bodily movement of the pitting knives through the flesh of the fruit.

The parts just described receive their motion from a worm 38 that is power driven in a manner presently to be described. This constitutes an essential part of the invention of this application.

Worm 38 meshes with worm wheel 39 rotatably mounted on an extension 40 from sleeve 29. A sleeve 41 surrounds sleeve 40 and is keyed thereto. A sliding pin 42 clutches worm wheel 39 and sleeve 41 together for rotation through one revolution, the pin 42 being released from sleeve 41 by tripping member 43 that retracts the pin after each revolution. Sleeve 41 carries a pawl (not shown) that engages a tooth on a sleeve 44 after sleeve 41 and sleeve 29 secured thereto have been rotated through a portion of a revolution to close the knives 10 and 11 and the jaws 12 and 13 about the pit. Sleeve 44 is keyed to the main shaft 30 for rotation therewith. A locking dog 45 carried by an upward extension 46 of frame 24 engages, at intervals, a tooth on a collar 47 keyed to sleeve 44 to hold the knives 10 and 11 in proper position at the completion of each operation.

Gauge 16 is retracted as the jaws 12 and 13 and the knives 10 and 11 are moved toward each other to close about the peach pit, by means of a tube 48 that is arranged in a longitudinal bore in the main shaft 30. Gauge 16 is secured at one end to tube 48. At the other end of said tube an actuating bracket 49 engages the yoke end of a bent lever 50 that is pivotally attached at 51 to bell crank 22, so that the movements of the jaw 13, itself controlled by the bell crank 22.

So far as described the machine is identical to that fully described in application Serial No. 191,334 above referred to and reference may be had to said application for a detailed

description of the parts that are above described generally. The machine of this application also includes the mechanical ejector described in application Serial No. 209,488. Said ejector comprises a tubular member 52 closed at one end as shown at 53 (Fig. 2). Tubular member 52 extends through the tube 48 and gage 16 and is projected to the left viewing Fig. 1, when the knives and jaws are open to engage the edge of the pit with a sharp blow to cause the pit to be ejected from the machine and to wedge apart the halves of the jaws as more fully described in the application just referred to.

Rod 52 is caused to move to its operative position by a spring 54 arranged in a bore 55 of bracket 56 bolted to the machine in any suitable manner. Spring 54 surrounds a rod 56' and is arranged between the head 57 secured to said rod and a sleeve 58 threaded in the bore of bracket 56. The movements of the rod 56' under the influence of spring 54 are communicated to the ejector rod 52 by a lever 59 connected by a lost motion connection 60 to an extension of bracket 56. The rod 56' is pivotally connected to lever 59 at 61 so that the movements of the rod are communicated to said lever. The opposite end of lever 59 is connected by a link 62 to the free end of rod 52 before referred to, a nut 63 serving to adjust the effective length of said rod. A cam 63' controls the spring 54 releasing it at the proper moment to eject the pit and halves. The operation of the ejector just referred to is more fully pointed out in application Serial No. 209,488.

In order to provide for the periodical rinsing or flushing of the jaws and pitting knives, means are provided to spray these members with a stream of water after each operation. Said stream is brought into play through tubular member 52 constituting the mechanical ejector above referred to which as shown in Figure 2 is provided with a plurality, preferably four, inclined openings 64 (Fig. 2) adjacent the operative end of said member. Water under pressure is supplied to said member by a flexible tube 64' arranged between the free end of tubular member 52 and a valve 65 carried by a bracket 66 secured to the base of the machine. A pipe 67 connected to any suitable source of water supply is connected to valve 65. In order that the flow of water may be turned on periodically the opening of the valve 65 is controlled by the movements of the ejector member 52. To accomplish this, valve 65 is provided with an actuating lever 67' that is biased by means of a spring (not shown) toward the position at which the valve is closed. As clearly shown in Figure 1 the end of lever 67' is arranged in the path of movement of an abutment 68 carried by the ejector rod 52, the arrangement being such that when the ejector rod

moves forward to bring the opening 63 into position between the jaws and the knives, the abutment 68 will engage the lever 67' to cause the valve to be opened and to thus project streams of water against the jaws and knives of the machine washing them clean.

Worm 38 is secured to shaft 69 (Fig. 4) adjacent the end of which a collar 70 is secured by a pin 71. Loosely mounted on shaft 69 and abutting against collar 70 is a driving pulley 72. This pulley is driven continuously from any suitable source of power. Mounted on a tubular extension 73 of pulley 72 is a disk 74 that is free to rotate on said extension. Disk 74 carries a pair of perforated lugs 75 and 76 (Fig. 3). A trigger 77 preferably of the form of a cross is pivotally mounted by means of a pin 78 in lugs 75 and 76, pin 78 traversing two arms of the cross as indicated in Figure 3. Suitably mounted on reduced ends of the other arms of the cross shaped member 77 are rollers 79 and 80. A spring 81 secured at one end to member 77 and at its other end to lug 76 biases the upper end of member 77 toward disk 74.

Disk 74 is held on extension 73 by a clutch member 82 keyed to the end of shaft 69 by a key 83, and secured thereon by a nut 84 engaging a threaded end 85 of shaft 69. Clutch member 82 is provided with a plurality of notches 86, of a width substantially equal to the diameter of rollers 79 and 80.

Disk 74 is provided further with a recess 87 and a projection 88 extending from the periphery thereof. Secured to the pulley 72 is a pin 89 arranged to ride in the recess 87 formed in disk 74, the ends of said recess and projection constituting abutments that engage pin 89 at the limits of its travel, whereby the movement of the disk relative to the pulley is limited.

Secured to the face of disk 74 is a perforated lug 90, the perforation of which is arranged to loosely receive the threaded shank of an adjusting member 91, the effective length of which may be varied by means of a nut 92 engaging one face of lug 90, as clearly shown in Figure 3. A coil spring 93 arranged between pin 89 and adjusting member 91 serves to yieldably join pulley 72 and disk 74. A suitable curved plate 94 serves as an abutment against which the side of spring 93 rests.

Secured to the edge of pulley 72 is a cam plate 95 having an inclined surface 96 (Figs. 3 and 5) and a straight surface 97 against which the roller 79 ordinarily rests. A recess 98 is provided in disk 74 in such position that the arm of the cross shaped member 77 carrying the roller 80 may swing thereinto as shown by the dotted lines in Figure 4.

Operation

In operation, knives 10 and 11 and jaws 12 and 13 are normally separated, while gauge

16 is forwardly disposed, and the ejector 52 is in its rearward position. Just before the completion of the separational movement of the jaws and knives, depression 73 permits rod 56' under the action of spring 54, to actuate the ejector 52, the end of which springs into the space between the partially separated knives, said end engaging the pit and moving it endwise of the knives.

Just before the completion of the separational movement of the jaws and knives, the cam 63' permits the spring 54 to become effective thus actuating the mechanical ejector tube 52, moving it forward to eject the pit and the fruit halves from the machine. Just before the ejector tube reaches the end of its movement, abutment 68 engages the valve lever 67' permitting water to flow from the pipe 67 through the valve 65, flexible connection 64' and the bore of the tube, to be discharged from the openings 64 in the operative end of said tube. The jaws and knives are thus effectively flushed. After the ejecting operation is completed, the ejector is withdrawn by cam 63' such action moving the abutment 68 away from the lever 67' of the valve 65 permitting the spring to close the valve and shut off the flow of water. The single revolution is then completed and the one revolution clutch automatically stops the machine with the knives in properly aligned relation with respect to the jaws and in position for repetition of the operation above described.

The worm 38 which actuates the gear 39 of the one revolution clutch above referred to, is driven by shaft 69 that is keyed to clutch member 82 as above pointed out. Normally the clutch member 82 is fixed with relation to the disk 74 by the swinging trigger 77 and the disk 74 is connected to driving pulley 72 by the coil spring 93. Accordingly, under normal conditions, the disk 74, and with it, the shaft 69, is yieldably driven from the pulley 72 by spring 93. As a result, the parts of the machine are yieldingly driven so that if the pitting knives 10 or 11 engage an unusual obstruction, a slight yielding thereof will be permitted. If the obstruction is of such a nature, that the inherent flexibility of the knives is insufficient to surmount it, the travel of the disk 74, with respect to the pulley 72, will be such as to cause the roller 79 to ride up the inclined surface 96 thus rocking the trigger member 77 in opposition to the spring 81 to throw the roller 80 into the recess 98 and from notch 86 in clutch member 82. The connection between the driving pulley 72 and the clutch member 82 is accordingly broken, thus avoiding breakage of the knives 10 and 11. It will be observed that the tension of the coil spring 93 may readily be adjusted by the nut 92 so that the force necessary to effect the automatic breaking of the connection between the

clutch member 82 and pulley 72, may be varied at the will of the operator.

The invention may be embodied in other forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be regarded in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are intended to be embraced therein.

I claim:

1. A pitting machine of the type that includes rotatable pitting means arranged to turn about the pit, comprising means to cause said pitting means to move from an initial position to sever the pit from the peach and to then stop at said position, and means to drive said first named means including a yieldable element whereby the pitting means is cushioned in its movement to and from said position.

2. A peach pitting machine such as defined in claim 1 in which the last named means includes mechanism to release the driving means when the yieldable element is subjected to a force in excess of a predetermined amount.

3. A fruit pitting machine of the type that includes rotatable pitting knives arranged to be centered with respect to the substantially intact pit and to rotate about said pit, comprising means to rotate said knives from their initial or centering position to cut the pit from the fruit and to then stop them in said position, means to drive said first named means including an adjustable spring arranged to cushion the movement of said knives through the fruit.

4. The combination defined in claim 3 in which the last named means embodies a releasable element that automatically disconnects said means when the force exerted on said spring exceeds a predetermined amount.

5. A fruit pitting machine comprising means to halve the fruit, means to sever the pit from the fruit halves, a mechanical ejector, arranged to operate in timed relation to said pit severing means, and means to flush said severing means arranged to be put in operation by the movement of said ejector.

6. The combination defined in claim 5 in which the mechanical ejector is a tubular member through which flushing fluid passes.

7. A fruit pitting machine comprising means to hold the fruit, means to cut the pit from the fruit when it is held by said holding means, a mechanical ejector, means to move said ejector to its operative position when the pit is cut from the fruit and to then retract it away from said cutting means, said ejector being provided with a conduit and fluid outlets to project a flushing fluid

against said cutting and holding means when it is in operative position.

8. The combination defined in claim 7 including a supply conduit connected to said ejector conduit and a valve to shut off the flow of fluid, the arrangement being such that the movement of the ejector controls said valve and the flow through the ejector conduit.

9. A fruit pitter embodying revolable knives to cut the flesh of the fruit from the pit, including a driving shaft to operate said knives, a continuously rotating operating means arranged on said shaft, and means to yieldably connect said operating means and said shaft, whereby the movement of said knives through the fruit is cushioned.

10. The combination defined in claim 9 including automatic means to disconnect said driving means from said shaft when the resistance to the rotation of said knives exceeds a predetermined amount.

11. A peach pitting machine including revolable knives arranged to rotate about the substantially intact pit, comprising means to drive said knives that includes a drive shaft, a driving pulley arranged to rotate freely on said shaft, a disk mounted to rotate a limited amount with respect to said pulley, means to connect said disk to said shaft, and a spring to connect the disk to said pulley.

12. A peach pitting machine including revolable knives arranged to rotate about the substantially intact pit, comprising means to drive said knives that includes a drive shaft, a driving pulley arranged to rotate freely on said shaft, a disk mounted to rotate a limited amount with respect to said pulley, a clutch member secured to said shaft, a trigger carried by said disk and normally engaging said clutch member, a spring connecting said pulley and disk, permitting a predetermined amount of relative motion between said pulley and disk, and means to release said trigger from said clutch member when the relative motion between disk and pulley exceeds said amount.

13. The combination defined in claim 12 in which said last named means is a cam secured to said pulley, having an inclined surface arranged in the path of said trigger.

14. A peach pitting machine comprising revolable knives arranged to rotate about the substantially intact pit; means to drive said knives including a drive shaft, a pulley loosely mounted on said shaft, a clutch member fixedly secured to said shaft, a disk arranged between said clutch member and pulley and mounted for limited rotary movement with respect to the pulley, a spring to resist such relative movement and releasable means operable when said relative movement exceeds a predetermined amount; said releasable means connecting said disk and clutch member.

15. The combination defined in claim 14 including means to adjust the effective length of said spring to vary the degree of cushioning effected thereby.

5 16. A peach pitting machine comprising a plurality of pitting knives arranged for rotary movement in a fixed path, and means to drive said knives including a driving shaft, a driving pulley loosely mounted on said shaft; a disk journaled on an extension from
10 the hub of said pulley, a spring connecting said disk and pulley in a manner permitting limited rotation of the disk with respect to the pulley; a clutch member secured to said
15 shaft and a trigger carried by said disk to rotate as a unit with said shaft, and means secured to said pulley to release said trigger from said clutch member when the relative
20 motion between said pulley and disk permitted by said spring exceeds a predetermined amount.

In testimony whereof I affix my signature.
ARTHUR L. DUNCAN.

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