E. WALKER.

LEMON SQUEEZER.

APPLICATION FILED DEC. 17, 1910.

1,115,754.

Patented Nov. 3, 1914.

3 SHEETS—SHEET 1.

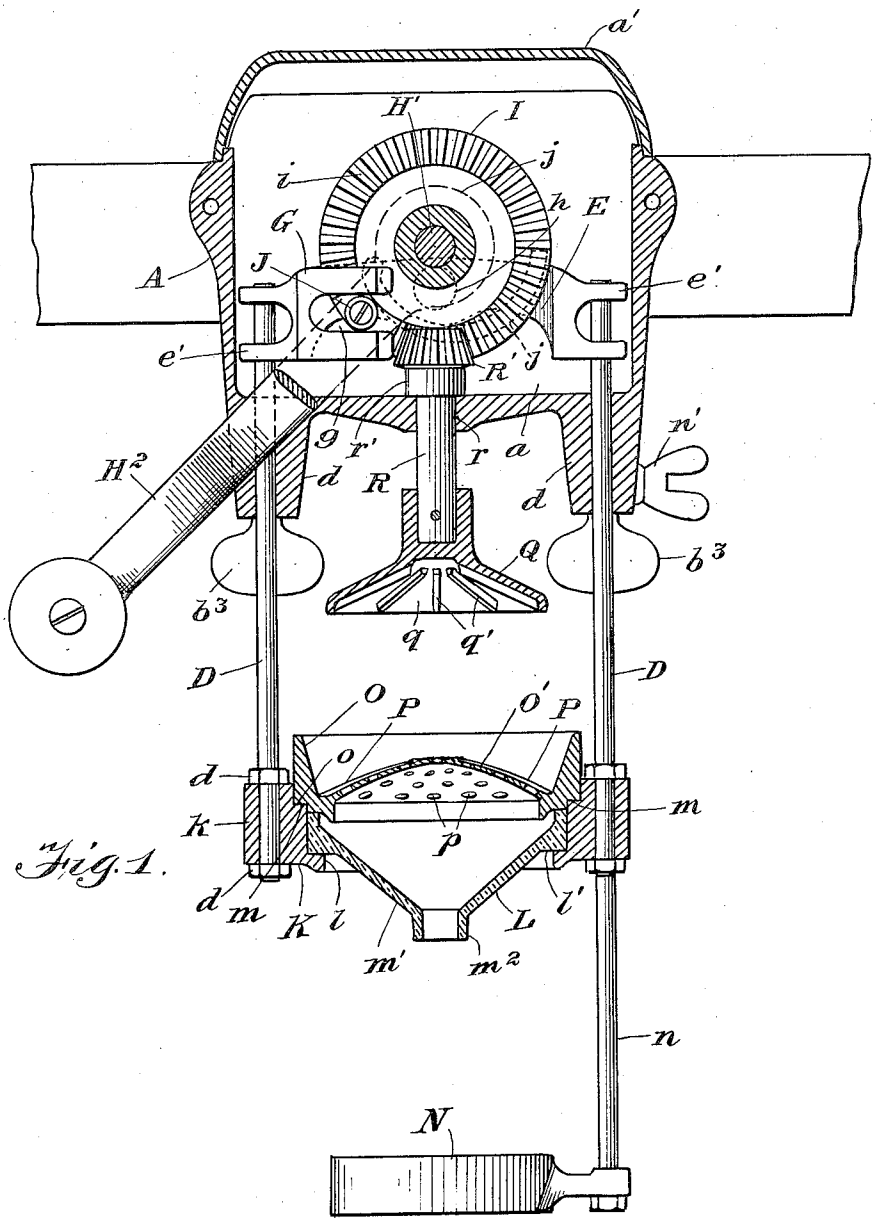


Fig. 1.

WITNESSES

Robert Head

J. Mothershead

INVENTOR

Edwin Walker

BY Griffin & Bernhard

ATTORNEYS

E. WALKER.

LEMON SQUEEZER.

APPLICATION FILED DEC. 17, 1910.

1,115,754.

Patented Nov. 3, 1914.

3 SHEETS—SHEET 2.

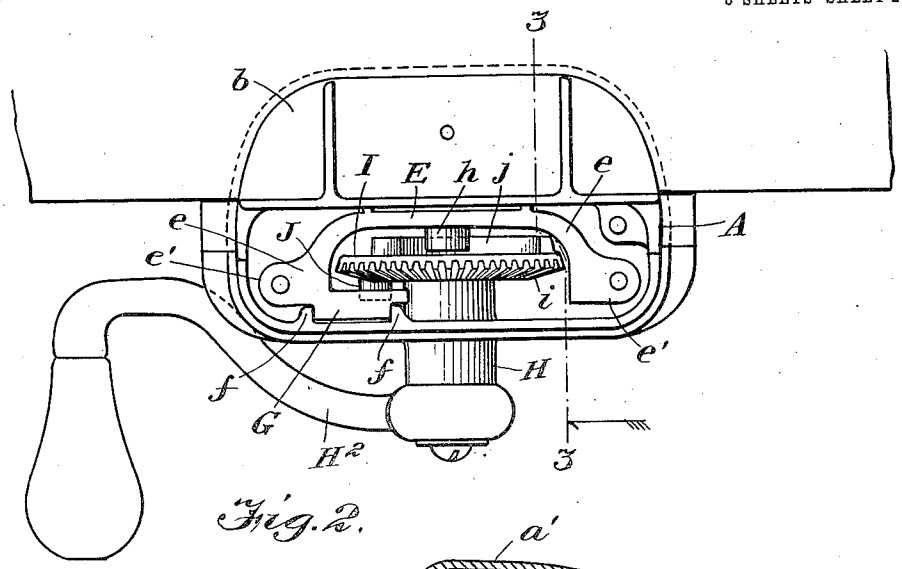


Fig. 2.

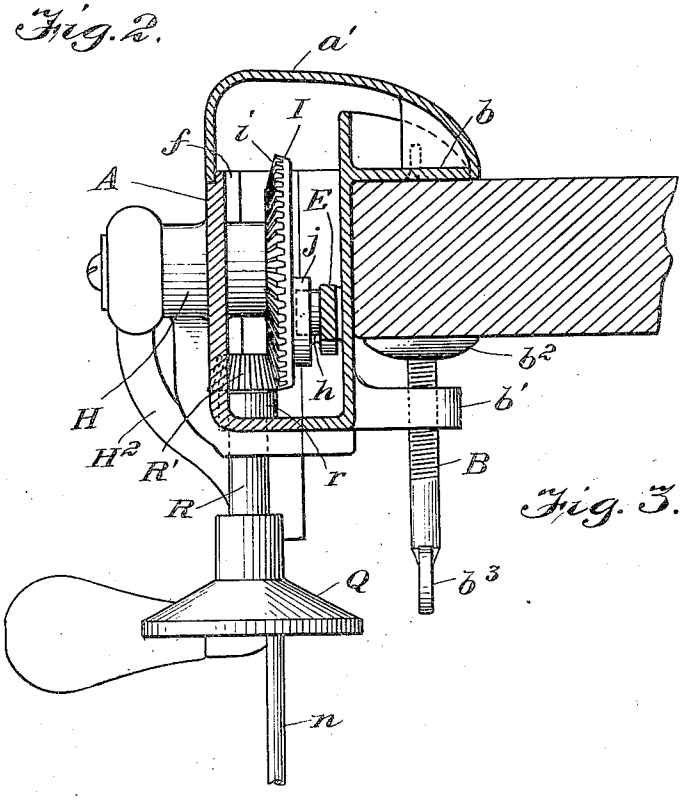


Fig. 3.

WITNESSES.

Robert Read

J. Mothershead

INVENTOR

Edwin Walker

BY Griffiths Bernhard

ATTORNEYS

E. WALKER.

LEMON SQUEEZER.

APPLICATION FILED DEC. 17, 1910.

1,115,754.

Patented Nov. 3, 1914.

3 SHEETS—SHEET 3.

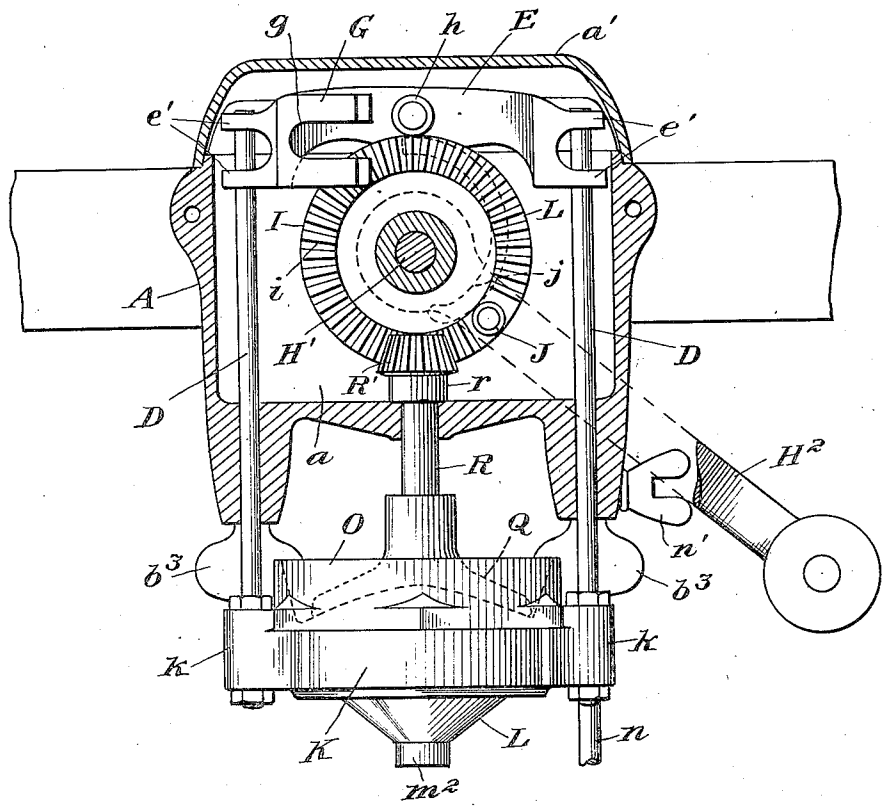


Fig. 4.

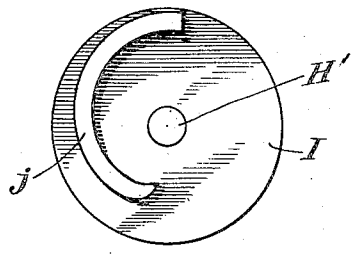


Fig. 5.

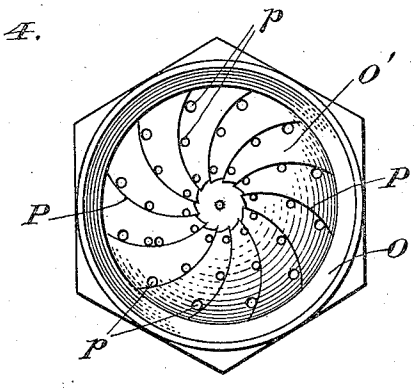


Fig. 6.

WITNESSES

Robert Head

J. Motherhead

INVENTOR

Edwin Walker

BY Griffin & Bernhard

ATTORNEYS

UNITED STATES PATENT OFFICE.

EDWIN WALKER, OF ERIE, PENNSYLVANIA.

LEMON-SQUEEZER.

1,115,754. Specification of Letters Patent. **Patented Nov. 3, 1914.**

Application filed December 17, 1910. Serial No. 597,916.

To all whom it may concern:

Be it known that I, EDWIN WALKER, a citizen of the United States, residing at Erie, county of Erie, and State of Pennsylvania, have invented a certain new and useful Lemon-Squeezer, of which the following is a specification.

This invention is a device for expressing the juices and pulp from fruits of various kinds, although the invention, or parts thereof, may be embodied on devices for operating upon substances of different kinds.

The device to be hereinafter described is intended, more particularly, to be attached or mounted upon a table, shelf, or the like, so as to position all the working parts in a very compact relation.

My device is characterized, among other things, by a novel organization of mechanisms whereby the height of said device above the table, shelf or the like is minimized; in other words, the device does not project above the table or shelf to such an extent as to be either noticeable or objectionable.

A distinctly novel feature of the invention consists of means for compressing the substance to be treated, said compressing means comprising a coöperating receptacle and a head, capable of a relative movement toward and from each other at different speeds, whereby the receptacle or the head may be operated to at first approach each other quickly for bringing the head into contact with the substance to be treated, and thereafter the head and receptacle approach each other more slowly, and in a manner to secure a slow, but powerful, compressing or squeezing action upon the substance.

The invention, furthermore, embodies means for imparting rotary motion to one of said parts relative to the other part during, or at the time of, the final compression or squeezing action.

Preferably, the receptacle is operated by a reciprocating motion with respect to the head, and the head is rotated relative to the receptacle, although it is not desired to limit the invention to this specific operation of these parts.

The invention embodies, also, a form of receptacle constructed to preclude the pulp of the lemon under treatment from bulging outwardly beyond the skin or rind, the aim being to so confine or position the lemon, and particularly the pulp thereof, as to bring the same under the compressing or squeezing action of the device. Said receptacle is provided with ribs, and, preferably, its bottom is conical, or substantially so, said bottom being perforated for the escape of the juices and pulp. While the ribs on the bottom of the cup may be straight ribs, it is preferred to employ curved ribs, or spiral ribs, for the reason that the pulp and the seeds expressed from the fruit will be forced toward the center of the receptacle. This displacement of the pulp and seeds is due, in part, to the rotary motion imparted to the fruit under treatment by the rotatable head when the final squeezing or high pressure action is obtained between the head and the receptacle, and in part to the fruit being given a rotative motion with respect to the ribs upon the bottom of the receptacle, whereby the juice and the pulp will escape through the perforations in the bottom of the receptacle, the seeds being retained upon the bottom of the cup for the reason that they cannot escape over the boundary wall of the receptacle, nor through the perforations in the bottom thereof.

Other features of the invention, and the advantages thereof, will appear in the course of the annexed detailed description.

In the accompanying drawings I have illustrated one practical embodiment of the invention, but the construction shown therein is to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 is a vertical section, partly in elevation, of a lemon squeezer embodying this invention, the receptacle being lowered relative to a rotatable compressor or head. Fig. 2 is a plan view with the cap of a casing removed to illustrate the parts contained within said casing. Fig. 3 is a vertical section on the line 3—3 of Fig. 2, parts being shown, also, in elevation. Fig. 4 is a sectional elevation similar to Fig. 1 but with the receptacle lifted into close relation to the compressor or head, whereby the substance may be compressed and treated for extracting the juices and pulp. Fig. 5 is a detail view of a cam in elevation. Fig. 6 is a detail plan view of a ribbed and perforated receptacle adapted for use in the machine.

A designates a casing for some of the working parts, other working parts being positioned below the casing, exteriorly there-

of, as will hereafter appear. The casing is provided with a chamber, *a*, the bottom, sides and ends of which are closed, but the top is, preferably, open, said top being closed by a cover, *a'*, adapted to be secured removably in position, whereby access may be obtained to the working parts housed within the casing. Said casing is compact in construction and it is provided with means for retaining it fixedly in position upon a shelf, table, bar, or other device, in such manner that the machine does not extend for an objectionable or appreciable distance above the top of said shelf, etc.

As shown more clearly in Fig. 3, the casing is provided with a rearwardly extending ledge, *b*, and with a plurality of arms, *b'*, said ledge and the arms being positioned to rest upon and to fit below the shelf, respectively. The arms are provided with threaded openings, in which work clamping screws, B, the latter being provided with heads, b^2, and with finger pieces, b^3, for their convenient adjustment. The machine is applied or fitted to an edge of the shelf by ledge, *b*, resting thereon, after which screws, B, are adjusted for the heads, b^2, to engage with the under face of the shelf whereby the machine is adapted to be clamped fixedly in position upon the shelf. As shown, cover, *a'*, extends over the ledge for the purpose of incasing and concealing it. On its under or bottom side the casing is provided with lugs, *d*, having openings, for the reception of vertically positioned rods, D, said lugs serving as guides for said rods when the latter are reciprocated.

E, designates a crosshead, the same being positioned within the casing for reciprocating movement therein. The crosshead is provided with bent or curved end portions, *e*, the latter having lugs, *e'*, through which pass the upper ends of rods, D. The rods are fastened rigidly to the lugs of the crosshead, whereby the rods and the crosshead are united for movement together and in a vertical direction relative to casing, A.

The front wall of casing, A, is shown in Fig. 2 as being provided with ribs, *f*, *f*, positioned parallel to each other so as to produce in connection with the rods, D, a guideway for the crosshead. The crosshead is provided with a guide member, G, which works in said guide way, said member, G, being constructed with a slot or recess, *g*, shown in Fig. 4, for a purpose to be explained. The crosshead is provided, also, with a stud or roller, *h*, positioned on one face of said crosshead and substantially midway between the ends thereof.

H is a shaft bearing provided on the front wall of said casing. In said bearing is journaled a main shaft, H', the same being provided with a crank handle, H^2, for its convenient operation. That end of the shaft which lies within chamber, *a*, of the casing carries a master wheel, I, the same embodying a combined gear and cam. Said master wheel, I, is positioned for operation within the path of the reciprocating crosshead, the latter being slidable relative to the master wheel. Said master wheel is provided with bevel gear teeth, *i*, on one face thereof, and on the other face of said wheel is a rib, *j*, forming a cam, see Figs. 2, 3 and 5 of the drawings, and the dotted lines in Figs. 1 and 4. The master-wheel is provided, also, with a stud or roller, J, the same being positioned on that face of the wheel having the gear teeth, and preferably near the periphery of said wheel. Said stud or roller, J, of the master wheel is positioned for cooperation with slot or recess, *g*, in guide member, G, of the crosshead when the master wheel is turned through a certain part of its motion, whereby stud or roller, J, operates to impart a reciprocating motion to the crosshead and to rods, D. Stud or roller, *h*, of the crosshead is positioned for cooperation with the cam, *j*, of the master wheel when said master wheel turns through a certain part of its revolution, the coöperating cam, *j*, and stud or roller, *h*, acting to impart the final squeezing or pressing operation upon the fruit or substance under treatment, as will presently appear.

K, designates a carrier positioned below casing, A, of the machine, said carrier being capable of a reciprocating motion with rods, D, and crosshead, E. As shown, the carrier is provided with perforated lugs, *k*, through which pass the lower ends of rods, D, said rods being provided with adjusting nuts, *d*, positioned for engagement with the upper and lower faces of lugs, *k*, for the purpose of rigidly fastening the carrier to the rods. The carrier is provided with a central opening and with internal shoulders, *l*, *m*, shoulder, *m*, being positioned above and parallel to shoulder, *l*, see Fig. 1.

O, designates a receptacle for the material to be treated, said receptacle being preferably embodied as a cup. On its under side the receptacle is provided with a ledge, *o*, adapted to occupy the shoulder, *m*, of the carrier, whereby the receptacle may be placed in position upon the carrier so as to be supported thereby and to be movable therewith, said receptacle being easily lifted out of position and removed from the carrier. The receptacle is provided with a bottom, O', preferably substantially conical in shape, although the particular shape of the receptacle is not a material item. On its upper face the bottom, O', of the receptacle is provided with a plurality of ribs, P. As shown, the ribs are curved from the outer wall of the receptacle, and they extend inwardly toward the center thereof. I may employ straight ribs, extending radially

from the center of the bottom, but it is preferred to use curved ribs. The curved ribs do not meet at the center of the bottom, thus leaving a flat raised central part in the bottom, which part assists in retaining the fruit in position within the cup. The ribs provide curved shoulders which extend substantially radially from the center of the bottom to the surrounding wall of the cup, the surface of the bottom between the ribs being inclined from the shoulders which are formed by the ribs. In addition to the ribs, the bottom of the cup is provided with openings, *p*, for the exit of the juices and pulp from the material under compression. Said openings, *p*, are positioned close to the shoulders formed by the ribs, as clearly shown in Fig. 6; any desired number of openings being employed in each series adjacent to one of the ribs.

The cup is square or hexagonal externally, and it is fitted in a correspondingly shaped opening provided in carrier, K, whereby the cup, when seated upon the carrier, is precluded from rotating relative to said carrier, the cup remaining in, or occupying a substantially stationary position upon the carrier during the final operation of compressing and rotating the material under treatment.

L, designates a collecting cup supported in the carrier and positioned below receptacle, O, within which the material is adapted to be compressed. The collecting cup is composed, preferably, of glass, or other non-metallic substance, but the particular material of the cup is not essential. At its edge, the cup is provided with a flange *l'*, adapted to occupy shoulder, *l*, of the carrier, said cup L, being fitted removably to the carrier for the purpose of withdrawing the cup when desired in order to clean it. As shown, cup, L, has an inclined bottom, *m'*, and a central outlet, m^2, said outlet providing for the escape of the juices and pulp expressed from the material under treatment and flowing through the perforations, *p*, in the bottom of receptacle, O.

The glass or other container is adapted to be positioned below cup, L, and to be supported in a holder, N, the latter being fastened to the rod, *n*, extending upwardly into an opening provided in one of the guides, *d*, of the casing, whereby the rod, *n*, is adapted to be fastened detachably to the casing by a bolt having a winged thumb nut, *n'*.

Q, designates a compressor adapted for coöperation with receptacle, O. Said compressor is shown as a head, the under face of which corresponds in shape to bottom, O', of the receptacle. Said head is shown as having a recess, *q*, provided with radial ribs, *q'*, said ribs of the compressor being brought into close relation to the ribbed surface, P, of the bottom, O', of the cup, during the final compressing and rotating operation of the material under treatment. The compressor is attached rigidly to the lower end of the vertical shaft, R, the latter being mounted in opening, *r*, provided centrally in the bottom portion of casing, A. Said shaft is provided near its upper end with a collar, *r'*, which rests upon the bottom of the casing to preclude downward movement of the shaft and the compressor. The upper end of said shaft, R, is provided with a beveled gear, R', which meshes with beveled gear teeth, *i*, of the rotary master wheel, I, said master wheel serving to impart rotary motion to shaft, R, and compressor, Q, when the crank, H^2, is moved in one direction or the other for imparting rotary motion to shaft, H'.

This being the construction of my new device, the operation thereof is as follows: With the crank, H in the position shown in Fig. 1, master wheel, I, is turned for stud or roller, J, to lie within slot or recess, *g*, of the crosshead. Rods, D, carrier, K, receptacle, O, and cup, L, are lowered away from the compressor Q, thus separating the compressor, Q, and receptacle, O, so that the operator is able to readily place the material to be treated within the cup. Assuming that a lemon is to be squeezed, it is cut in half, and the divided fruit is placed within receptacle, O, with the pulp thereof in contact with the ribbed perforated bottom, O', of said receptacle. The operator turns crank, H', from the position of Fig. 1 over into the position of Fig. 4, whereupon the following operations take place: Master wheel, I, is rotated so that the beveled teeth, *i*, thereof impart rotary motion to beveled gear, R', shaft, R, and compressor, Q, and at the same time the stud or roller, J, is carried upwardly during a part of the rotation of the master wheel. Such upward motion of stud or roller, J, acts upon the slotted or recessed guide member, G, to impart a quick upward movement to the crosshead, E, whereby rods, D, carrier, K, receptacle, O, and cup, L, are lifted quickly for the purpose of bringing the material to be compressed in the cup, O, into contact with the recessed or ribbed surface of compressor, Q. As the stud or roller, J, approaches the limit of its high point of travel, it leaves the slot or recess, *g*, in guide, G, so as to disconnect the stud or roller, J, of the master wheel from the slotted or recessed guide of the crosshead, and just as stud or roller, J, leaves the crosshead, the end portion of cam, *j*, of the master wheel passes below the stud or roller, *h*, positioned at the middle of the crosshead, whereby the crosshead and the parts carried thereby are precluded from dropping with relation to the master wheel and the compressor. As the master wheel continues to return, with cam, *j*, in contact

with stud or roller, *h*, of the crosshead, and with the receptacle, O, and other devices on carrier, K, in raised position with relation to compressor, Q, said cam, *j*, acts upon stud or roller, *h*, to still further elevate the crosshead and receptacle, O, whereby the final squeezing or compressing operation, at slow speed, is given to the material under treatment by the continued elevation of the crosshead under the action of cam, *j*. While said final squeezing or compressing operation takes place as just described, compressor, Q, is rotated by shaft, R, geared to the master wheel, said compressor acting to impart a rotative movement to the material under treatment during such final compressing operation. The ribs upon the upper surface of the bottom of the cup operate to force the pulp toward the center of the cup, thereby precluding the pulp from projecting outside the skin or rind of the lemon and bringing all the material into position between the compressor and the cup so as to squeeze it. The juices and pulp expressed from the material are free to escape through the perforations in the bottom of the cup, so that the expressed liquid and pulpy matters will be collected by the cup, L, and delivered through openings, m^2, in the bottom thereof into a glass or other vessel supported by holder, N, below said cup, L. While the juices and some of the pulp are free to escape through the perforated and ribbed bottom of the receptacle, O, the seeds and other parts of the pulp are retained within said receptacle, the liquid matter being practically strained. The rotating and squeezing operations having been completed by the movement of the crank in one direction, it is now in order for the operator to reverse the direction of the operation of the crank in order to open the machine and provide for the removal of the residue left in receptacle, O, as the result of the compressing operation. It is only necessary for the operator to turn the crank in an opposite direction, or from the position shown in Fig. 4 back to the position illustrated in Fig. 1. When the crank begins its movement in the reverse direction, the master wheel, I, is rotated to withdraw cam, *j*, from engagement with the roller or stud, *h*, and immediately thereafter stud, J, enters into the slot or recess of guide, G, whereby the continued movement of the crank and the master wheel operate to quickly lower the crosshead, the carrier, the receptacle, and cup, L, thus separating the receptacle from the compressor by an easily and expeditiously perfomed operation so that the receptacle is exposed for convenient access by the attendant.

Having thus fully described the invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In a device of the class described, a receptacle, a compressor, and means for imparting reciprocating motion and at variable speeds to one of said parts relative to the other, said means embodying a crosshead limited to slidable movement, and a rotatable member acting directly on said crosshead.

2. In a device of the class described, a receptacle, a compressor, and means for imparting reciprocating motion to one of said parts relative to the other, said means embodying a crosshead limited to slidable movement, and a rotatable member provided with devices operating directly and successively upon the crosshead to impart variable speeds thereto.

3. In a device of the class described, the combination with a frame, of a receptacle, a compressor, and means for imparting reciprocating motion, at variable speeds, to one part relative to the other, said means embodying a crosshead fitted within said frame for slidable movement relative thereto, and a rotatable member provided with devices positioned for successive contact directly with said crosshead.

4. In a device of the class described, a receptacle, a compressor, means for rotating one of said parts relative to the other, and means for imparting reciprocating motion, at variable speeds, to one part relative to the other, embodying a crosshead limited to slidable movement, and a rotatable member having devices positioned for successive contact directly with said crosshead.

5. In a device of the class described, a frame, a crosshead limited to reciprocating movement relative to said frame, a rotatable member having devices positioned for successive contact directly with said crosshead whereby reciprocating motion, at variable speeds, is imparted to the crosshead, a receptacle, a compressor, and means for securing relative rotative movement between the receptacle and compressor, one of said parts having reciprocating movement with the crosshead.

6. In a device of the class described, a master wheel provided with a cam, a crosshead operated at one period of its movement by the master wheel and at another period of its movement by said cam, said crosshead being guided for reciprocating movement transversely with respect to the master wheel, a receptacle operated by the crosshead, and a compressor positioned for cooperation with said receptacle.

7. In a device of the class described, a master wheel provided with a stud and with a cam, a crosshead in coöperative relation to the stud and the cam whereby the crosshead is operated at different speeds by the stud and the cam, respectively, said crosshead being limited to reciprocating movement relative to the master wheel, a recep-

tacle operated by the movement of the crosshead, and a compressor positioned for cooperation with the receptacle.

8. In a device of the class described, a master wheel provided with a cam, a crosshead having a stud adapted for coöperation with the cam, said crosshead being supported for slidable movement independently of the master wheel, a receptacle operated by the movement of the crosshead, and a compressor positioned for coöperation with said receptacle.

9. In a device of the class described, a crosshead, a compressor, a receptacle operated by the movement of the crosshead and adapted to coöperate with the compressor, and a single operating member having means for rotating the compressor and provided, also, with means for imparting reciprocating movement and at variable speeds to said crosshead, said crosshead being guided for reciprocating movement relative to said operating member.

10. In a device of the class described, a master wheel provided with gear teeth, a stud and a cam, a compressor geared to said teeth of the master wheel, a crosshead having a guide for coöperation with the stud, and a stud adapted to coöperate with the cam, said crosshead being guided for reciprocating movement with respect to the master wheel, and a receptacle movable by the crosshead into and from coöperative relation to the compressor.

11. In a device of the class described, a crosshead, a master wheel provided with devices for coöperating successively with the crosshead and imparting variable speeds thereto, said crosshead being guided for reciprocating movement with respect to the master wheel, a compressor, and a receptacle operated by the movement of the crosshead.

12. In a device of the class described, a suitable frame, a crosshead guided within the frame and limited to reciprocating movement relative thereto, a compressor, means for imparting reciprocating motion to the crosshead, means for rotating said compressor, a carrier attached to the crosshead and reciprocable therewith, and a receptacle supported by the carrier and movable therewith relatively to the compressor.

13. In a device of the class described, a suitable frame, a crosshead guided within the frame and limited to reciprocating movement relative thereto, a compressor, means for imparting reciprocating motion to the crosshead, means for rotating said compressor, a carrier attached to the crosshead and reciprocable therewith, a collecting cup seated on the carrier, and a receptacle supported on the carrier above said collecting cup, said cup and the receptacle being movable with the carrier.

14. In a device of the class described, a compressor, means for rotating it, a carrier below said compressor, means for imparting reciprocating motion to the carrier relative to the compressor, a receptacle supported by the carrier and movable therewith relative to the compressor, and coöperating flanges on the carrier and the receptacle for retaining said receptacle in a non-rotative position upon the carrier.

15. In a device of the class described, a compressor, a receptacle provided with substantially radial ribs upon the bottom thereof, said ribs operating to direct the pulp within the rind of the material under compression, coöperating flanges on the carrier and the receptacle for retaining said receptacle in a non-rotative position upon the carrier, means for imparting a traveling motion to one of said parts relative to the other, and means for imparting a rotative movement to one part relative to the other part.

16. In a device of the class described, a compressor, a cup-like receptacle provided with a perforated and substantially conical bottom, said bottom having ribs on its upper surface operating to direct the pulp within the rind of the material under treatment, means for reciprocating the cup-like receptacle relative to the compressor, means for rotating said compressor relative to the cup-like receptacle, and coöperating devices on the carrier and the receptacle for retaining said receptacle in a non-rotative position relative to the carrier.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN WALKER.

Witnesses:
H. T. BERNHARD,
J. F. MOTHERSHEAD.