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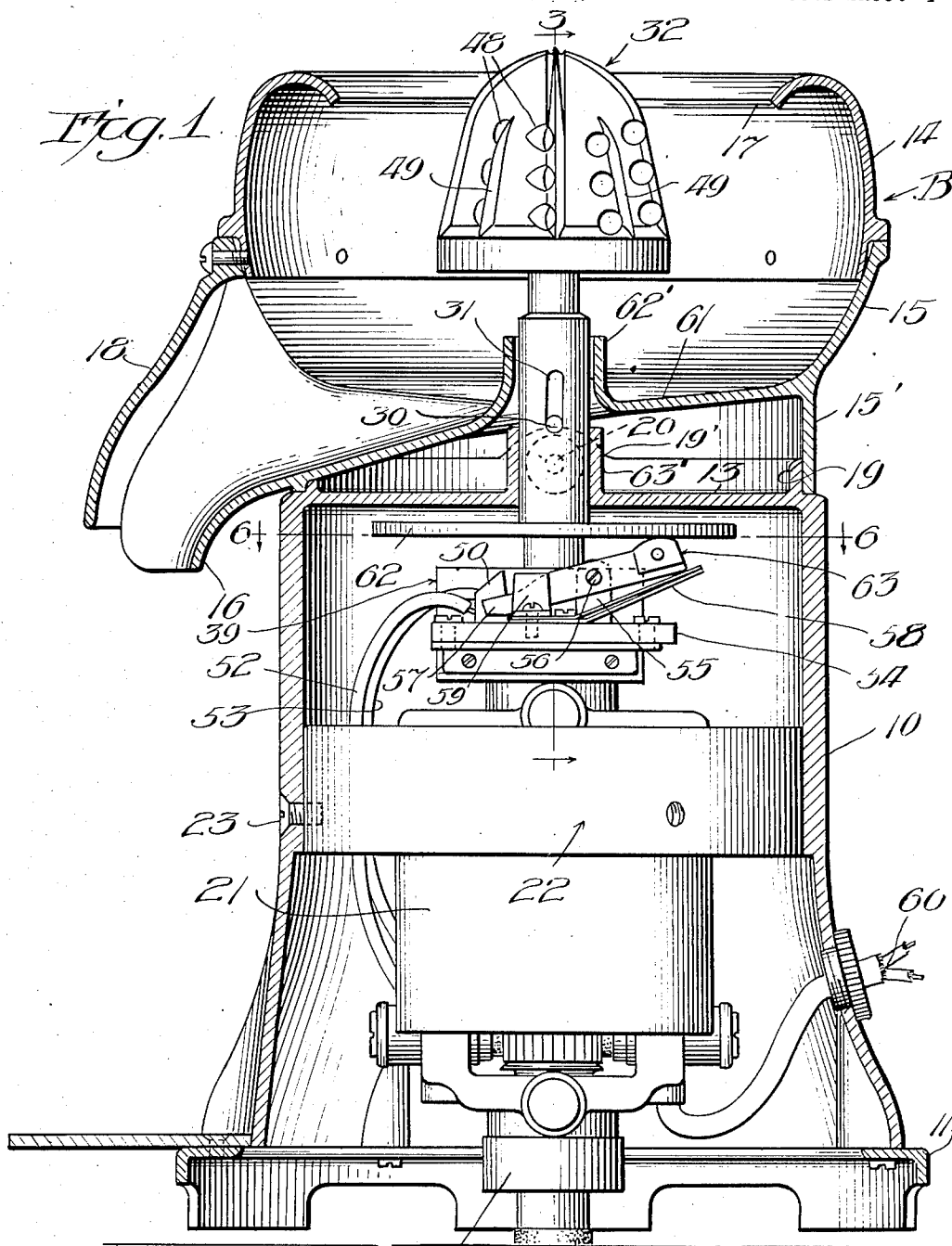
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A. T. PURSELL

FRUIT JUICE EXTRACTOR

Filed July 21, 1923

3 Sheets-Sheet 1



Witness:

Harry S. Gaither

26 12 Inventor
Arthur Todd Pursell

by William H. Hues
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April 14, 1925.

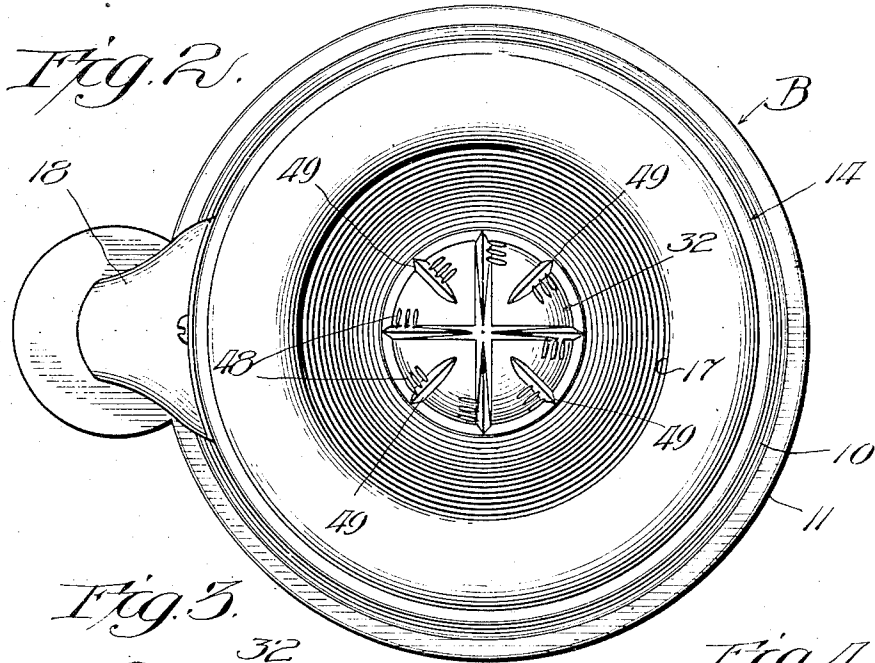
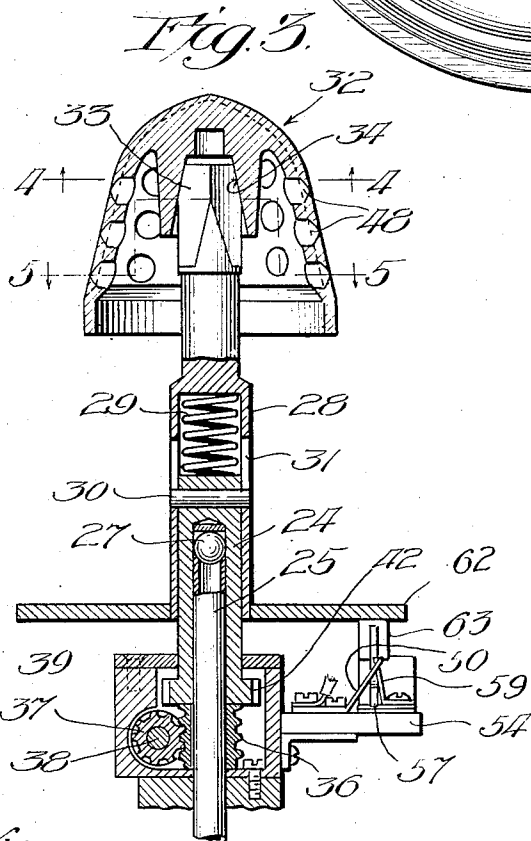
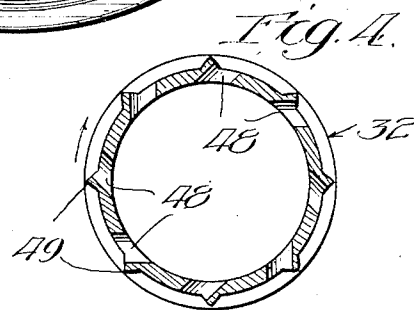
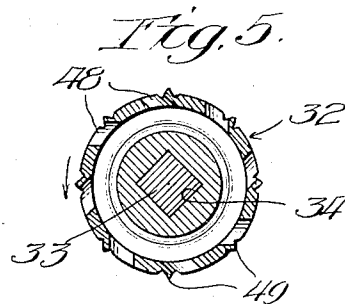
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A. T. PURSELL

FRUIT JUICE EXTRACTOR

Filed July 21, 1923

3 Sheets-Sheet 2



Witness:

Harry S. Gaither

Inventor:

Arthur Todd Pursell

by William H. [Signature]

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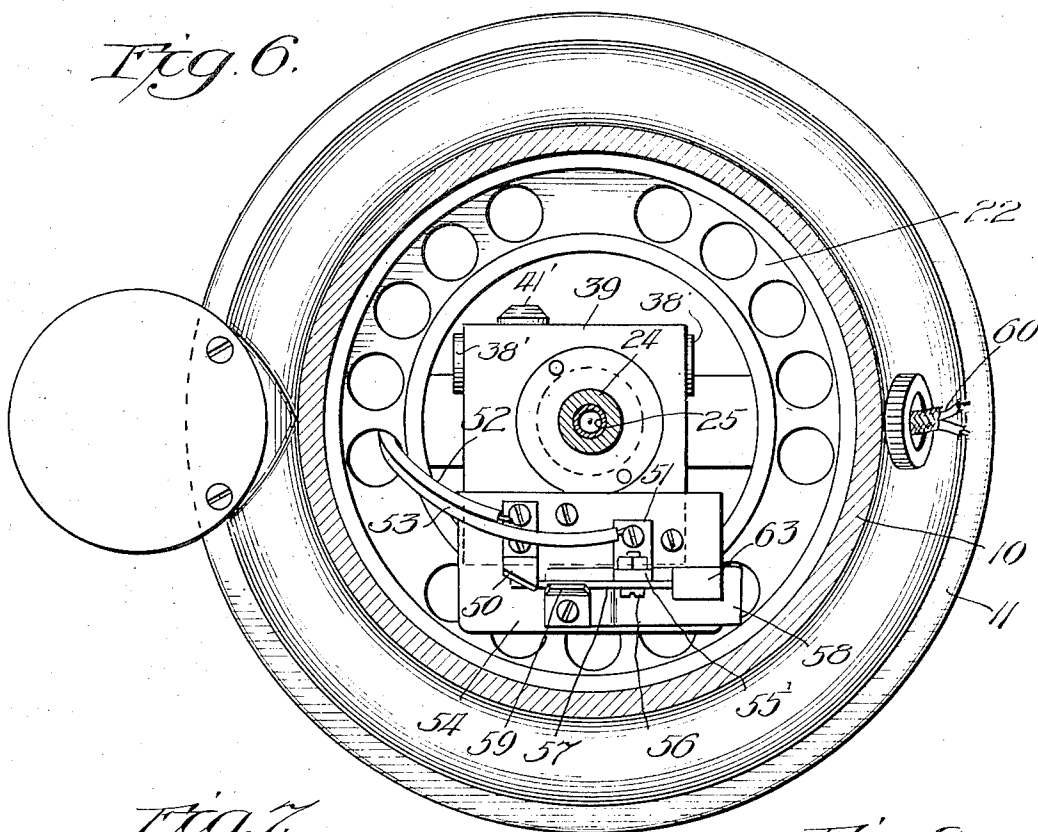
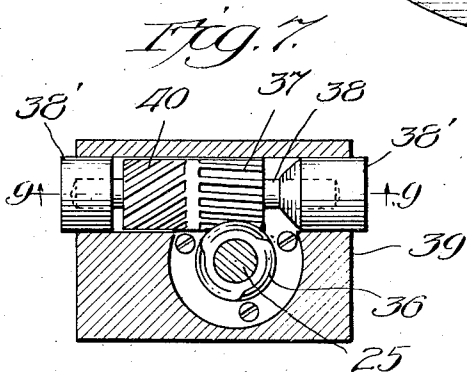
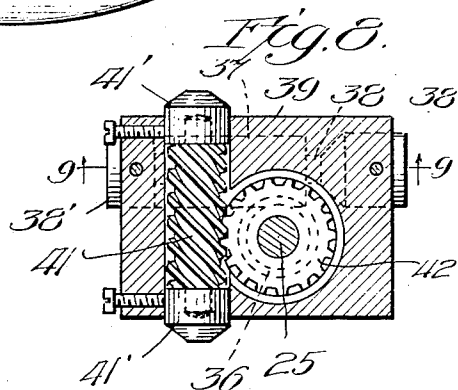
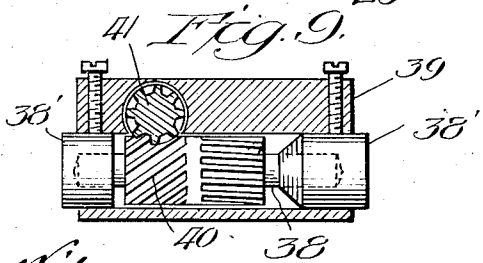
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A. T. PURSELL

FRUIT JUICE EXTRACTOR

Filed July 21, 1923

3 Sheets-Sheet 3



Witness:

Harry S. Gauthier

Inventor:
Arthur Todd Pursell

by *William H. Free*
July

UNITED STATES PATENT OFFICE.

ARTHUR TODD PURSELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO ARNOLD ELECTRIC COMPANY, OF RACINE, WISCONSIN, A CORPORATION OF WISCONSIN.

FRUIT-JUICE EXTRACTOR.

Application filed July 21, 1923. Serial No. 653,033.

To all whom it may concern:

Be it known that I, ARTHUR TODD PURSELL, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Fruit-Juice Extractors; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in motor-driven juice extractors for citrus and other fruits, and the invention consists in the elements and combination of elements shown in the drawings and described in the specification, and is pointed out in the appended claims.

Among the objects of the invention is to produce, in combination with the extractor bulb, means whereby pressure of the fruit on said bulb operates automatically to start the motor to rotate the bulb. If the motor be an electric motor, the depression of the bulb will operate the motor starting and stopping switch.

Another object of the invention is to produce in an extractor for this purpose a novel reducing gear mechanism between the high speed motor and the mounting by which the extractor bulb is carried so as to thereby enable a motor to be employed within the hollow stand of the extractor and reduce the dimensions of the device as a whole, while suitably controlling the speed of the extractor bulb.

Another object of the invention is to produce a novel bowl, into which the extractor extends, constructed to give free access to the bulb and to avoid the juice being thrown out of the bowl by centrifugal action generated by the rotating bulb, and also to provide a spout construction in connection therewith that gives free access to the spout and the bowl to permit cleaning of the spout and bowl.

Other objects of the invention are to otherwise improve and simplify juice extractors of this character.

In the drawings:

Figure 1 is a vertical section of the casing and bowl and an elevation of the operative

elements of an extractor embodying my invention.

Figure 2 is a plan view thereof.

Figure 3 is a partial section, on the line 3—3 of Figure 1, illustrating the construction of the extractor bulb, its mounting, a portion of the reducing gear, and of the switch for controlling the motor circuit.

Figures 4 and 5 are horizontal sections of the bulb taken on the lines 4—4 and 5—5, respectively, of Figure 3.

Figure 6 is a horizontal section on the line 6—6 of Figure 1.

Figures 7, 8 and 9 are details of the reducing driving mechanism, hereinafter to be described.

As shown in the drawings:

10 designates a hollow casing constituting the supporting and enclosing standard of the machine. It is open at its lower end and carries a flanged base 11 in which are secured cushioning feet 12, and is enclosed at its upper end by a wall 13. 14, 15 designate, respectively, upper and lower removably connected sections of a bowl, designated as a whole by B, which is supported on said standard and which catches the juice and directs it toward an outlet spout 16, shown as made part of the lower bowl section. The upper edge of the bowl section 14 is of general flat formation so as to afford ready access of a piece of fruit to the extractor bulb hereinafter described, and is formed with an inwardly turned lip 17 to prevent the juice being thrown outwardly by centrifugal force over the horizontal top of the bowl. The spout 16 is shown herein as formed in part integral with the lower bowl section 15, and in part by an upper removable plate 18, the removal of which permits access to the spout and the lower part of the bowl for cleaning the same, when desired, and also for the purposes of simplifying casting operations. Said bowl is supported on the top of the standard, being held concentrically thereon by a circular flange or ring 19, upstanding from the top wall of the standard, by means of set screws 20 extending through the skirt 15' of the lower section of the bowl and into raised parts 19' of the flange 19.

21 designates an extractor bulb operating motor which is housed within the hollow

standard 10 and is supported, as by a suitable mounting ring 22, on the shell of the standard through the medium of screws 23. The motor may be of any suitable type. It is shown as an electric motor, and can, by reason of its horse power rating, be a universal motor. This is a compact motor and therefore enables the upright standard 10 to be made of a correspondingly small diameter.

24 designates a part-tubular shaft that is sleeved over the upper end of the shaft 25 of the motor 21, which latter shaft is supported and stabilized at its lower end by a central step bearing 26. Between the upper end of the motor shaft and the top wall of the socket in said part-tubular shaft 24 is a ball thrust bearing 27. 28 designates a second part-tubular shaft which is sleeved over the upper end of the shaft 24, as best shown in Figure 3. It turns with the tubular shaft 24 and is axially depressible against the action of a spring 29 for the purpose of actuating a motor switch, as hereinafter described. For this purpose, a pin 30 extends through the solid upper end of the shaft 24 with its ends extending into and slidingly engaging diametric slots 31 in the shaft 28. The said shafts 24 and 28 are normally held axially extended by the spiral expansion spring 29 which is housed in the tubular shaft 28 and bears at its upper end against a wall in said shaft and at its lower end upon the shaft 24.

The shafts 24 and 28 constitute elements of a supporting and operating standard that lies in the axis of the machine for the juice extractor bulb, designated as a whole by 32. Said bulb is closed at its top and is open at its bottom. It is removably seated on a polysided tapered extension 33 of the upper axially movable shaft 28, it being provided with an interiorly tapered, polysided socket 34 to fit over the like-shaped upper or tipped end 33 of the shaft 28.

The bulb-supporting and operating standard structure, comprising the parts 24 and 28, are rotated at reduced speed from the motor shaft 24 through reducing gears made as follows:

36 designates a spiral pinion keyed or otherwise fixed to the motor shaft. It meshes with a spiral gear 37 that is fixed to one end of a shaft 38 at one side of the vertical plane of the axis of the motor shaft and is rotatively mounted in suitable bearings 38' in the side walls of a gear support and housing, designated as a whole by 39, as best shown in Figure 7. On the other end of said shaft 38 is a spiral gear 40, the thread of which is reversed and of greater pitch relatively to that of the spiral gear 37. Said spiral gear 40 meshes with a rotative gear 41 disposed at a right angle to the shaft 38 and is rotatively supported in bear-

ings 41' fixed in the housing 39. Said gear 41 meshes with a larger gear 42 that is made part of or fixed in any suitable manner to the lower end of the tubular shaft 24 constituting part of the bulb-supporting and actuating standard. The high rotation of the motor shaft 25, through the gears 36, 37, 40, 41 and 42, is reduced to drive the supporting and operating standard of the bulb, and the bulb surmounting the same, at a suitable low speed, and by a sturdy and simple gear mechanism which is very compact.

The extractor bulb is provided in its depending skirt or wall with a plurality of upright series of openings 48 which are angularly spaced and, as series, are slightly inclined to the axis of rotation of said extractor bulb, as best shown in Figure 1. These openings are drilled or otherwise made in the wall or skirt of the bulb on horizontal axes at sharp angles to the tangent of the parts of the wall which they pierce, as indicated most clearly in Figures 4 and 5. If desired, the outer face of said wall or skirt may be provided, adjacent to and parallel with each series of openings 48, with ribs 49 which are sharpened and are made deepest at their centers and are tapered toward their ends, as shown in Figures 1 and 3.

These openings 48 and their special formation perform two important functions. First, they permit the juice which is being extracted from the fruit to flow inwardly in part through said openings into the space enclosed by the wall of the bulb shell and thereby afford large release for the down-flow of the juice. Second, the angle of the openings is such as to provide cutting edges on the outer face of the wall which engage the meat of the fruit in a manner to better tear and crush the fruit meat in the extraction of the juice therefrom. The said ribs 49 are respectively positioned in rear of their series of openings 48 relatively to the direction of rotation of the bulb so as to serve, not only as a means to crush the fruit meat, but as a means to guide some of the juices inwardly through said holes 48, and thus avoid clogging of the juice flow. For this reason, the bulb can be made of smaller diametric dimension and can be rotated less rapidly than has heretofore been the common practice. Therefore, the area for flow may be increased approximately by the sum of the areas of said openings, and the capacity of flow is enhanced by the trailing ribs 49.

The depressibility of the upper element of the extractor bulb supporting and operating standard makes it convenient and practicable to apply to the said upper element or tube 28 means for automatically closing the operating switch of the bulb.

So also the construction hereinafter described, wherein the switch-operating means normally spring-holds the switch in its position to open the motor circuit, and where-
 5 in the extractor bulb is normally spring-raised, adds to the convenience of operating the machine inasmuch as the fruit is thus pressed down upon a yielding bulb instead of a non-yielding bulb. Therefore,
 10 any shock which might result in placing the fruit against a non-yielding ejector bulb is avoided.

A practical switch and automatic switch control for the purpose described, when an
 15 electric motor is used, is herein shown and is made as follows: 50, 51 designate terminals in a loop of the motor circuit, comprising the conductors 52, 53. The terminal 50
 20 is mounted on an insulating block or bracket 54. The second terminal 51 is also mounted on said block and is provided with an upstanding bracket 55 to which is piv-
 25 oted by a pivot bolt 56 a switch blade 57. Said blade is in current-conducting relation to the terminal 51 through said pivot bolt 56. Said switch blade normally occu-
 30 pies an inclined or motor circuit opening position, as shown in Figure 1, and is held in this position by a leaf spring or springs
 35 58. When in said open position, the forward end of the blade 57 is out of contact with the terminal 50. A spring plate 59 bears laterally against the free end of the
 40 blade and tends to hold it towards the terminal 50 and to press said blade into contact with the latter terminal when the free
 45 end of the blade is swung upwardly about its pivot, both by reason of the inclination of the said spring plate 59 and of the terminal 50, as will be clear from an inspec-
 50 tion of Figure 3. When the free end of the switch blade is swung into its upper position and is, therefore, in contact with the terminal 50, the motor circuit is closed
 55 through the blade 55 between the outside power leads 60.

62 designates a disc that is fastened to the lower end of the tubular element 28 of the bulb-supporting and operating stand-
 50 ard. It is below the pedestal top 13 and is above a sliding or roller bearer 63 that is fixed to the outer or rear end of the switch blade. The rising movement of said
 55 disc is arrested by contact of the cross pin 30 with the lower ends of the slots 31 in the tubular shaft element 28 of the bulb-supporting and operating shaft.

In operation of the switch control, pressure of the fruit on the extractor bulb
 60 serves to depress the tubular element 28 of the bulb-supporting and operating standard, and also the disc 62 against the bearer of the switch blade 57. This causes the switch blade to swing on its axis until its
 65 free or contact end engages the terminal

50, whereupon the operating circuit is closed to the motor to rotate the ejector bulb through the driving and supporting connections described. The speed of the motor is reduced through the speed-reduc-
 70 ing mechanism in the casing or box 39 so as to suitably reduce the driving speed imparted to the head. When the fruit is raised off the extractor bulb, the spring 29 raises the tubular shaft 28 and the bulb and
 75 also the disc 62, whereupon the switch blade control spring 58 swings said blade into its motor circuit opening position.

The floor 61 of the bottom section of the bowl is inclined towards the spout 16 and
 80 is interrupted by an upstanding guard 62' which surrounds the upper end of the standard element 28, which latter has bearing in an upstanding sleeve 63' made integral with the top wall 13 of the hollow
 85 pedestal.

I claim as my invention:

1. A fruit juice extractor comprising a rotative extractor bulb, power means for rotating it and means controlled by pres-
 90 sure of the fruit on the bulb for controlling transmission of power to said bulb.

2. A fruit juice extractor comprising a rotative extractor bulb, a motor for rotating
 95 said bulb and means actuated by pressure of the fruit on the bulb for controlling said motor.

3. A fruit juice extractor comprising a rotative extractor bulb, a motor for rotat-
 100 ing said bulb and means actuated by the release of pressure of the fruit on the bulb for disconnecting driving energy from the motor.

4. A fruit juice extractor comprising a rotative extractor bulb, an electric motor for
 105 rotating said bulb, a motor starting switch and means controlled by pressure of the fruit and the bulb for actuating said switch.

5. A fruit juice extractor comprising an extractor bulb, a rotative supporting and
 110 operating standard therefor, embracing a depressible element, a motor to rotate said standard, switch means for the motor, and switch actuating means carried by said de-
 115 pressible standard element.

6. A fruit juice extractor comprising an extractor bulb, a rotative supporting and
 120 operating standard therefor embracing spring-extended telescopic elements whereby the bulb is depressed upon the applica-
 125 tion of a piece of fruit thereto, a motor for rotating said standard, a switch for said motor, and means carried by a depressible element of the standard to control said switch.

7. A fruit juice extractor comprising an extractor bulb, a rotative supporting and
 130 operating standard therefor embracing spring-extended telescopic elements whereby the bulb is depressed upon the applica-

tion of a piece of fruit thereto, a motor for rotating said standard, a switch for said motor, and a disc carried by a depressible part of said standard and rotary therewith to engage and control said switch.

8. A fruit juice extractor comprising an extractor bulb, a rotative supporting and operating standard therefor, embracing an inner element adapted for connection to a driving motor, and an outer tubular element telescopic thereover and directly carrying said bulb, a spring to distend said outer element, a stop to arrest such distention, a motor connected to and driving in said standard, and means carried by said outer element to control said motor.

9. A fruit juice extractor comprising an extractor bulb, a rotative supporting and operating standard therefor, embracing an inner element adapted for connection to a driving motor, and an outer tubular element telescopic thereover and directly carrying said bulb, a spring to distend said outer element, a stop to arrest said distention and to lock the standard members to rotate together, a switch for said motor and a disc carried by said outer element of the standard and depressible thereby for contact with said switch to control said motor.

10. A fruit juice extractor including a hollow extractor bulb provided in its side wall with tangential juice clearance openings disposed at such angles to the axis of rotation as to produce at the outer ends of said openings fruit meat cutting and crushing elements.

11. A fruit juice extractor comprising a pedestal, a bowl supported thereon, a rotative extractor bulb centrally within the bowl and means to drive it, said bowl having a top, generally horizontal lip turned inwardly and downwardly around a top opening thereof.

12. A fruit juice extractor comprising a hollow pedestal formed with an upstanding bowl centering flange, a bowl supported on said pedestal and centered by said flange, a spout extending laterally from said bowl, an extractor bulb within said bowl and a motor within said pedestal for driving said bulb, said bowl having above the active part of said bulb a generally horizontal top opening, and the rim of said bowl around its horizontal top opening being provided with an inwardly and downwardly turned lip.

13. A fruit juice extractor comprising a bowl and its support and means to detachably fix it on said support, and a rotative extractor bulb in said bowl with means to drive it, said bowl being made of two horizontally separable parts, the lower part being provided with a spout and the upper part being formed with a top horizontal opening

and the rim of said upper part around said top opening being turned downwardly and inwardly.

14. A fruit juice extractor comprising a pedestal, a bowl supported thereon, a rotative extractor bulb centrally within the bowl and a motor to drive it, said bulb being hollow and downwardly open and provided with a plurality of juice clearance openings, and the bowl having a horizontal top opening surrounded by an inwardly and downwardly turned lip formed from the wall of the bowl.

15. A fruit juice extractor comprising a pedestal, a bowl supported thereon, a rotative extractor bulb centrally within the bowl and a motor to drive it, said bulb being hollow and downwardly open and provided in its side wall with an angularly spaced series of upright juice clearance openings, and provided also in rear of said openings, relatively to the direction of rotation of said bulb, with exterior formations to direct the juice to said openings, said bowl having a horizontal top opening surrounded by an inwardly and downwardly curved lip.

16. A fruit juice extractor comprising a rotative extractor bulb, an electric motor for rotating said bulb, a motor starting switch, means controlled by pressure of the fruit and the bulb for actuating said switch and spiral speed reducing gears in the driving connection between the said motor and bulb to reduce the speed of rotation of said bulb.

17. A fruit juice extractor comprising a hollow pedestal, a bowl supported thereon and open at its top, an extractor bulb within the bowl, a motor within said pedestal, a rotative supporting and operating standard carrying at its upper end said bulb, a spiral gear fixed to the lower end of said standard, a motor shaft having bearing in the socketed lower end of said standard, and speed reducing gears connected between said motor shaft and said spiral gear.

18. A fruit juice extractor comprising a hollow pedestal, a bowl supported thereon and open at its top, an extractor bulb within the bowl, a motor within said pedestal, a rotative supporting and operating standard carrying at its upper end said bulb, a spiral gear fixed to the lower end of said standard, said standard having at its lower end an axial socket, a motor shaft having bearing in said socket and provided between said spiral gear and motor with a spiral pinion, and speed reducing spiral gears between said pinion and said standard spiral gear.

19. A fruit juice extractor comprising a hollow pedestal, a bowl supported thereon and open at its top, an extractor bulb within the bowl, a motor within said pedestal, a rotative supporting and operating standard carrying at its upper end said bulb, a spiral

gear fixed to the lower end of said standard, said standard having at its lower end an axial socket, a motor shaft having bearing in said socket and provided between said spiral gear and motor with a spiral pinion, a shaft having two sets of spirals of different pitch, one of which meshes with said motor shaft pinion and a third shaft at a right angle to said last mentioned shaft having a spiral gear formation to mesh with one of said two sets of spirals and with the spiral gear of said standard.

20. In a fruit juice extractor, a resiliently supported juice extracting bit, an electrically operated motor for driving said bit, a circuit for said motor, a switch controlling said circuit, and means associated with said bit for operating said switch upon displacement of said bit.

21. In a fruit juice extractor, a juice extracting bit, a longitudinally movable shaft on which said bit is mounted, a motor for driving said shaft, a circuit for said motor, a switch controlling said circuit, said shaft being arranged to actuate said switch upon displacement thereof.

22. In a fruit juice extractor, a juice ex-

tracting bit, a displaceable support on which said bit is mounted, an electrically operated motor for rotating said support, a circuit for said motor, a switch controlling said circuit, and means associated with said support for operating said switch upon displacement thereof.

23. In a fruit juice extractor, a juice extracting bit, a displaceable shaft for driving said bit, a motor for driving said shaft, a circuit for said motor, a switch controlling said circuit, said shaft being arranged to actuate said switch upon displacement thereof.

24. In a fruit juice extractor, a juice extracting bit, a shaft on which said bit is carried, an electrically operated motor, reducing gearing between said motor and said shaft, a circuit for said motor, a switch controlling said circuit, and means associated with said bit for operating said switch upon displacement of said bit.

In witness whereof I claim the foregoing as my invention, I hereunto append my signature this 30th day of June, 1923.

ARTHUR TODD PURSELL