

June 2, 1942.

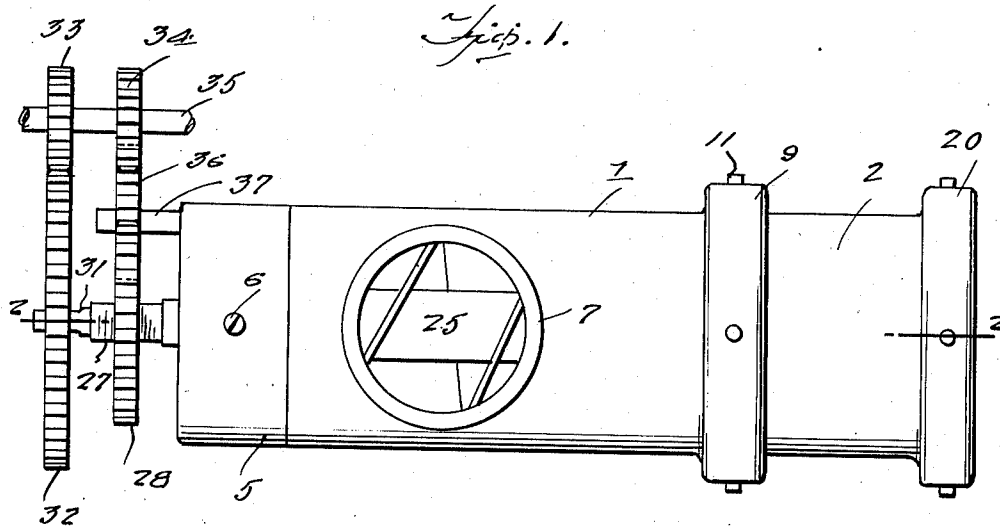
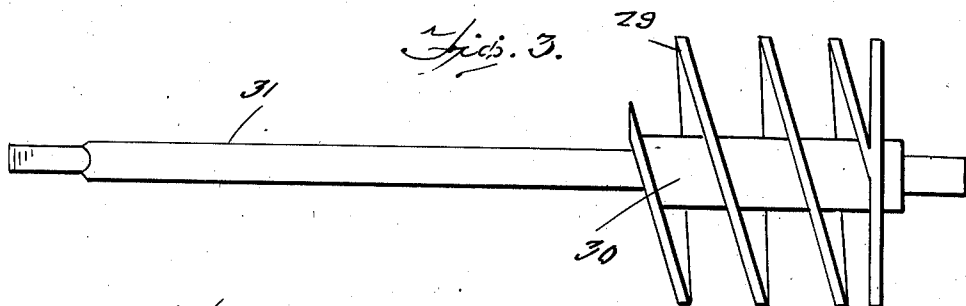
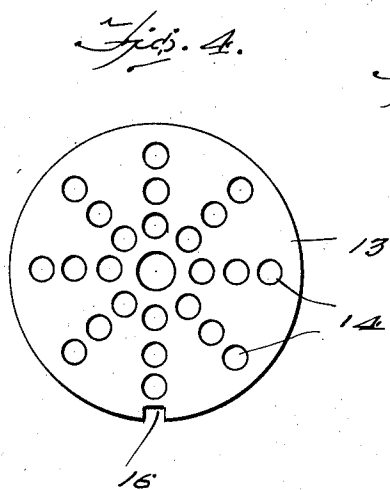
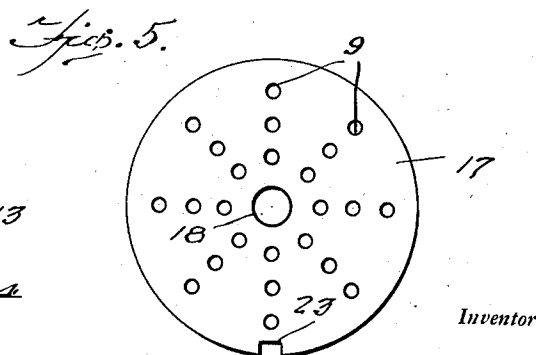
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2,284,722

GRINDING MACHINE

Filed June 7, 1941

2 Sheets-Sheet 1



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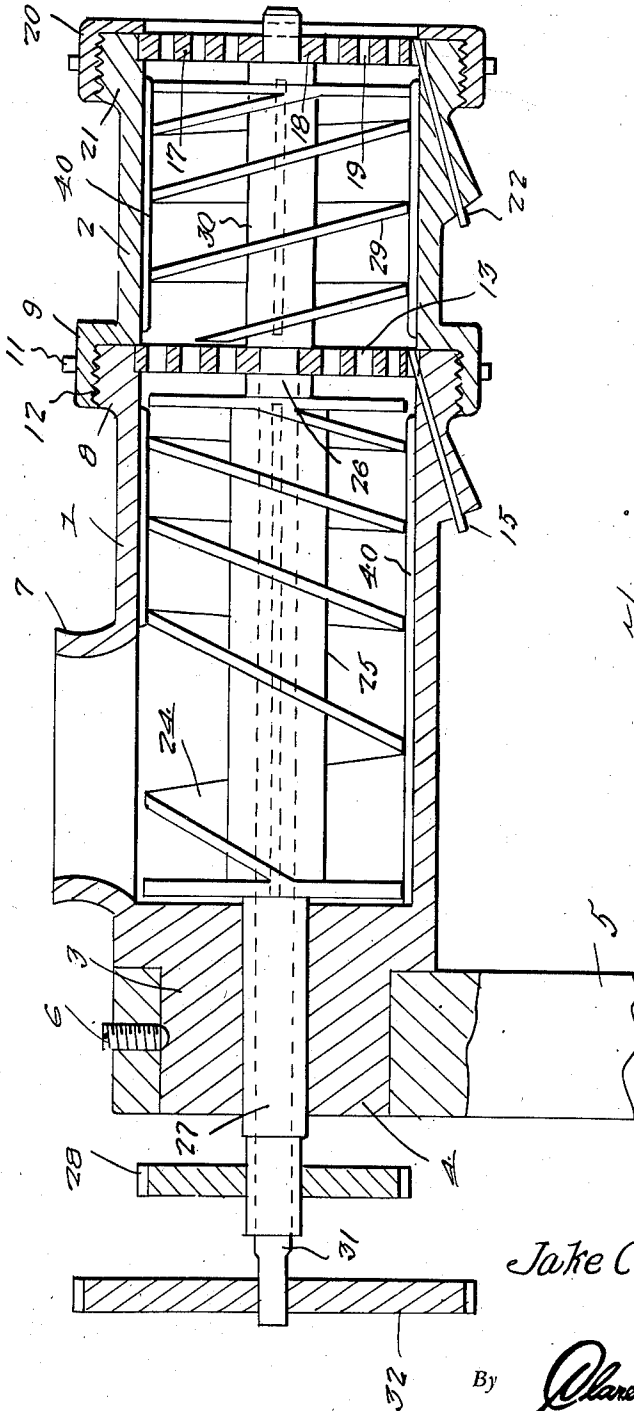


Fig. 2.

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UNITED STATES PATENT OFFICE

2,284,722

GRINDING MACHINE

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Application June 7, 1941, Serial No. 397,100

1 Claim. (Cl. 146—187)

My invention relates to improvements in grinding machines for reducing food, more particularly meats, into finely divided form.

The principal object of the invention is to provide an inexpensive machine operative by low power drive to grind meat into finely divided form quickly and with a minimum of strain and wear on the operating parts of the machine.

Another object is to provide a machine of the character and for the purpose above set forth which is adapted for easy cleaning to maintain sanitary and for quick replacement of parts.

To the accomplishment of the above, and subordinate objects presently appearing, a preferred embodiment of my invention has been illustrated in the accompanying drawings, set forth in detail in the succeeding description, and defined in the claim appended hereto.

In said drawings:

Figure 1 is a view in top plan of the preferred embodiment of my invention.

Figure 2 is a view in longitudinal section taken on the line 2—2 of Figure 1, and drawn to an enlarged scale.

Figure 3 is a view in side elevation of the secondary feeder unit.

Figure 4 is a face view of the primary extrusion plate, and

Figure 5 is a similar view of the secondary extrusion plate.

Reference being had to the drawings by numerals, the machine of my invention comprises a tubular casing embodying an elongated rear section 1 and a shorter front section 2. The rear section 1 includes an axially bored otherwise closed rear end 3 reduced, as at 4, to fit into a suitably apertured standard 5 shown fragmentarily, and for supporting the casing in elevated position. The end 4 is fixed in the standard 5 by a suitable set screw 6. Adjacent the rear end thereof, the section 1 is provided with a suitable feed opening formed by a collar 7 upstanding from said section. The front end of the rear section 1 is provided with a radial circumferential flange 8 against which the rear end of the front section 2 fits flush.

An internal annular flange 9 on the rear end of the front section 2 is threaded onto the flange 8 to detachably secure the sections 1 and 2 together. The flange 9 is provided with radial studs 11 forming wrench or tool grips for turning the same on and off the flange 8.

Fitted in an internal groove 12 in the front end of the rear section 1 is a circular, axially bored, primary extrusion plate 13 clamped in

said groove 12 by the rear end of the front section 2. Radial rows of extrusion apertures 14 are provided in the primary extrusion plate 13, said apertures being all of the same diameter. A key pin extended diagonally upwardly through the bottom of the rear section 1 into a bottom notch 16 in said plate 13 to hold the latter against turning. A secondary circular extrusion plate 17 is fitted into the front end of the front section 2 in the same manner as plate 13, said plate 17 being axially bored, as at 18 and provided with radial rows of extrusion apertures 19 therein of the same diameter relatively but substantially smaller in diameter than the apertures 14. A coupling 20, similar to coupling 9 and threaded onto a radial flange 21 on the front section 2 detachably secures the extrusion plate 17 in place. A key pin 22 extended into the front section 2 in the same manner as described in reference to key pin 15 and engaging a bottom notch 23 in said plate 17 holds the latter against turning.

The rear section 1 contains a primary feeder unit embodying a convolute blade 24 spiralling around an axial core 25. The core 25 is reduced at its front end, as at 26, said end bearing against the primary extrusion plate 13 to space the blade 24 at its front end from said plate 13. A reduced rear end portion 27 of the core 25 is journaled in the rear end 4 of the section 1 and provided exteriorly of the section 1 with a driving gear 28 fast thereon and for rotating the primary feeding unit. The core 25 is tubular for a purpose to be seen.

Within the section 2 is a secondary feeder unit also of the type embodying a convolute blade 29 spiralling around an axial core 30. The core 30 embodies a reduced shaft like extension 31 journaled in the bore of the primary extrusion plate 13 and in the core 25, said extension 31 projecting rearwardly out of the core 25 and having fast on its extending end a drive gear 32 of larger diameter than the gear 28. The front end of the core 30 is reduced and journaled in the bore 18 of the secondary extrusion plate 17.

It will be noted that the blades 24 and 29 of the primary and secondary feeding units are oppositely pitched, relatively, and said blades 24, 29 are rotatable in opposite directions, relatively, to force the meat through the extrusion plates 13 and 17, respectively, the blade 29 of the secondary unit being rotated faster than the blade 24. This is for the purpose of mixing the meat more thoroughly after the first grinding through the primary, or coarser extruding plate 13 and to

prevent clogging in the end section 2 caused by the restricting effect of the smaller apertures 19 in the secondary extrusion plate 17.

Preferably the pitch of the convolutions of each blade 24, 29, decreases progressively toward the related extrusion plate 13, 17, as the case may be, to pack the meat in front of said plates more closely.

Any suitable gearing may be utilized for driving the gears 32, 28 differentially, and consequently, the primary and secondary mixing units, respectively, for instance, a pair of like driving gears 33, 34 for the gears 32, 28, respectively, fast upon a power shaft 35, and a reversing gear 36 intermediate the gear 34 and the gear 38 rotatable on a stub 37 on the standard 5.

The sections 1 and 2 are provided with the usual internal riffling ribs 40, the purpose of which will be manifest.

The foregoing will, it is believed, suffice to impart a clear understanding of my invention without further explanation since the operation of the invention has been set forth in connection with the description of parts.

Manifestly, the invention, as described, is susceptible of modification without departing from the inventive concept, and right is herein reserved to such modifications as fall within the scope of the subjoined claim.

What I claim is:

In a machine of the class described, a tubular casing having a front discharge end and a top feed opening therein adjacent the rear end thereof, a pair of perforated primary and secondary extrusion disks fixed in said casing the former at the front end thereof and the latter intermediate the ends of the casing, said disks dividing the casing into front and rear chambers and the perforations in the secondary disk being smaller than those in the primary disk, a pair of primary and secondary feeding units in the front and rear chambers, respectively, each including a helical blade in the axis of the casing and forming a feed worm substantially filling the chamber, said blades of said units being pitched oppositely, relatively, and said units being relatively rotatable in opposite directions, and means for rotating said units in opposite directions relatively and simultaneously at different speeds, comprising a tubular core for one unit having an end extending out of one end of said casing and journaled at said end, an axial shaft-like extension on the other unit extending through said core with one end projecting out of the same, said extension being rotatably fitted in said core, and gearing comprising a pair of relatively large and small gears fast on the projecting end of the extension and on the extending end of said core, respectively.

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