June 13, 1944. J. G. CURRY 2,351,493

EXTRUDER

Filed Dec. 15, 1941 2 Sheets-Sheet 1

FIG. 1.

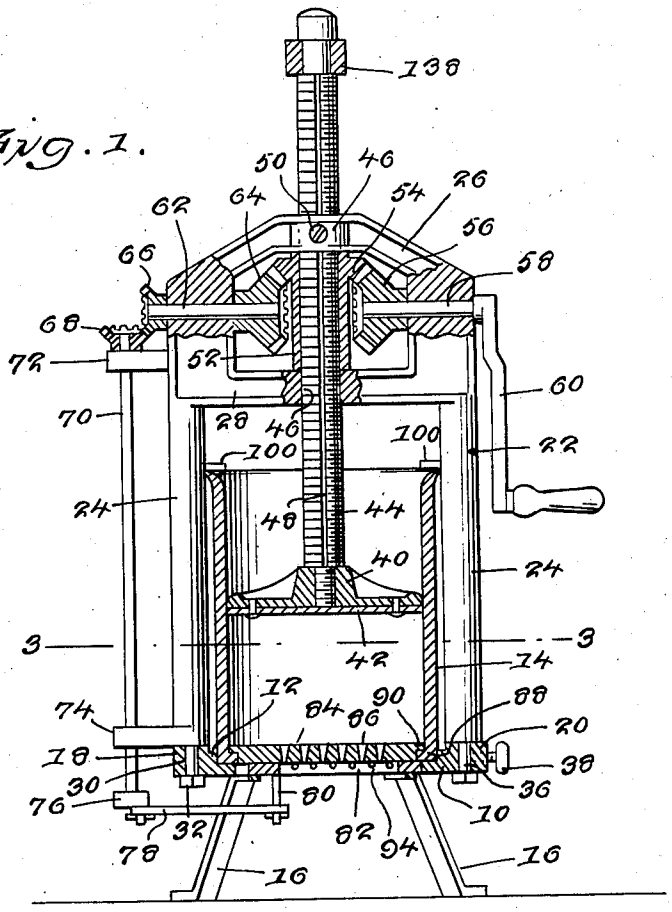
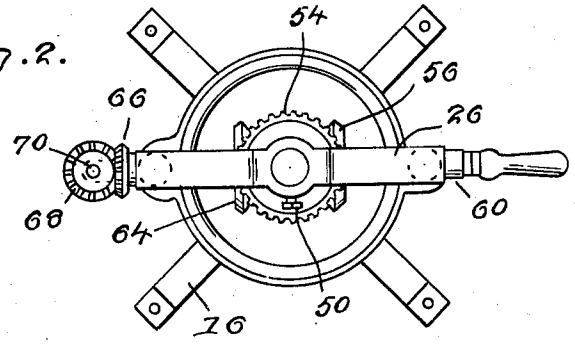


FIG. 2.



INVENTOR.
Joseph G. Curry
BY
Victor J. Evans & Co.
ATTORNEYS

June 13, 1944. J. G. CURRY 2,351,493

EXTRUDER

Filed Dec. 15, 1941 2 Sheets-Sheet 2

Fig. 3.

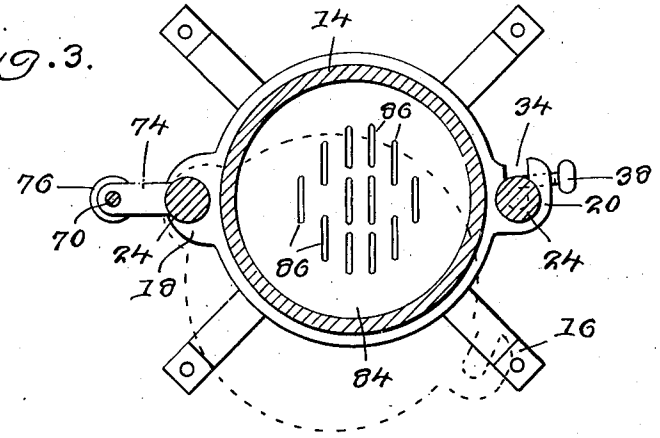


Fig. 4.

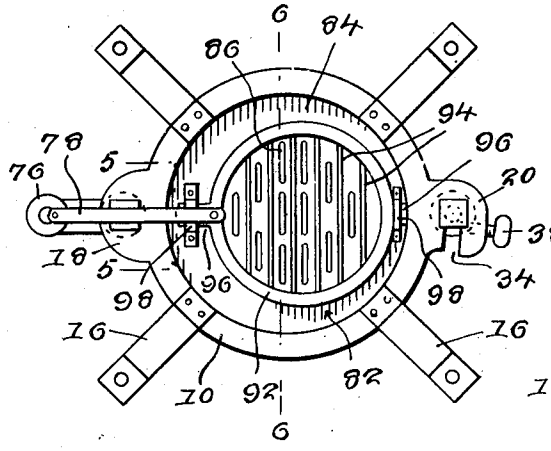


Fig. 5.

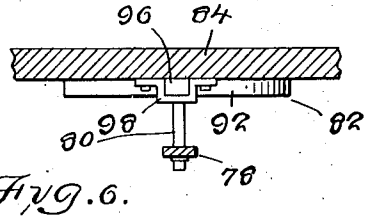
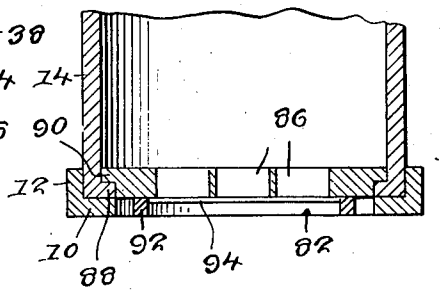


Fig. 6.



INVENTOR.

Joseph G. Curry

BY

Victor J. Evans & Co.

ATTORNEYS

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UNITED STATES PATENT OFFICE

2,351,493

EXTRUDER

Joseph G. Curry, Austin, Tex.

Application December 15, 1941, Serial No. 423,095

2 Claims. (Cl. 107—14)

My invention relates to the art of making chip-shaped food items and the like, and has among its objects and advantages the provision of an improved extruding machine for forming the foregoing food items.

In the accompanying drawings:

Figure 1 is a vertical sectional view of the machine equipped to form chips;

Figure 2 is a top plan view;

Figure 3 is a sectional view along the line 3—3 of Figure 1;

Figure 4 is a bottom plan view;

Figure 5 is a sectional view along the line 5—5 of Figure 4;

Figure 6 is a sectional view along the line 6—6 of Figure 4.

In the embodiment selected for illustration, I make use of a bed member or ring 10 having an upstanding annular flange 12 within which is positioned the lower end of a cylinder 14 which rests upon the ring 10. Four supporting legs 16 are attached to the ring 10, and the latter is provided with two diametrically opposed ears 18 and 20. Upon the ring 10 is mounted a frame 22 comprising vertical and horizontally spaced bars 24 interconnected at their upper ends by a yoke 26 and a bar 28.

The ear 18 is provided with a bore 30 for the reception of a bolt 32 threaded into the lower end of one of the bars 24. The ear 20 is provided with a slot 34 for the reception of a bolt 36 threaded into the lower end of the second bar 24. Thus the frame 22 may be pivoted laterally of the ring 10 about the axis of the bolt 32. A latch screw 38 is threaded into the ear 20 for holding the bolt 36 in the slot 34 during operation of the machine.

A piston 40 having a rubber pressure face 42 is slidably mounted in the cylinder 14 and is connected with a vertical screw 44 extending loosely through unthreaded bores 46 in the yoke 26 and the bar 28. A slot 48 extends longitudinally of the screw 44 for the reception of a key screw 50 threaded into the yoke 26, so that the screw is restrained from rotation in the bores 46 but is free to move longitudinally of the bores.

Upon the screw 44 and between the yoke 26 and the bar 28 is mounted a sleeve 52 having threaded connection with the screw but engaging the yoke and the bar 48 to be restrained against axial movement. A bevel gear 54 is secured to one end of the sleeve 52 and is in mesh with a bevel gear 56 keyed to a shaft 58 rotatably journaled in the yoke 26. Rotation is imparted to the shaft 58 by a manually actuated crank 60.

A second shaft 62 is rotatably journaled in the yoke 26 in axial alignment with the shaft 58 and has a bevel gear 64 keyed thereto and arranged in mesh with the gear 54. A second bevel gear 66 is keyed to the shaft 62 and meshes with a bevel gear 68 keyed to a vertical shaft 70 rotatably journaled in an arm 72 attached to the yoke 26 and an arm 74 attached to one of the bars 24.

To the lower end of the shaft 70 is secured a crank 76 pivotally connected with a link 78 having a pivotal connection with an arm 80 attached to a severing device 82 lying against the bottom face of a die 84. Die 84 is provided with a plurality of slots 86 through which material in the cylinder 14 may be extruded in strip forms to be severed to predetermined lengths by the severing device 82 to form chip-like shapes. The lower end of the cylinder 14 is provided with an annular flange 88 into which is inserted the die 84, the latter having a branch 90 resting on the flange 88.

The severing device 82 comprises a ring 92 provided with cutting wires 94 paralleling the slots 86 and lying adjacent the bottom face of the die 84. Two diametrically opposed projections 96 are formed on the ring 92 and are slidably guided in loop members 98 bolted to the bottom face of the die 84. The finger 80 is secured to the ring 92 for imparting reciprocatory motion to the ring through rotation of the crank 76.

In operation, the die 84 is employed when it is desired to extrude corn chips and the like. Rotation of the crank 62 in one direction causes the piston 40 to descend in the cylinder 14. At the same time rotation is imparted to the shaft 70 so that the severing device 82 is also actuated through rotation of the crank 60. Thus the material is extruded through the die 84 in a series of strips and severed in predetermined lengths through the reciprocatory motion of the device 82. When the piston 40 is elevated to a position outside the cylinder 14, the screw 38 may be loosened and the frame 22 together with the piston swung to one side for completely uncovering the cylinder, thereby lending easy access to the cylinder for filling purposes as well as to permit the cylinder to be removed for cleaning purposes or the substitution of dies. Each bar 24 carries an ear 100 which extends across the top end of the cylinder 14 in the operating position of the frame 22 so as to hold the cylinder in position on the ring 10 when the piston 40 is elevated.

Without further elaboration, the foregoing will so fully illustrate my invention, that others may, by applying current knowledge, readily

adapt the same for use under various conditions of service.

I claim:

1. A food shaping extruder comprising a flange having supporting legs, an upright cylinder having its lower end mounted on said flange and provided with a shoulder at its lower end, a die removably supported on said shoulder, a frame comprising two upright and spaced bars having a yoke fixedly connected with their upper ends and above the cylinder, a piston slidable in said cylinder and having a screw extending loosely through said yoke, means on said yoke and said screw coacting to restrain the screw from rotation but permitting axial movement of the screw, a bevel gear threadedly connected with said screw and engaging the yoke to be restrained from relative longitudinal movement, a second bevel gear meshing with said first bevel gear and rotatably supported on said yoke for imparting rotation to the first bevel gear and axial movement to said screw, a third bevel gear meshing with said first bevel gear and rotatably supported on said yoke, an upright shaft rotatably supported by said frame, meshing fourth and fifth bevel gears respectively fixedly connected with said shaft and said third gear, a crank at the lower end of said shaft, a reciprocatory cutter lying underneath said die, an operating connection between said cutter and said crank, said frame being pivotal to one side of said cylinder, and a lug on at least one of said bars normally lying across the upper end of said cylinder to hold the latter on said flange.

2. The invention described in claim 2 wherein there is provided a cross arm at the upper end of said screw, a head structure supportable on said shoulder in lieu of said die and provided with coaxial first and second nozzles of different diameters, said head being provided with first and second chambers respectively communicating with said first and second nozzles and with said cylinder, said head having an upstanding tubular member inside said cylinder, radial wings on said tubular member coacting with said cylinder to provide third and fourth chambers respectively communicating with said first and second chambers, pistons in said third and fourth chambers, and operating connections between said first and second pistons and said cross arm, said tubular member comprising a housing for said screw in the absence of said first mentioned piston.

JOSEPH G. CURRY.