Feb. 25, 1930. B. WINGER 1,748,374

CONTINUOUS TANKAGE PRESS

Filed Aug. 25, 1926 2 Sheets-Sheet 1

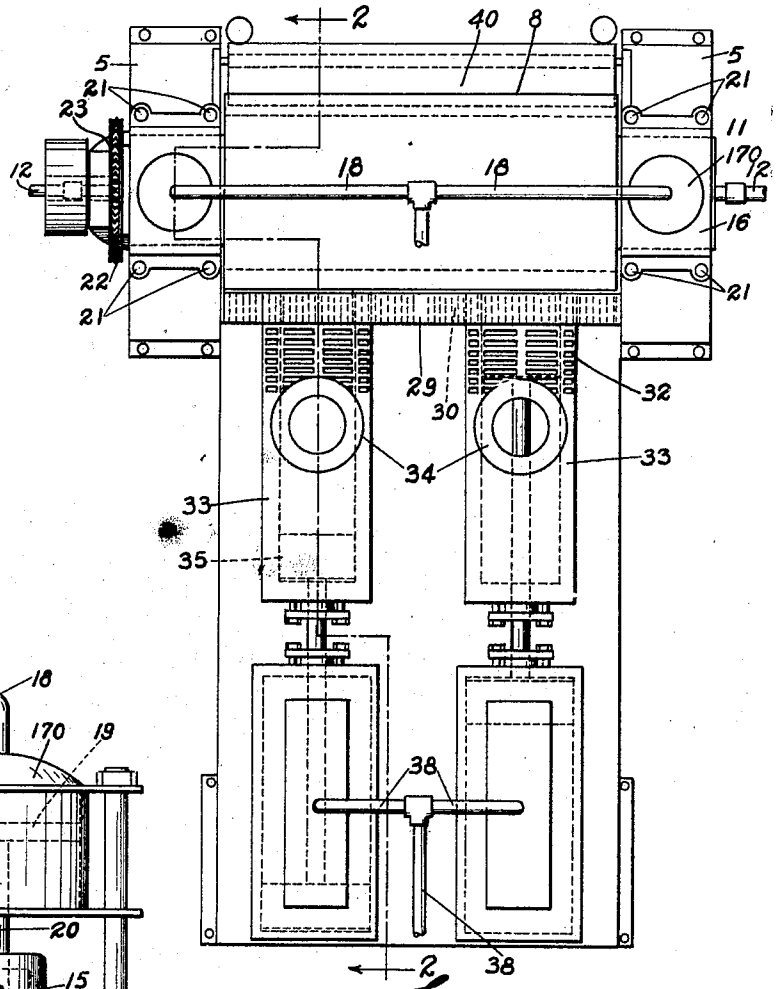

Fig. 1.

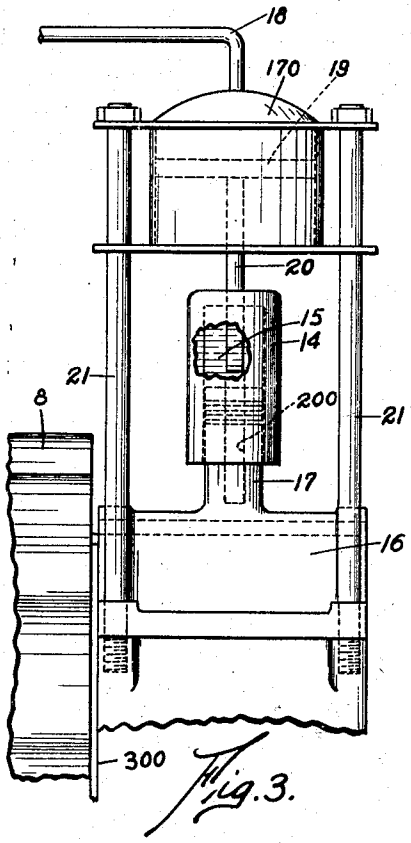

Fig. 3.

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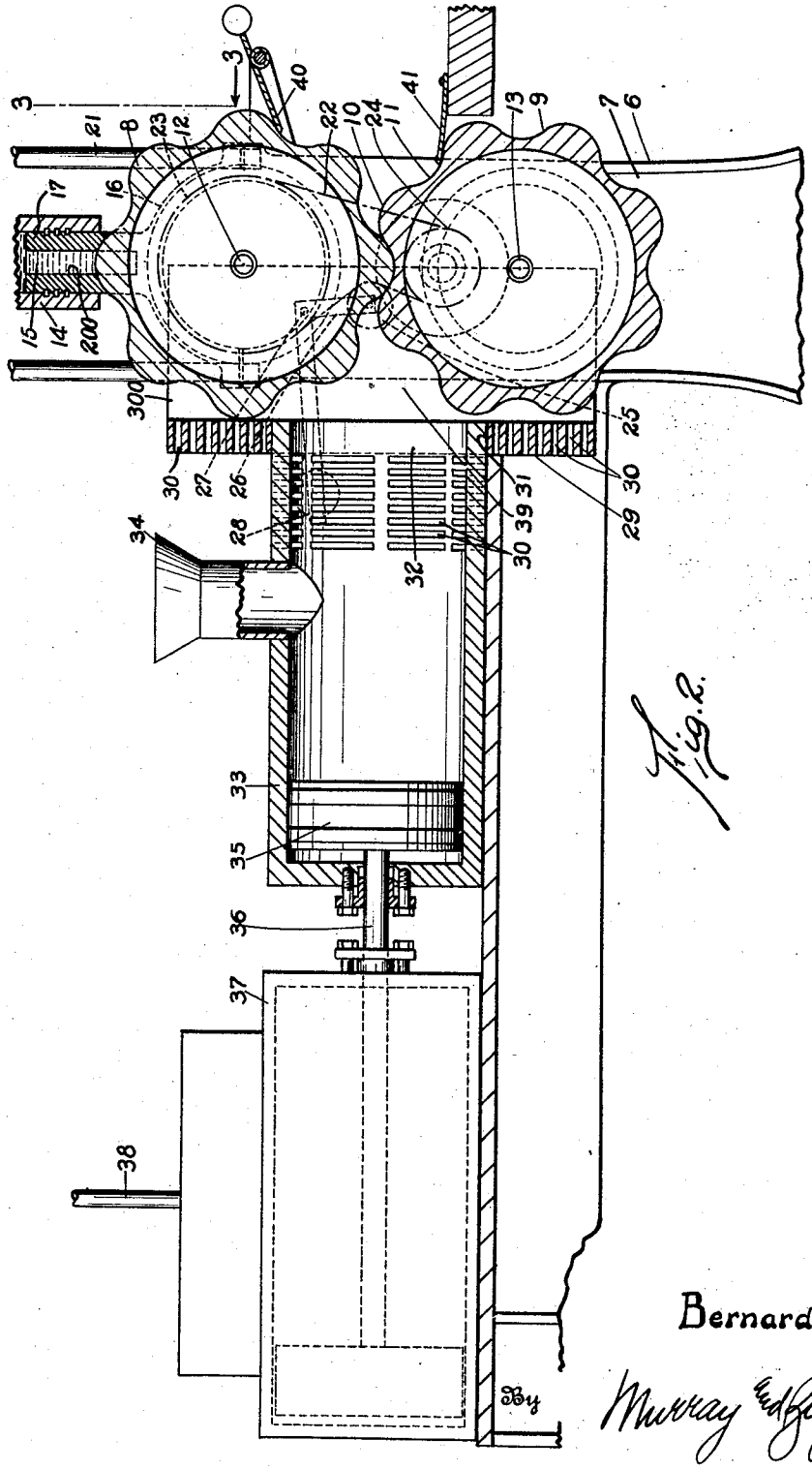

Fig. 2.

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UNITED STATES PATENT OFFICE

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CONTINUOUS TANKAGE PRESS

Application filed August 25, 1926. Serial No. 131,523.

This invention relates to a pressing apparatus for extracting moisture and greases from substances such as tankage, sludge and the like, such substances being the residue after greases and lard have been rendered from animal products.

An object of my invention is to provide a press which will squeeze the valuable greases from tankage and the like, leaving a residual substance practically dry and containing a minimum of such greases.

Another object is to provide a device of this kind which is continuously operating and which may be built in various sizes.

Another object is to provide a pressure feed mechanism which may be employed singly or in numbers in battery form, with a single extracting mechanism of my invention.

These and other objects are attained by the means described herein and disclosed in the accompanying drawings, in which Fig. 1 is a plan view of one embodiment of the device of my invention.

Fig. 2 is a cross sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a view taken on line 3—3 of Fig. 1.

The device comprises a suitable base 5, having uprights 6 provided with recesses within which are disposed suitable bearings for rotatably supporting heavy metallic rolls 8 and 9, the circumferences of which are preferably provided with corrugations comprising longitudinal ridges 10 and grooves 11. The corrugated faces of the rolls are adapted to normally intermesh as the rolls are rotated. The rolls 8 and 9 are preferably hollow and may be provided with suitable connections to steam pipes 12 and 13, for the purpose of heating said rolls by steam. Pressure is exerted upon roll 8 by means of suitable hydraulic cylinders 14, which are filled with oil or any other suitable liquid 15 which exerts pressure upon top bearing plate 16, which has a suitably packed piston 17 extending into cylinder 14. A suitable steam cylinder 170 supplied through steam pipe 18 from any suitable source acts upon piston head 19, carrying a piston 20 which extends into hydraulic cylinder 14 (see Fig. 3). One of the steam actuated hydraulic cylinders is provided at each end of roll 8 and the pressure therefrom is exerted upon the bearings of said roll so that the surfaces of the rolls are pressed tightly against one another and at the same time provides for movement of the rolls away from one another. The pipes 18 may be fed from a common source, so that uniform pressure is exerted at both ends of the roll 8. Rods 21 serve to mount the steam cylinders above the press and also serve as vertical guides upon which the bearing plates 16 are free to slide.

Referring to Fig. 3, it will be noted that the hydraulic cylinder 14 has the piston 20 extending for a distance into its interior and that the piston 17, carried by bearing plate 16, has a vertical bore 200 therein, into which the end of the rod or piston 20 may move. The oil or other liquid 15 is contained not only in the hydraulic cylinder 14 but in the bore 200 in the piston 17. From the foregoing, it will be apparent that when sufficient pressure is exerted in steam cylinder 170, the hydraulic chamber 14 will move relatively to piston 17 and the end of rod or piston 20 entering bore 200 will exert a greatly augmented pressure on bearing plate 16. This structure not only provides the necessary pressure but also permits sufficient resiliency for the roll 8, to permit any possible irregular masses of the tankage to be forced between the rolls. Roll 8 may be rotated by any suitable means such as a drive chain 22 passing to a suitable sprocket 23, mounted fixedly to the roll 8, the said chain being driven from a suitable drive sprocket such as 24. As shown in Fig. 1, an idler sprocket 25, freely rotatable upon arm 26 of a bell crank lever pivotally mounted as at 27 and having a counter-weight 28, serves to retain the chain 22 in proper driving engagement with sprocket 23 and at the same time permits movement of the roll 8 toward and away from roll 9. A perforated platen 29, which may be provided by suitably slotting a rectangular plate, is mounted snugly against the faces of the rolls so that the tankage or other material to be pressed will not find its way between the contacting surfaces. The perforations or slots 30 in platen 29 provide

for the escape of greases and other fluids which are pressed from the tankage or sludge. The platen 29 is provided with a circular opening 31 for receiving a suitably perforated or slotted end 32 of a pressure cylinder 33 having a suitable filling spout or hopper 34 extending therefrom. A ram 35 is mounted for reciprocation in the hollow interior of cylinder 33 and may be actuated by a suitable piston rod 36 operated by a suitable steam cylinder 37. Any suitable control for the steam cylinder 37 may be employed, the particular means used forming no part of this invention. As will be noted in Fig. 1, the embodiment herein disclosed is provided with two of the cylinders 33, rams 35 operating therein and steam cylinders 37 for actuating said rams. The steam cylinders may receive their steam from a common source through steam pipes 38. The operation of the device is as follows: The rolls 8 and 9 are brought into pressing relation with one another by supplying hydraulic pressure to bearing plates 16, which pressure is had through the agency of steam cylinders 17. The sprocket 24 is then actuated through any suitable power agency such as a motor, and in turn rotates the sprocket 23, which actuates corrugated roll 8, meshing with corrugated roll 9. Steam is then admitted to cylinders 37 through supply pipes 38 for reciprocating rams 35. Sludge or tankage to be pressed is then thrown into hopper or spout 34 when the ram 35 is in retracted position. As ram 35 moves forwardly in cylinder 33, it forces the tankage or sludge through the cylinder and into the space 39 bounded by portions of the peripheries of the rolls 8 and 9, and the platen 29, where the corrugations in the rotating rolls exercise great pressure upon the tankage and at the same time subject it to heat. Suitable end plates 300 fit snugly against the ends of the rolls and preclude escape of the tankage from the chamber 39. It will be readily apparent that the greases and other fluid matter will find its way through the perforations or slots 30, both in the platen and in the end 32 of cylinder 33. The solid matter, from which has been expressed the fluids or greases, is forced between the rolls by a new charge or quantity of sludge, which is fed into spout or hopper 34 prior to each forward movement of ram 35. The rolls will yield slightly against the hydraulic pressure in cylinder 14, to permit the solid matter to pass between them, and the force thus exerted serves to extract substantially all of the moisture and fluid matter therefrom. Scrapers 40 and 41 operate on the sides of rolls 8 and 9 respectively and keep the surfaces thereof clear of adhering pressed material. The pressed and substantially dry matter may be permitted to flow into any suitable container or truck, while the liquids and greases may be collected in any suitable tank or container disposed beneath the perforated cylinders and platens.

It will be readily understood that the rolls 8 and 9 may be made of any desired length and that the number of rams may be regulated by the desired capacity of the press. The entire mechanism and structure is preferably massive and heavy, in order that it may operate continuously and with great pressure upon a practically continuous volume of material to be pressed. It will be noted that the hoppers 34 are conveniently close together and that the rams are given an alternate movement in order to permit a workman to shovel quantities of sludge into one of said cylinders while the ram in the other cylinder is pressing its quantity of material between the rolls.

What I claim is:

1. A controllable pressure device having pressing rolls comprising a bearing plate adapted for use with a roll bearing, a hollow piston extending from said bearing plate, a hydraulic cylinder for receiving said piston and adapted to contain a non-compressible liquid, a stem chamber, a piston in said chamber, a piston rod fixed at its one end to said piston and extending into the hydraulic cylinder and means for admitting the steam to the chamber whereby the piston is moved forward, urging the piston rod and hydraulic chamber toward the hollow piston for exerting pressure on the roll.

2. In a steam actuated hydraulic pressure device, the combination of a steam chamber having a piston and piston rod slidably mounted therein, a hollow pressure piston, a hydraulic cylinder slidable in said cylinder and having the piston rod extending through the cylinder and adapted for entry into the hollow in said piston, a means for admitting uncompressible liquid in the hydraulic chamber and the hollow interior of the piston, a means for admitting steam to the steam chamber whereby the steam piston is moved forward, urging the hydraulic cylinder over the piston and tending to enter the end of the piston rod into the hollow interior of said piston.

3. In combination, a corrugated roll having a fixed axis, a second normally intermeshing corrugated roll mounted for bodily movement toward and away from the first mentioned roll, a bearing plate at each end of the movable roll, a piston on each bearing plate, a cylinder reciprocable over each of said pistons and adapted to contain liquid and steam actuated piston rods for moving the cylinders for exerting pressure on the rolls.

4. A controllable pressure device having pressing rolls and comprising a bearing plate adapted for use with a roll bearing, a hollow piston extending from said bearing plate, a cylinder for receiving the piston and adapted to contain a non-compressible liquid, a cham-

ber, a piston in said chamber, a piston rod fixed at its one end to said piston and extending into the hydraulic chamber and means whereby the piston is moved for urging the piston rod and hydraulic chamber toward the hollow piston for exerting pressure on the roll.

In testimony whereof, I have hereunto subscribed my name this 20th day of August, 1926.

BERNARD WINGER.