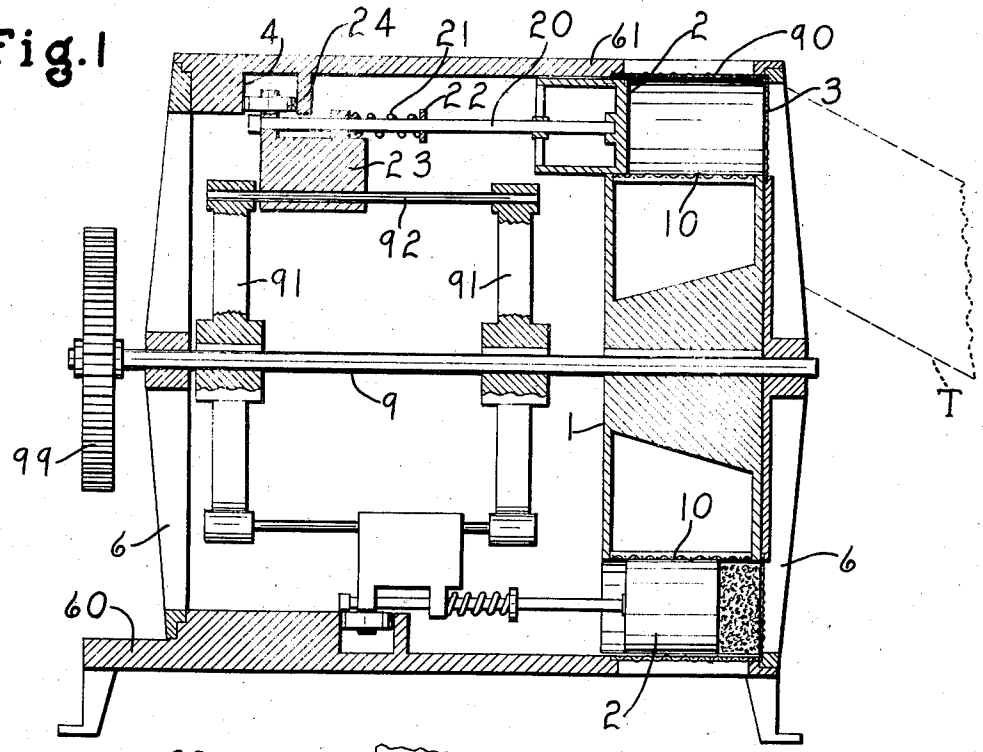
March 12, 1940. J. A. MORTENSON 2,193,140

PRESS

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Fig. 1



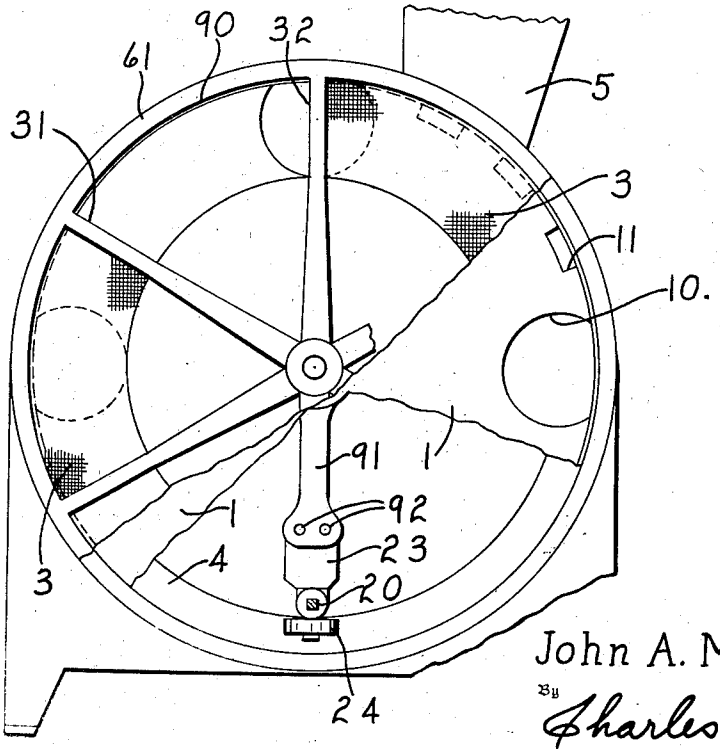


Fig. 2

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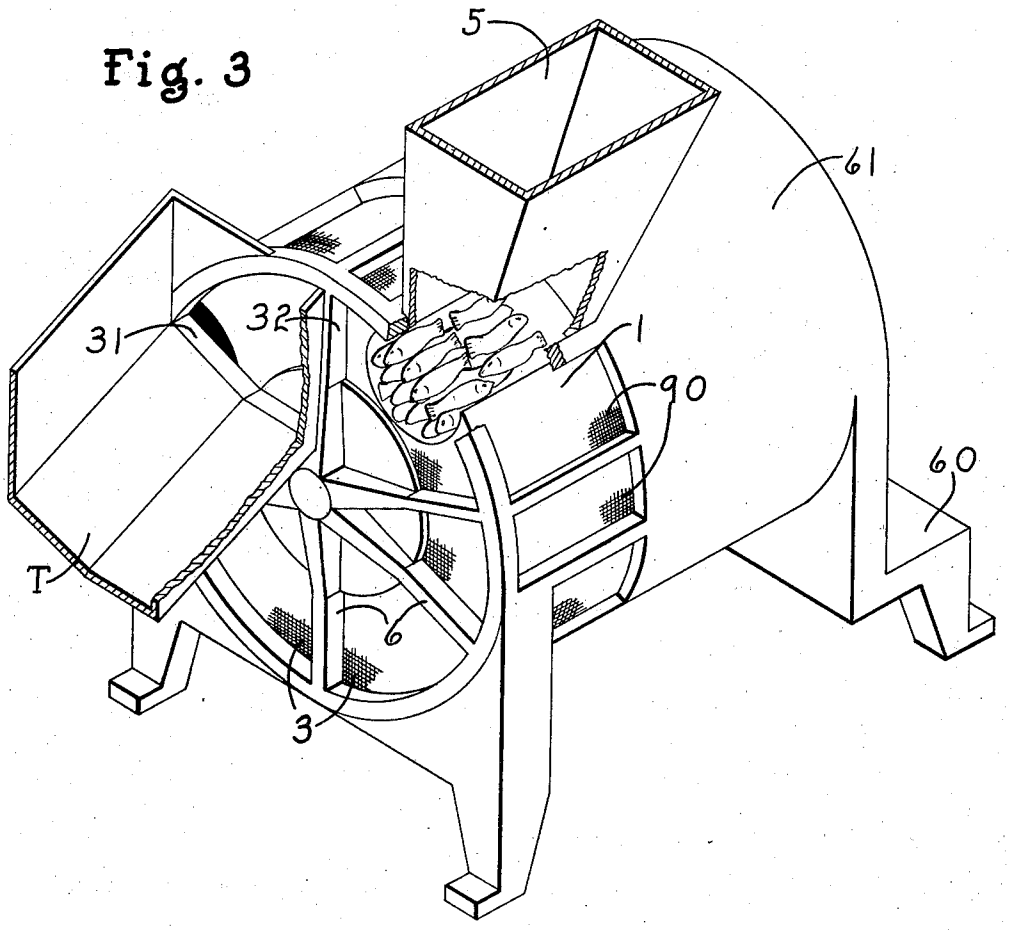
Attorney

March 12, 1940. J. A. MORTENSON 2,193,140

PRESS

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Fig. 3



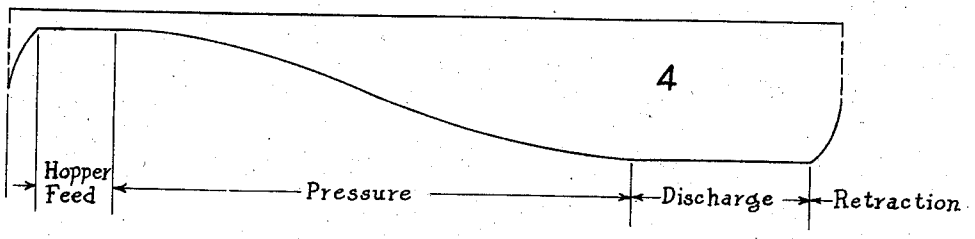


Fig. 4

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UNITED STATES PATENT OFFICE

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PRESS

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Application April 9, 1938, Serial No. 201,109

4 Claims. (Cl. 100—39)

It is the object of the present invention to provide a practicable press for the extraction of oil from fish by a continuous process, and one which will operate substantially without attention other than the supply of fish to be pressed in adequate quantities.

Such presses must be installed in the vicinity of the place where the fish are caught, which is usuallly remote from repair facilities, and such a press must therefore be simple, rugged, and reliable in operation, and require few repairs or simple repairs, if any are required, so that it may continue in operation over considerable periods of time.

More specifically it is an object to provide a press of the general nature and for such a purpose as is indicated above, which consists of a number of cylinders carried in a rotative body, and which are reticulated for the passage of the expressed oil, and to express the oil by plungers which are caused to move by cam means into and from the cylinders during revolution of the latter; to provide means whereby the machine will not be subjected to undue stresses in case of an overcharge or excessive resistance of the fish in a cylinder to pressure, but will yield; to provide a charging arrangement whereby the cylinders will be automatically charged as they pass a hopper, and will be automatically discharged at a further point in their revolution; and to provide cylinders and plungers for the same which preferably are peculiarly shaped, in conjunction with the remainder of the press, to accomplish these ends, and to maintain the plungers in place against rotation relative to their cylinders during revolution of the latter.

With these and other objects in view, as will appear more fully hereafter, my invention comprises the novel press as a whole, and the novel parts thereof and their relative arrangement, as shown in the accompanying drawings, described in this specification, and as more particularly defined by the claims which terminate the same.

In the accompanying drawings I have shown my invention embodied in a form which is at present preferred by me, it being understood that various changes may be made in the form, character and arrangement of parts without departing from the spirit of my invention.

Figure 1 is an axial section through the press.

Figure 2 is an end view of the press, at the discharge end, with parts broken away.

Figure 3 is a perspective view of the press, with parts broken away.

Figure 4 is a layout or development of the controlling cam.

A rotative body 1, keyed upon a shaft 9, is provided with a plurality of angularly spaced cylinders 10, which are disposed with their axes parallel to the axis of the shaft 9. These cylinders are preferably open at each end, whereby a plunger 2 may enter at one end and be moved axially towards the opposite end. This opposite end is closed by an end plate 3, which is preferably part annular in shape, and formed as part of or supported by the frame of the machine. Preferably the cylinders 10 and the end closure 3 therefor are of reticulated construction, whereby oil expressed from fish within the cylinders by the movement of the plunger may escape through the screen-like walls, to be collected in a pan (not shown) beneath the machine. The screen-like walls may be suitably reinforced and strengthened to prevent their bulging under the pressure of the plunger. It is also to be noted that the rotative body 1, which preferably is hollow in part to reduce its weight, is provided with apertures 11 for the escape of oil which reaches its interior, thus permitting expressing of oil throughout the entire periphery of each cylinder, and throughout its length.

Movement of the plungers 2 is controlled in any suitable way. Preferably a fixed cam 4 is employed, suitably shaped, as shown in Figure 4, to accomplish the desired movement of the plungers. In general this movement of the plungers is into the cylinders after the latter have been charged with fish, and gradually toward the screened end at 3, as the body 1 rotates relative to the fixed cam 4, until near the point of beginning the cycle, whereupon the plungers are retracted in readiness for receiving within each cylinder a fresh charge of fish.

Hot fish is supplied from a hopper 5, and it will be noted in Figure 2 that the cylinders are not completely cylindrical, in order to provide a slot extending lengthwise of each cylinder, which in the revolution of the cylinder about the axis of the shaft 9 comes into registry with the throat of the hopper 5 placed at a point adjoining the peripheral path of the cylinders, thus to charge into the entire length of the cylinder a fresh charge of fish. In order to prevent escape of fish the path of the cylinders is enclosed with a cylindrical enclosure 90, which preferably is also screened or reticulated and suitably reinforced. At the time of charging the cylinder it is enclosed at its end by the screen member 3, and as soon as it has cleared the throat of the hopper 5,

advance of the plunger into the cylinder commences, under the control of the cam 4, and this advance continues throughout a considerable portion of the rotation of the body 1, but it will be observed that the screen 3 is omitted between the points 31 and 32. When each cylinder in its revolution reaches the point 31 the fish is pressed outward by the pressure of the plunger behind it, and is discharged. The pressed fish may be received and carried away by a trough T. As the cylinder continues its revolution it passes the point 32, and by this time the plunger has been substantially entirely retracted by the cam 4, as the cylinder is about to come into registry with the throat of the hopper 5 to receive a fresh charge of fish.

It is preferable that there be provision for yielding between the plunger 2 and the cam 4, so that if an excessively large charge of fish enters a cylinder, or if the fish is unduly resistant to pressing, no damage to the machine will result. It is also desirable to provide such yielding means for the further purpose of providing a reservoir of force, which, when the cylinder passes the point 31, will serve to eject the pressed fish.

To this end the cam acts upon a cam follower 24, in the nature of a roller, which is mounted upon a carriage 23, which receives the end of the plunger rod 20 in guides parallel to the axis of the plunger and its cylinder, and a spring 21 is interposed between a collar 22, upon the rod 20, and a shoulder upon the carriage 23. The carriage 23 is guided preferably upon two spaced rods 92, carried by axially spaced spiders 91 keyed to the shaft 9. Movement is imparted to the plunger by movement of the carriage 23 along its rods 92, under the influence of the cam, and so long as the resistance of the fish is insufficient to overcome the spring 21 the plunger 2 advances with the carriage 23, and at the same rate. However, if the resistance of the fish is sufficient to overcome the spring 21, the latter yields. The spring may be made sufficiently strong to accomplish the desired pressing, yet sufficiently weak that it will yield before damage results to the screen 3 and other parts of the machine. Upon the cylinder reaching the point 31 in its revolution this accumulated compression of the spring 21 serves to advance the plunger, since the screen no longer resists its advance, and since the cam 4 may be so designed as to carry the plunger, with the spring 21 extended, into contact with the screen 3. This advance of the plunger, at and beyond the point 31, under the influence of the spring 21, serves to accomplish the final discharge of the fish from the cylinder. The plunger 20 and its guides in the carriage 23 may be made square or otherwise non-circular, if desired, in order to prevent rotation of the plunger relative to its cylinder, and since the cylinder is not completely circular in cross section in the preferred form, the plunger must also be of the same shape, and therefore is only partly cylindrical.

The frame of the machine is of no consequence, but end bracing members 6 are shown radiating from and supporting the rotative shaft 9 to which the spiders 91 and the body 1 are keyed, and the whole is supported from a base 60. The whole may be surrounded with an enclosure 61, joining the end members 6, and strengthening the machine against axial thrust. The shaft is rotated by a gear or pulley, illustrated at 99.

The machine as thus constructed is simple and capable of operating continuously. The fish might be charged endwise into the cylinders, but the side charging, as described, is preferred; this admits the fish uniformly from end to end, and insures complete filling of the cylinder. The machine is simple, and has few parts which are likely to get out of order, and excess strains which might serve to break parts of the machine are guarded against by the provision of the springs 21.

What I claim as my invention is:

1. A press for the extraction of fish oil or the like, comprising a rotative body having open-ended cylinders disposed about and parallel to its axis of rotation, a spider rotative with said body, a plunger received in each cylinder and supported by said spider for movement lengthwise of its cylinder, a hopper fixedly positioned adjacent the rotative path of the cylinders, the throat of which hopper extends substantially the length of the cylinders, to charge the latter from the side as they pass the hopper throat, cam means to effect and control lengthwise movement of the plungers, to advance each plunger into its cylinder after passing the hopper throat, and to withdraw it before again reaching the hopper throat, spring means compressible under the thrust of the cam, interposed between each plunger and the cam means, and a fixed plate closing the open end of the cylinders, from a point in advance of registry of the cylinders with the hopper throat angularly to a point corresponding approximately to the point of greatest advance of the plunger, but spaced from such first point to permit lengthwise discharge of the pressed fish, under the influence of the compressed spring means, when each cylinder reaches the discharge opening in the end plate, the cylinders, including their end-closing plates, being reticulated for escape of oil.

2. The combination of claim 1, wherein the fixed end plate, in its portion registering with the rotative path of the ends of the cylinders, is primarily formed of screen material.

3. A press for the extraction of fish oil or the like, comprising a cylindrical body keyed for rotation to a shaft and having open-ended cylinders disposed about and parallel to its axis of rotation, two spiders within the body, axially spaced apart and keyed to said shaft, and a plurality of pairs of parallel rods joining said two spiders, a carriage slidingly supported on each pair of rods, a cam follower supported for rotation on each carriage, a plunger rod received in axially spaced guides on each carriage and supported thereby for movement lengthwise of the axis of its complemental cylinder, a plunger on each plunger rod, each of said plungers being axially supported thereby for movement lengthwise of a cylinder, a collar between the ends of each plunger rod, and a spring interposed, on each said rod, between the collar and a shoulder on the complemental carriage, a charging orifice in the side of each cylinder, a hopper fixedly positioned adjacent the rotative path of the cylinders to charge the same as they pass, cam means to effect and control lengthwise movement of the plungers, to advance each plunger into its cylinder after passing the hopper throat, and to withdraw it before again reaching the hopper throat, and a fixed plate closing the open end of the cylinders, from a point in advance of registry of the cylinders with the hopper throat angularly to a point corresponding approximately to the point of greatest advance of the plunger, but spaced from such first point to permit lengthwise discharge of the pressed fish, the cylinders, in-

cluding their end closing plates, being reticulated for escape of oil.

4. A press for the extraction of fish oil or the like, comprising a cylindrical body keyed for rotation to a shaft and having open-ended cylinders, disposed about and parallel to its axis of rotation, two spiders within the body, axially spaced apart and keyed to said shaft, and a plurality of pairs of parallel rods joining said two spiders, a carriage slidingly supported on each pair of rods, a cam follower supported for rotation on each carriage, a plunger rod received in axially spaced guides on each carriage and supported thereby for movement lengthwise of the axis of its complemental cylinder, a plunger on each plunger rod, each of said plungers being axially supported thereby for movement lengthwise of a cylinder, a collar between the ends of each plunger rod, and a spring interposed, on each said rod, between the collar and a shoulder on the complemental carriage, means to charge the cylinders with fish or the like, cam means to effect and control lengthwise movement of the plungers, and a fixed plate having a discharge orifice but effecting closure of the open ends of the cylinders in all positions on their path of rotation with the exception of a position in registry with said discharge orifice, to permit lengthwise discharge of the pressed fish, the cylinders being reticulated for escape of oil.

JOHN A. MORTENSON.