

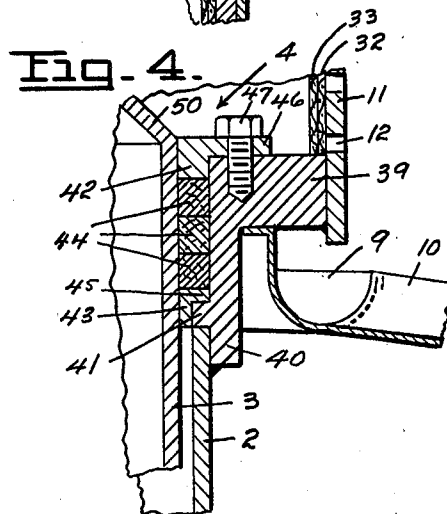
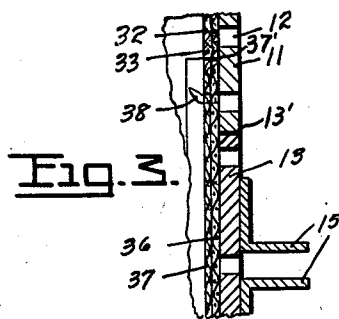
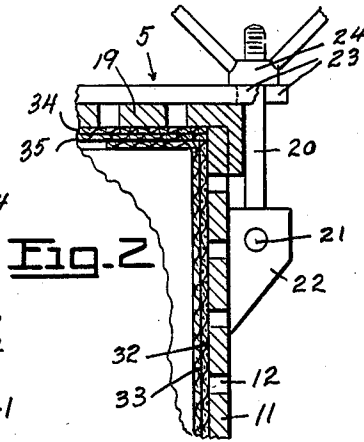
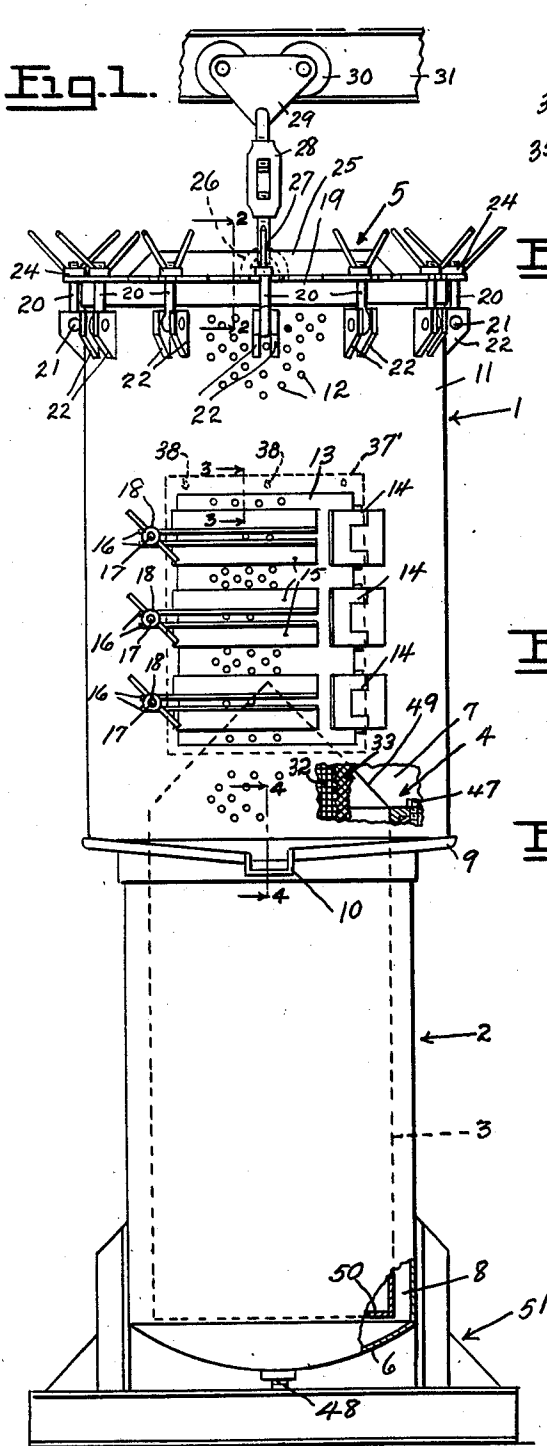
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OLIVE PRESS

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2,343,871

OLIVE PRESS

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10 Claims. (Cl. 100—50)

This invention relates generally to a fruit press, and more specifically to an olive press for expressing the oil from olives.

Olives for pressing are preferably picked when about ripe, and are ground up, sometimes without removal of the stones, and sometimes the stones are removed, but in the former case, the stones are not broken in the crushing. The pulp or pomace has heretofore been placed in fabric bags or enveloped in fabric, in which latter case a layer of pomace is placed in a tray-supported sheet of said fabric and the margins of the sheet folded over to cover the pomace. The bags or stacks of trays on which the fabric enclosed pomace is supported are positioned between the bed and head of a conventional hydraulic press and the oil is expressed from the pomace, flowing into a flow trough at the bottom of the press.

The labor and material costs involved in the expressing of olive oil by the above methods are quite high and the oil collected in the flow troughs contains an objectionably large amount of impurities.

The principal object of this invention is the provision of a press that will greatly accelerate the time required for expressing the oil from olives and that will accomplish this result at a substantial saving in labor and material costs, and which oil, when expressed by the press, will be relatively clean as compared with the oil expressed by the conventional means heretofore employed.

Other objects and advantages will appear in the description and drawing.

In the drawing,

Fig. 1 is an elevational view of the press as seen from the unloading side, parts thereof being broken away and certain parts being in section where broken away.

Fig. 2 is an enlarged fragmentary sectional view taken along line 2—2 of Fig. 1.

Fig. 3 is an enlarged fragmentary sectional view taken along line 3—3 of Fig. 1.

Fig. 4 is an enlarged fragmentary sectional view taken along line 4—4 of Fig. 1.

In general, the press illustrated in the drawing comprises a pair of vertically disposed, axially aligned upper and lower cylinders 1, 2 rigidly secured together at their lower and upper ends respectively, and a vertically reciprocable hydraulically actuated cylindrical ram 3 in the lower cylinder movable vertically into the upper cylinder and then retractable into the lower cylinder. A combination packing box and bearing 4 (Figs. 1 and 4) at the juncture between the

upper and lower cylinder cooperates with the ram to seal the upper cylinder from the lower at said juncture and slidably supports and guides the ram during its reciprocable movement, while a head 5 closes the upper end of the upper cylinder and a bottom 6 closes the lower end of the lower cylinder.

The diameter of the upper cylinder 1 is greater than the diameter of the lower cylinder 2, while the diameter of the ram is less than the diameter of the lower cylinder. The main walls of the upper cylinder define a pomace chamber 7 for receiving and holding pomace to be placed therein through the upper open end of the upper cylinder when the head 5 is removed, while the space between the walls of the lower cylinder and ram below the packing box 4 comprise a fluid chamber 8 for fluid to actuate the ram.

Encircling the upper and lower cylinders at their adjacent ends is an upwardly opening, annular oil receiving trough 9 that is inclined slightly relative to horizontal, and which trough communicates with a drain trough 10 at its depressed or lowered side for conducting oil from the trough to any desired point.

Each of the above generally designated elements will now be taken up more in detail, it being understood that the detailed descriptions are not to be considered restrictive, but illustrative of preferred structure.

The upper cylinder

The walls of the upper cylinder 1 are of perforated sheet metal 11, capable of withstanding relatively high pressure within the cylinder, the perforations therein being designated 12. In Fig. 1 only a limited number of the perforations are shown in elevation to preserve the clarity of the drawing, it being understood that the perforations are evenly distributed over the entire area of the walls 11.

One of the sides of the upper cylinder is formed with an opening closed by a door 13, which door is adapted to swing horizontally to open position on hinges 14 at one of its vertical edges.

This door 13, like the walls 11, is formed of perforated sheet metal, and is curved horizontally to conform with the curvature of the walls 11. The inner surfaces of the perforated sheet forming the door and of walls 11 are preferably flush with each other along the edges of the door and of the opening in walls 11 when the door is closed, as best seen in Figs. 1 and 3.

A plurality of pairs of spaced structural steel strips 15, such as angle strips, are secured on

the door and extend thereacross, thus reinforcing the latter. The ends of these strips opposite hinges 14 project from the door, as at 16 (Fig. 1) and pivoted clamping bolts 17 carried by the upper cylinders 1 are adapted to swing horizontally into and out of the spaces between the projecting ends 16 of the strips 15. These bolts carry manually actuatable screw clamps 18 threadedly secured therein for respectively engaging over the projecting ends 16 of each pair of strips 15 when the door is closed to securely hold the door closed against outward movement of the door under outward pressure exerted from within the chamber 7.

The head 5 comprises a circular metal plate 19 (Fig. 2) formed with perforations similar to those in walls 11 of the upper cylinder. This head is provided with a plurality of radially outwardly projecting ears rigidly secured thereto, the projecting ends of which ears are forked as indicated at 23 to respectively receive vertically disposed bolts 20 that are pivoted at their lower ends on horizontal pivots 21 between bracket members 22 rigidly secured to the upper end of the upper cylinder 1 for swinging of the bolts vertically into and out of the spaces between the fork ends 23 (Fig. 2) of the ears. A screw clamp 24 is threadedly carried by the outer end of each bolt 20 for tightening against the fork ends 23 when the bolts are in clamping position (Figs. 1, 2) and the clamps screwed down.

Reinforcing strips 25 of structural steel extend across the top of head 5, and an inverted U-bolt or eye 26 is secured to the head 5 centrally thereof for engagement by a hook 27 of any suitable hoist, which hoist may be a turnbuckle 28 depending from a carriage 29 supported by wheels 30 on an overhead track 31. Thus the cover may be hoisted clear of the cylinder 1 and carried to one side of the latter for loading material into said cylinder through its upper end after the head has been unclamped for removal from the cylinder 1.

Against the inner surface of the cylinder 1 is a sheet of wire cloth 32 (Fig. 2) and against the inner side of the wire cloth is a sheet of filter cloth 33. Thus the cylinder 1 has a removable liner of wire cloth and filter cloth with the filter cloth innermost.

The filter cloth is preferably longer than the cylinder 1 so as to project above the upper edge of the latter and after filling the cylinder with pomace, the upwardly projecting portion of the cloth is folded over the pomace as indicated in Fig. 2. The size of the liner is such as to extend to the lower end of the cylinder and across the openings 12 in walls 11. The cover 19 preferably has a flange fitting around the upper end of cylinder 1.

Below the cover or head 19 is a liner comprising circular sheet of wire cloth 34 and a sheet of filter cloth 35 with the filter cloth lowermost. This liner may rest at its marginal portion on the inwardly folded portion of the filter cloth 33 and on the upper edge of the wire cloth 32.

The door 13 being perforated, also has a liner similar to that of the cylinder, comprising a sheet of wire cloth 36 and a sheet of filter cloth 37 (Fig. 3). Preferably this liner for the door is larger than the door and extends outwardly past the edges 13' thereof and abuts the edges of the opening in the cylinder liner, the said opening being larger than the door opening. The edges of the opening in the cylinder liner are indicated by dotted lines 31' (Fig. 1). Inwardly projecting

hooks 38 (Fig. 3) on the cylinder above the door opening may be used to support the door liner in position.

The lower cylinder and packing box

The walls of lower cylinder 2, including bottom 6, are imperforate and are of a strength to withstand sufficient hydraulic pressure for forcing the ram 3 into the pomace to be loaded into the chamber 7 for expressing oil from the pomace.

A ring 39 (Fig. 4) within the lower end of walls 11 of the upper cylinder and projecting radially inwardly from said walls is rigidly secured to the latter, preferably by welding. This ring may carry trough 9 and drain 10, and is formed with a depending annular flange 40 that is formed at a point spaced slightly above its lower end with a radially inwardly projecting annular rib 41, the lower side of which rib engages the upper edge of lower cylinder 2, and said lower cylinder and flange may be rigidly secured together by welding, as indicated in Fig. 4.

An upper bearing ring 42 and a lower bearing ring 43 confine packing 44 therebetween for forming a tight, fluid seal with the outer surface of ram 3 and the flange 40 and the radially inwardly facing surfaces of said rings are formed to have a sliding fit with the outer surface of said ram, thus functioning as rigid bearings or guides for the ram.

Ring 43 is preferably formed with a radially outwardly projecting annular lip 45 that rests on rib 41, while ring 42 has a radially outwardly projecting flange 46 overlying the upper side of ring 39 and stud bolts 47 extending through said flange 46 and threadedly into ring 39 serve for tightening the packing 44 between rings 42, 43 and against ram 3. It will be noted that rings 42, 43 concentrically position the ram 3 in cylinder 2 and space the latter from the inner sides of said lower cylinder.

The bottom 6 of the lower cylinder has an inlet centrally thereof in which is secured one end of a fluid pressure pipe 48 that extends to any suitable pump and pressure release mechanism (not shown) for admitting and withdrawing fluid, such as water under pressure into the chamber 8 and for releasing the pressure and to permit the downward movement of ram 3 after each pressing operation.

The ram

The ram 3 is cylindrical and in coaxial alignment with the upper and lower cylinder, and has a conical head 49 at its upper end that projects into the lower end portion of cylinder 1. The lower end of said ram is closed by a bottom wall 50.

When fluid under pressure is admitted into the lower end of cylinder 2 the ram is forced upwardly into cylinder 1, and the packing box forms the seal between fluid chamber 8 and the pomace chamber 7 during said movement.

The entire press is supported on any suitable base, such as generally indicated at 51, to which it is secured.

Operation

When the upper cylinder 1 has its liner of wire cloth and filter cloth therein, and the door 13 clamped shut with the liner sheets 36 and 37 over the inner side thereof, the desired charge of pomace is loaded into the cylinder through its upper open end, and the head 5 is then clamped in place closing the upper end.

Fluid under pressure is then admitted through

conduit 48 into the lower cylinder 2 forcing the ram 3 upwardly into the upper cylinder and compressing the pomace between the ram and the wire screen and filter cloth that covers the inner surfaces of the walls 11, door 13, and the head 5, expressing the oil from the pomace through the mesh of the screen and cloth and through the openings 12 in the upper cylinder and in the door and head. The clean oil thus expressed drains by gravity into trough 9 and to drain conduit 10 for carrying by the latter to any desired collector or point for further handling or treatment.

The volume of pomace to be loaded into the upper cylinder is readily determined since it is compressed to about one-fourth of its original volume.

Upon withdrawing the fluid from the fluid chamber 8, the ram descends to its original position indicated in Fig. 1. The door 13 is then opened and the door liner of wire cloth and filter cloth is easily detached from hooks 38 and taken out through the door opening, after which the pomace from which the oil has been expressed is removed through the door opening, and the press is then made ready for a new charge.

The wire cloth and filter cloth liners 32 and 33 are easily removed from the upper cylinder and replaced with clean liners, and the removed liners may then be cleaned for re-use.

It will be seen that the oil expressed from the pomace is clean and the pressing job is accomplished with the minimum of labor, time and material, by the use of the above press.

Having described the invention, I claim:

1. A press of the character described comprising a hollow cylinder of perforated sheet metal having a liner of filter material and a removable head secured to said cylinder closing one end thereof; a cylindrical ram coaxial with said cylinder for closing the central portion of the opposite end of the latter; the outside diameter of said ram being substantially smaller than the inside diameter of said liner for leaving a substantial space between the sides of said ram and said liner when the ram is moved axially into said cylinder, and means for so moving said ram; a packing box and bearings sealing the remaining portion of said opposite end of said cylinder around said ram against leakage and slidably supporting said ram for axial movement into said cylinder.

2. A construction as defined in claim 1, said liner comprising a sheet of wire cloth removably supported against the inner sides of said cylinder and a sheet of filter cloth removably supported against the radially inwardly facing side of said wire cloth; said cylinder being vertically disposed and an upwardly opening annular trough coaxial therewith disposed below the lower edges of said cylinder for receiving liquid expressed from pomace to be held in said cylinder when said ram is moved into the latter.

3. A press of the character described comprising a hollow cylinder of perforated sheet metal having a liner of filter material and a removable head secured to said cylinder closing one end thereof; a cylindrical ram coaxial with said cylinder for closing the central portion of the opposite end of the latter and having a substantially conical head at its end adjacent the head of said cylinder; the outside diameter of said ram and of the base of its conical head being substantially smaller than the inside diameter of said liner; a packing box and bearings sealing the remaining portion of said opposite end of said cylinder around said ram against leakage and slidably

supporting said ram for axial movement into said cylinder; and means for so moving said ram.

4. A press of the character described comprising a hollow cylinder of perforated sheet metal provided with a head of perforated sheet metal closing one end of said cylinder and removably secured to the latter; a liner of sheet filter material removably supported against the inner sides of said cylinder and said head; a cylindrical ram coaxial with said cylinder for closing the central portion of the opposite end of the latter; the outside diameter of said ram being substantially smaller than the inside diameter of the liner covering the inner sides of said cylinder for leaving a substantial space between the sides of said ram and said liner when the ram is moved axially into said cylinder, and means for so moving said ram; a packing box and a bearing sealing the remaining portion of said opposite end of said cylinder around said ram against leakage and slidably supporting said ram for said axial movement thereof into said cylinder.

5. A press of the character described comprising a hollow cylinder of perforated sheet metal having a liner of filter material and a removable head secured to said cylinder closing one end thereof; a drum-like ram having cylindrical side walls and heads at opposite ends thereof coaxial with said cylinder for closing the central portion of the opposite end of the latter; the outside diameter of the side walls of said ram being substantially smaller than the inside diameter of said liner for leaving a substantial space between the sides of said ram and said liner when the ram is moved axially into said cylinder; a housing secured to said opposite end of said cylinder around said ram and enclosing the latter; a packing box carried by said cylinder adjacent the said opposite end thereof sealing the said opposite end of said cylinder around said ram against leakage of fluid from the inside of said housing to the inside of said cylinder upon axial movement of said ram into said cylinder; and a fluid pressure conduit communicating with the interior of said housing for admitting fluid into said housing for causing such movement of said ram.

6. A press of the character described comprising a hollow cylinder of perforated sheet metal provided with a head closing one end thereof and removably secured to said cylinder; an opening formed in one of the sides of said cylinder and a closure conforming in contour to that of the cylinder walls closing said opening; means releasably securing said closure in a position closing said opening; a liner of sheet filter material removably supported against the inner sides of the walls of said cylinder and extending across said opening; a ring coaxial with said cylinder secured to the end thereof opposite said head and projecting radially inwardly of the walls of said cylinder at said latter end; a cylindrical ram coaxial with said cylinder slidably supported by said ring for reciprocatory movement axially thereof and closing the central aperture of said ring; means for causing said movement of said ram; the cylindrical outer sides of said ram being of substantially uniform diameter from end to end thereof and of appreciably smaller diameter than the inside diameter of said liner, and the sides of said cylinder being of substantially uniform diameter from end to end thereof whereby a substantial space of uniform width is formed between the sides of said ram and said liner when the ram is moved into said cylinder.

7. A press of the character described, comprising a vertically disposed hollow cylinder of perforated sheet metal for holding pomace from which liquid is to be expressed, and provided with a head closing the upper end thereof; a liner of sheet filter material removably supported against the inner sides of said cylinder; a ring coaxial with said cylinder secured to the lower end of said cylinder and projecting radially inwardly of the walls thereof; a cylindrical ram coaxial with said cylinder having a closed upper end; and the cylindrical sides of said ram slidably supported by said ring for axial movement of the ram upwardly into said cylinder; an annular upwardly opening trough coaxial with said cylinder and secured thereto in a position for receiving liquid passing through the perforations in the walls of said cylinder and draining from said walls upon compression of pomace in said cylinder by upward movement of said ram; the said ram having an outside diameter appreciably smaller than the inside diameter of said liner to provide a space between said liner and ram for compression of such pomace in said space when said ram is moved into said cylinder; and hydraulic means for so moving said ram.

8. A hydraulic press of the character described, comprising an upper and a lower cylinder disposed vertically in axial alignment, one above the other, and secured together at their adjacent ends; a cylindrical ram in said lower cylinder reciprocable into said upper cylinder; a fluid pressure conduit opening into said lower cylinder below said ram for admitting fluid under pressure into said latter cylinder for moving said ram into said upper cylinder; said upper cylinder being of perforated sheet metal; a liner of filter material lining said upper cylinder; said upper cylinder being provided with an opening therein for loading the cylinder with pomace; a closure removably secured over said opening; and a liquid collecting trough below the lower edges of said upper cylinder encircling the latter for receiving liquid expressed from pomace in said upper cylinder when said ram is moved into the latter; said ram being of smaller diameter than said upper cylinder whereby such pomace will be pressed between the lateral sides of said ram and the inner sides of said upper cylinder when the ram is moved into said upper cylinder.

9. A hydraulic press of the character described, comprising an upper and a lower cylinder disposed vertically in axial alignment, one above the other, and secured together at their adjacent ends; a cylindrical ram in said lower cylinder

having a conical-shaped upper end and reciprocable into said upper cylinder; a fluid pressure conduit opening into said lower cylinder below said ram for admitting fluid under pressure into said latter cylinder for moving said ram into said upper cylinder; said upper cylinder being of perforated sheet metal; a liner of filter material lining said upper cylinder; said upper cylinder being provided with an opening in its upper end for loading it with pomace; a closure removably secured over said opening; said ram being of substantially uniform diameter from its conical upper end to its lower end and of lesser diameter than said upper cylinder whereby pomace in said upper cylinder will be directed by said conical upper end to between the lateral inner sides of said upper cylinder and the sides of said ram for expressing liquid from said pomace through said liner and through the perforations in said upper cylinder when said ram is moved upwardly into said upper cylinder.

10. A hydraulic press of the character described, comprising an upper and a lower cylinder disposed vertically in axial alignment, one above the other, and secured together at their adjacent ends; a cylindrical ram in said lower cylinder reciprocable into said upper cylinder; a packing box between said cylinders at their adjoining ends cooperating with said ram for providing a liquid-proof seal between said cylinders during reciprocation of said ram; said lower cylinder being of smaller diameter than the diameter of said upper cylinder, and said ram being of smaller diameter than the diameter of said lower cylinder, and the said upper cylinder, lower cylinder and ram respectively, being of substantially uniform diameter from end to end thereof; the said upper cylinder being of perforated sheet metal and having a liner of filter material lining the same; the upper end of said upper cylinder being provided with a loading opening for loading pomace into said upper cylinder and one of the sides of said upper cylinder being provided with a discharge opening for removal of such pomace; closures removably secured over said loading opening and over said discharge opening respectively; means for admitting fluid under pressure into said lower cylinder below said ram for moving said ram into said upper cylinder; and a liquid collecting trough below the lower edges of said upper cylinder encircling the latter for receiving liquid expressed from pomace in said upper cylinder when said ram is moved into the latter.

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