March 13, 1928. 1,662,531

E. T. MEAKIN

CONTINUOUS PRESS

Filed Feb. 18, 1924 2 Sheets-Sheet 1

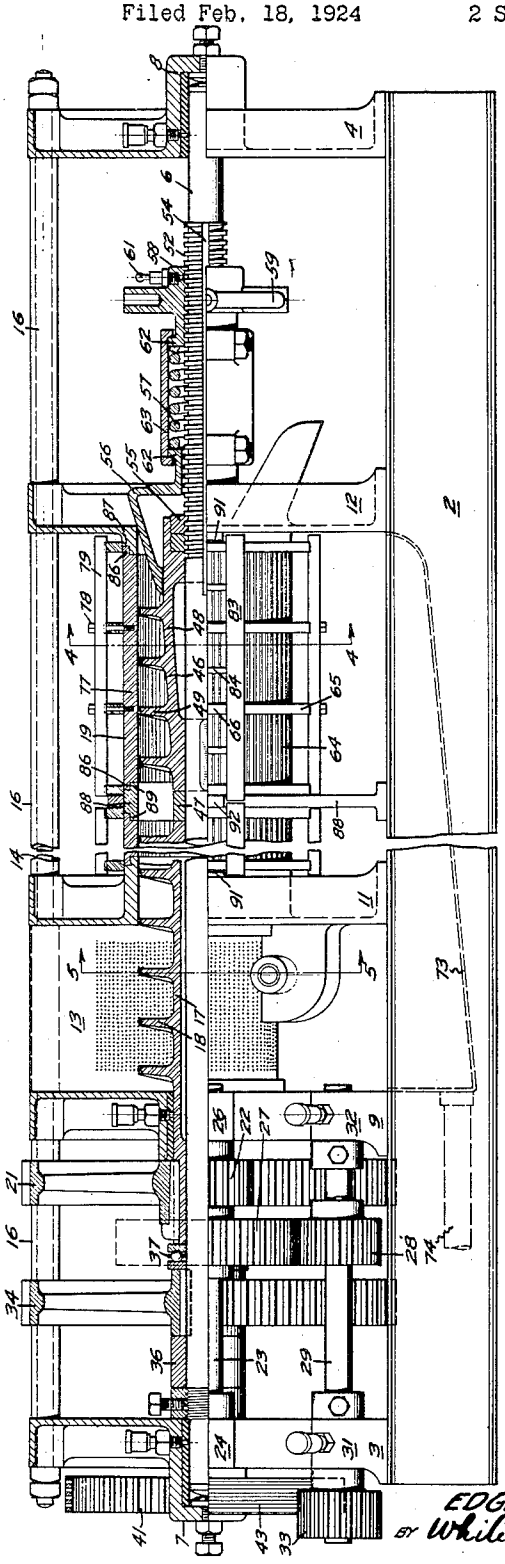


FIG. 1.

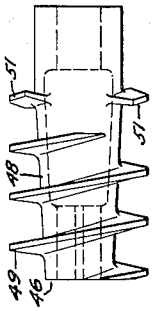


FIG. 2.

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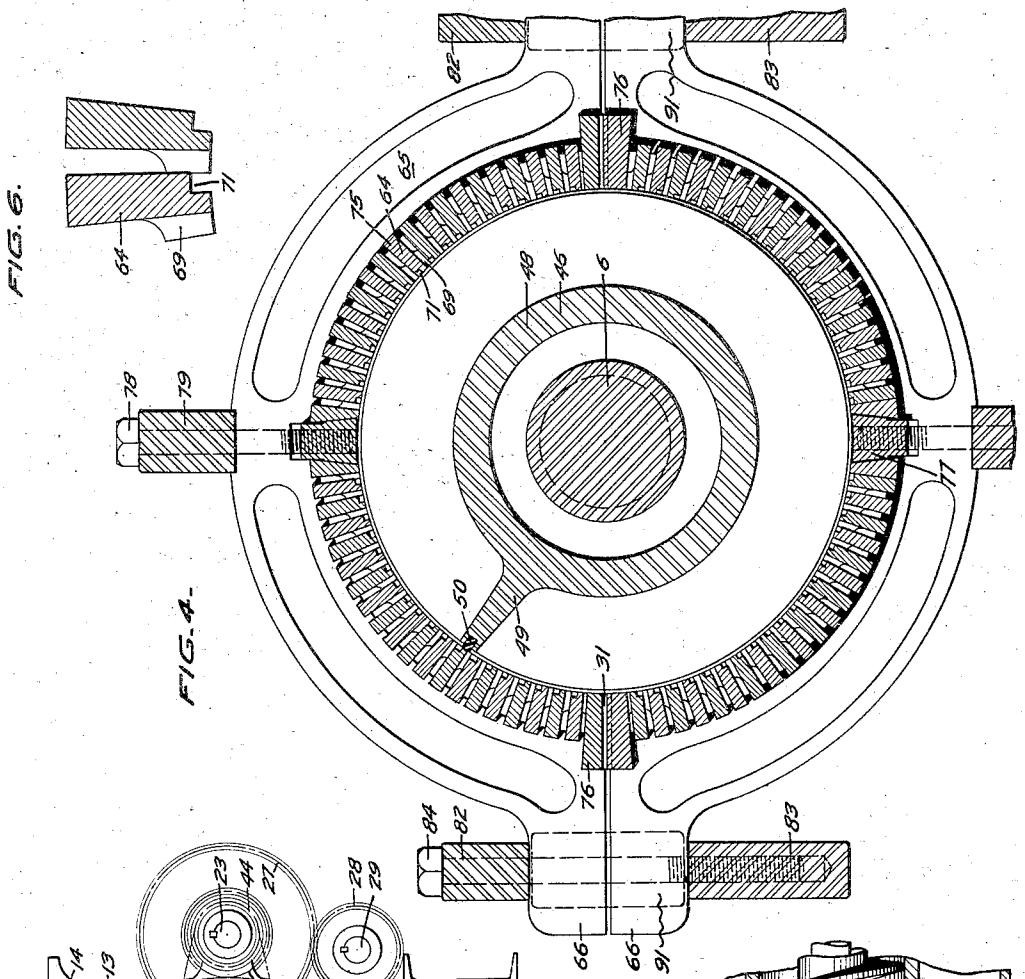


FIG. 6.

FIG. 4.

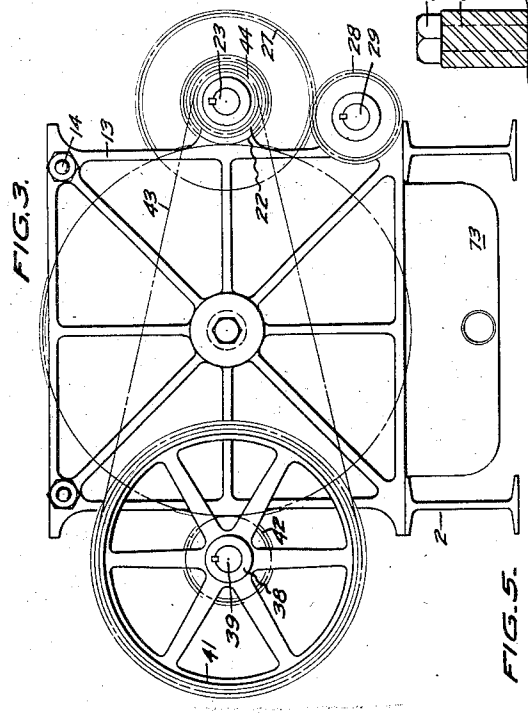


FIG. 3.

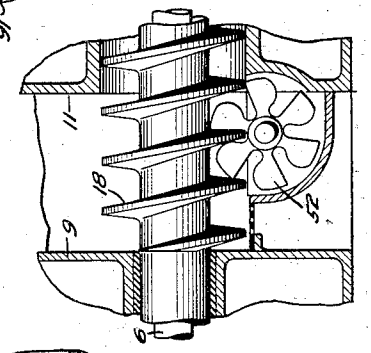


FIG. 7.

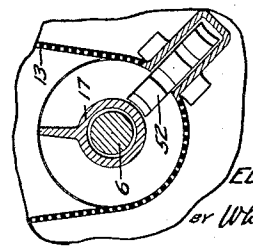


FIG. 5.

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Patented Mar. 13, 1928. 1,662,531

UNITED STATES PATENT OFFICE.

EDGAR T. MEAKIN, OF BERKELEY, CALIFORNIA

CONTINUOUS PRESS.

Application filed February 18, 1924. Serial No. 693,580.

One of the objects of the invention is to provide an improved type of continuous press comprising simplified means for disassembling and assembling the press cylinder.

Another object is to provide improved means for preventing the packing of material in the threads of the pressure screws and insuring its delivery into the press chamber.

A further object is to provide improved means for maintaining a pre-determined pressure on the material in the press chamber.

My invention possesses other advantageous features, some of which, with the foregoing, will be set forth at length in the following description, where I shall outline in full that form of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. In said drawings I have shown one embodiment of my invention, but it is to be understood that I do not limit myself to such form, since the invention, as set forth in the claims, may be embodied in a plurality of forms.

Referring to the drawings:

Fig. 1 is an elevation of my press, a portion being shown in vertical section.

Fig. 2 is a view in elevation of the tapered pressure screw.

Fig. 3 is an end elevation of my press.

Fig. 4 is an enlarged sectional view of the press chamber, the plane of section being indicated by the line 4—4, Fig. 1.

Fig. 5 is a vertical section view taken on the line 5—5, Fig. 1, illustrating the arrangement of the pressure screw feed wheel.

Fig. 6 is an enlarged sectional view of several channeled bars, particularly illustrating the filter bed rabbets.

Fig. 7 is a side view of the feed wheel and adjacent parts.

The press of my invention is arranged upon channels or I-beams 2, and comprises end frames 3 and 4, in which a shaft 6 is journaled in adjustable thrust bearings 7 and 8. Also arranged upon the channels and intermediate the end frames are a journal frame 9 and press cylinder supporting frames 11 and 12. A foraminated feed hopper 13 is arranged between the frames 9 and 11; and tie rods 14 connected at opposite ends to the upper portions of the end frames 3 and 4, and passing through the intermediate frames 9, 11 and 12, tie the frames together, the spacing tubes 16 arranged between the frames, maintaining their position.

Journaled in the frame 9 and rotatably disposed on the shaft 6, is a sleeve 17 comprising a pressure screw, and provided with a helical thread 18, which sweeps the inner surface of the feed hopper 13, and extends into the press cylinder, generally designated by the numeral 19. One end of the sleeve is provided with a gear 21, keyed thereto and adapted to mesh with a pinion 22 on the countershaft 23, which is journaled in the bearings 24 and 26, in the frames 3 and 9.

The countershaft 23 is also provided with a gear 27, keyed thereon and in mesh with a pinion 28, fixed to a drive shaft 29, also journaled in the frames 3 and 9, in the bearings 31 and 32. A small gear 33 keyed to the drive shaft, provides a driving connection to any suitable source of power.

Keyed to the shaft 6, adjacent the end of the sleeve 17, is a shaft driving gear 34, secured against axial displacement on the shaft by collars 36; and a conventional thrust bearing 37 is arranged on the shaft 6 between the hub of the driving gear 34 and the end of the sleeve 17.

Means are provided for driving the shaft 6 from the drive shaft 29 at a different speed of rotation than the sleeve 17.

Arranged in bearings 38 on the side of the frames 3 and 9, opposite to the countershaft 23, is a jack shaft 39, provided with a driven sprocket 41 and a driving pinion 42, both keyed to the shaft. The sprocket 41 is driven by a chain 43 from a small sprocket 44, keyed to the countershaft 23; and the driving pinion 42 meshes with the driving gear 34 for the shaft 6.

Arranged on the shaft 6 and keyed thereto within the press cylinder is a second sleeve 46, its inner or keyed end being spaced from the end of the sleeve 17 by an anti-friction collar 47. This sleeve is provided with an enlarged body portion 48, adjacent the discharge end of the press cylinder, the sleeve tapering outwardly from its inner end and having a helical thread 49 formed thereon. The thread 18 of the sleeve 17, and the thread 49 of the sleeve 46 are both preferably grooved to receive a packing strip 50

of any suitable material such as rubber or fiber, which prevents leakage of material between the flights of the screws.

This second tapered sleeve materially decreases the capacity of the press cylinder adjacent its discharge end, and having a slower speed of rotation than the sleeve 17, and with helical threads of similar pitch, the movement of material through this end of the cylinder is retarded. The last flight of the thread on the tapered sleeve adjacent the discharge end of the press cylinder is preferably interrupted to form vanes 51, as shown in Fig. 2, and preferably disposed at an increased pitch to provide a boosting effect on the discharge of material from the cylinder.

A feed wheel 52 is arranged in the feed hopper 13, as shown in Figs. 5 and 7, in mesh with the threads of the sleeve 17. The wheel is arranged for rotation in a plane coincident with the axis of the sleeve as shown in Fig. 5 and preferably lies at about 45° to the vertical, below the screw and to that side toward which the lowest portion of the periphery of the flight moves.

This position of the feed wheel in the hopper has been decided on only after extensive experiment, and has proven most efficient under test in preventing material from "boiling out" of the threads of the pressure screw at the entrance to the press cylinder and insuring the delivery of the material into the press cylinder.

Formed on the shaft 6 between the end frame 4 and the discharge end of the press cylinder are threads 52 and a keyway 54. Lock nuts 55 secured on the threads of the shaft in a recess in the outer end of the tapered sleeve 46, aid in positioning the sleeve; and the threaded portion of the shaft provides a mounting for a conical pressure plug 56.

The plug is adapted to maintain a resilient predetermined pressure on material in the press cylinder, and is forcefully held therein around the shaft and sleeve 46, by a spring 57 interposed between the plug and a collar 58, threaded on the shaft and provided with a flange 59, which may serve as a hand wheel. The flange is provided with sockets for the reception of a wrench bar or spoke to facilitate turning it. Rotation of the collar varies the pressure of the spring on the plug and hence the pressure exerted on material in the press cylinder. A pin 61, spring pressed in the collar against the keyway 54 in the shaft, prevents accidental rotation of the collar.

Both the collars 58 and the plug 56 are provided with flanges 62 on their adjacent ends which are connected by a split sleeve 63, so that the plug may be backed out of the press cylinder by releasing the pin 61 from the keyway and rotating the collar.

Referring now to Figs. 1 and 4, the press cylinder 19, which forms a pressing chamber by the action of the screws, comprises two cylindrical units. Each unit comprises a cylinder composed of two semi-cylindrical assemblies of longitudinally disposed grooved or channeled bars 64, each assembly retained in position in semi-circular clamp frames 65, having radially extending lugs 66. The bars 64 have a cross section as shown in Figs. 4 and 6, one of the faces of each bar having a wide flange grooved so that a multiplicity of minute passages 69 are formed between the contiguous faces of the bars when assembled in the frames 65.

A rabbet 71 is formed in the inner edge of each bar, preferably adjacent the grooves of the adjoining bar; and material packing in this rabbet and the adjacent portions of the passages 69, forms a filter bed which measurably increases the efficiency and range of the press. Material such as cooked pumpkin, which has heretofore been impossible to handle in such means, is readily pressed in my device. Fluid extracted from the material in the press chamber passes through the filter bed and passages 69, and is caught in a drip pan 73 arranged under the foraminated receiving hopper and press chamber between the I-beams 2, and may be removed therefrom by a suitable conduit 74.

The grooved or channeled bars are assembled in the semi-circular frames 65, in the slots 75, formed in the inner faces of the frames, and are clamped therein between the outside retaining bars 76 by wedge bars 77. The retaining bars are secured preferably by welding to the frames 65.

In each semi-cylindrical assembly the wedge bars 77 may be moved outwardly in the frames 65 to firmly clamp the grooved bars 64 against the outside bars by means of bolts 78 threaded in the wedge bars and passing through the anchor bars 79 which are longitudinally arranged across the spaced frames.

The grooved bars 64 are thus arranged in two semi-cylindrical assemblies, adapted to fit, one on the other to make the complete press cylinder 19. The adjacent faces of the retaining bars 76 are also formed with grooves 31 which perform the same function as the passages 69.

The semi-cylindrical assemblies comprising the assembled frames 65 and bars 64, 76 and 77 are brought together so that the retaining bars 76 of each semi-cylindrical assembly contact, and are held in cylindrical arrangement by bars 82 and 83 disposed on opposite sides of the lugs 66 and clamped together by tie bolts 84.

The press cylinder is preferably formed in two or more units considered longitudinally, each unit having two semi-cylindrical halves as just described.

The ends of the component bars of each unit are provided with lugs 86 to seat at one end on stepped rings 87, formed on the press cylinder supporting frames 11 and 12. The opposite ends of the bars of each unit are similarly formed and adapted to seat on a center frame 88 having stepped rings 89 and supported on the I-beams 2. It will thus be seen that one unit of the press cylinder comprising a semi-cylindrical assembly may be disassembled without disturbing the other units of the press cylinder.

Any tendency of the units of the press cylinder to rotate with the pressure screws is overcome by the bars 82 and 83, which also enclose lugs 91 projecting from the supporting frames 11 and 12, and lugs 92 projecting from the center frame 88.

I claim:

1. In a press for the extraction of liquids, a casing comprising a plurality of contiguous transversely grooved bars, each bar having a longitudinal rabbet on its inner edge for the retention of material to form a filter bed.

2. In a press for the extraction of liquids, a plurality of bars in cylindrical assembly, each bar formed with a longitudinally extending rabbet on one side at the inner edge and a transversely grooved flange in its opposite side at its inner edge.

3. In a press for the extraction of liquids, a plurality of bars in cylindrical assembly, each bar having a flat side and a longitudinally extending rabbet in said flat side at the inner edge thereof and a transversely grooved flange on the opposite side, said longitudinal rabbet in one bar providing a side entrance into the transverse grooves of the adjacent bar.

4. In a press for the extraction of liquids, a plurality of bars, each bar having grooves extending on one side from the inner face of the bar outwardly and on the opposite side of bar at its inner edge a longitudinally extending rabbet lying next to the grooves of the adjoining bar.

5. In a press having a pressure screw, a feed wheel comprising a plurality of teeth formed to mesh with the flight of the screw and journaled to rotate in a plane coincident with the axis of the screw and lying below and to that side of the screw toward which the lowest point of the periphery of the flight is moving.

6. A pressure screw having a body and a continuous spiral flight thereon, and spiral vanes each of less length than the circumference of the flight on said body adjacent one end of the flight, the spiral of the vanes differing from the spiral of the flight.

In testimony whereof, I have hereunto set my hand.

EDGAR T. MEAKIN.