Feb. 12, 1935. M. J. POWER 1,990,839

PRESS CYLINDER

Filed June 22, 1931

FIG. 1.

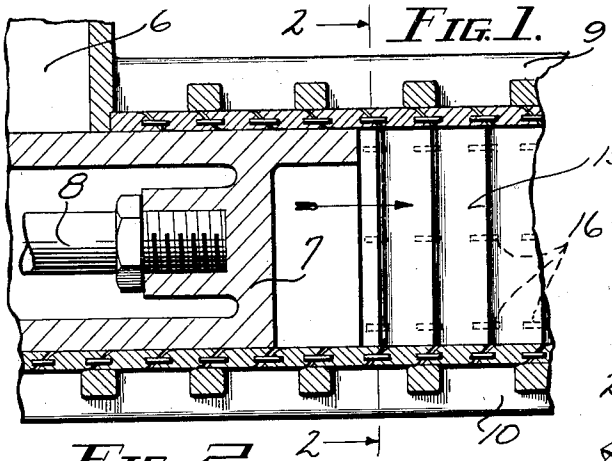


FIG. 2.

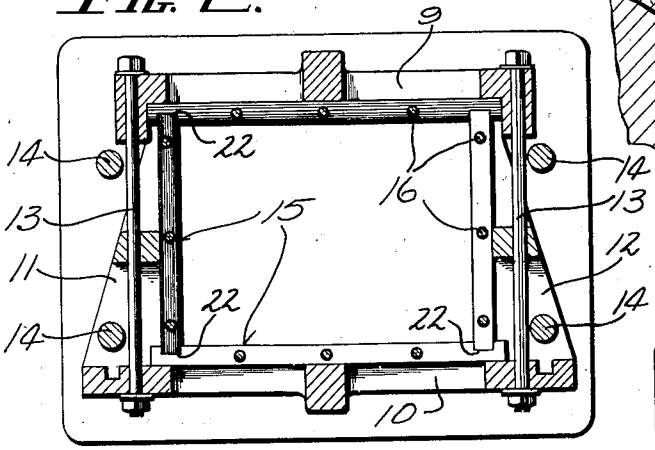


FIG. 3.

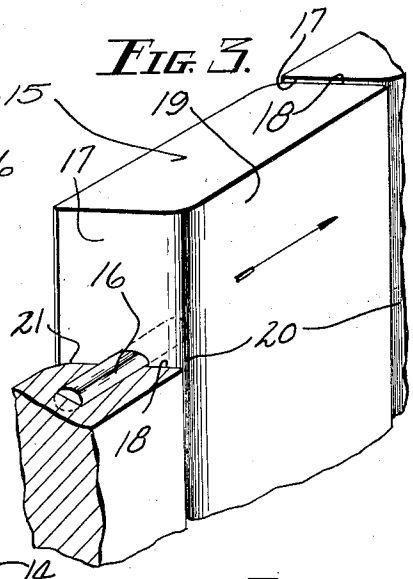


FIG. 5.

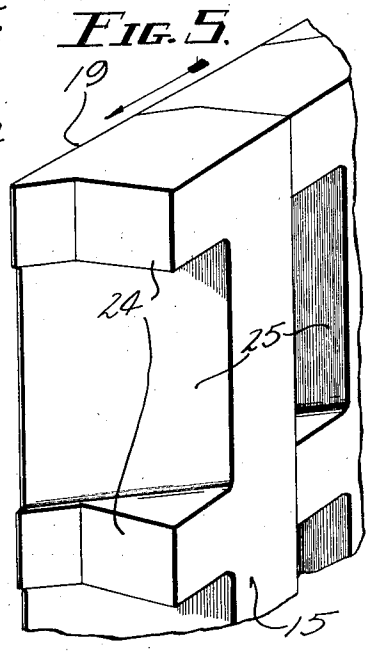
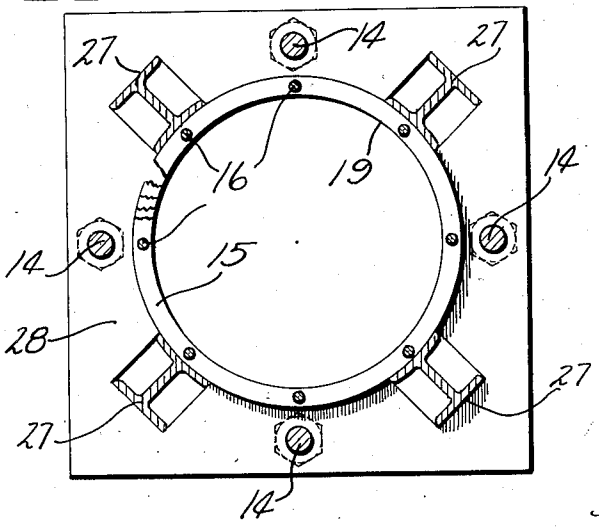


FIG. 4.



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PRESS CYLINDER

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Application June 22, 1931, Serial No. 545,945

15 Claims. (Cl. 100—50)

This invention relates to improvements in press cylinders.

It is the primary object of the invention to provide a press cylinder made up of component units which may be standardized as to construction and assembled to suit the requirements of a particular press, both as to length and the size of slot provided for the escape of liquid from the press.

Presses designed for squeezing water from bark are obliged to meet a wide variety of conditions depending on the nature and condition of the bark with which a particular press is intended to be used. A given length of press or a size of water escape opening may be well adapted for use under some circumstances and may still be unsatisfactory for use in other circumstances. A bark press may be very satisfactory for bark but may not function successfully to press other material of a lighter or heavier nature, either because the length of the press is wrong or the dimensions of its water escape openings are too large or too small. Under these circumstances the design of a press has heretofore been entirely a matter of special construction for each particular piece of work. By means of the present invention, however, the water escape openings are provided by spaces between component elements which are assembled to make up the press, and which may be used in a greater or lesser number to vary the length of the press, or may be used at a greater or lesser spacing to vary the dimensions of the openings through which the water passes.

In the drawing:

Figure 1 is a fragmentary axial section through a press piston and a press cylinder embodying the invention.

Figure 2 is a transverse section through the press cylinder, taken generally in the plane indicated at 2—2 in Figure 1.

Figure 3 is a fragmentary detail in perspective, on an enlarged scale, showing the relation of consecutive units of the cylinder wall to each other.

Figure 4 is a view similar to Figure 2, showing a modified form of cylinder having a cylindrical bore instead of a rectangular bore.

Figure 5 is a further modification, showing the use of integral portions of the cylinder units for spacing the units from each other.

Like parts are identified by the same reference characters throughout the several views.

Material introduced through the hopper 6 is acted on by piston 7 as the piston is reciprocated through the usual mechanism including connecting rod 8.

The cylinder is assembled within the customary reenforcing frame, which in this instance includes upper and lower castings 9 and 10 and side castings 11 and 12 interlocked therewith, the whole assembly being held together by tie-bolts 13 and 14 running vertically and longitudinally of the frame assembly. The frame castings described are in the form of open grids to permit the free escape of liquid in all directions, as clearly shown in Figures 1 and 2.

Supported by the grid castings comprising the frame are the component cylinder elements generically designated by reference character 15. In the construction shown in Figures 1, 2, 3, and 5 these elements constitute straight bars, while in the construction shown in Figure 4 the elements are annular. In each case the principle is the same to the extent that the elements are manufactured as standardized units and may be assembled to any desired number to make up a cylinder of any required length. It is important to note that in each instance the liquid escaping from the cylinder passes between the elements 15, thus eliminating the necessity for expensive milling or machining operations heretofore required in the manufacture of presses of this character.

In the construction shown in Figures 1, 2, 3, and 4, the individual elements are spaced by dowel pins 16 fitted into sockets of predetermined depth. Obviously the length of the dowel pin may be made to determine accurately the spacing between the bar elements 15 and thus the width of the slot provided for the escape of liquids.

The form of slot preferably corresponds in a general way to that disclosed in my copending application, Serial No. 505,253, filed December 29, 1930 and issued on Oct. 25, 1932 as Patent No. 1,884,212.

It will be noted that the bars 15 are not rectangular in cross section but have correspondingly beveled side faces 17 and 18 inclined rearwardly with reference to the direction of piston advance, which is indicated by the arrows in the various views where such an indication is possible. The angle between each side face 18 of a given bar 15 and the inner face 19 of said bar is relatively acute, while the angle between side face 17 and the inner face 19 is rounded as shown at 20 in Figure 3. Thus, any bark or paper stock or other material subject to the action of the press which tends to

exude from the cylinder into the escape slot provided between successive bars tends to be forced by the curvature of surface 20 back into the cylinder when subjected to the action of the advancing piston. The juncture of surface 18 with the outer face of each bar is relieved, as shown at 21 in Figure 3, so that any material which actually passes into the slot out of the range of the piston is cleared and will discharge freely from the slot with no tendency to wedge therein.

The annular bar shown in Figure 4 preferably corresponds in cross section to the form of bar indicated in Figure 3, the only difference between the bars lying in the rectilinear form of the one and the annular form of the other. Where the bars are rectilinear it is preferred to interlock bars at contiguous sides of the cylinder by rabbeting upper and lower bars, as shown at 22 in Figure 2.

The Figure 5 construction differs from that just disclosed in that the adjacent bars are not adjustable except through the use of shims. No dowels are necessary, each bar being provided with shoulders at 24 directly abutting the next bar of the series, as clearly shown in Figure 5. The arrow is placed at the side of the bars across which the piston moves, and it will be noted that the channel 25 integrally formed in the side of each bar will be completed when the next successive bar is placed in its proper position. The complete channel increases rapidly in cross section from the narrow slot occasioned by the intersection of the milled channel with the inner face 19 of the bar and affords ready escape for any material which enters the slot.

As above noted, all milling or machining operations conducted on cylinder elements embodying this invention involve only the simple machining of exterior surfaces. There are no holes or slots in integral pieces of metal which have to be drilled, milled, or machined.

It will be understood that the exact form of retaining frame is immaterial in the broader aspects of this invention, as is also the exact form and disposition of the cylinder elements. In the construction shown in Figures 1 and 2 the frame comprises open grids. In the construction shown in Figure 4 I-beams 27 confine the annular cylinder bars 15 between frame elements 28 through which the I-beams pass.

I claim:

1. A press cylinder comprising a longitudinal series of transversely extending cylinder bars having portions of their adjacent faces in spaced relation to provide slots and their inner faces aligned to comprise a cylinder in which a piston is operable and means interposed between said bars operative to maintain said spacing, the side face of each bar presented toward the advancing piston being curvilinearly merged with the inner face of the bar at said portions.

2. A cylinder comprising a plurality of wall elements, means including a dowel pin of predetermined length partially embedded in and spacing portions of said elements to provide liquid escape slots therebetween, and means holding the spaced elements in alignment in the form of a cylinder.

3. A press cylinder comprising a set of corresponding bars having aligned inner faces and proximate spaced side face portions, means including dowel pins of predetermined length interchangeably positioned between said bars determinative of the spacing between said portions, and means for maintaining said bars in alignment in the operative form of a cylinder.

4. As a new article of manufacture, a bar adapted to be assembled with other parts to comprise a press cylinder, said bar having a smooth inner face, and side faces inclined rearwardly relatively to the direction of advance of a piston in said cylinder, one of said faces having portions merged curvilinearly with said inner face.

5. As a new article of manufacture, a press cylinder bar adapted to be assembled with like bars to form a press cylinder, said bar having a smooth inner face, a side face having portions inclined with reference to the inner face and merging curvilinearly therewith, and sockets in its side faces adapted to receive spacing means.

6. A press cylinder comprising a frame, upper and lower longitudinal series of bars in said frame individually extending transversely thereof, a lateral series of like bars positioned between said upper and lower series of bars and other bars positioned between said upper and lower series and defining a cylinder between said bars.

7. A press cylinder comprising a frame, upper and lower longitudinal series of bars in said frame individually extending transversely thereof, a lateral plurality of series of like bars positioned between said upper and lower series of bars and defining a cylinder between said bars, certain of said bars having spaced cut-away portions providing liquid escape slots.

8. In a press cylinder, the combination with a frame of upper, lower and lateral series of bars assembled in said frame to comprise a cylinder, and dowel pins interposed between adjacent bars aligning and spacing said bars, whereby to provide liquid escape slots from the cylinder between the bars.

9. A press cylinder comprising a frame, longitudinal series in said frame of transversely extending bars arranged at the sides of said frame to comprise a cylinder, and means spacing certain contiguous bars of said series to provide liquid escape slots the form of which is determined by the shape of the component bars of the series, the sides of said bars being rearwardly inclined with respect to the direction of advance of the press piston and being curvilinearly merged with the inner faces of the bars.

10. A press cylinder comprising a frame, upper and lower series of bars in said frame having their ends provided with aligned rabbeted portions, lateral series of bars in said frame having their upper and lower ends engaged in the rabbeted portions of the bars of the first mentioned series, certain of said bars being provided with means spacing portions of their adjacent margins to provide liquid escape openings.

11. A press cylinder comprising a series of axially aligned annuli means interposed between said annuli operative to space them, the adjacent faces of said annuli being inclined so that the openings therebetween resulting from said spacing are rearwardly inclined with relation to the direction of advance of a piston movable in said cylinder.

12. A press cylinder comprising annular cylinder elements mounted in a frame, and means spacing side portions of said elements, whereby to provide escape slots therebetween, said elements being so shaped as to incline said slots

rearwardly, relatively to the direction of advance of a piston movable in said cylinder.

13. A press cylinder comprising a series of cylinder bars having mutually abutting portions, and intermediate relieved portions, whereby to provide a predetermined space for the escape of liquids, said relieved portions being shaped to incline said space rearwardly in relation to the direction of advance of a piston movable in said cylinder.

14. A press cylinder comprising a longitudinal series of transversely extending cylinder bars having portions of their adjacent faces in spaced relation to provide slots, and means interposed between said bars operative to maintain said spacing, both of said face portions being inclined rearwardly relatively to the direction of advance of said piston, and means for maintaining said bars in alignment in the operative form of a cylinder.

15. As a new article of manufacture, a press cylinder bar adapted to be assembled with like bars to form a press cylinder, said bar having a smooth inner face, and a side face inclined rearwardly relatively to the direction of advance of a piston in said cylinder.

MICHAEL J. POWER.