March 29, 1932. R. T. LANG 1,851,191

PULP SCREW PRESS

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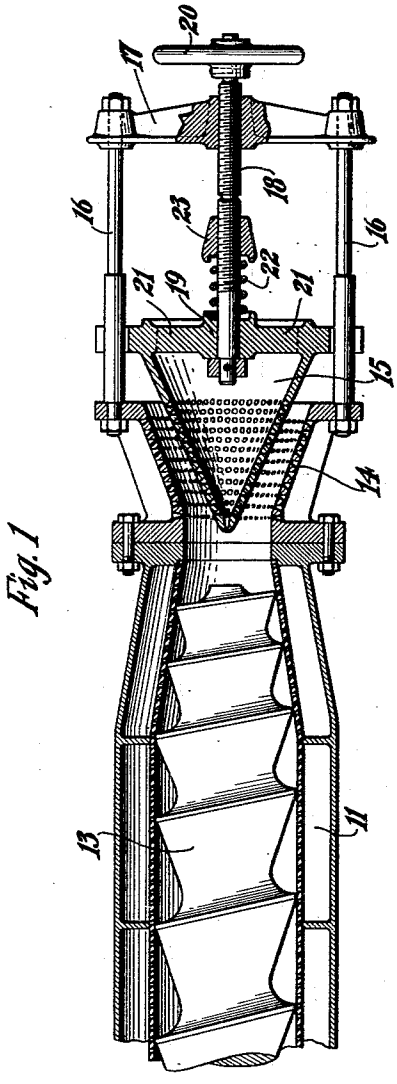



Fig. 1

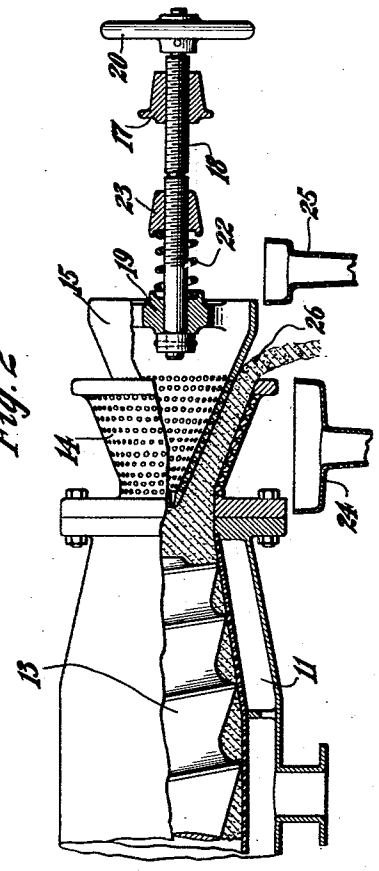



Fig. 2

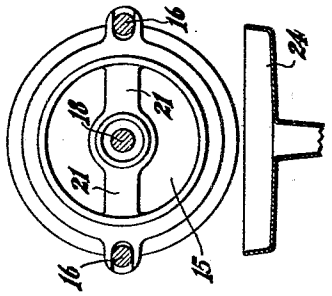



Fig. 3

INVENTOR
Richard T. Lang.
BY C. P. Goepel
ATTORNEY

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Fig. 4

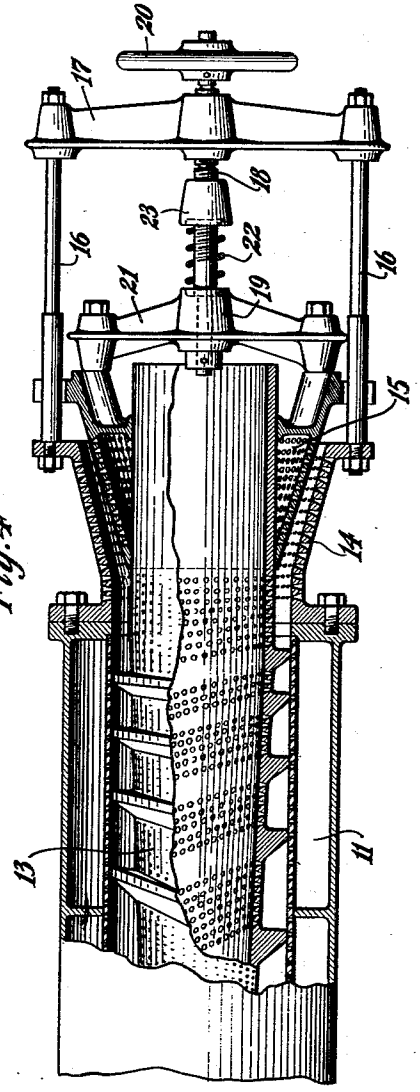
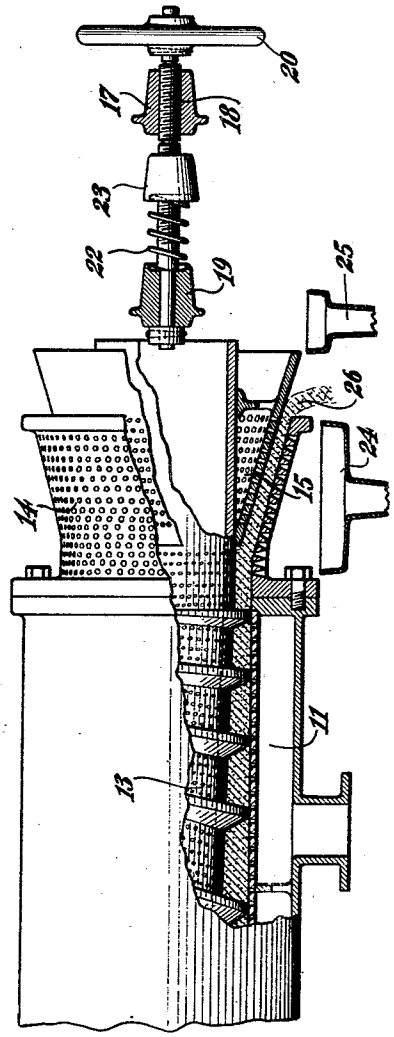



Fig. 5




INVENTOR
Richard T. Lang,
BY C. P. Goepel
ATTORNEY

Patented Mar. 29, 1932 1,851,191

# UNITED STATES PATENT OFFICE

RICHARD T. LANG, OF WEEHAWKEN, NEW JERSEY, ASSIGNOR TO AMERICAN VOITH CONTACT COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

## PULP SCREW PRESS

Application filed February 11, 1927. Serial No. 167,414.

This invention relates to screw presses for removing liquids from pulp or the like especially for use in paper and pulp mills, and it has for its object to improve the construction and the operation of such presses so as to obtain a greater and more uniform dryness of the whole mass of pulp when it leaves the machine.

According to the present invention I devised a new and improved screw press in combination with a particularly shaped outlet spout and a plug cooperating with the latter in such a way that the pulp passes from the screw room into a space of larger cross sectional area, whereafter the pulp is forced through a narrow passage with continuously decreasing cross sectional area. It is a part of my invention to form this passage by a conically enlarged outlet spout and a conical plug within the latter, both parts, the spout and the plug, being provided with perforations which allow the liquid contained in the pulp to drain off from both sides through these perforations.

The invention consists further in providing such pulp treating apparatus, in which the mass of the pulp, after having left the screw room proper for the outlet compartment or spout, is more or less broken up on account of the change in area and is then formed into a relatively thin layer between the inner face of the outlet spout and the plug. This forming of the pulp into a thin layer and subjecting the latter to a second pressing out has the advantage of allowing a very easy removal of the liquid from both sides of the layer, thus insuring a uniform dryness of the pulp over its entire mass when it leaves the screw press.

It is an essential feature in my invention that by my new method and apparatus for pressing the pulp out into the form of a thin layer and expelling thereby the liquid to both sides of this layer, a very high and uniform dryness of the pulp over its entire mass may be obtained even with a screw press having a solid screw of large diameter and deep threads. With the screw having these improvements of a conical and perforated outlet spout and plug a much higher percentage of moisture can be removed from the pulp than with the present type of not perforated outlet spout and plug.

In the drawings I have shown two preferred embodiments for carrying out the invention, whereby the same or similar parts in the different figures are marked by the same numbers of reference.

Figs. 1 and 2 represent a horizontal and a vertical longitudinal section respectively through the outlet end of a first embodiment of my new and improved screw press which is provided with solid screw;

Fig. 3 is a side view of the outlet looking towards the press, from the right side of Fig. 2;

Figs. 4 and 5 represent the same sections as Figs. 1 and 2 but through a modified construction, in which the screw press is provided with a hollow screw.

In both examples the screw press casing 11 forms the press room, and the perforated shell 12 separates the press room from the screw room, which contains the screw 13. To the front end of the screw press casing is fixed the perforated outlet spout 14 of preferably conical shape, and a perforated plug 15 which is rather sharp pointed, extends with its point into the interior of the outlet spout, leaving however in the spout a certain amount of free space.

In the zone of the point of the plug the left free cross section is larger than the free cross section at the zone of the last screw thread, and then the free angular space decreases in its area towards the outlet of the spout. The guiding spindles 16 fixed to the end of the spout are connected by means of the cross head 17, through the threaded center hub of which passes the adjusting spindle 18 attached to a hub 19 rigid with the plug 15. A handwheel 20 serves for moving the plug towards or away from the outlet spout, thereby decreasing or increasing the area of the angular ring space between the outlet spout and the plug, and thereby controlling the pressure in the screw chamber and in the outlet spout. The arms 21 hold cross head 19 fastened to the plug 15 of the screw press.

In order to make the mounting of the plug

yieldable, the spindle 18 may be guided only in the hub 19 and a spiral spring 22 resting at one side against hub 19 and at the other side against the threaded spring cup or nut 23 which, when turned, moves towards or away from the hub 19 or the cross head 21, thereby increasing or decreasing the pressure of the spring exercised on the plug 15. The gutters 24 and 25 serve for collecting the liquid which drains off through the perforations in the outlet spout 14 or the plug 15 respectively, whilst the dewatered pulp leaves the press at 26.

Instead of providing the gutter 24 the outlet spout can be shaped in such a way so as to form a chamber in which the liquid pressed out collects, and which chamber connects to the discharge pipes in the press room.

In Figs. 4 and 5 the construction is similar except that the screw 13 is hollow and perforated and the end thereof projects out of the spout 14; and the plug encircles this projecting end.

Likewise the shape of the outlet spout and of the plug can be varied without departing from the spirit of my invention.

I claim:

A press of the character described comprising a perforated tube, a screw therein, said tube having a discharge end provided with an outwardly flaring perforated wall, a plug movable within said discharge end of the tube and also having a perforated wall opposed to said perforated wall of the discharge end of the tube and cooperating therewith to cause liquid to be exuded from the material through the perforations of each of said walls, and means for adjusting said plug mounted upon the perforated end of the tube by spaced supports constituting guides for said plug.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

RICHARD T. LANG.