

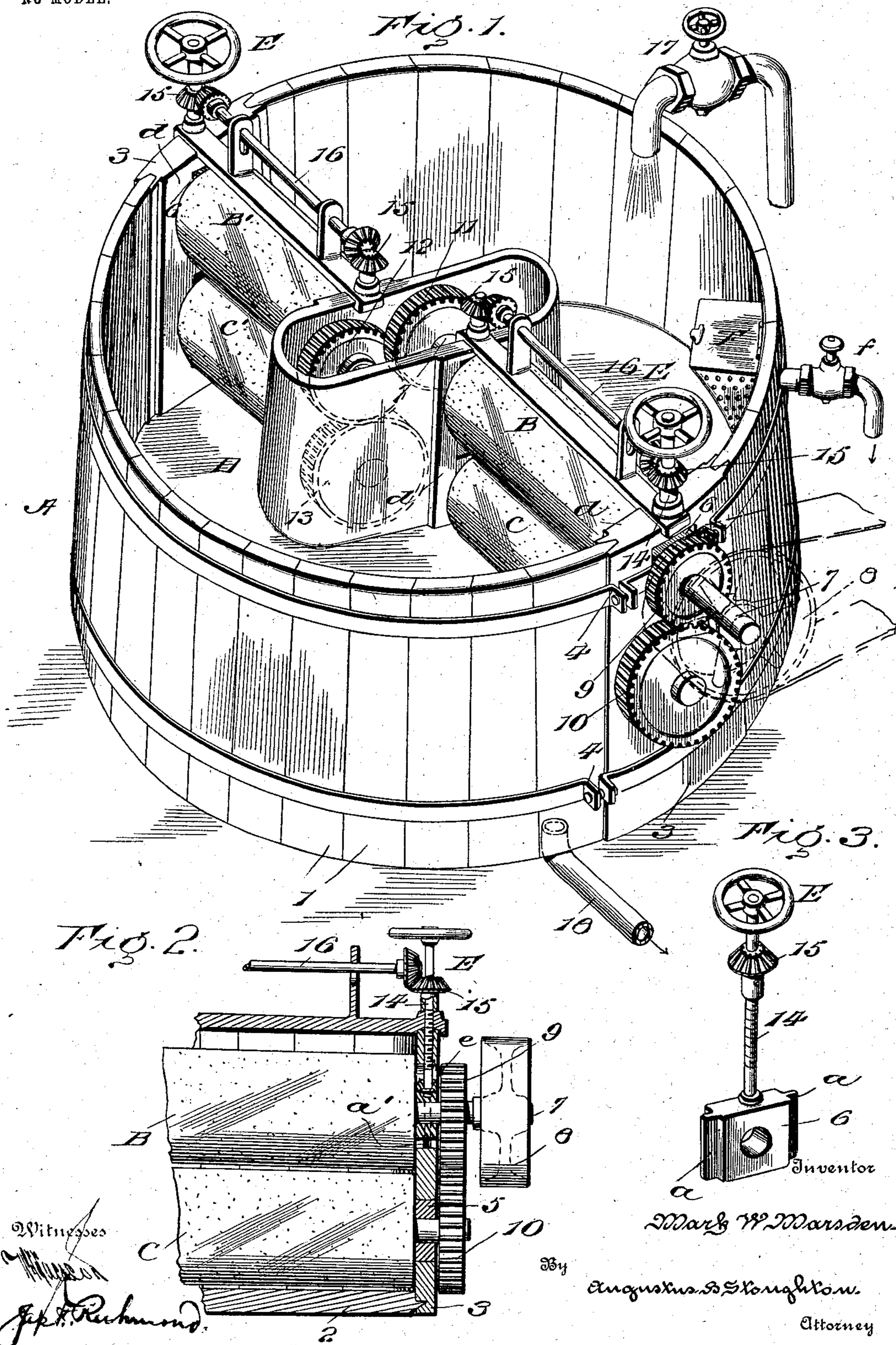
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PATENTED FEB. 24, 1903.

M. W. MARSDEN.  
PULP MACHINE.

APPLICATION FILED MAY 5, 1902.

NO MODEL.



# UNITED STATES PATENT OFFICE.

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## PULP-MACHINE.

SPECIFICATION forming part of Letters Patent No. 721,378, dated February 24, 1903.

Application filed May 5, 1902. Serial No. 105,945. (No model.)

*To all whom it may concern:*

Be it known that I, MARK W. MARSDEN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pulp-Machines, of which the following is a specification.

One object of the invention is to provide a machine for pulping or disintegrating fibrous materials wherein the pulping operation shall be a practically continuous one and shall be accomplished in a speedy and efficient manner.

Another object is to render the machine available as a pulp-washer.

The machine comprises a vat or tank and duplicate sets or pairs of compression-rolls arranged within the tank at opposite sides thereof. The rolls of each set are superposed one above the other and are arranged to be driven at different speeds through the intervention of suitable gearing. The rolls are formed with smooth cylindrical faces, and the upper roll of each set is movable with respect to its mate, so that an adjustment can be effected to accommodate the rolls to coarse or fine cut material. The action of the rolls upon the fibrous material is a peculiar rubbing action, as contradistinguished from that of a beating-engine, so that the fibers are obtained in a long good strong condition. The movement is practically a synchronous one, motion being imparted from one set of rolls to the other, so that an even and continuous circulation of the material is obtained, thereby insuring a uniform product. The head-blocks in which the rolls are journaled may be tongue- and -grooved or otherwise fitted directly in the sides of the vat and are provided with flat inner faces against which the ends of the rolls snugly fit. The mid-feather or partition which incases the intermediate gearing is likewise provided with flat faces flush with the abutting ends of the rolls, so that the fibrous material must of necessity pass through and be acted upon by the rolls.

The machine is equipped with suitable inlet and discharge passages and also with a sieve or strainer with its complemental outlet to adapt it to pulp-washing purposes.

The foregoing and other novel features will be referred to more in detail in the following

description, taken in connection with the accompanying drawings, forming a part hereof, wherein—

Figure 1 is a perspective view of a pulp-machine embodying features of the invention. Fig. 2 is a view principally in section, illustrating the mechanism for adjusting the upper rolls. Fig. 3 is a detail of the sliding journal-block and handpiece for raising and lowering same.

In the example illustrated the vat is circular, but may be elliptical or of other appropriate form, and as a matter of convenience may be made up of wood side pieces or staves 1 and bottom 2.

3 represents metal head-blocks incorporated in the sides of the vat—for instance, as by means of tongues and grooves—and 4 represents clamping hoops or bands, which serve to secure the whole.

B B' C C' are compression-rolls having smooth cylindrical faces, preferably of rubber. The rolls are superposed one above the other and are arranged in pairs, as shown. The bottom rolls C C' are journaled in stationary bearings 5 in the head-blocks, and the axles of the upper rolls B B' find their bearings in journal-blocks 6, which are shiftable vertically in the head-blocks, so as to render said rolls movable in respect to the bottom rolls, and thus accommodate the machine to various grades of work. The respective rolls are afforded similar bearings at their opposite ends in the mid-feather or casing D. The latter besides coöperating with the head-blocks to support the rolls also surrounds and protects the intermediate gearing for driving the follower or second set of rolls B' C'. The shaft or axle 7 of the roll B constitutes the drive-shaft and is provided with a drive-wheel 8 and with a gear-wheel 9, which meshes with a larger gear-wheel 10 on the shaft of bottom roll C. By this arrangement the upper roll is made to rotate at a much higher speed than that of the lower roll. For example, the upper roll may be required to make eighty revolutions per minute to fifty revolutions of the lower roll. It is obvious, however, that the arrangement may be reversed, if desired, and the lower roll made the high-speed roll. Motion is imparted to rolls B' C' through the intervening gears 11 12 13, which are selected

so that the different speeds of said rolls correspond with those of the rolls B C. The means for adjusting the upper rolls is the same for both sets of rolls, and one description will suffice.

As clearly shown in Figs. 2 and 3, the journal-block 6 is provided with tenons *a*, which are arranged to slide in ways *a'* in the head-block.

E is a handpiece which affords a convenient means of adjusting the upper rolls. The handpiece E includes a spindle 14, which is screw-threaded to engage corresponding screw-threads in the head-block and is operatively connected with the journal-block 6, as by swivel connection *e*. It will be apparent that by turning the handpiece in one or the other direction it can be made to raise or lower the upper roll through the instrumentality of sliding block 6 and without stopping the roll. Both ends of the roll are simultaneously raised or lowered through the medium of connections 15 and 16.

The head-blocks 3 and the casing D are provided with flat surfaces *d*, against which the ends of the rolls snugly fit, so that the fibrous material preferably digested in an excess of water is compelled to successively pass through and be acted upon by each set of rolls, thereby maintaining a constant circulation of the material and insuring a uniform product. The fibers are obtained in a long good strong condition, due to the peculiar rubbing action of the smooth-faced rolls, as opposed to the unsatisfactory product of a beating action.

17 is a valved feed-water pipe, and 18 a discharge-pipe.

The machine is rendered available as a pulp-washer by the provision of a strainer F and its complemental discharge-pipe *f*.

It will be obvious to those skilled in the art to which the invention appertains that modifications may be made in details without departing from the spirit or scope of the invention. Hence I do not limit myself to the precise construction hereinabove described, and illustrated in the accompanying drawings; but,

Having described the nature and objects of the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A pulp-machine comprising compression-rolls of which one is arranged to be driven faster than the other, and a tank surrounding said rolls, the relation between the rolls and tank being such that the pulp material is made to pass and repass between the rolls, whereby it is continuously subjected to the rubbing or compressing action of the same, substantially as specified.

2. A pulp-machine comprising compression-rolls having smooth working faces, one of said rolls being arranged to be driven faster than the other, and a tank surrounding said rolls, the relation between the rolls and tank

being such that the pulp material is made to pass and repass between the rolls, whereby it is continuously subjected to the rubbing or compressing action of the same, substantially as specified.

3. A pulp-machine comprising compression-rolls of which one is arranged to be driven faster than the other, and one of said rolls being adjustable in respect to the other, and a tank surrounding said rolls, the relation between the rolls and tank being such that the pulp material is made to pass and repass between the rolls, whereby it is continuously subjected to the rubbing or compressing action of the same, substantially as specified.

4. A pulp-machine comprising superposed compression-rolls of which one is arranged to be driven faster than the other, and a tank surrounding said rolls, the relation between the rolls and tank being such that the pulp material is made to pass and repass between the rolls, whereby it is continuously subjected to the rubbing or compressing action of the same, substantially as specified.

5. A pulp-machine comprising superposed coincident compression-rolls of which one is arranged to be driven faster than the other, and one of said rolls being adjustable in respect to the other, and a tank surrounding said rolls, the relation between the rolls and tank being such that the pulp material is made to pass and repass between the rolls, whereby it is continuously subjected to the rubbing or compressing action of the same, substantially as specified.

6. A pulp-machine comprising superposed cylindrical rolls of which one is arranged to be driven faster than the other, and of which one is adjustable in respect to the other, and a tank surrounding said rolls, the relation between the rolls and tank being such that the pulp material is made to pass and repass between the rolls, whereby it is continuously subjected to the rubbing or compressing action of the rolls, substantially as specified.

7. A pulp-machine comprising differential-speed compression-rolls superposed one above the other, one of said rolls being adjustable in respect to the other, means for effecting such adjustment without stopping the machine, and a tank surrounding said rolls, the relation between the rolls and tank being such that the pulp material is made to pass and repass between the rolls, whereby it is continuously subjected to the rubbing or compressing action of the rolls, substantially as specified.

8. A pulp-machine comprising differential-speed rolls having coincident smooth working faces, one of said rolls being adjustable in respect to the other, means for effecting such adjustment without stopping the machine, a handpiece for controlling said means, and a tank surrounding the rolls, the relation between the rolls and tank being such that the pulp material is made to pass and repass be-

tween the rolls, whereby it is continuously subjected to the rubbing or compressing action of the rolls, substantially as described.

9. A pulp-machine comprising superposed differential-speed rolls having cooperating smooth working faces, one of said rolls being adjustable in respect to the other, means for effecting such adjustment without stopping the machine, a handpiece for controlling said means, and a tank surrounding the rolls, the relation between the rolls and tank being such that the pulp material is made to pass and repass between the rolls, whereby it is continuously subjected to the rubbing or compressing action of the rolls, substantially as specified.

10. A pulp-machine comprising compression-rolls having their working faces sheathed with rubber, and a tank surrounding said rolls, the relation between the rolls and tank being such that the pulp material is made to pass and repass between the rolls, whereby it is continuously subjected to the rubbing or compressing action of the same, substantially as specified.

11. A pulp-machine comprising superposed coincident compression-rolls having their opposed faces sheathed with rubber, one of said rolls being adjustable in respect to the other, and a tank surrounding said rolls, the relation between the rolls and tank being such that the pulp material is made to pass and repass between the rolls, whereby it is continuously subjected to the rubbing or compressing action of the rolls, substantially as specified.

12. A convertible pulp making and washing machine comprising compression-rolls, a tank surrounding said rolls, a valved feed-water inlet, and a strainer and its complementary outlet, substantially as specified.

13. A pulp-machine comprising a tank for the pulp material, head-blocks fitted in the sides of the tank and having flat inner faces, and cylindrical compression-rolls journaled in said blocks and having their ends flush with said faces, whereby the pulp material is made to pass and repass between the rolls and be continuously subjected to the rubbing or compressing action of the latter, substantially as specified.

14. A pulp-machine comprising a tank for the pulp material, head-blocks fitted in the sides of the tank and having flat inner faces, and cylindrical compression-rolls, with their opposed faces sheathed with rubber, journaled in said blocks and having their ends flush with said faces, whereby the pulp material is made to pass and repass between the rolls and be continuously subjected to the rubbing or compressing action of the latter, substantially as specified.

15. A pulp-machine comprising sheathed cylindrical compression-rolls superposed one above the other and arranged to be driven at different speeds and whereof one is adjustable in respect to the other, means for effecting such adjustment without stopping the machine, a handpiece controlling said means, and a tank surrounding the rolls, the relation between the rolls and tank being such that the pulp material is made to pass and repass between the rolls, whereby it is continuously subjected to the rubbing or compressing action of the rolls, substantially as specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

MARK W. MARSDEN.

Witnesses:

W. J. JACKSON,  
J. D. RICHMOND.