H. HOLLINGSWORTH.

Paper-Pulp Washers.

No. 210,853. Patented Dec. 17, 1878.

Fig. 1.

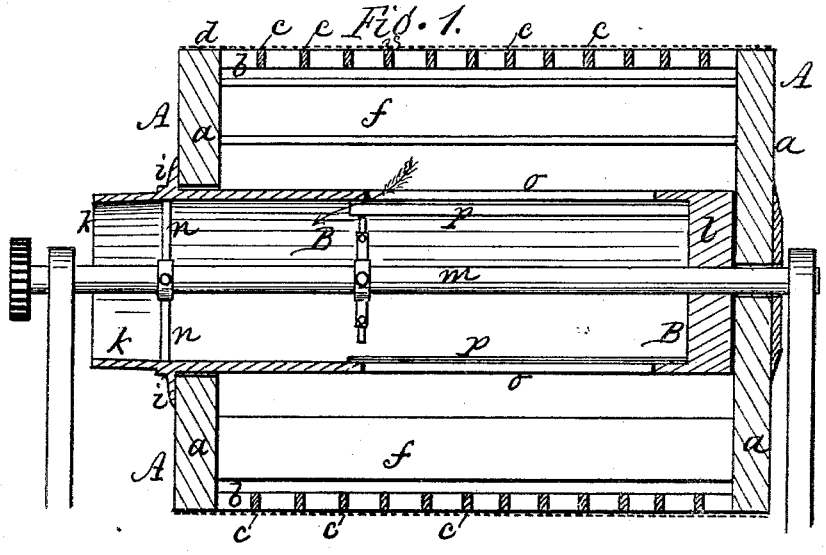


Fig. 2.

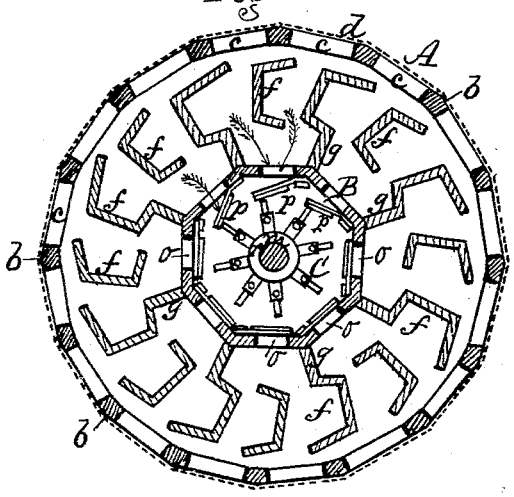


Fig. 3.

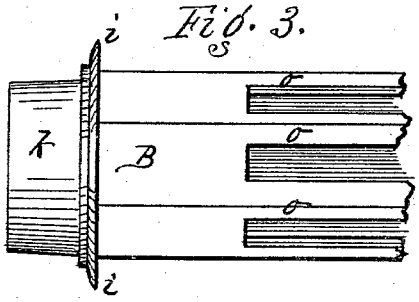


Fig. 4.

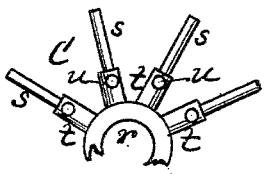


Fig. 6.

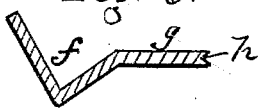
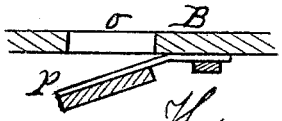


Fig. 5.



Attest.

John C. Purse.

R. E. White

Inventor:

Henry Hollingsworth,

per R. F. Osgood,

Atty.

UNITED STATES PATENT OFFICE.

HENRY HOLLINGSWORTH, OF DANSVILLE, NEW YORK.

IMPROVEMENT IN PAPER-PULP WASHERS.

Specification forming part of Letters Patent No. **210,853,** dated December 17, 1878; application filed November 30, 1878.

To all whom it may concern:

Be it known that I, HENRY HOLLINGSWORTH, of Dansville, in the county of Livingston and State of New York, have invented a certain new and useful Improvement in Paper-Pulp Washers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of the machine. Fig. 2 is a cross-section of the same. Fig. 3 is a plan of one end of the discharging-chamber. Fig. 4 is a view of a portion of the gage for regulating the opening of the valves. Fig. 5 is a section of one of the valves. Fig. 6 is a modification of one of the buckets.

My improvement relates to apparatus for making paper-stock; and consists, essentially, of the combination of an exterior dipping-cylinder provided with buckets and an interior discharge-cylinder provided with valves, the whole so arranged that the water which is raised by the buckets is passed through the valves and discharged through the end of the interior cylinder, all as hereinafter described.

A is the exterior dipping-cylinder, and B the interior discharge-cylinder. The dipping-cylinder consists of two heads, *a a*, united by longitudinal ribs *b b'*, which, in turn, are connected by transverse strips *c c*, in a well-known manner. The whole is covered on the outside by wire-cloth *d*, as usual. *f f* are the buckets, of which any desired number may be used, sixteen being shown in the drawing. These buckets may be made of the square form shown in Fig. 2, or of the V form shown in Fig. 6, or of such other form as is best adapted to raise the water. Every alternate bucket is provided with a partition, *g*, which extends in radially till it strikes the angles of the interior chamber, thereby making an inclosed space between said buckets. The edges of the partitions are preferably grooved, as shown at *h*, Fig. 6, to receive the angles of the interior chamber, and thereby prevent leakage. The intermediate buckets have no partitions, but empty into the spaces between the alternate buckets. The outer cylinder, as it revolves, dips up the water and discharges it into these spaces. The outer edges of the alternate buckets are made longer than those of the intermediate ones, as shown, so that as the other buckets empty the long ones will not overrun.

The interior discharge-cylinder is fitted into an opening in the exterior cylinder, but is made removable, so that the valves and other parts may be readily repaired. It is made of iron, and has a flange, *i*, which abuts against the end of the outside cylinder, to which it is screwed. Outside this flange is a horizontal circular collar, *k*, which is a continuation of the interior of the cylinder, and serves as a spout to discharge the water over the engine. The opposite or inner end of the cylinder is made solid, as shown at *l*, and the shaft *m* passes through the same, being sustained at the outer end by spokes or arms *n n*, resting inside the collar. Both the exterior and interior cylinders are preferably made of polygonal form, as shown. In the squares forming the perimeter of the inside cylinder are made ports *o o*, opening from the spaces between the buckets of the outside cylinder to the interior of the inside cylinder, and covering the ports on the inside of the latter are valves *p p*. As the cylinder revolves the valves at the top open automatically, and allow the water from the spaces between the buckets to flow through the ports into the inside cylinder, and the valves at the bottom remain closed by reason of the weight of the water on them, so that the water that enters the inside cylinder is forced to flow outward through the open end of the same, which allows a free and unimpeded discharge. The ports and valves may be located at any point in the cylinder, and, if desired, two sets of ports and valves may be used; or they may be located toward the outer end, and the inner end may be made closed and of cone form, to facilitate the throwing of the water outward. The valves are preferably made of strips of rubber, having sheet-metal backs, to give them stiffness and strength and make them close properly.

In order to regulate the opening of the valves, a gage, C, is employed, consisting of a hub, *r*, which slides on the shaft to a proper position beneath the valves and spokes or arms *s s*, resting in radial sockets *t t*, and made adjustable by sliding out or in, and se-

cured in any position by set-screws *u u*. These arms serve as stops to the valves which strike thereon. One of these gages may be used at each end of the valves. By their use the valves may be set to open more or less, and therefore be adapted to the flow of the water without too much movement. The inner head of the inside cylinder may also be notched out to receive the ends of the valve, and prevent too great motion of the latter in opening.

A pulp-washer constructed, as above described, with an interior discharge-cylinder is more effective than the old form of washer, in which the water is discharged by the buckets alone.

What I claim herein as new is—

1. In a paper-pulp washer, the combination of the exterior cylinder, A, provided with the buckets *f f*, and the open-ended interior cylinder, B, provided with the ports *o o* and automatic valves *p p*, the buckets raising the water and discharging the same through the valves, and the interior cylinder carrying the water off through the open end, as shown and described, and for the purpose specified.

2. In a paper-pulp washer, the combination, with the cylinder B, provided with the automatic valves *p p*, of the gage C, provided with extensible arms *s s*, as shown and described, and for the purpose specified.

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

HENRY HOLLINGSWORTH.

Witnesses:

CHRISTIAN GILBERT,

JOHN GEORGE GROSS.