J. S. SMART.

PAPER-PULP SEPARATOR.

No. 182,137. Patented Sept. 12, 1876.

Fig: 1.

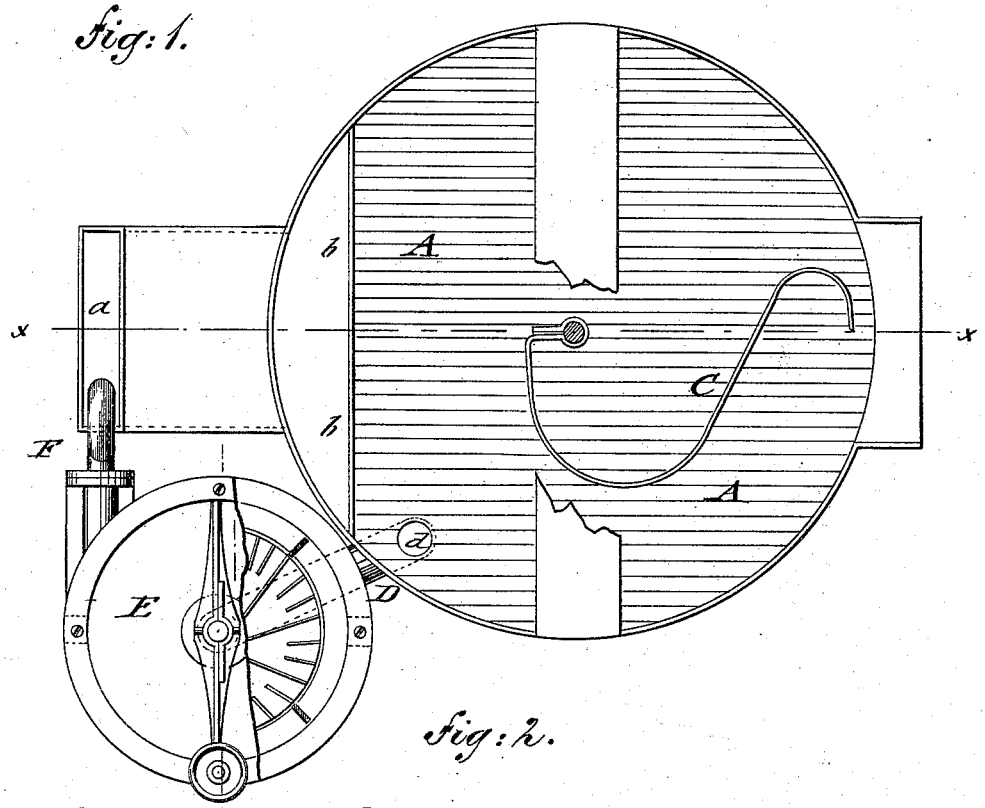
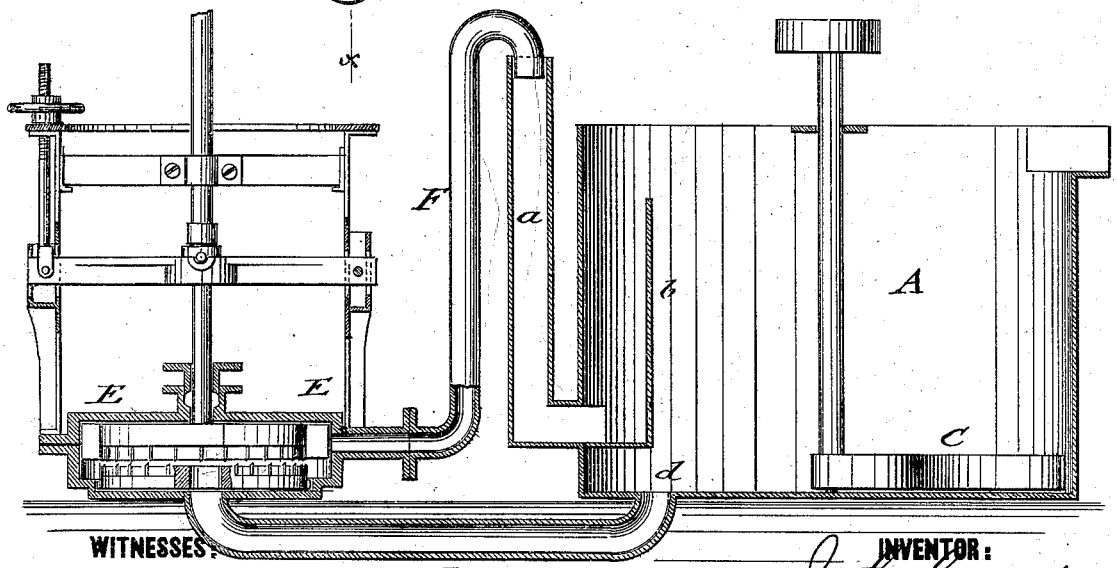


Fig: 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOSEPH S. SMART, OF TROY, NEW YORK.

IMPROVEMENT IN PAPER-PULP SEPARATORS.

Specification forming part of Letters Patent No. **182,137**, dated September 12, 1876; application filed May 22, 1876.

To all whom it may concern:

Be it known that I, JOSEPH S. SMART, of Troy, in the county of Rensselaer and State of New York, have invented a new and Improved Paper-Pulp Separator, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a top view, with parts broken off, of my improved paper-pulp separator; and Fig. 2 is a vertical longitudinal section of the same on the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of my invention is to utilize the coarse and heavy stock that is collected at the bottom of the settling-vats in the manufacture of paper, so as to draw the same off to regrind, and conduct it back to the vat for use.

The invention consists of a settling-vat with one or more revolving bottom arms, that convey the heavy particles of pulp to an outlet, and, by a connecting-pipe, to a grinding-engine, that forces the ground particles through a goose-neck pipe back into the vat.

In the drawing, A represents the usual settling-vat, to which the pulp is supplied in the customary manner by a stuff pump through an outer casing, *a*, and interior partition *b*.

The pulp is mixed in the vat or separator A with a sufficient quantity of water, so that the fine pulp passes out to the paper-machine, while the heavier and coarser stock settles to the bottom.

Hitherto this stock had to be drawn off as waste; but with my separator the same is conducted off for utilization by means of one or more curved arms, C, of suitable shape, that are attached to a central revolving shaft near the bottom of the vat, the same being so constructed and slowly revolved that the heavy particles of stock are conveyed to an outlet, *d*, from which it is passed, by the pressure of the column of pulp, through a bottom pipe, D, to a grinding-engine, E, where it is ground up fine enough to be held suspended in the water of the vat, and then passed up through a goose-neck pipe, F, into the casing *a*, to be conveyed into the vat, and pass with the fine pulp to the paper-machine.

The grinding-engine E is made of special construction, so as to combine a pump-action with the grinding-action.

The knives of the revolving disks are filled with wood in such a manner as to bring all the pulp in direct contact with the knives. The upper disk is so suspended as to be raised from or lowered to the bed-plate, obviating the necessity of the shaft running through the bed-plate and casing to a seat or step below, and leaving thereby the inlet-opening entirely free for the unobstructed entrance of the heavy pulp particles from the vat. The upper disk is provided with radial wings, that take up the ground-up particles and force it up the pipe F into the casing *a*, overcoming by their pump-action the height of the delivery-pipe above the level of the pulp in the vat.

The grinding-engine and pump combined form an important point of my invention, and I reserve myself the right to file a separate application for Letters Patent for the same.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

A grinding-engine, E, and separator A, connected by pipe D and outlet *d*, in combination with the partition *b*, pipe F, and casing *a*, and the curved revolving arms C, arranged on a central shaft of vat or separator, as and for the purpose specified.

JOSEPH S. SMART.

Witnesses:
PAUL GOEPEL,
ROBT. T. SMART.