(No Model.) 2 Sheets—Sheet 1.

I. & J. SMITH.

APPARATUS FOR SCOURING WOOL, &c.

No. 432,573. Patented July 22, 1890.

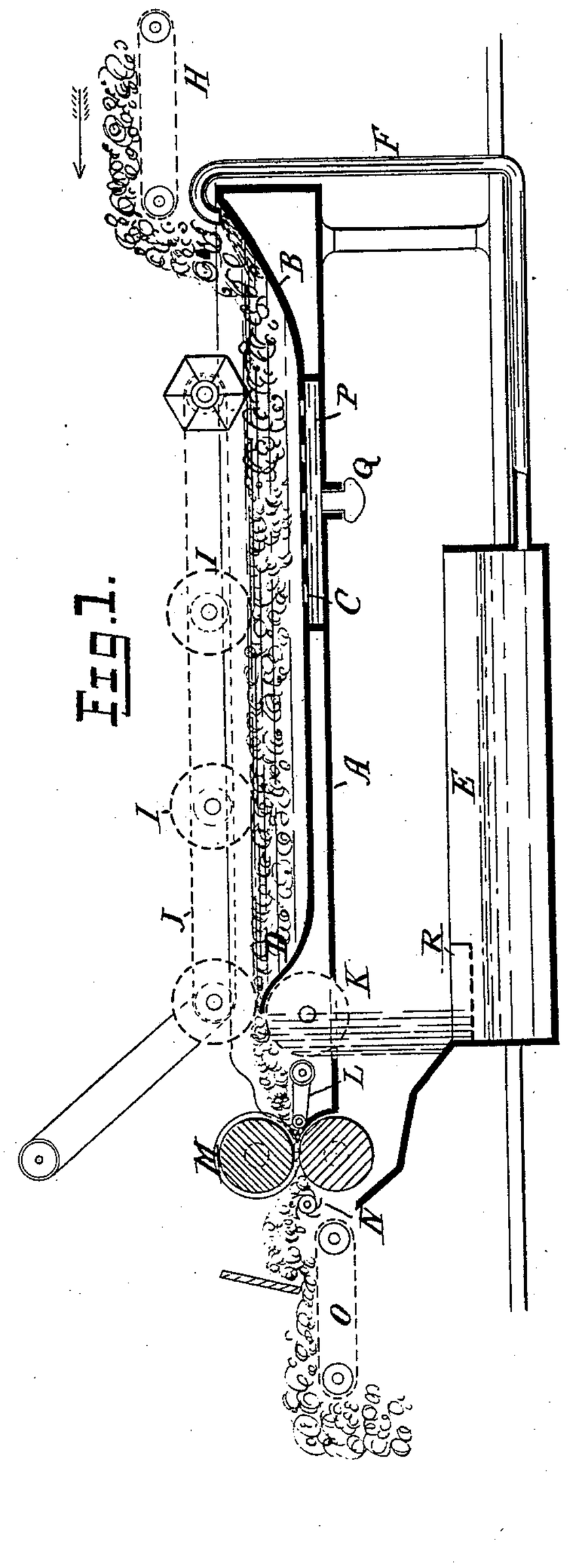

Fig. 1.

WITNESSES.

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Geo. L. Wheelock

INVENTORS

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by Herbert W. J. Jenner. Attorney

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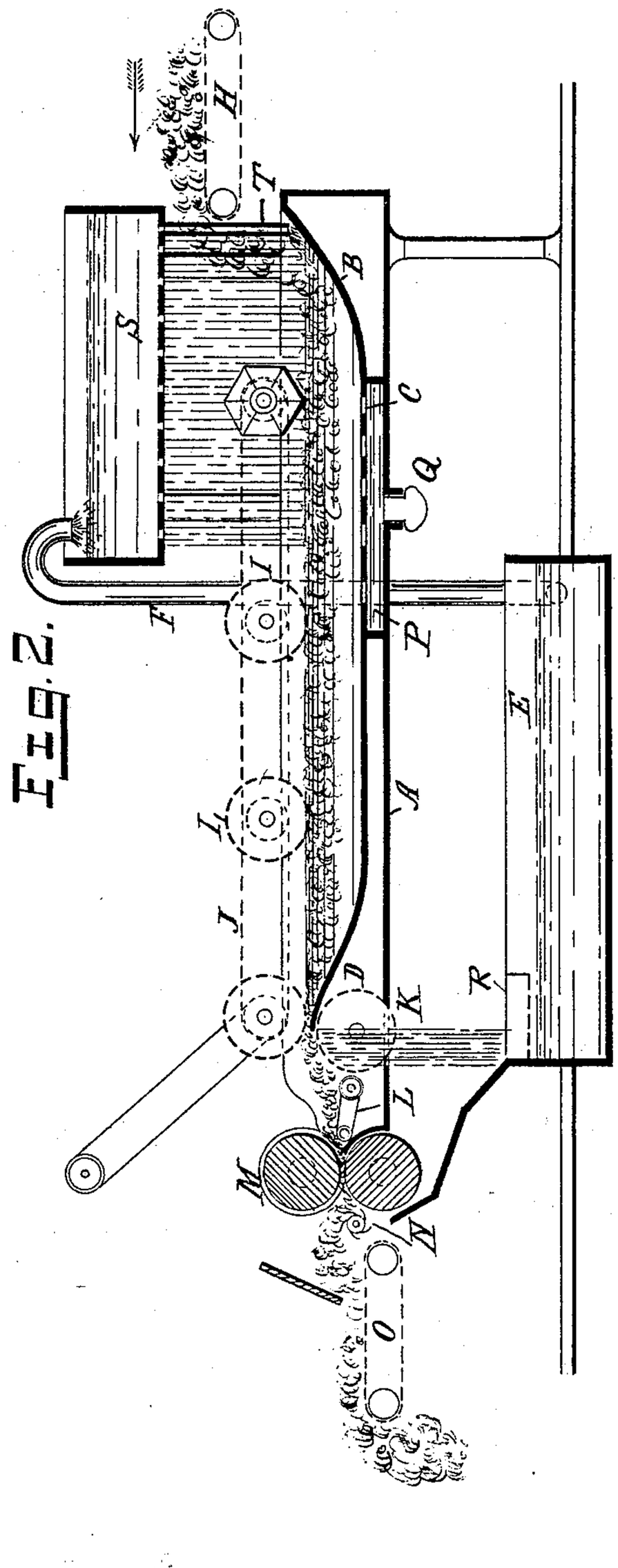

FIG. 2.

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UNITED STATES PATENT OFFICE.

ISAAC SMITH AND JOSEPH SMITH, OF HALIFAX, COUNTY OF YORK, ENGLAND.

APPARATUS FOR SCOURING WOOL, &c.

SPECIFICATION forming part of Letters Patent No. 432,573, dated July 22, 1890.

Application filed March 13, 1890. Serial No. 343,740. (No model.)

To all whom it may concern:

Be it known that we, ISAAC SMITH and JOSEPH SMITH, citizens of Great Britain, residing at Halifax, in the county of York, England, have invented certain new and useful Improvements in Apparatus for Washing or Scouring Wool and other Fibrous Substances, also for Mordanting, Dyeing, and Extracting Animal from Vegetable Fiber; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In constructing a machine according to our invention we employ any suitable form of vessel provided with a perforated false bottom. This perforated false bottom is elevated at the outlet end of the machine, the height of which practically determines the depth of liquor contained in the said vessel. The scouring, dyeing, or other liquor is introduced at the feeding end of the machine in a continuous stream, escaping or running over the bridge at the outlet end of the machine. The fiber to be treated is introduced into the vessel and floats on the top of the liquor; but a series of revolving rollers or perforated cylinders are employed for the purpose of immersing or dipping the fiber into the liquor as it is being carried along by the stream. Finally the fiber floats to the bridge, where it enters between one or more pairs of squeezing-rollers; but between the squeezing-rollers and the bridge there may be a revolving perforated cylinder or roller and an endless apron. The sediment from the fiber passes through the perforated false bottom, so as to keep the liquor pure, but the overflow-liquor falls into a vessel placed underneath the scouring-vessel, from whence it is removed by a pump and conducted back again to the feeding end of the machine, so that the liquor is used and reused.

We may employ, in combination with the above-mentioned apparatus, another vessel placed above the one described, having a perforated bottom through which the liquor may pass onto the fiber in the form of a spray or shower. In this case the liquor would be pumped back to the upper vessel.

In order that our invention may be better understood, we will now make reference to the accompanying sheets of drawings illustrative thereof, wherein—

Figure 1 represents a machine constructed according to our invention for washing and scouring wool and other fibers, also for mordanting, dyeing, and extracting animal from vegetable fiber. Fig. 2 is a longitudinal section through a machine similar to Fig. 1, with the vessel for delivering the liquor in a shower applied to it.

A represents a vessel provided with a false bottom B, preferably perforated at C. This false bottom B is elevated at the outlet end of the machine, as shown at D, and the scouring or other liquor which is being employed may be contained in the lower vessel E, from which it is pumped through the pipe F into the scouring or dyeing vessel A, or the liquor may be introduced into the said vessel from other sources. The quantity of liquor in the vessel A is determined by the height of the bridge D. It is therefore apparent that if a continuous stream of liquor is entering into the feeding end of the vessel A it will overflow at D at the same rate as it is entering at the feeding end, and as the false bottom B at the feeding end of the machine is made at an angle, as the drawings indicate, the liquor is caused to flow quickly across the vessel A, for purposes hereinafter described.

The fiber to be treated is first of all placed on the endless traveling apron H, from which it falls upon the liquor in the vessel A, the flowing stream of such liquor carrying the fiber floating on its surface to the opposite end of the machine; but in order to prevent the fiber traveling as quickly as the flowing stream revolving immersion-cylinders I are employed, driven by the endless chain or cord J, for the purpose of immersing or dipping the floating fiber into the liquor, thereby retarding or holding the fiber back; but meanwhile the flowing stream runs through and permeates the fiber, and, as the dipping-cylinders are perforated, the scouring or dyeing liquor forces its way through the perforations, escaping out of the opposite side of the dipping-cylinders, thereby removing the fiber which may be adhering to the periphery of the said perforated cylinders. When the

floating fiber reaches the bridge D, it is washed over by the liquor, which liquor escapes through another revolving perforated cylinder K, falling into the lower vessel E. The fiber afterward gets onto the endless traveling apron L, passes through the squeezing-rollers M, from which it is removed by small revolving roller N onto the endless apron O, after which it may fall into a suitable receptacle placed to receive it, or the said fiber may pass through a machine corresponding to that already described, for the purpose of being subjected to another like process. The sediment washed from the fiber will pass through the perforations C into the chamber P, and can be removed therefrom by removing the stopper Q. There is also a perforated dish R in the lower vessel to receive the impurities from the liquor falling therein.

In combination with the machine above described, and illustrated in Fig. 1, we may use an upper vessel S, (see Fig. 2,) having a perforated bottom, so that the liquor contained therein will escape through such perforations and fall in the form of a spray or shower upon the fiber floating on the top of the liquor in the vessel A. In this case the scouring or dyeing liquor falling into the lower vessel A is pumped back into the upper vessel S, instead of into the lower vessel, as illustrated and described with regard to Fig. 1, and in order to increase the impetus of the flowing stream one or more pipes T may be connected to the under side of the upper vessel E, so that in addition to the shower of liquor such liquor may pass down the said pipe T, accelerating or increasing the speed of the flowing liquor.

So far the invention has been described as applied to scouring, mordanting, and dyeing fibers; but we use a machine, as shown in Figs. 1 or 2, for the purpose of extracting animal from vegetable matter, the process or operation being the same as in the washing or dyeing, with this exception, that the liquor employed is a solution of bichloride of calcium prepared by the admixture of hydrochloric acid or other suitable acids for the purpose of destroying vegetable matter contained in the fiber.

We claim as our invention—

1. In apparatus for treating fibers, the combination, with a shallow vessel provided with a bridge at its rear end and with perforations in its bottom and a chamber for sediment under the said perforations, of an inlet for liquor at the front end of the said vessel, whereby the fiber may be carried along by the liquor and floated over the said bridge at its rear end, substantially as set forth.

2. In apparatus for treating fibers, the combination, with a shallow vessel provided with a bridge at its rear end, of an inlet for liquor at the front end of the said vessel, whereby the fiber may be carried along by the liquor and floated over the said bridge, and revoluble cylinders journaled above the said vessel for retarding the motion of the floating fiber and pressing it below the surface of the liquor, substantially as set forth.

3. In apparatus for treating fibers, the combination, with a shallow vessel provided with a bridge at its rear end, of an inlet for liquor at the front end of the said vessel, whereby the fiber may be carried along by the liquor and floated over the said bridge, and a vessel provided with a perforated bottom and supported over the front end of the aforesaid vessel for causing a shower of liquor to descend upon the surface of the fiber, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

ISAAC SMITH.
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