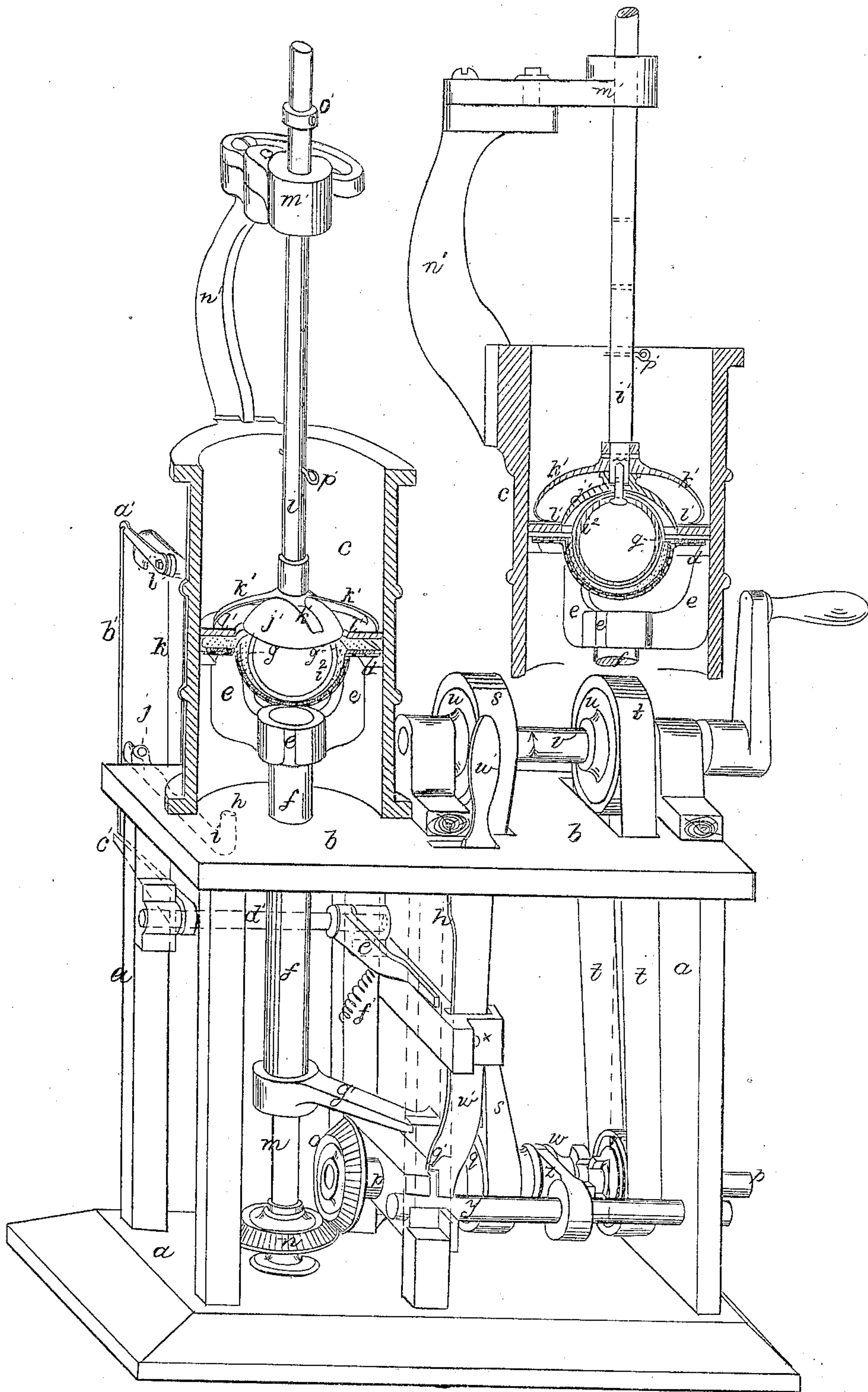


*H. Kellogg,*  
*Farming Bats.*

No. 65,393.

Patented June 4, 1867.



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# UNITED STATES PATENT OFFICE.

HENRY KELLOGG, OF NEW HAVEN, CONNECTICUT.

## IMPROVEMENT IN MACHINES FOR MAKING PAPER HATS.

Specification forming part of Letters Patent No. **65,393**, dated June 4, 1867.

*To all whom it may concern:*

Be it known that I, HENRY KELLOGG, of New Haven, in the State of Connecticut, have invented certain new and useful Improvements in Machinery for Forming Hats from Fibers Suspended in Water, which is applicable to the making of other articles; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and which represent the machinery in perspective, with the cylinder and certain parts within it in section.

My said invention was designed and is organized mainly for forming hats from reduced fibers of vegetable and other substances suspended in water, by causing such fibers to deposit on the inner surface of a pervious former of the shape of the article to be produced, while the water in which the fibers are suspended filters through the meshes or perforations of the former; and although designed for forming hats, it will be obvious that it can be used for forming other articles.

In working my said invention, I prefer to take pulp made of vegetable fibrous substances, such as is used for the manufacture of paper, mixed with from fifteen to thirty per cent. of animal fiber, such as the shearings of woolen cloth, and in the operation a larger quantity of water is used than is employed with pulp.

In the accompanying drawings, *a* represents a suitable frame, on the upper platform *b* of which is mounted a vertical cylinder, *c*, open at the upper end, and to this cylinder is fitted a piston, *d*, properly packed, so as to work therein water-tight, or nearly so. This piston is an annular ring, connected by brackets *e* with a cylindrical piston-rod, *f*, fitted to slide in a hole in the bottom of the cylinder, provided with a packing-box of the usual construction, and to the upper surface of this annular piston is secured the flat rim of the pervious former *g*, while the body thereof extends into and through the annulus. The inside and the upper rim of the said former should be of the form of the outside of the hat or other article to be made therein.

In the bottom of the cylinder there is a hole, *h*, to which is fitted one end of a pipe, *i*,

the other end of which is provided with a stop-cock, *j*, for the discharge of water from the inside of the cylinder when it becomes desirable to clean out the cylinder; and from this pipe a branch, *k*, extends up about two-thirds the height of the cylinder, where it is bent over and provided with a valve, *l*, which, when open, permits the accumulation of water in the cylinder above the level of the said discharge-pipe to escape; but as the said pipe communicates with the bottom of the cylinder, all the water which escapes must have passed through the meshes or perforations of the former, and after the fibers shall have been deposited in the former.

The piston-rod *f* is hollow for a considerable distance from the lower end, and threaded to receive a thread-shaft, *m*, the lower journal of which is fitted to turn in a step. This shaft is provided with a bevel cog-wheel, *n*, which is turned by a corresponding bevel-wheel, *o*, on a shaft, *p*, on which two belt-pulleys, *q* and *r*, turn freely by belts *s* and *t* from pulleys *u u* on the driving-shaft *v*, and the belt *s* is crossed, so that the two pulleys *q r* rotate in opposite directions.

A clutch, *w*, is feathered in the usual manner, so as that it will turn with, but be free to slide on, the shaft *p*, so that it can be made to clutch either of the pulleys *q* or *r* to the shaft *p*.

The driving-shaft *v* being turned in the direction of the arrow by any suitable motor, if the pulley *r* be clutched to the shaft *p*, it will be rotated in the direction of the arrow, and this will, by the turning of the threaded shaft *m*, elevate the piston, and when the clutch is reversed, and the pulley *q* is clutched to the shaft, the motions will be reversed and the piston drawn down.

The shifting of the clutch is effected by a shipping-lever, *w'*, which turns on a fulcrum-pin, *x*, the lower end of which lever is received in a mortise in a sliding rod, *y*, provided with a forked arm, *z*, which is fitted to a groove in the sliding clutch *w*. In this way, while the driving-shaft *v* is rotated, by shifting the position of the shipping-lever, the threaded shaft can be turned in either direction to lift or depress the piston, or stopped, at the will of the attendant.



The stem of the valve *l* in the discharge branch pipe *k* is provided with an arm, *a'*, connected by a rod, *b'*, with an arm, *c'*, of a rock-shaft, *d'*, which has an arm, *e'*, attached to a spring, *f'*, the tension of which keeps the valve closed; but as soon as the piston and pervious former have been elevated to the required height, an arm, *g'*, on the piston-rod *f* comes into contact with and lifts the arm *e'* of the rock-shaft, and this, by the connections described, opens the valve *l*, to permit the escape of the surplus water in the cylinder, and at the same time the said arm acts on a cam-like projection, *h'*, on the shipping-lever *w'*, which unclutches the shaft *p*, and then, by moving the said lever by hand a little farther, the shaft is clutched by the other pulley, and the piston is drawn down, the arm *g'* liberates the arm *e'* of the rock-shaft *d'*, and the valve *l* is then closed by the tension of the spring *f'*.

To the lower end of a rod, *i'*, is secured what I denominate a "couching-pad," *i*<sup>2</sup>. It is a hollow vessel, made by preference of vulcanized india-rubber, water-tight, and nearly filled with water or other liquid, and the outer surface covered with woolen cloth, such as is used by paper-makers for couching paper-pulp. Above this couching-pad there is a concave disk, *j'*, secured to the lower end of the rod *i'*, but of less concavity than the convex form of the upper part of the pad, to permit the said pad to spread a little when the lower portion of it meets with resistance. The rod *i'* is also provided with three (more or less) spring-arms, *k'*, to the outer ends of which is secured a ring, *l'*, corresponding with the rim of the former, and which I denominate the "rim-coucher," the under surface of which is also covered with couching-cloth.

The rod *i'* is fitted to slide freely in a hole in a boss, *m'*, pivoted to the upper end of a standard, *n'*, so that when the couching-pad is elevated above the upper end of the cylinder the boss can be turned to one side, to admit of removing for repairs or otherwise. The rod *i'*, near the upper end, is provided with an adjustable collar, *o'*, so that weights fitted to the upper end of the rod may rest on it. Holes are formed through the rod *i'* at different parts of its length, to receive a pin, *p'*, to act as a stop to prevent the couching-pad from rising beyond the desired height. Other equivalent means may be substituted for the said pin and holes.

Water is to be put in the cylinder to the height of the discharge-pipe *k*, and the piston, with the former, let down to its lowest position. The prepared fibers, thoroughly mixed in water, like pulp for making paper, and sufficient in quantity to make a hat or other article, are poured into the cylinder above the former, where the fibers will be diffused in the water previously in the cylinder and above the former. The shipping-lever *w'* is then moved by the attendant to clutch the pulley *r*, and the piston with its former then begins

to rise. The water in the cylinder filters through the meshes of the former, and deposits the fibers on the rim and inner surface of the former, and when the piston has risen to such a height that the quantity of fibers deposited on the surface of the former is sufficient to produce the required thickness for the tip of the hat, the central portion of it comes into contact with the lower portion of the couching-pad *i*<sup>2</sup>, which is made of greater convexity than the concavity of the former, but which, being hollow, of flexible material, and containing a liquid, will yield to the pressure, and gradually spread out by the continued rising of the piston, thereby gradually making pressure on the deposited fibers. The pressure in this way is made first at the tip and gradually spreads out all around, thereby couching or laying the fibers from the center to the circumference, the layer of fibers gradually increasing from the tip to the rim, until finally the fibers which have accumulated to a greater thickness on the rim of the former are there couched by coming in contact with the under surface of the couching annulus-pad *i*<sup>2</sup>. All this time the couching operation has been performed by the rising of the piston and former against the weight of the couching-pad, and the rod to which it is attached, and such additional weight as may be found necessary; but at the end of the couching operation the rod *i'* is stopped by its pin *p'* striking against the top of the boss *m'* of the standard *n'*, and, the piston being raised a little more, a very considerable pressure is brought to bear on the couched fibers, which are thereby consolidated. At this time the arm *g'* on the piston-rod lifts the arm *e'* of the rock-shaft, opens the valve *l*, which permits the discharge from the cylinder of the water which was put in with the fibers, and the said arm, at the same time, acts on a cam-like projection, *q'*, on the lower end of the shipping-lever *w'*, by which the shaft *p* is unclutched, by which the further rising of the piston is stopped.

By the foregoing operations the fibers have become so compacted that the fabric so formed is practically impervious, and as it is necessary to remove it from the former without injury, the shipping-lever is moved to clutch the shaft *p* to the pulley *q*, which causes the piston to descend into the cylinder, and as the upper part of the cylinder was filled with air while the former was elevated, the resistance of the air liberates the hat from the former, so that it can be readily taken out.

The shape of the former is to be suited to the article which is to be made.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the annular piston carrying the pervious former with the cylinder and the means described, or the equivalent thereof, for controlling the water, substantially as and for the purpose described.

2. The combination of the elastic couching-



pad, the annular piston carrying the pervious former, and the cylinder, substantially as and for the purpose specified.

3. The combination of the elastic couching-pad, the annular piston carrying the pervious former, the cylinder, and the means for stopping the couching-pad to compress the fibers, substantially as and for the purpose specified.

4. The combination of the elastic couching-pad, the couching-annulus, the annular piston carrying the pervious former, and the cylinder, substantially as and for the purpose specified.

5. The combination of the means for auto-

matically controlling the water in the cylinder, of raising and lowering the annular piston carrying the pervious former, and the cylinder, substantially as and for the purpose specified.

6. The combination of the cylinder, the annular piston carrying the pervious former, the elastic couching-pad, and the means for stopping the upward movement of the couching-pad, substantially as and for the purpose specified.

HENRY KELLOGG.

Witnesses:

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R. FITZGERALD.