C. T. APPLETON.

Dyeing Apparatus.

No. 10,677. Patented Mar. 21, 1854.

Fig. 1.

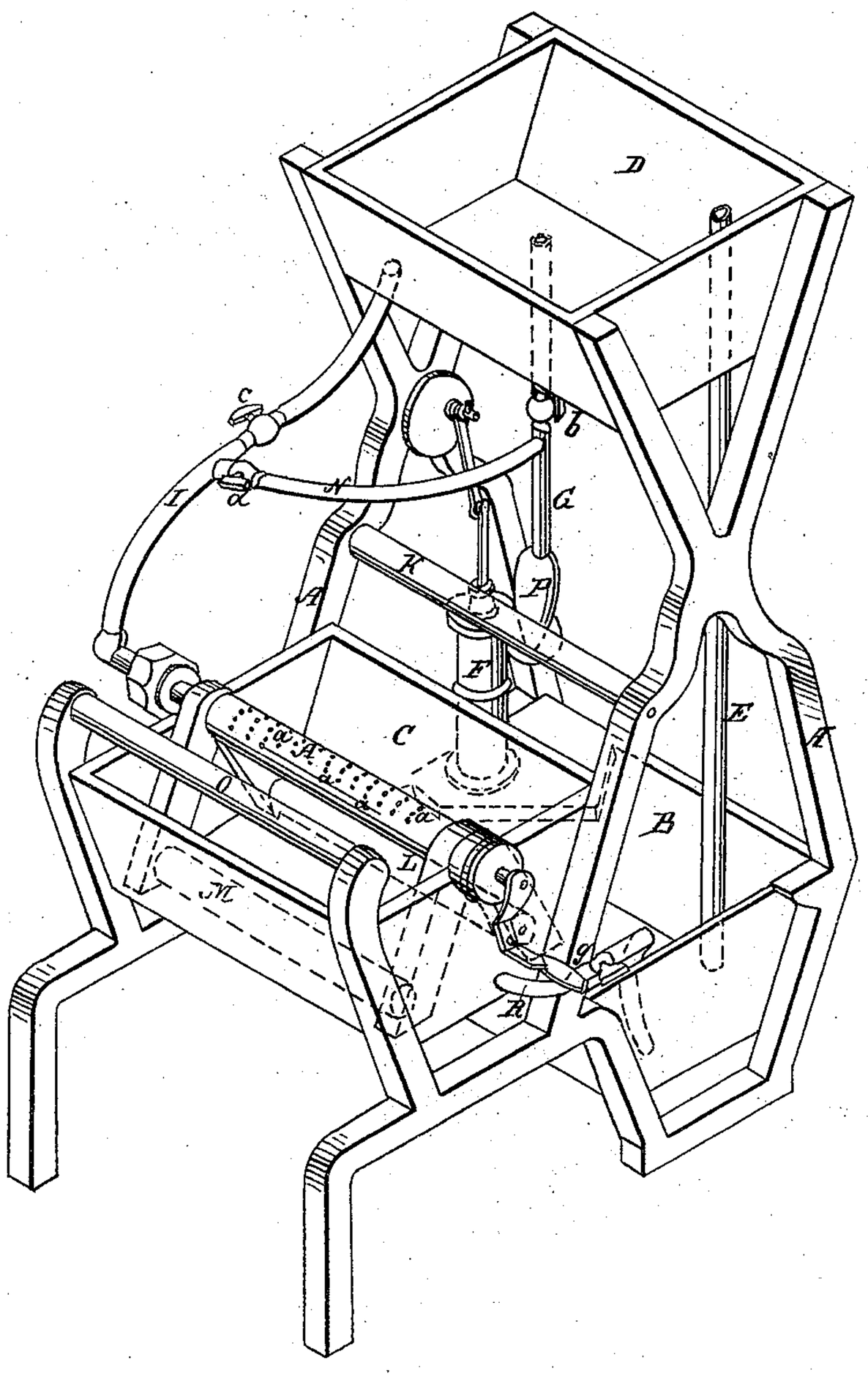

Fig. 2.

UNITED STATES PATENT OFFICE.

CHARLES T. APPLETON, OF ROXBURY, MASSACHUSETTS.

DYEING APPARATUS.

Specification of Letters Patent No. 10,677, dated March 21, 1854.

To all whom it may concern:

Be it known that I, CHARLES T. APPLETON, of Roxbury, in the county of Norfolk and State of Massachusetts, have invented a new and useful Method of Dyeing, of which the following is a full, clear, and exact description, reference being had to the annexed drawing, making part of this specification.

My invention consists in passing the material to be dyed over the surface of a perforated cylinder or tube, the dyeing liquor being forced into the tube and out at the perforations in the same, through the body of the cloth, which is passed through the machine from one roller to another and is made to press tightly upon the surface of the cylinder, fine streams of dyeing liquor from the perforations passing through it in such quantities as may be requisite, and displacing and forcing out the globules of air with which the pores of the goods may be filled.

To enable others skilled in the art to make use of my invention, I will proceed to describe the method which I have adopted of carrying it out.

Figure 1 is a view of the machine employed for the purpose.

A, is the framework of the machine.

B, is the trough or vat containing the dyeing liquor.

C, is the tub in which the dyeing operation is performed.

D, is a reservoir in a sufficiently elevated position to produce the requisite degree of pressure upon the liquor within the tub, the object of which will be explained hereafter.

E, is an overflow pipe from the reservoir D, to the vat B.

F, is a force pump by which through the means of the pipe G, the dyeing liquor is forced from the vat B, to the reservoir D.

H, is a hollow cylinder, seen in section at Fig. 2, and which is pierced with the perforations *a*. These perforations may be simple holes or slits and should be so arranged that the holes of one row may be opposite to the spaces of another.

I, is a pipe which conducts the dyeing liquor from the reservoir D, to the interior of the perforated cylinder H.

b, *c* and *d* are stop cocks, the object of which will be explained hereafter.

The cylinder H, is stationary, though it is so arranged that it may be turned so as to bring the perforations *a*, either at the top or bottom of the cylinder. Through the interior of this cylinder is passed a rod *e*, having attached to it a projection or wiper *f*.

g, is a crank attached to the rod *e*, by which the latter may be turned and any lint which may collect to obstruct the passage through the perforations *a* may be wiped off.

K, L, M, O, are guide rollers over which the cloth is fed through the machine.

The dyeing liquor may be forced uniformly through the cylinder N, by means of a head from a reservoir above. This reservoir D, is shown in the drawing as attached to the balance of the apparatus. In practice, however, it should be placed at a great distance above, as in the upper story of the building where the operation is performed. In such case the force pump is made use of solely to raise the liquor to the reservoir D. The cock *d* upon the pipe N, which opens a communication between the pipes G, and I, is then closed and the cocks *b*, *c*, opened, the liquor from the reservoir D, being allowed to pass freely down the pipe I, into the cylinder H, and out of the perforations *a*, under a pressure due to the height of the reservoir D. The liquor may also be forced through the perforations in the cylinder H, by the direct action of the force pump F, the cock *d* being opened and *b* and *c* being closed, the liquor passing through the branch pipe N, into the pipe I. In such case an air chamber T, may be adapted to the pipe G, and for additional security it may sometimes be found necessary to apply a safety valve to this pipe or to some other part of the apparatus to guard against the danger of an excess of pressure. It is obvious that the force with which the liquor is caused to flow from the perforations *a*, may be varied by operating the machine by means of the force pump, the cock *d* being open, *c* closed and *b* partially open. If the latter be entirely open the liquor will be forced out under a pressure due only to the height of the reservoir D. If the cock *b* be partially closed, so as to obstruct the passage of the liquor through the pipes G, it will be forced into the cylinder H, under an increased pressure.

R is a pipe for the purpose of conducting the dyeing liquor that has passed through the perforated cylinder back to the vat B. Under some circumstances it is necessary to strain the liquor that has once passed through the cylinder before permitting it to

return to the vat B, in order to free it of any lint that it may have gathered while passing through the cloth.

In operating this machine the cloth is fed in over the roller O, beneath the roller M, up over the cylinder H, beneath the roller L, thence up over the roller K, out of the machine, the dyeing liquor being constantly forced out of the perforations in the cylinder H, through the cloth as it passes over it.

When goods of varying width are to be dyed upon the same machine the cylinder H, should be furnished with tight fitting caps of metal, wood, leather or other suitable substance, which may be confined to the surface of the cylinder immediately over the perforations in any appropriate manner. These caps should be capable of adjustment to and from the edges of the cloth, so that when narrow goods are to be dyed the liquor may not be forced out through the perforations which are not covered by the cloth.

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

The above described machine or apparatus for the purpose of dyeing, to wit: the combination of the perforated cylinder constructed as described, with the force pump or its equivalent, operating in the manner substantially as set forth.

C. T. APPLETON.

Witnesses:
WM. C. APPLETON,
M. L. APPLETON.