T. B. DOOLEY.

Varnishing-Machine.

No. 205,367. Patented June 25, 1878.

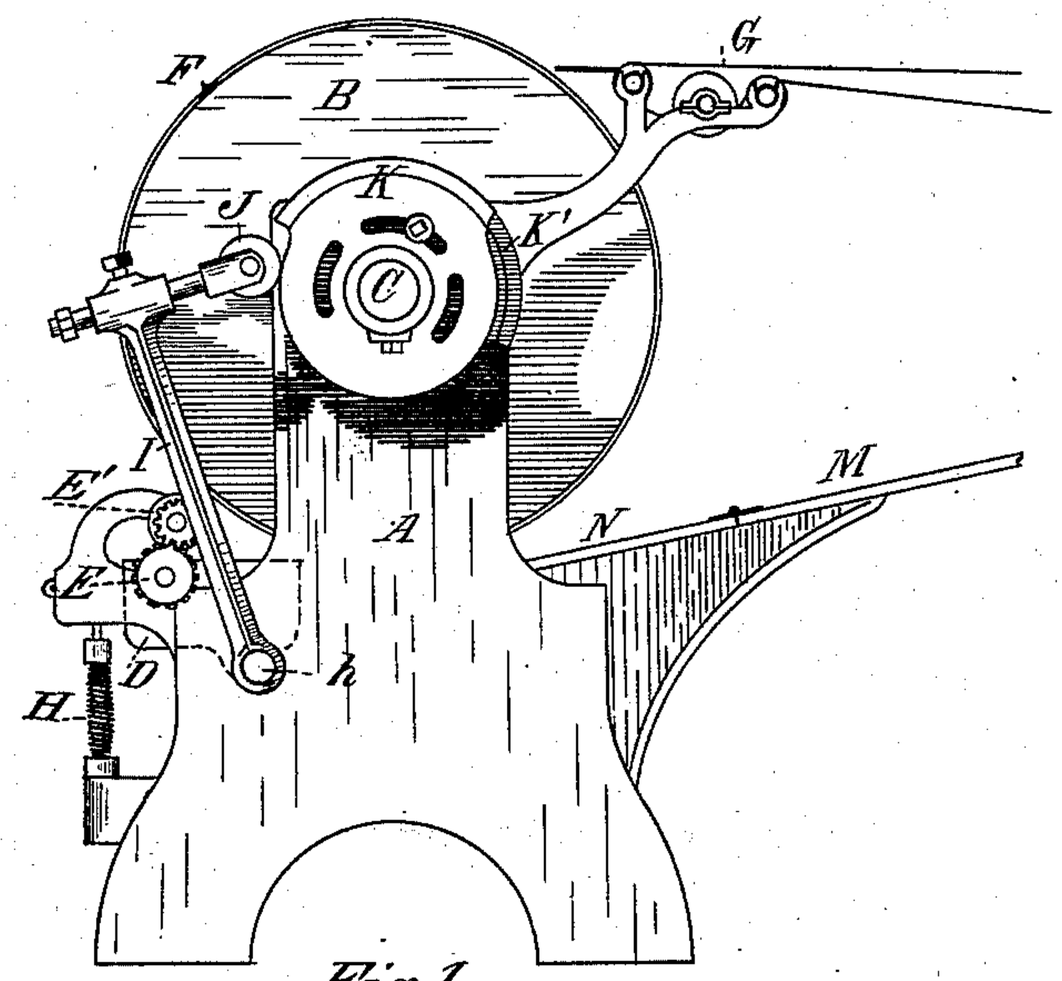


Fig. 1.

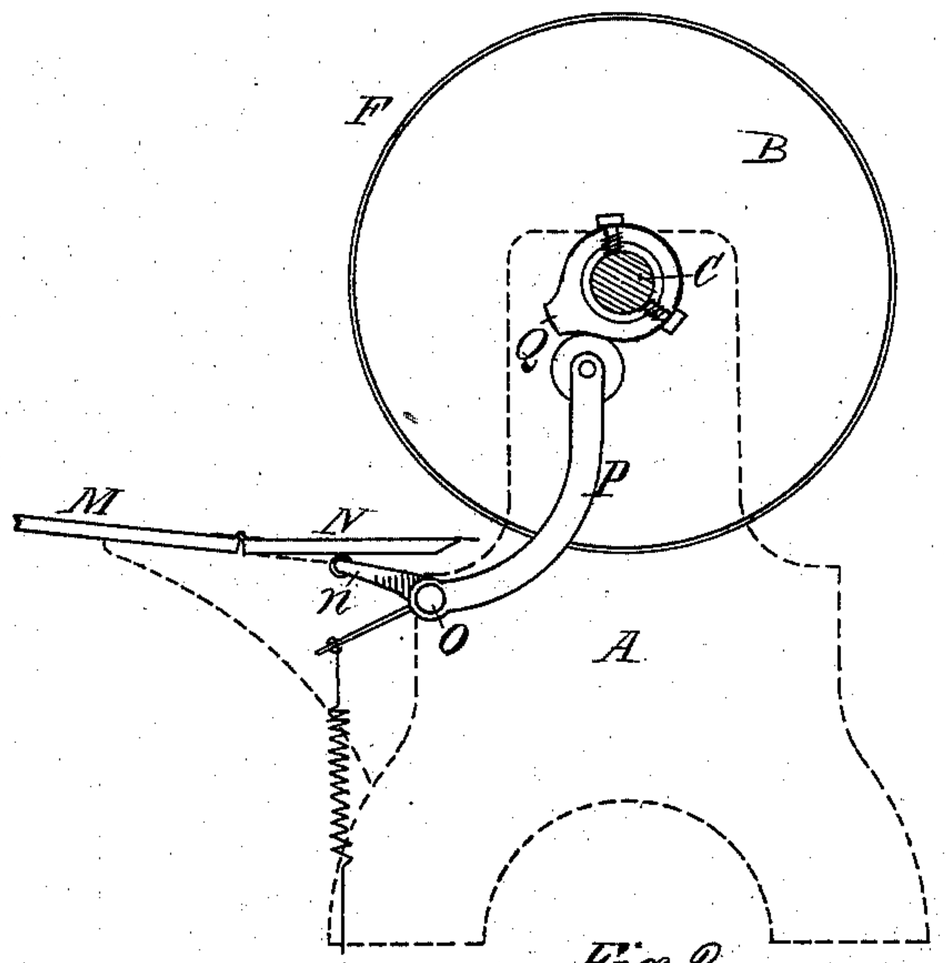


Fig. 2.

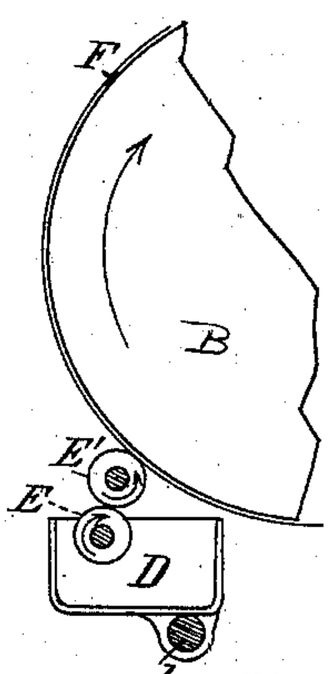


Fig. 3.

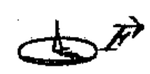


Fig. 4.

Witnesses:

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# UNITED STATES PATENT OFFICE.

THOMAS B. DOOLEY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF, DANIEL GUNN, AND GEO. N. BLISS, OF SAME PLACE.

## IMPROVEMENT IN VARNISHING-MACHINES.

Specification forming part of Letters Patent No. **205,367**, dated June 25, 1878; application filed April 4, 1878.

*To all whom it may concern:*

Be it known that I, THOMAS BROWN DOOLEY, of Boston, Massachusetts, have invented certain Improvements in Varnishing-Machines, or machines for spreading varnish, paste, glue, sizing, &c., over sheets of paper, cloth, or similar material; and that said improvements are fully described in the following specification and illustrated in the accompanying drawing.

My present inventions are in the nature of improvements upon the machine for which Letters Patent of the United States No. 199,625 were granted to me January 29, 1878. They relate to the use in varnishing-machines of one or more flexible rollers for spreading the material over the paper sheets, and adjustable pins for securing the sheets temporarily upon the cylinder; also, to the employment of an arm projecting from the axis of the fountain, to engage with adjustable cams on the cylinder-axle to regulate the contact of the cylinder and varnishing-roller, and to a hinged feed-table operated by a cam on the axle of the cylinder.

My inventions consist in the devices and combinations of devices set forth in the several claims.

My original machine, the Letters Patent therefor, and the model thereof filed in the Patent Office, to which reference may be made, embraced the following essential features, viz: a frame or pair of standards, a revolving drum mounted thereon, a tank for varnish or other material, and a pair of varnishing-rollers. All these parts are essential to my present invention; and my improvements are each employed in combination therewith.

In the drawing making a part of this specification, Figure 1 is an end view of a machine embodying my improvements, showing particularly the mechanism for disconnecting the cylinder and varnishing-roller. Fig. 2 shows at the opposite end the mechanism for operating the hinged table. Fig. 3 shows the relative position of the cylinder, varnishing-rollers, and fountain; and Fig. 4, one of the adjustable pins.

A A are the standards, preferably of iron, and united by suitable cross-bars. B is the cylinder or drum, around which the sheets are passed to be varnished. It revolves with its axle C upon bearings in the standards, there being suitable gearing or pulleys upon the axle, by which motion is communicated to the cylinder.

D is the fountain or tank, containing a supply of the varnish or other material to be spread. This fountain is so arranged as to be replenished from time to time, either by an attendant or automatically, without in either case requiring stoppage of the machine.

E E′ are the varnishing-rollers, made of varying diameter and geared together. The lower one, preferably of metal, revolves, partially immersed in the liquid, in bearings formed in or secured to the ends of the fountain. The other roller, E′, revolves in contact with the first with pressure upon the sheet to be varnished, which is carried around upon the surface of the drum B. This upper roller E′, I make of any elastic or resilient material adapted to spread the varnish smoothly, such as india-rubber or its compounds; but I prefer, for cheapness, to employ a composition of glue and glycerine, which may be readily obtained, and can be cut away to varnish a strip of any given width, and may be worked over without loss when desired. The elastic roller serves to spread the varnish more uniformly than could be done by any other means, since it adapts itself to any inequalities in the surfaces upon which it continuously acts, takes up a given portion only of the varnish, and applies it smoothly and with a yielding pressure. The bearings of the upper roller are so hinged that it may be thrown back out of contact with the drum and the lower roller when not in use.

I am aware of the use of elastic inking-rollers in printing-presses of various forms, and I disclaim such apparatus as foreign to my invention.

The sheet to be varnished, being fed into the machine, may be seized by a set of nippers, which correspond to those used for a like purpose in printing-presses, and, like them, may be provided with a suitable tripping device. When this mechanism releases its hold the varnished sheet is liable to slide upon the drum and drop back into the varnish-tank. To obviate this difficulty, I employ one or more adjustable pins, which may be attached at will to the drum or its blanket, and may be readily removed or located elsewhere. These

pins penetrate the sheet under treatment, preferably at the edges, and hold it after the nippers have ceased to act upon it, or as a substitute for them. The most convenient form in which to employ this feature of my invention is illustrated in the drawing, in which F represents one of the pins—an ordinary engineer's brad or thumb-tack, with broad flat head, short fine body, and sharp point. The head is placed beneath the cylinder-blanket, the body extending through it outwardly, so as to be held in position thereby. The sheet to be varnished is pierced at the edges by these projecting pins, and held during the operation of varnishing until, by the carrying-tapes G, it is automatically removed from the machine to the drying-frames.

It is of the utmost importance that the varnishing-rollers shall be kept from actual contact with the drum B, because the least particle of varnish on its surface will cause the succeeding sheets to adhere tenaciously thereto, and thereby interrupt the proper working of the machine. The sheets vary in length, and hence it is necessary to provide adjustable devices by which the cylinder and varnishing-roller may be disconnected at any desired point in the rotation. My improvement in this particular is as follows: The fountain D is supported by one or more springs, H, and by a shaft, *h*, to which it is secured, so that it may move slightly with the shaft *h* as its axis. An arm, I, projects from the shaft *h* at a right angle, and engages with a cam, K, secured adjustably upon the axle of the drum, outside of the standard A, and preferably formed of about the shape shown in Fig. 1. This engagement has the effect to lift the extremity of the arm I and partially rotate the shaft *h*, while the spring H is slightly compressed. Thus the fountain D and the rollers E E′ are carried slightly away from the surface of the drum, and held in that position during part of each rotation, while the open part of the periphery of the drum (where the nippers are placed) passes the roller E′. Another cam, K′, loose upon the axle C, and adjustable radially thereon, is placed beside the cam K, and secured to it by a screw passing through a slot in the one into a threaded aperture in the other. By adjusting the cam K′ radially with relation to its fellow, the extent of rotation of the drum without contact with the varnishing-roller may be regulated as desired.

The arm I may be furnished with a friction-roller, J, at its extremity; and I prefer to mount this roller in a bracket, which may be moved forward and back in a sleeve, and held in position by a set-screw, as will be obvious from an inspection of Fig. 1.

By locating the cams and arm I outside of the standards much expense and complication of the machine are saved, and the mechanism may be more readily adjusted. Furthermore, the entire surface of the drum is available to resist the pressure of the varnishing-roller, and a sheet of any width which can pass between the standards may be treated.

The feed-table M, upon which the sheets are laid preparatory to treatment in the machine, is provided at its front end with a hinged extension, N, resting upon one or more arms, *n*, secured to a rock-shaft, O, which has an arm, P, projecting from it, so as to be depressed by the rotation of a cam, Q, on the axle of the drum. This mechanism serves to lift the front edge of the entering sheet into position before the nippers at the moment when, in the rotation of the drum, they are ready to receive it, after which the hinged part N drops out of the way until the next sheet is to be fed in.

I claim as of my invention—

1. The standards, the rotating drum, the tank, and the feed-roller, in combination with the elastic varnishing-roller, adapted to apply the varnish directly to the paper sheet, and provided with hinged bearings, whereby it may be thrown out of contact with the feed-roller, substantially as set forth.

2. The combination of the rotating drum and its supporting-standards with the varnish-tank and rollers and the adjustable pins, substantially as and for the purpose set forth.

3. The combination of the supporting-standards A, the rotating drum B, and the adjustable cams K K′ on the axis of the drum with the rollers E E′, fountain D, and arm I, projecting from the shaft *h*, substantially as set forth.

4. In a varnishing-machine, the combination of the drum, the fountain, and the varnishing-rollers with the hinged extension N of the feed-table and the rock-shaft arms and cam for operating the same, substantially as set forth.

THOMAS BROWN DOOLEY.

Witnesses:
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A. H. SPENCER.