2 Sheets—Sheet 1.

T. B. DOOLEY.

Machine for Varnishing.

No. 199,625. **Patented Jan. 29, 1878.**

Fig 1.

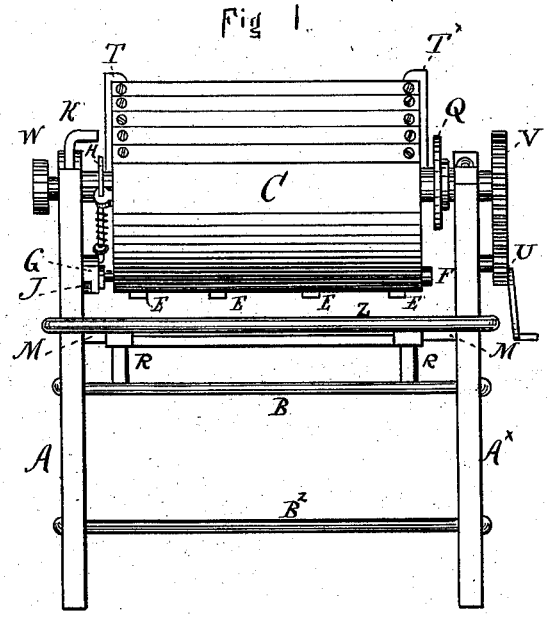
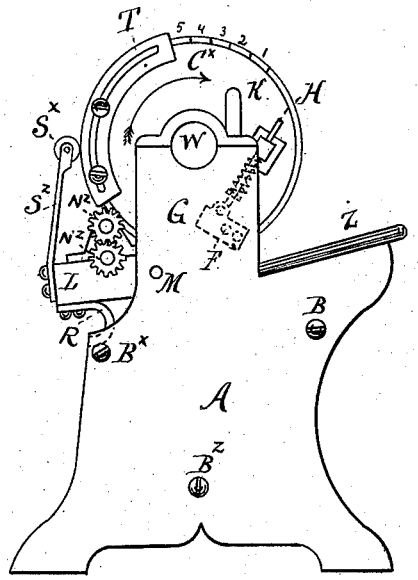


Fig 2.



WITNESSES.

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per Lemuel P. Deuk. atty.

2 Sheets—Sheet 2.

T. B. DOOLEY.

Machine for Varnishing.

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Fig. 3.

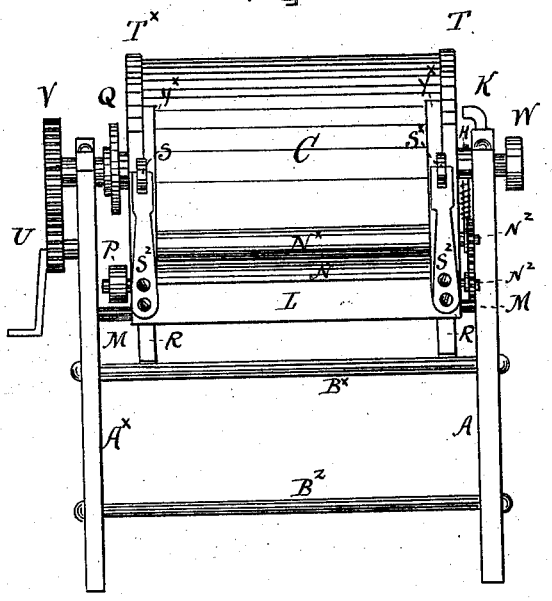


Fig. 4.

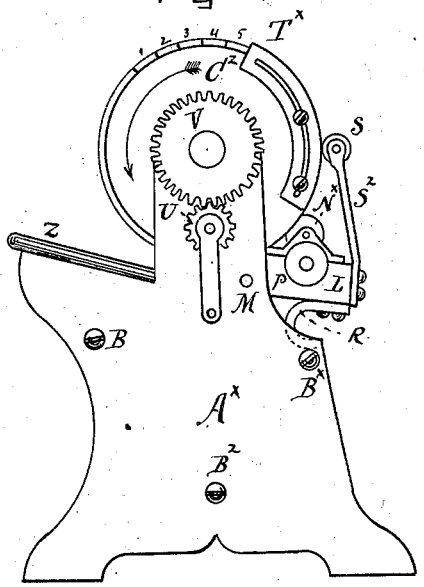


Fig. 5.

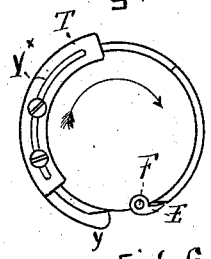
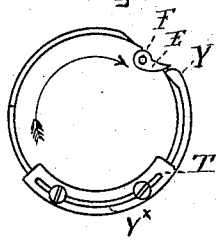


Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

THOMAS B. DOOLEY, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENT, TO EDWARD K. BUTLER, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR VARNISHING.

Specification forming part of Letters Patent No. **199,625**, dated January 29, 1878; application filed September 13, 1877.

To all whom it may concern:

Be it known that I, THOMAS BROWN DOOLEY, of Boston, Suffolk county, State of Massachusetts, have invented a new and Improved Varnishing-Machine, of which the following is a specification:

The nature of my invention is that of a drum or cylinder supported by two upright standards, and formed by two circular plates or heads, connected by slats or staves, some of which are movable. The drum rotates on a shaft, and the heads of the drum bear (on a rod which runs parallel with the axis of the drum) four curved claws, which, by means of a device hereinafter described, are alternately opened and shut upon one of the drum slats or staves, thus seizing or releasing the sheet to be varnished. A trough or tank, to which are attached (above) two feeding-rollers, is supported by the two standards, and devices hereinafter described alternately stop or cause to continue the depositing of the varnish on the sheet operated on.

The object is to provide machinery for the cheap, quick, and thorough coating of paper, &c., with varnish.

Referring to the drawings, Figure 1 is a view from the front side, where the paper, &c., enters into the machine. Fig. 2 is a side view of the machine as taken from the left side of Fig. 1. Fig. 3 is a view from the rear or back side, where the tank containing the varnish, &c., is held. Fig. 4 is a side view of the right-hand side of Fig. 1. Figs. 5 and 6 are hereinafter explained.

In the drawings, A $A^{\times}$, Figs. 1 and 2, (A, Fig. 2, $A^{\times}$, Fig. 4,) are two standards, formed, respectively, of slabs, preferably of metal, and connected together in the lower halves of the standards by three horizontal bars, (two seen in Figs. 1 and 3,) the ends of the whole three—marked, respectively, B, $B^{\times}$, and B^{z}—being seen in Figs. 2 and 4. C C, Figs. 1 and 3, ($C^{\times}$, Fig. 2, and C^{z}, Fig. 4,) is the drum, borne by a shaft passing from standard to standard, and composed of two circular plates, (of wood or metal,) connected together by slats, bars, or staves, screwed or otherwise fastened to the edges of the plates. Five of these bars, the ends of which are seen in Figs. 2 and 4, numbered from 1 to 5, inclusive, are movable by unscrewing from the drum. These bars vary in width, for reasons mentioned hereinafter.

Sundry devices (not original with me) are attached to the cylinder or drum C to seize and release the sheets of paper to be operated on, and need not be further described, more than by saying that certain claws E E, &c., Fig. 1, borne by a rod, F, Fig. 1, (which rod is actuated by what I call the "shifter" G, Fig. 1, shifter-rod H, pin J, and shifter-pin K,) alternately seize the sheets as they are presented to the claws, and release them after they are varnished, during a partial rotation of the drum or cylinder C′.

L, Figs. 2, 3, and 4, is a trough or tank, with no cover and of an oblong shape, as seen from above, which tank hangs parallel with the drum from a rod, M M, Figs. 1 and 3, (M, Figs. 2 and 4,) which passes from one standard to the other. At the ends of the tank L, and borne by them, respectively, are seen in Figs. 2 and 4 two bearings, each being a member of a pair, which bearings carry, respectively, two shafts, holding, respectively, the rollers N $N^{\times}$, Fig. 3, called the "varnishing-rollers." The lower one of these rollers, N, is partially immersed in the cavity of the tank L, and the upper roller, $N^{\times}$, touches the lower one.

P, Figs. 3 and 4, is a pulley, borne by the shaft which carries the lower roller N, and is, in practice, rotated by a belt or cord passing round it from the pulley Q, Figs. 1 and 3, on the drum-shaft.

A pair of cog-wheels, N^{z} N^{z}, Fig. 3, on the ends, respectively, of the shafts of the rollers N and $N^{\times}$, effect the communication of motion from the lower roller to the upper. The tank L, being suspended from the rod M M, is pressed up by springs, so that the upper roller $N^{\times}$ comes in contact with the cylinder C. These springs R R, Figs. 1 and 3, (R, Figs. 2 and 4,) are flat, and are fastened to the lower side or bottom of the tank L, and, thence curving as seen in Figs. 2 and 4, rest their compressed lower ends on the rod $B^{\times}$, Figs. 2, 3, and 4. The action of these springs has a constant

tendency to keep the upper roller N^x in contact with the drum. But this should be done only for the length round the drum which corresponds with the length of the sheet to be varnished, otherwise the drum itself would become coated with varnish.

To coat the proper distance only, I use this device: S S^x, Fig. 3, (S^x, Fig. 2, S, Fig. 4,) are two rollers, called the "guard-rollers," borne, respectively, by two arms, S^z S^z, Fig. 3, called the "guard-roller arms," projecting upward from the outer side of the tank L, to which they are fastened. When these rollers are pressed back to the left in Fig. 2, (and to the right in Fig. 4,) the springs R R are compressed, and the upper roller, N^x, ceases to be in contact with the cylinder C. I press the guard-arms and rollers back in this manner.

T T^x, Figs. 1 and 3, (T, Fig. 2, T^x, Fig. 4, T, Figs. 5 and 6,) are the guard-slides, being two pieces of metal (or other substance) curved to the shape of an arc of the circle shown by the drum-heads, and bearing each, at their respective centers, a slot lengthwise, through which slots pass, respectively, the shanks of a pair of screws, whose ends screw into the ends of slats or bars of the drum. The guard-slides are thus borne at the corners of the drum, the tops, or edges, or outer surfaces of them farthest from the axial line of the drum being elevated a slight distance above the curved line or arc formed by the outer surface of the drum-slats. By the loosening and tightening of the screws (seen in Figs. 2, 4, 5, and 6) the guard-slides can, within a certain limit, be placed at any point on the periphery of the circle formed by the drum-heads. In the rotation of the drum the guard-rollers S S^x, Figs. 2, 3, and 4, strike the rounded corners (see the figures mentioned) of the ends of the guard-slides first presented to them, these rollers then rolling to the highest surface of the guard-slides, and being thus pressed back with the arms which bear them, the tank L, with its rollers N and N^x, recedes also from contact with the drum or the sheet of paper on it, thus stopping the depositing of varnish. The removal or replacement of the movable slats (Nos. 1, 2, 3, 4, and 5, Figs. 2 and 4) is to be governed always by the length of the sheet of paper operated on, care being had to replace and fasten on again only so many of the movable slats as that the sheet of paper operated on shall reach from the claws E E, &c., which hold it, to a point beyond the edge or outer corner of the last slat replaced. Thus the varnish cannot be fed by the roller N^x onto that part of the drum. The guard-slides, also, are readily fastened, by means of their screws, at such a point as that their raised curved surfaces shall strike and press back the rollers S S^x before, in the rotation of the drum, the fixed irremovable slats of the same shall have reached the roller N^x. Thus this part of the drum cannot be reached by the varnish.

Y Y^x, Figs. 5 and 6, (Y^x Y^x, Fig. 3,) are the guards. These are curved projections, fastened permanently on some of the drum-slats which are irremovable, and they run side by side with the guard-slides T T^x. These guards have their corners rounded at each end, and they reach from the point seen in Fig. 2, also in Figs. 5 and 6, to the open space in the cylinder, wherein are held the claw-shaft F and its claws, (marked in Figs. 5 and 6 by the letters E.) The function and operation of these guards Y Y^x are the same as those of the guard-slides T T^x, half of the guard-rollers S S^x, respectively, impinging upon the guards, which latter, being continued beyond the guard-slides, as seen in Figs. 5 and 6, supplement their action.

Z, Figs. 2 and 4, is the table, supported by the standards A A^x, upon which the sheets of paper to be operated on are laid.

The operation of the invention is as follows: The machine being with its parts in the positions shown in Figs. 1 and 2, the drum is rotated slightly in a reverse direction, thus opening the claws E E, &c. The tank L is then supplied with varnish, and the sheet of paper to be varnished is fed in; and motion being communicated to the drum, (by means of the handle attached to the cog-wheel U,) the shifter G strikes the pin J, the claw-shaft is partially rotated, and the claws E E, &c., seize the paper sheet. The rotation of the drum continuing, the point Y, Figs. 5 and 6, of the guards reaches the guard-rollers S S^x, and the upward pressure of the springs R R is permitted to force the varnishing-roller N^x against the paper sheet. The varnish taken by this roller from the roller N below it, as the latter rotates in the tank L (by means of the pulleys Q P and the cog-wheels N^z N^z) is thus rubbed against the sheet, depositing thereon a coating. When the end of the slatted portion (see directions above) of the drum is reached, the paper sheet, its length and the length of the clothed or slatted part of the drum being properly adapted to each other, is found to project over the edge of the last slat the sheet touches, so the varnish reaches the paper sheet only; and as the claws E E, &c., in rotation of the drum, come to their most elevated position, the shifter G strikes the upper shifter-pin K, thus partially rotating the claw-shaft F, and turning over the claws E E, &c., and thus releasing the paper sheet, now completely varnished, which sheet is then removed from the machine by the hand, or in other convenient manner.

I sometimes use weights instead of the springs R R, and sometimes use smooth and polished surfaces instead of the rollers S S^x; and I do not confine myself solely to the mode described, by suspension of the tank L upon the rod M, to facilitate the advance and recession of the varnishing-roller N^x to the drum, as I sometimes cause the rollers only to advance and recede, and I sometimes sink the

movable slats in toward the center of the drum, instead of removing them; and I do not confine myself to any special number or width of movable slats.

I claim—

In varnishing-machines, the combination of a rotating drum, its standards, and the varnishing-tank and varnishing-rollers with the guards Y Y^{x}, the movable guard-slides T T^{x}, and the guard-roller arms S^{z} S^{z}, where the drum is provided with one or more movable slats, all when constructed and arranged to operate substantially as described and shown.

THOMAS BROWN DOOLEY.

Witnesses:
LEMUEL P. JENKS,
JEROME DAVIS.