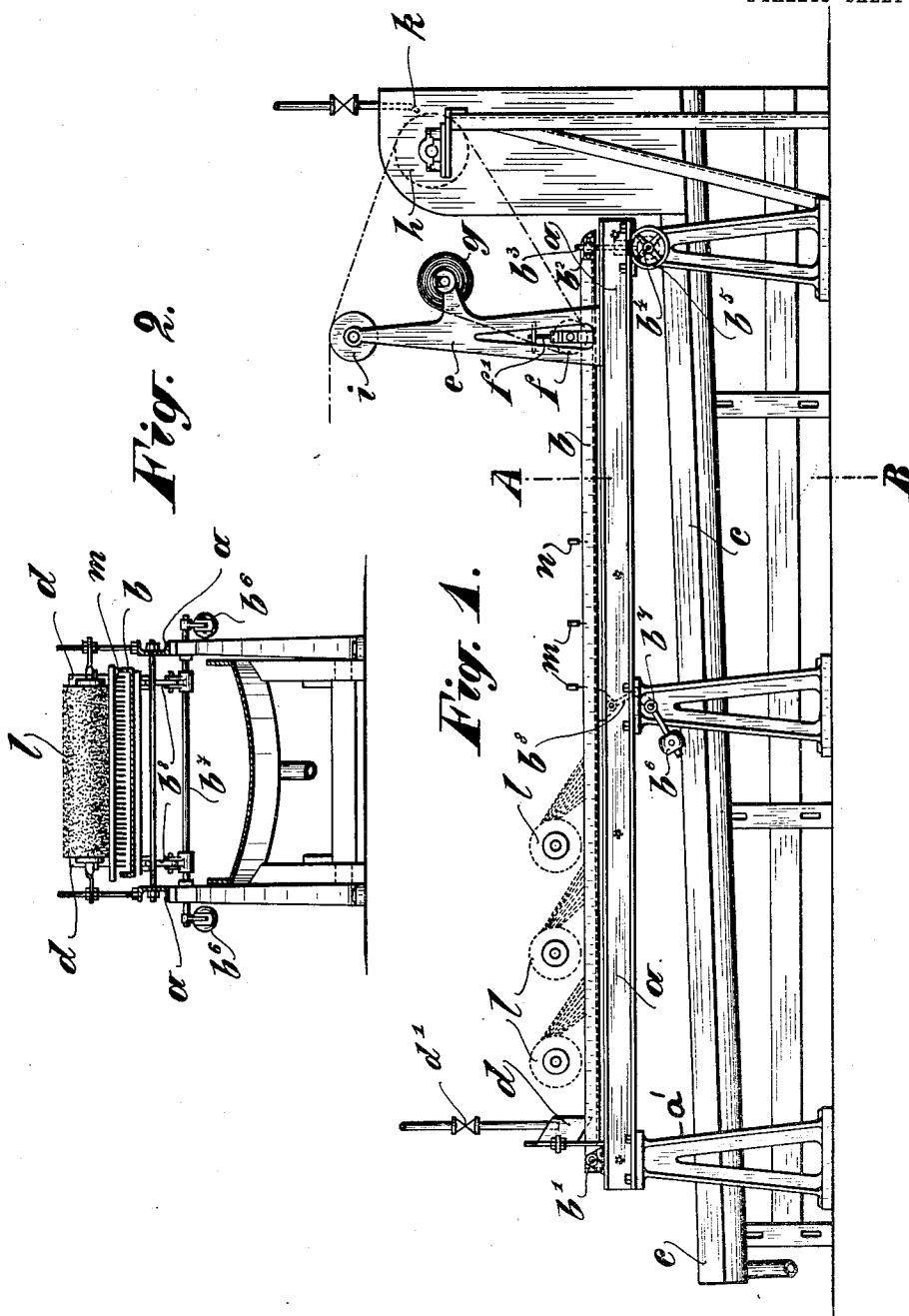


H. METZGER.
 PROCESS AND MACHINE FOR MARBLEIZING PAPER AND THE LIKE.
 APPLICATION FILED JAN. 15, 1908.

936,010.

Patented Oct. 5, 1909.

2 SHEETS—SHEET 1.



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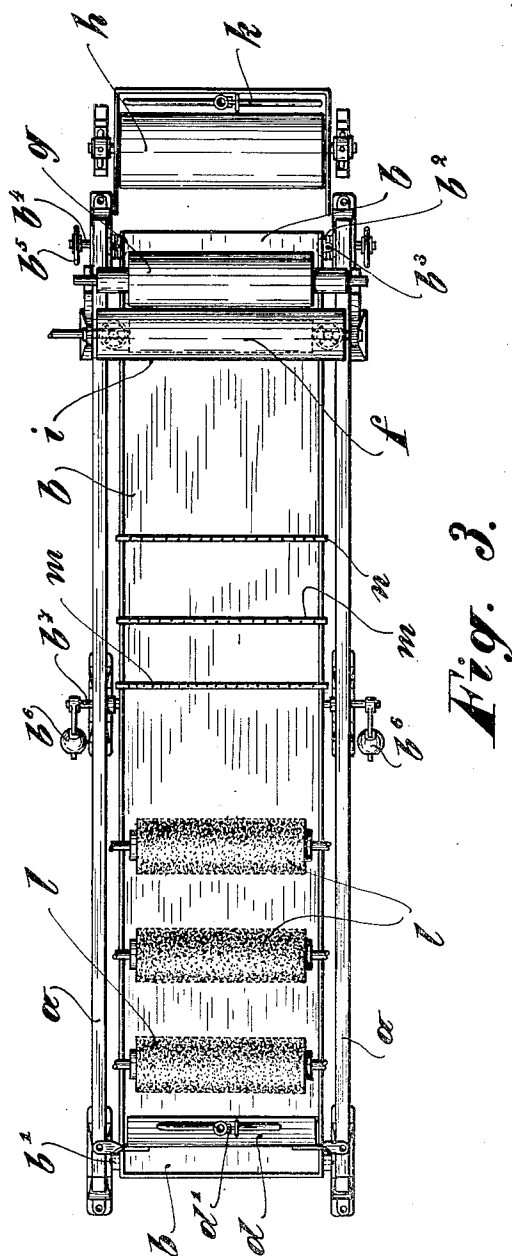


Fig. 3.

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UNITED STATES PATENT OFFICE.

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PROCESS AND MACHINE FOR MARBLEIZING PAPER AND THE LIKE.

936,010.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed January 15, 1908. Serial No. 410,887.

To all whom it may concern:

Be it known that I, HEINRICH METZGER, a subject of the Emperor of Germany, and resident of Aschaffenburg-Damm, Bavaria, Germany, have invented certain new and useful Improvements in Processes and Machines for Marbleizing Paper and the Like, of which the following is a specification.

My invention relates to the marbleizing of paper, card board and the like, particularly in the form of a continuous web, and has for its object to carry out such treatment efficiently and expeditiously.

Other objects and features of my invention will appear from the description following hereinafter.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a side elevation of a machine suitable for carrying out my invention; Fig. 2 is a vertical section on line A—B of Fig. 1; and Fig. 3 is a plan view.

The machine has a frame *a* resting on legs *a'* and supporting the supply channel *b*. This channel has a cross flange at its rear end and also longitudinal side flanges, but is open at its forward end so that the marbleizing fluid (for instance water) may run off at such forward end, to drop into an inclined discharge channel *c*. The supply channel is preferably inclined in the opposite direction and its inclination may be adjusted in any suitable manner. Thus in Fig. 1 the rear end of the channel *b* is pivoted at *b'* and the front end has secured to it perforated lugs or nuts *b²* into which screw threaded rods *b³* so carried by the frame as to be capable of rotation but not of vertical movement. The shaft *b⁴* which may be turned by means of either one of the hand-wheels *b⁵*, is suitably geared to the rods *b³* to operate them both. To relieve the adjusting mechanism of undue strain, I have connected a counterweight *b⁶* (pivoted on the frame at *b⁷*) with the central portion of the channel *b*, by means of links *b⁸*.

At the front end of the channel *b*, which is generally its upper end, I locate the distributor *d* for marbleizing fluid. This distributor may be a simple overflow box combined with a pipe *d'* applying a continuous stream of said fluid. The latter overflows into the channel *b* and flows toward the open rear end of the same, forming a thin sheet

or film on the bottom of the channel. The flanges of the channel would compel the fluid to seek the open lower end, even if the channel were perfectly horizontal, but in practice the channel will generally be inclined more or less. Near the front end of the machine are located brackets *e* carrying the guide roll *f* arranged slightly above the liquid film, said roll being preferably adjustable vertically as by means of screws *f'*, so that its position may be varied to correspond to the adjustment of the supply channel *b*. The brackets *e* also support the paper roll *g* and a guide roll *i*. The paper passes from the roll *g* to the roll *f* then to a roll *h* journaled on the frame, and finally to the roll *i*.

While the marbleizing liquid is on its way to contact with the paper at the roll *f*, I apply to such liquid the marbleizing colors and distribute them. This may be done by hand or by means of mechanical devices. Thus I have shown spray-heads *l* for discharging the colors on to the surface of the liquid film in the channel *b*, and between said heads and the roll *f* I have arranged movable combs *m* and stationary combs *n* for distributing the colors on the film and forming them into designs. Any suitable colors may be employed, including oil colors.

The parts are so adjusted that the surface of the paper just touches the surface of the liquid, that is, the paper does not dip into the liquid. The surface of the liquid being tangential to that of the paper, contact occurs practically only along a single transverse line. The colors floating on top of the liquid adhere to the paper and are carried away by it. As the liquid sheet or film is comparatively thin it flows evenly, without eddies, and there is therefore but little disturbance (if any) of the designs into which the colors have been formed. As the paper does but touch the surface of the film, it does not materially retard the flow of the liquid, and I thus avoid distortions of the designs which might be caused by a backing up of the liquid. The paper takes but a minimum of moisture, and thus the colors will not run on the paper even should it rise vertically from the roll *f*. The liquid arriving at the roll *f* is always absolutely fresh, as the used or spent liquid is drawn off at the lower end of the channel *b*.

The paper with the marbled designs thereon may be sprayed with a suitable liquid (as indicated at *k*) to clean and fix the colors. The surplus liquid dripping off at this point may be collected separately, or run together with the spent marbling liquid. Finally the paper would be dried in any suitable manner.

By varying the inclination of the channel *b*, the velocity of the marbling fluid can be adjusted, so as to vary the designs produced; such variation is also obtained by operating the combs *m* differently.

The process and machine described above may be employed in connection with plain or colored or printed paper, cardboard, paste-board or the like.

I claim as my invention:

1. The herein described process of marbling paper and the like, which consists in causing a thin film of a readily movable liquid to flow bodily on a stationary support, applying color to the surface of said flowing film, and bringing only the surface of the paper in tangential contact with the color on the moving film, to transfer such color from the film to the paper.

2. The herein described process of marbling paper and the like, which consists in causing a thin film of a readily movable liquid to flow bodily on a stationary support, applying color to the surface of said flowing film, bringing only the surface of the paper in tangential contact with the color on the moving film to transfer such color from the film to the paper, and spraying a liquid against the marbled side of the paper after it has come out of contact with the film.

3. In a machine for marbling paper and the like, an inclined supply channel, a discharge channel arranged below the supply channel and inclined in the opposite direction, a paper guide located slightly above the supply channel adjacent to its lower end, and means for supplying a marbling liquid at the upper end of the supply channel.

4. In a machine for marbling paper and the like, an inclined supply channel, a paper guide located slightly above said channel adjacent to its lower end, and means for supplying a marbling liquid at the upper end of the channel.

5. In a machine for marbling paper and the like, a supply channel pivoted at one

end so that it may swing up or down, adjusting mechanism connected with the other end of said channel, a paper guide located slightly above the channel adjacent to its adjustable end, and means for supplying a marbling liquid at the other end of the channel.

6. In a machine for marbling paper and the like, a supply channel pivoted at one end so that it may swing up or down, adjusting mechanism connected with the other end of said channel, counterbalancing means connected with the central portion of the channel, a paper guide located slightly above the channel adjacent to its adjustable end, and means for supplying a marbling liquid at the other end of the channel.

7. In a machine for marbling paper and the like, an inclined supply channel, means for adjusting its inclination, a paper guide located slightly above the channel adjacent to its lower end, and means for supplying a marbling liquid at the other end of the channel.

8. In a machine for marbling paper and the like, an inclined supply channel, means for adjusting its inclination, counterbalancing means connected with the channel, a paper guide located slightly above the channel adjacent to its lower end, and means for supplying a marbling liquid at the other end of the channel.

9. In a machine for marbling paper and the like, a supply channel, means for supplying a marbling liquid at one end of said channel, a paper guide located adjacent to the other end of the channel and slightly above the same, color-distributing means located above the channel between its ends, and means for spraying a liquid against the marbled side of the paper after it has left said guide.

10. In a machine for marbling paper and the like, a supply channel, means for supplying a marbling liquid at one end of said channel, a paper guide located adjacent to the other end of the channel and slightly above the same, and means for spraying a liquid against the marbled side of the paper after it has left said guide.

In testimony whereof I have hereunto set my hand this 2nd day of January 1908.

HEINRICH MÖTZGER.

Witnesses:

JEAN GRUND,
CARL GRUND.