

(No Model.)

J. H. AUBLE & J. F. HORNBERGER.
MECHANISM FOR PRINTING FROM WOOD.

No. 455,379.

Patented July 7, 1891.

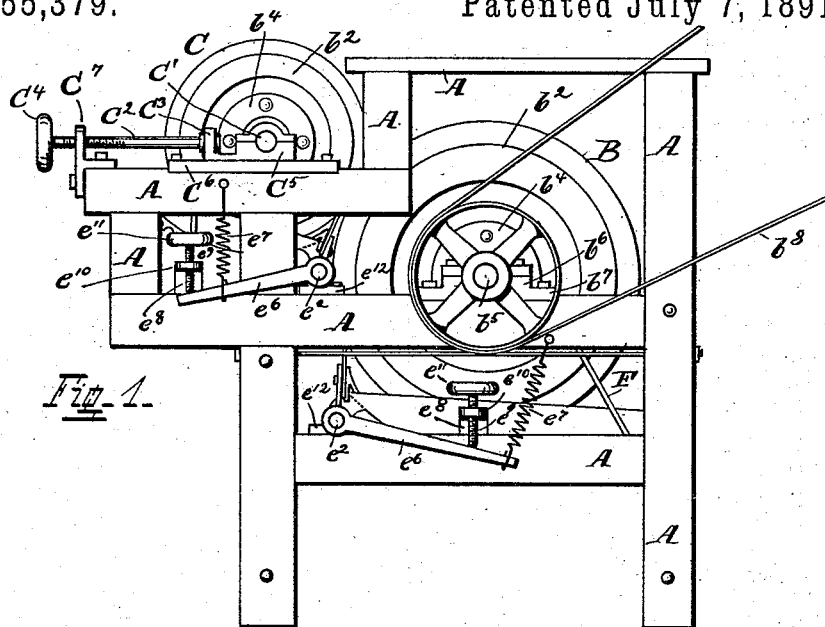


Fig. 1.

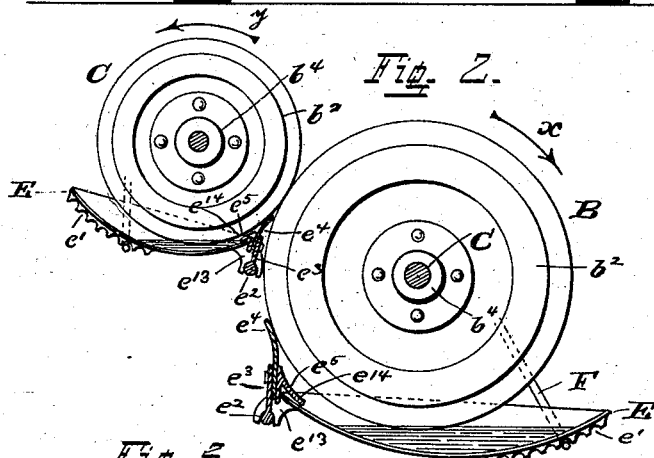


Fig. 2.

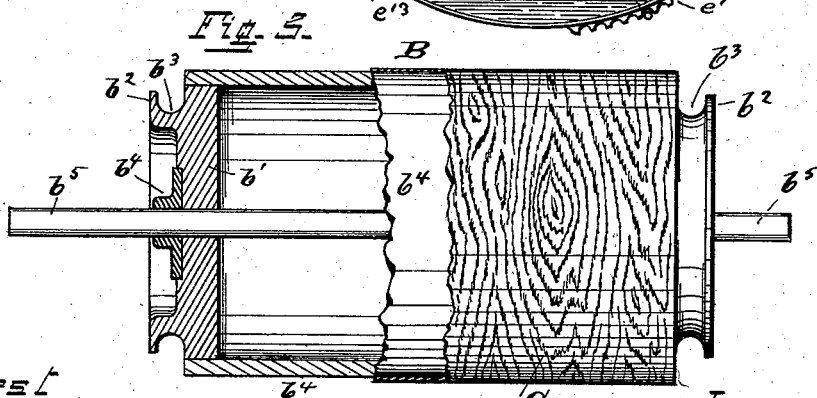


Fig. 3.

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MECHANISM FOR PRINTING FROM WOOD.

SPECIFICATION forming part of Letters Patent No. 455,379, dated July 7, 1891.

Application filed May 31, 1889. Serial No. 312,718. (No model.)

To all whom it may concern:

Be it known that we, JAMES HARLEY AUBLE and JOHN F. HORNBERGER, citizens of the United States of America, and residents of the city of Lawrenceburg, in the county of Dearborn and State of Indiana, have invented certain new and useful Improvements in Mechanism for Printing from Wood, of which the following is a specification.

The various features of our invention and the several advantages resulting from their use conjointly or otherwise will be apparent from the following description and claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a machine illustrating certain features of our invention. Fig. 2 is an end elevation of the two cylinders by means of which the figure of the growth of the wood is transferred to and printed upon boards or veneer applied to and operated upon by the machine and showing in section the pans and scrapers hereinafter specified. Fig. 3 is a side elevation of the main or design roller carrying on its outer surface the material which prints upon the transfer-cylinder the form of the figure to be printed, this cylinder in Fig. 3 being shown partly in vertical longitudinal section and the outer layer of the cylinder being also broken away beyond the inner layer or cylinder proper to more fully illustrate certain features of our invention.

One of the principal features of our invention relates to an entirely new departure. Heretofore it has been customary to take from the natural wood an impression of the pores of the wood. The pores of the wood represent what is known as the "grain" of the wood. The mode in which the grain of the wood has been printed and transferred to the surfaces of other woods or other materials is as follows: The surface of the wood from which the impression is to be taken is flat and suitable composition applied to the face of the wood and an impression taken from the said wood by means of a design-roller, which delivers the impression either to another roller or directly to the surface of the article upon which the impression is to be made. By these means the pores or grain of

the wood is printed. One of the principal objects of our invention, on the other hand, is to print the growth of the wood, so to speak, as well as the pores. This growth of the tree consists of hard poreless elongated arrow-head-shaped figures. It is neither the shade nor the grain. Our object is more particularly to transfer the season's growth of the tree and along with this the grain of the wood. We accomplish this in a novel manner. We have discovered that by bending the surface of the wood on which the impression is to be taken in a convex form we are enabled to throw the season's growth out beyond the rest of the surface of the wood—that is, after the manner of a cameo, and at the same time open the pores of the wood. The wood while in this position will transfer not only an impression of the pores, but also the season's growth, to the substance pressed against it to receive such impression.

The particular mode in which we carry out this part of our invention will now be described along with those other features of our invention which relate to a perfected mechanism for transferring such impressions from the wood to the article which is to receive the impression, and also to mechanism for keeping the rollers clean and economizing the composition or paint used, and other minor features hereinafter apparent from the following description.

A indicates a supporting-frame of suitable dimensions.

B is the design-roller, having an axis-shaft fixed thereto and journaled in suitable bearings, as b^5 , supported by the frame. This roller B is rotated by hand or other power. A convenient mode of imparting rotation to the roller is through the agency of the belt-wheel b^7 , fixed on said shaft b^5 , and receiving rotary motion from the moving belt b^8 . This roller B is of any suitable material. In completing it for use in carrying into effect that feature of our invention which consists in providing means for the proper presentation of the growth of the wood we take a thin longitudinal section G of the natural wood. This section we bend around the roller B, the length of the growth of the section G being

parallel to the direction in which the roller B revolves. This section is everywhere in close contact with the periphery of the roller B, and hence forms therewith a symmetrical roller. Suitable composition being applied to the periphery of this roller B G, the revolution of the roller will communicate to any surface with which it comes into contact an impression not only of the grain shown by the pores, but also of the growth of the wood. A preferred mode of carrying this transfer of the impression from the roller B G to the surface upon which it is finally to rest is the well-known mode of delivering the impression from the roller B G to a printing-roller, as C, having a peripheral surface elastic enough to enter the depressions in the wood surrounding roller B and taking the printing-ink or equivalent composition according to the formation of the surface of the roller B and transferring the print so obtained onto the surface of the article destined to receive and carry said impression.

An improved apparatus for enabling design, impression, or transfer rollers to do their work accurately and economically will now be described. The design-roller B is provided at each end with an outlying annular flange b^2 , between which latter and the end of the cylinder lies an annular groove b^3 . Below the roller B is a pan or trough E containing the ink or paint. The lower portion of the periphery of this roller is immersed in this ink. This pan E extends under the roller the length of the latter and also beyond the flanges b^2 of the roller B, in order to catch the drippings of ink from the flanges b^2 . The object of the grooves b^3 is to catch the ink running over the ends of the roller and the object of the flanges b^2 is to aid in redelivering this ink to the pan E, where it can be used. Where the end portion b' of the roller B is of a weak material, a metallic shaft-eye b^4 may be employed, embracing the shaft b^5 and rigidly attached thereto and to the end b' of this roller.

In order to cause the roller at all times to be immersed to a given depth in the ink in the pan without continually refilling the pan to a given height, the pan E is vertically adjustable, preferably in the following manner: One side of the pan is pivotally supported at e^2 and the other side is supported by a hanger F, which latter is duly pivoted above to the frame A and which extends underneath the free end portion of the pan E. On the under side of the free end portion of the pan E is the rack e' , and into any one of the depressions of this rack the hanger may be received. When the hanger is in the groove of the rack nearest the free side edge of the pan, the pan is elevated to its highest point. The farther from the side edge of the pan the recess occupied by the hanger F is the lower will the pan E be depressed. By adjusting the hanger F in the proper recess in the rack e' the altitude of the pan will be such as to cause the

roller B to be immersed a proper depth in the ink within the pan E.

In connection with the roller B we provide a scraper e^4 . This scraper extends the entire length of the roller B and bears against the periphery of the said roller. The scraper preferably consists of a piece of stiff leather or equivalent semi-elastic material, and this scraper e^4 is suitably secured in position, preferably as shown, by being screwed to or otherwise secured between the clamping-piece e^5 on the one side and e^3 on the other, the clamping-piece e^3 being connected to the shaft e^2 , which is pivoted in journal-bearings e^{12} in the frame.

The preferred means of keeping the scraper e^4 against the periphery of its roller B consists in the lever e^6 , rigidly fixed at one end to the shaft e^2 . The pressure against the lever e^6 , so as to cause the scraper e^4 to bear with sufficient pressure against the roller B, is exerted, preferably through the agency of the device, as shown—namely, the screw e^9 , engaging the fixed bearing e^8 e^{10} , fastened to the frame, the screw e^9 being duly provided with a hand-wheel, as e^{11} . By adjusting the screw up or down the pressure of the brake against the roller may be increased or diminished at will. A spring e^7 is the preferred means of keeping the lever e^6 against the adjusting-screw e^9 .

A novel and compact mode of supporting the pivoted side of the pan E consists in providing the said side with extension-arms e^{13} , whose under side is recessed and receives the shaft e^2 of the brake e^4 .

The printing or transfer roller C is covered with a suitable elastic substance, which conveys the impression received from the roller B to the wood or other article upon which the impression is to be transferred. In this machine the wood or other article which is to receive the impression from the printing-roller C is passed along over the top of frame A and upon the upper peripheral surface of the roller C. In this way the design upon the roller B can be impressed upon large articles, such as safes, refrigerators, coffins, ready-made furniture, and the like. The roller C is preferably formed with end flanges b^2 and grooves b^3 , substantially as roller B. The shaft C' of roller C is secured to the roller C in a manner similar to that in which shaft b^5 is secured to its roller B. The shaft C' is suitably supported in journal-bearings connected to the frame A. As it is necessary that the roller C should have an adjustment to and from the roller B, the journal-bearing C^5 is made adjustable along the length of the bearing C^6 , attached to the frame. The journal-bearings C^5 are respectively secured in position by a rod C^2 , one end of which rotates freely in the lug C^3 of the journal-bearings C^5 , and is prevented from leaving said lug in either direction by means of collars, a collar in front of and a collar behind said lug C^3 , these collars being rigidly fastened to said

rod C². The other portion of the rod C² is provided with a screw-thread engaging a lug C⁷, rigidly connected to the frame, the rod C² being provided with a hand-wheel C⁴. By rotating the rod C² its adjacent journal-bearing C⁵ is advanced or retracted at will. Thus either or both ends of the shaft C' of the roller C may be advanced or retracted at will, and the periphery of roller C be kept in proper and even contact with the peripheral surface of roller B. The roller C is likewise provided with a pan E, having hanger F, whereby it may be elevated or lowered at will. The pivoted side edge of the pan E is provided with the lugs e¹³, similar to those on the pan E of the roller B, and these lugs e¹³ rest upon the shaft of the scraper e⁴, bearing against roller C. This last-named scraper e⁴ is made of a material similar to that of the scraper against roller B, and is secured by similar clamps to its respective shaft e², duly supported in the frame. It may be here remarked that the purpose of the lug e¹³ of the clamps e⁵ of the scraper e⁴ belonging to the respective rollers is to prevent the pivoted edge of the respective pans from rising off of and away from the shaft e², upon which they rest, unless intentionally removed by human agency. The preferred means for causing the scraper e⁴ to impinge against the peripheral surface of roller C are the same as those provided for a similar purpose in connection with the scraper e⁴ of roller B, and are the lever e⁶, rigidly fixed to shaft e², and adjusting-screw e⁹, provided with hand-wheel e¹¹, the screw e⁹ working in the lug e⁸, connected to the frame, and a lever e⁶ being kept against the end of the screw e⁹ by the spring e⁷. The pan E of the roller C contains benzine or equivalent substance for cleansing the roller C.

The mode in which our apparatus operates is, in general, as follows: The roller B, rotating in the direction of the arrow X, takes up the ink on its periphery. As the peripheral surface of the roller passes its scraper e⁴, the latter removes therefrom all superfluous ink, leaving upon said surface of the roller the proper amount for transmission to the roller C. The surplus ink scraped off by the scraper e⁴ runs back down over the shield e¹⁴, which latter serves the purpose of a conveyer as well as a detent, as heretofore described, to hold the pan in position, and flowing on downward returns to the pan E for use. The roller B, pressing against roller C, not only imparts a rotating motion to the roller C, but transmits to the said transfer-roller C an impression of the surface of the wood-section G, located on the periphery of the roller B. The roller C, being in contact with the article destined to receive the impression or print of the wood surface G, transfers to said article said impression or print, the wood or other article receiving said impression from the roller C, moving forward from right to left over the roller C as the roller C revolves. As

the roller C rotates, those portions of it which have given off their impression to the article to be printed upon successively enter the bath of benzine or equivalent cleaning and washing substance located in the pan E below roller C. The effect of this benzine is to quite thoroughly wash and cleanse the roller C and soften all of the ink or equivalent composition upon that portion of the roller which is immersed in and passed through the bath of benzine. As the roller continues to revolve, its scraper e⁴ scrapes clean the surface of the roller C and presents that portion of the said surface which is to come into contact with the roller B in a clean condition and ready to receive a new impression from the roller B. Thus that part of the roller C which is to transfer the impression from the roller B to the article destined finally to receive the print or impression is not, as it meets the roller B, covered with a previous coating of ink, bearing a previous impression, thereby compelling the roller B to perform a double operation of erasing by pressure the previous print contained upon roller B, as well as to impress thereupon a new impression. Such mingling of the old and new impressions tends to blur the new impression and injure the definition of the last-made impression. By means of our provision of the cleansing-bath and a scraper in connection with roller C the impression from roller B is made upon a sufficiently clean and clear surface of roller C, and as a result the impression transferred from roller B by roller C to the article which is destined finally to receive the impression is clear, definite, and accurate.

While the various features of our invention are preferably employed together, one or more of said features may be used without the remainder, and in so far as applicable one or more of said features may be used in connection with machines for transferring the impression of the grain or pore markings of wood.

What we claim as new and of our invention, and desire to secure by Letters Patent, is—

1. In a mechanism for obtaining a design from wood and transferring it to the surface of the article to receive the design, a thin section of wood bent in a curved or cylindrical form, the growth of the wood being thrown out and forward for imparting an impression of itself, together with that of the grain, to the article to be marked, substantially as and for the purposes specified.

2. In mechanism for transferring impressions of the surface of wood to another surface, the wood-section G, bent closely around the design-cylinder B, the growth of the wood being projected outward, substantially as and for the purposes specified.

3. The combination of the wood-section G, enveloping the design-cylinder B, the growth

of the wood being thrown forward and outward, and the printing-cylinder C, substantially as and for the purposes specified.

4. In a mechanism for transferring impressions from the design-roller, the roller provided with the pan E, pivoted at one side edge and at or near its opposite edge provided with the rack e' , curved in cross-section, and adjustable hanger F, whose point of suspension is elevated above the adjacent portion of the pan and whose lower cross piece or arm fits into any one of the grooves of the rack, as desired, substantially as and for the purposes specified.

5. In a mechanism for transferring impressions from the design-roller, the roller provided with scraper e^1 , operated through the shaft e^2 and provided with clamps e^3 e^5 , and pan E, provided with supporting-lugs e^{13} , resting upon shaft e^2 of the scraper, the clamp e^5 being provided with outlying flange e^{14} , lapping over the adjacent edge of the pan, substantially as and for the purposes specified.

6. In a mechanism for transferring impressions from the design-roller, the roller provided with the scraper e^1 , operated through the shaft e^2 and provided with clamps e^3 e^5 , and pan E, provided with supporting-lugs e^{13} , resting upon shaft e^2 of the scraper, the clamp e^5 being provided with outlying flange e^{14} , lapping over the adjacent edge of the pan, the other side of the pan E being provided with rack e' , in combination with hanger F, supported by the frame, substantially as and for the purposes specified.

7. In a mechanism for transferring impressions from the design-roller, the roller-brake e^4 , oscillating on the shaft e^2 , the lever e^6 , having an end fixed to shaft e^2 and the other end held down by an adjustable and adjusting

screw e^9 , thereby pressing the brake against the roller, and a device, substantially as spring e^7 , for holding the lever e^6 against the end of screw e^9 , substantially as and for the purposes specified.

8. In a mechanism for transferring impressions from a design-roller, the combination of the design-roller B and the roller C, and apparatus for cleansing and cleaning roller C of ink already used in a previous impression, substantially as and for the purposes specified.

9. In mechanism for transferring impressions from the design-roller, the roller B and scraper e^1 , bearing against same for enabling the said roller to be cleaned of surplus ink before imparting an impression to the transfer-roller C, the latter roller and a scraper e^1 bearing against this last-named roller, and a pan or bath of cleansing-fluid, whereby the latter is applied to the transfer-roller, substantially as and for the purposes specified.

10. In a mechanism for transferring impressions from the design-roller, the combination of the design-roller B and transfer-roller C, the latter provided with pan E, containing a cleansing-liquid, and also provided with scraper e^1 , substantially as and for the purposes specified.

11. In a mechanism for transferring impressions from the design-roller, the combination of the design-roller B, provided with pan E and scraper e^1 , and the roller C, provided with pan E and scraper e^1 , substantially as and for the purposes specified.

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