No. 670,847. Patented Mar. 26, 1901.

# W. N. CORNELL.

## IMITATION WOOD AND PROCESS OF MAKING SAME.

(Application filed Apr. 12, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1

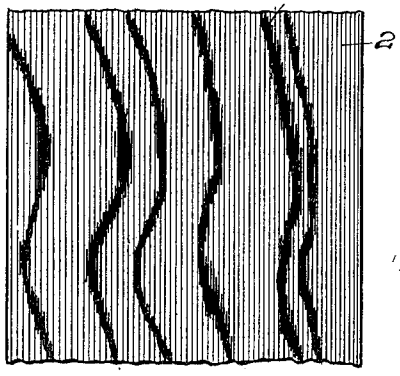



Fig. 2

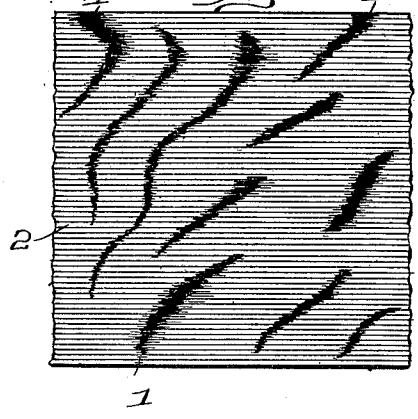



Fig. 3

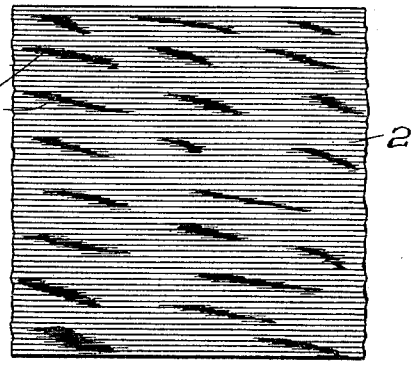
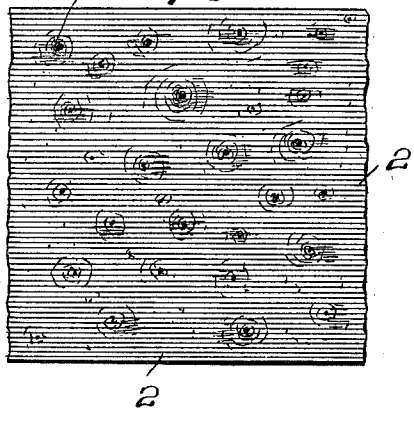



Fig. 4




Witnesses:
J. M. Fowler Jr.
C. G. Stickney

Inventor:
William N. Cornell
by Ronald Hunter Dyer
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 670,847. Patented Mar. 26, 1901.

W. N. CORNELL.

IMITATION WOOD AND PROCESS OF MAKING SAME.

(Application filed Apr. 12, 1900.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 5.

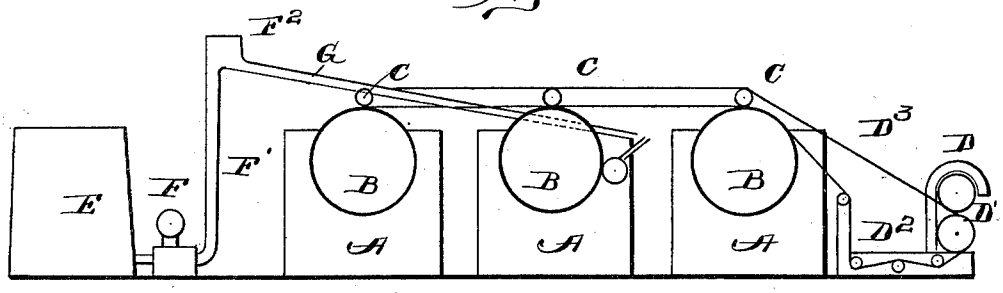



Fig. 6.

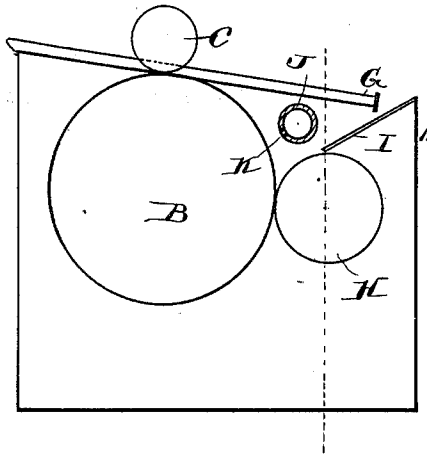
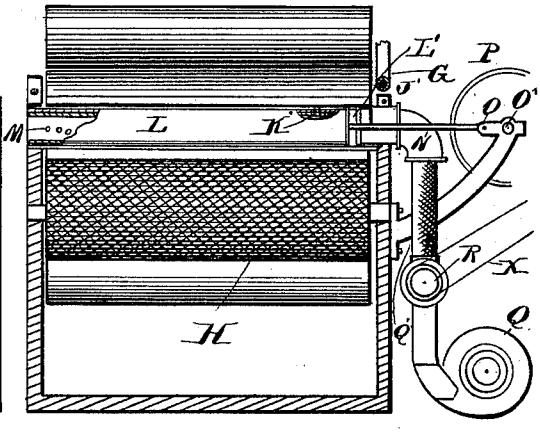



Fig. 7.




Witnesses:
J. McTowler Jr.
E. G. Stickley.

Inventor
William N. Cornell.
by Leonard Hunter Dyer
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

WILLIAM N. CORNELL, OF WATERTOWN, NEW YORK, ASSIGNOR TO LYNDON H. STEVENS, OF NEW YORK, N. Y.

## IMITATION WOOD AND PROCESS OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 670,847, dated March 26, 1901.

Application filed April 12, 1900. Serial No. 12,580. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM N. CORNELL, a citizen of the United States, residing at Watertown, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Imitation Wood and Processes of Making the Same; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in imitations of various varieties and kinds of woods and to the process of making the same.

The object of my invention is to so distribute irregular particles or portions of pulp upon a continuous backing formed on the face of the making-cylinder of the ordinary type of paper-making machines as to produce a perfect imitation of the knots and burls of natural woods. I have heretofore experienced great difficulty in distributing these particles of pulp across the face of the making-cylinder and at the same time to have the particles of pulp of uniform thickness and yet distributed irregularly upon a backing, so as to give the paper the appearance of natural wood. I have also experienced great difficulty in having the pulp thick enough in contact with the working face of the cylinder to accomplish this end.

The improved imitation wood is characterized by the irregular disposition of the pulp particles, which differ in appearance from the embracing sheets of pulp, which are formed upon the cylinders in the usual way. By my process I place the pulp (which for the purpose of this invention is supposed to be preliminarily formed in a rather thick state) in independent particles upon a sheet or backing which is formed on the surface of the making-cylinder, thereby separating them sufficiently to form the irregular appearance of natural wood. This irregular application of the particles of pulp is made through the agency of a blast of air, which may be varied in duration, location, and intensity to differentiate the distribution and imitate woods of different physical characteristics.

One way of carrying out my process is by the means described and illustrated in my copending application, Serial No. 3,827, filed February 3, 1900.

In order to better understand the nature and characteristics of my improved product, together with one means for carrying out my process, attention is called to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a view of imitation mahogany or rose-wood. Fig. 2 is a view of imitation quartered oak. Fig. 3 is a view of imitation curly maple. Fig. 4 is a view of imitation pin or bird's-eye maple. Fig. 5 is a side view of an ordinary style of wood-pulp machine, with a device attached thereto for carrying out my process. Fig. 6 is an enlarged view of one of the vats. Fig. 7 is a side view of the vat, cylinder, and distributing-tube, and a sectional view of the auxiliary cylinder.

In all the several views like parts are designated by the same letters of reference.

Fig. 1 represents a wood having a continuous streak 1, of darker color, upon a base or backing 2, of uniform color, like a certain grade of mahogany or rose-wood. This is produced in the following manner: The vibrating pipes are locked together and slowly vibrate. The air-valve is set to allow of a continuous blast. The pulp placed on the cylinder by the air-blast is of a darker shade than the sheet taken up by the other cylinders from the vats. There being no break in the air-blast, the deposit of pulp is in continuous streaks.

Fig. 2 represents imitation quartered oak and woods having a long flake or cut quartering of the annular growth. It is produced by vibrating the pipes while locked together, in combination with the air-blasts varied in intervals of such length as to produce the result desired.

Fig. 3 represents curly maple or woods having a natural wavy flake. It is produced by clamping the inner pipe and vibrating the outer pipe, so as to change the size and distribution of the flakes. At the same time the air-blasts are varied in duration and force, as may be desired.

Fig. 4 represents pin or bird's-eye maple and other woods having small knots distributed throughout their surface. It is pro-

duced by clamping the inner pipe and rapidly vibrating the outer pipe, in combination with short quick blasts of air through the openings caused by rapidly opening and closing the valve.

As shown in Fig. 5, the plant for carrying out my process may consist of a series of vats A A A, each containing a making-cylinder B, with a couch-roll C, mounted in swinging bearings and engaging with the upper face thereof. The upper and lower press-rolls D D′ and the felt roll $D^2$ and felt $D^3$ are arranged, as heretofore, upon almost every variety of pulp-machine known to the trade. The stuff-vat E, which contains the pulp in a very thin paste, is arranged as shown. A pump F forces the pulp from the stuff-vat through the pipe F′ into an elevated reservoir $F^2$, from which it passes through an inclined pipe G to a point adjacent to the centermost of the making-vats. As shown in the illustration, the center vat is the only one having the addition thereon; but this is not essential, as the attachment to be described may be applied to any or all of the vats. Mounted within bearings upon the sides of the central vat A and so arranged as to be parallel to the shaft of the making-cylinder is the feed-roll H. This roll is covered with fine wire-cloth or its equivalent. A suitable apron or board I is arranged above the roll and adjacent to the outlet of the pipe G for the pulp in a thin liquid state to flow between it and the cylinder. The water will pass away through the interstices of the wire-cloth and transform the pulp into a thick mass at the point of contact with the rolls D and H. Above the roll and cylinder and parallel thereto, but separated a short distance from the cylinder, is arranged a normally stationary pipe J, having openings K K, pointing toward the working face of the cylinder. The pipe is mounted in pipe-bearings J′ on the edge of the vat, so that it may be twisted to vary the angle of the openings. Surrounding this pipe J is a second pipe L, having registering openings M therein. In order to give the tube L an oscillatory, undulatory, and vibratory motion, a pitman N is provided, which connects with a groove L′ in the pipe L to a crank O, mounted upon a shaft O′. The latter is rotated by means of a pulley P, driven by a belt from any suitable source of power—as, for instance, the making-cylinder shaft. Two holes or openings may be made in the pipes J and L, which will register when the holes K and M are registered. These holes are lettered K′. When registered, a suitable pin may be inserted, which will lock the two pipes together. The clamp-bearing J′ J′ being loosened will allow the two pipes to vibrate simultaneously.

Q is a fan or blower connected to the inner stationary pipe J by means of a flexible tube Q′, the latter being used to allow the inner pipe, when desired, to be vibrated.

R is a rotary cut-off valve to vary the blasts of air passing through the inner pipe. The valve is rotated at any desired rate of speed by means of a belt X, which connects with a constantly-moving source of power.

My process is carried out in the following manner: The pulp passes through the pipe G and flows down the apron over the top of the wire-gauze roll H into the "nip" or space between the top of the wire-roll and a corresponding height on the face of the cylinder B. From the nip particles of pulp are blown by the air escaping under pressure through the perforations K in the pipe J. As shown in Fig. 6, the blast of air may be directed downward upon the surface of the pulp and portions removed therefrom and splashed or spattered upon the web of pulp being carried up by the making-cylinder B. It will be understood that the making-cylinders in the three vats A take up and form a sheet of pulp of a single color. As shown in Fig. 5, the sheets from the central vat and the one to the left will be united; but these two will be separated from the sheet formed at the right by the separate particles of spattered pulp. This will form a sheet with two layers of plain pulp for a backing, covered with the particles and an extra layer of the plain pulp. The attachment is kept in operation until the necessary number of layers have been formed to produce the desired thickness of board. The openings of the perforated pipes may turn downward below the surface of the pulp or above, according to the amount of pulp desired to be thrown upon the face of the cylinder or the size of the particles to be blown against the cylinder-face. By making the feed-roll of wire-cloth it allows the water to pass away, thus leaving the pulp thicker than it could flow into this nip and in proper condition to be blown against the cylinder. The pulp has to be very thick at this point to accomplish this object. If this valve be set for a continuous blast or current of air through the pipe, it will blow or lift a streak or strip of pulp on the cylinder-face. When this is desirable, the valve is locked open by removing the belt X, so as to give one opening and a continuous blast, the two pipes J and L being locked together, and therefore vibrating simultaneously. The effect of crotched mahogany is produced. By making the blast of air of desirable duration quartered oak is produced. Any other variety of wood may be imitated by varying the position and operation of the pipes J and L and the valve R.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An improvement in imitation wood, formed of a plurality of continuous sheets or backings of pulp, between which separate pieces of pulp are irregularly disposed.

2. The art of making imitation wood, which consists in forming a layer or sheet of pulp and in blowing pulp upon the same by means

of a blast of air varying in duration, whereby separate pieces or particles of pulp will be placed upon the layer or sheet irregularly, and a non-continuous surface formed.

3. The art of making imitation wood, which consists in forming a layer or sheet of pulp and in blowing pulp upon the same by means of a blast of air, varying in intensity, whereby separate pieces or particles of pulp will be placed upon the layer or sheet irregularly, and a non-continuous surface formed.

4. The art of making imitation wood, which consists in forming a layer or sheet of pulp and in blowing pulp upon the same by means of a blast of air, varying in location, whereby separate pieces or particles of pulp will be placed upon the layer or sheet, irregularly, and a non-continuous surface formed.

5. The art of making imitation wood, which consists in forming a layer or sheet of pulp and in blowing pulp upon the same by means of a blast of air, varying in duration and intensity, whereby separate pieces or particles of pulp will be placed upon the layer or sheet irregularly, and a non-continuous surface formed.

6. The art of making imitation wood, which consists in forming a layer or sheet of pulp and in blowing pulp upon the same by means of a blast of air, varying in duration and location, whereby separate pieces or particles of pulp will be placed upon the layer or sheet irregularly, and a non-continuous surface formed.

7. The art of making imitation wood, which consists in forming a layer or sheet of pulp and in blowing pulp upon the same by means of a blast of air, varying in duration, intensity and location, whereby separate pieces or particles of pulp will be placed upon the layer or sheet, irregularly, and a non-continuous surface formed.

This specification signed and witnessed this 30th day of March, 1900.

WILLIAM N. CORNELL.

Witnesses:

CORNELL N. SMITH,

O. D. COLLINS.