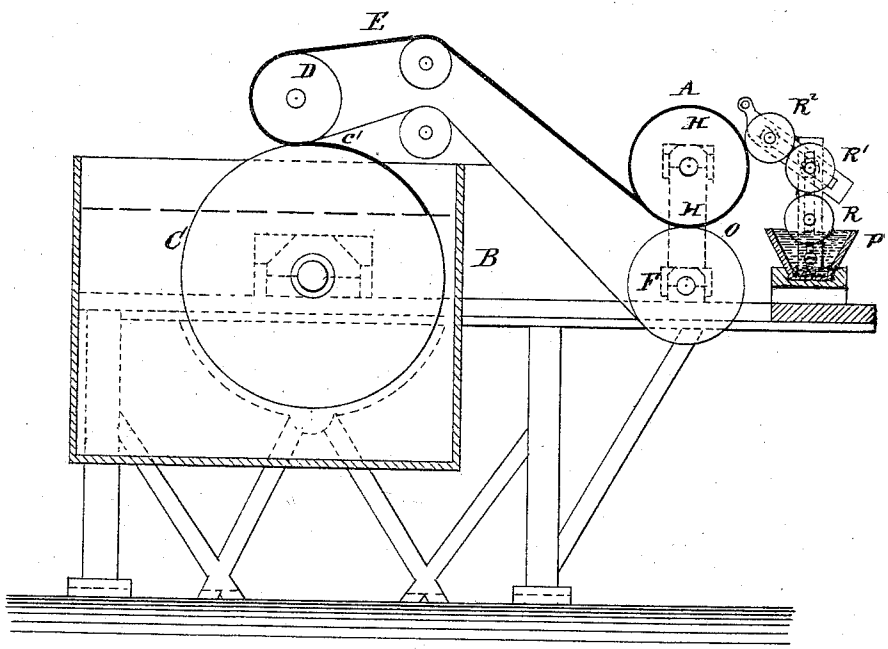
W. P. ARNOLD.

Improvement in the Manufacture of Pasteboard, Composition-Boards, Panels and other Articles from Reed.

No. 130,463. Patented Aug. 13, 1872.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN THE MANUFACTURE OF PASTEBOARD, COMPOSITION BOARDS, PANELS, AND OTHER ARTICLES FROM REED.

Specification forming part of Letters Patent No. **130,463**, dated August 13, 1872.

Be it known that I, WILLIAM P. ARNOLD, of the city of New York and State of New York, have invented a certain new and useful Process and Machinery for the Manufacture of Pasteboard, Composition Boards, and Panels, and other similar articles from the reed-cane disintegrated by the explosive force of steam and other fibrous substances, of which the following is a specification, reference being had to the accompanying drawing, which will serve to illustrate more fully my invention.

To make pasteboard from the cane-fiber disintegrated as aforesaid it is beaten up in a rag-engine in the ordinary way and then run off upon a wet-roll machine, thin paste or other adhesive liquid matter being applied, by the machinery hereinafter described, to the web as it is passing around the wet roll. In this way the paste or other matter is interposed between the sheets, which serves to fasten them together and give the necessary tenacity, compactness, and hardness to the cane-fiber, which would otherwise be too soft and tender to make good pasteboard or box-board by the wet-roll machinery. The manufacture is completed by drying and calendering, which may be done in the ordinary way. The steam-blown cane-fiber prepared as aforesaid is specially adapted to this method of applying liquid paste or adhesive and stiffening and strengthening matter in a liquid form to the web running around a wet roll; but the same method may be applied with good effect to bamboo and other vegetable fibrous substances prepared for the same purposes. Fire-proofing and water-proofing liquid compositions can be applied in the same way to the web running around the wet roll to make fibrous boards and panels. The several webs forming the board or panel are thoroughly charged or covered with the fire-proofing or water-proofing composition, and thus rendered fire-proof or water-proof, or both, as may be desired, and, the same being dried and passed through calender-rolls or otherwise subjected to a proper degree of pressure, will be available for building and other purposes.

The following is a description of the machinery for making the said new articles of manufacture, reference being had to the drawing hereto annexed.

A is the roll upon which the continuous web is deposited after leaving the endless felt at O. B represents the mold-vat of an ordinary board-machine; C, the making or forming mold or cylinder. C′ is the point at which the web formed in the mold is taken up by the felt; D, the coucher-roll; E, the endless felt; F, the lower roll around which the felt passes. H H are the grooves along which the machine-tender draws his knife to divide the sheets prior to taking them from the roll A; P, the paste box or trough; R R′ R″, rolls for supplying paste, &c.

Instead of permitting layer upon layer of the web to form and felt one upon the other, as is now the practice, I interpose coatings or layers of paste, mucilage, gum, glue, or other materials between each successive fibrous web or layer deposited upon the roll A. This may be effected at any point of the roll A, either in the front, top, or rear, by means of two or more rollers revolving in a bath, or being otherwise supplied with paste, mucilage, gum, glue, &c., from a vessel or reservoir conveniently placed. I prefer the application of the paste, mucilage, glue, or other liquid or semi-liquid to be made to the web at the point I have named, because at the point O on the roll A the bulk of the water has been gradually and efficiently expressed. If applied to the surface of the continuous web at any point after it has left the forming-mold C, it must be after it has been subjected to the action of rollers to squeeze out the water. It is better, however, not to apply the paste, &c., before the final passage of the web onto the wet roll, because much of the paste, glue, or other liquid or semi-liquid is wasted by being expressed with the water in the pulp at the point where the rolls A and F come in contact. Two forming-molds may also be used, but I have found that a better material is made where one only is used. In front of the roll A, and parallel with it, I place a paste box or trough, P, supported by standards or attached to the frame of the machine, or otherwise. This is placed at a convenient elevation, and is supplied from a vessel or reservoir containing the liquid that it is intended to apply. In this box or trough P the roll R revolves. Upon this roller lies another roller, R′, and still upon this is another roller, R″. These rollers are made of

wood or other suitable material, and are evenly covered with woolen felt, rubber cloth, or other material suitable to take up and distribute the paste, &c., uniformly. Two rolls may suffice, but I prefer the arrangement of three rolls, as described in the drawing. The three rolls are driven by the friction imparted to them by roll A, and run in contact with each other and synchronously with rolls A and F. If gearing or belting be used to drive the rolls R, R′, and R″, then, in order to prevent the breaking or disarrangement of the wet and tender web, such gearing or belting, in lieu of the friction from roll A, must connect one or both of the rolls A and F (or a roll having precisely the same degree of speed as the rolls A and F) with the series of rollers R, R′, and R″, so as to secure the synchronous movement. The paste or other liquid, being first taken up on R, is passed by means of R′ onto R″. This latter roller is allowed to lean upon the sheet as it is forming on roll A. The rollers so arranged secure a proper supply of the paste, &c., to the web without breaking or disarranging such web, and the continuous sheet forming on the roll A is uniformly coated with the paste or other liquid and passes round the roll until it meets the web (as yet untouched with paste, &c.) at the point K. This is allowed to continue until a board of the required weight is made. The upper roll R″ is so arranged that it may be thrown back and the supply of liquid stopped whenever it is found desirable. A stout iron rod running above and along the roll R″ will accomplish this; but this, in connection with a hand-lever properly arranged, is preferable. Before the last web is run upon the roll the paste-roll, brought in contact with the web running on the wet roll, is withdrawn, so as to leave a clean outer web or covering, whereby the sheets are prevented from sticking to the calender-rolls.

By the use of the above method or process many liquids, or semi-liquids other than paste or mucilage, &c., may be applied to the continuous web and deposited on the wet roll. For example, the various chlorides or oxides may be so applied, for the purpose of rendering paper boards, panels, &c., fire-proof or water-proof, or both.

Materials which, from their nature, would be unfit or ill adapted for the manufacture of a merchantable "board" can by my process be converted into a board of a very superior quality. For example, the cane-fiber disintegrated by Lyman's steam-blowing process is somewhat too soft and tender (unless heavily treated with chemicals) to make a hard, compact, and tenacious board; but by the application of mucilaginous matter as above all those defects are remedied, and a board of a very superior quality is obtained.

What I claim as new, and desire to secure by Letters Patent, is—

1. The above-described method or process of manufacturing pasteboard, fibrous composition boards, and panels from the reed-cane disintegrated by the explosive force of steam and other fibrous substances, by applying paste, mucilage, gum, glue, and other materials to the web running around a wet roll, substantially as above described.

2. The improved articles of manufacture, consisting of pasteboard, fibrous composition boards, and panels, and other similar articles, made by the process and method herein described.

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Witnesses:
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