J. W. HYATT.

Apparatus for Covering Cores and Forming Tubes of Celluloid and other Plastic Material.

No. 204,227. Patented May 28, 1878.

Fig. 1.

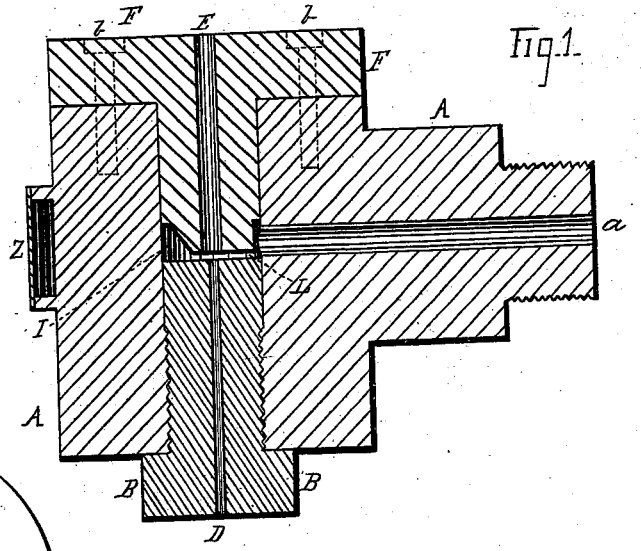


Fig. 3.

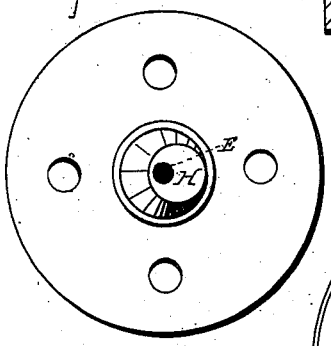


Fig. 2.

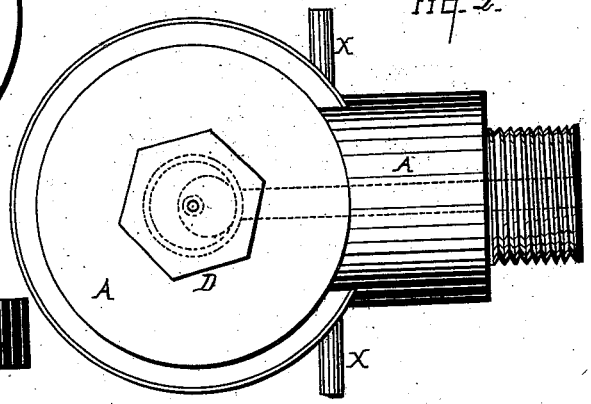
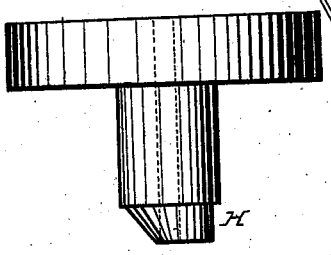


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN W. HYATT, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE CELLULOID MANUFACTURING COMPANY, OF NEW YORK, N. Y.

IMPROVEMENT IN APPARATUS FOR COVERING CORES AND FORMING TUBES OF CELLULOID AND OTHER PLASTIC MATERIALS.

Specification forming part of Letters Patent No. **204,227**, dated May 28, 1878; application filed April 27, 1878.

To all whom it may concern:

Be it known that I, JOHN W. HYATT, of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Nozzles for Covering Cores with and Forming Tubes of Plastic Composition, of which the following is a specification, reference being had to the accompanying drawings.

The invention relates to a means of coating a core or bar of wood or other substance with plastic composition; and consists in a nozzle, through which the material is fed to a chamber having an annular space, which increases at its apex in width proportionately to the distance of its periphery from the point of supply, thus proportionately reducing and equalizing the friction of the material in its passage from the point of supply to its contact with the core. The essential elements of the invention are an inlet, through which the core, snugly fitting, passes into the space which contains the coating material, being therein covered, whence it passes out through an outlet of such size as to accurately fit the coated core.

The supply of the material is furnished into a space arranged eccentrically to the outlet through which the core passes in being coated, this to the end that the flow of the material may be so proportionately retarded by friction as to furnish a relatively similar supply to all sides of the core.

Figure 1 is a vertical central longitudinal section of the device in question. Fig. 2 is an end view of the same, the internal construction being shown in dotted lines. Fig. 3 is a plan view of the head of the plug F. Fig. 4 is a side elevation of same.

In the accompanying drawings, A represents the nozzle, provided with a suitable channel, *a*, and having its shank attached by a thread, or in any other suitable manner, to the base of a stuffing-machine. (Not shown.) B is a plug securely and adjustably attached to the nozzle A, for the purpose of advancing or retracting the plug, and accordingly reducing or permitting an increase in the flow of the material to the core. The plug B is provided with the inlet D, of such size as to accurately correspond with the transverse section of the core, opposite the channel in which, and having a coincident axis therewith, is provided the outlet E, which is of such size as to accurately correspond with the transverse section of the coated core, being therefore larger than the inlet D.

The outlet E is located in the plug F, which is secured to the nozzle A by means of the screws *b*, and terminates in the circular head H, which, as to its apex, is beveled eccentrically to the mouth of the outlet E, being reduced on its edge in a proportionately greater degree as said edge is distant from the mouth of the channel *a*. The diameter of the head H is less than the adjacent parts of the plug F, and does not extend so as to impinge the plug B, thus forming the space L.

The periphery of the head H is nearly vertical at the point opposite the channel *a*, whence it is provided with a constantly-increasing bevel to the point opposite that aforesaid, where the bevel reaches its maximum. Thus an eccentric annular chamber, I, is formed about the sides of the head H. The outlet is therefore central as to the base of the head H and eccentric as to its upper surface.

To heat the device, and thus keep the material in a plastic condition, there is provided the pipe X, which supplies a current of steam or other suitable heating agent to the steam-band Z, which encompasses the device at about its center, one end of the pipe Z serving as an inlet and the other as an outlet for the steam.

The operation is as follows: The nozzle being attached to the stuffing-machine provided with suitable material, the machine is operated. The material flows into the channel *a*, and thence into the annular chamber I, and also into the space L. The rod or core is now introduced into the inlet D, which prevents the flow of the material through the inlet, and causes a current toward the outlet E, which takes up the rod and gradually draws it through the space L, thus coating it evenly on all sides. Now, as the material passes through the space L it comes in contact with a correspondingly-reduced surface in propor-

tion as it becomes removed from the channel *a;* hence, the friction being reduced at each succeeding point, the flow of material to the core is correspondingly equalized, being the same at the point nearest to and farthest from the mouth of the channel *a,* as well as at all the other intermediate points. Care must be taken not to so advance the plug B as to reduce the space L so much that the friction between the outlet and the channel *a* would be so great as to prevent the proper supply at the point on the outlet next opposite to the channel *a.* At the same time care should be exercised not to so far retract the plug B as to inordinately enlarge the space L, and thus permit an excessive supply at the point directly opposite the mouth of the channel.

It is to be carefully noted that the greater the space between the edge of the outlet E and of the upper part of the head H the greater the friction encountered by the material, and hence, the plug B being retracted, there would be a freer supply over the narrow than the wider surfaces.

It is plain that by the above-described operation cores of any material may be readily coated, and that such cores may be of considerable length; also, that they may be withdrawn from their covering, which would remain tubes or tubular structures of almost any desired length.

Preferably the cores should be removed before the covering has fully dried, as the shrinkage might retard their removal; also, the cores should, in this operation of forming tubes, be coated with some suitable lubricant to facilitate their being withdrawn.

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

1. A machine for coating surfaces with plastic composition, in which the outlet occupies a position to reach which the flow of material is equalized by proportionate friction with the space over which it passes, substantially as specified.

2. The outlet E, located eccentrically to the upper surface of the head H, substantially as set forth.

3. The head H, beveled substantially as specified.

4. The plug B, adjustable with relation to the head H, substantially as expressed.

5. The combination of the head H and a suitable adjustable surface, arranged with relation to increasing or reducing the friction of the material passing over the upper surface of the head H, substantially as set forth.

6. The plug F, provided with the outlet E and head H, in combination with the plug B, provided with the inlet D, sub
forth.

7. A machine for coating a surface with plastic composition, in which the flow of material to the core or surface to be coated is equalized by the proportionate surface over which it passes in reaching the core, substantially as set forth.

8. A machine for coating a continuous core with plastic composition, in which the core is sustained at all points by the evenly-distributed flow of the material to it, which flow also causes its progress through the chamber containing the coating composition, substantially as set forth.

9. The process of forming tubes of plastic composition, which consists in feeding the composition in equal quantities to all sides of a core, which core is withdrawn from the composition, leaving the tubular coating, substantially as set forth.

In testimony that I claim the foregoing improvement in nozzles for covering cores with and forming tubes of plastic composition, as above described, I have hereunto set my hand this 5th day of March, 1878.

JOHN W. HYATT.

Witnesses:
SAMUEL S. TIFFANY,
WILLIAM R. SANDS.