2 Sheets—Sheet 1.

W. H. BROCK.

PAPER-TUBE MACHINE.

No. 169,620. Patented Nov. 9, 1875.

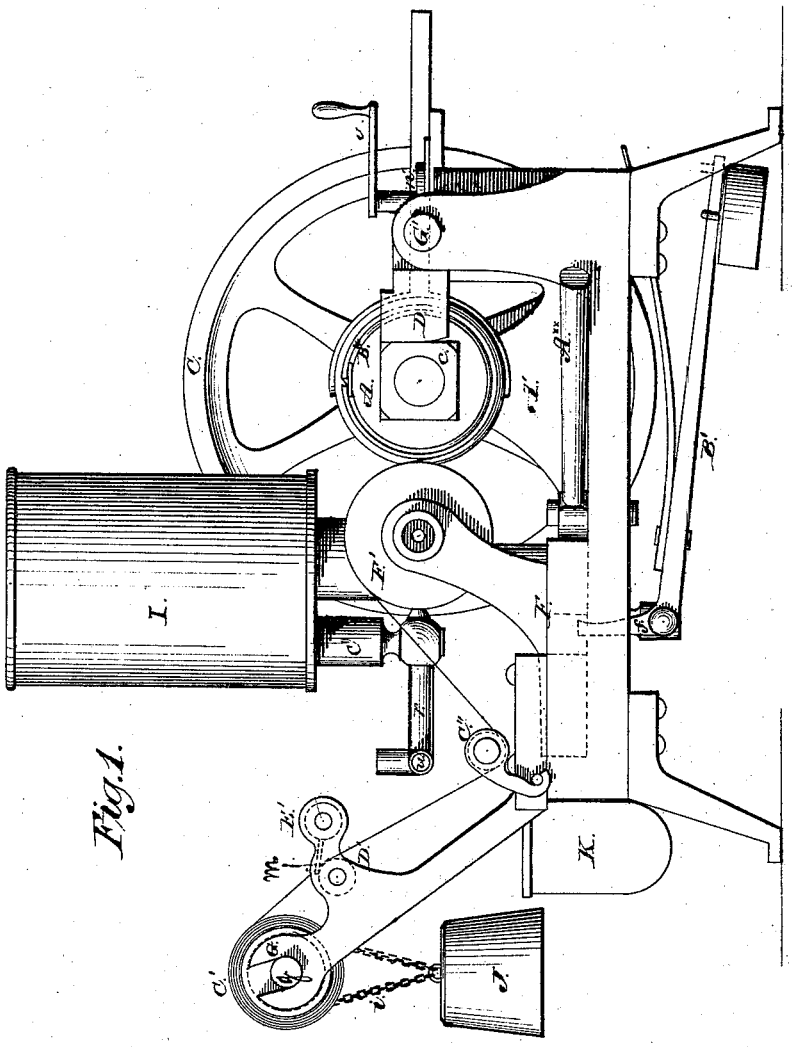

Fig. 1.

Attest:
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Atty.

2 Sheets—Sheet 2.

W. H. BROCK.

PAPER-TUBE MACHINE.

No. 169,620. Patented Nov. 9, 1875.

Fig. 3.

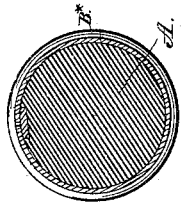
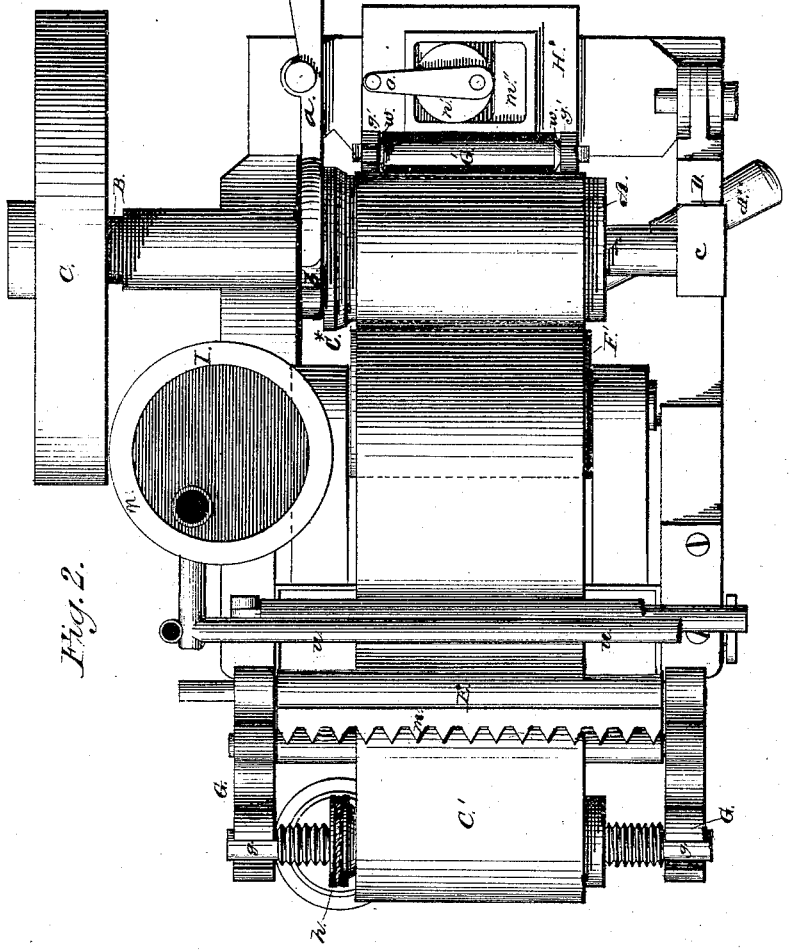


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM H. BROCK, OF HUNTER'S POINT, ASSIGNOR TO JABEZ A. BOSTWICK, OF NEW YORK, N. Y.

IMPROVEMENT IN PAPER-TUBE MACHINES.

Specification forming part of Letters Patent No. **169,620**, dated November 9, 1875; application filed January 7, 1875.

CASE C.

To all whom it may concern:

Be it known that I, WILLIAM H. BROCK, of Hunter's Point, in the county of Queens and State of New York, have invented certain Improvements in Paper-Tube Machines, of which the following is a specification:

This invention relates more particularly to the manufacture of the cylindrical bodies of paper vessels used for holding oils and other liquids, the said bodies being formed of successive layers of paper cemented together with glue or other suitable cement.

The invention comprises certain novel combinations of parts, whereby, during the operation of laying or winding the paper in successive layers, the glue or other cementing material may be evenly and uniformly distributed thereto in the hot and liquid condition, most favorable to the complete cementing of the layers together; whereby the length of paper requisite for the formation of one of the said bodies may be quickly and effectually severed from the roll at the proper stage in the operation of forming the body; whereby the end of the length of paper used in such formation of the body is snugly brought up upon the surface of the body to complete the final layer; whereby the body is brought to the proper length for use; and whereby provision is made for the convenient removal of the finished body from the machine.

Figure 1 is a side elevation and partial section of a machine made according to my invention, and Fig. 2 is a plan view of the same.

A is a mandrel or cylindrical former, rotating with its shaft B, but capable of removal therefrom, as hereinafter explained. The said shaft B may be used as the driving-shaft of the apparatus, and for that purpose provided with the band-wheel C. Upon the mandrel is a longitudinally-divided sleeve, B*, of spring steel or brass, the end of which abuts against the inner side of a collar, C*, caused to rotate with the mandrel by a key attached to the collar, and playing in a groove in the mandrel. A limited longitudinal movement may be given to the collar, and consequently to the sleeve on the mandrel, by means of a shipping-lever, a^*, the forked end of which plays into a peripherical rabbet, *b*, in the outer edge of the collar, as represented in Fig. 2. D is a lever, provided at one end with a squared recess, fitting the exposed corner of the bearing *c*, so as to hold the same in place. F is a sliding carriage, carrying a roller, F′, which may have a diameter about the same as that of the mandrel A. In the normal working of the machine this carriage with its roller is kept in position by its own weight, or friction upon its guides, formed on the supporting-frame of the apparatus; but on occasion it is moved inward by depressing a lever, B′, the toe or short arm *f* of which (shown in dotted outline in Fig. 1) bears against the base of the aforesaid carriage. G are stirrups, which receive the ends of the shaft *g* of the roll C′ of paper designed for use in the fabrication of the body. On the shaft *g* is provided one or more grooved wheels, *h*, on which is hung a loop, *i*′, each sustaining a weight, *j*, the friction of the loop on the pulley steadying the motion of the roll of paper as it revolves during the operation of the machine. D′ is a supporting-roller, and C″ a small guide-roller. E′ is a cylindrical bar, capable of an axial motion when turned by a handle, the said bar having its ends journaled in suitable bearings in the main frame. Projecting radially from this bar is a serrated cutter, *m*, the serrated edge of which is constituted by a series of acutely-pointed teeth. The position of the bar E′ is, of course, parallel with that of the roller, mandrel, &c. A^{**} is a lever, the inner end of which is of cam-like form, so that, by moving the said lever to a position transverse to the length of the machine, the roller F′ may be brought away from the mandrel A. I is a glue-pot or cement-reservoir, surrounded by a steam-jacket, *n*, supplied with steam from a suitable generator through a pipe, this jacket *n* being also extended downward around the outlet-throat *c*″ of the reservoir I aforesaid. In the closed lower end of this throat *c*″ is a tap, *r*, the orifice of which is of such proportions, and so situated, that by turning the tap axially the outflow from the reservoir may be

stopped in the same manner as by turning the tap of a faucet. Upon the outer end of this tap *r* is a cross-pipe, *u*, that, in the operation of the apparatus, extends across the same in a position parallel with that of the bar E′. This cross-pipe *u* is perforated on its under side with a longitudinal series of holes.

The several parts being in the position represented in the drawings, and hereinbefore described, the end of the paper on the roll C′ is passed upon the supporting-roller D′, under the guide-roller E′, over the roller F′, and thence downward to the lower side of the mandrel A, and is held in contact with the latter until one or more revolutions thereof have wound one or more layers upon the mandrel to insure the draft or traction of the latter in the continued drawing of the paper to and upon the said mandrel. As the paper thus passes to the mandrel the liquid glue or other cement from the reservoir flows through and from the perforations in the cross-pipe *u* uniformly upon the uppermost surface of the paper as it passes underneath. The paper, passing under the guide-roller C″, is not only straightened on its way to the roller F′, but, by pressing upon the upper surface of the paper, forces off any surplus of the liquid cement, such surplus flowing off at the sides into a trough, K, arranged below to receive it. The roller F′ brings the paper to the proper position with reference to the mandrel, and as the successive layers are wound upon the latter, and pressed one upon another by the tension exerted upon the paper as it is thus drawn to and upon the said mandrel, the glue, or other liquid cement, is caused to unite the layers to form a firm cylindrical mass of cemented concentric layers of the paper. As the body thus formed approaches the requisite thickness of material, say just before the winding of the final layer, the bar E′ is turned axially to bring the serrated edge of the cutter *m* down upon the paper, whereupon the sharp teeth pass through the paper and sever the same in a transverse direction. As the end of the paper thus severed from that on the roll approaches the mandrel the lever B′ is forced downward to move the carriage F inward, and bring the roller F′ up snug against the mass wound on the mandrel—in other words, against the now nearly completed body to press the end of the paper snug and firm upon the body to finish the winding of the same without leaving any loose end thereto. It now remains in order to complete the body, to trim the ends thereof, and bring it to the exact length required for use. This is done as follows: At one end of the machine is a shaft, G′, running loose in bearings *g′*, provided in a slide, H′, and having two circular knives, *w*, upon it, these knives being at a distance apart equal to the desired length of the body to be trimmed. The slide H′ rests upon the main frame of the machine, which latter has pivoted to it an eccentric, N, furnished with a crank-handle, *o*, whereby it may be turned, the said eccentric, moreover, playing into a square slot, *m″*, in the base of the slide. The rotation of the mandrel being continued, the eccentric *n* is actuated to move inward the slide H′, thereby bringing the knives *w* in contact with the body wound or formed on the mandrel, and cutting off from the ends of the said body the surplus or edge material, leaving the ends clean and smooth for the insertion or attachment of the heads.

In order to remove the completed body from the mandrel, the roller F′ is moved farther from the mandrel by the lever A**, and the lever D is turned away from the bearing *c*, and the shipping-lever is actuated to move the collar C*, and consequently the sleeve B*, longitudinally upon the mandrel, so that one end of the said sleeve with the paper cylinder upon it will project beyond the clear end of the mandrel. This done, the projecting end of the sleeve is grasped by the operator and withdrawn from the mandrel, whereupon the sleeve, being of spring-metal, contracts in diameter through its inward spring, and is readily withdrawn from the cylinder and is replaced upon the mandrel. It will be seen from this that the shipping-lever, collar, and sleeve enable the finished cylinder to be removed from the mandrel with very great quickness and facility.

As soon as one body is completed and removed from the machine, the parts are made to resume their previous or normal position, and another and another are formed in succession in the same manner from the paper on the roll C′.

What I claim as my invention is—

1. The steam-jacketed cement-reservoir, provided with the tap and the perforated cross-pipe, in combination with the guide-roll and the mandrel, the whole arranged for operation substantially as and for the purpose herein set forth.

2. The shaft G′, provided with the circular knives *w*, and running loose in bearings in the slotted slide H′, in combination with the eccentric N and the mandrel, the whole arranged for operation substantially as and for the purpose set forth.

3. The combination of the bearing *c* of the mandrel H, the standard A′, constructed with a squared recess, and the balanced lever D, also provided at its inner end with a squared recess, adapted to the bearing *c*, the whole arranged for operation substantially as and for the purpose set forth.

4. The shipping-lever *a*, collar *b*, and longitudinally-divided spring-metal sleeve B*, in combination with the mandrel A of a machine for making paper cylinders, whereby the finished cylinder may be readily removed from the mandrel, substantially as herein set forth.

WILLIAM H. BROCK.

Witnesses:

W. W. JOHNSON,

W. M. EDWARD.