

(No Model.)

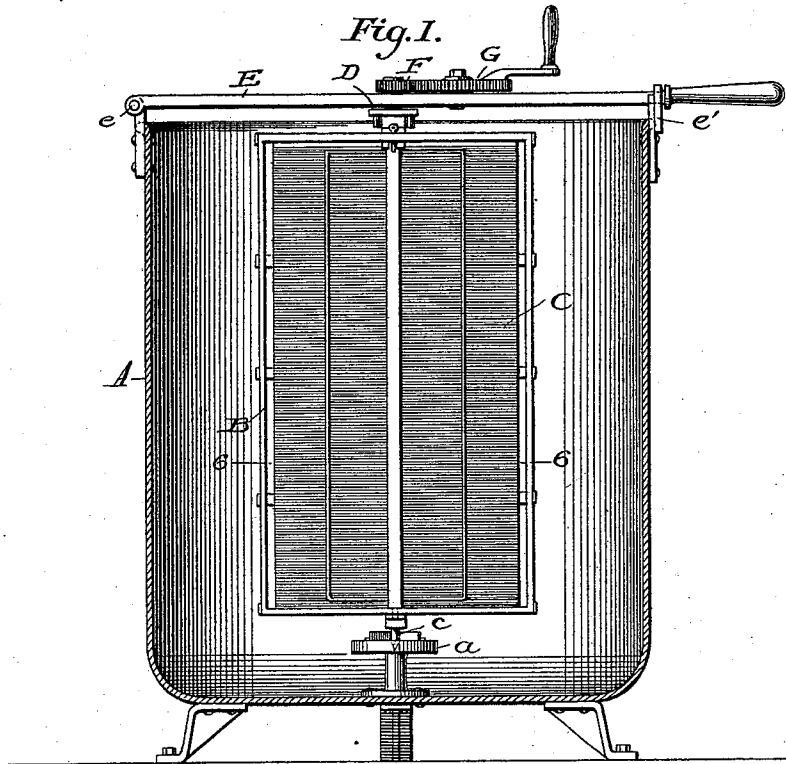
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M. C. STONE.

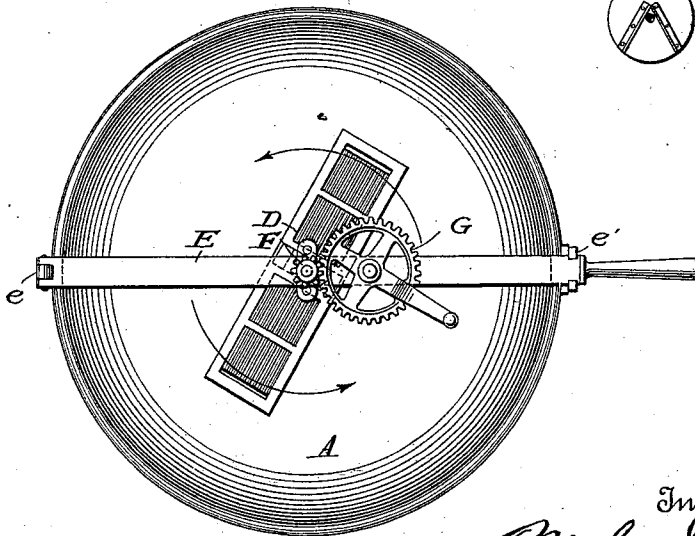
METHOD OF COATING PAPER TUBES, &c.

No. 527,736.

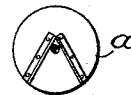
Patented Oct. 16, 1894.



*Fig. 2.*



*Fig. 3.*



Witnesses

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

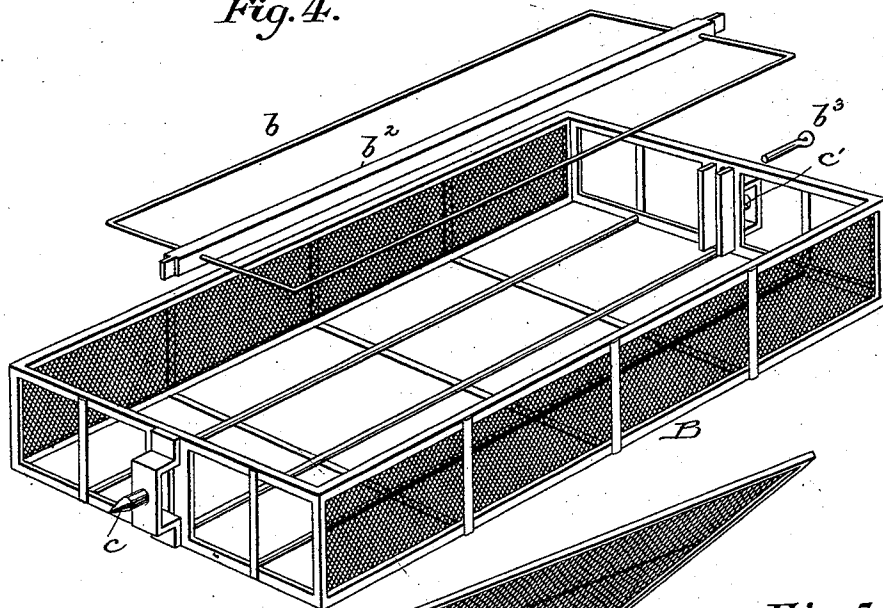


Fig. 5.

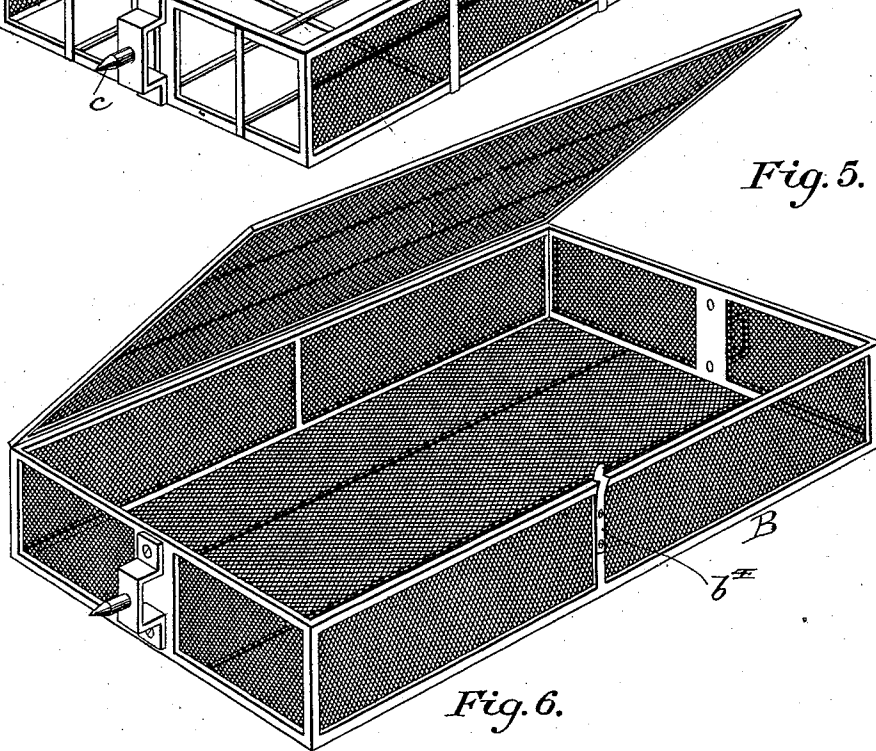
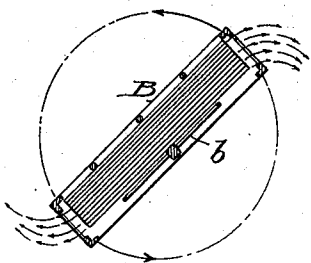


Fig. 6.



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# UNITED STATES PATENT OFFICE.

MARVIN C. STONE, OF WASHINGTON, DISTRICT OF COLUMBIA.

## METHOD OF COATING PAPER TUBES, &c.

SPECIFICATION forming part of Letters Patent No. 527,736, dated October 16, 1894.

Application filed July 24, 1893. Serial No. 481,332. (No specimens.)

To all whom it may concern:

Be it known that I, MARVIN C. STONE, of Washington, District of Columbia, have invented a new and useful Improvement in Methods of Coating Paper Tubes, &c., of which the following is a specification.

In the manufacture of small paper tubes, such, for instance, as the artificial straws employed for imbibing liquids, it is desirable to coat them with paraffine or other water-proof material. In practice it is found extremely difficult to apply this coating material uniformly and in a thin film throughout the interior and exterior surfaces of the tubes. This is peculiarly the case with small paper tubes, coated with molten paraffine, which sets and hardens at a low temperature.

The object of my invention is to effect the speedy and uniform distribution of the paraffine or other coating material, and the removal of the surplus,—and to this end my invention consists in assembling the tubes side by side confining them in this position, subjecting the assembled tubes to a primary coating of the liquid material, and finally imparting to the same while confined *en masse*, a rapid rotary motion in a direction transverse to their axes.

I have represented in the accompanying drawings and prefer to employ in practice, a machine in which the tubes lie *en masse* in a horizontal position and are revolved horizontally around their longitudinal centers.

Figure 1, is a sectional elevation of my machine; Fig. 2, a top plan view of the same; Fig. 3, a top view of the bottom, step or pivot thereunder; Fig. 4, a perspective of the cage or holder, in its preferred form; Fig. 5, a perspective view of the cage in the alternative form; Fig. 6, a horizontal section on the line 6—6 of Fig. 1, illustrating the rotary action of the cage and the manner in which the fluid is delivered by centrifugal force from the opposite ends of the tubes or straws.

Referring to the drawings:—A represents an upright vessel or body which may be of any suitable form and construction adapted to receive the operative parts.

B represents a cage or holder for the tubes or straws C. This cage is provided at the lower end with a supporting pivot c, situated

in a step a, and is also provided at the upper end with a central socket c', to receive the pivot of a rotary driving head D. This driving head is a vertical shaft extended through a supporting bar E and provided on the upper end with a pinion F, driven by a large gear wheel G, mounted on the bar and provided with a crank or handle, through which it may be turned so as to impart a rapid rotation to the cage. The bar E is connected at one end to the body or vessel by a hinge e, and locked thereto at the opposite end by a catch or fastening e', of any suitable character, so that when released it may be turned upward, carrying with it the driving head D, in order to release the cage and admit of its being removed from the vessel, so as to insert or remove the tubes or straws to be treated.

In making use of the machine, I fill the detached cage with the coated straws or tubes, then place it in position in the vessel and rotate it until the excess of liquid is thrown from the ends of the tubes and the remaining portion properly distributed thereover, after which the cage is detached and the tubes removed therefrom.

If preferred, the uncoated tubes may be introduced into the cage and the latter dipped into a bath containing the coating material, or the tubes may be coated with the liquid material in any other suitable manner, as by pouring the material over the tubes, &c.,—the essence of the invention in this respect residing in subjecting the tubes to a primary coating previous to their rotation.

The cage may be constructed in any manner adapted to permit the convenient introduction and removal of the tubes. In Fig. 4 it is shown in skeleton form with one side, b, adapted for removal at will. This side has a central longitudinal bar b<sup>2</sup>, with projecting ends adapted to be seated in slots in the cage and secured by a pin b<sup>3</sup>, or otherwise.

In the form shown in Fig. 5, the cage consists of a skeleton frame covered with wire gauze, one side being hinged and a catch b<sup>4</sup>, being provided to hold it when closed.

When the machine is in action, with the tubes lying in a horizontal direction, across the axis of rotation, the rotary motion will have the effect of distributing the liquid from

their middle toward their ends and discharging the surplus at such ends, as indicated by the arrows in Fig. 6.

5 The expression "side by side" which occurs in the specification and claims, as describing the manner of assembling the tubes, is not to be understood as meaning necessarily that the tubes must contact, for it is obvious that if the tubes were sustained parallel to one another, with spaces between them, the action of the coating liquid would be substantially the same.

10 Having thus described my invention, what I claim is—

15 1. The method of treating tubes with liquid, to distribute the latter and remove the surplus, consisting in first assembling the tubes side by side, confining them in this position, subjecting the assembled tubes to a primary  
20 coating of the liquid material as by submersion or otherwise, and finally imparting to the same while confined *en masse*, a rapid rotary motion in a direction transverse to their axes;

whereby the uniform distribution of the coating will be effected and the surplus material 25 thrown off from the ends of the tube.

2. The method of treating tubes with liquid to distribute the latter and remove the surplus, consisting in first assembling the tubes side by side in a body of a thickness considerably less than the length of the tubes, confining them in this position, subjecting the assembled and confined tubes to a primary coating of the liquid material and finally rotating the body of the confined tubes rapidly 35 in a horizontal plane, in a direction transverse to the axes of the tubes and about a point midway of the length of the same.

In testimony whereof I hereunto set my hand, this 5th day of July, 1893, in the presence of two attesting witnesses. 40

MARVIN C. STONE.

Witnesses:

W. R. KENNEY,  
D. B. GALLATIN.