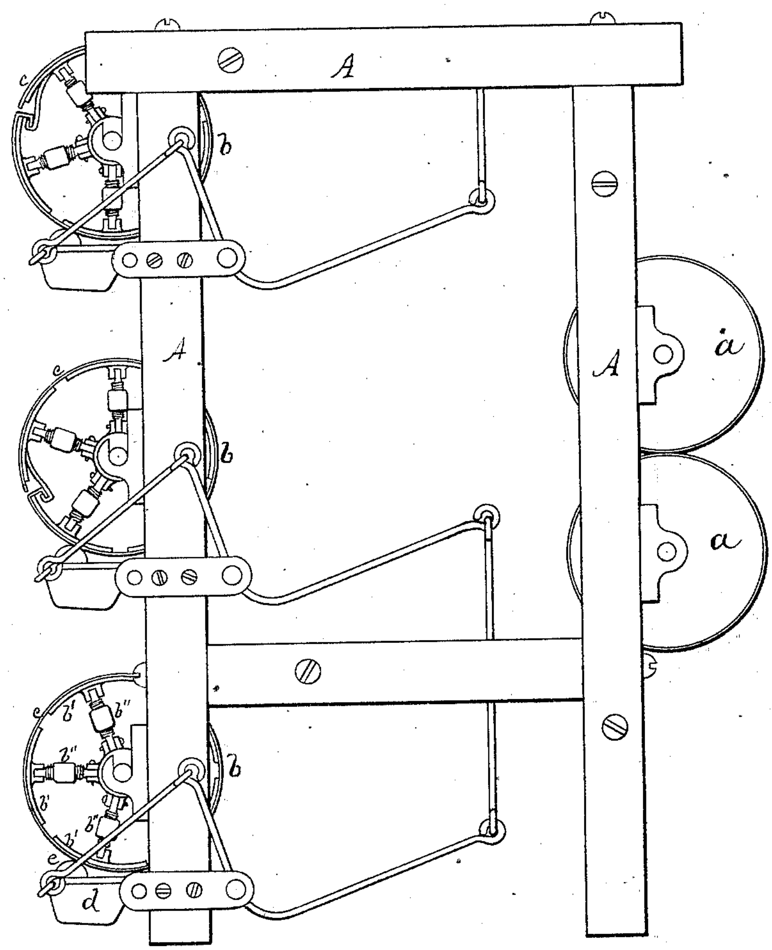
J. F. JONES.

Paper-Tube Machine.

No. 162,236.

Patented April 20, 1875.

Fig. 1.



Witnesses

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2 Sheets--Sheet 2.

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Fig. 2.

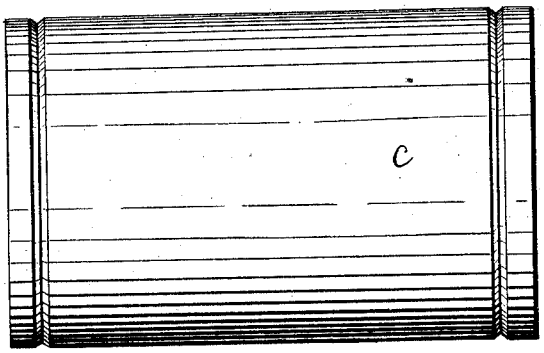
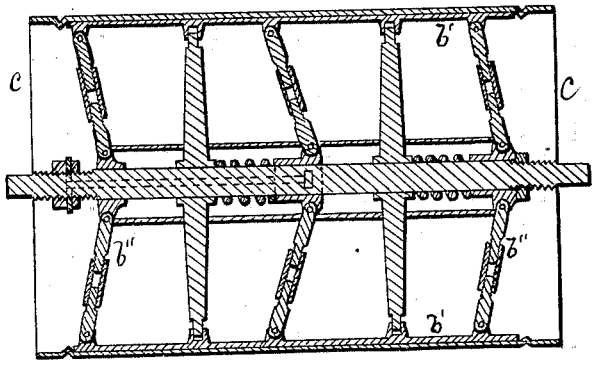


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN F. JONES, OF MARCELLUS FALLS, NEW YORK.

IMPROVEMENT IN PAPER-TUBE MACHINES.

Specification forming part of Letters Patent No. **162,236**, dated April 20, 1875; application filed November 28, 1874.

To all whom it may concern:

Be it known that I, JOHN F. JONES, of Marcellus Falls, New York, have invented a Paper-Tube Machine, to be used in the making of barrels and other vessels, &c., of which the following is a specification:

Many attempts have been heretofore made to make barrels and other vessels for dry and liquid purposes; but heretofore, owing in part to a want of practical knowledge of the paper manufacture, they have all failed to produce proper machinery to make them with expedition and cheapness sufficient to introduce them into the market, so as to supersede the wooden articles now in common use.

In my present invention I have been enabled from my long experience in the paper manufacture to make a paper barrel with great facility and expedition, and so cheaply as to furnish them at a much lower price than has ever before been attained.

The manufacture of a paper cylinder by winding a strip of paper around a mandrel has been so long and well known to paper-makers and others as to be public property, and the cylinders thus formed have been applied to various uses, which, when very small, can and have been made by automatic machines; but with larger articles the difficulties increase, which has heretofore prevented the profitable manufacture.

My present improvement is described as follows, referring to the accompanying drawing, in which—

Figure 1 is a side elevation of the winding apparatus. Fig. 2 is one of the jackets used upon my winding-cylinder. Fig. 3 is the expanding winding-cylinder, a section through the plane of the axis.

I use any well-known ordinary paper-machines that need not be described or represented.

My drawing, Fig. 1, shows the pressing-rollers *a a* of said paper-machine, through which the sheet of pulp passes, and is compressed into a sheet of paper of sufficient consistency to be handled and worked. From this point the sheet of damp paper passes onto a forming-cylinder, *b*, hereafter described, on which it is wound with a liquid or layer of adhesive size or paste or water until a sufficient thickness is attained for the purpose intended, when it is cut off and is ready to pass onto another forming-cylinder without stopping the machine. The forming-cylinders *b*, three of which are shown in the frame in the drawing, consist of an expanding apparatus in five, more or less, sections, the periphery being made of thin metal staves *b′*, as clearly seen in Fig. 1, with stretchers or arms *b″* jointed at their outer ends to the staves, and at their inner ends to the hubs, through which the cylinder-shaft passes. It will be noticed that the arms *b″* are inclined to the shaft, and can be made to expand and contract similar to the stretchers of an umbrella by means of screw-nuts on the shaft, so that the thin plates or staves *b′* will form a larger or smaller cylinder, as desired, and the center can be expanded more than the ends, so as to form an enlargement or bilge at that point, if desired, by having the arms at the center move independent of the end ones. In this way the size of the cylinder as well as its form can be varied at will within the limits of its expansion and contraction. Over this expanding-cylinder I put a case or jacket, *c*, divided along one side, as shown at Fig. 1, and with its edge turned over, so that it catches around the edge of one of the staves *b′*, and is made to conform to the surface beneath. The cylinder thus clothed is suspended in journal-bearings in the frame, and the end of the paper running from the paper-machine is brought around it. Just below cylinder *b* there is a reservoir, *d*, filled with water, thin liquid, size, or paste of proper character and consistency to thoroughly dampen the newly-formed paper as it is wound, and cover the surface with adhesive material, so that when a second layer comes around it will adhere in a homogeneous mass. The size, &c., is applied by means of a roller, *e*, that conveys it up onto the surface of the formed paper, against which it presses by any convenient means.

By thus first forming a perfect paper that can be readily handled and rolled on the former *b*, and then as it is rolled saturating and softening it with water or a very thin adhesive liquid, it is reduced to a state that causes it to unite into a homogeneous mass of great strength and durability. When one cylinder

has been thus formed, conforming to the cylinder or mold *b*, the paper is cut off and instantly applied to another cylinder, *b*, above or below it in the same frame without moving either roller, and without stopping for a single instant the paper-machine, or otherwise breaking the continuous running off of the paper, which would be fatal to the manufacture of perfect paper. As soon as the paper is transferred onto the second cylinder *b*, and the paper-cylinder is complete on the first, it is removed to the drying apparatus that forms an application for another patent of even date herewith, and the second cylinder *b* is covered to the proper thickness, and the end of the paper is again transferred to another cylinder, and so on continuously without intermission.

Having thus fully described my improvements in forming tubes by machinery directly from the paper-machine, I claim—

1. The process of forming paper tubes, either bulging or straight cylinders, by first compressing the pulp from the paper-machine, and then, while green, conveying it to the molds, upon which it is wound in suitable form, and the layers, as they are wound on, saturated on the mold to make them plastic, so as to form a homogeous mass of layers, as herein described.

2. The expanding and contracting mold or cylinder *b*, around which the tubes are formed with expanding and contracting arms at its center and at both ends, operated as herein described, so as to vary the diameter independently at its center and end, in combination with a jacket, *c*, as and for the purposes specified.

JOHN F. JONES.

Witnesses:
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