

L. D. BENNETT.

Cop-Tubes.

No. 156,972.

Patented Nov. 17, 1874.

fig. 1.



fig. 2.

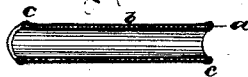


fig. 3.



Attest

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LORENZO D. BENNETT, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN COP-TUBES.

Specification forming part of Letters Patent No. **156,972**, dated November 17, 1874; application filed February 28, 1873.

To all whom it may concern:

Be it known that I, LORENZO DOW BENNETT, of Providence, in the county of Providence and State of Rhode Island, have invented an Improvement in Cop-Tubes, of which the following is a specification:

This invention relates to an improvement in the tubes which are placed upon the spindles of spinning-machines, for the purpose of receiving the yarn, and are afterward transferred, together with the yarn wound around them, to the shuttle of a loom, and are technically called "cop-tubes."

The present improvement consists in coating the ordinary paper cop-tubes with a steam-heat and oil proof enamel, which is hardened by baking. This enamel preserves the shape of the tubes, and forms a permanently hard and smooth surface, to which the yarn will not adhere. The enamel coating serves further to form end enlargements, which hold the yarn in place.

Figure 1 represents an ordinary paper cop-tube. Fig. 2 is a longitudinal section; and Fig. 3 is a perspective view of this improved cop-tube.

In Fig. 1 of the drawing is shown an ordinary paper cop-tube, *a*, formed by winding a strip of paste-covered paper around a spindle, until it acquires sufficient thickness to give it the required strength. The tubes thus formed are dried and cut to the proper length, when they are ready for use. But in their use much difficulty and loss have been encountered, from the fact that it is generally found necessary to steam the cops, as the tubes when covered with yarn are called, before using them in the process of weaving, which operation softens the tubes so much that they are soon rendered useless, and not only this, but the yarn becomes entangled in the softened material of the tubes and is broken, seldom running entirely off the tubes, which causes much waste. This loss has been so serious that cop-tubes of metal have been constructed and used, in order to obviate the difficulty, but with indifferent success, as they are heavy and costly, and when formed of soft metal sometimes discolor a portion of the yarn.

My invention enables the manufacturer to

retain the paper tube with its advantages, while it secures the advantages possessed by the metallic tube without any of its disadvantages.

The sectional view given in Fig. 2 represents one-half of one of my improved tubes, divided longitudinally, and shows the layers of paper, *a*, and enamel *b*, as they occur in the finished article. The external appearance of the improved tube is represented in Fig. 3. The tube presents a perfectly smooth surface with the exception of a slight enlargement, *c*, at each end, which is found to be of service in retaining the yarn in its place.

In carrying out my improvement, I take the paper tube *a*, shown in Fig. 1, and apply to it a coating, *b*, of enamel, covering it completely, and giving it a hard and smooth surface, which is not affected in any deleterious manner by steam-heat or oil. This allows the yarn to run freely to the end, so as to leave no waste, while it preserves the shape and pliability of the paper tube. The enameled tubes are easier to handle than ordinary paper tubes, owing to their smoothness and freedom from clinging waste, and can be seen more readily at night, owing to their dark color, while their size and weight are not materially increased, and their ultimate cost is reduced, the enameled tubes lasting much longer than those formed simply of paper in the ordinary manner.

The liquid enamel for coating these tubes is compounded as follows: Linseed-oil, two gallons; Prussian blue, one ounce; asphalt, half a pound; bone-black or lamp-black, half a pound.

This compound is boiled for several hours—say, six—and, when cool enough to permit, naphtha is used to thin the mixture to a proper consistency, which may be that of varnish. The tubes are then dipped in this preparation, and put on pins. They are next placed in an oven, and baked for several hours—say, twelve—at a temperature of from 150° to 250° Fahrenheit. This last operation completely hardens the composition, and concludes the process. The product is a paper cop-tube, having a hard smooth surface, formed by an enamel coating, which is steam-heat and oil proof, as hereinbefore set forth. The enamel

in setting on the paper tube collects slightly at the ends, and hardening in this shape forms the end enlargement *c*.

The following is claimed as new in this invention, namely:

1. The enameled paper-cop tube, herein described, having a permanently hard and smooth oil and steam proof surface, as specified, as a new article of manufacture.

2. The enameled paper-cop tube, herein

described, having a permanently hard and smooth surface and end enlargements, as specified.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of February, 1873.

L. D. BENNETT.

Witnesses:

WALTER ALLEN,
JAS. L. EWIN.