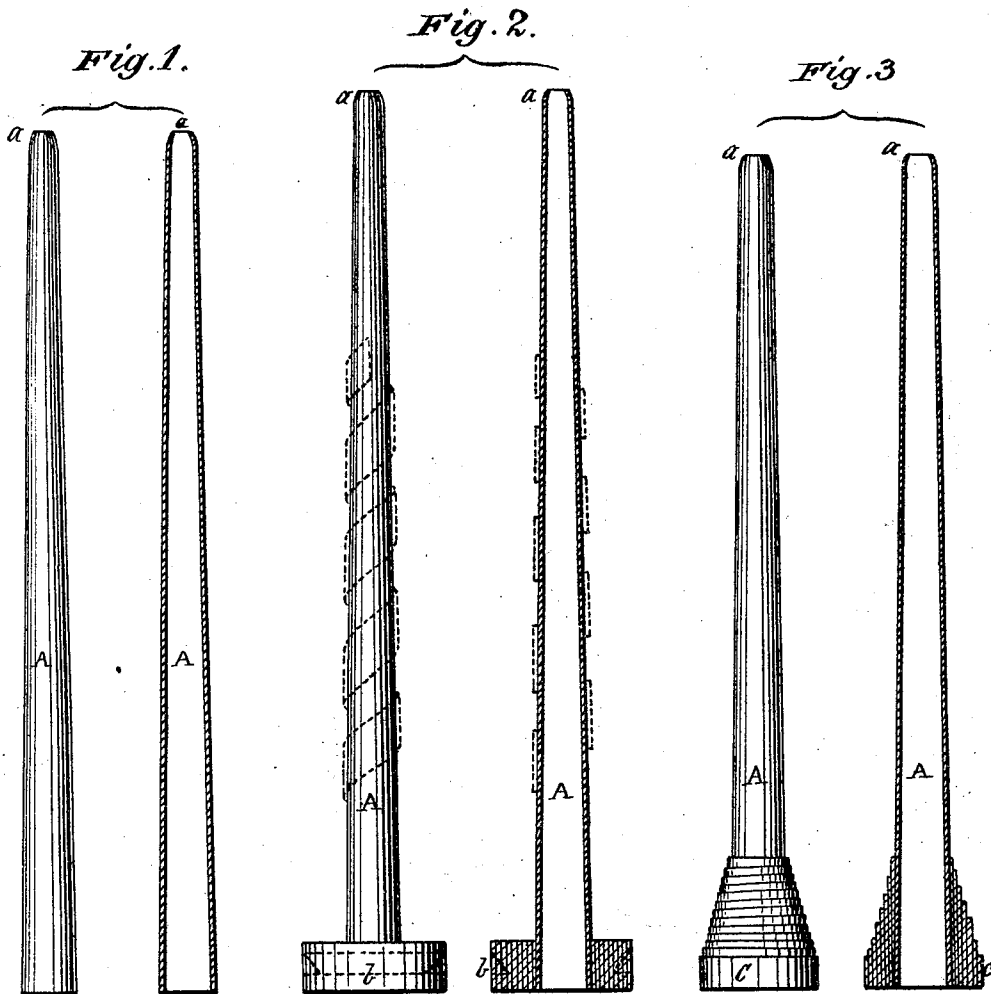


J. McCAUSLAND.
PAPER-COP TUBE.

No. 171,577.

Patented Dec. 28, 1875.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN McCAUSLAND, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN PAPER COP-TUBES.

Specification forming part of Letters Patent No. **171,577**, dated December 23, 1875; application filed October 22, 1875.

To all whom it may concern:

Be it known that I, JOHN McCAUSLAND, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Paper Cop-Tubes; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description thereof.

The objects of my improvements are to render paper cop-tubes as serviceable in wool-spinning as in cotton, to afford a positive frictional contact with the spindle at the tip of the tube, and to prevent the tip from readily becoming burred or ragged.

In cotton-spinning no practical difficulty is experienced in laying the yarn so firmly in the cop that it will remain intact after its removal from the spindle, and throughout the subsequent handlings incident to its use. In wool-spinning, however, the yarn is neither so solidly twisted as cotton, nor so solidly copped, and hence the cop is more liable to injury by the falling or slipping of the yarn at the base of the cop.

My invention partially consists in a paper cop-tube tapered to correspond with its spindle, and provided with a solid flanged base. Another feature of my invention consists in a tapered paper cop-tube with an interior contracted tip, whereby a firm frictional contact is attained with the spindle at the tip of the tube, and said tip prevented from readily becoming ragged or burred.

To more particularly describe my invention, I will refer to the accompanying drawings, in which—

Figure 1 represents, in side view and in section, a tapered tube with an interior contracted tip. Fig. 2 represents, in like manner, a tapered tube with a contracted tip and one form of solid flanged base. Fig. 3 represents, in like manner, a similar tube with another form of solid base.

It is well known that paper cop-tubes are less expensive than any other kind of cop-tubes, and that they have, therefore, practically superseded all others. It is also well known that they are made by wrapping a

sheet of paper charged with adhesive matter in successive layers upon a spindle.

Heretofore in the manufacture of long-tapered tubes their tips have been made by conforming them to the tapered sides of the spindle on which they were made. This resulted in a tube having throughout its length a uniform frictional contact with the spindle.

In each of the sectional figures in the drawings, the tubes A have tips, as at *a*, which are internally contracted. Instead of conforming the tips to the tapered sides of a spindle, I contract them by forming them partially over the rounded end of a spindle or a rounded shoulder on a spindle. By means of this contracted tip the tube always maintains a firm frictional contact at that point with the spindle, and in use the tip is much less liable to burr or become ragged than the tips of tubes not thus contracted. This close fitting of the tube at its tip to the spindle, and the non-liability of the contracted end to burr and become ragged, result in little or no appreciable wear of the yarn in its contact with the exterior of the tube at its tip during the spinning of the yarn. The solid base shown at *b*, Fig. 2, may be variously constructed. I prefer to form it of a narrow long strip of heavy paper, well charged with suitable adhesive matter, and wound in successive layers until a base of the required diameter is obtained. The form of solid base shown at *c*, Fig. 3, may be constructed in a similar manner; but in order to produce the exterior inclined sides thereof I use, instead of a parallel-sided narrow strip, as in Fig. 2, a strip as much wider at one end than at the other as will produce a base of the required sectional outline when wrapped upon the tube, commencing with the widest end of the strip. These bases may, however, be made of material other than paper—as, for instance, of wood—and these may be secured to the tubes by adhesive matter or otherwise. It will be seen that my cop-tubes, thus provided with a solid base, will perform the general functions of such wooden or metal bobbins as have heretofore been used in spinning. As compared with them, however, they are far superior, in that they are cheaper than either of

those kind of bobbins, lighter, and will take on more yarn.

The item of economy in first cost is very considerable, and this item is in no manner appreciably offset by their seeming lack of durability when compared with tubes and bobbins composed of wood or of metal. The feature of lightness is one of great practical value, involving a saving of power, lubricants, and wear of the spinning machinery. The feature of capacity for taking on more yarn than the wooden or metal tubes and bobbins is obviously of great practical value, as it involves less frequent doffing and the consequent greater capacity of the spinning machinery.

In Fig. 2 I show at the base, in dotted lines, a groove with a square shoulder, which is of value, when the tubes are to be used in shuttles, as a means whereby the retaining-spring of the shuttle may securely engage with the tube. In the same figure, also in dotted lines, I show a spiral strip of cloth or paper, which is secured to the outside of the tube, for preventing the cop from moving bodily longitudinally on the tube. Such a strip will be useful on tubes which are to be used in shuttles.

I am well aware that it has heretofore been proposed, in connection with enameled-paper

cop-tubes, to provide them with bases and with tips enlarged by stretching and outwardly flaring the paper. Flanges at the bases of tubes of this character serve to retain the yarn on the tube; but they cannot perform the service of my solid bases, because the stretched flanges are readily compressible, and do not afford a surface with which the spring of the shuttle may engage; nor can paper cop-tubes be flared sufficiently by stretching to enable the flanges thus formed to be of value with long cotton or woolen cops. Moreover, the cop-tube at its base and its tip should always engage with the spindle under frictional contact, and when flared by stretching, as heretofore, they have no such contact with the spindle at the flared portions.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A tapered paper cop-tube, provided with a solid flanged base built up from or attached to the tube, substantially as described.

2. A tapered paper cop-tube, having an internally-contracted tip, substantially as described.

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Witnesses:

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1,250 words