I. P. Tice.

Mach. for Making Paper Twine.

No. 46,405. Patented Feb. 14, 1865.

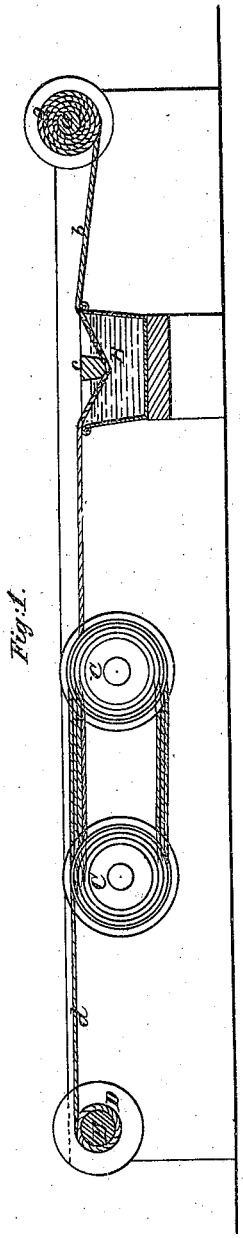

Fig. 1.

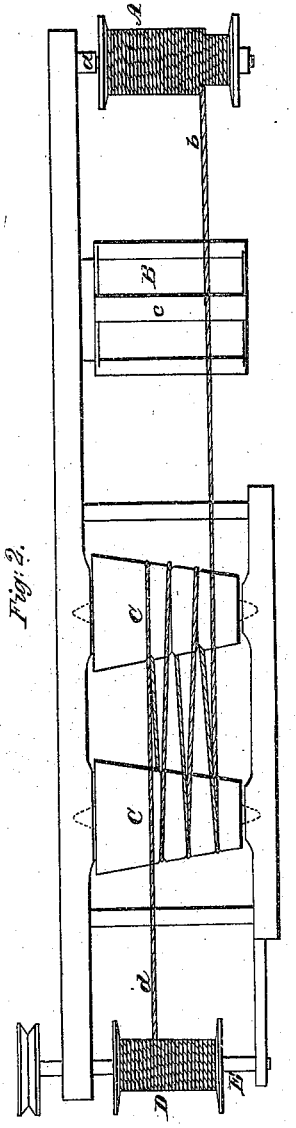

Fig. 2.

Witnesses.
D. W. Coombs.
G. W. Reed

Inventor.
Isaac P. Tice.

UNITED STATES PATENT OFFICE.

ISAAC P. TICE, OF NEW YORK, N. Y.

IMPROVEMENT IN THE MODE OF MANUFACTURING PAPER TWINE.

Specification forming part of Letters Patent No. **46,405**, dated February 14, 1865.

To all whom it may concern:

Be it known that I, ISAAC P. TICE, of the city, county, and State of New York, have invented a new and useful Improvement in the Manufacture of Paper Twine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention consists in the manufacture of paper twine by first twisting the paper in a dry state, and afterward moistening it and while in a moist state stretching it sufficiently to render it compact, smooth, and of uniform thickness.

To enable others to manufacture the twine according to my invention, I will proceed to describe that method of performing the process which I have found in practice to be the best.

The paper is first cut from a roll of the greatest convenient length into strips of suitable width, and the strips are twisted in a dry state, either singly or two or more together, but preferably singly, by machinery—such as is commonly used in spinning cotton and other fibrous materials.

I have used for the twisting process the the ring-spinning frame, but a throstle-frame may serve the purpose equally well. As this machinery is well known, I need not here describe it. The twist thus given need not be very tight, but only sufficient to bring the strip or strips into the form of a yarn.

The moistening or stretching may be performed in various ways, but, after several experiments, I have adopted that represented in the accompanying drawings, in which—

Figure 1 is an elevation, and Fig. 2 a plan view.

Similar letters of reference indicate corresponding parts in both figures.

A is a bobbin on which the yarn *b* has been wound in the twisting operation. This bobbin, having been removed from the spindle of the spinning-frame, is placed on a fixed spindle, *a*, on which it is free to turn easily. From the bobbin the yarn passes through a vessel, B, containing water, the said vessel having a fixed bar, *c*, arranged along its center, under which the paper passes to insure its entering the water and being properly moistened. After leaving the water the moistened yarn passes several times around two grooved conical rollers, C C, which turn easily in fixed bearings, being first received in the grooves of smaller circumference and afterwards passing to those of larger circumference, as illustrated in Fig. 2, and finally being received upon a spool or reel, D, which is secured upon a spindle, E, to which rotary motion is given at a suitable speed by any convenient means. The yarn is drawn from the bobbin A by the tension produced upon it by the rotation of the spindle E and reel or spool D, and this tension also produces rotation of the rollers C C. The yarn, before it arrives at the rollers C C, is in the rough, uneven condition shown at *b*, but after having been moistened, the stretching to which it is subjected in passing from the smaller to the larger circumferences of the grooves in the rollers reduces its diameter and brings it to the condition of a compact, smooth and even twine, as shown at *d*, in which condition it is received upon the reel or spool D.

By this process of manufacturing paper twine I avoid the frequent breakages which occur in its manufacture by other processes, and produce a twine of more uniform thickness and with a smoother surface.

I do not confine myself to the use of the machinery or apparatus herein described in performing my invention; but

I claim and desire to secure by Letters Patent—

The manufacture of paper twine by twisting the paper in a drystate, afterward moistening it, and subjecting it to a stretching operation while in a moist state, substantially as herein described.

ISAAC P. TICE.

Witnesses:

J. W. COOMBS,

HENRY T. BROWN.