No. 611,343. Patented Sept. 27, 1898.

M. TILDEN.

SPOOL.

(Application filed Feb. 16, 1898.)

(No Model.)

Fig. 1.

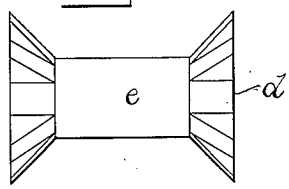


Fig. 2.

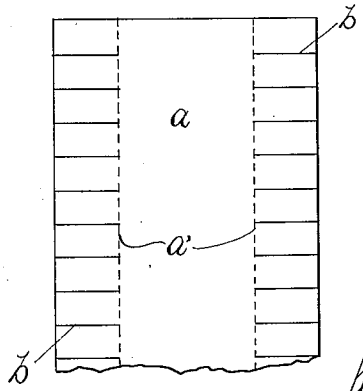


Fig. 5.

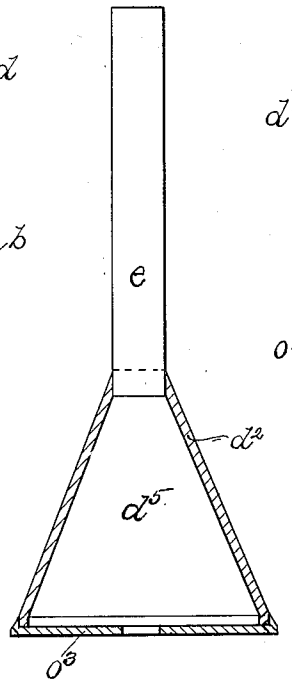


Fig. 3.

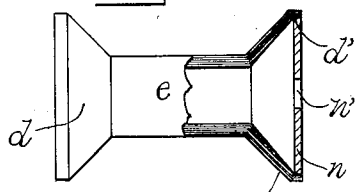


Fig. 4.

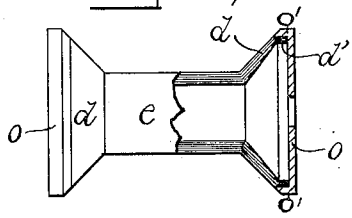


Fig. 5a.

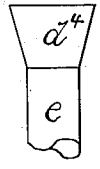


Fig. 8.

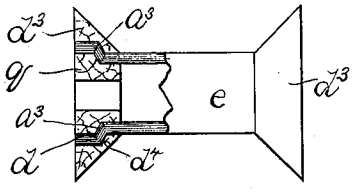
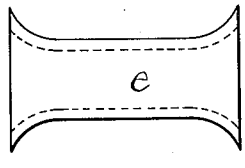


Fig. 6.



WITNESSES

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SPOOL.

SPECIFICATION forming part of Letters Patent No. 611,343, dated September 27, 1898.

Application filed February 16, 1898. Serial No. 670,565. (No model.)

To all whom it may concern:

Be it known that I, MARSHALL TILDEN, a citizen of the United States, residing at Willimantic, in the county of Windham and State of Connecticut, have invented certain new and useful Improvements in Spools, of which the following is a full, clear, and exact description.

This invention is in that class of spools constructed of strips of paper or like material tightly wound upon itself and glued or pasted together to form a solid mass and, if necessary, molded into desired shape. By the construction just described a spool having great rigidity is produced and one which is also much lighter than the ordinary wooden spools, the weight of the latter, especially in large sizes, being often very objectionable.

The chief object of this invention is to improve spools of the kind described by forming the same from peculiarly-prepared strips of paper, and to assist in explaining my said invention the annexed drawings have been provided, illustrating the same, as follows:

Figure 1 is an elevation of a spool produced from strips of paper in accordance with my newly-invented construction. Fig. 2 is a view showing a short section of one form of said strips. Figs. 3 and 4 illustrate modifications of the same. Figs. 5 and 5ª illustrate my invention as utilized in the manufacture of bobbins. Figs. 6 and 7 are side and end views of a spool formed by coiling a strip of pasted paper upon itself and simultaneously stretching and molding its ends into desired shape. Fig. 8 illustrates a modification in the style of spool produced by my newly-invented method.

Referring to the drawings, the letter *a* denotes a strip of paper or similar flexible material from which the spool is to be produced, said strip having its edges slitted, as at *b*, at a suitable angle to the length of the strip or otherwise weakened.

When the strip *a* is wound upon itself during the operation of constructing a spool, that portion of the same between the dotted lines *a'* forms the body portion *e* of the spool, and the slits *b* permit those portions of the strip outside lines *a'* to bend upon said lines while the strip is being wound to form the flanged heads *d* of the spool. If desired, strip *a* may be previously creased or scored upon lines *a'* in order that such bending may be positively performed. As the strip *a* is wound upon itself it is retained in shape by means of glue or similar adhesive substance, which, hardening, forms with said paper a solid mass of spool shape, as shown in Fig. 1, but, as already mentioned, of greater lightness than the ordinary wooden spools.

The particular manner of weakening strip *a* shown in Fig. 2 is not essential for the successful winding of said strip, as any other means may be employed.

When the strips *a* are being coiled to produce a spool, the weakened portions thereof outside the dotted lines *a'* separate or stretch and the projecting sections then overlap each other and are stuck together to produce the laminated heads of the spool, each of the successive layers overlapping the projections and intervening spaces of the last preceding coil, thus providing in the finished spool heads that are cone-shaped or angular to the body portion of the spool. When the glue has hardened, the heads thus provided are sufficiently stiff to support tape, worsteds, and the like loosely-wound materials. To render the said spool sufficiently strong to support tightly-wound thread, I finish its ends in one of the ways illustrated in Figs. 3, 4, 5, and 8.

In Fig. 3 I have shown a simple means for thus stiffening the spools of Fig. 1 and for finishing their ends should it be desired to do so. To accomplish this, I mold the extremity of flange *d*, thus providing a shallow cupped portion *d'*, and in this cupped portion I glue a disk *n*, having, preferably, a central opening *n'*. Disks *n* serve to stiffen the spool, and it may be further finished by pasting printed labels over said disks. In Fig. 4 I reach the same result—that is to say, I stiffen the heads and finish the ends of the spools by slipping over each of the cupped ends a disk *o*, having a circumferential flange *o'*, that fits tightly around the shell of the cupped portion *d'*, substantially like a box-cover, whose outer face may have printed thereon a suitable label or may have said label pasted thereon.

In Fig. 5 I have illustrated a bobbin formed substantially as a spool, having a single head d^2, in which the lower or base portion is cone-shaped and is formed by slitting or otherwise

weakening the stock from which the bobbin is made in the same manner as in the spools in the preceding figures. In this bobbin the lower end of the cone-shaped base is reinforced by a flanged disk a^3, as in Fig. 4 last described, and the said cone may be further strengthened, if desired, by a supplemental cone d^2, which is slipped over the main cone or head d^3, shown as in said Fig. 5, or may be slipped within said main cone or head, in either case being preferably glued or otherwise secured thereto. This construction provides a very stiff form of cone adapted to withstand great pressure from the outside and preventing the collapsing of said cone under ordinary conditions. Sometimes in this class of cones, which are used very commonly with sewing-machines, crocheting-machines, machines for knitting webbing, &c., it is desirable to provide a small enlargement or head at the upper end to prevent the yarn from running off too freely, and in such instances a cone-shaped head d^4 like that illustrated in Fig. 5^a may be provided, it being understood, of course, that this smaller head or cone is produced by weakening that end of the strip of paper from which the bobbin is manufactured, precisely as in the case of the larger cone at the lower end of the bobbin.

The spool illustrated in Figs. 6 and 7 is produced by coiling up a pasted strip of paper upon itself until a sufficient thickness is reached, the heads or flanged ends being simultaneously formed by stretching and molding said ends while the paste is moist and the paper in a semiplastic or pulpy condition. In the formation of this spool the strip of pasted paper is not weakened by slitting, but by stretching or molding the edges of said strip as it passes between rollers so constructed as to give said edges the desired shape to form the heads of said spool during the process of its construction, as shown in Fig. 2.

In Fig. 8 I have shown a spool of extraordinary strength adapted for receiving wire, cord, &c., the body portion of said spool being formed in the same manner as the spools of Figs. 1 to 5—that is to say, the strip of paper is weakened along its edges and the body portion is coiled upon itself. When dry, the said heads are then molded to form an offset or shoulder a^3, and a head d^3, of wood or other suitable material, is mounted thereon whose outer end is chambered to provide an offset d^4, which when the described parts of the spool are assembled abuts the said offset a^3. Within the coiled-paper head d I then insert a core or plug q, which positively prevents the collapsing of the said paper flange d, as will be clearly understood by reference to the said Fig. 8. The body e is first formed, the edges extending in a straight line therewith, and after drying the heads d^3 are placed upon the body, and then the flanges a^3 are formed, the plugs q inserted into position, so as to form supports for the flanges, and then the heads are forced outwardly into position. It will thus be seen that the inner face of flange d is supported by the plug q and the outer or circumferential face of said flange is supported by the surrounding head d^3, making in the finished spool a practical solid end upon which a label may be pasted or printed, if desired.

In the spool of Fig. 9 the laminated flanges d, formed by coiling up the pasted paper, as described, are at right angles, or nearly so, to the body of the spool, and a disk r is mounted on said body inside the said flange at each end of the spool. Glued to the outer face of disk r is a similar disk r', having a circumferential flange r^2, that fits over the edge of the disk r, the flange d being inclosed between the said disks, and thus stiffened and concealed. This form of support is especially suitable for receiving ribbons, webbing, and the like articles.

The body and flanged ends of the spool of Fig. 10 are formed in the same manner as the corresponding parts of the spool of Fig. 1, and said flanges are supported, strengthened, and finished by a wooden core s, adapted to fit snugly within the body of the spool and having an enlarged cone-shaped head whose outer face is of greater diameter than the laminated paper flange d. On the inner side of the spool of said Fig. 10 I place a cone s' of thin material, like strawboard, which is of a diameter equal to or slightly greater than the flange of the wooden core s, and after the body portion, core s, and cone s' have been assembled they are glued firmly together. In this spool, as well as in the spool of Fig. 9 last above described, it will be noted that the paper flange d is concealed between the stiffening and finishing disks.

My improved spools are not expensive to produce, they perform in a very satisfactory manner the office for which they were designed, and are much lighter than spools as ordinarily produced.

Having thus described my invention, I claim—

1. A spool having a cylindrical barrel and flanged heads, said spool being formed of a single piece of paper having its edges slitted and wound a plural number of times upon itself.

2. A spool having a cylindrical barrel and solid flanged heads, said spool being formed of a single piece of paper having its edges slitted and wound a plural number of times upon itself, each layer of the slitted edges being made to overlap the intervening spaces of the preceding layer.

3. A spool having a cylindrical barrel and flanged heads, said spool being formed of a single piece of paper having its edges slitted and wound a plural number of times upon itself, combined with strengthening-pieces applied to the ends of the spool.

4. A spool or bobbin having a cylindrical barrel and a flanged head, said spool or bobbin being formed from a single piece of paper

having a slitted edge and wound a plural number of times upon itself.

5. A spool having a cylindrical barrel and molded heads, said spool being formed from a single piece of paper having weakened edges and wound a plural number of times upon itself, the heads being formed simultaneously with the winding of the barrel.

6. A spool having a cylindrical barrel and flanged heads, said spool being formed of a single piece of paper having edges weakened, so as to form the flanged heads, and which piece of paper is wrapped a plural number of times upon itself.

Signed at Willimantic, Connecticut, this 9th day of February, 1898.

MARSHALL TILDEN.

Witnesses:
JOHN G. MITCHELL,
FREDERICK ROGERS.