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APPLICATION FILED JULY 6, 1917.

1,298,369.

Patented Mar. 25, 1919.
2 SHEETS—SHEET 1.

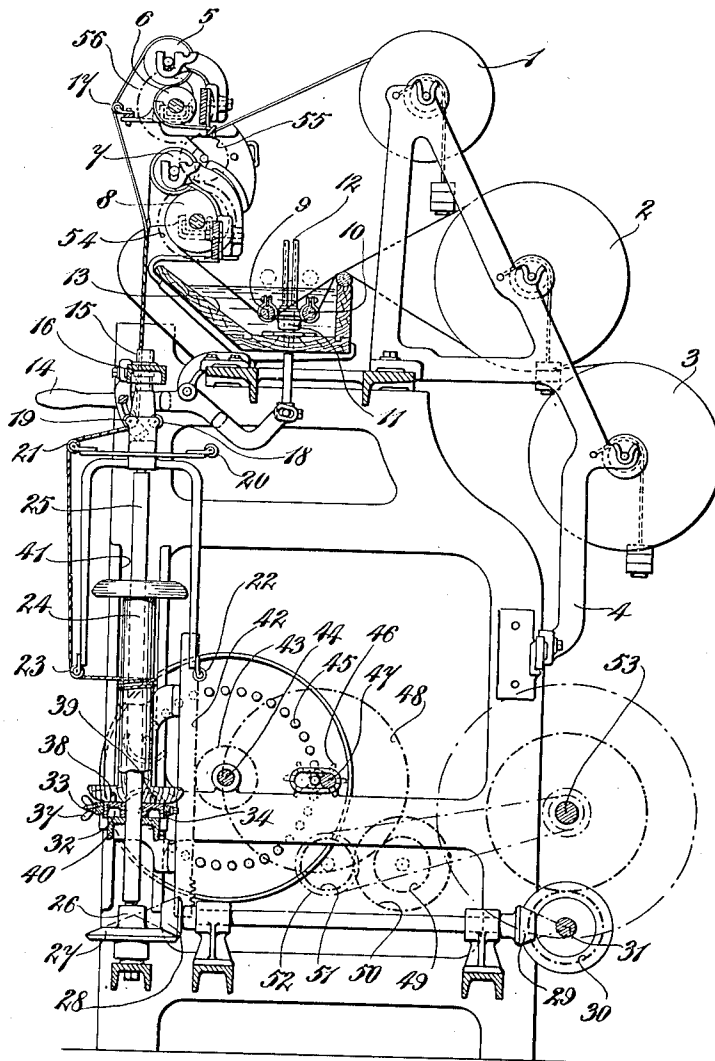


Fig. 1.

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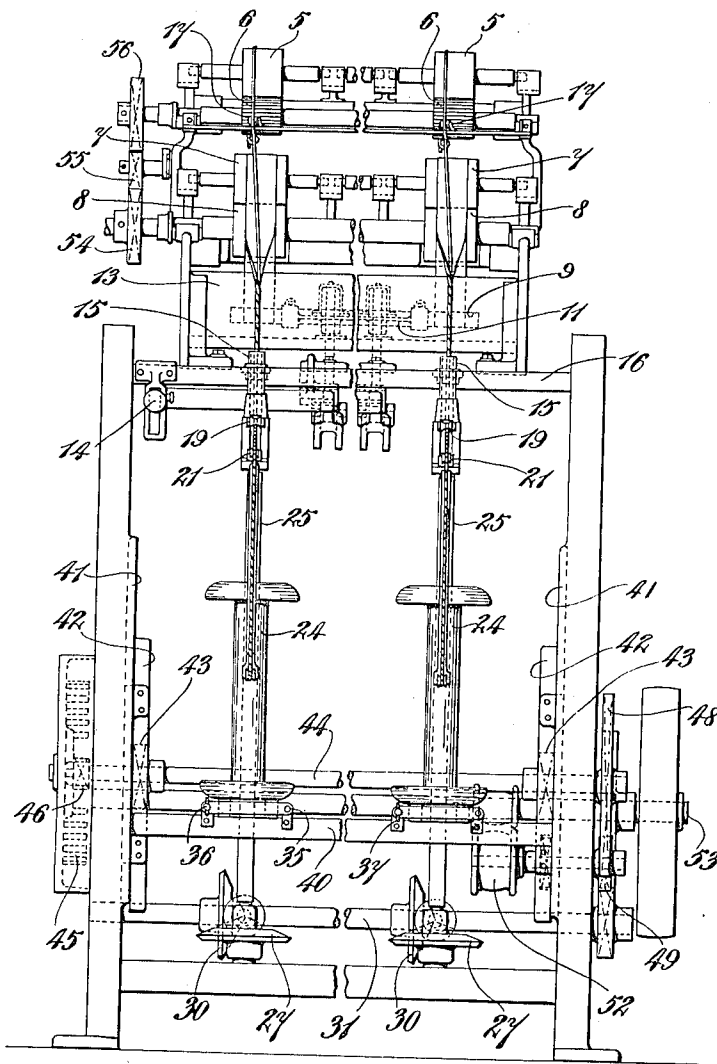


Fig. 2.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR FORMING TWINE OR CORD FROM RIBBONS OF PAPER.

1,298,369.

Specification of Letters Patent.

Patented Mar. 25, 1919.

Application filed July 6, 1917. Serial No. 179,043.

To all whom it may concern:

Be it known that I, GEORGE SEATON MILDE, a citizen of the United States of America, residing at London, in the city of London and county of London, England, have invented certain new and useful Improvements in Machines for Forming Twine or Cord from Ribbons of Paper; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to improvements in connection with spinning machinery for forming twine or cord from ribbons of paper, the object being to enable a number of independent strips or ribbons of paper to be twisted upon themselves or with a core of hemp or other suitable material, for the purpose of forming a twine, or cord of paper.

In the attempts that have hitherto been made for producing a cord from a paper strip or ribbon, it has been considered necessary to twist each independent ribbon into a yarn-like length, with or without a core, and then subsequently to spin or twist two or more strands of such yarn in an independent machine employed solely for thus twisting or spinning together the strands.

According to the present invention, a plurality of strips or ribbons of paper are placed together and, in one operation, are spun into cord.

If desired according to the invention, with the plurality of strips of paper, a strand or strands of filamentary material may be spun together in a single operation.

Thus a strand or strands of metal wire or filament, for instance a lead wire, may in one operation be spun together with a plurality of strips or ribbons of paper.

As one object of the invention is to obviate the necessity of folding the paper strip preparatory to spinning, the invention comprises the provision on the spinning machine, of suitable devices for reducing the friction of the paper in passing through the necessary guides.

Such devices for reducing the friction, employed in accordance with the invention may be rollers, thus for instance, grooved rollers may be substituted for twizzled wire guides.

The invention also comprises the provision of means for securing uniformity of motion in spinning, thus for example the provision of a positive drive between the counter-shaft of the machine and the flier spindles.

In the production of cord provided with a core the present invention comprises the provision of means to insure the core being centrally disposed within the cord.

Certain other features of the invention are hereinafter referred to and are indicated in the appended claim.

In carrying my invention into effect, I may for example mount a number of rolls upon my machine, each of such rolls or reels having thereon independent lengths or ribbons of paper. These independent lengths or ribbons I cause to be drawn from each such roll, and to pass under a guide or guides and through a bath of any suitable moistening or treating material that may be necessary for any particular purpose for which the paper is to be used, and I carry the independent ribbons after they have been thus treated in the liquid bath over a guide roller or other device, then under and over other absorbing and drying rollers which not only remove any superfluous moisture or material from the paper after it has left the bath, but consolidate the different independent strips of paper into one thickened ribbon-like strip composed of the whole of the independent strips compounded or consolidated together. I carry this consolidated ribbon through ordinary guides on to a bobbin which has thereon, or in connection therewith, a loop or flier-like member that enables the consolidated ribbon to be twisted, spun and wound in a twisted form on the bobbin during its rotation.

I give motion to the bobbin and its connected mechanism by any suitable driving arrangements, making provision for the twisted consolidated ribbon to travel up and down the bobbin so that it may be regularly wound thereupon in a manner well known in connection with machines that are employed for ordinary textile and other spinning purposes.

I do not limit the application of my invention to any particular method of producing the paper ribbon and mounting the reels upon the framework of the machine nor to any special method of rotating the bobbin

upon which the twisted consolidated paper is to be wound, but, I modify the ordinary and other machines at present employed for spinning independent strips of paper or other material to suit the number of independent ribbons or strips of paper that I mount on one machine and the form of bath through which the ribbons are passed before being twisted and spun in a consolidated form upon the bobbin.

I vary the arrangement of the bath and the manner of moistening or treating independent ribbons to suit the strength and quality of the paper that is to be treated and the number of ribbons that are to be employed, sometimes dispensing with the bath and employing moistening or treating rollers or the like over or about which the paper passes. When employing a bath I make arrangements by means of guides, forks or gates so that each ribbon or strip of paper may be separately and properly treated in the bath to suit the material which I employ as a solution in the bath for incorporating or attaching to the paper when thus passing through.

Similarly, I vary the manner in which I guide and convey the paper from the bath solution through two or more rollers for removing superfluous moisture and, for compressing the ribbons one upon the other to suit the machine to which my improvements are to be applied, and the form of bobbin member and mechanism in use therewith that is to be employed in connection with such.

In the accompanying drawings, a spinning machine, according to the invention, is shown by way of example:

Figure 1 is a side sectional elevation and Fig. 2 is a front elevation of the machine.

In the figures, 1 represents a bobbin of lead wire or other filamentary material and 2 and 3 the reels of paper mounted on the frame 4. The feed rollers for the lead wire are represented by 5 and 6, the feed rollers for the paper strip by 7 and 8. These latter feed rollers draw the paper strip from the reels under the glass bars 9 and 10 connected to the slide 11 which is arranged on the guide 12 within the tank 13 and is connected to the lever 14 by which the slide and the associated glass bars may be raised from the tank, if desired, for instance, when as in starting it may be desirable to deliver the paper in a dry state to the feed rollers.

The paper strips are fed in the manner shown to the throat of the flier, which is a collar 15 so formed that it may be dropped into an aperture in the supporting bar 16 and in this position encircle the upper end of the flier spindle. The paper strips as they enter this collar, assume a tubular form, the lead wire fed forward by means of the feed rollers 5 and 6 and passing over the

guide roller 17, which, as illustrated, directs the lead wire forward and away from the direction of rotation of the flier, the lead-wire then being carried toward and centrally disposed with respect to the paper-strips as a core within the cord.

The spindle of the flier is tubular and is provided with rollers 18 and 19 at the apertures beneath one or other of which the paper and wire emerge, passing over the rollers 20 or 21 and 22 or 23 on to the bobbin 24 mounted on the flier spindle 25 which is at its lower end squared or otherwise suitably formed so that when the end of the spindle is inserted in the socket 26 which is rotated by the train of wheels 27, 28, 29, and 30 from the countershaft 31 the flier also is rotated.

It may here be pointed out that the provision of a positive drive for the flier spindle is regarded as one feature of the present invention.

The flier spindle passes through the brake drum 32 with which are associated brake blocks 33 and 34 on posts 35 and 36, the latter of which is provided with a fly nut 37 by which the brake blocks are caused to bear more or less closely upon the drum. This drum being provided with two projecting pins 38 and 39 which enter corresponding holes in the end of the bobbin is caused to rotate by the action of the flier drawing the cord which is wrapped about the bobbin and according to the grip of the blocks upon the drum the latter and therefore the bobbin is caused to lag a greater or less extent after the flier and in this way in conjunction with the rotation of the flier to impart the desired spin or twist to the cord.

The brake and bobbin in order that the cord may be properly laid upon the latter are gradually raised and then lowered in repeated succession by means of the lifter plate 40 on which the brake is arranged. This lifter plate slides in guides 41—41 on the side frames of the machine, being raised and lowered by means of the rack 42 with which the pinion 43 meshes. This pinion 43 is mounted on the shaft 44 which is driven at first in one and then in the other direction through the intermediary of the reversing pin wheel 45 which meshes with the pinion 46 mounted on the shaft 47. This shaft is mounted so that the end on which the pinion 46 is mounted may be moved laterally so that the pinion may rotate outside the row of pins or inside this row as shown in dotted lines, and is rotated by means of the spur wheel 48 through the train of wheels 49, 50 and 51 which is driven by a belt wheel 52 from the main driving shaft 53 of the machine.

In order to keep the bobbin down on the lifter plate, hooks (not shown) may be provided.

This shaft at the end remote from that which imparts motion to the reversing mechanism is connected to and operates the spur wheel 54 driving the paper feed roller by any suitable chain or gear connection (not shown), and through the idle pinion 55 the spur wheel 56 operating the lead wire feed roll 6. The ratio between these wheels is as indicated above a matter of importance when it is desired to maintain the wire or like member as a centrally disposed core. In the machine illustrated, the wheel 54 has sixty teeth and the wheel 56 has forty-nine teeth.

I do not limit the application of my invention to the spinning of independent ribbons of paper to a cord that is to be composed entirely of paper, but I may mount upon the same machine a reel or reels of hemp or other twine that it may be desired to incorporate with the ribbons to form a core or to give additional strength thereto when such may be needed for any particular purpose for which my improved ribbon or consolidated cords may be employed.

I vary the manner in which I mount the rolls or reels of paper and other material upon the framework of the machine to suit

the number of independent ribbons that are to be employed and the purpose for which such ribbons are to be spun, twisted or treated before twisting, without departing from the general construction of the machine hereinbefore described by way of example for carrying my invention into effect.

What I claim as my invention and desire to secure by Letters Patent of the United States of America is:—

A cord-making machine, including cord strip feed reels and lead-wire bobbin, a spinning means for the cord-strips, feed rolls for said cord-strips intermediary of said reels and bobbin and said spinning means, a moistening tank intermediary of said reels and said cord feed-rolls through which tank may be passed said cord-strips, a vertically slidable member positioned in said tank and equipped with spaced elements beneath which are passed said cord-strips and means for effecting the movement of said slidable member comprising an angular lever having a limiting slot and projection connection with the machine frame and a rod connection with said slidable member.

In testimony whereof I affix my signature.
 GEORGE SEATON MILDE.