G. M. MONTGOMERY AND G. L. MASON.

SERVING SPINDLE.

APPLICATION FILED OCT. 20, 1919.

1,386,350.

Patented Aug. 2, 1921.

Fig. 1.

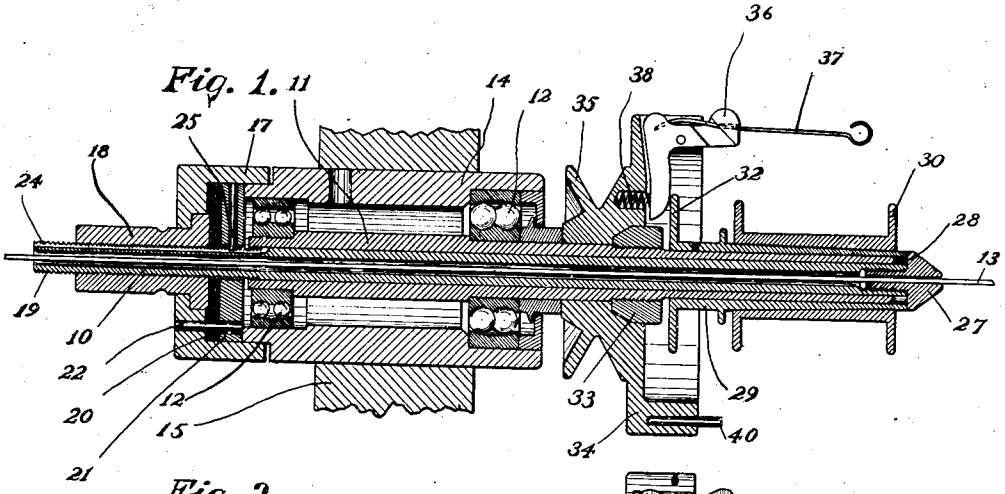


Fig. 2.

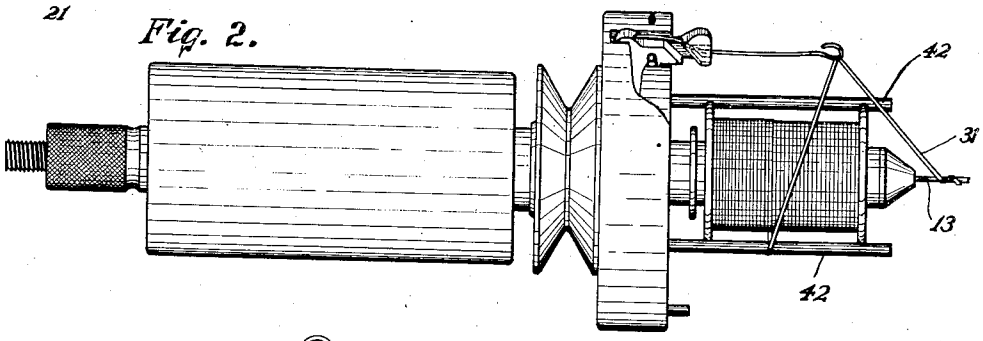
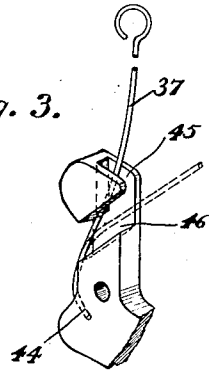


Fig. 3.



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SERVING-SPINDLE.

1,386,350. Specification of Letters Patent. Patented Aug. 2, 1921.

Application filed October 20, 1919. Serial No. 331,816.

To all whom it may concern:

Be it known that we, GEORGE M. MONTGOMERY and GEORGE L. MASON, citizens of the United States, and residents of Windsor Locks and Warehouse Point, respectively, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Serving-Spindles, of which the following is a specification.

This invention relates to serving spindles or heads of machines for winding or wrapping one strand about a second strand or core of the same or a different material. While the present invention is adapted for use generally in winding one strand about another, it has particular utility in the textile industry where, as a matter of economy, it is important that the work be done at relatively high speeds.

A device constructed in accordance with the present invention has peculiar practicability when employed to wind or wrap a metal ribbon about a thread or core of cotton or other pliable fabric, and therefore by way of example, we describe the invention as applied to this use.

The present invention has as one of its objects to provide novel features of construction in a serving spindle whereby the covering strand is maintained under proper tension at all times so that it is uniformly wound about the core. The structure is of particular advantage in that the tension under which the covering strand is wound upon the core may be adjusted or changed, at will, during the operation of the device.

It is a further object of the invention to provide a serving spindle or head which is simple in construction, and efficient and reliable in operation.

In the drawings we have illustrated the preferred embodiment of our invention, but it is of course understood that the construction may be variously modified without departing from the spirit of the invention.

In the said drawings—

Figure 1 is a longitudinal sectional view through a serving head in which our improvements are incorporated.

Fig. 2 is an elevational view with a portion broken away, and

Fig. 3 is an enlarged perspective view of our improved thread guide.

Referring to the drawings in detail; 10, designates a non-rotatable tubular guide through which the thread 13, forming the core, passes. Journaled about the tubular guide 10 and terminating short of each end thereof is a spindle 11 rotatably carried by ball bearings 12 housed within a bearing box 14 which is fixed to a portion of the frame 15 of the machine in which the serving spindle is mounted. It is not deemed necessary to show the constructions of the frame of the machine and the various instrumentalities which are associated with the serving head as they form no part of the present invention.

Tightly fitting about one end of the box 14 is a cap 17 through which the tubular guide 10 passes. Mounted in an opening in the end wall of the cap 17 and in a manner so that it may be manually rotated is an adjustable nut 18, which may be knurled to give a good grip, and this nut is screwed onto a threaded portion 19 of the tubular guide 10. The inner end of the nut abuts against a friction washer 20, positioned between the end wall of the cap 17 and a metallic disk 21. The washer 20 and disk 21 are held against rotation by a dowel pin 22. The threaded end of the tubular guide 10 is broached or splined to form a key-way 24 which receives a key 25 formed by a pin positioned in a radial opening in the disk 21. The bearing box 14 constitutes a reservoir for oil.

Threaded into the forward end of the tubular guide 10 is a head 27 which is of greater diameter than the external diameter of the guide so as to extend therebeyond and form an abutment 28. About the forward end of the spindle is a sleeve 29 which may rotate freely about the spindle 11 and move longitudinally thereon. Forward movement of the sleeve 29 is limited by the engagement of the forward end thereof against the abutment 28 of the head 27.

About the sleeve 29 and connected thereto in any suitable manner so as to rotate therewith is the spool 30 carrying the covering strand, such as a metal ribbon 31. In the present illustrative disclosure, the external periphery of the sleeve 29 and the opening through the spool 30 are similarly tapered so that the spool may be wedged onto the sleeve. The sleeve 29 has a flange or head 32 at its rear end.

Between the bearing box 14, and the sleeve 29 and fixed to the spindle 11 by means of a nut 33 is a flier 34 having a pulley 35, about which passes a belt (not shown) driven in any suitable manner. Carried by the flier is a pivoted thread guide comprising a lever 36 and a wire 37 having an eye at its free end. One end or arm of the lever 36 is positioned behind the flange 32 of the tension sleeve 29 and is normally urged thereagainst by means of a spring 38 seated in a recess in the body portion of the flier. At a point diametrically opposite to the thread guide is a pin 40 which serves to balance the flier.

The flier has one or more pins 42 over which the strand or ribbon 31 is passed. In the present case two pins, diametrically positioned, are provided so as to balance the flier and so that when the flier is rotated in one direction the ribbon may be passed over one of the pins and when the flier is rotated in the opposite direction the ribbon may be passed over the other pin.

The operation of the device is briefly as follows:—

The strand 13 is drawn, as is usual, through the tubular guide, it being customary to pass the thread after the covering strand is applied thereto about a capstan and then wind it upon a spool. The covering strand, such as the metal ribbon 31 is passed about one of the pins 42 and threaded through the eye of the thread guide 37 and as the flier is rotated the ribbon will be laid in a spiral manner upon the thread 13. If during the winding operation, the tension upon the ribbon is lessened, the ribbon will become slightly slack with the result that the free end of the thread guide will swing outwardly. Due to the force of the spring 38, the arm of the lever 36 is forced against the flange 32 of the sleeve 29 and thus the sleeve will be urged against the head 27 of the tubular guide. Because of the increased friction between the forward end of the sleeve 29 and the head 27, a braking action takes effect which slows up the rotation of the sleeve and the spool carried thereby, so that the tension on the ribbon is increased. In the event that the tension under which the ribbon is wound upon the strand 13 becomes too great the tendency of the ribbon is to become more taut and urge the thread guide 37 inwardly and thereby swing the arm of the lever 36 away from the flange 32 of the sleeve. Thereupon the friction between the forward end of the sleeve and the head 27 is reduced so that the spool may rotate more freely.

One of the important features of the present invention is that the tension under which the covering strand is wound upon the core, may be quickly and readily changed or adjusted at will by an operator without stopping or otherwise interfering with the work. This is accomplished by merely rotating the adjustable nut 18 so as to move the non-rotatable thread guide 10 longitudinally of the spindle 11 and thus change the position of the abutment 28 which constitutes the part against which the spool carrying member or sleeve 29 frictionally engages. If it is desired that the ribbon 31 be wound tighter about the core, the nut 18 is rotated in a direction to feed the tubular guide rearwardly so as to increase the friction between the forward end of the sleeve 29 and the abutment 28 on the guide. If it is desired that the covering strand be loosely wound on the core, the nut 18 is rotated in the opposite direction so as to move the abutment 28 away from the flier and reduce the friction between the sleeve and the abutment 28.

The thread guide shown in the drawing has features of novelty and advantage. It will be noted particularly from Fig. 3 that in one edge or face of the lever 36, there is a hole or recess 44 into which one end of the wire 37 of the thread guide is positioned. The lever on its opposite edge or face and adjacent its outer end is bifurcated to form a slot 45 which opens into a groove 46 in the side of the lever. It will readily be seen that in placing the wire 37 in position one end thereof is placed in the hole 44 and the wire is then sprung or bent into the position shown in dotted lines of Fig. 3 and then when the thread guide is released it will spring into the slot 45.

We claim—

1. A serving spindle having a flier, a spool, means for automatically controlling the tension under which a strand is drawn from the spool, and means operable during the operation of the flier for changing the tension on the strand.

2. A serving spindle having a flier, a spool, means carried by said flier for automatically controlling the tension under which a strand is withdrawn from the spool, and means operable during the operation of the flier for changing the relation between said controlling means and spool and thereby adjust the tension of the strand.

3. A serving spindle, a flier, a spool, means carried by the flier for automatically controlling the tension under which a strand is drawn from the spool, and means for regulating said controlling means operable independently of said flier.

4. A serving spindle having a flier, a spool, means carried by the flier for automatically controlling the tension under which a strand is withdrawn from the spool, and means normally stationary during the operation of the flier for changing the tension of said strand.

5. A serving spindle having a flier, a ro-

tatable spool carrying member, means carried by the flier for automatically controlling the tension under which a strand is withdrawn from said member, a part against which said automatic means is adapted to urge said spool carrying member, and means for adjusting the position of said part to change the tension of the strand.

6. A serving spindle having a thread guide, a flier, a rotatable spool carrying member adapted to frictionally engage said guide, and means carried by the flier for automatically controlling the friction between said spool carrying member and guide to thereby control the tension under which a strand is withdrawn from the spool carrying member.

7. A serving spindle having a non-rotatable thread guide, a flier, a spool carrying member adapted to frictionally engage said guide, means carried by the flier for automatically controlling the friction between said spool carrying member and guide to thereby control the tension under which a strand is withdrawn from said spool carrying member, and means for moving said guide and thereby change the tension of the strand.

8. A serving spindle having a non-rotatable longitudinally movable thread guide, a spindle journaled on said thread guide, a flier carried by said spindle, a spool carrying sleeve journaled on and movable longitudinally of said spindle and adapted to frictionally engage a portion of said thread guide, means carried by said flier for automatically controlling the friction between said sleeve and thread guide, and means for moving the guide longitudinally to change the tension of the strand.

9. A serving spindle having a longitudinally movable thread guide provided with an abutment, a sleeve journaled on said guide, bearings carrying said spindle, a bearing box housing said bearings, an adjusting nut threaded on said guide and rotatably mounted in said bearing box, a flier carried by said spindle, a tension sleeve journaled on and longitudinally movable of said spindle and adapted to frictionally engage against the abutment on said guide, and a thread guide yieldingly urging said sleeve into engagement with said abutment.

10. A serving spindle having a spool carrying member, a flier, a pivoted thread guide on the flier, and a spring yieldingly urging a portion of the thread guide against said sleeve.

11. A thread guide having a part provided with a hole in one face and a slot in another face, and a wire having one end positioned in said hole and extending through said slot.

12. A thread guide having a part provided with a hole in one face, a slot in another face and a groove in its side into which said slot opens, and a wire having one end positioned in said hole and extending through said groove and slot.

13. A serving spindle having a thread guide provided with an abutment at its forward end, a flier rotatably mounted thereon, a spool carrying member rotatably mounted on said guide between said flier and abutment and adapted to frictionally engage the latter, means carried by said flier and engaging said spool carrying member for automatically controlling the tension under which a strand is drawn therefrom, and means for longitudinally moving said guide to vary the distance between said flier and abutment and thereby change the tension on the strand.

14. A serving spindle having a thread guide provided with an abutment at its forward end, a flier rotatably mounted thereon, a spool carrying member rotatably mounted on said guide between said flier and said abutment and adapted to frictionally engage the latter, resiliently acting means carried by said flier and engaging said spool carrying member for automatically controlling the tension under which a strand is drawn therefrom, and means on the rear end of said guide for moving the same longitudinally.

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