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E. F. CABEZOLA.

THREAD CARRIER FOR BRAIDING MACHINES.

(Application filed Oct. 22, 1897.)

(No Model.)

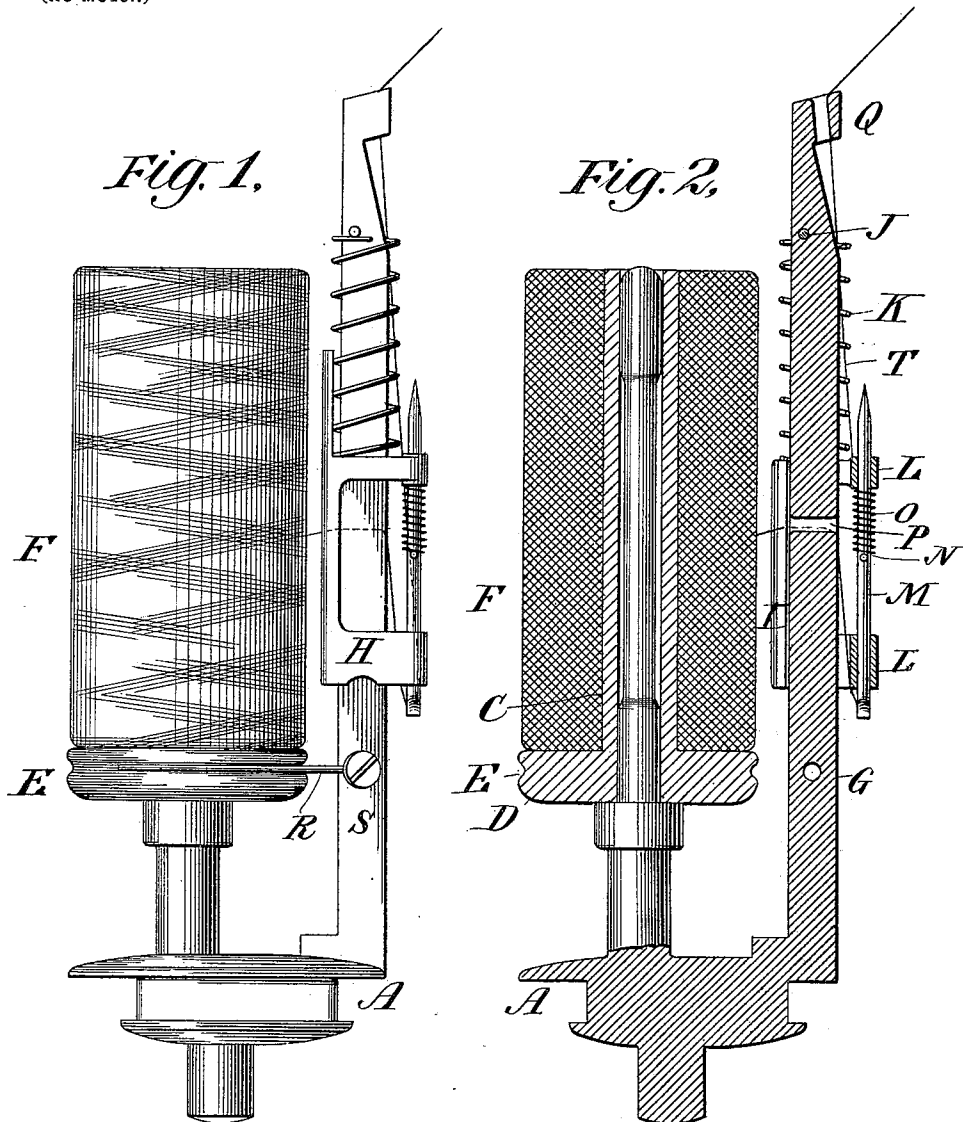
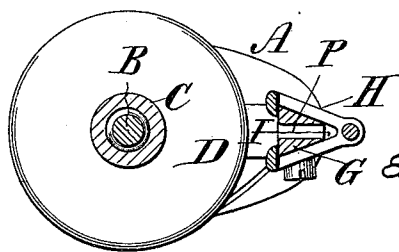


Fig. 3,



WITNESSES:

R. H. Hayward
H. P. Moller

INVENTOR

Eusebio F. Cabezola

BY

Park Benjamin
his ATTORNEY

UNITED STATES PATENT OFFICE.

EUSEBIO FRANCISCO CABEZOLA, OF TRENTON, NEW JERSEY.

THREAD-CARRIER FOR BRAIDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 623,515, dated April 25, 1899.

Application filed October 22, 1897. Serial No. 656,000. (No model.)

To all whom it may concern:

Be it known that I, EUSEBIO FRANCISCO CABEZOLA, of Trenton, Mercer county, New Jersey, have invented a new and useful Improvement in Thread-Carriers for Braiding-Machines, of which the following is a specification.

My invention relates to that class of braiding-machines in which a number of thread-carriers are vertically disposed and moved around one another in and out, so that the threads which extend to said carriers from the wire line, cord, rod, or other object to be covered with braiding are by the motion of these carriers braided together, so as to produce a tubular braided covering inclosing the wire or cord. Such carriers as at present constructed consist, substantially, of a base-piece from which rise vertically a spindle for holding the bobbin and a stem parallel to the spindle, which is provided with a sliding weight and above said weight with a movable latch. The thread from the bobbin passes beneath the weight, thus holding said weight suspended on the stem, so that the breaking of a thread or running out of a bobbin causes the weight to drop to the bottom of the stem. As the thread is taken up in the process of braiding it raises the weight until the latter comes in contact with the ratchet on the top of the stem. This ratchet is provided with a nose-piece engaging with the latch on the top of the bobbin. The weight raises the latch, so disengaging the nose-piece from the ratchet and permitting the bobbin to let off thread. This act releases the weight, which falls to its natural position, when the nose-piece again engages the bobbin and holds it as before until the motion is repeated. To this device there are certain objections, which are obviated by my present invention, thus—

First. A bobbin of special form must be used—that is to say, it must be provided with a ratchet formed upon or attached to its upper end. Upon this bobbin the thread must be wound. In the case of cotton the thread comes in skeins or hanks and undergoes two operations—first, winding upon large spools, and, second, upon the special bobbins. In the case of silk, which comes upon wooden spools, the winding is done from these spools upon the special bobbins; but in

such case the spools upon which the silk is wound are wasted, and their cost is a considerable item in the economy of manufacture. 55

Second. The bobbins themselves being of special form—that is to say, provided with ratchet-teeth at their upper end—are expensive to construct.

Third. The object of the weight is to keep the thread under tension; but this tension being derived from a definite weight or mass of metal is of course invariable. Consequently it becomes necessary in using different threads upon the bobbin to use different weights corresponding thereto in order to give to a given thread its proper tension; nor can the tension be varied for any given thread in order to adjust it to the proper amount for that particular thread. 60 65 70

Fourth. The thread is not given off the bobbin until the weight is raised sufficiently to lift the latch and so remove the nose-piece from the ratchet, and then the bobbin is unrestrained and is free to move around unchecked for a distance equal to that between two successive ratchet-teeth, when the nose-piece again enters into engagement. It is found in practice that a sudden jerk upon the free bobbin often causes it to fly around rapidly, so that a second loop comes beneath the nose-piece before engagement, and as a consequence too much thread is given off. It is then necessary for the attendant to single out the particular bobbin which has thus given off too much thread, find the loop, and turn back the bobbin to wind the thread. 75 80 85

Fifth. It is obvious that with the ratchet and nose-piece device the let off of the thread is positive in amount—that is to say, for any pull upon the thread sufficient to lift the nose-piece clear of the ratchet the bobbin will give off a definite amount of thread and not an amount proportionate to whatever the strain may be. When it is remembered that a braiding-machine contains numerous bobbins moving in and out from circumference of circle to center, and vice versa, so that the strain upon the thread is constantly varying, positive let off of thread and invariable tension exercised by the weight materially affect the efficiency of the machine. 90 95 100

In my present device I employ no weight, but provide means whereby the tension of

the thread is self-regulating, so that upon a given carrier any thread within the capacity of the machine may be used. I also do away with the positive let off of thread and with a bobbin provided with ratchet-teeth and substitute an arrangement whereby the amount of thread drawn from the bobbin depends solely upon the extent of strain applied. In lieu of a special form of bobbin I substitute a simple tubular sleeve upon which the thread or silk wound upon the ordinary commercial cop and so supplied to the market may be directly applied without any previous rewinding. Thus I save the expense of the spools in the case of silk and two windings in the case of cotton.

My invention consists more particularly in the construction and arrangement of carrier, as hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a side elevation of my improved carrier. Fig. 2 is a vertical section, and Fig. 3 is a transverse section taken just above the hole in the stem through which the thread passes from the bobbin.

Similar letters of reference indicate like parts.

A is the bottom plate of the carrier.

B is a bobbin-supporting spindle.

C is a sleeve surrounding the spindle and free to turn thereon and having a wide circular flange D at its lower portion. In the periphery of flange D is a groove E. The bobbin F, which may be the ordinary commercial cop, is received upon the sleeve C, as shown.

G is a vertical stem, which can be integral with the bottom plate A and which is parallel to the spindle B. Upon this stem is a freely-moving sliding piece H, which is slit on its rear side at I. Surrounding the stem G and interposed between the sliding piece and a fixed stop J on said stem is a spring K, which operates to press said sliding piece H downwardly. On the front side of the sliding piece H are two guides L, through which freely passes a sliding pin M. Interposed between the upper guide L and a fixed stop N on said pin is a spiral spring O, which operates to press said pin downwardly.

The thread T for bobbin F passes through the slit I in the sliding piece H, thence through an opening P in the stem G, thence through a notch on the lower end of pin M, and thence through a tubular projection Q at the top of stem G.

R is a spring fastened at one end by the screw S to the stem G and bearing at its other end upon the groove E on the periphery of flange D. The pressure of this spring upon the flange D may be adjusted by means of the screw S.

In operation this device works as follows: Tension upon the thread first draws up the pin M against the resiliency of the spiral spring O, the pin being supported at a height and the spring depressed to a degree depending upon the extent of strain. As represented

in the drawings, the thread has drawn up the pin nearly to the limit of its upward movement. Further strain upon the thread then tends to lift the sliding piece H upon the stem G, thus compressing the spiral spring K on said stem. After the spring K has been compressed to some predetermined extent the pull on the thread is sufficient to rotate the bobbin F despite the frictional resistance of the spring-finger R, and thus thread is given off until the tension relaxes, when the two springs K and O successively expand, bringing the parts back to their normal position. It will be observed, therefore, that the tension of the thread first overcomes the resistance due to the resiliency of spring O, then that due to the resiliency of spring K, and then the frictional resistance of the finger R. Hence no matter how sudden the strain upon the thread it is never referred to a fixed stop or abutment, but is opposed by gradually-increasing spring resistances either up to a point where the resistance balances the strain or where the giving off of thread relieves the tension.

I claim—

1. The combination in a thread-carrier of a fixed spindle, a bobbin-support rotary thereon, a disk on said bobbin-support, a spring bearing against the periphery of said disk and constantly operating to check the revolution of said bobbin-support, a stem parallel to the axis of said spindle, a thread-conducting sliding piece on said stem, and a spring supported on said stem and interposed between said sliding piece and a fixed stop; the aforesaid springs being constructed and arranged so that the tension of the thread shall be resisted first by the spring on said stem and subsequently and after a predetermined limit of resistance of said spring has been reached by the fixed spring on said disk, substantially as described.

2. The combination in a thread-carrier of a fixed spindle, a thread-bobbin rotary thereon, a stem parallel to the axis of said spindle, a thread-conducting sliding piece on said stem, a spring supported on said stem and interposed between said sliding piece and a fixed stop, a thread-conducting pin in said sliding piece and a spring interposed between and bearing upon said sliding piece and said pin; the aforesaid springs being constructed and arranged so that the tension of the thread shall be first resisted by the spring in said sliding piece and second by the weight of said sliding piece and the spring on said stem, substantially as described.

3. The combination in a thread-carrier of a spindle, a bobbin-support rotary thereon, a disk on said bobbin-support, a spring bearing against the periphery of said disk and operating to check the revolution of said bobbin-support, a stem parallel to the axis of said spindle, a thread-conducting sliding piece on said stem, a spring supported on said stem and interposed between said sliding piece and

a fixed stop, a thread-conducting pin in said sliding piece, and a spring interposed between and bearing upon said sliding piece and said pin; the aforesaid springs being constructed
5 and arranged so that the tension of the thread shall be resisted first by the spring in said sliding piece, second by the weight of said

sliding piece and the spring on the stem, and third by the fixed spring on said disk, substantially as described.

EUSEBIO FRANCISCO CABEZOLA.

Witnesses:

SAML. D. OLIPHANT, Jr.,

H. R. MOLLER.