

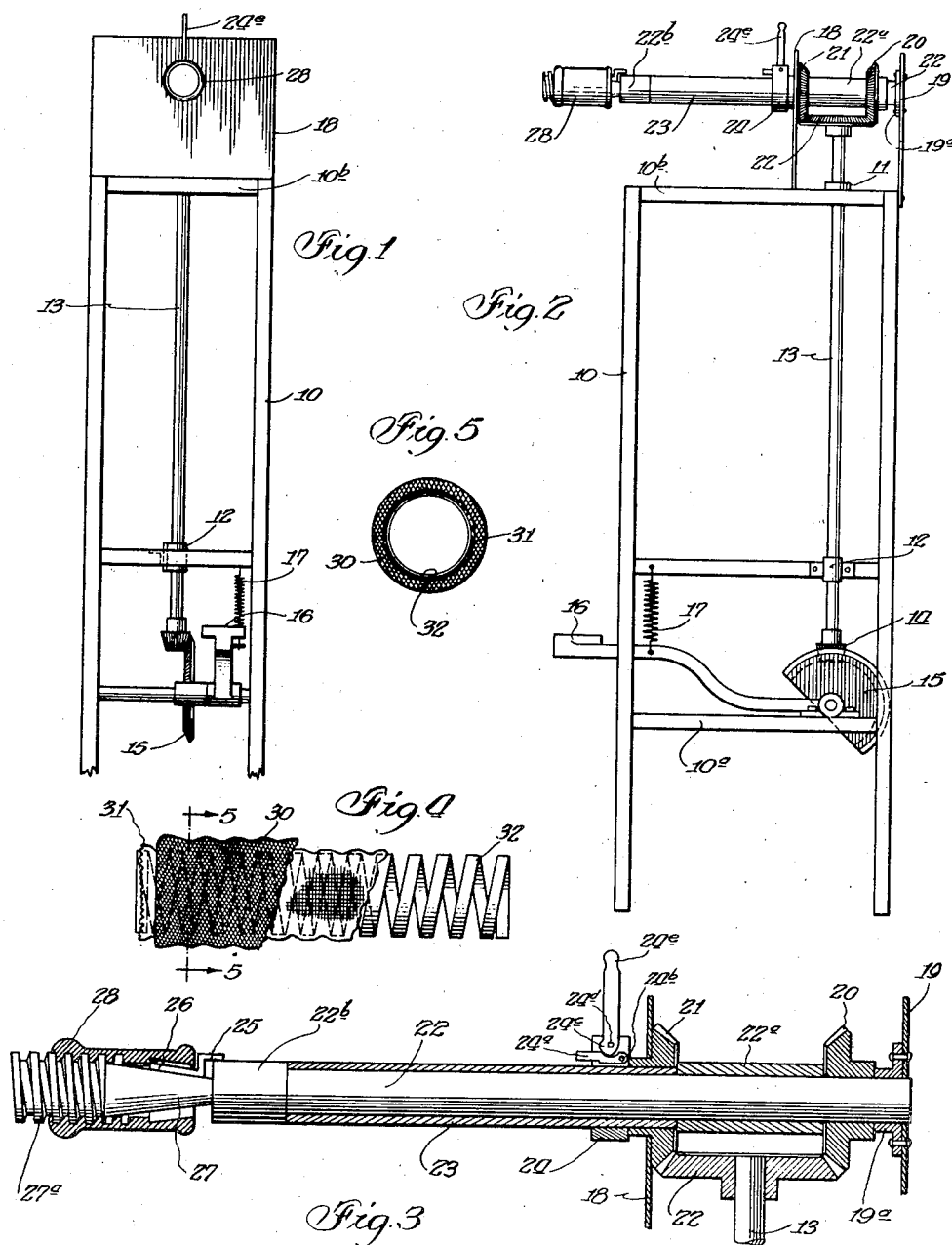
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CORE REMOVING MACHINE

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CORE REMOVING MACHINE

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5 Claims. (Cl. 29—84)

My invention relates to a product obtained in the art of textile dyeing, and more particularly to the spools of yarn that have been dyed and are ready to be removed from the cores, and my main object is to provide a mechanical appliance for this purpose which will leave the spool in a form to be completely unwound and used.

A further object of the invention is to provide a machine of the above character which employs a quick and highly efficient action to remove the core from the spool.

Another object of the invention is to provide a machine of the above character which is composed of few and simple parts and capable of being operated by anyone.

Another object of the invention is to provide an appliance for changing the diameter of a helical coil spring, forming a core for a tubular body.

Another object of the invention is to provide an appliance for contracting a coil spring to receive a tubular fabric spool.

With the above objects in view and any others which may suggest themselves from the description to follow, a better understanding of the invention may be obtained by reference to the accompanying drawing, in which—

Fig. 1 is a front elevation of the novel machine;

Fig. 2 is a side elevation thereof;

Fig. 3 is an enlarged vertical section of the principal mechanism in the machine;

Fig. 4 is an enlarged elevation, partly broken away, of a spool whose core is removable by the present machine; and

Fig. 5 is a sectional view along the line 5 of Fig. 4.

In the process of dyeing yarn or thread, the same is wound into spools with a metallic center core. The latter is in the form of a coil spring made from flat strip material, and the core first receives a sleeve of ribbed or other strong fabric, the yarn then being wound on the combined core and sleeve to form the spool.

In the process of impregnating the yarn with the dye, the spool is pressed or contracted longitudinally, in order that the dye may more thoroughly penetrate the windings of the yarn. While this operation assures the thorough dyeing of the yarn, it incidentally causes the sleeve and the yarn windings close thereto to crowd into the convolutions of the spring core, so that the sleeve and such windings either become clamped therein or so tightly jammed that it is impossible to unwind the spool completely.

While the greater amount of yarn can be unwound, difficulty is had in drawing the windings free of the spool as the inner portion thereof is reached. Such portion must, therefore, remain as waste; also, on account of its tendency to cling to or remain clamped in the spring core, it is ordinarily impossible to remove the latter for use in

other spools. To do this, it is necessary to cut the clinging portion of the yarn in a longitudinal direction and to pull the same off the core with difficulty and loss of time, the effect often being to deform or injure the core so that it is useless for the next spool.

I have departed from the wasteful and unsatisfactory method just described by providing a machine which not only enables the final portion of the spool and the core to be usable in a complete sense, but makes the removal of the core an easy and rapid operation.

In accordance with the foregoing, specific reference to the drawing indicates the stand for the novel machine at 10. The same is of rectangular skeleton form to be light and easily portable. Near the rear of the stand journals 11 and 12 are provided for a vertical shaft 13, the lower end of the same carrying a bevel pinion 14. The base 10^a of the stand carries a bevel gear segment 15 operable by a treadle 16 to rotate the shaft 13. The return of the treadle is procured by a spring 17.

The top 10^b of the stand has a pair of spaced upstanding plates 18 and 19 between which are horizontally centered and facing bevel pinions 20 and 21. A bevel gear 22, carried by the upper end of the shaft 13, meshes with the pinions 20 and 21 to impart motions in opposite directions thereto when the shaft is rotated.

The bevel pinion 20 is carried by a shaft 22, one end of which is journaled in a bearing 19^a carried by the plate 19; and the pinion 21 is carried by the inner end of a sleeve 23 freely mounted on the shaft 22. A spacer bushing 22^a is mounted on the shaft 22 between the bevel pinions. The shaft 22 projects from the outer end of the sleeve to assume the form of a cylindrical headpiece 22^b even with the exterior of the sleeve 23.

It is my intention that the coil spring core of the yarn spool be placed on the combined support formed by the sleeve 23 and head-piece 22^b and to clamp the ends of the core to these parts respectively. For this purpose, the sleeve 23 is provided with a band 24 which incorporates a finger 24^a pivoted at 24^b to the band and adapted to be pressed down by an eccentric cam 24^c centered at 24^d in the band. The cam is extended upwardly to form a lever 24^e. Thus, when the final convolution of the spring core is placed under the finger 24^a, the lever 24^e may be drawn forward to securely clamp the said convolution to the sleeve 23.

As the opposite final convolution of the core occurs on the head-piece 22^b, a clamp in the form of a finger 25 is provided to secure the same to the head-piece. The finger 25 forms an extension of a jaw 26 slidable on a cone 27 extended from the head-piece 22^b. The cone has

a forward continuation in the form of a screw 27^a on which a tubular nut 28 is disposed. Thus the finger 25 is ordinarily loose in the rear portion of the nut 28, but when the latter is turned by hand to move forward along the jaw 26 the effect is to force the finger 25 inwardly and thus clamp the corresponding convolution of the core.

The arrangement just described is a familiar one in the common drill brace, except that only one jaw instead of three is employed.

In this manner the sleeve 23 and the head-piece 22^b act as core members, being received within the core of the helical spring and supporting the same by attachment to the ends thereof. These core members may be positioned axially of said spring and in alignment with each other. In addition, it is preferred that the shaft 22 and sleeve 23 be in telescopic relation as shown.

Figures 4 and 5 show the remaining portion of a typical dyed yarn spool, after the greater portion of the yarn has been unwound. The remainder of the yarn is indicated at 30, the internal fabric sleeve at 31, and the spring core at 32. The space within the latter is sufficient to amply clear the clamping nut 28, head-piece 22^b and sleeve 23 as the spool is slid thereon. The core projects from the ends of the fabric, exposing the final convolutions of the core. Thus these are readily arranged under the fingers 24^a and 25 and clamped as previously described.

The novel machine is now ready for the core removing operation. For this purpose it is only necessary for the attendant to depress the treadle 16. This action causes the head-piece 22^b and sleeve 23 not only to turn rapidly in opposite directions, but in a manner to wind the spring core 32 from both ends. This necessarily induces a diametrical contraction of the core, so that the latter is quickly and smoothly extracted from the internal cavities and corrugations of the fabric sleeve 31 and spool portion 30. It is, therefore, easy to pull these parts forward and clear of the machine.

The release of the treadle 16 automatically reverses the operation of the gearing so that the spring core unwinds and becomes restored to its original form. It may now be easily unclamped and slipped off its support. Finally, the composite fabric tube may be pulled or drawn into a rigid metal core to correct its wrinkled condition, and the core used as a base from which is unwound the remaining portion of the yarn.

Obviously, with the yarn threads freed from clamping or tightening pressure, no resistance will meet the unwinding of the yarn, so that the latter will be saved instead of wasted. This also applies to the fabric sleeve 31. At the same time the spring core 32 will also be had in its original and proper condition, since the removing operation imposes no deforming or injuring strain thereon.

It will be evident from the above description that I have provided a machine for the purpose specified which eliminates the unsatisfactory situation presented by the inner portions of the spools whose yarn has been dyed. First, all the material is saved for purposes of supply or to be

used over again, and second, no difficulty is experienced to procure the removal of the spring core. The machine accomplishes this action quickly, smoothly, safely and efficiently. Yet the novel machine is composed of parts which are few and simple, and may, therefore, be produced inexpensively and used indefinitely without appreciable need of attention or repair.

This application is a continuation-in-part of my copending application, Serial No. 143,237, filed May 17, 1937, for an improvement in core removing machines.

While there are shown and described certain embodiments of the invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is intended to claim all novelty inherent in the invention as broadly as permissible, in view of the prior art.

I claim:

1. An appliance for removing a coil spring forming the embedded core of a tubular fabric spool, comprising, a pair of telescoped shafts positioned axially of said spring, the ends of the inner shaft projecting from the outer one, a clamp carried by one end of the outer shaft, a second clamp carried by the opposite end of the inner shaft, said clamps being adapted to secure the end portions of the spring to the respective shafts when said spring is mounted to surround the same, and a gearing to rotate the shafts in opposite directions to wind said spring to contract the same towards its axis and withdraw the convolutions of said spring from the inner wall of said spool.

2. The structure of claim 1, in which the gearing comprises facing bevel pinions on the respective shafts, an intermediate gear in mesh with the pinions, a drive shaft carrying the gear, and foot-control means to operate the drive shaft.

3. An appliance for removing a coil spring forming the embedded core of a tubular fabric spool, comprising, a support for said spring, said support comprising a pair of telescoped shafts positioned axially of said spring, means for securing each end of said spring to a different shaft, and means for moving at least one of said shafts in a direction to contract said spring towards its axis and extract its convolutions from the inner wall of said spool.

4. An appliance for changing the diameter of a coil spring, comprising, a support for said spring, said support comprising a pair of telescoped shafts positioned axially of said spring, means for securing each end of said spring to a different shaft, and means for rotating at least one of said shafts in a direction to contract said spring towards its axis and extract its convolutions from the inner wall of said spool.

5. An appliance for changing the diameter of a coil spring comprising, a support for said spring, said support comprising a pair of telescoped shafts positioned axially of said spring, means for securing each end of said spring to a different shaft, and means for rotating at least one of said shafts in a direction to contract said spring towards its axis.

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