

Nov. 3, 1953

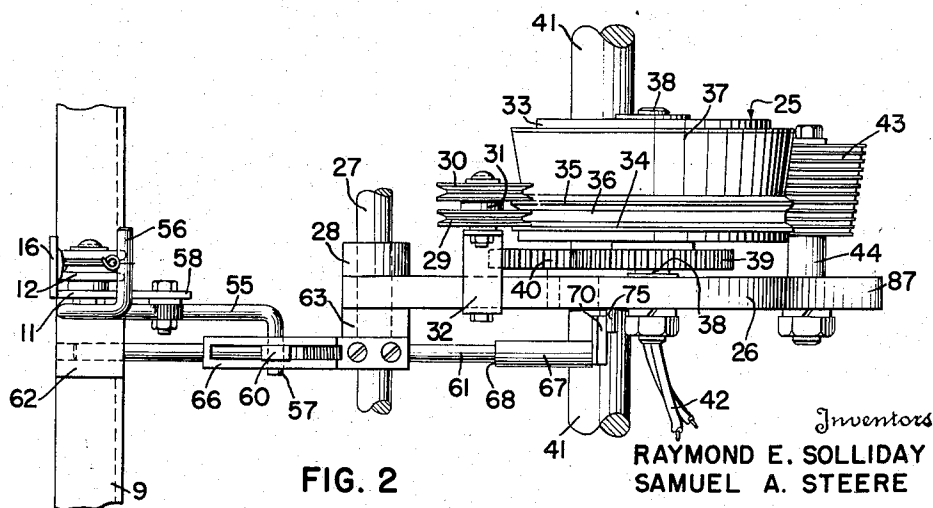
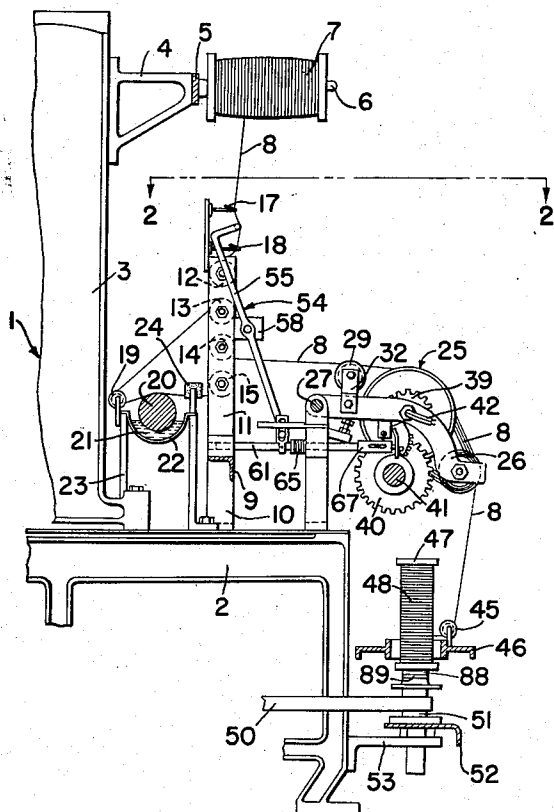
R. E. SOLLIDAY ET AL

2,657,451

STOP MOTION DEVICE FOR STRAND MANIPULATING APPARATUS

Filed Aug. 23, 1950

4 Sheets-Sheet 1



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Inventors
RAYMOND E. SOLLIDAY
SAMUEL A. STEERE

K. L. Miller
ATTORNEY

Nov. 3, 1953

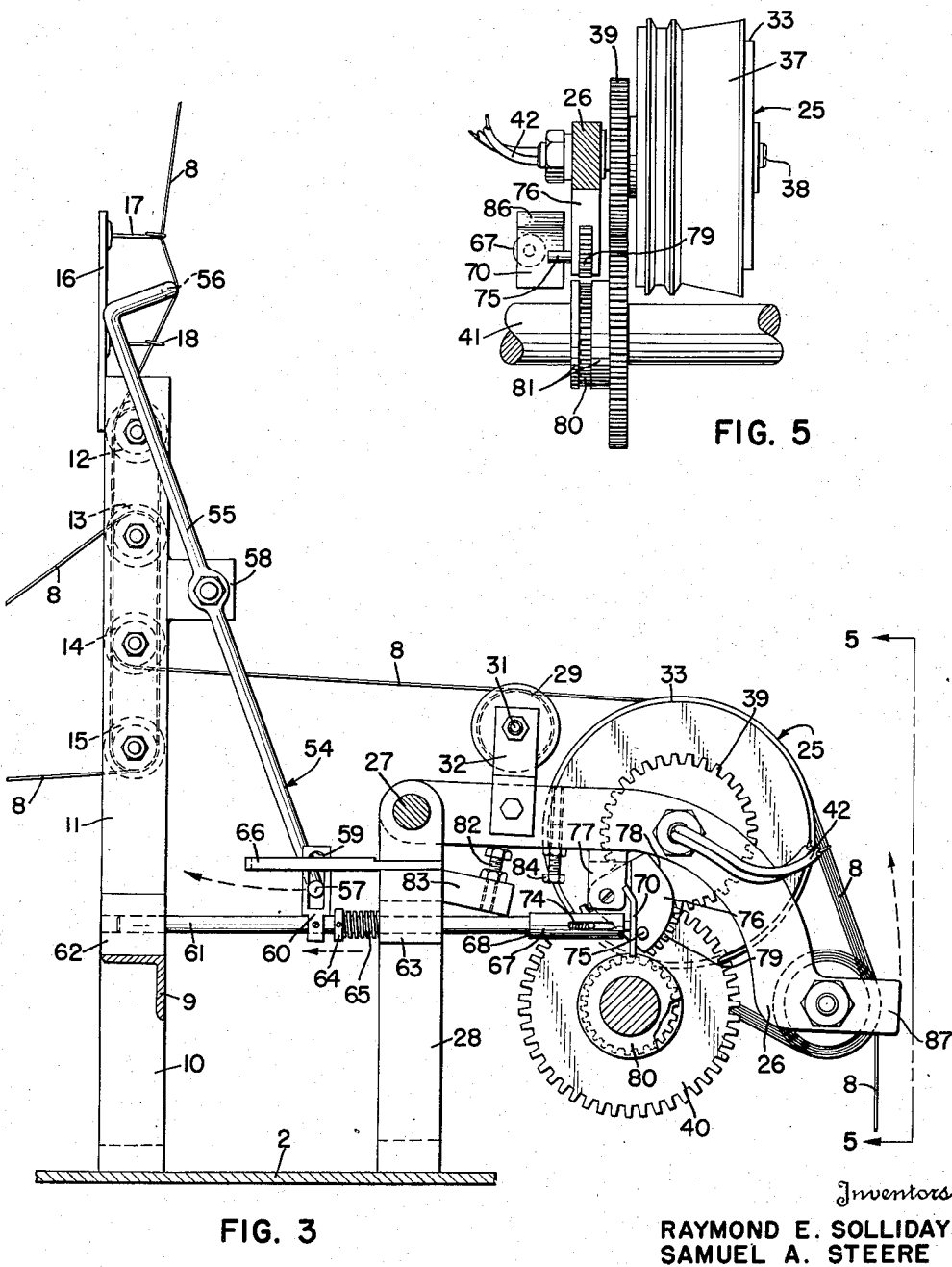
R. E. SOLLIDAY ET AL

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Inventors
RAYMOND E. SOLLIDAY
SAMUEL A. STEERE

R. L. Miller
ATTORNEY

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4 Sheets-Sheet 3

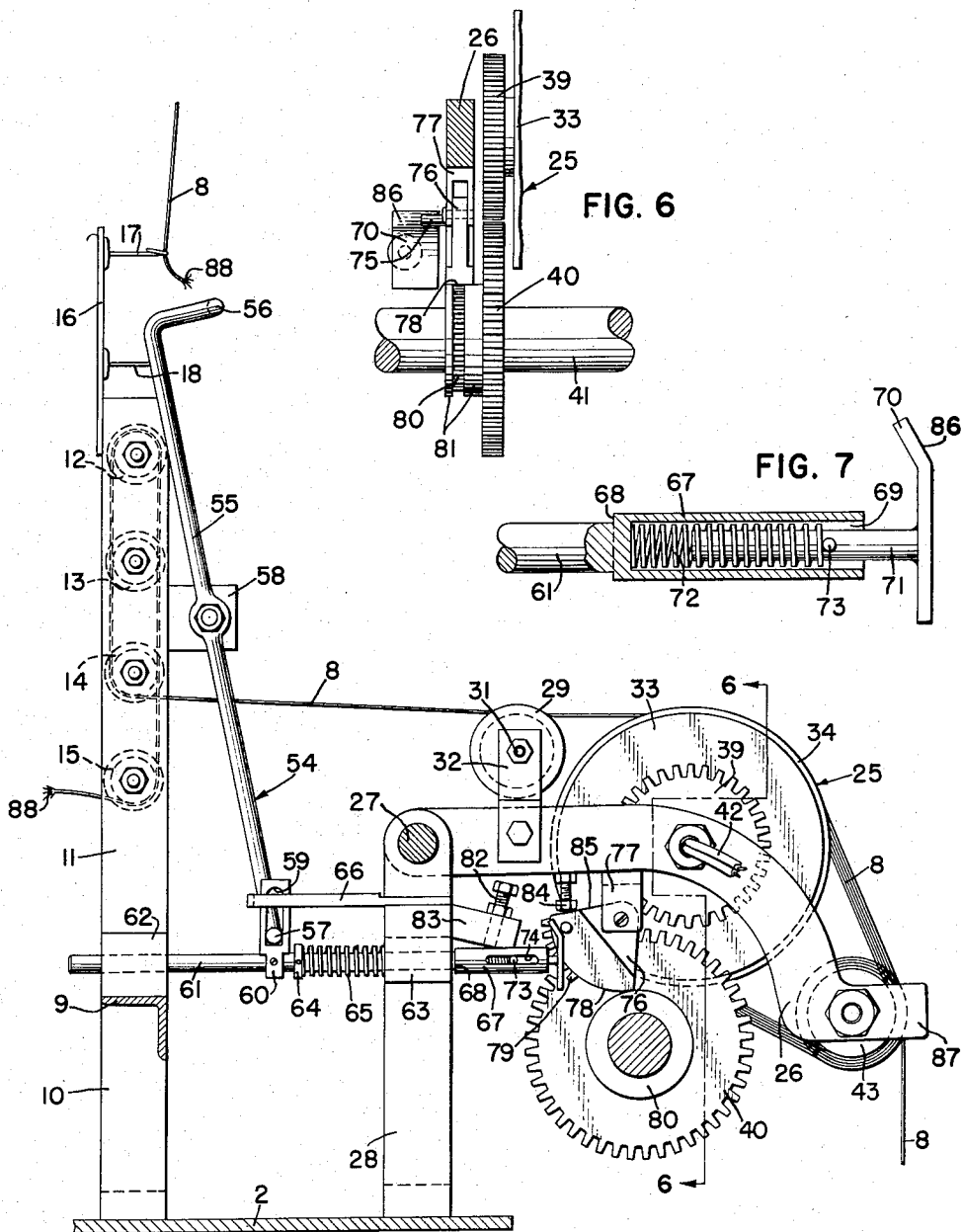


FIG. 4

FIG. 6

FIG. 7

Inventors
RAYMOND E. SOLLIDAY
SAMUEL A. STEERE

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R. L. Miller
ATTORNEY

Nov. 3, 1953

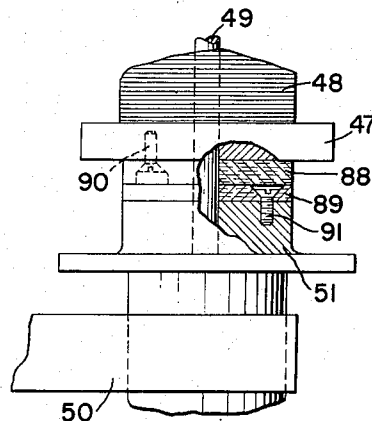
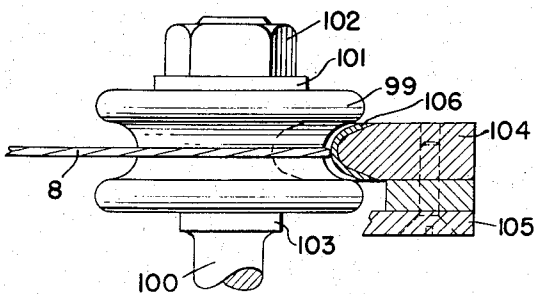
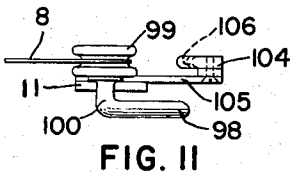
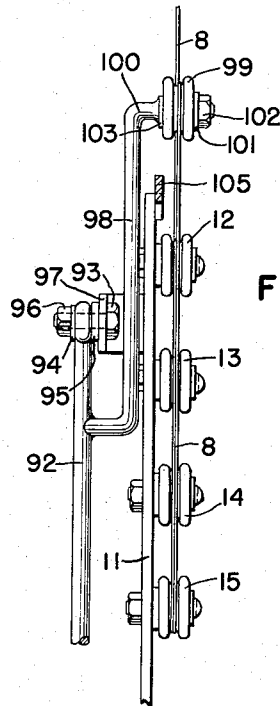
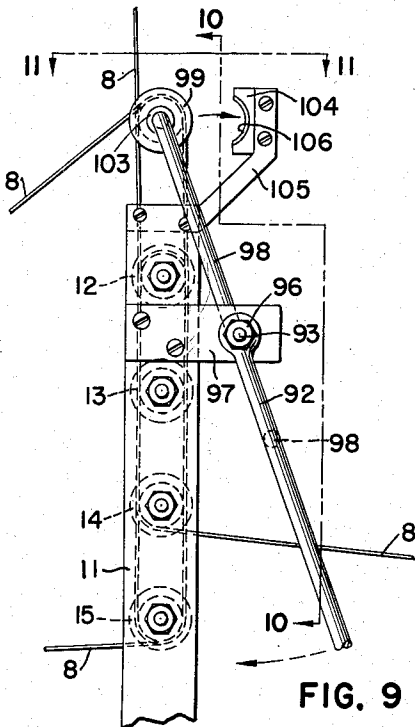
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4 Sheets-Sheet 4



INVENTORS
RAYMOND E. SOLLIDAY
BY SAMUEL A. STEERE

R. L. Miller
ATTORNEY

UNITED STATES PATENT OFFICE

2,657,451

STOP MOTION DEVICE FOR STRAND
MANIPULATING APPARATUSRaymond E. Solliday and Samuel A. Steere,
Akron, Ohio, assignors to Wingfoot Corpora-
tion, Akron, Ohio, a corporation of Delaware

Application August 23, 1950, Serial No. 180,944

14 Claims. (Cl. 28—71.5)

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The present invention relates to a novel form of stop-motion device for use in apparatus for the manipulation of cord, thread, and other similar filamentous material of substantially continuous lengths. More particularly, the invention pertains to a means for instantly stopping cord winding or treating machinery in which the cord being treated is temporarily stored in an intricate pattern or series of windings which it would be necessary to restore in the event of cord breakage or a supply failure unless the operation of the apparatus is quickly arrested.

It is an object of the present invention to provide a form of stop-motion which is actuated by the cord as it leaves the supply source to control the arresting of the cord processing apparatus whenever the supply runs out or the cord breaks.

It is another object of the present invention to provide a stop-motion which will operate without delay to arrest the operation of the cord processing apparatus, thereby insuring against unauthorized withdrawal of the cord end from the apparatus to an extent such that partial rethreading of the apparatus becomes necessary.

Other objects and advantages will become apparent as a detailed description of one form of device embodying the principles of the present invention proceeds.

In the accompanying drawings, Fig. 1 represents an end elevation of a cord treating apparatus with parts in section and broken away. Fig. 2 is a partial plan view at an enlarged scale of a portion of the apparatus of Fig. 1 with parts removed and broken away for the sake of clearness. Fig. 3 is an elevation of the portion of the apparatus illustrated in Fig. 2 showing the stop-motion of the present invention in operating relation to the parts of the cord treating apparatus. Fig. 4 corresponds generally to Fig. 3, but shows the stop-motion released. Fig. 5 is an end view of the apparatus of Fig. 3 as seen from the line 5—5 therein with parts broken away. Fig. 6 is a vertical section taken along the line 6—6 in Fig. 4 with parts in elevation. Fig. 7 is an enlarged view of one of the elements of the stop-motion with parts broken away. Fig. 8 is an enlarged cut-away view of the winding spool on which the finished cord is collected.

Fig. 9 illustrates another form of stop-motion embodying the features of the present invention and corresponds generally to the device of Fig. 3 with parts broken away. Fig. 10 is a front elevation of the device of Fig. 9 as seen from the line 10—10 therein. Fig. 11 is a plan view of

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the apparatus shown in Fig. 9 from the line 11—11 therein. Fig. 12 is an enlarged plan view of the stop-motion of Fig. 9 corresponding generally to Fig. 11, but with the parts thereof in their respective positions assumed when the cord processing operation is halted.

In Fig. 1 of the drawings, the reference numeral 1 identifies a cord treating apparatus generally for the treatment of cord, thread, or the like. The cord treating apparatus 1 comprises a base portion 2 on which is mounted a vertically extending support structure 3.

A plurality of supporting brackets 4 are mounted on the several support structures 3 so as to carry spindle rail 5 extending in longitudinal relation along the cord treating apparatus 1. The spindle rail 5 has a plurality of spindles 6 thereon, each of which serves to support a supply package 7 from which an end 8 of cord, thread, or the like is withdrawn for processing treatment in the cord treating apparatus 1. The cord end 8, which will be referred to hereinafter simply as "cord," is directed through a devious path of travel in the course of its treatment. Since this feature does not constitute the subject matter of the present invention, only one such cord path will be described in part, but it should be understood that the apparatus of the present invention has equal adaptability to any similar form of path which may be employed in conducting the cord 8 through the cord treating apparatus 1.

The cord treating apparatus 1 is provided with an angle member 9 extending longitudinally thereof and supported at its ends and at intermediate spaced points by a plurality of supports 10 which are mounted on the base portion 2. The angle member 9 serves to support the vertical members 11 which are arranged therealong in spaced, generally parallel relation, one such member being provided for each cord processing step on the cord treating apparatus 1. On each vertical member 11 there are a number of grooved idler rolls 12, 13, 14, and 15 which are mounted in freely rotatable relation. The several idler rolls serve to provide a means of guiding the cord 8, both before and after treatment.

An extension 16 is secured to the uppermost end of the vertical member 11 and provides a mounting for a pair of spaced pigtail guides 17 and 18. From its path about the several grooved idler rolls 12 to 15, inclusive, the cord 8 is passed to a grooved guide roll 19 which directs the cord over and in contact with the surface of a Scotch roll 20. The Scotch roll 20 is supported at its

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ends in such fashion that it is partially immersed in a supply 21 of treating liquor such, for example, as a suitable adhesive or bonding agent to facilitate the adherence of the cord with rubber or other like plastic material.

The treating liquid 21 is disposed in a trough 22 which is suspended from the base portion 2 of the cord treating apparatus 1 as by means of the supports 23 secured to the base portion 2. It will be understood that the treating liquid 21, by virtue of the fact that the trough 22 extends lengthwise of the cord treating apparatus 1, will serve to supply a treating medium for all of the cord treating stations therealong. A wiper 24 supported by the trough 22 is disposed in contact with the cord 8 after it leaves the Scotch roll 20 for the purpose of removing from the cord any excess treating liquor to prevent contamination of the several parts of the apparatus.

The cord 8, after the application of the treating liquor 21 is completed, is again guided over one or more of the grooved idler rolls 12, 13, 14, and 15, after which it is directed to a series of cord manipulating devices identified generally in Fig. 1 by the reference character 25. The cord manipulating devices 25 may include suitable idler guide rolls, a stretching cone, a heated flared drum, and a suitable driving mechanism, all of which will be described in greater detail hereinafter.

The cord manipulating devices 25 are advantageously supported on a pivotally mounted means which takes the form of the swinging arm 26. The arm 26 is appropriately mounted upon a longitudinally extending rod 27 which is supported in fixed relation to the base portion 2 of the cord treating apparatus 1 by a plurality of supports 28. Similar mounting means are provided for each of the several cord treating stations along the cord treating apparatus 1.

The arm 26 provides a support for a pair of grooved idler rolls 29 and 30 disposed in spaced parallel relation to each other on a stud 31 which is secured to the mounting bracket 32 carried by the arm. Adjacent to the grooved idler rolls 29 and 30 is a heated drying drum 33 of cantilever construction. The drying drum 33 is provided at its supported end with an integrally formed flange 34. An annular rib 35 is formed on the periphery of the drying drum 33 in spaced and generally parallel relation to the flange 34 so as to provide therebetween a generally cylindrical surface 36. Extending outwardly toward the unsupported end of the drying drum 33 is a flared portion 37.

The drying drum 33 is mounted for positive rotation upon a mounting stud 38 which is appropriately secured to the arm 26 and carries a gear 39. A suitable driving means embodying the gear 39 and a meshing gear 40 mounted on the driving shaft 41 extending lengthwise of the cord treating apparatus 1 serves to rotate the drying drum 33 at a constant predetermined rate. The drying drum 33 is heated as by means of an internally disposed electrical resistance unit (not shown) of conventional design which employs electrical energy supplied through the wires 42 which are connected to a suitable source of electricity. Any other suitable source of heat other than the electrical unit may be employed.

The drying drum 33 operates in conjunction with a stretching cone 43 to provide a predetermined path of travel for the cord 8 which embodies a plurality of spaced, generally helical turns of gradually increasing diameter. The

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stretching cone 43 is freely rotatably supported about a mounting stud 44 which is, in turn, secured to the arm 26.

From the stretching cone 43, the cord 8 is directed downwardly as indicated in Fig. 1 to a grooved guide roll 45 freely rotatably mounted upon a conventional ring rail 46 which is mounted for reciprocation with respect to a spool or bobbin 47 on which the cord 8 is collected in the form of a package 48. The bobbin 47 is supported by a vertical spindle 49 (see Fig. 8) and is driven by a belt 50 and a pulley 51 in a manner more fully described hereinafter. The spindle 49 is supported in each case by a stationary spindle rail 52 which is in turn supported by brackets 53 from the base portion 2 of the cord treating apparatus 1.

In order to facilitate the operation of the cord treating apparatus 1 and to avoid the necessity of restoring the entire path of travel of the cord 8 about the several elements of the apparatus and in particular on the cord manipulating devices 25 thereof, a stop-motion 54 is provided. The stop-motion 54 may take several different forms, but is here illustrated as embodying among other things, a feeler 55 for contacting the cord. The feeler 55 has a bent portion 56 at one end thereof for contact with the cord 8 as it passes between the pigtail guides 17 and 18 in the cord treating apparatus 1. At the opposite end of the feeler 55 is disposed a bent portion 57. The feeler 55 is pivotally mounted on a boss portion 58 in the manner illustrated in Figs. 1, 3, and 4 so as to be free to assume a generally vertical position in the event that the cord 8 should break or the supply should run out.

The bent portion 57 of the feeler 55 is arranged to engage a slotted opening 59 in the trigger 60. The trigger 60 is secured to the slidable rod 61. The rod 61 is mounted for axial movement in a horizontal plane on the blocks 62 and 63 mounted upon the angle member 9 and the support 28, respectively. Adjacent the trigger 60 on the slidable rod 61 is disposed a collar 64 and a compression spring 65 which is disposed in biasing relation between the collar and the block 63 on the support 28 which affords an abutment for the spring.

The trigger 60 is held in vertical position with respect to the slidable rod 61 as by means of a slotted guide member 66 secured to the block 63. The trigger 60 is freely slidable in the slotted opening formed in the guide member 66. The spring 65 is retained in compression between the collar 64 and the block 63 when the feeler 55 is in operating relation and retained by the cord 8 as it passes through the pigtail guides 17 and 18. The relationship of the several elements herein described is best illustrated in Fig. 3 of the drawings.

The slidable rod 61 is provided at its end adjacent the block 63 with an enlarged end portion 67 providing a shoulder 68 thereon which limits the lateral movement of the slidable rod 61 in its blocks 62 and 63. The enlarged end portion 67 has a counterbore 69 in one end thereof as best shown in Fig. 7 of the drawings. This counterbore 69 houses the keeper 70, the stem portion 71 of which extends into the counterbore. The stem portion 71 of the keeper 70 is inserted in a compression spring 72 with a pin 73 extending through a slot 74 in the end portion 67, serving to retain the keeper 70 in place therein against the action of the spring.

When the stop-motion 54 is in operative rela-

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tion as shown in Fig. 3 of the drawings, the face of the keeper 70 is in contact with a pin 75 in the cam member 76 and serves to retain the latter in the position illustrated as long as the supply of the cord 8 in the cord treating apparatus 1 is uninterrupted. The cam member 76 is advantageously mounted in pivotal relation in a mounting boss 77 on the arm 26 so as to be free to rotate in a vertical plane when the keeper 70 is moved laterally by the action of the slidable rod 61 in a manner hereinafter to be described.

The cam member 76 is provided with a cam surface 78 and an adjacent portion having a plurality of teeth 79 in the nature of a segmental gear for meshing engagement with the teeth of a gear 80. The gear 80, which is mounted on the longitudinal drive shaft 41, is disposed closely adjacent to the driving gear 40 mounted thereon. The gear 80 is constructed with a pair of spaced cam surfaces 81 for contact with the cam surface 78 of the cam member 76 after the latter has been rotated through a vertical plane by the meshing of the teeth 79 with the teeth of the gear 80.

Suitable adjustment features may be provided for the positive location of the swinging arm 26 to insure proper meshing of the teeth of the gear 39 with the driving gear 40 on the shaft 41. Such adjustment features include a stud bolt 82 which is threaded through an internally threaded hole in the boss portion 83 on the support 28. A similar adjusting stud bolt 84 is threaded into an internally threaded hole in the arm 26 for the purposes of providing an adjustable stop for the cam member 76 when the flat surface 85 thereon is rotated about into contact therewith.

The keeper 70 is bent at its uppermost portion 86 so as to provide a slight relief for the pin 75 when the cam member 76 has been rotated to its uppermost limit, thereby bringing the flat undersurface 85 thereon into contact with the stud 84 on the arm 26. A handle portion 87 at the free end of the arm 26 facilitates the manual adjustment of the position of the arm by the operator in the course of operation of the thread manipulating apparatus 1.

The cord treating apparatus 1, just described, is threaded up by bringing the end of the cord 8 from the supply package 7 through the pigtail guides 17 and 18. The cord 8 is then directed along a predetermined path over and around a series of grooved idler rolls 12, 13, 14, and 15 from one of which, in this case the roll 13, the cord is advanced to the idler roll 19. The cord 8 is next passed over and in contact with the surface of a Scotch roll 20 which dips into the supply of treating liquor 21, thence over the wiper 24, and back to the grooved idler rolls 12, 13, 14, and 15.

The cord 8 now leaves the treating portion of the cord treatment apparatus 1 and is directed to the several cord manipulating devices 25. Here the cord 8 is subjected to a predetermined amount of heating and stretching. From this stage of treatment, the cord passes next to the wind-up stage as illustrated in Fig. 1 of the accompanying drawings where the finished and treated cord 8 is collected in the form of a package 48 on a rotating bobbin 47.

The path of travel of cord 8 described above represents only one of several through which the cord may be manipulated to produce the desired finished product. It will be readily

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understood that since the path of cord 8 is tortuous and requires a considerable expenditure of time and skill on the part of the operator in threading up the cord treating apparatus 1, any break in the cord 8 or run-out of the supply package 7 would cause considerable waste and require frequent time consuming rethreading operations. Such stoppages ultimately result in increased costs for the entire cord treating operation.

Of even greater importance is the fact that the let-off, treating, heating and stretching, and wind-up steps shown comprise but one unit of a complete cord treating apparatus 1. The cord treating apparatus 1 usually contains a battery of from fifty to one hundred such units and any loss of time resulting from rethreading operations or cord wastage would necessarily be multiplied many times in the course of the normal operation of the cord treating apparatus.

It will be noted that the stop-motion 54 has not been rendered operable until the initial threading operation has been completed. Upon completion of the threading operation, the stop-motion 54 is placed in operable relation by shifting the segment of the cord 8 passing between the two pigtail guides 17 and 18 to one side far enough to permit the bent portion 56 of the feeler 55 to be positioned as shown in Figs. 2 and 3. The cord 8 is then permitted to return to its normal position in contact with the bent portion 56 of the feeler 55. The feeler 55 remains biased in the position shown until the cord 8 breaks or an end runs out releasing the biasing effect which it exerts upon the bent portion 56 of the feeler.

It will be understood that as long as a driving pull is maintained on the cord 8 by the cord manipulating apparatus 25 and a sufficient supply of the cord is present in the supply package 7, the feeler 55 will be retained in the slightly tilted position illustrated in Fig. 3. As a result of this restrained position of the feeler 55, the rod 61 will be biased in the direction of its longitudinal axis, thereby compressing the spring 65. The keeper 70 will contact the pin 75 of the pivoted cam 76 holding it temporarily in the position shown in Fig. 3.

It will be understood that as long as the cord 8 remains unbroken or the supply package 7 does not run out before it can be replaced by the operator with a new package and the cord ends 8 tied together, the stop-motion unit 54 will remain in the position illustrated in Fig. 3 without affecting the cord path or the treating operations described above. Breakage of the cord seldom occurs, but a supply failure may be quite frequent.

In the event that the cord 8 runs out or breaks anywhere in the thread circuit from the let-off to the wind-up of the cord treating apparatus 1, the restraining action of the taut cord is instantly removed from the bent portion 56 of the feeler 55. Due to its counterbalanced suspension, the feeler 55, temporarily biased in tilted relation, will return to a vertical position. The compression is thus removed from the spring 65, and the rod 61 is shifted along its longitudinal axis in the direction indicated by the arrow in Fig. 3, withdrawing the enlarged portion 67 on said rod housing the spring 72, pin 73, stem portion 71, and keeper 70 (see Figs. 4 and 7).

The purpose of the spring 72 in the assembly shown in Fig. 7 is to insure a smooth operation of the stop-motion unit 54 when such a cord

breakage or run-out as described above occurs. While the feeler 55 is still restrained by the pressure contact of the cord 8 on the bent portion 56 thereof, both spring 72 and spring 65 are compressed although the release of spring 72 would be opposite to that of the spring 65. Thus, the spring 72 has a tendency to delay or hold back slightly the shiftable movement of the keeper 70 and consequently restrains the movement of the cam member 76 through the contact of the keeper 70 with the pin 75.

When the compression has been removed from the spring 72 and it has extended to its full length or at least to a point where it is overcome by the weight of the pivoting cam member 76 with the retraction of the rod 61, the cam member swings downwardly in a smooth and steady manner. The teeth 79 of the cam member 76 now engage the teeth of the gear 80. When this occurs, the gear 80 being driven by the shaft 41 rotates the cam member 76 until the cam surfaces 78 thereon contact the cam surfaces of the gear 80. The cam member 76 continues to rotate until it assumes the position shown in Fig. 4.

This rotation of the cam member 76 against the cam surfaces 81 of the gear 80 results in the arm 26 pivoted at 27 being raised to the position shown in Fig. 4. This causes the gear 39 to be disengaged from the gear 40 in the driving shaft 41, thereby stopping the rotation of the driving drum 33. During the rotation of the cam member 76 the spring 72 again comes into play. When the cam member 76 is in its neutral position, the spring 72 is in its free or uncompressed position. While the cam member 76 is moving toward the position shown in Fig. 4, the pin 75 remains in contact with the keeper 70, thereby compressing the spring 72.

When the cam member 76 reaches the uppermost extremity of its path of travel, as shown, spring 72 again releases to enable the bent portion 86 of the keeper 70 to come into contact with the pin 75. The relatively slight pressure exerted by the spring 72 on the keeper 70 tends to assist in holding the cam member 76 in its elevated position until the operator has threaded up the cord treating apparatus 1 and again reset the stop-motion unit 54 in the manner previously described.

As soon as the gear 39 is disengaged from the gear 40 by the pivoting of the arm 26 about its mounting on the rod 27, the positive feed of the cord 8 from the cord manipulating devices 25 to the bobbin 27 ceases. The tension induced in the cord 8 by the rotation of the bobbin 47 in building the package 48 is very slight by reason of the fact that the bobbin is only frictionally driven by the pulley 51. This frictional drive is accomplished through the use of a pair of facings or disks 88 and 89 of fiber or other similar material secured to the base of the bobbin 47 and the top of the pulley 51 by means of the screws 90 and 91, respectively.

Since the bobbin 47 is only frictionally driven from the pulley 51, the several generally helical turns of the cord 8 encompassing the driving drum 33 and the stretching cone 43, as well as the multiple cord loops on the several grooved idler rolls 12, 13, 14, 15, 29, and 30, serve to produce a snubbing action which prevents the end of the cord 8 from being drawn completely through the cord treating apparatus 1. This stoppage of the cord 8 from drifting or releasing itself is a very important feature of any stop-

motion device in that unless this can be satisfactorily achieved, it becomes necessary to rethread the entire apparatus involving loss of time and expenditure of labor.

The feeler 55 of the stop-motion 54 may advantageously take the modified form illustrated in Figs. 9, 10, 11, and 12 and identified by the reference numeral 92. The lowermost end of the feeler 92 and the means for its connection to the rod 61 are identical to those employed with the feeler 55 previously described. The present description will, therefore, be confined to the differences in feeler 92 which are not present in its counterpart element 55.

The feeler 92 is pivotally mounted as by means of the bolt 93, washers 94, 95 and the nut 96 from a bracket 97 suitably secured to the support 11. The feeler 92 is provided with a projecting arm 98 extending outwardly from and adjacent the supported end of the feeler. A grooved idler roll 99, which is generally similar to the other idler rolls 12 to 15, inclusive, is freely rotatably mounted on the uppermost extremity 100 of the arm 98, being retained thereon by a washer 101 and a nut 102 threaded on the extremity cooperating with the collar 103 (see Fig. 12).

In normal operation of the cord treating apparatus 1, the path of travel of the cord 8 on the apparatus is modified only in the respect that a segment of the cord is brought upwardly from the idler rolls 12 to 15, inclusive, to permit it to pass over the idler roll 99 on the arm 98 of the feeler 92. This additional length of cord 8 employed in placing the feeler 92 in operative position affords a somewhat longer tail portion in the event of a supply run-out. The longer tail portion insures that the stop-motion 54 will operate to stop the withdrawal of the cord 8 before the end passes over the idler 99. Thus, it is seldom necessary to rethread any of the cord path in the cord treating apparatus 1.

From an inspection of the cord path illustrated in Fig. 9, it will be noted that as soon as the cord supply runs out, the vertically projecting portion of the cord 8 will drop. This action relieves the biasing effect of the cord 8 passing around the idler 99 and the feeler 92, being counterbalanced, pivots about the bolt 93 and moves instantly through the path indicated by the dotted arrow to a substantially vertical position. This travel of the feeler 92, as we have already seen, sets in motion all of the related elements of the stop-motion 54, disengaging the drive for the cord manipulating devices 25 and acting to snub the cord 8 so as to stop it from being wound up on the bobbin 47.

In addition to the steps previously described, the travel of the feeler 92 through the arcuate path indicated by the dotted arrow in Fig. 9 puts an additional brake on the cord 8. A brake element 104 is secured to and supported by the bracket 105 mounted in suitable fashion at or adjacent the uppermost end of the support 11. The concave surface of the brake element 104 is provided with a facing 106 of suitable friction material which may be of the order of rubber, leather, or other similar substances.

As will be seen from Fig. 9, when the lower end of the feeler 92 swings in the direction indicated toward the vertical position, the uppermost extremity 100 of the arm 98 on the feeler will swing in the opposite direction (see arrow). This travel of the uppermost extremity 100 of the arm 98 will bring the idler roll 99 mounted thereon into contact with the facing 106 in the

concave surface of the brake element 104. The action of the brake element 104 registering with the groove in the idler roll 99 nips the end of the cord 8 in the manner shown in Fig. 12.

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in this art that various changes and modifications may be made therein without departing from the spirit or scope of the invention.

We claim:

1. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn from the cord supply; means for driving the cord manipulating device; a cam for selectively disengaging the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; a shiftably mounted feeler element arranged to contact and be retained in position by the cord as it passes between the cord supply and the cord manipulating device; means on the driving means for actuating the cam; and a trip mechanism which is operated by the feeler element in the event of relaxation of the cord tension thereon to release the cam for engagement with the cam actuating means.

2. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn from the cord supply; means for driving the cord manipulating device; a cam for selectively disengaging the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; a counterweighted feeler element for contacting the cord between the cord supply and the cord manipulating device, said feeler element being temporarily biased against its counterweight by the cord; means on the driving means for actuating the cam; and a trip mechanism which is operated by the feeler element to release the cam for driving engagement with the cam actuating means.

3. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn from the cord supply; means for driving the cord manipulating device; a cam for selectively disengaging the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; a counterweighted feeler element for contacting the cord between the cord supply and the cord manipulating device, said feeler element being temporarily biased against its counterweight by the cord; means on the driving means for actuating the cam; a slidable member for retaining the cam in inoperative relation with respect to the cam actuating means; and linkage connecting the slidable member to the feeler element.

4. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn from the cord supply; means for driving the cord manipulating device; a cam for selectively disengaging

the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; a counterweighted feeler element for contacting the cord between the cord supply and the cord manipulating device, said feeler element being temporarily biased against its counterweight by the cord; means on the driving means for actuating the cam; a slidable member for retaining the cam in inoperative relation with respect to the cam actuating means; means on the slidable member for biasing it in opposition to the action of the feeler element; and linkage connecting the slidable member to the feeler element.

5. In an apparatus for the manipulation of cord, thread, and other similar filamentous material of substantially continuous lengths embodying a cord manipulating device and means for driving the cord manipulating device, a stop motion comprising means for disengaging the driving means from the cord manipulating device; means on the driving means for actuating the disengaging means; and means the operation of which is initiated by the cord for maintaining the disengaging means temporarily in inoperative relation with respect to the actuating means.

6. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn from the cord supply; means for driving the cord manipulating device; means so constructed and arranged that it is actuated upon relaxation of the tension in the cord passing between the cord supply and the cord manipulating device for selectively disengaging the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; and means disposed adjacent the contacting means for snubbing the cord against the contacting means on the disengagement of the cord manipulating device from the driving means.

7. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn from the cord supply; means for driving the cord manipulating device; means for contacting the cord as it passes between the cord supply and the cord manipulating device, said contacting means being operable upon relaxation of the tension in the cord; means actuated by the contacting means for selectively disengaging the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; and means disposed adjacent the contacting means for snubbing the cord against the contacting means on the disengagement of the cord manipulating device from the driving means.

8. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn from the cord supply; means for driving the cord manipulating device; a cam for selectively disengaging the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; means disposed in the path of the cord passing between the cord supply and the cord manipulating device for contacting the cord, said contacting means being oper-

able upon relaxation of the tension in the cord to actuate the cam; and means adjacent the contacting means for snubbing the cord against the contacting means when the tension on the cord is relaxed.

9. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn from the cord supply; means for driving the cord manipulating device; a cam for selectively disengaging the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; a shiftably mounted feeler element arranged to contact and be retained in position by the cord as it passes between the cord supply and the cord manipulating device; a trip mechanism operable on the shifting of the feeler element in the event of relaxation of the cord tension against the feeler element to release the cam; and means adjacent the feeler element for snubbing the cord thereagainst whenever the cord fails to restrain the shiftable movement of the feeler element.

10. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn from the cord supply; means for driving the cord manipulating device; a cam for selectively disengaging the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; a shiftably mounted feeler element arranged to contact and be retained in position by the cord as it passes between the cord supply and the cord manipulating device; means on the driving means for actuating the cam; a trip mechanism which is operated by the feeler element in the event of relaxation of the cord tension thereon to release the cam for engagement with the cam actuating means; and a brake element for engaging the cord in contact with the feeler element on the failure of the cord to restrain the shiftable movement of the feeler element.

11. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn from the cord supply; means for driving the cord manipulating device; a cam for selectively disengaging the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; a counterweighted feeler element for contacting the cord between the cord supply and the cord manipulating device, said feeler element being temporarily biased against its counterweight by the cord; means on the driving means for actuating the cam; a trip mechanism which is operated by the feeler element to release the cam for driving engagement with the cam actuating means; and a brake element for engaging the cord in contact with the feeler element when the counterweight thereon overcomes the bias of the cord.

12. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn

from the cord supply; means for driving the cord manipulating device; a cam for selectively disengaging the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; a counterweighted feeler element for contacting the cord between the cord supply and the cord manipulating device, said feeler element being temporarily biased against its counterweight by the cord; means on the driving means for actuating the cam; a slidable member for retaining the cam in inoperative relation with respect to the cam actuating means; linkage connecting the slidable member to the feeler element; and a brake element for engaging the cord while in contact with the feeler element when the counterweight thereon overcomes the bias of the cord.

13. Apparatus for the treatment of cord, thread, and other similar filamentous material of substantially continuous lengths comprising a cord supply; a cord manipulating device which exerts tension on the cord as it is withdrawn from the cord supply; means for driving the cord manipulating device; a cam for selectively disengaging the cord manipulating device from the driving means and temporarily maintaining them in disengaged relation; a counterweighted feeler element for contacting the cord between the cord supply and the cord manipulating device, said feeler element being temporarily biased against its counterweight by the cord; means on the driving means for actuating the cam; a slidable member for retaining the cam in inoperative relation with respect to the cam actuating means; means on the slidable member for biasing it in opposition to the action of the feeler element; linkage connecting the slidable member to the feeler element; and a brake element for engagement with the feeler element to snub the cord thereagainst when the counterweight on the feeler element overcomes the bias of the cord thereon.

14. In an apparatus for the manipulation of cord, thread, and other similar filamentous material of substantially continuous lengths embodying a cord manipulating device and means for driving the cord manipulating device, a stop motion comprising means for disengaging the driving means from the cord manipulating device; means on the driving means for actuating the disengaging means; means the operation of which is initiated by the cord for maintaining the disengaging means temporarily in inoperative relation with respect to the actuating means; and means cooperating with the last-mentioned means for snubbing the cord when the disengaging means is operated.

RAYMOND E. SOLLIDAY.
SAMUEL A. STEERE.

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