Nov. 2, 1965 D. A. WHITTEMORE 3,215,321

APPARATUS AND METHOD FOR EVERTING TUBULAR FABRICS

Original Filed Oct. 17, 1963 3 Sheets-Sheet 1

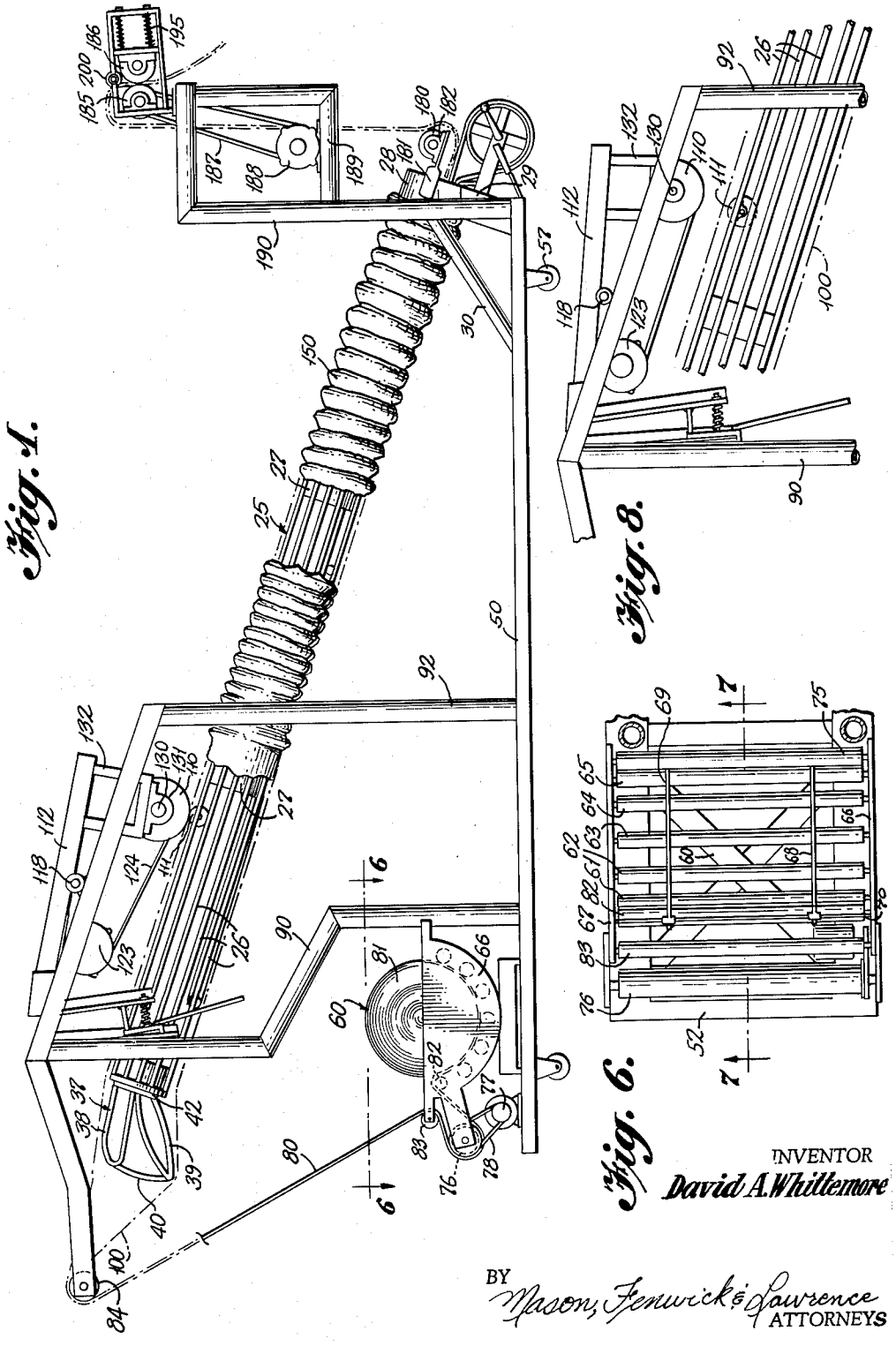

Fig. 1.

Fig. 8.

Fig. 6.

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Fig. 2.

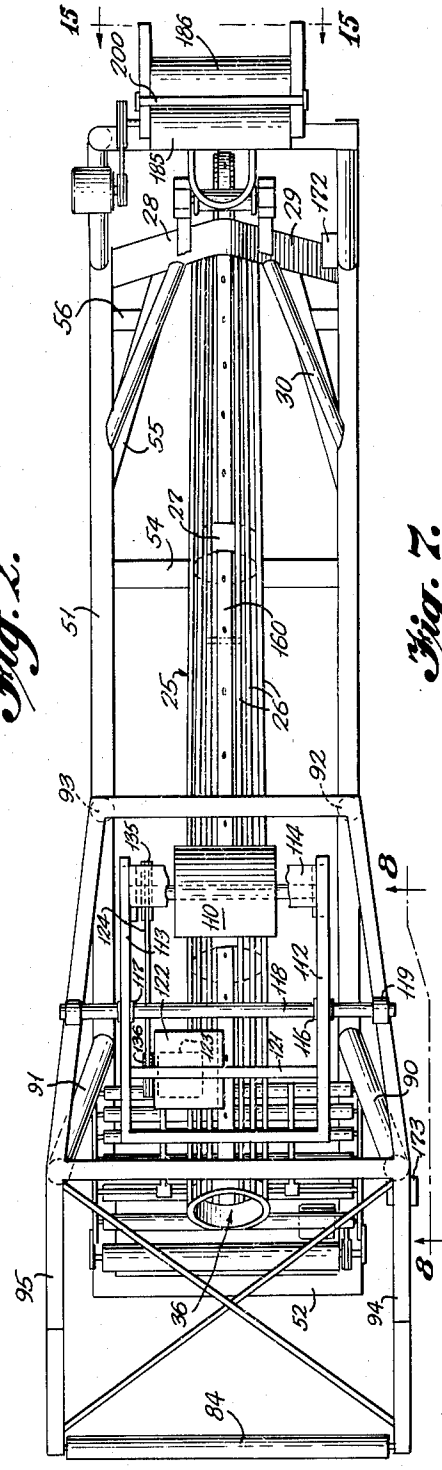

Fig. 3.

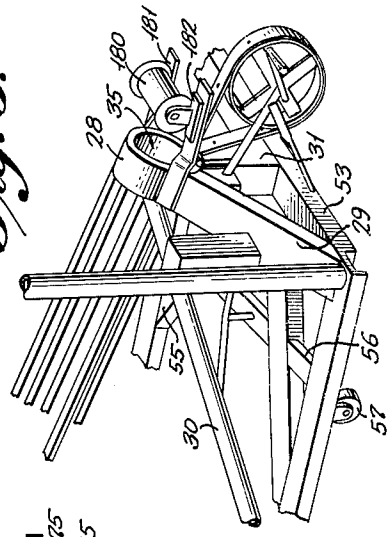

Fig. 7.

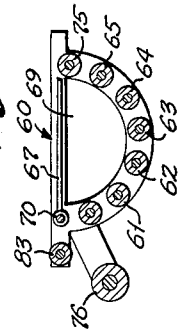

Fig. 12.

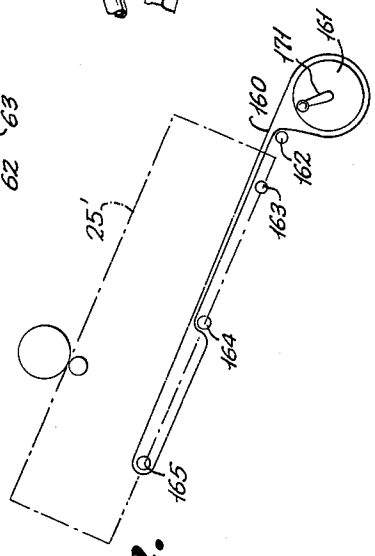

Fig. 5.

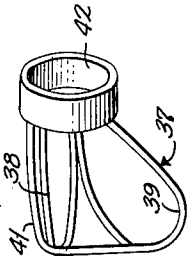

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Fig. 15.

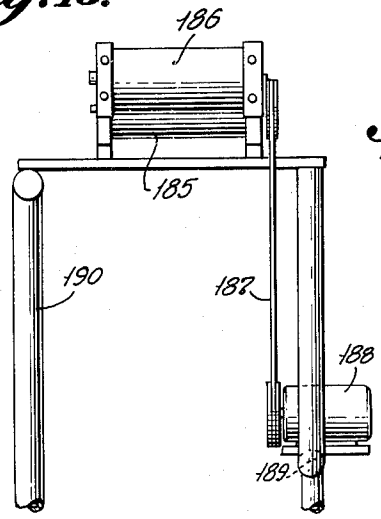


Fig. 11.

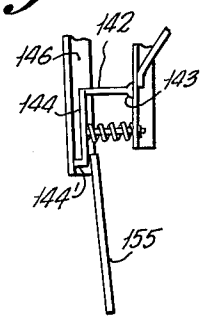


Fig. 9.

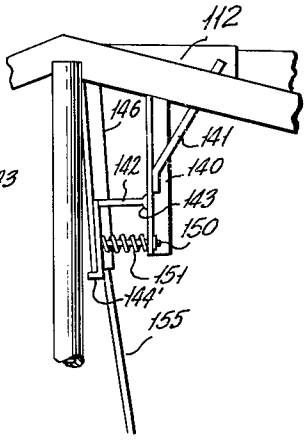


Fig. 4.

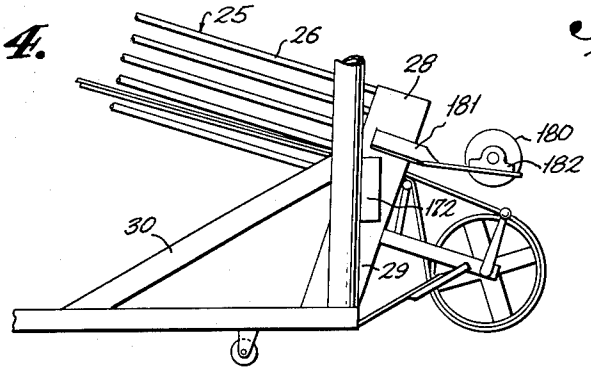
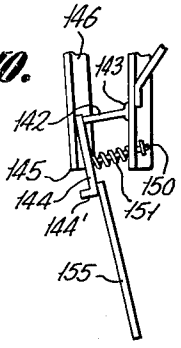


Fig. 10.



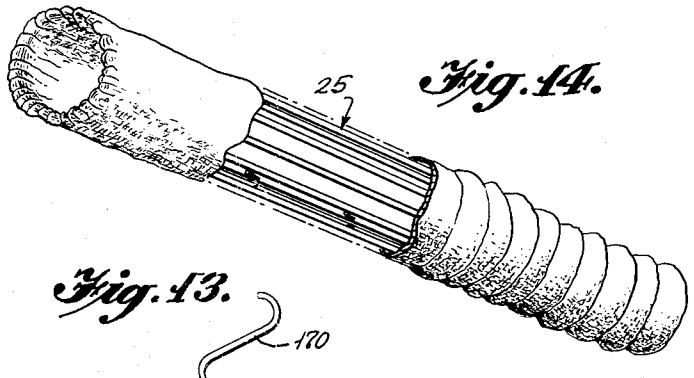


Fig. 14.

Fig. 13.

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3,215,321

APPARATUS AND METHOD FOR EVERTING TUBULAR FABRICS

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Continuation of application Ser. No. 317,013, Oct. 17, 1963. This application July 17, 1964, Ser. No. 384,048
13 Claims. (Cl. 223—39)

This application is a continuation of my previously copending application Serial Number 317,013, filed October 17, 1963, now abandoned.

This invention relates to apparatus and method for turning a tubular fabric inside out and particularly to improved apparatus for handling cloth during such an everting operation.

Manufacturers of knit garments follow the practice of knitting the original fabric in the form of a tube of considerable length. After being knit the tube is rolled flat and at various times is unrolled and rerolled as it is carried through various processes prior to being cut into garments. At various stages its becomes necessary to turn the fabric.

In the present invention it has been found that an extremely rapid everting or turning operation can be accomplished with essentially simple feed roll apparatus based on employment of a turning tube open at both ends and preferably positioned at a vertical angle between true horizontal and true vertical. The present invention also approaches the everting problem from the viewpoint of providing an everting unit which can be moved to various locations within the plant thus eliminating the need for duplication of apparatus at each turning location.

An object of the present invention is therefore to provide an apparatus capable of everting tubular knit fabric at maximum speed with a minimum disturbance to the stitch alignment.

Another object of the invention is to provide a tubular fabric everting apparatus which can be easily moved as an integral unit in the plant to various processing points.

Another object of the invention is to provide a tubular fabric everting apparatus capable of handling and everting an extremely long fabric tube.

Another object of the invention is to provide a tubular fabric everting apparatus specifically adapted to utilize a turning tube tilted at an angle between horizontal and vertical.

Another more specific object of the invention is to provide a tubular fabric everting apparatus in which the fabric tube after being packed on the outside of the tube can be rapidly drawn through the turning tube at the start of the everting operation.

Other objects and advantages of the present invention will become apparent to those skilled in the art, from the following description when read in conjunction with the accompanying drawings wherein:

FIGURE 1 is a side elevation view of an apparatus embodying the invention, the drive for driving the cloth onto the outside of the turning tube being shown engaged;

FIGURE 2 is a plan view;

FIGURE 3 is an enlarged fragmentary perspective of the structure around the turning tube base;

FIGURE 4 is an enlarged fragmentary side elevation of the structure around the turning tube base;

FIGURE 5 is a perspective of a removable tube nose;

FIGURE 6 is a plan view taken along line **6—6** of FIGURE 1;

FIGURE 7 is an elevation cross-section taken along line **7—7** of FIGURE 6;

FIGURE 8 is a fragmentary side elevation of the apparatus for driving the cloth onto the outside of the turning tube as it appears disengaged;

FIGURE 9 is a fragmentary side elevation of the latching mechanism employed to position the drive apparatus of FIGURE 8 as it appears when the drive apparatus is locked in disengaged position;

FIGURE 10 is a fragmentary side elevation of the mechanism shown in FIGURE 9 as it appears when the drive apparatus is being disengaged;

FIGURE 11 is a fragmentary side elevation similar to FIGURE 10 as it appears when the drive apparatus is fully engaged;

FIGURE 12 is a schematic view of a belt arrangement employed in the invention;

FIGURE 13 is a side view of a hook device employed in the invention;

FIGURE 14 is a fragmentary perspective illustrating the operation of starting the fabric through the turning tube;

FIGURE 15 is a fragmentary end elevation taken in the direction reference line **15—15** in FIGURE 2.

Briefly described, the present invention relates to an apparatus for everting a tubular fabric comprising a support means, hollow means having open ends supported on an end thereof on the support means, means for supporting a flat wound coil of the fabric on the support means, means for guiding a length of the fabric over the unsupported end and onto the hollow means and means mounted on the apparatus engageable in holding relation with the trailing end of the fabric disposed on the hollow means having been inserted through the unsupported end of the hollow means, operable for drawing the fabric through the interior of the hollow means toward the unsupported end thereof. The apparatus preferably also includes a removable guide means mounted on the unsupported end of the hollow means for opening and guiding the fabric onto the hollow means, a first friction means mounted on the apparatus engageable with the fabric guided onto the hollow means, operable for advancing the same toward the unsupported end thereof and a second friction means operable responsive to slack conditions of the portion of the fabric extending between the wound fabric coil and the hollow means for unreeling the fabric coil.

Referring to the drawings, there is illustrated an embodiment of the invention. The basic turning tube represented generally by the numeral **25** is formed of a group of substantially smaller diameter tubes **26** parallel and evenly spaced and fixedly secured to the outside of a series of longitudinally spaced circular bands **27**. Such an arrangement allows the operator to effectively reach into tube **25** at almost any point along its length. Tubular member **25** has a hollow substantially unobstructed interior and is formed as a substantially long tube open at both ends. The tubular member **25** is supported at its lower end only at a vertical angle preferably of about thirty degrees and in one form has been made about twelve feet long and about ten inches inside diameter.

Support for tubular member **25** is provided by arranging for each of the component tubes **26** to terminate in and be secured to a fixed heavy circular band member **28**. Band member **28** is in turn secured to a pair of angled brace members **29**, a pair of angled brace members **30** and a vertical brace member **31**. Any suitable joining means such as welding, bolting or the like may be employed to secure the structure together.

The lower end of tubular member **25** indicated at **35**, FIGURE 3, remains open during all phases of the turning operation. The upper end indicated at **36**, FIGURE 2, is left open during the actual turning operation but is closed by means of a removable tapered nose device **37**,

FIGURES 1 and 5, during the first part of the operation when the leading end of the fabric is being opened and manually placed on the outside of the upper end of tube **25**. Nose **37** in the form shown consists of an upper, horizontally placed, U-shaped rod **38**, a lower horizontally placed U-shaped rod **39**, a connecting vertically placed rod **40**, a horizontal top guide rod **41** and a thin circular band **42** to which rods **38**, **39**, **41** are secured and which is adapted to fit snugly in the upper end **36** of tube **25** as illustrated by FIGURE 1. Rods **38**, **39**, **40**, **41** may be brass wire or the like brazed together at the intersections. In operation, as later explained, nose **37** serves to open the flat fabric tube and direct it over the outside of the upper end of tube **25**.

The turning apparatus is mounted on a base frame which includes side members **50**, **51**, end members **52**, **53** (FIGURE 3) and cross and angled bracing members such as those indicated at **54**, (FIGURE 2), **55**, and **56**. A suitable number of wheels **57** when mounted below the frame makes the entire apparatus mobile and easily movable from place to place in the plant where needed.

The tubular fabric prior to being turned is conventionally folded flat and delivered to the turning apparatus as a cell where it is initially placed in a receptacle or tub device **60** secured to the base frame and positioned below the upper end of tube **25**, the receptacle device being best illustrated in FIGURES 1, 2, 6 and 7.

As later explained, the coil of fabric, depending on its diameter, will rest on various of the small rollers **61–65** which are rotatably mounted between the tub sides **66** and **67**.

To accommodate variation in width of the fabric coil there is provided a pair of thin, semi-circular plate members **68**, **69** which are adjustably mounted on a rod **70** fixedly secured between the tub sides **66**, **67**.

In addition to the fabric coil supporting rollers **61–65** previously mentioned, the tub device **60** also includes a rotatably mounted idle roller **75** and a roller **76** which is rotatably driven at one end by a suitable motor **77** and belt drive **78**. The driven roller **76** is preferably somewhat loosely mounted on its driven end with a degree of slack motion such that roller **76** drives only when the fabric passes around roller **76** and pulls on roller **76** so as to tighten belt **78**. The full purpose of this clutch type action at roller **76** will be better understood as the description proceeds.

In the turning process, the flattened fabric tube indicated in FIGURE 1 by the dashed line **80** is led from the fabric coil indicated at **81** and is first passed over a roller **82** which like rollers **61–65** and **75** is mounted between the tub sides **66**, **67**. The flat fabric tube **80** is then passed under and around driven roller **76** and then under and around an additional roller **83** which is rotatably mounted between extensions of the tub sides **66**, **67**. From roller **83**, the fabric tube still in the flat form **80** passes to a further rotatably mounted roller **84**. As indicated in the drawings particularly in FIGURES 1 and 2, roller **84** is positioned in front of nose **37** above tub **60** substantially in alignment with the axis of tube **25** and is mounted on an upper cantilevered frame structure which includes bent vertical post members **90**, **91** secured to the previously described base frame, straight vertical post members **92**, **93** also secured to the base frame and a pair of bent cantilevered arms **94**, **95** secured to the tops of post members **90**, **91**, **92** and **93**.

After being manually fed to the upper end of tube **25**, the leading end of the flat fabric tube **80** is opened into tube form and is spread over the nose **37** and is then manually guided over tube **25** as an open tube represented by the broken line **100**. This initial manual operation therefore includes entraining the flat fabric **80** over rollers **82**, **76**, **83** and **84**, and the starting of the fabric in tube form **100** over nose **37** and over the upper, unsupported end of tube **25**. In order to turn the fabric according to the method of the invention it is necessary to first store

the entire length of the fabric tube on the outside of the turning tube **25** and much time is saved in this phase of the turning operation by employment of the drive apparatus next to be explained.

Referring to FIGURES 1, 2, 8, 9 and 10, the fabric in the tube form is drawn down manually over tube **25** until its leading end lies between the relatively wide driven roller **110** and the relatively narrow idle roller **111**. Roller **110** forms part of a vertically adjustable bearing frame assembly which can be tilted so as to move roller **110** selectively against tube **25** and in contact with the fabric as in FIGURE 1, or tilted in the opposite direction so as to bring roller **110** out of contact with the fabric as in FIGURE 8. The mentioned assembly includes a pair of side rails **112**, **113** rigidly joined to a pair of end rails **114**, **115**. Side rails **112**, **113** in turn mount a pair of bearings **116**, **117** through which pass a shaft **118**. The ends of shaft **118** terminate in suitable mountings **119**, **120** in which the ends are secured by set screws or the like, not shown.

Suspended beneath and between and rigidly secured to side rails **112**, **113** is a further bar **121**. Fixedly secured to bar **121** is a motor mounting plate **122** to which is affixed an electric drive motor **123**. Motor **123** is connected through a suitable drive belt **124** to drive the previously mentioned roller **110**. While not shown, it should be understood that power is supplied to the various motors mentioned in the description through electric supply lines and switches appropriate to apparatus of this kind.

Drive roller **110** is mounted on and fixedly secured to a shaft **130** whose ends are rotatably mounted in suitable bearings as indicated at **131**. Bearings **131** are in turn secured to U-shaped brackets such as shown at **132** which are mounted below side rails **112**, **113** at opposite ends of end rail **114**. Shaft **130** is driven by a suitable pulley **135** which in turn is driven by the previously mentioned belt **124** and the motor pulley **136**.

The position of the vertically adjustable drive roller **110** with respect to the relatively fixed positioned idle roller **111** is regulated by the latch mechanism illustrated in FIGURES 9, 10 and 11, in which **140** represents a vertical bar fixed to and below rail **112** and which is braced to rail **112** by an angle bar **141**. Vertical bar **140** mounts the latch mechanism proper which includes a rod member **142** having a pivotal mounting **143** at one end, the other end of rod member **142** being fixed to a latch **144** having a lip **144'** which may engage the bottom edge **145** of a fixed vertical bar member **146**. Bar member **146** is rigidly secured to vertical post **90** and has a fixed position. A bolt and spring arrangement which includes a bolt **150** screwed into latch **144** and slidably mounted in vertical bar **140** assists in keeping latch **144** in position. A compression spring **151** which surrounds the body of bolt **150** between latch **144** and vertical bar **140** tends to keep latch **144** and bar **146** together. A handle **155** is fixedly secured to latch **144** and affords a convenient means for adjusting the position of drive roller **110**.

In operating the latch mechanism to disengage roller **110**, handle **155** is pulled downwardly until lip **144'** is below edge **145**, after which handle **155** is manipulated to bring lip **144'** in engagement with edge **145**, which position it will hold due to the compression effect of spring **151**. To engage roller **110**, handle **155** is manipulated to disengage lip **144'** from edge **145** and lip **144'** is allowed to rise upwardly above edge **145** as in FIGURE 11. It should of course be understood that the location of shaft **118** and the weight of roller **110** and motor **123** are taken into account and arranged such that roller **110** inherently tends to move downward and be resiliently engaged with the fabric tube. Roller **110** can however be disengaged by pulling downwards on handle **155** and engaging lip **144'** with edge **145** in the manner just described.

Drive roller **110** and its mating idle roller **111** should be located a substantial distance from the upper end of the turning tube **25** in order for drive roller **110** to be able to operate on the fabric at relatively high speed. For example, with a twelve-foot long, roughly ten-inch diameter turning tube handling from fourteen-inch to thirty-six inch tubular fabric, the axis of drive roller **110** was located about three and one-half feet from the upper end of the tube. Drive roller **110** was made as a ten and one-half inch rubber covered pulley and was driven at about 650 r.p.m. With drive roller **110** located as described, fabric was observed to flow rapidly and smoothly with substantially no lag of that portion of the fabric running on the bottom of tube **25**. Simultaneous with operation of drive roller **110**, drive roller **76** in the form of a three-inch wooden roller was driven at about 800 r.p.m. whenever the flat fabric **80** between drive roller **110** and drive roller **76** would tighten so as to tighten the slack mounting at roller **76** and thereby tighten belt **78**. That is, by mounting drive roller **76** so that its driving action depends on the tautness of the fabric between drive roller **110** and drive roller **76**, drive roller **76** exhibits a clutch type action and cannot overrun the factic coming from tub **60**.

After the coil **81** is completely uncoiled, the fabric will lie folded and stored on the outer portion of tube **25** as indicated at **150**. To complete the turning operation, it is necessary to remove nose **37** and to next draw the fabric through the upper end of tube **25**, through the interior of tube **25** and out the lower end of tube **25**. It is also necessary at this point to lift roller **110** to a disengaged position as illustrated by FIGURE 8. To assist in starting the fabric, that is the trailing end of the coil, through the interior of tube **25**, there is provided a belt **160** which resides in the bottom of tube **25** and is trained over a hand driven pulley **161** and a series of idle pulleys **162, 163, 164, 165** all of which are suitably mounted in the bottom of tube **25** and which as schematically represented in FIGURE 12, tube **25** being represented by the dashed line **25'**.

As shown in FIGURE 12, both upper and lower runs of the belt are carried inside the tube between idle pulleys **164** and **162** whereas between idle pulleys **164** and **165**, the upper belt run is carried inside the tube and the lower belt run is carried outside the tube. This arrangement allows the upper belt run to run the full length of the tube **25** and keeps both runs out of the way of cloth gathered on the outside of tube **25**. Belt **160** is punched with holes along its length to receive one end of a bent wire double hook device **170** illustrated in FIGURE 13 the other end of which is snagged into the end of the fabric to be pulled through the turning tube.

As illustrated by FIGURE 14, the operator after snagging the hook device **170** into the trailing end of the fabric that came from coil **81** then engages the hook device **170** with the belt **160** by inserting the opposite end of the hook device **170** with one of the holes in belt **160**. The hand driven pulley **161** is then manually turned by means of the handle **171** which causes belt **160** to rapidly pull the fabric through tube **25** until it reaches the lower opening **35** of the tube, at which point the hook device **170** is disengaged from both the belt **160** and the fabric. Suitable storage boxes for hooks **170** are located at each end of tube **25** and are provided by the open receptacles **172, 173**.

In order to rapidly complete the turning operation, the fabric is now led under an idle roller **180** which is mounted on suitable brackets **181** and in bearings **182**. From idle roller **180**, the fabric is manually fed along the path indicated by broken lines **196** to a driven roller **185** and an idle roller **186** both of which are supported from the base frame and are positioned substantially above the lower end of tube **25**. Roller **185** is connected through a belt **187** to be driven by an electric motor **188** mounted on frame member **189** which in turn is rigidly secured to a vertical post member **190**. Idle roller **186** as shown in the drawings is continually pressed against driven roller **185** by suitable compression spring devices indicated at **195**. With motor **188** energized from a suitable source, not shown, and the fabric initially manually fed between rollers **185** and **186**, the fabric will be rapidly withdrawn from its stored position on the outside of tube **25**, through the tube interior, and will be ejected from the rollers **185, 186** at a level appropriate to following processes or to suitable storage bins or the like. A suitable electrically grounded bar represented at **200** is preferably placed very close to rollers **185, 186**, particularly when composed of rubber, in order to eliminate static electricity.

From the foregoing detailed description it will be evident that there are a number of changes, adaptations and modifications of the present invention which come within the province of those skilled in the art. However, it is intended that all such variations not departing from the spirit of the invention be considered as within the scope thereof as limited solely by the appended claims.

What I claim is:

1. An apparatus for everting a tubular fabric comprising a support means, hollow means having open ends supported on an end thereof on said support means, means for supporting a flat wound coil on said fabric mounted on said support means, removable guide means mounted on the unsupported end of said hollow means for opening and guiding a length of said fabric onto said hollow means, friction means mounted on said apparatus engageable with said fabric guided onto said hollow means, operable for advancing said fabric toward the unsupported end thereof, friction means operable responsive to slack conditions of said fabric extending between said wound fabric coil and said hollow means for unreeling said fabric coil, means mounted on said apparatus engageable in holding relation with the trailing end of said fabric disposed on said hollow means when said guide means has been removed and the trailing end of said fabric has been inserted into the unsupported end of said hollow means, operable for drawing said fabric through the interior of said hollow means toward the supported end thereof and means engageable with said fabric for drawing said fabric out of said hollow means.

2. An apparatus for everting a tubular fabric comprising a frame, an elongated tubular member having open ends supported on an end thereof on said frame, a receptacle for seating a flat wound coil of said fabric mounted on said frame, a removable guide member mounted on the unsupported end of said tubular member for opening and guiding a length of said fabric onto said tubular member, an endless friction belt extending at least a portion of the length of said tubular member through the interior thereof engageable in holding relation with at least the trailing end of said fabric disposed on said tubular member when said guide member has been removed and said trailing end of said fabric has been inserted into the unsupported end of said tubular member operable for drawing said fabric through the interior of said tubular member toward the unsupported end thereof.

3. An apparatus for everting a tubular fabric comprising a frame, an elongated tubular member supported on on an end thereof on said frame, a receptacle for seating a flat wound coil of said fabric on said frame, a removable guide member mounted on the unsupported end of said tubular member for opening and guiding a length of said fabric onto said tubular member, a driven friction roll member mounted on said apparatus selectively engageable with said fabric guided onto the tubular member operable for advancing the same toward the unsupported end thereof and an endless friction belt extending at least a portion of the length through the interior of said tubular member engageable in holding relation with at least the trailing end of said fabric disposed on said tubular member when said guide member has been removed and said trailing end of said fabric has been inserted into the

unsupported end of said tubular member operable for drawing said fabric through the interior of said tubular member toward the unsupported end thereof.

4. An apparatus for everting a tubular fabric comprising a frame, an elongated tubular member supported on an end thereof on said frame, a receptacle for supporting a flat wound coil of said fabric on said frame, a removable guide means mounted on the unsupported end of said tubular member for opening and guiding a length of said fabric onto said hollow means, driven roller means operable responsive to slack conditions of said fabric extending between said wound fabric coil and said unsupported end of said tubular member for unreeling said fabric coil and an endless drive belt extending at least a portion through the interior of said tubular member engageable in holding relation with at least the trailing end of said fabric disposed in said tubular member when said guide means has been removed and said trailing end of said fabric has been inserted into the unsupported end of said tubular member operable for drawing said fabric through the interior of said tubular member toward the unsupported end thereof.

5. An apparatus for everting a tubular fabric comprising a frame, an elongated tubular member supported on an end thereof on said frame, a receptacle for supporting a flat wound coil of said fabric mounted on said frame, a removable guide member mounted on the unsupported end of said tubular member for opening and guiding a length of said fabric onto the tubular member, a driven friction roll member mounted on said apparatus selectively engageable with said fabric having been guided onto said tubular member, operable for advancing said fabric toward the unsupported end thereof, a second driven roll member mounted on said frame operable responsive to slack conditions of said fabric extending between said wound coil and the unsupported end of said tubular member for unreeling said fabric coil, an endless friction belt extending along at least a portion of said tubular member through the interior thereof engageable in holding relation with the trailing end of said fabric disposed on said tubular member when said guide member has been removed and said trailing end of said fabric has been inserted into the unsupported end of said tubular member operable for drawing said fabric through the interior of said tubular member toward the unsupported end thereof and friction roll members mounted on said frame adjacent the unsupported end of said tubular member for drawing said fabric out of said tubular member.

6. An integral plant apparatus for everting a long length of tubular faric comprising a combination, a horizontally disposed base frame, a turning tube having both ends open and positioned on said frame at a substantial vertical angle with its lower end only being secured thereof, a tub adapted to hold a flat wound coil of said fabric being secured to said base frame and positioned beneath the upper end of said tube, motor driven friction roll means and idle fabric guide roll means mounted on said base frame effective to unroll said coil and to pull and guide the fabric therefrom over the upper end of said tube and to pack all of said fabric on the lower end thereof, manually driven belt means mounted in the bottom of said tube and adapted to draw the trailing end of said fabric coil from its position on the outside of said tube through its upper end and out its lower end thereby commencing the turning of said fabric, and additional motor driven friction roll means and idle fabric guide roll means mounted on said base frame adjacent said lower end for continuing the drawing and turning of said fabric and ejecting the turned fabric from said apparatus.

7. An apparatus as claimed in claim 6, in which said vertical angle is about thirty degrees.

8. An integral plant apparatus for everting a long length of tubular fabric comprising in combination, a horizontally disposed base frame, a turning tube having both ends open and positioned on said base frame at a substantial vertical angle with its lower end only being secured thereto, a tub adapted to hold a flat wound coil of said fabric being secured to said base frame and positioned beneath the upper end of said tube, a first friction roll and driving means therefor mounted on said frame adjacent said tube and effective to unroll and pull fabric from said coil, a vertically adjustable bearing frame supported by said base frame and positioned above the upper end of said tube, a second friction roll and driving means therefor mounted on said bearing frame, said second friction roll being arranged to engage fabric directed over the upper end of said tube at a point on the fabric substantially downward from the upper end of said tube and to pack all of the said fabric coming from said coil on the outside of the lower end of said tube, an endless belt having its upper run guided for movement within said tube for substantially its entire length, means for temporarily attaching the trailing end of said fabric from said coil to said upper run, means mounted on said base frame for driving said belt enabling said trailing end to be pulled through the upper end and out the lower end of said tube thereby commencing the turning of said fabric, and a third friction roll and driving means therefor mounted on said base frame above the lower end of said tube, said third friction roll being adapted to receive the fabric pulled through said lower end and to complete the turning of said fabric and the ejecting of the turned fabric from said apparatus.

9. An apparatus as claimed in claim 8, in which said turning tube is composed of a plurality of laterally spaced parallel small diameter tubes extending the length of and arranged to form said turning tube.

10. An apparatus as claimed in claim 8, in which said first, second and third friction roll driving means comprise electric motion means.

11. An integral mobile plant apparatus for everting a long length of tubular fabric comprising in combination, a horizontally disposed base frame, wheel means supporting said base frame, a turning tube having both ends open and positioned on said base frame at a substantial vertical angle with its lower end secured thereto, a tub adapted to hold a flat wound coil of said fabric being secured to said base frame and positioned beneath the upper end of said tube, a first slack mounted type friction roll and driving means therefor mounted on said frame adjacent said tub and effective to unroll and pull fabric from said coil, a removable tapered nose guide device connectable with and adapted to open and guide said fabric end over the outside upper end of said tube, a vertically adjustable bearing frame supported by said base frame and positioned above the upper end of said tube, a second friction roll and driving means therefor mounted on said bearing frame, said second friction roll being adapted to engage said fabric at a point substantially downward from the upper end of said tube and to pack all of the said fabric on the outside of the lower end of said tube, a fabric guide roller supported by said frame above said tub and positioned between the upper end of said tube and said first friction roll, an endless belt having its upper run guided for movement within said tube for substantially its entire length and having both its upper and lower runs extending beyond the lower end thereof, means for temporarily attaching the trailing end of said fabric from said coil to said belt upper run, pulley means carrying said belt and mounted on said base frame adjacent the lower end of said tube for manually driving said belt enabling said trailing end to be pulled through the upper end and out the lower end of said tube thereby commencing the turning of said fabric, and a third friction roll and driving means therefor mounted on said base frame above the lower end of said tube, said third friction roll being adapted to receive the fabric pulled through said lower

end and to complete the turning of said fabric and the ejecting of the turned fabric from said apparatus.

12. The method of turning a long length of tubular fabric in a flat wound coil which comprises opening and manually guiding the leading end of said coil over the upper end of a turning tube open at both ends and positioned at a substantial vertical angle and provided with an endless belt located along the bottom of the tube, then motor driving by means of a friction roll pressing towards the tube and at a point substantially downward from the upper end of the tube the remainder of the fabric until packed entirely on the outside of the tube, then temporarily attaching the trailing end of the fabric to said belt and manually pulling the belt to draw the trailing end through the upper end and out the lower end of the tube whereby to commence the turning, then motor pulling by means of a friction roll positioned near the lower end of the tube the remainder of the fabric through the upper end and out the lower end of the tube whereby to complete the turning.

13. The method as claimed in claim **12**, in which said angle is about thirty degrees.

References Cited by the Examiner

UNITED STATES PATENTS

1,030,336	6/12	Shields	223—39
1,545,556	7/25	Guignard	223—39

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