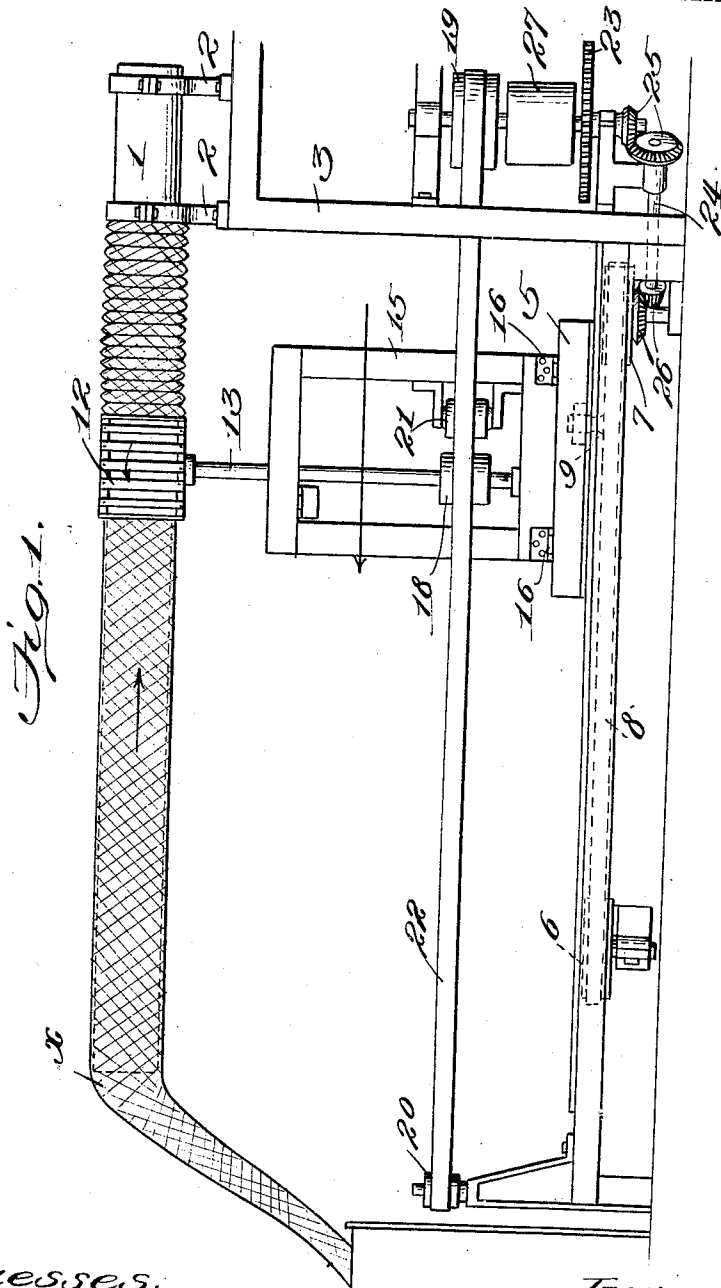


W. B. PALMER.
MACHINE FOR INVERTING TUBULAR FABRICS.
APPLICATION FILED APR. 14, 1909.

952,274.

Patented Mar. 15, 1910.

2 SHEETS—SHEET 1.



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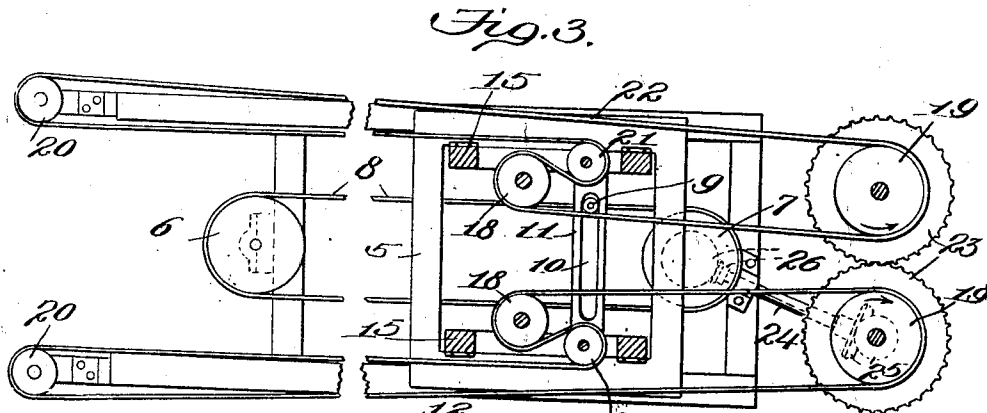
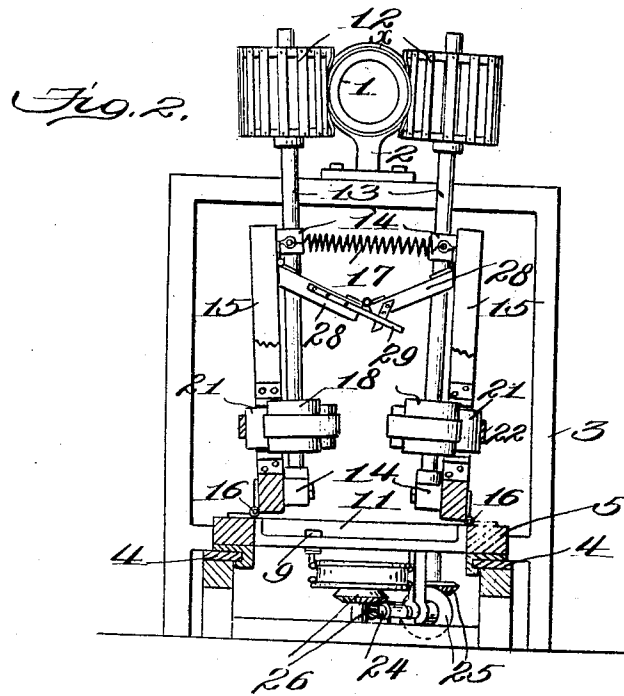


Fig. 4.

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30

UNITED STATES PATENT OFFICE.

WILLIAM B. PALMER, OF GREENWICH, NEW YORK, ASSIGNOR OF ONE-HALF TO
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MACHINE FOR INVERTING TUBULAR FABRICS.

952,274.

Specification of Letters Patent.

Patented Mar. 15, 1910.

Application filed April 14, 1909. Serial No. 489,817.

To all whom it may concern:

Be it known that I, WILLIAM B. PALMER, a citizen of the United States, residing at Greenwich, in the county of Washington and State of New York, have invented new and useful Improvements in Machines for Inverting Tubular Fabrics, of which the following is a specification.

My present invention relates to improvements in apparatus for inverting knitted or other tubular fabric or hose of the class illustrated and described in Letters Patent, No. 878,995 granted to me February 11, 1908, and the object of the present invention is to provide an improved machine of this class whereby the packing of the fabric or hose upon the tubular mandrel preparatory to its inversion, is accomplished uniformly and with a minimum friction between the fabric and the tubular mandrel, and because of the manner in which the fabric is packed upon the tubular mandrel, the withdrawal of the packed fabric from the outside of the mandrel while its ends are being drawn through the tubular mandrel is facilitated.

In the present embodiment of the invention, I have shown the same as adapted to that type of machine shown in my prior patent aforesaid and in this instance, a relative movement is provided between the tubular mandrel and the feeding or packing rolls or heads whereby these feeding rolls or heads may retreat as the packing of the fabric progresses, suitable mechanism being provided for operating the feed rolls or heads during the retreating and packing operation.

To these and other ends, the invention consists in certain improvements, and combinations and arrangements of parts, all as will be hereinafter more fully described, the novel features being pointed out particularly in the claims at the end of the specification.

In the accompanying drawing:—Figure 1 is a side elevation of a fabric inverting machine constructed in accordance with my present invention; Fig. 2 represents an end view of the machine as viewed from the left in Fig. 1, portions of the carriage and its track being shown in section; Fig. 3 represents a horizontal section of the machine shown in the preceding figures; and Fig. 4 is a diagrammatic view of another arrangement of the machine wherein the retreating

movement of the packing heads is retarded or controlled by a weight instead of by driving means.

Similar parts are designated by the same reference characters in the several views. 60

In the accompanying drawing, I have shown one embodiment of the invention, it being adapted to a fabric inverting machine such as that illustrated and described in my prior patent mentioned above. While it may be preferable to apply the invention to a machine of this class, it will be understood that I have so shown the invention merely as an example of one of its applications, and certain changes or modifications in the construction may be made in order that the invention may be applied to the best advantage in each particular instance. 65 70

In the present instance, the machine comprises generally a tubular mandrel 1 which is supported in a suitable position by means of brackets 2 mounted upon a stationary frame 3, and a pair of tracks 4 are mounted upon the floor or some other suitable support and are arranged in parallelism with the tubular mandrel. On the tracks 4 there is mounted a carriage 5 of any appropriate construction, this carriage being capable of movement longitudinally of the receiving tube or mandrel whereby the feed rolls or heads may retreat during the packing of the fabric upon the mandrel, and after the fabric has been fully packed and during its inversion, the carriage with the feed rolls or heads may be returned, preparatory to the next packing operation. 75 80 85 90

In the present instance I have shown as an example one form of driving mechanism for reciprocating the carriage which consists of a pair of pulleys 6 and 7 which are mounted on stationary vertical axes and a belt or endless carrier 8 passes around these two pulleys, this belt being in the form of a chain and having attached to one of its links a projection which carries a roller 9, this roller engaging in a transversely elongated slot 10 which is formed in a cross-bar 11 attached to the carrier. The carrier may move in the same direction, the roller 9 engaging in one end of the slot 10 to cause a retreating motion of the feed rolls or heads and while the roller 9 passes around one of the pulleys, it will travel longitudinally of the slot 10 and assume a position at the opposite end thereof which latter position it 95 100 105 110

maintains during the return motion of the carriage and its position is reversed when the next pulley is reached.

The invention is not limited to the specific form of driving mechanism for the carriage, as the form shown in the drawing is merely illustrated as an example.

The carriage supports a pair of oppositely arranged feed rolls or heads 12 which are mounted on shafts 13 journaled in appropriate bearings 14 that are carried by a pair of oppositely arranged hinged frames 15, these frames being pivotally attached to the carrier 5 at their lower ends by means of the hinges 16 which permit a yielding of the feed rolls or heads in a direction transverse to the axis of the mandrel, and these rolls or heads are yieldingly pressed against the fabric upon the tubular mandrel with the proper degree of pressure to insure the requisite hold by means of a tension spring 17 which in the present instance connects the upper portions of the two frames.

Practice has demonstrated that feed rolls or heads of a peculiar construction must be used in order that they may obtain the proper hold upon the fabric and thereby advance it along the tubular mandrel, it being necessary to employ rolls having series of circumferentially spaced fabric-engaging portions which are flexible or yieldable so as to engage a suitable surface of the fabric, and the spaces between the fabric-engaging portions enable the latter to produce the proper feeding and packing thereof. The specific construction of these feed rolls, however, is not claimed in the present instance, as it forms the subject matter of a separate application.

It is desirable to provide suitable power transmission mechanism whereby the rolls may be revolved simultaneously in reverse directions irrespective of the position of the carriage with reference to the mandrel. Any suitable mechanism for accomplishing this result may be employed. As an example, I have shown in the present instance a pair of pulleys 18 on the shafts of the respective feed rolls, a pair of driving pulleys 19 and a pair of stationary idler pulleys 20 and also a pair of movable idler pulleys 21 which are mounted on the carriage so that they may remain in fixed relation to the pulleys 18 on the shafts of the feed rolls. Belts 22 pass over these various pulleys and they are arranged in reverse relation, and rotation of the driving pulleys 19 in reverse directions will cause corresponding rotation of the feed rolls in opposite directions so that those portions of their peripheries which engage the fabric upon the tubular mandrel will operate to properly feed the fabric thereon.

In order to insure uniform speed of movement of the feed rolls, the driving pulleys

19 may be connected by gearing 23. Or, the ratio of speed between the feed or packing rolls may be varied so as to pack the fabric more or less tightly as may be desired; or the mechanism attached to the carriage may serve merely to retard the retreating movement thereof, the resistance offered the revolving rolls serving in such a case to not only pack the fabric but to also produce the retreating movement. Moreover, the retreating movement of the carriage may be produced or controlled in different ways, an instance being shown in Fig. 4 wherein the mechanism previously described for moving or controlling the motion of the carriage may be omitted, and a weight or other resistance device 30 may be used which in the construction shown is attached to the carriage by a flexible member 31, the weight operating to resist or retard to the proper degree the retreating of the carriage during the packing of the fabric. Any construction may be adopted, however, which is capable of accomplishing the proper packing of the fabric during the relative movement between the carriage and the receiving tube or mandrel.

In operating a machine constructed in accordance with the present invention, the tubular fabric α may be introduced upon the free or unsupported end of the tubular mandrel from a basket or other appropriate receptacle, and the packing of the fabric begins at a point adjacent to the brackets which support the mandrel, the walls of the fabric being folded owing to the action of the feed rolls so that it becomes closely packed upon the mandrel. However, the feed rolls should retreat at a certain speed with respect to the desired packing of the material, and in order to accomplish this result, the means for imparting the traversing movements to the carriage carrying the feed rolls is connected in the present instance to the driving pulleys for the feed rolls by gearing of appropriate ratio, a connecting shaft 24 being shown in the present instance which may be connected by bevel gearing 25 and 26 to one of the pulleys 19 and to the pulley 7, respectively. Power may be applied to one of the driving pulleys 19 by means of the pulley 27. In the construction shown in Fig. 4, however, the application of power to operate the carriage is not necessary. After the fabric has been packed upon the tubular mandrel, the feed rolls are moved out of cooperative relation with the mandrel in order to permit a return motion of the carriage preparatory to the next packing operation and also to permit one end of the tubular fabric to be introduced into the tubular mandrel and then drawn therethrough so as to invert the fabric. In the present instance, I have shown a pair of toggle links 28 which are

pivotaly connected respectively to the two frames carrying the feed rolls, and an appropriate catch 29 is shown for retaining the toggle members in alinement with one another at which time they will serve as a lock to positively hold the feed rolls out of engagement either with the tubular mandrel or with the fabric thereon. The breaking of the toggles will permit the spring 17 to operate freely to produce the necessary pressure between the feed rolls and the fabric upon the mandrel during the next packing operation.

By permitting a relative movement between the fabric-receiving tube or mandrel and the feed or packing rolls, the packing of the fabric on the tube or mandrel takes place progressively from one end toward the opposite end thereof so that an even packing of the fabric is insured without making it necessary for the feed rolls to push the fabric the full length of the tube or mandrel and, moreover, there is no liability of the fabric bunching or catching while it is being drawn from the exterior to the interior of the tube during the inverting operation owing to the even or uniform packing of the fabric.

I claim as my invention:

1. An apparatus for handling tubular fabrics comprising a receiving tube or mandrel and feed rolls or heads coöperative therewith, said tube and rolls being relatively movable longitudinally, and means for operating the rolls to feed the fabric longitudinally with respect to the tube, said rolls being capable of a retreating movement during the packing of the material on the tube.

2. An apparatus for handling tubular fabrics comprising a receiving mandrel and feed rolls coöperative therewith, said mandrel and rolls being capable of a relative longitudinal movement, and means for operating the rolls to pack the material toward one end of the mandrel, said rolls being mounted so as to permit a relative longitudinal movement between them and the mandrel during the packing of the fabric thereon.

3. An apparatus for handling tubular fabrics comprising a receiving tube supported on one end and adapted to receive a tubular fabric at its opposite end, a pair of rolls mounted in coöperative relation with the mandrel, means for operating the rolls to pack the material on the tube, and means for causing a relative movement between said rolls and the tube whereby said rolls recede in a direction from one end of the tube during the packing of the fabric thereon.

4. An apparatus for inverting tubular fabrics comprising a receiving tube, a carriage relatively movable axially thereof, feed

rolls movable with said carriage and adapted to pack the fabric on said tube, means for driving said rolls irrespective of the position of said carriage, and means for controlling the relative movement between said rolls and the tube in a direction axially of the latter during the packing of the fabric thereon.

5. An apparatus for inverting tubular fabrics comprising a receiving tube, feed rolls adapted to pack the fabric thereon, said rolls and tube being relatively movable in a direction longitudinally of the tube, means for revolving the rolls to produce a packing of the fabric on the tube, and means for producing a relative longitudinal movement between said rolls and tube according to the packing of the fabric thereon.

6. An apparatus for inverting tubular fabrics comprising a receiving tube, a carriage movable longitudinally with respect thereto during the packing of the fabric thereon, a pair of feed rolls movable with said carriage and operable to pack the fabric on said tube, pulleys connected to the rolls for operating them, and a pair of belts coöperative with said pulleys and having means for driving them in reverse directions and at the same speed.

7. An apparatus for inverting tubular fabrics comprising a receiving tube, a track arranged in parallelism therewith, a carriage movable on said track, a pair of frames pivoted on said carriage to move transversely to said track, feed rolls mounted on the respective frames and movable toward and from said tube, means for revolving said rolls to pack a fabric on said tube, and means for reciprocating the carriage and the rolls thereon in a direction longitudinally of the receiving tube during the packing of the fabric thereon.

8. An apparatus for handling tubular fabrics comprising a mandrel to receive the fabric, and a feed device coöperative therewith, said feed device and mandrel being relatively movable in a direction longitudinally of the mandrel, means for operating the feed device to pack the fabric toward one end of the mandrel, and means for retarding or controlling the relative longitudinal movement of the mandrel and feed device during the packing of the fabric on the mandrel.

9. In an apparatus for handling tubular fabrics, the combination of a receiving element for a tube of fabric, feeding means coöperative with said receiving element and adapted to progressively engage a tube of fabric on said receiving element to feed the same longitudinally thereon, mountings for said receiving element and feeding means constructed to permit relative receding movement between such parts in a direction longitudinally of the receiving element dur-

ing the progressive feeding of the tube of
fabric thereon, and operating means for
causing said feeding means to progressively
engage the tube of fabric on said receiving
5 element to feed such fabric longitudinally
thereon.

In testimony whereof I have hereunto set

my hand in presence of two subscribing witnesses.

WILLIAM B. PALMER.

Witnesses:

JESSE V. PALMER,
WILLIAM E. COX.