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DETACKING MACHINE FOR ROPE FABRIC

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2 Sheets-Sheet 1

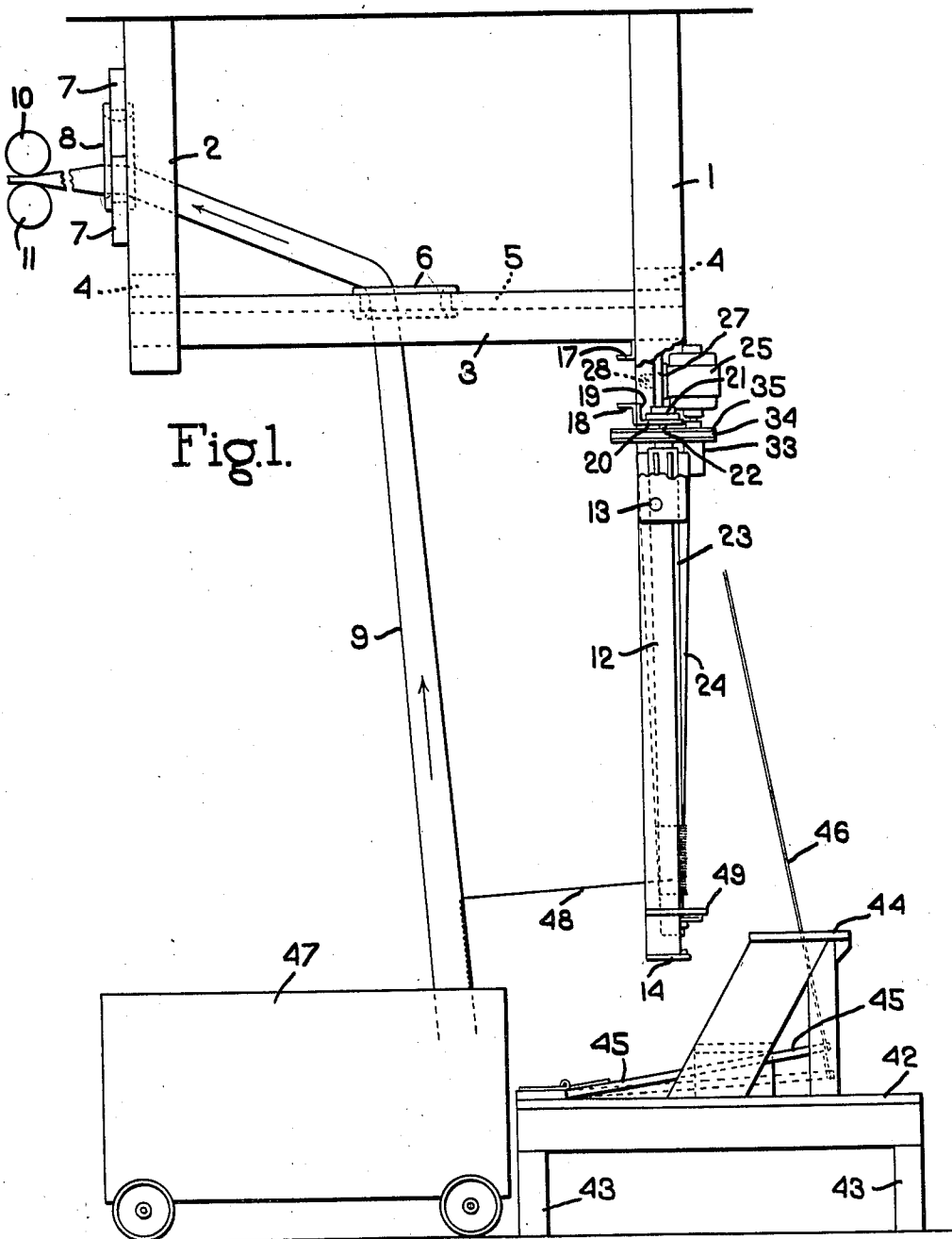


Fig. 1.

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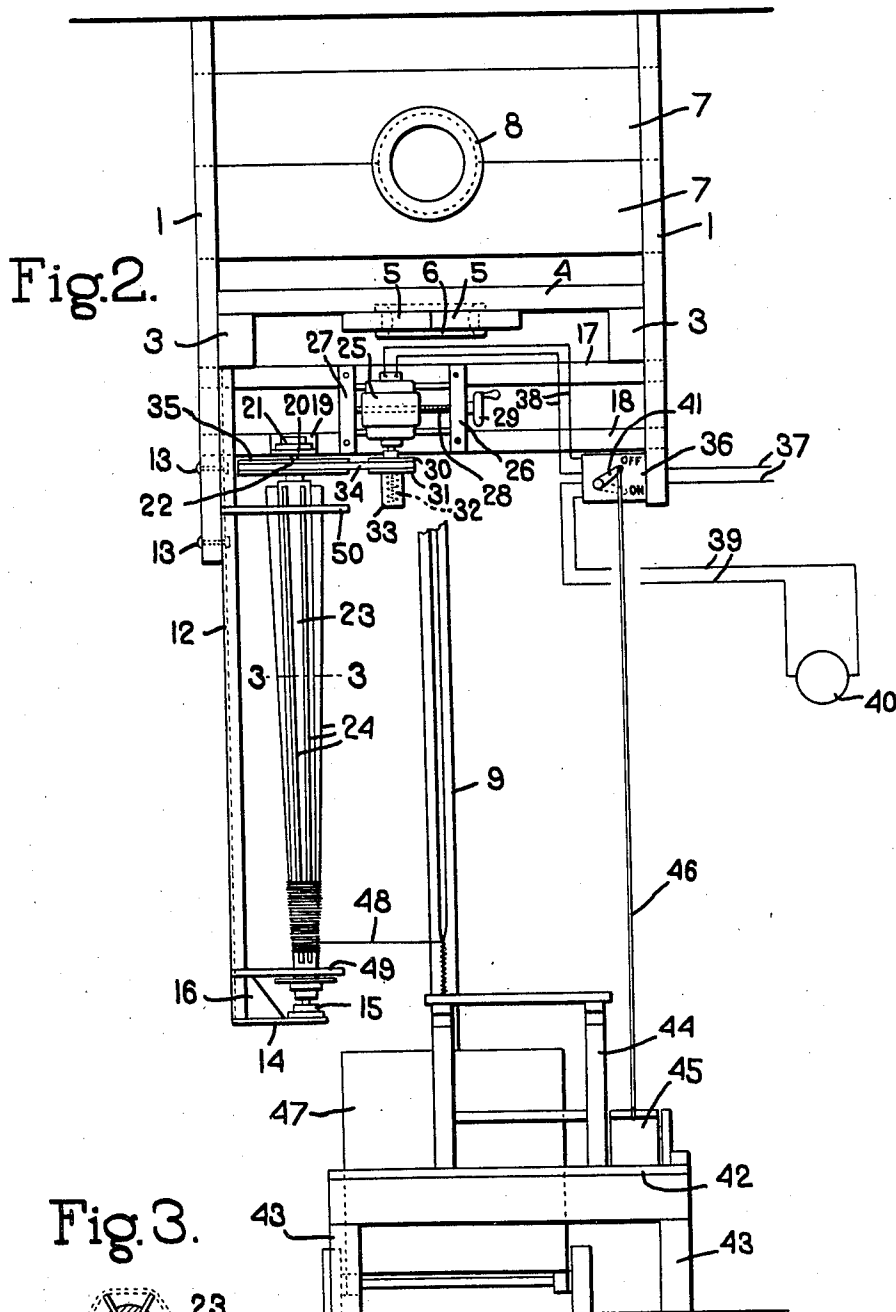
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DETACKING MACHINE FOR ROPE FABRIC

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This invention relates to improvements in detacking machines for unstitching the tacking thread which connects adjoining edges of a web of fabric and holding the fabric in tubular or rope form. It is customary in the finishing of woolen and worsted fabrics and the like to fold the web of fabric longitudinally with the face inside and tack the adjoining edges, usually the selvage edges, thereof together to produce a tubular or rope form. This is found advantageous, particularly in fulling, to protect the face of the goods from chafing during fulling as the face is kept from being worn by contact with the heavy rolls of the fulling machine. At the same time the selvage edges are prevented from rolling or curving over and from being caught or torn in the fulling mills. When such fabrics are run in the fulling mills or washers after being tacked the air inside the goods causes the folds to change position each time as they pass between the rolls, thus avoiding creases or wrinkles and consequent streaking of the goods. The tacking of the adjacent or selvage edges of the web of fabric is usually done by a chain stitching machine in which a single thread is anchored in the goods by concatenated loops so that when the thread is desired to be removed one end can be unlocked from the goods and the thread progressively drawn out. Such detacking or untacking of the tacking thread has heretofore been accomplished manually or by winding the detacking thread upon a rotating cylindrical roll as the goods are progressively drawn in the direction of the axis of the roll. It is a tendency of the tacking thread to be drawn at right angles to the direction of movement of the roll and as a consequence to bunch upon the periphery of the roll. The longitudinal and lateral movements of the tube or rope of fabric, particularly when the fabric is drawn from a stack, varies considerably so that the thread is wound with uneven tension upon such cylindrical roll.

One of the objects of the present invention is to provide a machine having means for progressively unstitching the tacking thread under continuous tension irrespective of variations in the movement of the fabric.

The wetting of the stitched rope of fabric, when the fabric is woolen, worsted or other shrinkable material, naturally results in the variation in the position of the stitches longitudinally of the rope due to the difference in shrinkage of the fabric and of the tacking thread especially when the thread, as is usual, is of cotton.

Another object of the invention is to provide a machine which acts upon the occurrence of any such variation to shift the thread longitudinally of the reel as it is withdrawn and thus to cause the thread to be wound snugly on the reel under all conditions.

Another object of the invention is to provide a machine for unstitching the tacking thread which will maintain a substantially uniform tension upon the thread. This is accomplished in the present invention by providing a reel located in suitably spaced relation to the path of movement of the fabric and in axial alinement therewith and having a conoidal surface for winding the thread diverging in the direction of movement of the fabric so that if the speed of the fabric is increased the thread, which tends to extend perpendicularly from the point of detachment to the reel, will be wound upon progressively increased effective diameters of the reel, thereby maintaining the substantially uniform tension upon the thread and conversely if the speed of movement of the fabric is decreased the thread will be wound upon progressively decreasing effective diameters again maintaining substantially uniform tension upon the thread. Furthermore such variations in the relative speed of movement of the fabric and the speed of rotation of the reel will cause a traverse of the thread upon the reel which will decrease the tendency of close bunching of the thread on the reel.

Another object of the invention is to provide means for adjusting relative speed of movement of the fabric and the peripheral speed of the reel which will enable the thread to be wound upon different portions of the reel throughout its length.

Where cylinders have been employed in previous detacking machines for winding up the detacking thread it has been necessary either to unwind the reel or to cut the accumulated thread by a knife which is drawn longitudinally of the cylinder with its edge in contact with the periphery of the cylinder to insure complete severance of the thread therefrom. In such case the roll rapidly becomes scarred and soon worn out as considerable pressure is required to insure severance of all the thread.

Another object of the invention is to provide a reel of the character above described having alternating longitudinal ribs and longitudinal spaces therebetween so that the end of the knife can be inserted into a space and drawn along with a reciprocating movement to sever all the spirals

of the threads without in any wise injuring the surfaces upon which the thread is reeled.

Another object of the invention is to provide a construction in which an operator can readily control the driving mechanism for moving the fabric longitudinally and the reeling mechanism for the tacking thread and also conveniently adjust the rate of rotation of the reel to cause the tacking thread to be wound upon different portions of the reel.

These and other objects and features of the invention will more fully appear from the following description and the accompanying drawings and will be particularly pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawings, in which, Fig. 1 is a side elevation of a detacking machine embodying the invention the portion of a depending supporting bracket being broken away;

Fig. 2 is a front elevation of the same illustrating graphically an electric motor for actuating the mechanism for drawing the fabric longitudinally upwardly and having the circuit thereof and the circuit for actuating the reel controlled by a common switch mechanism; and

Fig. 3 is a transverse sectional view on line 3—3 Fig. 2.

The detacking machine which is illustrated in the drawings comprises an overhead framework having suitably spaced front posts 1 and correspondingly spaced vertical rear posts 2 which are firmly anchored at their upper ends to suitable horizontal beams, such as the beams of the ceiling of a room. The front and rear posts are connected by parallel side girders 3 and the front posts 1 are connected by horizontal girders 4 the ends of which desirably rest upon the girders 3. A pair of boards or plates 5 abutting at their edges are mounted upon the under sides of the front and rear girders 4 midway of the length thereof and are provided centrally with complementary semi-circular recesses in which is mounted a flanged pot eye 6. Similar boards or plates 7 which abut at their edges are mounted centrally of the length of the rear posts 2 and are likewise provided with complementary semi-circular recesses in which a similar flanged pot eye 8 is mounted. The tubular fabric or rope of fabric 9 which has been fullled or otherwise treated is drawn upwardly from a suitable stack through the horizontal pot eye 6 and thence through the vertical pot eye 8 and is drawn therefrom preferably in open width form by cooperating rolls 10 and 11 of a scutcher and squeezer. As the tube or rope of fabric is thus drawn upwardly the chain stitch tacking thread which secures the adjoining edges of the web of fabric, usually the selvage edges thereof, is progressively drawn out as the fabric moves upwardly.

Inasmuch as the adjoining edges of the fabric are usually tacked together by a chain stitch machine the term "chain stitch" or "chain stitching" is used herein as descriptive of any form of stitching which can be progressively withdrawn to unstitch the seam, whether in the form of a usual chain stitch, double chain stitch, or any other form of stitching which can be progressively withdrawn.

The mechanism for progressively detacking or untacking the tacking seam comprises a downwardly converging conoidal reel which is suspended vertically from the framework. As illustrated herein a bracket, preferably in the form of a pair of angle bars or a channel bar 12, is secured at its upper end by bolts 13 to a project-

ing portion of one of the front posts 1 and has secured to its lower end a horizontal plate 14 upon the end portion of which suitable antifriction bearings 15 are mounted which support the shaft of the reel. The plates 14 desirably are reinforced by gussets 16 welded to the plate 14 and to the vertical channel or angle bars 12.

A horizontal angle bar girder 17 is secured at its ends to the posts 1 and desirably abuts the under faces of the side girders 3. A parallel angle bar girder 18, which is spaced from the girder 17, is secured at its ends to the posts 1 and has welded to it the vertical flange 19 of a horizontal angle plate 20 upon which is mounted an antifriction bearing 21 for the vertical shaft 22 of a conical reel, the lower end of said shaft being stepped in the bearing 15.

The reel comprises a conical body 23, which may be of wood or other suitable material, having longitudinally extending radial recesses in which are seated cleats 24 which diverge upwardly from the lower end of the conical body and provide in effect a conoidal winding surface for the tacking thread.

The reel is driven from an electric motor through suitable variable speed mechanism having means for adjusting the peripheral speed of rotation relatively to the speed at which the rope of fabric is drawn upwardly from the stack. In the preferred construction illustrated an electric motor 25 is slidably mounted upon a base which is secured by spaced plates or brackets 26 and 27 to the girders 17 and 18. A screw 28, which is journaled in the brackets 26 and 27, extends through and engages a nut upon or fixedly secured to the motor and is provided with a hand wheel 29 by means of which the motor can be adjusted horizontally relatively to the brackets 26 and 27.

One end of the motor shaft has mounted upon it a variable speed pulley for a V-belt, the pulley being formed in complementary sections 30 and 31, the section 30 being fixedly secured to the shaft and the section 31 being slidably mounted upon it with a suitable spring 32, which is mounted in a housing 33 which is secured to the shaft acting to press the pulley section 31 toward the section 30. A V-belt 34 is mounted upon a variable speed pulley and engages a large V-pulley 35 which is fixedly secured to the shaft 22.

By adjusting the motor 25 laterally with respect to the axis of the shaft 22 of the reel the tension of the V-belt upon the variable speed pulley will cause the belt-engaging faces of the variable speed pulley to separate or to come together and consequently change the effective driving radius of the pulley upon the V-belt, so that the speed of rotation of the reel can be accurately adjusted properly to correlate the effective peripheral speed of the reel to the speed of the rope of fabric being detacked.

Inasmuch as it is desirable that an operator may simultaneously control the motor for the detacking mechanism and also the motor of the scutcher and squeezer or other mechanism which draws the fabric lengthwise, suitable switch mechanism is provided for both motor circuits as is graphically illustrated in Fig. 2 of the drawings. Such mechanism comprises a switch box 36 which is conveniently mounted upon the supporting frame, such for example as upon one of the posts 1. A suitable electric circuit 37 leads from a source of power to the switch box and circuits 38 and 39 lead from the switch respectively to the motor 25 and to the motor 40 for

the scatcher and squeezer or other mechanism which draws the fabric upwardly. The switch which simultaneously controls both the circuits 38 and 39 is provided with an actuating arm 41 which is normally held in "off" position so that both motors may be started and continuously run only when the switch arm 41 is moved to "on" position.

Inasmuch as the reel can be made of considerable length, as for example five or six feet, a platform is provided for the operator, having a step mounted thereon which shall enable the operator readily to reach the hand wheel for adjusting the speed of the reel in proper correlation to the speed at which the fabric is moved upwardly. In the construction illustrated a platform 42, which is mounted upon suitable legs 43, has mounted upon it a stepladder 44 of sufficient height to enable the operator conveniently to reach the hand wheel. The platform 42 also has mounted upon it a hinge pedal 45 the free end portion of which is connected by a chain or cord pull 46 the upper end of which is connected to the switch arm 41. The operator therefore standing on the platform will depress the pedal 44 to start the motor which actuates the mechanism for pulling the fabric upwardly and also to start the motor 25 for the reel and actuation of such motors will be maintained so long as the pedal is depressed.

When it is desired to change the adjustment of the speed of the reel the operator will release his foot from the pedal 45 thereby permitting the switch arm 41 to swing upwardly to "off" position. The operator can then mount the steps and make such proper adjustment of the speed of the motor 25 as may be desirable, properly to wind the detacking thread upon the reel as it is withdrawn from the rope of fabric.

As illustrated in the drawings the rope of fabric 9 is brought to the detacking machine in a wheeled truck 47 which is located approximately vertically beneath the pot eye 6.

When the machine is in operation the proper end of the detacking thread 48 is secured to the lower end portion of the reel which is of smallest diameter. Suitable lower and upper plates 49 and 50, which are secured to the bracket 12, are provided to prevent the detacking thread from passing beyond the respective ends of the reel.

As the successive stitches of the tacking thread are progressively detached from the fabric by the tension placed upon the thread by the reel the section of thread between the fabric and the reel normally tends to assume horizontal position. If, however, the movement of the rope of fabric increases relatively to the peripheral speed of the part of the reel upon which it is wound the point of detachment of the thread from the rope of fabric will be carried progressively upwardly and as a consequence the thread will be wound upon progressively larger effective diameters of the reel. Conversely if the upward movement of the fabric decreases the thread will traverse downwardly upon the portions of the reel of smaller diameter. This will cause the thread to be wound smoothly upon the reel. Similarly variations in the movement of the fabric away from and toward the reel, as the fabric is withdrawn from the pile, will cause a traverse of the thread upon the conoidal reel which will maintain a continuous and substantially uniform tension upon the tacking thread.

So long as the relative upward movements of

the fabric and the peripheral speed of the reel is maintained at a substantially fixed correlation the length of traverse of the thread upon the reel will be relatively short. However, by reducing the speed of rotation of the reel continued upper movement of the fabric at the same rate will cause the tacking thread to be wound upon a larger effective diameter of the reel. The operator therefore by adjusting the speed of the variable speed motor by manipulation of the hand wheel 29 will cause the tacking thread to be wound upon a section of the reel of larger diameter and by successively continuing such adjustment the reel can be filled practically to the upper end thereof until limited by the plate 50.

By reason of the present construction therefore a long rope of fabric can be detacked without unloading the reel.

Another feature of the invention consists in the provision of means for readily removing the tacking thread from the filled reel. As above stated in previous constructions where cylindrical wooden rolls have been employed in detacking machines it is customary to remove the tacking thread by running a knife lengthwise of the cylindrical roll thereby cutting into and injuring the rope.

In the present construction the thread is reeled upon the cleats 24 which are spaced apart so that a knife can be employed to sever the spirals without injury to the surfaces upon which the thread is reeled. The space between the windings upon the reel and the core or body of the reel is sufficient to enable the knife to be reciprocated as it is drawn along the windings thereby facilitating the severance of all of the threads. If the knife should nick the body or core of the reel it is of no consequence as the periphery upon which the thread is wound will remain uninjured. It will be understood that the embodiment of the invention shown and described herein is of an illustrative character and is not restrictive and that various changes in form, construction and arrangement of parts may be made within the spirit and scope of the following claims.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A machine for untacking a chain stitch seam uniting the adjoining edges of a longitudinally traveling tubular rope of fabric comprising a rotating reel for the tacking thread located in suitably spaced relation to and in axial parallelism with the path of movement of the fabric having means for maintaining constant substantially uniform tension upon the stitching thread irrespective of variations in the movement of the fabric.

2. A machine for untacking a chain stitch seam uniting the adjoining edges of a longitudinally traveling tubular rope of fabric comprising a rotating reel for the tacking thread located in suitable relation to and in substantially axial parallelism with the path of movement of said fabric having thread-engaging means so diverging in said direction of movement that variations in the rate of movement of the fabric will cause the thread to be wound upon such circumferential portion of the reel as will maintain a constant substantially uniform tension on the thread.

3. A machine for untacking a chain stitch seam uniting the adjoining edges of a longitudinally traveling tubular rope of fabric comprising a reel located in suitably spaced relation to and in axial parallelism with the path of movement of said

fabric and rotated at a constant speed and provided with a longitudinally recessed thread-engaging periphery divergently tapering in the direction of movement of the fabric operable to cause the traverse of the thread thereon produced by irregular movements of the fabric to wind the tacking thread on the reel under constant tension.

4. A machine for untacking a chain stitch seam uniting the adjoining edges of a longitudinally traveling tubular rope of fabric comprising means for progressively guiding the fabric upwardly from a folded stack thereof, a conoidal reel located in suitably spaced relation to and in substantially axial parallelism with the path of movement of said fabric, and means for rotating the reel in correlation to the speed of movement of the fabric, whereby variations in the movements of the upwardly moving fabric will produce such upward and downward traverse of the thread upon the conoidal reel as will maintain substantially uniform tension upon the thread.

5. A machine for untacking a chain stitch seam uniting the adjoining edges of a longitudinally traveling tubular rope of fabric comprising means for progressively guiding the fabric upwardly from a folded stack thereof, means for drawing said fabric upwardly, a conoidal reel located in suitably spaced relation to and in substantially axial parallelism with the path of movement of said fabric, means for rotating the reel in correlation to the speed of movement of the fabric, whereby variations in the movements of the upwardly moving fabric will produce such upward and downward traverse of the thread upon the conoidal reel as will maintain substantially uniform tension upon the thread, and means for adjusting the speed of rotation of the reel relatively to the speed of travel of the fabric to cause the thread to be wound upon different longitudinal portions of the reel.

6. A machine for untacking a chain stitch seam uniting the adjoining edges of a tubular rope fabric stacked in zig-zag folded form comprising an overhead frame having means for guiding the fabric lengthwise upwardly, a reel for the tacking thread supported by and extending downwardly from said frame located in suitably spaced relation to and in axial parallelism with the path of movement of said fabric, means for rotating said reel including an electric motor and manually adjustable speed mechanism mounted on said frame operable so to correlate the speed of rotation of said reel to the speed of movement of the fabric as to maintain a constant tension upon the thread and by suitable adjustment to cause the thread to be wound upon different longitudinal portions of the reel.

7. A machine for untacking a chain stitch seam uniting the adjoining edges of a tubular rope fabric stacked in zig-zag folded form comprising an overhead frame having means for guiding the fabric lengthwise upwardly, electric motor actuated means for progressively drawing the fabric upwardly, an upwardly diverging conoidal reel for the tacking thread supported by and extending downwardly from said frame located in suitably spaced relation to and in axial parallelism with the path of movement of the fabric, means for rotating said reel including an electric motor and variable speed mechanism mounted on said frame, manually operable

means for adjusting said variable speed mechanism to correlate the peripheral rotation of the reel relatively to the speed of the fabric to cause the thread to be wound upon different portions of the reel, and manually operable means for simultaneously stopping and starting said electric motors.

8. A machine for untacking a chain stitch seam uniting the adjoining edges of a tubular rope fabric stacked in zig-zag folded form comprising an overhead frame having means for guiding the fabric lengthwise upwardly, electric motor actuated means for progressively drawing the fabric upwardly, an upwardly diverging conoidal reel for the tacking thread supported by and extending downwardly from said frame located in suitably spaced relation to and in axial parallelism with the path of movement of the fabric, means for rotating said reel including an electric motor and variable speed mechanism mounted on said frame, manually operable means for adjusting said variable speed mechanism to correlate the peripheral rotation of the reel relatively to the speed of the fabric to cause the thread to be wound upon different portions of the reel, manually operable means for simultaneously stopping and starting said electric motors comprising an electric switch mounted on said overhead frame for simultaneously starting and stopping said motors normally held in "off" position, a platform for the operator located in proximity to said reel having a pedal mounted thereon with means connecting the same to said switch mechanism operable when maintained in depressed position by the operator to cause the actuation of both motors.

9. A machine for untacking a chain stitch seam uniting the adjoining edges of a longitudinally traveling tubular rope of fabric comprising a rotating conoidal reel, means for correlating the normal rate of travel of the fabric and the speed of rotation of the reel to cause variations from the normal rate of travel of the fabric to shift the thread longitudinally of the reel as it is wound thereupon to maintain a constant tension upon the thread.

10. A machine for untacking a chain stitch seam uniting the adjoining edges of a longitudinally traveling tubular rope of fabric comprising a rotating conoidal reel, means for correlating the normal rate of travel of the fabric and the speed of rotation of the reel to cause variations from the normal rate of travel of the fabric to shift the thread longitudinally of the reel as it is wound thereupon to maintain a constant tension upon the thread, and manually adjustable means for controlling the normal position of the thread as it is wound on the reel.

11. A machine for untacking a chain stitch seam uniting the adjoining edges of a longitudinally traveling tubular rope of fabric comprising a rotating conoidal reel for the tacking thread located in suitably spaced relation to and in axial parallelism with the path of movement of the fabric, and means for correlating the normal speed of travel of the fabric and the speed of rotation of the reel, the said elements acting upon occurrence of variations in the position from which successive stitches are detached from the traveling rope of fabric to shift the thread longitudinally of the reel and thus wind the thread snugly thereon.