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FEEDING MECHANISM FOR COTTON BATTING AND THE LIKE

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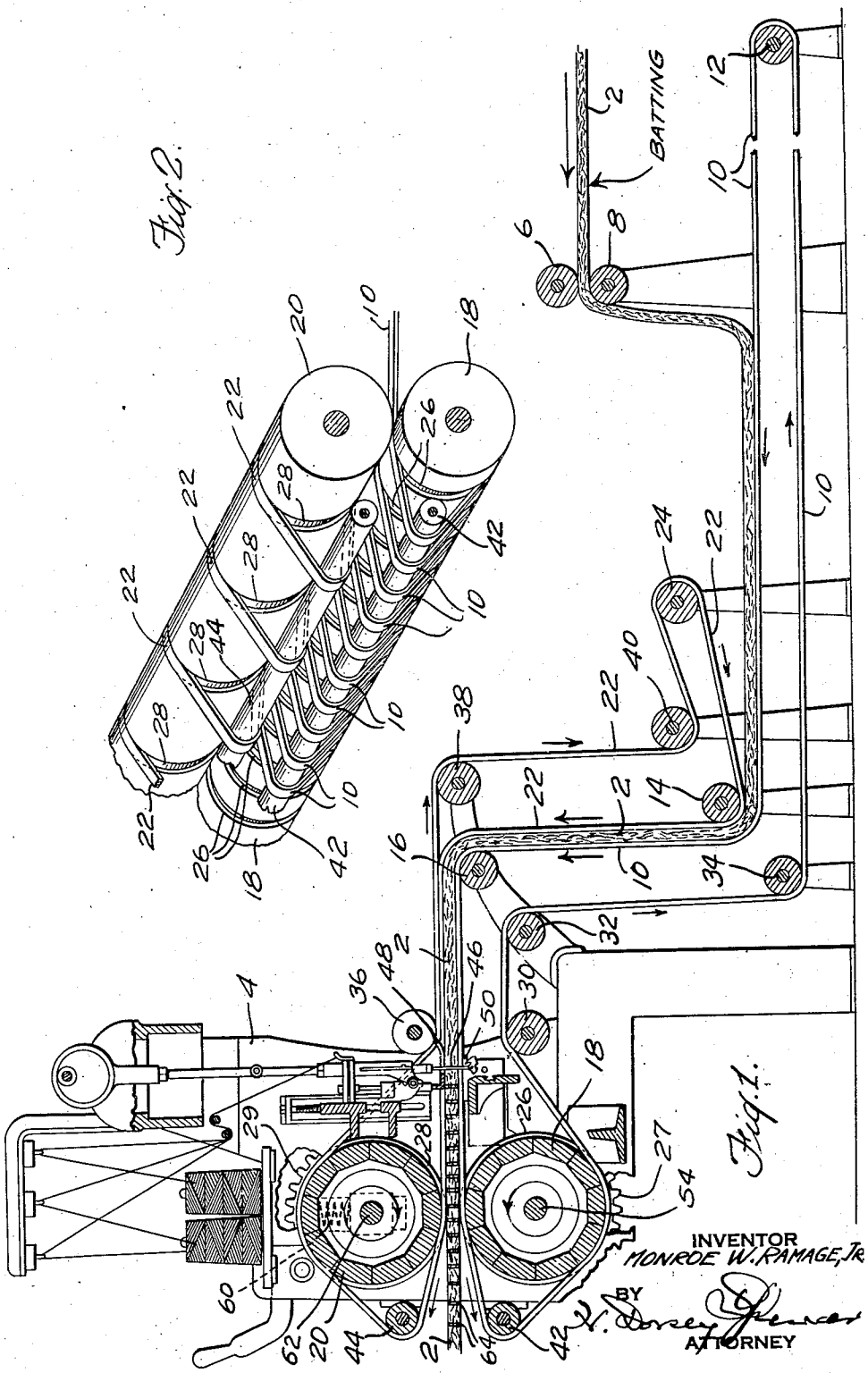


Fig. 2.

Fig. 1.

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FEEDING MECHANISM FOR COTTON BATTING AND THE LIKE

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10 Claims. (Cl. 112—203)

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This invention relates to means for feeding cotton or other batting or similar material through machines in which further operations are to be performed thereon.

In the manufacture of reinforced batts for use in making comforters or the like the subsequent operations on cotton or other batting are usually performed immediately after the forming of the batting in the garnetting or other batting forming machine. Since cotton batting of itself has little inherent strength to resist disruption of its structure in any direction, it is customary, in order to facilitate the handling thereof, where it is to be used, for example, in the manufacture of comforters, and also in order to increase its resistance to displacement in the finished comforter, to reinforce it in various ways. One of the most successful methods of reinforcing cotton batting is to stitch together the laps of which it is composed by parallel rows of stitching, this being followed, in the manufacture of the better grades of quilting batts, by cross stitching, as disclosed more fully in U. S. Letters Patent No. 1,405,185, granted January 31, 1922, to Walter E. Cochran.

The stitching of batts to reinforce them is performed by multiple needle sewing machines or gang stitchers so arranged that, as the freshly formed batting is fed through the stitching machine, a plurality of laterally spaced longitudinal rows of stitches will be inserted simultaneously. Some difficulty has been experienced, however, in devising satisfactory means for feeding the unreinforced batting to and through the stitching machines.

As commonly practiced, the uncut batting, as it comes from the garnetting machine in a continuous strip, is taken up from the accumulator upon a plurality of laterally spaced endless belts which carry the batting to and through the bite of feeding rolls about which the belts travel and by which they are usually driven. The stitchers are located behind the feeding rolls, so that the batting is drawn by the feeding rolls and belts through the stitchers, the stitchers being arranged to insert their stitches in rows located between the laterally spaced belts. Each belt usually travels in a groove in the feeding roll which is substantially of a depth equal to the thickness of the belt so that the batting engaging face of the belt is substantially flush with the feeding roll at the bite.

It is customary also to provide a series of endless belts travelling about the upper feeding roll in order further to facilitate introducing the batting between and drawing it through the rolls without rupturing it in any way. It has been found in practice that not so many belts are required upon the upper face of the batting to produce the desired feeding and controlling effect as are required on the lower face. Customarily the number of belts on the lower face approximates, or is one in excess of, the number of lines of stitching so that a row of stitches is inserted between each two adjacent belts.

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Although this method of feeding the batting through a stitching machine has for the most part been found to be satisfactory, it has also been found that, with some kinds of batting, there is a tendency for fibres of the batting to become pinched between the edges of the belts and the sides of the grooves in the feeding rolls, with the result that the fibres are carried around the roll with the belts after they have passed through the bite of the rolls. This frequently causes tearing of the batting and sometimes the interlocking is sufficient to cause the batting to wrap itself part way around the feeding roll, thus interfering with the entire operation and spoiling the batt subsequently cut from this length of batting.

A general object of the present invention is to provide improved feeding means in which conditions are avoided which might cause such accidental disruption of the batting structure.

To this end the invention contemplates the provision of means for temporarily disengaging the batting supporting and guiding belts from the feeding roll or rolls, after the essential feeding operation has been completed, in feeding mechanism of the type in which a plurality of endless belts, each passing over a pulley and over a feeding roll, serve to support and guide the batting into the feeding bite of the feeding rolls.

An important feature of the invention is the arrangement of a pulley, preferably an idler pulley, of small diameter as compared with that of the associated feeding roll, upon the discharge side of the feeding rolls in such manner that the laterally spaced endless belts of the associated feeding roll, after passing through the bite of the feeding rolls, then pass over the idler pulley, the idler pulley being preferably so located that the belts are both lifted from their grooves in the feeding roll, just beyond the bite, and are also caused to depart from the further path of travel of the batting. Another important feature of the invention is the association of a pulley with each of the feeding rolls, in the manner just described, to prevent pinching of fibres, project-

ing from either surface of the batting, between the belts and the rolls.

Other objects and important features of the invention to which attention has not been specifically directed hereinabove will appear hereinafter when the following description and claims are considered in connection with the accompanying drawing in which—

Figure 1 is a side elevation of a multiple needle sewing machine having the feeding mechanism of the present invention embodied therein.

Figure 2 is a perspective detail showing the grooved construction of the feeding rolls and the multiple belt arrangement.

In the illustrative embodiment the improved feeding mechanism of the present invention is shown as incorporated in a multiple needle sewing machine for inserting a plurality of rows of stitching lengthwise of a continuous strip of batting as it comes from the garnetting or other batting forming machine, not herein shown. The batting 2 which, as just suggested, is led to the gang stitcher 4 directly from the accumulator of a garnetting or other batting forming machine, may first pass between driven guide and feed rolls 6 and 8 which serve to deposit it upon a plurality of laterally spaced endless belts 10, each of which has a horizontal stretch between an end pulley 12 and a pulley 14 about which it is bent, together with the batt, to travel through a shorter vertical stretch, after which it passes over a third pulley 16 and over the lower roll 18 of a pair of feeding rolls 18 and 20 to provide a second horizontal stretch at the stitching level.

To provide adequate support for and control of the batting during its travel through the vertical stretch and its subsequent travel through the stitcher and between the feeding rolls, a plurality of laterally spaced upper belts 22 are so arranged that each, after passing over a pulley 24, meets the upper face of the batting 2 as the belt 22 starts to pass about the pulley 14 to travel, parallel to the belt 10, through the vertical stretch between the pulleys 14 and 16, each belt 22 then passing about the pulley 16, together with the batting 2, and about the upper one of the feeding rolls. As shown particularly in Figure 2, the lower feeding roll 18 is provided with a groove 26 for each of the belts 10 and the upper feeding roll 20 is provided with a groove 28 for each of the belts 22.

The feeding rolls 18 and 20 are preferably power driven in any suitable manner so that they provide the drive for the belts 10 and 22. They are also preferably intergeared, as shown at 27 and 29, so that they rotate in timed relation to each other in opposite directions, that is, in the directions of the arrows shown thereon in Figure 1. It will also be noted that the shaft of the upper roll 20 is arranged to move up and down to permit the roll to accommodate itself to various thicknesses of batting and thus to provide any necessary bite for the feeding operation. The shaft of the upper roll 20 is preferably spring impelled toward the lower roll, as shown, so that it tends to cause the upper roll 20 to exert the required feeding pressure on the batting 2 in the bite between the two feeding rolls.

As hereinabove pointed out, it has been customary heretofore merely to wrap the belts 10 about the lower roll 18 in the grooves thereof, the idler pulley 30 serving to hold the belt 10 in driving engagement with the roll 18 and the idlers 32 and 34 serving to guide the belt back to the pulley 12. In the case of the upper belts 22 the

idler 36 serves to hold the belt in engagement with the roll 20 and the idlers 38 and 40 guide the belt back to the pulley 24.

As hereinabove pointed out, however, difficulty has been experienced with the prior arrangements of the belts because of the tendency of the belts to pinch fibres of the batting between the edges thereof and the edges of the grooves 26 and 28 in which they run and either tear the batting or sometimes even cause it to wrap itself around the feeding roll 18 or the feeding roll 20. To overcome this difficulty is the main purpose of the present invention. To this end each of the belts 10 is caused to pass over an idler pulley 42 of relatively small diameter and so located that this pulley serves to lift the belt 10 out of its groove 26 in the feeding roll 18 just beyond the feeding bite between the rolls 18 and 20. Not only is the idler 42 so arranged that it lifts each belt 10 out of its groove 26 in the pulley 18, thus releasing any fibres that may have been pinched therein as the batting was fed between the rolls, but the idler 42 is also so located that the belt moves away from the plane of continued movement of the batting and thus disengages the feeding mechanism entirely from the batting as soon as it has passed through the bite of the feeding rolls. Since the batting has now been reinforced by the lines of stitching it will be understood that it can be carried from the bite of the feeding rolls 18 and 20 to the point at which it is cut into individual batts without the assistance of the supporting belts or any equivalent mechanism.

In a similar manner a second idler pulley 44 is arranged to carry the belts 22 out of their grooves 28 in the feeding roll 20, thus releasing any fibres on the upper face of the batting that may have been pinched between the edges of these belts 22 and the sides of their grooves 28.

As hereinabove pointed out, the feeding mechanism of the present invention is herein shown as incorporated in a multiple needle sewing machine which operates to insert a continuous line of stitching between each pair of belts 10 as the batting 2 is fed through the machine. As herein shown, each needle 46 has associated therewith a separate presser foot 48 so located that it holds the batting down against the throat plate 50 as the needle 46 drives the thread through the batting 2. This presser foot 48 does not, however, assist in the feeding, that is, it has no travel in the direction of feed of the batting 2. In the illustrative embodiment of the invention the belts 10 are arranged to travel over the upper faces of the throat plates 50.

Since such close support of the upper face of the batting 2 is not required as in the case of the lower face there are usually not so many of the upper belts 22 provided. In the illustrative embodiment of the invention only four of the upper belts are shown, these necessarily being so spaced, of course, that they avoid the needles 46.

The driving of the belts 10 and of the belts 22 is preferably effected by driving the feeding rolls 18 and 20 from the source of power. This may be done, as shown, by providing a suitable driving pulley (not shown) on the shaft 54 of the lower roll and intergearing the rolls through the gears 27 and 29 hereinabove referred to. The upper roll 20 may, if desired, be spring pressed into engagement with the lower roll 18 by means of springs 60 bearing upon the ends of its shaft 62, although sometimes the weight of the roll itself is sufficient to provide the required feeding bite for feeding the batting 2.

After the batting 2 leaves the bite of the feeding rolls 18 and 20 and moves out of engagement with the belts 10 and 22, it is usually carried to any suitable cutting machine, not shown, in which it is cut crosswise into individual comforter batts. Since it has been reinforced by the longitudinal lines of stitching 64 it does not require the belt support to carry it from the feeding mechanism of the multiple needle sewing machine to the cut-off machine.

As hereinabove suggested, in the better grades of quilting batts it is customary also to reinforce them by cross stitching, as more fully disclosed in U. S. Letters Patent to Walter E. Cochran, No. 1,405,185, granted January 31, 1922. This is done by running the individual batts through a second multiple needle sewing machine, substantially identical with the one herein shown, the batts being fed crosswise of their original lengthwise dimension. In practice it has been found advantageous to employ the same type of feeding mechanism as that just described for the cross stitching operation as well as for the original longitudinal stitching operation, thus preventing any likelihood of the partly stitched batts becoming torn in the cross stitching operation.

From the foregoing description it will be apparent that the invention provides a simple and effective solution of the problem of feeding freshly formed batting through machines, such as multiple needle sewing machines, by which subsequent operations on the batting are to be performed. It will also be apparent that, although the invention has been herein shown as applied to the feeding of material, such as freshly formed cotton batting, through a multiple needle sewing machine, it has wide utility in the field of feeding materials of loose texture for other purposes.

It will be understood that the term "support" as used in the specification and claims applies as well to the upper endless belts 22 as to the lower endless belts 10, the function of these belts as described by the term "support" being the backing up of the batting and its support on both faces against longitudinal disruption which might occur if the feeding pull were exerted directly on the batting instead of primarily on the belts.

What is claimed as new is:

1. Batting feeding mechanism comprising cooperating feeding rolls, laterally spaced endless belts, each traveling over one of said rolls and arranged to support the batting as it is carried into the feeding bite of the rolls, a pulley on the intake side of said rolls over which each belt travels and a second pulley on the discharge side of said rolls over which each belt also travels, said second pulley being so located in respect to the feeding bite of said rolls as to separate each belt from the belted roll just beyond said feeding bite.

2. Batting feeding mechanism according to claim 1 in which said second pulley is of considerably smaller diameter than the belted roll.

3. Batting feeding mechanism according to claim 1 in which said second pulley is of considerably smaller diameter than the belted roll and is located outside the plane of the continued path of travel of the batting.

4. Batting feeding mechanism according to claim 1 in which the belted roll is provided with grooves in which said belts run with their batting engaging faces approximately flush with the surface of the roll.

5. Batting feeding mechanism according to claim 1 in which the other feeding roll is also similarly belted and in which a second small diameter pulley is likewise provided to separate each belt from said roll just beyond the feeding bite thereof.

6. Batting feeding mechanism according to claim 1 in which the other feeding roll is also similarly belted and in which a second small diameter pulley is likewise provided to separate each belt from said roll just beyond the feeding bite thereof, said feeding roll being also provided with grooves in which its belts run with their batting engaging faces approximately flush with the surface of the roll.

7. Batting feeding mechanism comprising opposed driven rolls between which the batting travels, endless laterally spaced belts driven by the respective rolls and between which the batting is carried into the feeding bite of the rolls, and a pulley associated with each roll, of smaller diameter than the roll and over which each belt also travels, each pulley being so located on the discharge side of the associated roll as to separate each belt from the roll for a portion of the travel thereof just beyond the feeding bite of the rolls.

8. Batting feeding mechanism according to claim 1 in which a multiple needle sewing machine is so located on the intake side of the feeding rolls that the needles thereof operate to insert lines of stitching in the batting between the endless belts as the batting is fed through the rolls.

9. Batting feeding mechanism according to claim 1 in which a multiple needle sewing machine is so located on the intake side of the feeding rolls that the needles thereof operate to insert lines of stitching in the batting between the endless belts as the batting is fed through the rolls, said sewing machine comprising throat plates for the needles over which said endless belts also travel.

10. Batting feeding mechanism according to claim 1 in which a multiple needle sewing machine is so located on the intake side of the feeding rolls that the needles thereof operate to insert lines of stitching in the batting between the endless belts as the batting is fed through the rolls, said sewing machine comprising throat plates for the needles over which said endless belts also travel, and a presser foot for each needle located between each pair of belts.

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