Dec. 18, 1951 J. F. KEITH ET AL 2,579,322

METHOD OF AND APPARATUS FOR LEASING

Filed Nov. 19, 1948 3 Sheets-Sheet 1

Fig. 1.

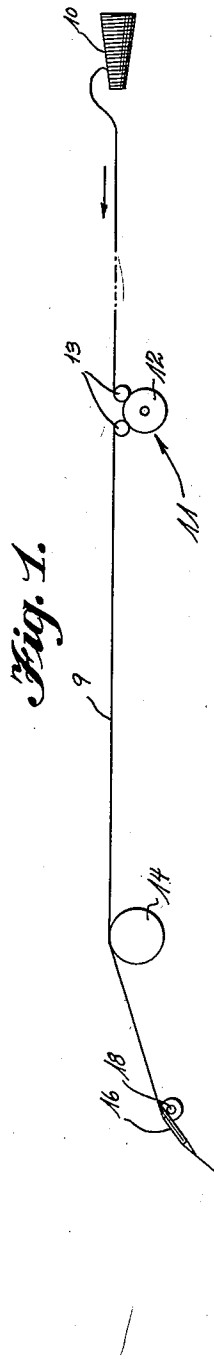
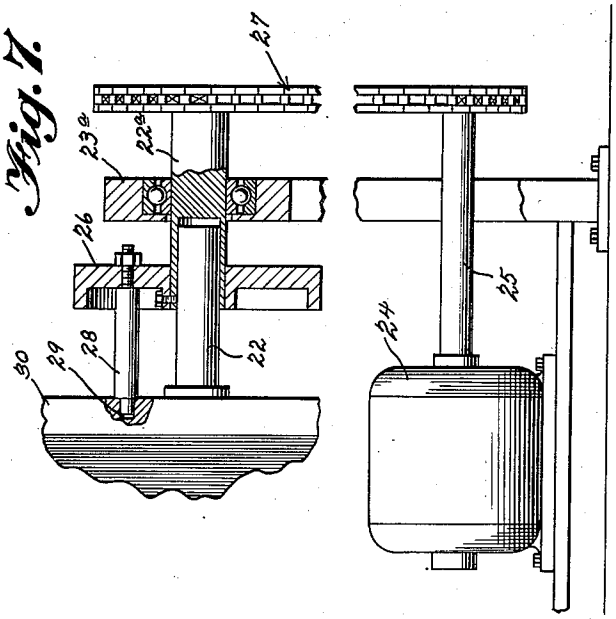


Fig. 2.



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Fig. 2.

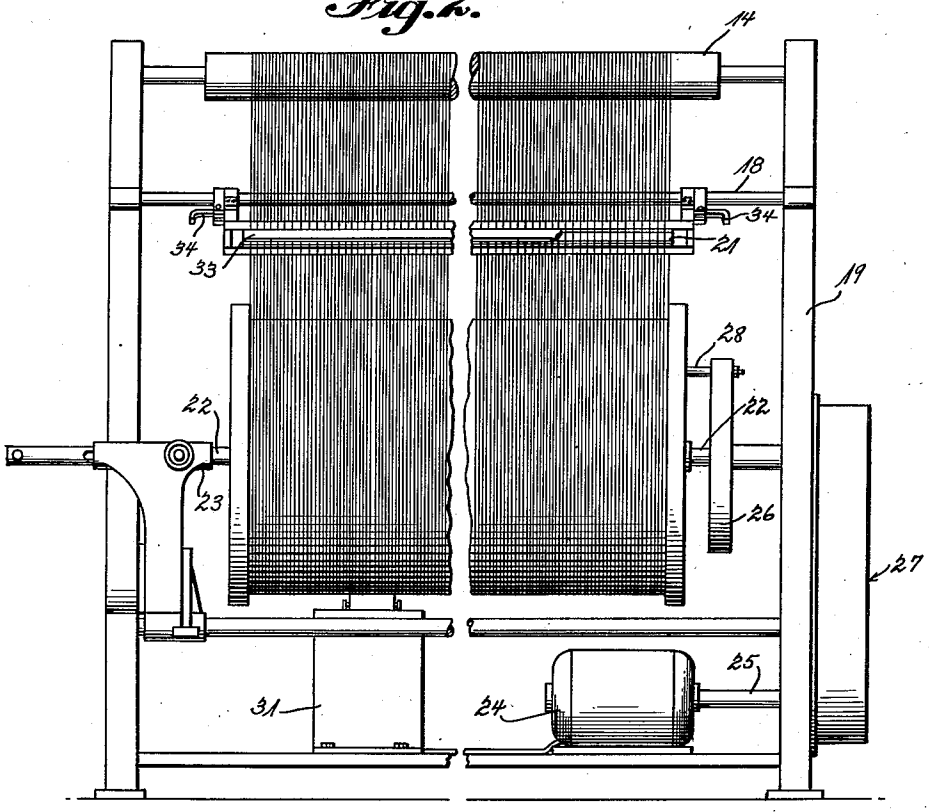
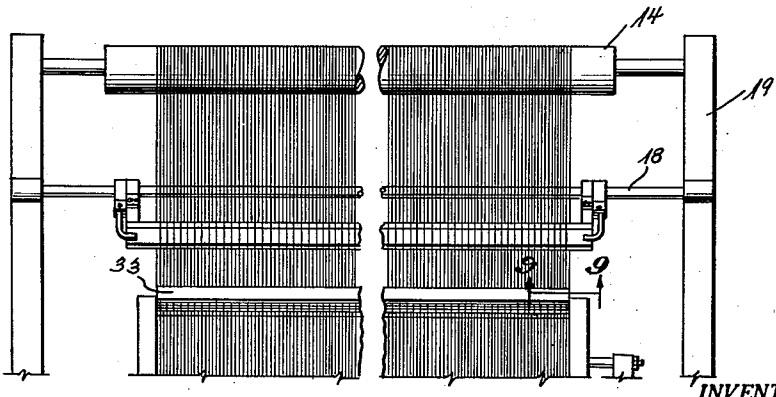


Fig. 3.



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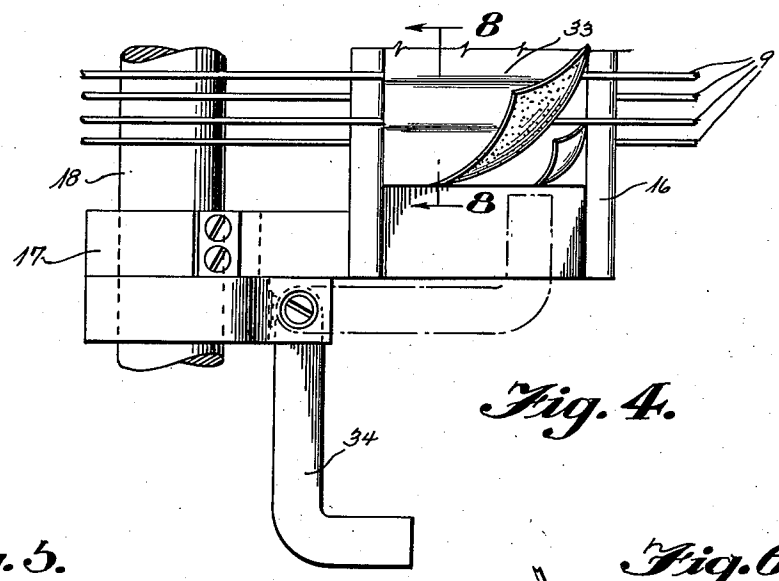


Fig. 4.

Fig. 5.

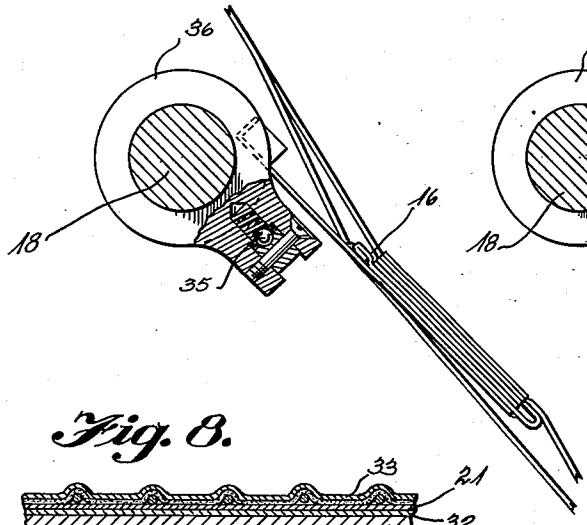


Fig. 6.

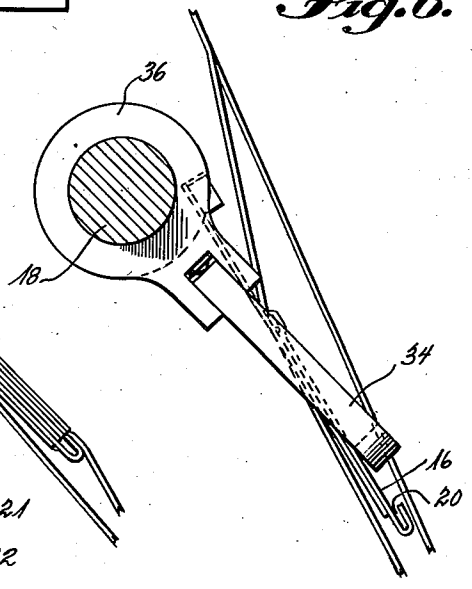


Fig. 8.

Fig. 9.



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METHOD OF AND APPARATUS FOR LEASING

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Application November 19, 1948, Serial No. 60,938

5 Claims. (Cl. 28—40)

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The present invention relates to leasing beams of yarn and more particularly to a method of and apparatus for separating a group of rayon yarns into at least two sheets during their passage to a beam and maintaining the groups separable thereon for subsequent use.

In beaming or slashing operations, a plurality of yarns are drawn from a creel or other suitable source and passed in parallel relationship to a take-up device known as a warp or beam. Between the point of supply and point of collection, the yarn may be subjected to various physical and chemical treatments which are conventional in the industry and which form no part of the present invention except to the extent that the yarns are wound and collected under tension.

This invention is concerned primarily with that part of the winding operation that takes place at or near the point of collection and the manipulating steps that are effected on the yarn after a beam has been filled to the desired extent. The invention is also directed to an apparatus required for performing these steps.

In past practice, when a beam was filled with yarn and was in readiness to be replaced by an empty beam, the individual yarns were leased with a needle and cord arrangement. By this arrangement either one cord was threaded under and over each adjacent yarn and then back again over and under these same yarns, or two cords were used to effect the same result, namely, that of segregating the alternate yarns into two separable groups. It is obvious that this was a tedious and time consuming operation, and in view of the fact that it was also necessary to apply adhesive tape to the cut ends of the yarns to affix them to the beam, the operation was uneconomical in that several yards of yarn were wasted.

In an effort to overcome the above mentioned disadvantages, an apparatus was developed as shown in U. S. Patent No. 2,446,580. In this apparatus, the patentee provided an eyeboard consisting of two series of horizontally parallel thread-guiding eyes vertically spaced from each other. In this way, two sheets of yarns were passed to a delivery roll and thence to a beam. At the point near the eyeboard where the two sheets of yarn were maintained in separated relationship, a paper strip of double thickness was passed between the two sheets of yarns by means of a lease rod at the time the beam was filled. The lease rod was then removed and the longitudinal movement of the yarns caused the paper to pass along with and maintain alternate threads

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separated. When the yarns were passed over the delivery roll, an adhesive tape was applied to the top sheet of yarns to thereby fasten the top sheet of yarns to the top sheet of paper. Upon further passage of the yarns around the beam, the other sheet of yarns was fastened to the other thickness of paper by means of a second tape.

Such an apparatus probably would overcome the disadvantages with respect to the time consumed and the tedious operation theretofore utilized. However, it is still open to the objection of providing a more or less complicated mechanism for maintaining the yarns separated, although the most serious objection is that the arrangement involves considerable waste, since the patentee states that the yarns are cut between the delivery roll and the beam, and therefore, at least the amount of yarn equivalent to the circumference of the beam cannot be used for any practical purposes.

As distinguished from the above described patented apparatus, the present invention contemplates the use of more or less standard beaming or slashing equipment together with the improvement of a very thin rigid bar permanently fixed to the machine between the delivery roll and collecting device. This bar performs the dual function of maintaining alternate yarns separated from the remaining yarns and also acts as a support and carrier for a double strip of paper which can be readily inserted in a channel formed at the lower edge of the bar, and the paper may be inserted at any time prior to completely filling the beam with yarn without impairing the beaming operation.

Other objects and advantages of the present invention will become apparent from the following detailed description when considered in conjunction with the accompanying drawings, wherein:

Figure 1 is a diagrammatic view of a portion of beaming apparatus showing the path of the threads from their source to the beam and their physical relation to the improvement of the present invention;

Figure 2 is a view in front elevation of beaming apparatus illustrating the leasing bar assembly of the present invention in the position assumed during a part of the leasing operation;

Figure 3 is a view similar to the view constituting Figure 2 but illustrating the leasing bar assembly of the present invention in the position assumed thereby during another part of the leasing operation;

Figure 4 is a detailed view in plan and to an

enlarged scale of one end of the leasing bar of the present invention;

Figure 5 is a detailed end view showing the leasing bar at the completion of the leasing of the upper sheet;

Figure 6 is a detailed end view showing the leasing bar during the leasing of the lower sheet;

Figure 7 is a detailed view showing the drive for the beam;

Figure 8 is a view in section taken on the line 8—8 of Figure 4 showing the upper sheet in leased position; and

Figure 9 is a view in section taken on the line 9—9 of Figure 3 showing both sheets in leased position.

Referring more particularly to Figure 1, a multiplicity of yarns 9 which have been drawn from any suitable source of supply, such as that shown diagrammatically at 10, and have been given suitable treatments such as oiling, stretching, drying, etc., are passed through a tension device generally shown at 11 and consists of a positively driven roller 12 and two smaller thread driven rollers 13, which rotate in contact with the driven roller 12 and thereby provide the necessary pinching action on the yarns to create the proper amount of tension. The yarns 9 are then passed over a delivery roller 14 and thence to a beam 15 for collection thereon.

Between the delivery roller 14 and beam 15 is positioned a very thin leasing bar 16 constructed of any suitable material such as stainless steel and the like which will minimize the friction on the yarns. This leasing bar 16 is fixed to sleeves 17, rotatably mounted on rod 18 which in turn is mounted on the frame of the machine indicated at 19. The limited rotation of sleeves 17 permits the leasing bar 16 to be moved radially downwardly when it is desired to disengage the double strip of paper therefrom. The leasing bar is provided at its lower edge with a trough or channel 20, see Figure 6, for retaining the paper in position until the adhesive tape has been applied. In the initial threading up of the yarns, alternate yarns are caused to pass over the top of the leasing bar 16 to form what will be hereinafter termed the upper sheet of yarns, and the remaining alternate yarns are caused to pass under the leasing bar 16 to form what will be hereinafter termed the lower sheet of yarns.

The beam 15 is mounted for rotation by means of stud shafts 22 on each end of the beam, see Figure 2. The stud 22 which extends to the left of Figure 2 is mounted in a sleeve bearing 23. The stud 22 which extends to the right of Figure 2 is received in the hollow end of a shaft 22*a* mounted in a bearing block 23*a*, see also Figure 7. The beam is rotated by means of variable speed drive motor 24 carrying motor shaft 25 which drives disk 26 through a chain and sprocket assembly 27. Disk 26 has a lug 28 mounted thereon which engages a depression 29 in one of the beam heads 30. The tension on the yarns is controlled by rheostat 31.

Referring to Figures 4, 5, 6, 8 and 9 of the drawings, the leasing bar 16 has mounted therein two strips of paper fastened at each end, or a double strip of paper, the upper course of which is designated in the drawing at 21 and the lower course of which is designated at 32. During the entire beaming operation the strips 21 and 32 may rest in the trough of the leasing bar 16 and the threads passing to the beam in their relation to the strip can be clearly seen to the right of the breakaway in Figure 2. When the beam has been filled and stopped and the leasing operation is to be conducted, an adhesive tape 33 is passed across the top sheet of yarns and pressed against the strip 21 to hold between the strip 21 and tape 33 the yarns of the top sheet. At the completion of this operation the upper sheet is held in the manner shown in Figure 8. At this point the leasing bar is dropped to the Figure 6 position and held by pivoted hooks 34. The operation of the hooks 34 is quite apparent from reference to Figures 4, 5 and 6. Each hook 34 is held in the broken-line position of Figure 4 or the full-line position of Figure 6 by a spring-urged ball 35 mounted within a projection from a hook supported sleeve 36 mounted on the rod 18.

With the leasing bar 16 held in the lower position by the hooks 34 at the opposite ends thereof, the entire group of parallel threads are moved from the Figure 2 position to the Figure 3 position as indicated above and then a lower adhesive tape 37 is fastened across the lower sheet of yarns to the strip 32 and the leasing operation is complete. In this way, the user of the beamed yarn can separate the two sheets by simply tearing apart strips 21 and 32.

Stated concisely, the procedural steps are as follows: prior to the time that the beam is completely filled with yarn, an operator inserts a double strip of paper in the channel of the leasing bar. When the beam is completely filled, motion of the beam is arrested and an adhesive tape is pressed against the upper sheet of yarns which are supported on the upper strip of paper thereby sticking this sheet of yarns together as a group or unit. The tension is then released on all the yarns by a motor cut-out that permits the beam to rotate slightly in the reverse direction as a result of the pulling tension of the yarns. The leasing bar is then pushed radially downwardly and hooked in place by means of hooks. The combination of releasing the tension and pushing the leasing bar downwardly causes the double strip of paper, which is now affixed to the tape, to become disengaged from the channel in the lease bar and upon resumption of the tension and rotation of the beam for a part of a revolution, the tape and paper are moved downwardly to the position shown in Figure 3.

Another piece of adhesive tape is now passed underneath the sheets of yarns and pressed against the lower strip of paper. The beam is rotated until the laminated tape and paper holding both sheets of yarns separated, but as a unit, is firmly in engagement with the outer convolutions of yarns on the beams. The tape and yarn are then secured to the beam by means of several strips of adhesive tape applied at right angles to the axial tape.

Finally, the tension is released and the yarns are cut parallel to the axial tape and adjacent the tape fastening the yarns to the beam. The loose ends of yarns from the machine are tied together in bunches and an empty beam is substituted for the full beam and the yarns thereafter rethreaded on the empty beam to repeat the beaming operation.

It can be seen that by the use of the above described apparatus and method, a multiplicity of yarns can be leased and separated into units in a very simple and expedient operation which involves substantially no waste. Obviously, minor modifications can be made in the invention without departing from the spirit and scope thereof.

The invention is to be limited only to the extent of the appended claims.

What is claimed is:

1. A process for leasing warp yarns that comprises inserting two strips of paper between a pair of sheets of yarns and supporting the paper in a stationary manner during a beaming operation, stopping the movement of the yarns at the end of the beaming operation, applying an adhesive tape across the upper sheet of yarns to the top strip of paper, displacing the strips toward the beam and attaching another tape to the bottom strip of paper to hold the other sheet of yarns in position.

2. In a method of leasing a group of parallel warp yarns that have been wound on a beam the desired amount and wherein the yarns are passed from a point of delivery to a point of collection under tension the steps that comprise separating the yarns into at least two sheets near the point of collection by passing alternate yarns of the group over a thin rigid bar and passing the remaining yarns under the thin rigid bar, inserting a double strip of paper or the like between the two sheets of yarns and supporting the paper in engagement with the thin rigid bar, arresting motion of the yarns and taping the upper sheet thereof to the upper strip of paper backing, releasing the tension on the yarns and moving the bar radially downwardly whereby the paper strips are moved out of engagement with the thin rigid bar, retensioning the yarns and taping the lower sheet thereof to the lower strip of paper backing, and finally taping the thus taped groups of yarns to the beam and cutting the same parallel to the axis of the beam at a point adjacent the tape.

3. In apparatus for beaming parallel warp yarns including a source of supply and a beam, the improvement that comprises a flat strip-supporting leasing bar, means mounting said leasing bar for free pivotal movement transversely of the path of the parallel yarns adjacent the beam and means for holding the leasing bar in a position below the normal position predetermined by the passage of alternate yarns above and below it in their path to the beam whereby strips of paper may be held in the leasing bar during the beaming operation in a position to co-act with adhesive tapes to hold the parallel threads in parallelism at the outer end of the beam.

4. In apparatus for collecting a group of parallel warp yarns wherein the yarns are collected on a beam or the like, means for delivering the yarns to the beam under tension and in parallel relationship, a thin rigid bar between the delivery means and the beam for separating alternate yarns into at least two sheets, said bar including means for retaining a double strip of paper thereon during the winding operation whereby upon arresting motion of the yarns the top sheet of yarns may be taped in a group to the top strip of paper, means for releasing the tension on the yarn and means for moving the bar radially downwardly whereby the bottom sheet of yarns may be taped in a group to the bottom strip of paper.

5. A leasing bar in the form of an elongate trough of a length greater than the width of the sheets to be beamed characterized by a retaining channel for holding paper strips against displacement incident to passage of a large number of yarns thereover, means mounting the bar for pivotal movement transversely of the path of the sheets and means for holding the bar against the action of the lower sheet tending to force it into a plane parallel to the sheets.

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