July 9, 1940. C. C. BLOM 2,207,607

SETTING FRAME

Filed March 25, 1939

Fig. 1

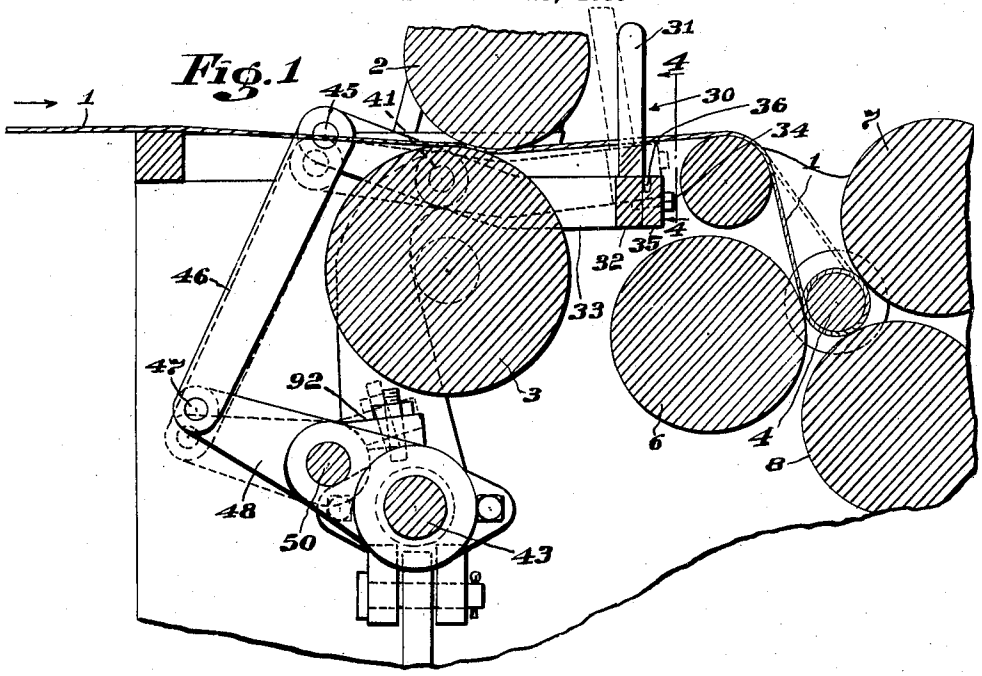


Fig. 2

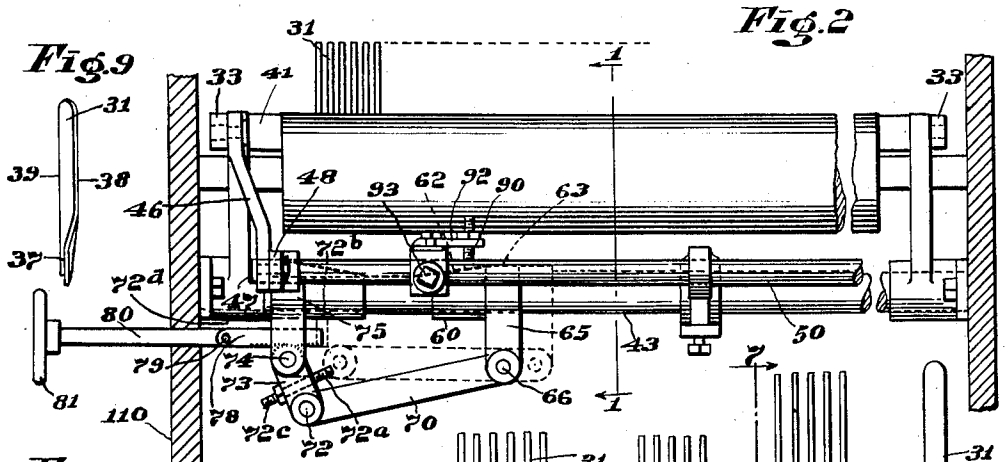


Fig. 9

Fig. 10

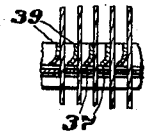


Fig. 3

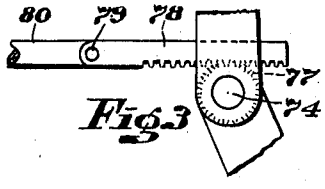


Fig. 4

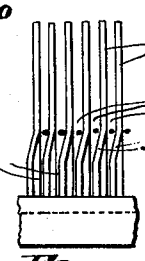


Fig. 5

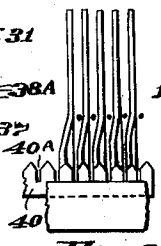


Fig. 6

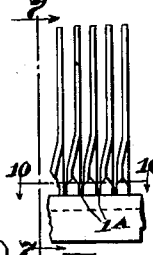


Fig. 7

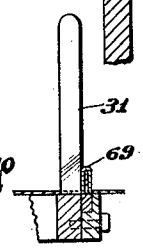


Fig. 8



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SETTING FRAME

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Application March 25, 1939, Serial No. 264,133

2 Claims. (Cl. 28—55.5)

This invention relates to winding frames employed for winding spools used in the weaving of Axminster rugs.

The object of the invention is to facilitate the operation of clamping the strands of yarn together after winding and prior to cutting, by the provision of a combination of comb clamp and spool reed of novel construction whereby the yarn is guided between the teeth of the clamp without the danger of splitting the individual strands of yarn by the teeth as has been common heretofore.

In the drawing:

Fig. 1 is a vertical section, on the line 1—1 of Fig. 2, of portions of a winding or setting frame embodying my invention;

Fig. 2 is an elevation view, partly in section, of the reed elevating mechanism;

Fig. 3 is a detail elevation view of certain parts of Fig. 2;

Fig. 4 is a detail elevation view of the reed as seen when looking in the direction indicated at 4—4 of Fig. 1;

Fig. 5 is a view similar to Fig. 4 but showing the comb clamp inserted in position adjacent the base of the reed;

Fig. 6 is a detail elevation view showing the reed elevated to effect depression of the yarn strands between the teeth of the clamping comb;

Fig. 7 is a vertical section taken on the line 7—7 of Fig. 6 but with the clamping cap shown in position over the comb;

Fig. 8 is a detail view of the assembled clamp, consisting of comb and cap, after removal from the slot adjacent the base of the reed;

Fig. 9 is a perspective view of one dent of the reed, and

Fig. 10 is a horizontal section taken on the line 10—10 of Fig. 6.

As indicated in Fig. 1, the setting frame of my invention is provided, as is customary, with a pair of tension rolls 2 and 3 engaging the yarn 1 as it passes from the creel, in the direction indicated by the arrow, to the spool 4 which is rotated by a plurality of winding rolls 6, 7 and 8, one or more of which is power-driven. These details may be variously contrived.

At 30 I have indicated by novel reed, disposed in proximity to the spool 4. It comprises a plurality of dents 31 extending vertically from a mounting 32 which is supported at both ends by levers 33 which are pivotally mounted, as will appear, to elevate the reed to its dotted line position for clamping up the yarn after the run.

As indicated in Fig. 9, each of the dents 31 is constructed of a strip of metal of uniform width and thickness, the bottom portion 37 of the front edge of which is twisted slightly out of alignment with the upper portion 38 of the front edge. This twisting operation may be performed by holding securely the entire rear face 39 of the dent and then grasping the lower corner 37 of the front face, after which the lower portion is bent to the left as viewed in Fig. 9 and out of alignment with the upper portion 38 of the front face, without bending either the upper portion of the front face, or the rear face throughout its entire area. After the dents are bent in this manner, they are mounted in the supporting block 32 at equally spaced intervals, parallel with each other and with their twisted lower portions all curving to the left, as viewed in Fig. 4, in parallel curves.

The supporting block 32 has secured to its front face, adjacent the bases of the dents 31, by suitable bolts 34, a block 35 which is slotted at 36 to receive a comb member 40 (Figs. 5 and 8) forming one element of the usual comb clamp adapted to clamp up the yarn after winding.

The levers 33 supporting the opposite ends of reed 30 are fixed to opposite ends of a rotatably mounted shaft 41. The lever 33 shown in Fig. 1 joins pivotally at 45 with one end of a link 46, the other end of which link is pivoted at 47 to arm 48 which is fixed to a shaft 50, suitably mounted to rotate.

As indicated in Fig. 2, shaft 43 mounted adjacent shaft 50 carries freely mounted thereon, a cam member 60 which may be in the general shape of a truncated cone to provide a tapering cam surface which gradually diverges from a low portion 62 closely adjacent the surface of the shaft 43, to a high annular portion 63 formed of a hub of substantial thickness as compared with the low portion 62 of the cam. The cam 60 has lugs 65 depending from the enlarged end thereof. Pivotally secured to the bolt 66 passing though the lugs 65 is one end of a link 70 which is pivoted at its other end at 72 to a link 73. The link 73 is fixed to stud shaft 74 rotatably mounted in lug 75 depending from and secured to the frame of the machine in any suitable way.

The links 70 and 73 form a toggle joint actuated by rotation of shaft 74 to which link 73 is secured and the toggle is provided with a stop 72*a* adapted to abut the surface 72*b* when the toggle is straightened and a second stop 72*c* which abuts surface 72*d* when link 73 is swung to the left slightly beyond a horizontal position. As indicated in Fig. 3, a pinion 77, secured to shaft 74, meshes with a rack 78 pivoted at 79 to a push-pull rod 80 which has a sliding bearing in the side frame member 110 of the machine and is provided at its extremity with a hand knob 81 by which the rack may be moved longitudinally of the shaft 43.

Riding on the surface of the cam 60 is a cam follower 90 carried by an arm 92 (Fig. 2) fixed to the aforesaid shaft 50 by one or more bolts 93.

With the machine constructed as above de-

scribed, its operation is as follows: The winding position of the spool reed 30 is that shown in full lines in Fig. 1 obtained by disposing the cam 60 in its dotted position of Fig. 2 with stop 72a against surface 72b. Cam follower 90 is now on lower portion 62 of the cam. It will be noted from Fig. 4 that the yarn 1 now passes through the dents 31 of the reed above the lower twisted portions 37 thereof, in which position the strands of yarn guided by adjacent dents, are given ample space 38A for the running of the yarn.

Prior to commencing the winding, the comb member 40 of the clamp is secured in position in the groove 36 immediately in front of the dents 31 below the yarn and in alignment with the bases of the dents. It will be observed by a comparison of Figs. 4 and 10, that the partial twists of the lower front edge portions 37 of the dents form a plurality of straight line openings for the passage of taut yarn, each of which openings is bounded on one side by the front edge portion 37 of one dent and on the other side by the rear edge 39 of the next adjacent dent on the left, as viewed in Figs. 4 and 10. Thus, as a result of the straight line position of the yarn under tension, the twisting of the bottom portions of the dents 31 provides, in effect, a number of areas 37A for guiding the yarn at the bottom of the dents which are quite narrow as compared with the wide areas 38A at the upper portion of the dents.

The clamping comb 40, when properly positioned in the slot 36 provides narrow spaces 40A, between adjacent teeth, in alignment with the narrow spaces 37A at the base of the dents, with the pointed tips of the comb teeth disposed, as indicated in Fig. 5, in alignment with the deflected portions 37 of the dents. To insure this position of the comb, the slot 36 may be of fixed length to receive and properly position a comb of corresponding length or, if desired, it may be provided with adjustable end portions for varying its length to adjust the position of the comb.

At the completion of the winding operation, during which, as stated, the yarn is guided by spaces 38A as shown in Fig. 5, the push rod 80 (Fig. 2) is pushed to the right, as indicated in that view, to elevate the reed 30 from its full line position of Fig. 1 to its dotted line position, whereby, in effect, to depress the yarn 1 into the comb of the clamp and between the teeth thereof. By this movement of the push rod 80 to the right, a clockwise rotation of the link 73 is effected until stop 72c abuts surface 72d which moves the link 70 to the left, thereby pushing the lugs 65 and cam 60 to the left to make the cam follower 90 ride from its lower position at 62 to the elevated position at 63. This movement of the cam follower elevates the lever 92 to which it is secured, to impart a slight rotation to the shaft 50. This movement of the shaft 50 is imparted to the lever 48 to rotate that lever and the lever 46 (Fig. 1) and lever 33 from their full line to their dotted line positions to elevate reed 30 to its dotted line position. As indicated in Fig. 6, this movement in effect causes depression of the taut strands of yarn, first into the narrow passages 37A and thence into the slots 40A between the teeth of the comb, as indicated at 1A, and it will be observed that during this movement the yarn cannot touch the points of the teeth of the comb. After this operation, the cap 69 is secured over the comb to clamp the yarn in the usual manner, a small length of yarn is drawn off from the creel, the clamp is removed from the slot 36 and the yarn is cut adjacent the clamp. The operation of drawing off a small length of yarn from the creel may be effected manually after elevating the upper roll 2, or it may be effected mechanically by imparting rotation to the roll 2 in engagement with roll 3, in a manner described in my co-pending application Ser. No. 45,838 filed October 21, 1935.

Thereafter, the wound spool with clamped ends is removed from the setting frame (after the top roll 7 has been moved out of the way in any suitable manner), an empty spool is inserted in winding position, the yarn ends are lapped about the empty spool and the winding operation repeated. Prior to the commencement of rotation of the winding rolls, the reed 30 is dropped from its dotted line to its full line position by movement of the push rod 80 to the left, until stop 72a abuts surface 72b to position the link 70 as indicated in dotted lines in Fig. 2 and to dispose the yarn as indicated in Fig. 4. A comb clamp is then inserted.

It will be noted that the dents of the spool reed 30 by being twisted at their bases present the narrow straight-line apertures 37A without actually diminishing the spaces between adjacent dents at their bases and I thereby provide ample room at the base of the reed for the passage of knots during the operation of drawing off yarn from the creel after the spool has been clamped.

I claim:

1. A yarn guiding reed for use with a clamping comb, the dents of said reed being spaced from each other to form a series of apertures of predetermined width along the upper portion of the reed for guiding yarn during the run of the machine, means forming a second series of yarn guiding apertures, below said first series, of an effective guiding width which is less than that of the apertures of the upper series, a yarn clamping comb having teeth separated by spaces adapted to register with the lower series of apertures, a comb-holder fixedly secured to the reed for holding the comb spaces in registry with said lower apertures, means for simultaneously moving the reed and the comb holder relative to the yarn to depress the yarn into said lower apertures, and yarn deflecting means for guiding the yarn past the comb teeth and into the comb spaces during such movement.

2. In a setting frame, the combination of a yarn guiding reed having dents spaced to form a series of apertures of predetermined width along the upper portion of the reed for guiding the yarn during the run of the machine, the lower portions of said dents being deflected out of alignment with the upper portions thereof to form a lower series of apertures which confine the yarn more narrowly than the upper series, a yarn clamping comb having teeth separated by spaces adapted to register with the lower series of apertures, a comb holder fixedly secured to the reed for holding the comb spaces in registry with said lower apertures, and means for simultaneously moving the reed and the comb holder relative to the yarn to depress the yarn into said lower apertures, the tips of the teeth of the comb being aligned with the deflected lower portions of the reed dents so that when the yarn is so depressed it is guided past the tips of the teeth of the comb and into the comb spaces.

CONRAD C. BLOM.