May 10, 1938. G. B. PHILLIPS 2,116,766

REEDING APPARATUS USED IN TEXTILE MANUFACTURES

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Fig. 1.

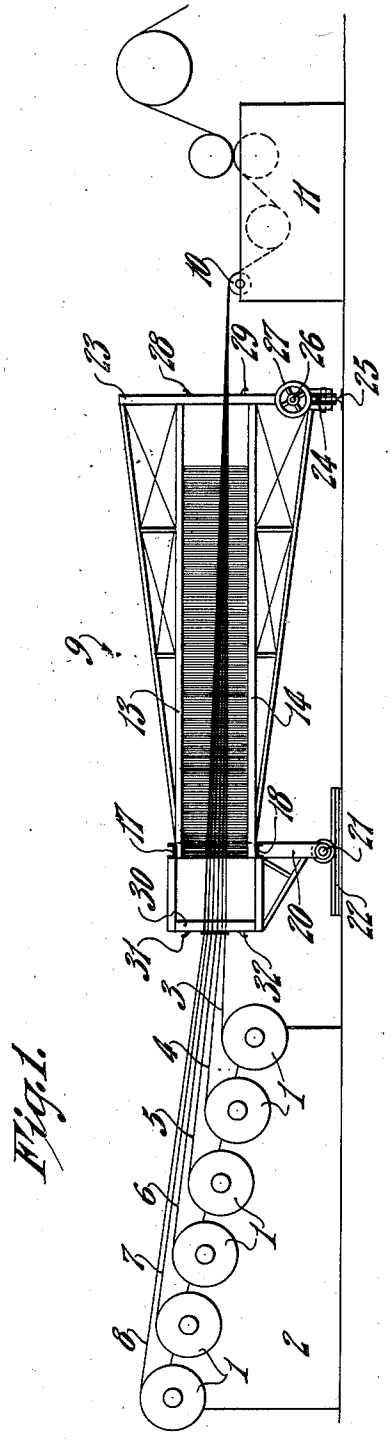
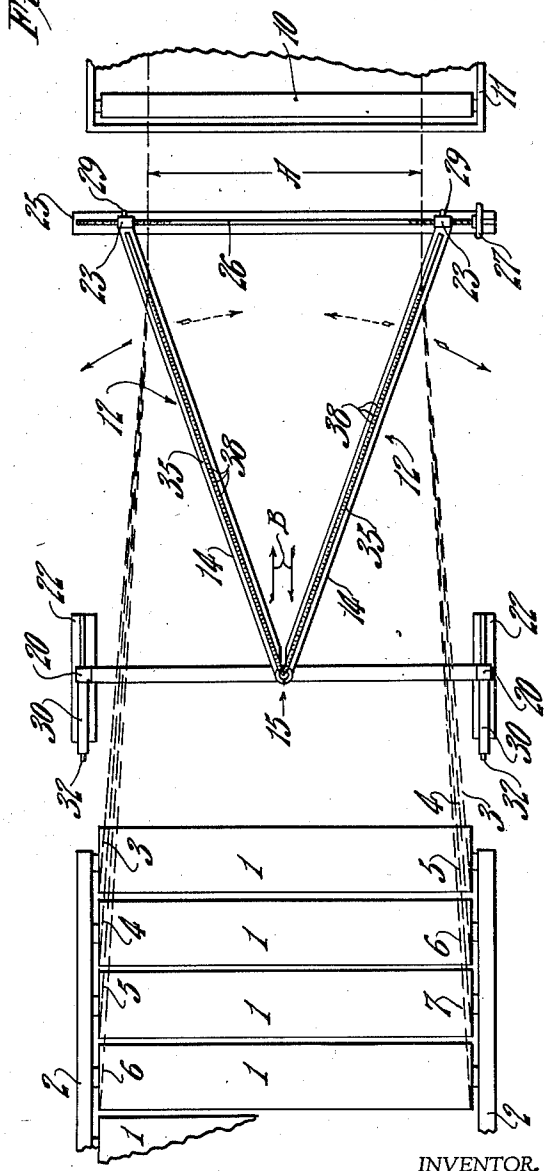


Fig. 2.



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Fig. 3.

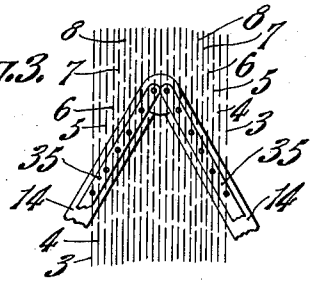


Fig. 4.

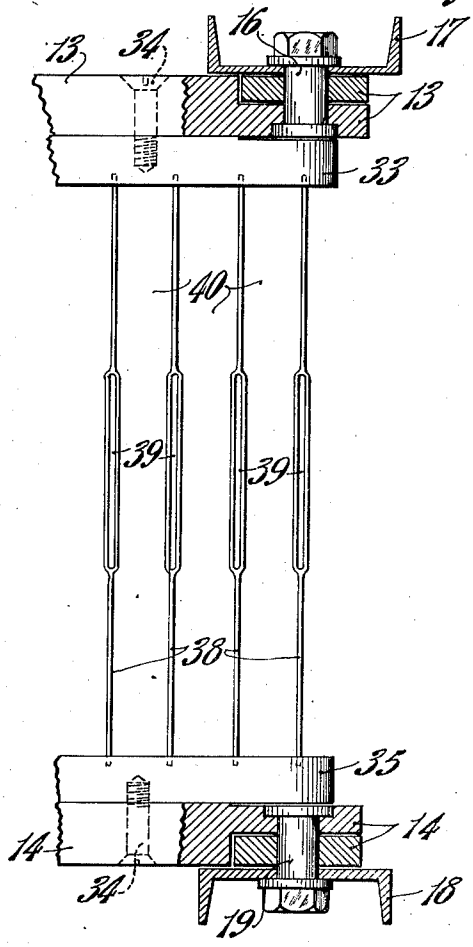


Fig. 5.

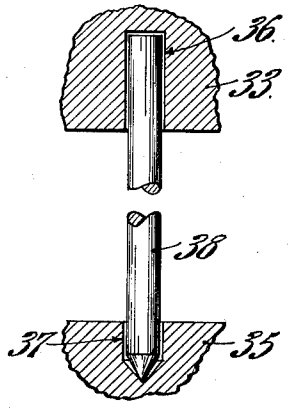
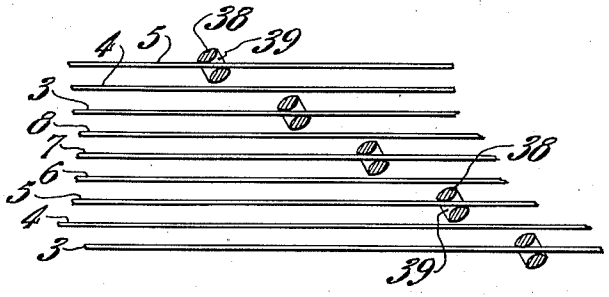


Fig. 6.



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REEDING APPARATUS USED IN TEXTILE MANUFACTURES

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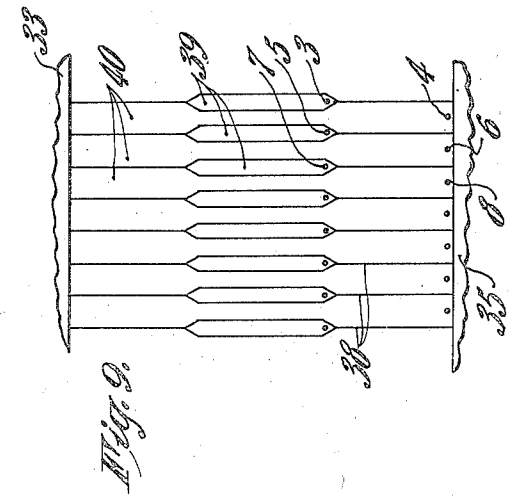


Fig. 9.

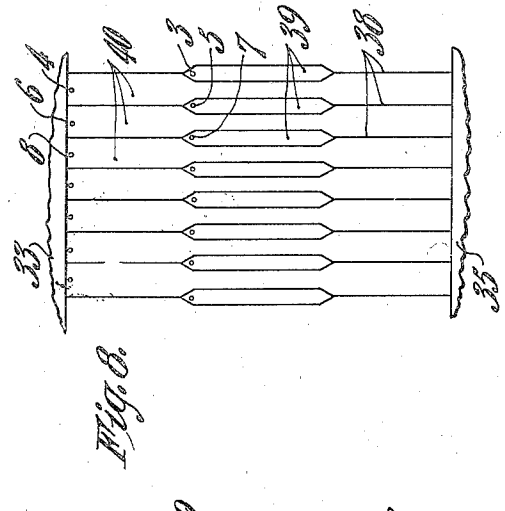


Fig. 8.

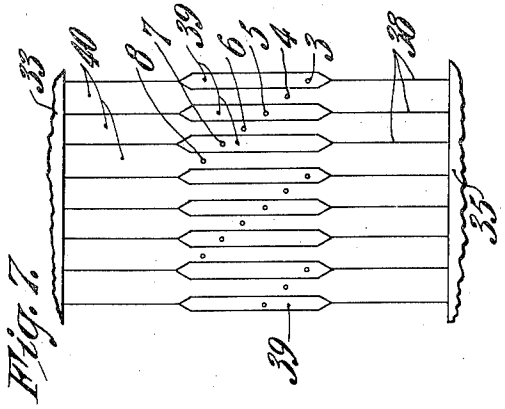


Fig. 7.

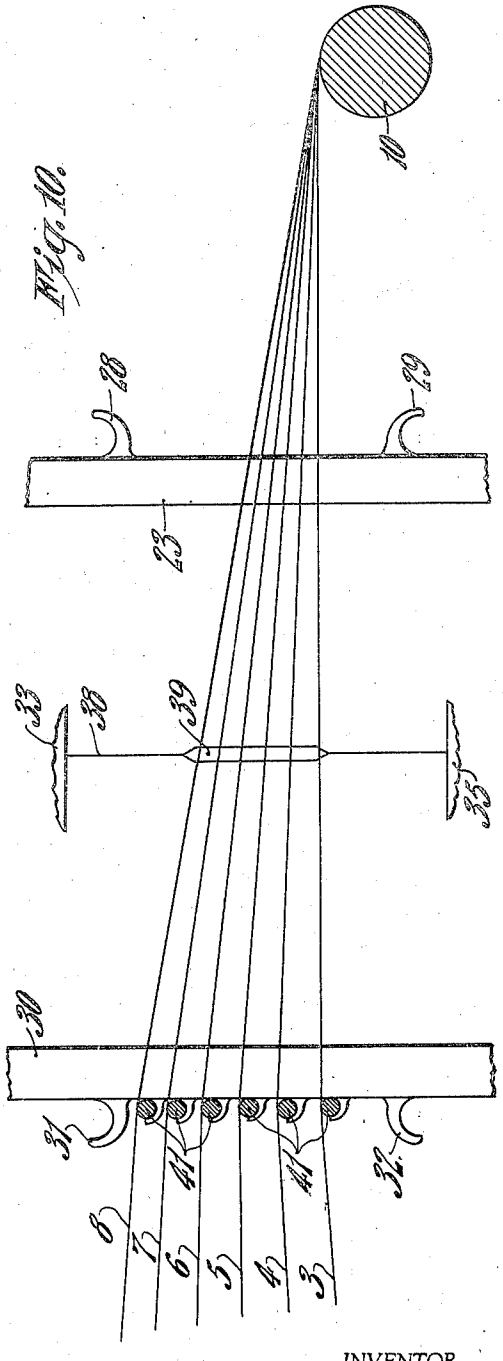


Fig. 10.

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REEDING APPARATUS USED IN TEXTILE MANUFACTURES

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Fig. 11.

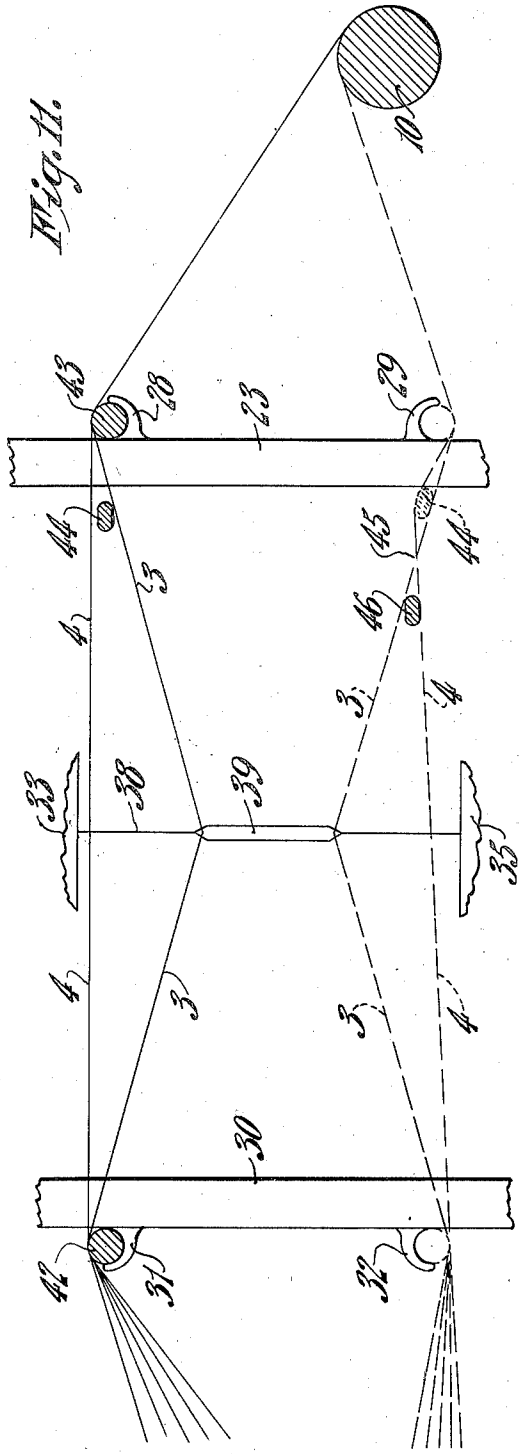


Fig. 13.

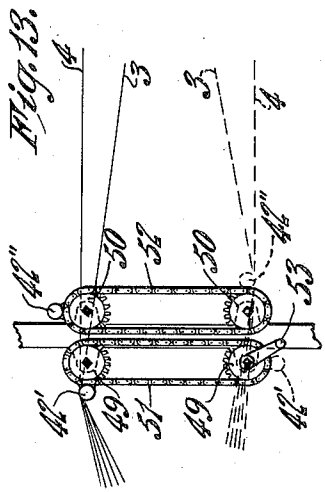
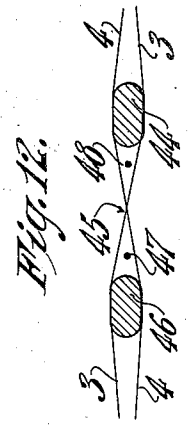


Fig. 12.



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Patented May 10, 1938 2,116,766

UNITED STATES PATENT OFFICE

2,116,766

REEDING APPARATUS USED IN TEXTILE MANUFACTURES

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Application February 8, 1937, Serial No. 124,547

6 Claims. (Cl. 28—40)

This invention relates to improvements in reeding apparatus used in textile manufacture, and is particularly pertinent to leasing reeds used in the manufacture of artificial silks.

An object of this invention is to provide a reeding device which will include means for controlling the width of the warp, means for guiding the individual threads of the warp, and means for forming an end and end lease in the warp.

This invention is designed primarily for use in co-operation with a sizing apparatus. The customary practice in the art, at present, is to lead the threads from a plurality of section beams revolvably supported in a frame, through a hook reed, thence into and through a slasher or sizing machine, then through an adjustable comb or reed onto a loom beam. In order to "throw" an end and end lease with a hook reed, at least two operators are required, working from twenty to thirty minutes. After taking or "throwing" the end and end lease, time and labor are required to work the end and end lease through or by the adjustable comb reed adjacent the loom beam. Individual leads or ends are broken in the operation, and must be tied or twisted and placed back in proper position and relation in the comb reed. If the width of the warp on the loom beam is to be changed, additional time is required in resetting the comb to control the new width.

It is an object of this invention to incorporate the function of the comb reed in the leasing reed, thereby eliminating the comb reed and the time and labor now required to work the end and end lease by the comb reed.

In the operation of this invention, which may be considered as replacing the hook reed and the adjusting comb, one operator can form an end and end lease in the warp and adjust the reed for varying the width of the warp in one and one-half or two minutes. It is, therefore, a further object of this invention to provide a reed for sizing machines used in the manufacture of artificial silks, by means of which the time and labor required in necessary but non-productive operations is materially reduced.

A still further object of this invention is to provide, in a warp reed, revolvably supported needles which will automatically adjust themselves, through engagement with the leads, to adapt themselves to varying angles of the leads, relative to the center line of the warp, thereby automatically presenting, at all times, a minimum of friction on the leads, or threads.

These, and other objects and advantages of this invention, will be more completely disclosed and described in the following specification, the accompanying drawings, and the appended claims.

Broadly, my invention comprises a V-shaped reed frame, the sides of which are pivotally connected at the apex of the V; means for varying the distance between the free ends of the frame for controlling the width of the warp; spaced, vertically disposed reed needles, provided with a centrally located elongated eye, revolvably supported in the reed frame; means on the frame for removably supporting leasing rods in proper relation to the needles; and guiding means for controlling the movements of the free ends and the pivot point of the V-shaped frame for maintaining the axis of the frame on the central axis of the sizing apparatus.

A preferred embodiment of my invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a side elevational view of a sizing apparatus, showing the operating relation between the section beams, the reed, and the sizing tank.

Fig. 2 is a plan view of the apparatus illustrated in Fig. 1, taken on a plane passing through the reed needles.

Fig. 3 is a partial plan view at the pivot point of the reed frame.

Fig. 4 is a detail sectional view of the pivot construction of the reed frame.

Fig. 5 is a detail sectional view, indicating the supporting means for the reed needles.

Fig. 6 is a diagrammatic view, illustrating the adaptability of the reed needles to the angle of the leads.

Fig. 7 is a diagrammatic view, showing the relation of the needles and leads during the ordinary run of the warp.

Fig. 8 is a view similar to Fig. 7, showing the relation of the needles and leads during the first leasing operation.

Fig. 9 is a view similar to Fig. 8, showing the relation of the needles and leads during the second leasing operation.

Fig. 10 is a diagrammatic longitudinal view, indicating the relation of the leads and any one of the needles during an ordinary run.

Fig. 11 is a view similar to Fig. 10, showing, in full lines, the position of the leads during the first leasing operation, and in dash lines, the position of the leads during the second leasing operation.

Fig. 12 is a diagrammatic view of the completed end and end lease, with the secondary leasing rods and leasing threads in place, and

Fig. 13 is a side elevational view of a modified

form of reed frame, showing mechanical means for moving or adjusting the leasing rods.

Referring now to the drawings in detail, in which like numerals refer to like parts throughout:—

Section beams 1 are revolvably supported in a frame 2. Threads, or "leads" 3, 4, 5, 6, 7, and 8 are taken off the beams 1, pass through a reed 9 and onto a roll 10 in a sizing box, or vat 11. All parts of the above apparatus are old, with the exception of the reed 9.

The width of the finished warp, as run onto the loom beam, is indicated at A, in Fig. 2.

The reed 9 includes two main wings 12, each wing having a top frame 13 and bottom frame 14. The frames 13 are pivotally connected at 15 by means of a pivot bolt 16 which serves to pivotally support the frames 13 on a transverse supporting member 17, and the frames 14 are similarly connected and supported on a transverse supporting member 18 by means of a pivot bolt 19, the axes of the bolts 16 and 19 being identical. The members 17 and 18 are secured on posts 20 which are supported on flanged wheels 21, the wheels 21 being engaged on rails 22 which are secured on the floor. Thus, the pivot point 15 may be moved forwardly and backwardly, as indicated by the arrows B, but must remain on the axis of the apparatus, being controlled by the rails 22. The ends of the frames 13 and 14, opposite the pivot point 15, are supported on posts 23, and the posts 23 are supported on flanged wheels 24 which are engaged on a rail 25. The rail 25 is perpendicular to the rails 22. The posts 23 are connected by a right and left threaded shaft 26, operated by a handwheel 27. Revolution of the shaft 26, in one direction, will cause the posts 23 to approach each other, and opposite revolution of the shaft 26 will cause the posts 23 to separate. Thus, the working width of the reed 9 may be varied by operation of the handwheel 27 and, with the leads engaged in the reed 9, the finished width A of the warp may be varied at will by manipulation of the handwheel 27 and shaft 26. The posts 23 are provided with hooks 28 and 29, and the posts 20 have secured thereon auxiliary frames 30; also provided with hooks 31 and 32. The purpose of these hooks will be explained later.

The reed 9 is preferably positioned with the apex 15 adjacent the section beams 1, and the spaced posts 23 controlling the free ends of the V-reed adjacent the roll 10. Thus, the ends 23 are farthest removed from the section beams 1, and the angle of the selvage of the warp is reduced to a minimum. This minimum angle is important, as it tends to uniformity in the tension on the leads throughout the warp.

Needle strips 33 are secured on the lower faces of the frames 13 by any suitable means, such as screws 34, and needle strips 35 are secured in a similar manner on the upper faces of the frames 14. The needle strips 33 and 35 are provided with a plurality of sockets 36 and 37 in axial alignment, and needles 38 are freely and revolvably supported between the strips 33 and 35 in the sockets 36 and 37, (see Fig. 5). The needles 38 are formed with centrally located, elongated eyes 39.

The "ends" or "leads" are arranged with every other lead, such as the leads 3, 5, and 7, in an eye 39, and the alternate leads, such as 4, 6, and 8, in the spaces 40 between the needles 38, as indicated in Figs. 3, 6, and 7 to 9 inclusive. During a normal run, rods 41 are removably supported on the posts 23 and serve as guides to restrict the leads within a range slightly less than the length of the eyes 39, and registering therewith, as indicated in Figs. 1, 7, and 10.

An important feature of the invention resides in the free support of the reed needles 38 in the sockets 36 and 37. As the width A of the warp is varied by manipulation of the handwheel 27, the angle of approach of the leads to the needles will vary, and engagement of the leads in the eyes of the needles will cause the needles to revolve, until a minimum of frictional surface is presented to the leads, as illustrated in Fig. 6. The inner surfaces of the eyes 39 are rounded, as indicated in Fig. 6, to further reduce the frictional contact of the leads in the needles.

The operation of forming an end and end lease in the warp is described as follows: First, the guide rods 41 are removed from the posts 23. An operator then passes a lease rod 43 beneath the warp, lays one end of the rod 43 in a hook 28 on the post 23 on the opposite side of the reed, then, with the aid of the rod, lifts the warp, until the end of the rod adjacent the operator can be placed in the hook 28 on the post 23, nearest the operator. This operation is then repeated with a second leasing rod 42 at the front end of the reed, lifting the warp by means of the rod 42, until the same may be placed in the hooks 31 on the frames 30, (see Fig. 11). With the leasing rods 42 and 43 in place, the threads or leads of the warp assume the position, with respect to the reed, indicated in Fig. 8 and in full lines in Fig. 11. The leads in the eyes of the needles are drawn to the top of the eyes, and the leads between the needles are drawn to the top of the reed, adjacent the strip 33. Thus, the leads, or threads 3, 5, and 7, are engaged in the needles at the top of the eyes, and the alternate leads, or threads 4, 6, and 8, are located at the top of the reed, as indicated in Fig. 8. While in this position, a secondary leasing rod 44 is inserted between the odd and even leads, as indicated in Fig. 11. Next, the leasing rods 42 and 43 are removed, positioned above the warp, and by means of the rods 42 and 43, the warp is carried downwardly, until the rods 43 and 42 may be placed in the hooks 29 and 32, respectively, as indicated by dotted lines in Fig. 11. With the leasing rods 43 and 42 in place in the hooks 29 and 32, the leads and secondary leasing rod 44 assume the position indicated by dash lines in Fig. 11, with the odd leads above the even leads, the secondary leasing rod 44 thus causing the odd and even leads to cross at 45. Another secondary leasing rod is then inserted, as indicated at 46 in Fig. 11. With the two secondary leasing rods in position in the warp, as shown in Figs. 11 and 12, leasing threads or strings 47 and 48 are inserted, thus completing the end and end lease. After the threads, or strings 47 and 48 are inserted, the rods 44 and 46 are withdrawn.

A modified form of construction, providing mechanical means for operating the leasing rods, is illustrated in Fig. 13. Sprockets 49 and 50 are mounted on the posts 20 and 23, and are operatively connected by chains 51 and 52, respectively. A leasing rod 42' is secured on the chains 51 below the warp, and a leasing rod 42'' is secured on the chains 52 above the warp. A crank 53 may be removably secured on any of the sprockets 49 or 50 to revolve the same. Clockwise revolution of the sprockets 49 will raise the rod 42' and thus carry the warp upward into a position corresponding to the position, indicated in full

lines in Fig. 11. Counter-clockwise revolution of the sprockets 49 will lower the rod 42' to inoperative position, as indicated in dotted lines. Similar movements of the sprockets 50 will carry the rods 42'' into operative and inoperative position, indicated by dotted and full lines respectively. An advantage of this mechanical operation of the leasing rods lies in the maintenance of the leasing rods in horizontal positions at all times. Thus, contact is made and continued throughout the leasing operation with all of the ends, or leads, simultaneously and uniform tension is maintained. All possibility of "slack" has been eliminated.

It will be understood by those skilled in the art, from the above description, that a single operative may perform all the necessary operations for forming an end and end lease in a warp in a very short time, and without any movement of the reed, in any direction; and that the same operative may change the width of the warp at will by manipulating the handwheel to increase or decrease the angle at the apex of the V-reed.

Whereas, I have shown and described my reed as used in co-operation with section beams, it will be understood by those skilled in the art that this reed is equally adaptable for use in co-operation with, and warping direct from a cone creel.

What I claim is:—

1. A leasing reed for the purpose described, comprising, a pair of reed frames angularly disposed relative to each other and pivoted on a common axis, a second pair of reed frames supported above said first-named pair and pivoted on the same axis, a plurality of reed needles rotatably supported in said frames, each of said needles being formed with an elongated eye located midway of its length.

2. A V-shaped reed comprising, two pairs of top and bottom reed frames, a plurality of reed needles formed with elongated eyes midway of their length rotatably supported between each pair of top and bottom reed frames, said top frames being pivotally connected at one end, said bottom frames being also pivotally connected at one end, the pivots of said top frames and bottom frames having a common axis, a supporting post for the free ends of each pair of top and bottom frames, a right and left screw connecting said posts, whereby said posts may be variably and adjustably spaced, a supporting frame for the pivoted ends of said frames, hook elements on said posts and said supporting frame for supporting leasing rods, means for guiding movement of said posts comprising, flanged wheels on said posts engaged on a rail positioned in a plane including said posts, and means for guiding movement of said supporting frame comprising, flanged wheels on said supporting frame engaged on rails positioned in planes parallel to a plane bisecting the angle of the V-shaped reed.

3. In a sizing apparatus, a V-shaped reed frame having the sides of the V pivoted at the axis thereof, means for adjustably spacing the free ends of the V-shaped reed frame for controlling the width of a warp; spaced, vertically disposed reed needles, each provided with a centrally located elongated eye, revolvably supported in said reed frame, means on said reed frame for positioning and supporting leasing rods in proper relation to said needles, and guiding means for controlling the movements of the free ends and the pivot point of the V-shaped frame for maintaining the axis of the frame on the central axis of the sizing apparatus.

4. A warping and leasing reed comprising a pair of reed frames arranged in the form of a V and pivotally connected at the apex of the V, a pair of spaced post members, the free ends of said frames being supported on said post members, means for adjustably spacing said posts within a plane including said posts, and means for guiding movement of the apex of the V within a plane perpendicular to the plane including said posts.

5. A V-shaped reed comprising two pairs of top and bottom reed frames, a plurality of reed needles formed with elongated eyes midway of their length rotatably supported between each pair of top and bottom reed frames, said top frames being pivotally connected at one end, said bottom frames being also pivotally connected at one end, the pivots of said top frames and said bottom frames having a common axis, a supporting post for the free ends of each pair of top and bottom frames, means for adjustably spacing said posts.

6. A V-shaped reed comprising two pairs of top and bottom reed frames, a plurality of reed needles formed with elongated eyes midway of their length rotatably supported between each pair of top and bottom reed frames, said top frames being pivotally connected at one end, said bottom frames being also pivotally connected at one end, the pivots of said top frames and said bottom frames having a common axis, a supporting post for the free ends of each pair of top and bottom frames, means for adjustably spacing said posts, and a movable supporting frame to which the pivoted ends of said frames are secured.

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