Oct. 27, 1936. H. A. KLAHRE 2,058,994

MEANS FOR LOADING LOOPS ON THE AUTOMATIC LOOP FEED MEMBER OF MACHINES FOR APPLYING ORNAMENTATION TO HEADER LOOPS

Filed Aug. 17, 1935 2 Sheets-Sheet 1

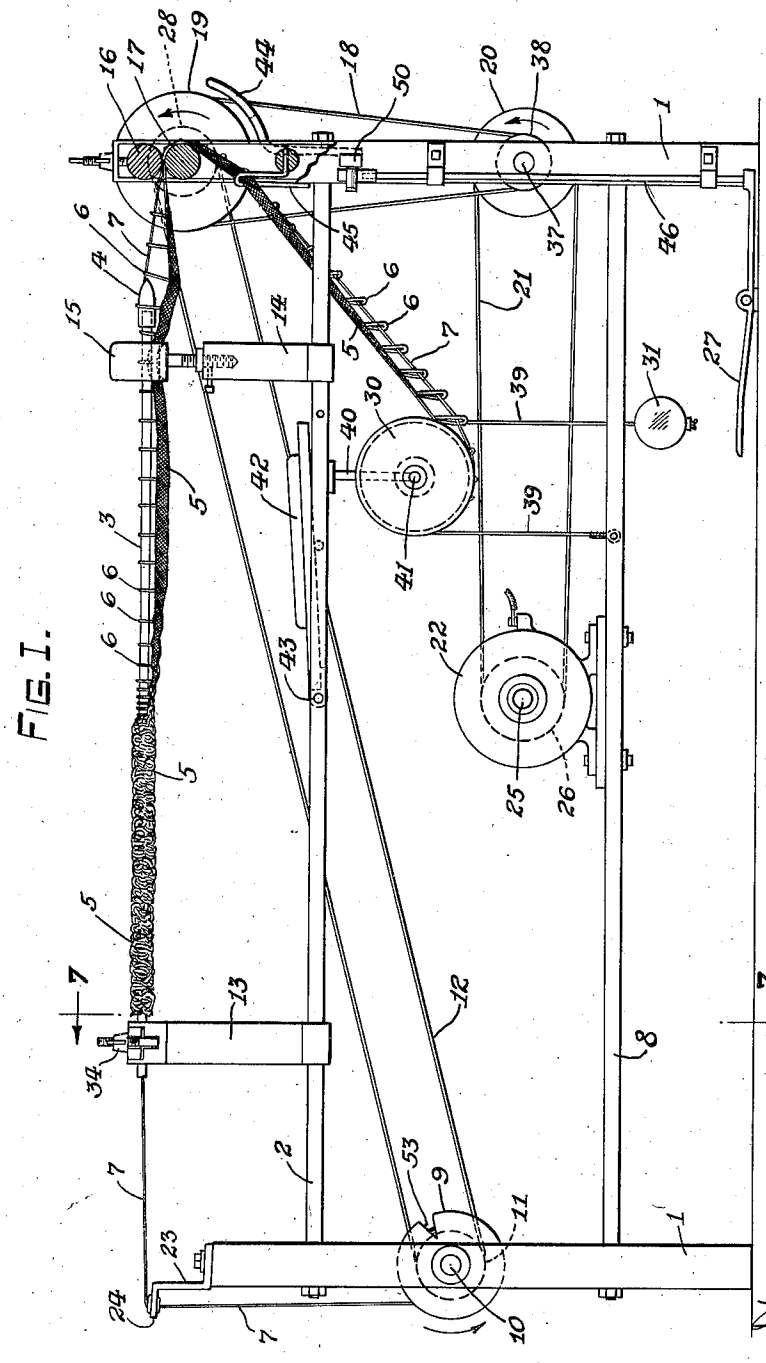


FIG. 1.

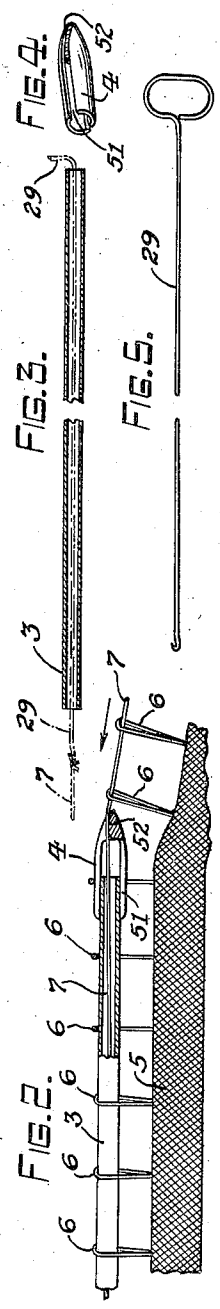


FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

INVENTOR.

HUGO A. KLAHRE

ATTORNEY.

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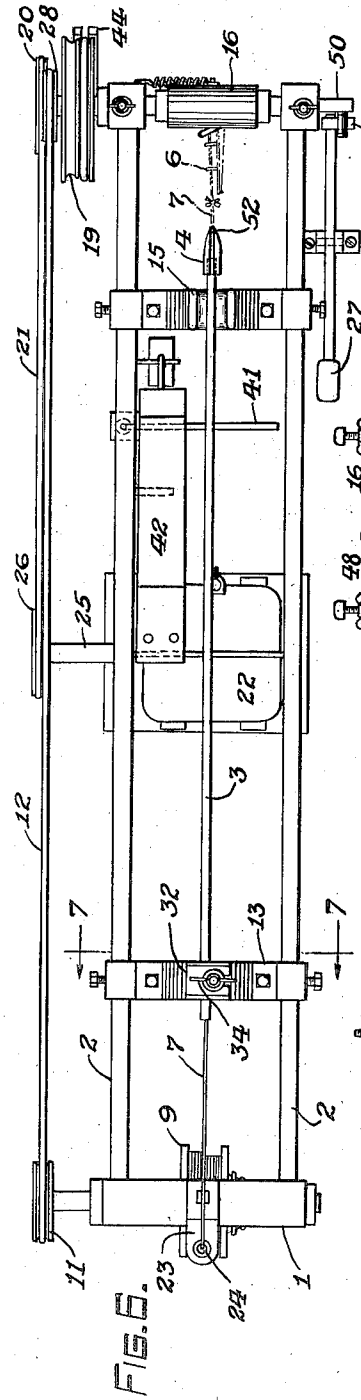


FIG. 6.

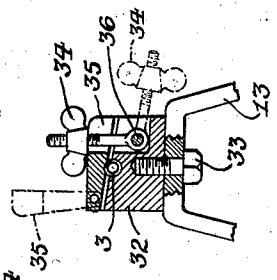


FIG. 9.

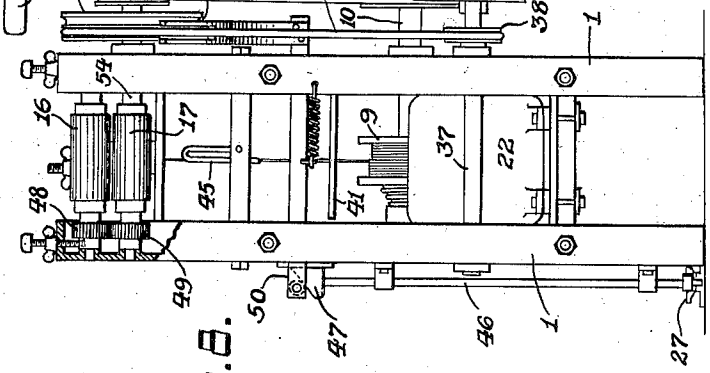


FIG. 8.

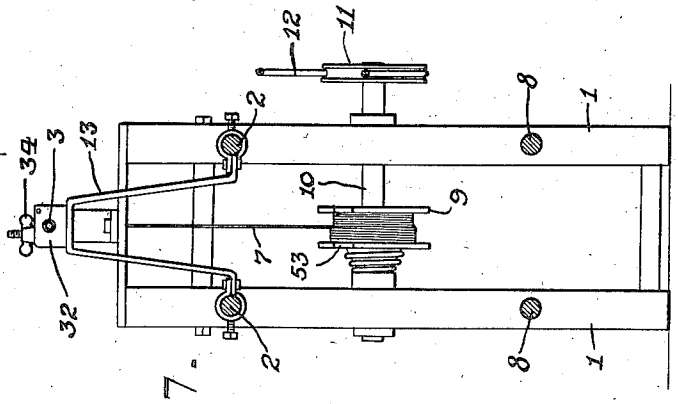


FIG. 7.

INVENTOR.
HUGO A. KLAHRE
BY J. Barnwell Meyers
ATTORNEY.

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MEANS FOR LOADING LOOPS ON THE AUTOMATIC LOOP FEED MEMBER OF MACHINES FOR APPLYING ORNAMENTATION TO HEADER LOOPS

Hugo A. Klahre, Teaneck, N. J., assignor to Consolidated Trimming Corporation, New York, N. Y., a corporation of New York

Application August 17, 1935, Serial No. 36,741

17 Claims. (Cl. 223—1)

My present invention refers to certain new and useful improvements in means for loading or mounting loops on the feed members of the kind that are employed in automatically delivering the loops of header fabrics or other edgings to a machine which operates to make and apply tufts or balls or other ornamental features to such loops; and the invention consists essentially in means whereby the loops may be loaded or mounted upon the tubular section of the feed member which is described in my copending application filed July 30th, 1935, Serial Number 33,889 for Automatic loop feed for machines for applying ornamentation to header loops.

Said mechanism in my copending application includes devices for causing the loops to be carried in a series of successive individuals into the die mechanism of a machine which forms and attaches ornamentation to the loops, so as to manufacture ball fringe or some similar textile product, and the feed member alluded to which constitutes a part of the automatic loop feed mechanism consists of two parts, one being a slotted and notched delivery end and the other being a tubular rod or member, the two being separable from each other at times and being conjoined rectilineally by frictionally inserting the delivery section into the tubular end of the other section when the device is arranged in a manner for actual operation. The tubular part of the feed member is taken out of the supporting frame from time to time to be reloaded with a length of looped fabric whose loops will be strung on the said tubular part. In view of the fact that this reloading or remounting of loops upon the tubular member occurs very often, it becomes necessary to devise some effective means for doing this work promptly and efficiently and said means constitutes the substance and object of the present invention.

In the accompanying drawings illustrating my present invention:—

Fig. 1 is a side elevation of the entire machine for loading the loops on to the feed member;

Fig. 2 is an enlarged sectional detail side view of a portion of the looped fabric and of the feed member, showing the relation of the different parts at the beginning of the operation of mounting the loops upon the feed member;

Fig. 3 is a detail section of the tubular feed member and shows the instrument therein which engages the filamentary element to draw it through the tubular member;

Fig. 4 is an enlarged detail perspective view of the pointed spring transfer shuttle, by means of which the loops are guided directly on to the tubular feed piece;

Fig. 5 is a detail view of a rod or tool of proper length to be inserted through the tubular member for the purpose of drawing the thread or cord through the same at the beginning of the operation, as shown in Fig. 3;

Fig. 6 is a top plan view of the entire machine;

Fig. 7 is a vertical cross-section, partly in end view, on the line 7, 7, of Figs. 1 and 6;

Fig. 8 is a right hand end elevation of the machine as represented in Fig. 6;

Fig. 9 is a sectional detail of the rear clamp for holding the feed rod stationary while it is being supplied with loops.

Similar characters of reference designate corresponding parts throughout the different figures of the drawings.

The main parts of the machine in which the tubular feed member is to be temporarily held while the loops are being delivered thereto, and in which the several operative parts are arranged for conjoint actuation in delivering the fabric having the loops into a proper relation to the tubular feed member in order that the loops may be transferred to said member, as also the mechanism for effecting such a transfer and enabling the said feed member to be fully supplied with a series of loops which fill it from end to end so that it can be then removed and put into use in its normal relation to the mechanism for which it is intended, are all shown as arranged in a frame consisting in the present example of the invention of vertical end standards, uprights, or posts 1, joined together by longitudinal top rails 2 and longitudinal lower rails 8, while suitable crosspieces connect the posts 1 so that the whole forms a solid framework of convenient size and plan.

On the top rails 2, near one end of the machine, is mounted a light upright frame 13, which is held adjustably on the rods 2 by set screws or the like, and which carries at the upper end a clamp shown in detail in Fig. 9, and consisting of a block 32 held to the frame 13 by a set screw 33 and having a pivoted portion 35 which is slotted adjoining a slot in the part 32 to allow the operation of a thumb nut 34 on a screw bolt which is pivoted at 36, the contacting faces of the members 32 and 35 being bored to receive the end of the tubular feed member 3, and the whole arranged substantially as illustrated in Fig. 9, where it is seen that the thumb nut 34 can be screwed down to hold the parts 32 and 35 together with the tubular feed

rod 3 between them. This pivotal bolt may be loosened and dropped down to the position shown in dotted lines, so that the part 35 may be lifted into the position shown in dotted lines, which releases the feed member 3 and allows it to be taken out. Near the other end of the machine there is a corresponding vertical frame 14 mounted on the upper rods 2, 2, and this frame carries an open socket 15 in its top portion having a threaded pin on the underside which engages into the frame 14 to enable the socket 15 to be adjustably raised and lowered, it being held in any position of adjustment by means of a set screw. Thus are provided two supports 13 and 14 for the tubular feed member 3, and these supports enable said member to be held fast at one end and to lie loosely at its other end, it being evident that it can be quickly and easily removed or replaced accordingly as it may be full or empty of loops. The tubular member 3 is simply a hollow piece, with a passage therein large enough for the thread or wire 7 to run through.

The loops with which my present invention is concerned and with which the tubular feed member must necessarily be kept supplied in order to be in a position to properly fulfill its function, are those loops as 6, formed on a header fabric, as 5, clearly depicted in Fig. 2 which header is ordinarily made as a narrow fabric, ribbon, or textile edging, in any usual weaving loom or other apparatus for producing similar narrow textiles, and such loops 6 are provided in a series so that balls, tufts, trinkets, tassels, or other ornamentation may be applied thereto, and thus to the fabric, to make a suitable ornamental fringe which is popularly used with upholstery, draperies, hangings, and other furniture or articles.

As these narrow fabrics come from the loom they carry the loops 6 of greater or less size, and suitably spaced apart, preferably equidistant from each other. For the purpose of the present invention and in order to enable the looped fabric to be passed through the present machine in such a manner that the loops may be mounted upon the tubular feed member, the producing loom or apparatus invests these loops with a continuous thread, cord, wire, or other filamentary endless body or element, support or carrier 7, which runs loosely through all of the loops of the series, so that the looped fabric when it begins to pass through the present machine is carrying with it as a part of its construction this loose continuous filamentary element 7. It is shown very clearly in Figs. 1 and 2, and in dotted lines in Figs. 3 and 6, and its function will hereinafter be fully explained.

This fabric 5 with its loops 6 and carrying its continuous thread 7 on which all the loops are strung is supplied to the machine on large reels, spools or drums, as 30, which are mounted on a horizontal spindle 41 which projects at right angles from an arm 40 attached to the main frame work, as, for example, to one of the longitudinal rails 2. The spool 30 preferably has a grooved pulley fast on one end, around which passes a belt cord 39 fastened to frame 8 at one end, while the other end carries a weight 31. This cord and weight serve as a brake on the spool 30 to keep it from revolving too rapidly while the fabric is being unwound therefrom. This fabric, as shown in Fig. 1 unwinds from the spool 30 and passes up into the machine through a guide 45 on one of the posts 1,

Power is communicated to the mechanical features of my present machine for their joint operation by a small electric motor 22 carried on the frame 8 and having a driven shaft 22 on which is a drive pulley 26, around which passes a belt 21 that passes also around the pulley 20 on a shaft 37 journaled in the standards 1, 1, on the right hand end of the machine, as indicated in Fig. 1. On the same shaft 37 is another small pulley 39 alongside of pulley 20, around which pulley 39 passes a belt 18 which likewise runs over a tight and loose pulley 19 on a shaft 54 journaled in the standards 1, 1, at the right hand end of the machine near the top thereof, as shown in Figs. 1 and 6. This tight and loose pulley 19, is controlled by the operator through a foot treadle 27 pivotally supported adjoining the machine frame, and it actuates a vertical rod 46 on the upper end of which is a cam 47 which acts against a pin on a horizontally sliding bar 50 that carries on its outer end a forked belt shifter 44 that engages the belt 18 and transfers it from the tight to the loose pulley or the reverse at the will of the operator. Thus by a simple movement of the treadle 27 the shaft 54 can be started and stopped and the train of mechanism connected with said shaft be set in motion or caused to stop, all in consonance with the requirements of the feeding of the fabric to such a point in the machine that its loops may reach their destination swiftly and uniformly on the tubular feed member.

At the rear end of the machine, or in the present example, at the left hand end (the use of left and right and top and bottom being simply for convenience in explanation), is a shaft 10 mounted in the frame standards 1 at each side of the machine, and outside of the frame this shaft 10 is provided with a grooved pulley 11 around which passes a belt 12, which runs to the other end of the machine and passes around a grooved pulley 28 on the aforesaid shaft 54 alongside of the tight and loose pulley 19, in order that power may be communicated through these connections from the shaft 54 to the shaft 10. On the top of the frame work at the left hand end of the machine and above the shaft 10 is a bracket 23 carrying a vertical guide 24. On the shaft 10 between the standards 1, 1, is a drum 9 on which winds the thread, cord or filament 7 after it leaves the tube 3, that is to say, after the loops have been transferred from the thread 7 on to the tubular element 3, and this thread or cord 7 passes downwardly through the guide 24 and around the drum 9 and winds thereon until the drum is full. The thread or string 7 when wound on the drum 9 becomes so much waste, as there is no further need for its use in this machine or in fact for any use and it is easier to convert it into waste than to unwind it from the drum 9. Therefore the drum 9 is provided with side disks cut with a V-shaped notch 53 deep into the disks down to the core or drum, and when the drum is entirely filled up to the peripheries of the disks a knife or cutter may be used to cut across the bunch of thread 7 and into the notches 53 until the hub of the drum at the center is reached, when the bunch of thread will be entirely cut through and can be pushed off the drum. Then by making a few turns of the loose end of the thread 7 around the drum it can be connected again thereto as to allow the winding of the thread on the drum to continue. The thread 7 thus passes away

from the tubular member 3, and when the latter has been completely loaded with loops this tubular part 3 is removed manually from the machine. The portion of the thread between the clamp 34 and the guide 24 must be broken by hand, and the connection of this broken end with the other end of the thread 7 in the looped fabric will have to be restored after the empty member 3 has been returned to the machine for a new loading. Several of these tubes 3 can be loaded one after another and a supply of loaded tubes kept on hand for use in the other machine as needed.

In the upper portion of the right hand end of the main frame are journaled two rollers 16 and 17, whose shafts are supported in the vertical parts 1, 1, the shaft of the roller 17 being in line with the shaft 54 already alluded to, which carries pulleys 19 and 28. Roller 17 has thereon a pinion 49 and roller 16 a pinion 48; which pinions mesh with each other so that the revolution of the roller 17, which is the driven roller, actuates the roller 16. The looped fabric 5 after it leaves the guide 45 is caught between the rollers 16 and 17, and by them is directed forward steadily and surely and rapidly, (although not too rapidly because of the detaining effect produced on the spool 30 by the weight 31, or its equivalent), and thereafter the fabric is fed toward the tubular member 3, now mounted in support 15 and clamp 34, as shown in Fig. 6, where said member is indicated as empty of loops. Before the end of the fabric which has just passed the rollers 16 and 17 can effectively relate its loops to the feed member 3 it is necessary that the end of the supporting thread 7 at that point, which is associated with the looped fabric, should be conjoined to the loose end of the waste portion of said thread 7 which is at the other end of the machine. In order to effect this I use the implement 29 which is simply a long piece of wire with a small hook at one end which engages a loop tied in the loose end of the thread 7 near the guide 24, then by running the instrument 29 through the tubular member 3 from the opposite end as shown in Figure 3 so that its hooked end may emerge from the left hand end, the thread at that point can be engaged and drawn through the full length of the member 3 until it emerges from the right hand end thereof, and then it can be fastened to the end of the thread 7 which is still connected with the loops of the fabric; and if the two parts are tied together there will be a continuous thread or filament once again. The tie or loop at the left hand end of the tubular member 3 to be engaged by rod 29 is shown in Fig. 3, as also the connection of the threads, and the tool in tube 3.

It is not sufficient merely to feed the looped fabric on to the tubular member 3 after the thread 7 has been restored into a continuous line, because the loops 6 as the fabric is moved forward by the feed rollers would strike against the peripheral edge of the end of the hollow feed tube, the thread being much smaller than the tube opening and a clogging would ensue, so that it becomes necessary to provide means for lifting the loops 6 individually over and on to the member 3. This is accomplished by the provision of a pointed guide or shuttle, as it may be termed, shown in detail in Fig. 4. 4 denotes this pointed guide which is hollow and cut with slots for a part of its length so that it may be spring like and can be pressed over or into the end of the tube 3 with a tight grip. The open slots therein communicate with a side groove in the pointed end 52, which is adapted to impale the loops 6 one after the other and permit said loops to ride upon the guide shuttle 4, as seen in Fig. 1, which results in carrying them one by one over and on to the tube 3, along which they ride easily and without obstruction, because the open socket 15 loosely holding the tube 3 at that point, does not offer any obstacle to the passage of the fabric and its loops. In other words, the effect of such a movement is that the tubular member 3 is in reality substituted for the thread or cord 7 on which the loops have previously been strung, and this is clearly evident from an inspection of what takes place from such movements as seen in Fig. 1, where the tube 3 engages and retains the loops 6 thereon while the cord 7 passes away from such loops 6 at the left and goes into the waste. In this operation it is quite necessary that the operator should manipulate the loops when they are fed upon the feed member, as the delivery and alignment of loops thereto and thereon cannot be entirely made by means of the feed rollers. It is necessary that the operator should by hand keep the fabric between the point where he bunches it up as shown in Fig. 4 and the feed rollers taut the whole length in order that the loops should easily ride up and take their proper place on the tube 3. By continually manipulating these loops and pressing them forward into a bunched condition in order that the fabric should be taut when the loops arrive at the pointed guide shuttle 4, said loops may be transferred with extreme rapidity to the tube 3, and it only takes a short time to fill the entire tube full of bunched up loops from end to end. The operation is easy and most effective, though it is somewhat puzzling to understand the transfer of the loops and the elimination of the filamentary support 7, which accompanies the loops as an important factor until they reach the tubular feed member. In thus controlling the movement of the fabric and loops the foot treadle is of great value in stopping and starting the feed.

After the two ends of the string 4 have been tied together near the feed rollers, as is indicated in dotted lines in Fig. 6, said thread 7 will be caused to enter the grooved pointed portion 52 of the guide 4, said guide having been attached to tube 4, and then through the slotted part 51, and as it is already in the tube 3, it will be noted that it slips easily through the slot in the guiding end 52. The waste drum 9 is positively actuated, as has been pointed out, by the belted connection with the drive pulley 28, which is on the drive shaft 54, so that there is a pull on said cord 7 all the time that the feed rollers 16 and 17 are in action, the pulley 9 revolving uniformly with the feeding impulse of the fabric, so that as the fabric advances toward the pointed guide 4 the cord 7 is being pulled through said guide. Obviously when the feed tube 3 has been filled and it is desired to remove it from the machine, the pointed guide 4 may be detached from the end of the tube, because it is not needed on the feed member 3 during the later use of said member in its relation to the automatic mechanism required with the ball fringe machine hereinabove alluded to as being the mechanism with which this tubular feed member s designed to be used.

Of course at all times the starting and stopping of the feed is under the control of the

operator by means of the foot treadle **27** and intervening mechanism, and this controls the unwinding of the looped fabric from the supply bobbin **30** as also the winding up of the waste thread **7** on the drum **9**. The operator can instantly start up and immediately check the movement to correspond with the necessities of the case and the proper delivery and functioning of the tubular member **3** and its reception of the numerous loops furnished by the traveling fabric, and the traveling filamentary element **7** which operates lengthwise through the tubular feed member and cooperates in the delivery of an endless succession of rings or loops upon the feed member.

I have hereinabove alluded to the fact that the unwinding of the spool or bobbin **30** is delayed or checked by having a pulley and cord carrying a weight hung thereon. The same effect may be produced in a great many other different ways and I do not wish to be restricted to this particular weight effect. Another method, for example, consists of a heavy block **42** pivoted at **43** held normally in a horizontal position in the frame by means of a pin or detent, but if desired it can be released and caused to drop upon the fabric on the spool **30** and rest thereon as a weight, which will have a braking effect upon the revolution of the spool and cause unwinding to proceed only as fast as may be desired and in a manner that will keep the fabric taut between the spool **30** and the feed rollers.

Various changes in many of the parts and in their relation to each other may be made without exceeding the scope of the invention. It is realized that what is here exhibited is only one specimen of means in which the principles of my present improvements may be embodied, and I therefore reserve the liberty of rearranging and modifying the construction and relative placing of the different members in order to secure the best cooperative results, or to modify the effects in accordance with the needs of individual cases, in order to obtain the greatest breadth of application for the invention and its utmost serviceableness in all the situations to which it is adapted, provided only that such changes and rearrangements are made within the scope of the appended claims.

What I claim is:

1. The combination with the tubular member of a loop feed device, of a support traveling through said tubular member, on which a series of loops is strung, and means for transferring the loops individually from the traveling support to the tubular member.

2. The combination with the tubular member of a loop feed device, of means for loading the tubular member with the loops, consisting essentially in a support on which the loops are strung, and means for substituting the tubular member for said support.

3. The combination with the tubular member of a loop feed device, of a flexible filamentary element traveling through said member, and means for transferring the loops individually from the traveling element to the outside of the tubular member to load the same.

4. The combination with the tubular member of a loop feed device, of a carrier traveling through said tubular member, on which a series of loops is strung, and means for transferring the loops from the traveling carrier to the tubular member consisting of a pointed guide shuttle detachably secured on the end of the tubular member.

5. The combination with the tubular member of a loop feed device, of a loop support traveling through said tubular member, on which the loops are strung, and means for transferring the loops individually from the traveling support to the tubular member consisting of a pointed guide shuttle slotted to clasp the end of the tubular member and grooved adjacent to its pointed end to permit the traveling element to run easily through the said guide and the tubular member.

6. The combination with the tubular member of a loop feed device, of a flexible filamentary element traveling through said tubular member, on which the loops are strung, and means for transferring the loops individually from the flexible element to the tubular member to load the same, consisting of a pointed guide on the end of the tubular member to direct the course of the traveling element and allow the loops to be impaled thereby and then delivered upon the outside of the tubular member.

7. The combination with the tubular member of a loop feed device, of a carrier traveling through said member, on which a series of loops is strung, and means for transferring the loops individually from the traveling carrier to the tubular member consisting of a pointed guide slotted to clasp the end of the tubular member and telescope therewith and grooved adjacent to its point to receive and guide the traveling carrier.

8. The combination with a tubular loop feed member, of a support traveling through the same, on which the loops of a looped fabric are strung, means for feeding the looped fabric towards the tubular member, means for drawing the loop support through the tubular member while it is being freed of the loops by depositing them on the tubular member, and a conical union separably carried on the receiving end of the tubular member to give the loops a smooth path on to the outside of said tubular member.

9. The combination with a tubular loop feed member, of a support traveling through the tubular member, on which the loops of a looped fabric are strung, means for feeding the looped fabric, means for drawing the loop carrier through the tubular member while it is being freed from the loops by depositing them upon the tubular member, and a pointed conical nose on the receiving end of the tubular member to afford the loops a smooth surface to ride on to the outside of the tubular member, said nose piece being telescopically held in place on the end of the tubular member and having a runway therein for the traveling support.

10. The combination with a tubular loop feed member, of a support traveling through the tubular member and consisting of a textile filament on which the loops of a looped fabric are strung, feed rollers for feeding the looped fabric towards the tubular member, means for drawing the textile filament through the tubular carrier while it is being freed from the loops by depositing them on the tubular member, and a conical shuttle on the receiving end of the tubular member, provided with a slot to guide the textile filament and to allow the loops to pass smoothly from said filament to the outside of the tubular feed member.

11. The combination with a tubular loop feed member, of a support traveling through the tubu-

lar member, on which the loops of a looped fabric are strung, said support consisting of a textile filament which passes through the tubular member while it is being freed from the loops by depositing them on the tubular member, and a conical grooved and slotted separable guide shuttle telescopically attached to the end of the tubular member to direct the textile filament into the tube and to impale each loop as it arrives at the end of the tube and direct its course on to the outside of the latter.

12. In combination, a tubular loop feed member, a filamentary textile loop support traveling through the tubular member, on which support the loops of a looped fabric are strung, means for feeding the looped fabric forward so that its loops may be transferred from the filamentary support to the tubular member and the filamentary support drawn through the said tubular member freed of loops, said support becoming waste textile material, and a pointed guide on the end of the tubular member to enter each loop as it arrives at that point and direct it on to and over the outside of the tubular member so that the latter may be loaded with a bunch of loops still associated with the looped fabric.

13. In combination, a tubular loop feed member, a frame, a clamp in the frame for holding one end of the tube, an open socket on the frame for holding the other end of the tubular member, a feed device for feeding looped fabric to the tubular member, a continuous textile element on which the loops of the looped fabric are strung, means for drawing the said textile element lengthwise through the tubular member while the looped fabric moves toward the latter, and a pointed and slotted guide on the end of the tubular member which engages the loops individually and directs them along a smooth path to load them on the outside of the tubular member.

14. The combination of a tubular element, belonging to a feed mechanism, supports therefor, a cord running through the tubular member on which the loops of a looped fabric are hung, a conical terminal piece for the said tube which piece is slotted to guide the cord, means for drawing the cord through the tube while it is being freed of its loops by depositing them on the outside of the tube, means for feeding the looped fabric to the tube, so that the loops will be engaged by the conical terminal piece and caused to mount the tube for the purpose of being loaded thereon, means for controlling the movement of both of said means by starting and stopping the operation of the machine, a support for the fabric supply, and a disposal means for the waste cord.

15. The combination of a tubular element of a loop feed device, supporting means therefor, a textile cord running through the tubular element on which the loops of a looped fabric are hung, an inclined terminus separably attached to the end of the tubular element, the same being slotted to guide the textile cord through the tubular element, means for drawing the cord through the tube, and means for feeding the looped fabric to the tube so that the loops thereon will be engaged individually by the inclined piece and caused to mount the tube, means for controlling the joint movement of the aforesaid means, and feeding mechanism for the looped fabric consisting of coacting rollers which engage and feed the fabric together with the cord towards the tubular member for the aforesaid results of loading together with the removal of the used cord as waste material.

16. In a loading mechanism for loop feed tubes of the class described, the combination of a tubular member, a textile filament traveling through said member, on which the loops of a looped fabric are hung, means for feeding the looped fabric towards the tubular member, means for simultaneously and synchronously drawing the textile element through the tubular member and depositing the loops thereon, and a pointed and removable slotted guide device on the end of the tubular member which impales each individual loop arriving thereat and allows it to ride smoothly on to the outside of the tubular member.

17. In a machine of the class described, the combination of a tubular loop carrier, a frame, means for holding said carrier in said frame, and allowing the length thereof to expose a free surface for the passage thereover of loops, a continuous filament running through the tube on which the loops of a looped fabric are strung, feed rollers for feeding the fabric from a supply to the tube, mechanism for drawing the continuous filament through the tube at the same rate of movement as the fabric approaches the tube, control means for the said feed, retarding means for the delivery of the fabric supply, and a union device for transferring the loops individually from the filament to the outside of the tubular carrier.

HUGO A. KLAHRE.