March 18, 1958 E. S. BEARD 2,826,802

TUBULAR FABRIC SPREADING AND PROPELLING MEANS

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Fig. 1

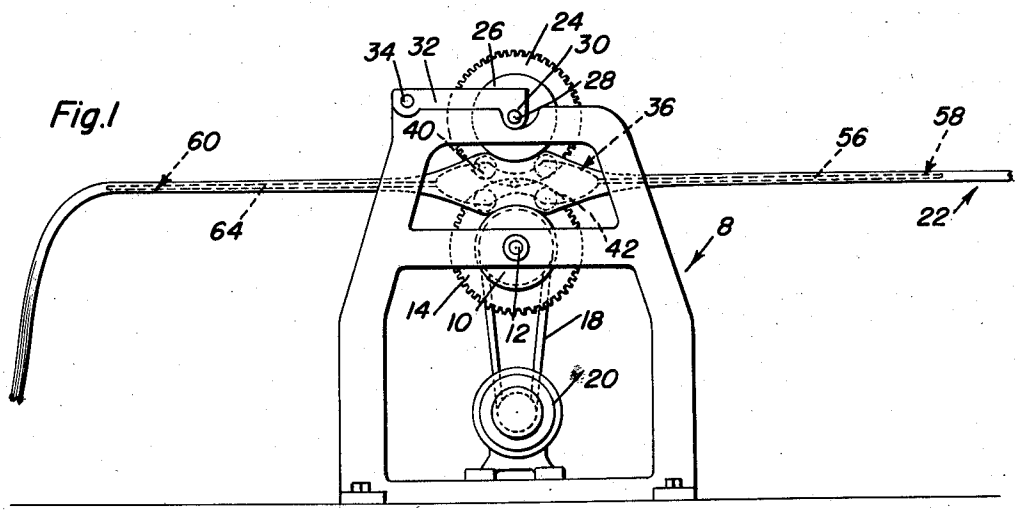
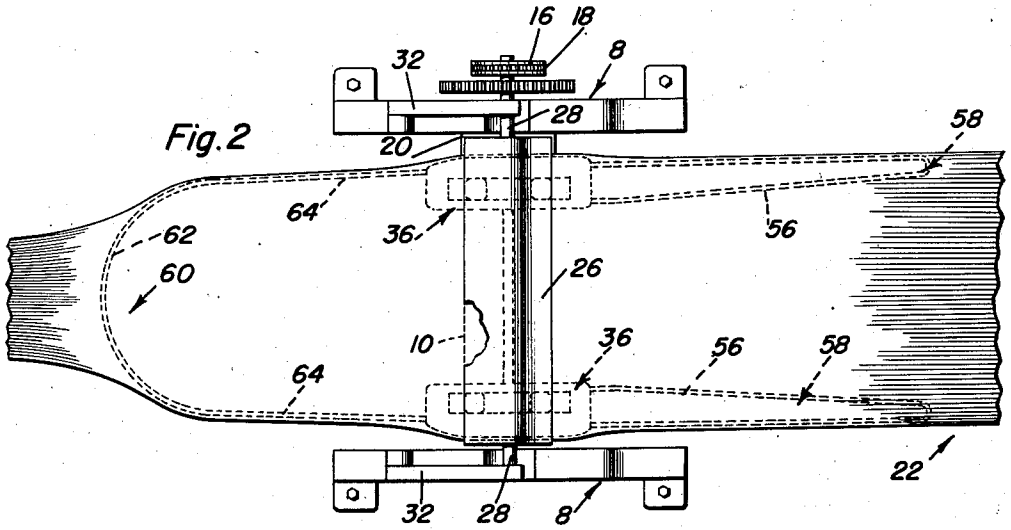


Fig. 2



Edward S. Beard
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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Fig.3

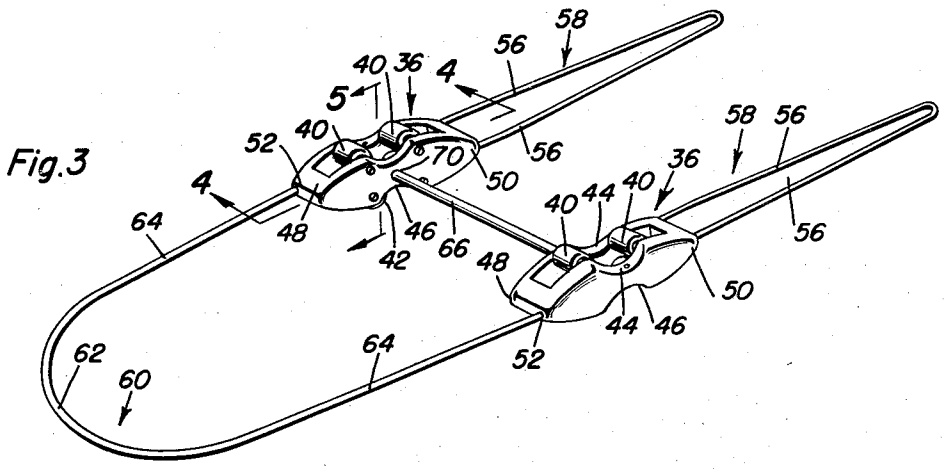


Fig.4

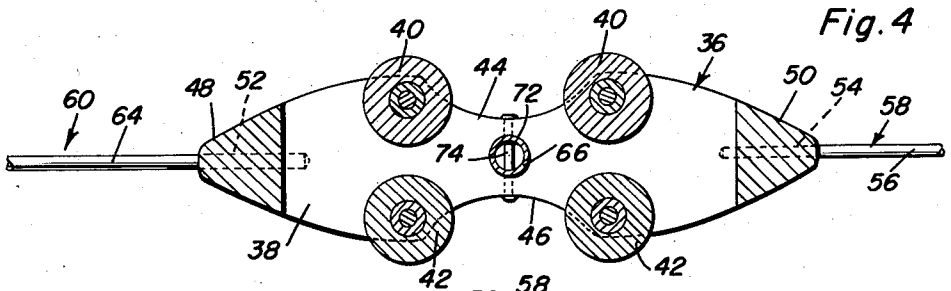


Fig.6

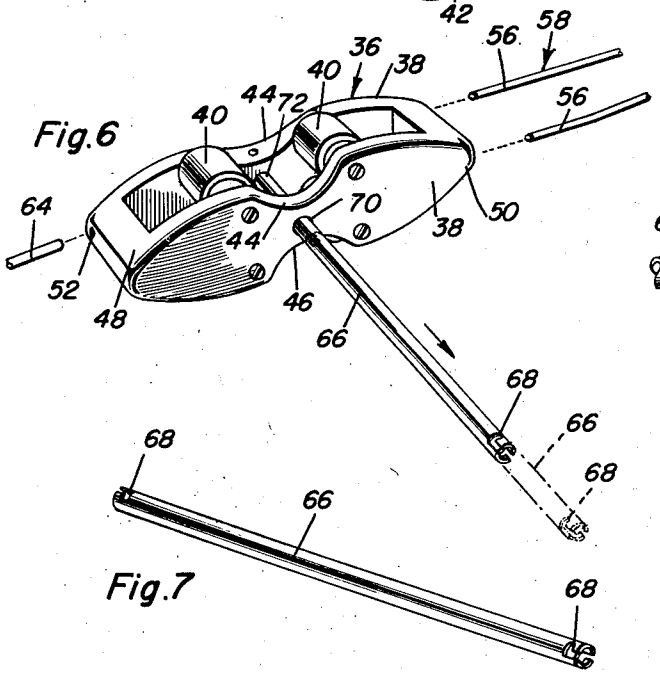


Fig.5

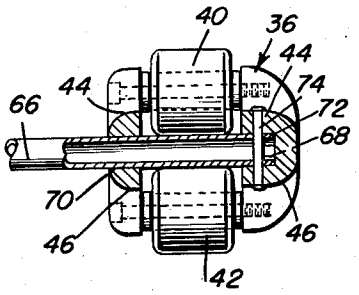


Fig.7

Edward S. Beard
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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TUBULAR FABRIC SPREADING AND PROPELLING MEANS

Edward S. Beard, Royersford, Pa.

Application October 12, 1954, Serial No. 461,878

4 Claims. (Cl. 26—55)

This invention relates to power driven means which is expressly designed and effectually adapted for use during the handling of tubular knitted fabrics and has reference in particular to spreading, flattening and propelling the same during the course of applying weighting media, or while sizing, softening, bluing and otherwise processing and finishing the same.

Stated otherwise, the invention has to do with an improved apparatus for feeding of tubular knitted fabric to the rolls in a wringer structure or other well known handling machine, for finishing in the dry stage, for example, preparatory to folding and rolling, and which lends itself admirably well to uniform and precise spreading results and is therefore, aptly and satisfactorily usable in conjunction with striped cloth, so much so that the stripes run straight and parallel when the stretched tube of fabric leaves the rear portion of the spreader.

It is a matter of common knowledge to those conversant with textile equipment, especially stainless steel spreaders for tubular knitted fabric, that it is necessary to effectively handle fabric tubes ranging in width from 6 inches to 48 inches. In this connection it is, of course, old in the art to utilize so-called driven-type spreaders, that is, spreaders which have idling rollers incorporated therein and with which power driven external-type rollers cooperate, portions of the fabric tube being pulled between the inside rollers on the spreader construction and the friction contacting exterior rollers. So far as has been learned from a survey of the prior art adaptations, the exterior rollers turn in a horizontal plane on vertical axes and drive the fabric tube along the lengthwise folds or so-called longitudinal edges.

An object of the instant invention is to cause the fabric tube to pass and travel between elongate power driven horizontally disposed rollers which latter contact and frictionally drive the top and bottom portions of the tube of fabric and extend transversely across the lengthwise dimension of the tube and wherein the interiorly disposed idling rollers on the spreader device are likewise in a horizontal plane and turnable on horizontal axes.

Briefly summarized, a preferred embodiment of the invention reduced to its simplest form has to do with a "machine" embodying stationary end frames or equivalent supports between which the upper and lower rollers are mounted for rotation, journals on the lower roller being turnable in stationary bearings on said frames and the journals on the upper roller being so constructed and arranged that the upper roller may be moved toward and from the lower roller, allowing the two rollers to be parted or spaced so that the bodily insertable and removable spreader device may be readily sandwiched and wedged between the two rollers, or withdrawn whenever necessary or desired.

More specifically, novelty is predicated on the spreader device per se characterized by a U-shaped front spreader frame, rear spreader fingers, and coplanar adaptors or coupling and assembling members arranged in opposed spaced

parallelism with the respective spreaders detachably connected thereto.

Then, too, novelty is predicated on the adoption and use of adapters or castings which provide satisfactory guides over which the tube is caused to travel, said adapters having their intermediate portions constructed to accommodate cooperating detachable end portions of an assembling and connecting rod, whereby the adapters, using a rod of a given length, may be utilized for tubular fabrics six inches in width, and also used with another rod for forty-eight inch width, and all other required rod lengths and widths between the two extremes.

Objects, features and advantages in addition to those specifically touched upon will become more readily apparent to the reader as he reviews the following detailed description and subjoined claims.

In the accompanying drawings, wherein like numerals are employed to designate like parts throughout the views:

Figure 1 is an elevational view of tubular fabric spreading and propelling means or so-called apparatus, constructed in accordance with the principles of the present invention, and showing the manner in which the same is used.

Figure 2 is a top plan view of the same.

Figure 3 is a perspective view of the assembled ready-to-use insertable and removable roller-equipped spreader device.

Figure 4 is an enlarged fragmentary sectional view taken on the plane of the line 4—4 of Figure 3, looking in the direction of the arrows.

Figure 5 is a view at right angles and on the vertical line 5—5 of Figure 3, also looking in the direction of the arrows.

Figure 6 is an enlarged perspective view showing certain of the structural details and the manner in which they are constructed and separably joined with one another.

Figure 7 is a perspective view of the aforementioned adapter connecting an assembling rod.

Reference is had first to Figures 1 and 2 wherein the machine or apparatus is shown. The numerals 8—8 designate suitably constructed fixedly mounted relatively stationary end frames. There is a horizontally disposed lower roller 10 provided with suitable journals 12 which are rotatable in appropriate bearings provided therefor in the end frames 8—8. This roller is provided at one end with an appropriate motion transmitting gear 14 and a sprocket (see Fig. 2) denoted at 16 and serving to accommodate a sprocket chain 18 operated by an electric motor or other equivalent prime mover 20. The frames, rollers and power means may be of any suitable construction, the idea being to provide a first or primary roller to contact the underneath side of the traveling or propelled tubular fabric denoted generally by the numeral 22. The gear 14 serves to drive a complemental gear 24 carried by the upper horizontally disposed fabric feeding roller 26. This has journals 28 at its ends mounted in appropriate bearings 30 on support arms 32 pivotally mounted at 34 on the respective end frames. The idea here is to have the roller 26 movable toward and from the roller 10 so that the spreader device and fabric may be inserted and removed. Any sort of spring tensioning device (not shown) may be employed to maintain the two rollers 10 and 26 in proper operative relationship. So much for the machine part of the over-all apparatus.

With respect to the bodily insertable and removable knockdown spreader construction or device, this is best shown in Fig. 3. It has already been pointed out that the device is characterized essentially by a pair of duplicated elongated block-like coupling members or castings 36—36. These castings are identical in con-

struction and the description for one will suffice for both. It will be noticed in this connection that coupling members are essentially hollow and have spaced parallel side members 38—38 with rubber or equivalent idling rollers journaled in any suitable manner therebetween. The rollers are preferably readily applicable and removable as shown by way of the bolt means seen in Figure 5. I provide pairs of upper rollers 40—40 which are horizontal and in spaced parallelism and pairs of duplicate lower rollers 42—42. These paired rollers are located forwardly and rearwardly of the arcuate notches which are perhaps best described as segmental recesses 44 and 46. The forward or leading end portion of each member is tapered to provide a nose-like guide 48 and the rear end is likewise tapered at 50 to provide a similar nose-like guide, for smooth and uninterrupted movement of the tubular fabric. There is a lengthwise socket to one side of the nose 48 which is denoted at 52. There are spaced parallel longitudinal sockets 54 in the rear tapered end 50 and these serve to accommodate the telescoping ends of the limb portions 56 of the readily attachable and detachable rear spreader members which are here referred to as generally V-shaped spreader fingers 58—58. The front spreader is a U-shaped frame and this is denoted by the numeral 60 and the bight portion 62 bridges the respective spaced adapters or coupling members and the limb portions 64 are fitted telescopically into the aforementioned sockets 52 whereby the spreader frame 60 is readily attachable and detachable in respect to the adapters 36—36. It will be understood that the front spreader frames 60 will range inside from six inches to forty-eight inches to accommodate the gamut of sizes required for use in the mill and trade.

In addition to having to use a multiplicity of readily applicable and removable U-frames 60, it is also necessary to utilize rigid one piece connecting rods 66 of different lengths so that the adapters 36—36 may be set and firmly joined together either in closely spaced parallelism or spread relatively wide apart, as varying conditions require. Each rod is preferably of tubular form and has bayonet slots or notches 68 at its respective ends. The notched ends fit through holes 70 (see Fig. 5) and into sockets 72 in the side members 38—38 of the adapters where the notched ends are connectible releasably with a retainer or keeper pin 74, a permanent part of the adapter block. Thus, the rod 66 is slid into position or withdrawn and detached depending upon the size requirements of any given or particular spreading job.

It will be seen, therefore, that a multiplicity of connecting and assembling rods 66 are utilized depending on size requirements and that the rod ends are releasably connected with the respective adapter blocks. The same adapter blocks are used, however, from sizes of six inches to forty-eight inches, as is evident. In other words, it is not necessary to use adapters of different sizes but only spreaders 60, 58—58 and connecting rod 66. In any event, these adapters lend themselves for placement between the aforementioned upper and lower friction pulling or driving rollers 10 and 26 as brought out in Figs. 1 and 2. The curvate or segmental shaped recesses 44 and 46 lend themselves to conformation and location between the segmental portions of the rollers 10 and 26 in an obvious manner. Thus, the fabric tube is spread over the forward spreader frame 60 and is thus opened up and flattened out. The rear end portion is drawn over and envelops the adapters 36—36 and their upper and lower rollers 40—40 and 42—42 whereby the latter rollers are on the interior of the fabric tube and the driving rollers 10 and 26 extend transversely across the exterior surfaces of both top and bottom portions of said fabric tube. The rear end portion of the fabric tube is, of course, held in properly spread condition by way of the V-shaped spreader fingers 58—58. One can open up the rollers 10 and 26 by swinging the roller 26 out of the way and then inserting the spreader device of

Figure 3. The rollers are again closed and the device is ready for operation.

It seems advisable to stress the fact that the adapters are roller equipped for disposition on the interior of the fabric tube, that they are properly recessed for lodgment and wedge-like retention between the rollers 10 and 26. The fabric is thus pulled with great rapidity and uniform evenness between these interior and exterior contacting rollers. The adapters being separably connected by insertable and removable connecting and assembling rods 66 are unique. The readily attachable and detachable spreaders 60 and 58—58 are also thought to be a feature and improvement of appreciable advantage.

Persons skilled in the art to which the invention relates are, of course, conversant with various kinds of spreaders, feeding and driving rollers and so on. Perhaps, therefore, it may not be necessary to dwell at greater length on what appears to be a clear-cut disclosure of the subject matter of the invention under advisement and the obvious appropriation and use brought out especially when considering Fig. 3 first and then in conjunction with the ready-to-use apparatus in Figs. 1 and 2.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. For use between a pair of upper and lower spaced parallel tubular fabric driving and propelling rollers, a readily insertible and removable knockdown spreader device embodying a pair of duplicate spaced parallel elongated front and rear spreader mounting and coupling members having segmental recesses on their intermediate upper and lower sides to accommodatingly receive projecting segmental portions of said driving rollers, the leading and trailing end portions of said coupling members being smooth-surfaced, reduced in cross-section and tapered, idling rollers mounted for rotation on said upper and lower sides and arranged in spaced parallel pairs and having segmental peripheral portions projecting into their respective recesses, a rigid one-piece assembling and connecting rod of predetermined length having its ends detachably connected to the respective coupling members, a front U-shaped spreader frame having its limbs separably connected with and mounted on the leading ends of the respective coupling members and its bight portion bridging the space between said coupling members, and rear spreaders separably connected with and supported on the trailing ends of the respective coupling members.

2. The structure defined in claim 1 and wherein the required length-size of said rod corresponds to the intended width-size of said front U-shaped spreader frame, and wherein said members remain the same and serve to accommodate any number of selectively usable connecting rods and prescribed companion front spreader frames.

3. For use between a pair of upper and lower spaced parallel tubular fabric driving and propelling rollers, a readily insertable and removable knockdown spreader device comprising, in combination, a front U-shaped spreader frame, a pair of complemental rear spreaders, and means for mounting and supporting the same in coplanar operative alignment when they are in use, said means comprising a pair of duplicate spaced parallel spreader mounting and coupling members provided with smooth-surfaced tapered leading and trailing end portions having correctly positioned sockets for removable reception and retention of the respective cooperating limbs of said front and rear spreaders, upper and lower

pairs of idling rollers removably mounted on and carried by said coupling members and aligned for cooperation with said spreaders, a rigid one-piece connecting rod of established size-length interposed between said members and serving to space and positively retain the members apart a prerequisite distance in keeping with the prescribed size of said front spreader, and means separably connecting the end portions of said rod with corresponding intermediate portions of said coupling member.

4. For use between a pair of upper and lower spaced parallel tubular fabric driving and propelling rollers, a readily insertable and removable knockdown spreader device comprising, in combination, a front U-shaped spreader frame, a pair of complemental rear spreaders, and means for mounting and supporting the same in coplanar operative alignment when they are in use, said means comprising a pair of duplicate spaced parallel spreader mounting and coupling members provided with smooth-surfaced tapered leading and trailing end portions having correctly positioned sockets for removable reception and retention of the respective cooperating limbs of said front and rear spreaders, upper and lower pairs of idling rollers removably mounted on and carried by said coupling members and aligned for cooperation with said spreaders, a rigid one-piece connecting rod of established

size-length interposed between said members and serving to space and positively retain the members apart a prerequisite distance in keeping with the prescribed size of said front spreader, each coupling member having spaced parallel lengthwise side members between which the paired idling rollers are removably mounted, one side member having a socket therein provided with a fixed keeper pin, the other side member having a hole therein in line with said socket, the end portions of said rod having bayonet slots therein, said end portions passing through their respective holes, bridging the space between the side members and the slotted ends fitting into their intended sockets and being detachably connected to their respective keeper pins.

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