Oct. 12, 1948. E. VOSSEN 2,451,133

YARN CARRIER STOP MOTION

Filed Jan. 23, 1948

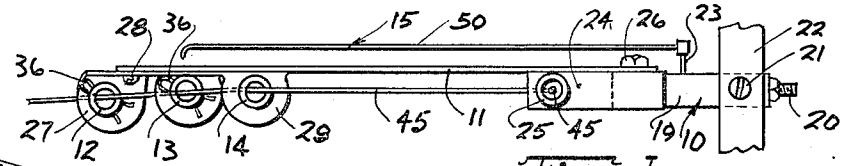


Fig. 1

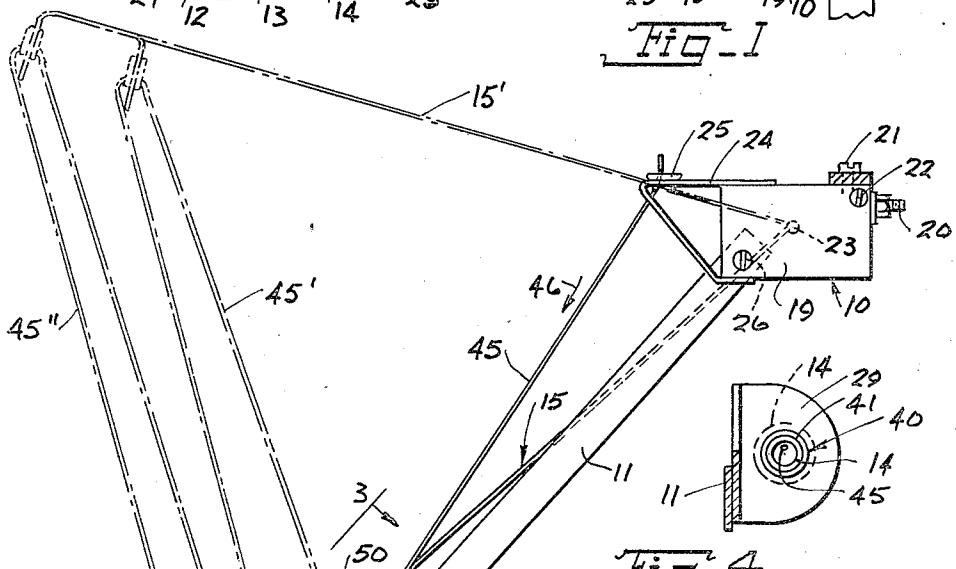


Fig. 2

Fig. 4

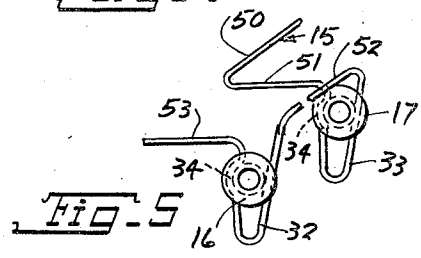


Fig. 5

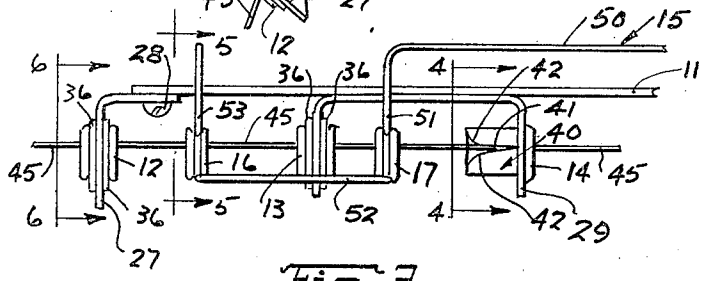


Fig. 3

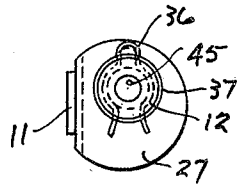


Fig. 6

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YARN CARRIER STOP MOTION

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4 Claims. (Cl. 66—163)

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This invention relates to new and useful improvements in yarn carrier stop motions, and has particular reference to those types of stop motions which are mounted above the feeds of a knitting machine.

The new and improved yarn carrier stop motion, in accordance with this invention, is particularly useful on knitting machines which do knitting in which certain threads alternately stop and start knitting during the knitting operation. Striper knitting machines fall in this class. For example, in a striper knitting machine having 32 threads, it is customary that a certain group of these threads knit at one time, and at another time another group knits, etc. to form the stripe design. A 32 end knitting machine could use 8 striper boxes with 4 color changers on each box. The striper machine could also operate without the striper boxes. However, in all machines of this type when a thread stops knitting it becomes slack. Unless this slack is taken up the thread will become entangled and knotted. It is not unusual for the slack threads to become wound around the center post of the knitting machine. Not only is this a waste of thread, but frequently the thread becomes entangled in a way to operate the stop motion devices on the knitting machine to stop the machine for preventing a press-off.

It is customary to use a yarn carrier stop motion at each of the feeds of knitting machines. These stop motions are usually each provided with an arm having one or more yarn guiding elements and a cooperative fly-wire switch operator provided with a yarn guiding element for controlling the operation of the stop motion. When slack in the thread occurs, the fly-wire operator is freed and moves, and if it moves a sufficiently large distance the stop motion operates to stop the knitting machine. However, in those types of knitting machines in which striping is done, or in which there is starting and stopping of threads, the slack is exceptionally large and the ordinary type of yarn carrier stop motion does not work very satisfactorily here. It functions to correctly stop the knitting machine should a press off threaten, but it does not prevent the entangling of the yarn around the central post of the knitting machine which results in wasting of thread. It is customary to enlarge the lengths of the arms and of the fly-wires on the stop motions used at the feeds of knitting machines in which the threads stop and start, but this enlarged construction is objectionable in that the arms and fly-wires are then so

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long that the entire arrangement is too cumbersome and not very satisfactory or practical when in use.

This invention proposes to shorten the arms of the yarn carrier stop motions, and to correspondingly shorten the fly-wire switch operators, and then in order to take up the large amount of slack in the yarn, it is further proposed to construct the fly-wires and the yarn guiding elements on the arms so that each fly-wire draws more than one loop of the thread. With this arrangement the stop motion device is capable of taking up all of the slack and hold the yarn in a position in which it will not become entangled, resulting in a great saving of yarn.

This specification shows one form of the invention in which two loops are drawn in the yarn with one fly-wire, but this is merely by way of illustration since the principle may be enlarged to draw more than two loops with each fly-wire.

The invention also proposes to make other desirable improvements in the yarn carrier stop motion. For example, now that more than one loop is being drawn it is necessary to provide the stop motion with many yarn guiding elements. An arrangement is therefore proposed by which the yarn guiding elements may be cheaply and easily mounted in position.

A simple arrangement is also proposed for catching and holding the yarn when the loops are being pulled, to prevent yarn from being drawn off the supply spools so that the loops will take up the slack yarn between the stop motion and the feeds of the knitting machine.

Another object of the invention is the construction of a device as described which is simple and durable and which may be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawing, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawing forming a material part of this disclosure:

Fig. 1 is a plan view of a yarn carrier stop motion constructed in accordance with this invention, the outer end of the fly-wire switch operator being broken away to simplify the disclosure.

Fig. 2 is a front elevational view of Fig. 1, to which a schematic showing has been added indicating the manner in which a plurality of loops are drawn by one fly-wire.

Fig. 3 is a fragmentary enlarged elevational

view looking in the direction of the line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary perspective view of the fly-wire, per se, as seen looking in the direction of the line 5—5 of Fig. 3.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 3.

The yarn carrier stop motion 10, in accordance with this invention, is provided with an arm 11 having a plurality of spaced yarn guiding elements 12, 13 and 14, and a fly-wire switch operator 15 provided with yarn guiding elements 16 and 17. The details of the stop motion 10 will not be given in this specification as they are well known to those skilled in the art. However, certain parts will be indicated to assist in the recognition thereof. The stop motion 10 essentially is merely a switch. It has the usual box 19 in which the switch elements are housed. There is an insulated terminal 20 at one side for the electric circuit through the stop motion. The box 19 is supported by a fastening element 21 on the usual support bar or ring 22. The fly-wire switch operator 15 is mounted on an operator shaft 23 which extends into the box and controls the switch action. At the front the box 19 is provided with a frame 24 formed from a strip of material. This frame 24 is provided with a yarn guiding element 25. The arm 11 is held in various angular position on the box 19 by a screw 26.

The yarn guiding element 12 is mounted on a bracket 27 which is adjustably connected with the arm 11 by a screw 28. The yarn guiding elements 13 and 14 are mounted on a U-shaped bracket 29 which is mounted on the arm 11 by spot welding at the points 30. The fly-wire switch operator 15 is in the nature of a piece of wire having a longitudinal main portion 50 attached to the operator shaft 23. The main portion 50 continues into a laterally extending portion 51 continuing into a V-shaped offset portion 33 which connects with a small longitudinal portion 52 connecting with a V-shaped offset portion 32 which continues into a laterally extending end 53. The laterally extending portion 51 and end 53 extend across the top edge of the arm 11 for limiting downward movement of the fly-wire operator 15 to a position approximately aligning the yarn guiding elements 16 and 17 with elements 13 and 14. The yarn guiding elements 16 and 17 are mounted between the arms of the V-shaped offset portions 32 and 33. One of the arms of each of these offset portions is formed with a bulged out portion 34 mating with the curvature of the yarn guiding element to releasably hold it in position. The yarn guiding elements 12, 13, 16 and 17 are of the type having end flanges so that the yarn may be pulled laterally with a minimum of friction at each of the ends of it.

The yarn guiding elements 12 and 13 are held in position by a pair of removable clips 36 engaging behind each of the flanged ends thereof. Relatively large apertures 37 are formed in the brackets 27 and 29 which are large enough for the yarn guiding elements to pass through. However, the clips 36 are engaged behind each of the flanges of the yarn guiding elements and abut the adjacent faces of the brackets for removably holding the yarn guiding elements in place. With this arrangement there is no need for cementing the yarn guiding elements in position.

The yarn guiding element 14 which is closest to the switch box 19 is associated with a thread catcher 40. This thread catcher 40 is in the nature of a tube having a slot 41 formed in its top. This slot 41 has its outer end large and tapers to its inner end. The edges 42 of the outer end of said slot 41 are curved so as to guide the yarn into the converging inner end of said slot 41. The bracket 27 is set below the bracket 29 so that yarn guiding element 12 is below yarn guiding element 13, causing the yarn 45 passing through the catcher 40 to move along the bottom of catcher 40 free of the slot 41 when the fly-wire operator is in its extreme down position and held by the taut moving yarn 45.

The thread or yarn 45 works in the direction of the arrow 46 during the knitting operation. It comes from the supply spool. It passes through the yarn guiding element 25, then through the yarn guiding element 14, then the yarn guiding element 17, then 13, then 16, and finally 12.

The operation of the new device may be understood from the following:

In full lines, in Fig. 2, the yarn carrier stop motion device is shown as it appears during the knitting operation of the yarn 45. The tension of the yarn 45 holds the fly-wire switch operator 15 in the position shown. However when the knitting machine functions so that knitting of the yarn 45 stops, the yarn 45 becomes slack. Immediately, the fly-wire switch operator 15 moves upwards because of the usual function of the yarn carrier stop motion 10. When the fly-wire switch operator 15 moves upwards it pulls two loops from the yarn 45, namely, the loop 45' and the loop 45'', indicated by the dot and dash lines. The dot and dash lines 15' indicate the fly-wire switch operator in its fully raised position in which the stop motion 10 will function to stop the knitting machine. During the normal operation of the stop motion 10 the fly-wire switch operator 15 does not reach the full up position, but reaches an intermediate position. However, all the slack in the yarn 45 will be taken up because the fly-wire switch operator 15 draws two loops 45' and 45''.

It should also be noted that as soon as the fly-wire switch operator 15 moves upwards the yarn 45 is forced into the catcher slot 41. This prevents yarn 45 being drawn off the spool. It causes the yarn to the front of the thread catcher 40 to be drawn back to form the loops 45' and 45'' and in this way takes up the slack of the yarn 45 caused by this yarn being cut out of the knitting operation. When the knitting operation resumes the pull of the knitting machine will draw the fly-wire switch operator 15 back into its original position, illustrated by the full lines, in which position the yarn 45 will be moved downwards and forced out from the catching slot 41 and back to its free position. The knitting now proceeds in the usual way.

The yarn guiding elements 12 and 13 may be removed and replaced merely by pulling the clips 36 out. The yarn guiding elements 16 and 17 may be released by slightly spreading the arms of the V-shaped offset portions 32 and 33. The yarn guiding element 14 is permanently mounted in position.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications com-

ing within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. The combination with a yarn carrier stop motion having an arm provided with a plurality of spaced yarn guiding elements and a fly-wire switch operator provided with a yarn guiding element normally between a pair of said yarn guiding elements for pulling a loop of said yarn when said yarn slackens, of an additional yarn guiding element on said fly-wire switch operator and normally disposed between a pair of said first mentioned yarn guiding elements other than said pair for pulling an additional loop of said yarn when said yarn slackens.

2. The combination with a yarn carrier stop motion having an arm provided with a plurality of spaced yarn guiding elements and a fly-wire switch operator provided with a yarn guiding element normally between a pair of said yarn guiding elements for pulling a loop of said yarn when said yarn slackens, of an additional yarn guiding element on said fly-wire switch operator and normally disposed between a pair of said first mentioned yarn guiding elements other than said pair for pulling an additional loop of said yarn when said yarn slackens, and yarn catching and releasing means to the front of said yarn loops for catching and holding said yarn at this point when said fly-wire switch operator starts drawing said loops and releasing said yarn when said fly-wire switch operator moves back to its normal position.

3. The combination with a yarn carrier stop motion having an arm provided with a plurality of spaced yarn guiding elements and a fly-wire switch operator provided with a yarn guiding element normally between a pair of said yarn guiding elements for pulling a loop of said yarn when said yarn slackens, of an additional yarn guiding element on said fly-wire switch operator and normally disposed between a pair of said first mentioned yarn guiding elements other than said pair for pulling an additional loop of said yarn when said yarn slackens, and yarn catching and releasing means to the front of said yarn loops for catching and holding said yarn at this point when said fly-wire switch operator starts drawing said loops and releasing said yarn when said fly-wire switch operator moves back to its normal position, said yarn catching and releasing means comprising a tube with a slot having its sides converging and into which said yarn moves when said fly-wire switch operator moves from its normal position.

4. In a yarn carrier stop motion having an arm provided with a plurality of spaced brackets having apertures, flanged yarn guiding eyelets engaging through said apertures, and a pair of clips for each eyelet engaging behind the end flanges thereof and against the faces of said brackets for releasably holding said eyelets upon said brackets.

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