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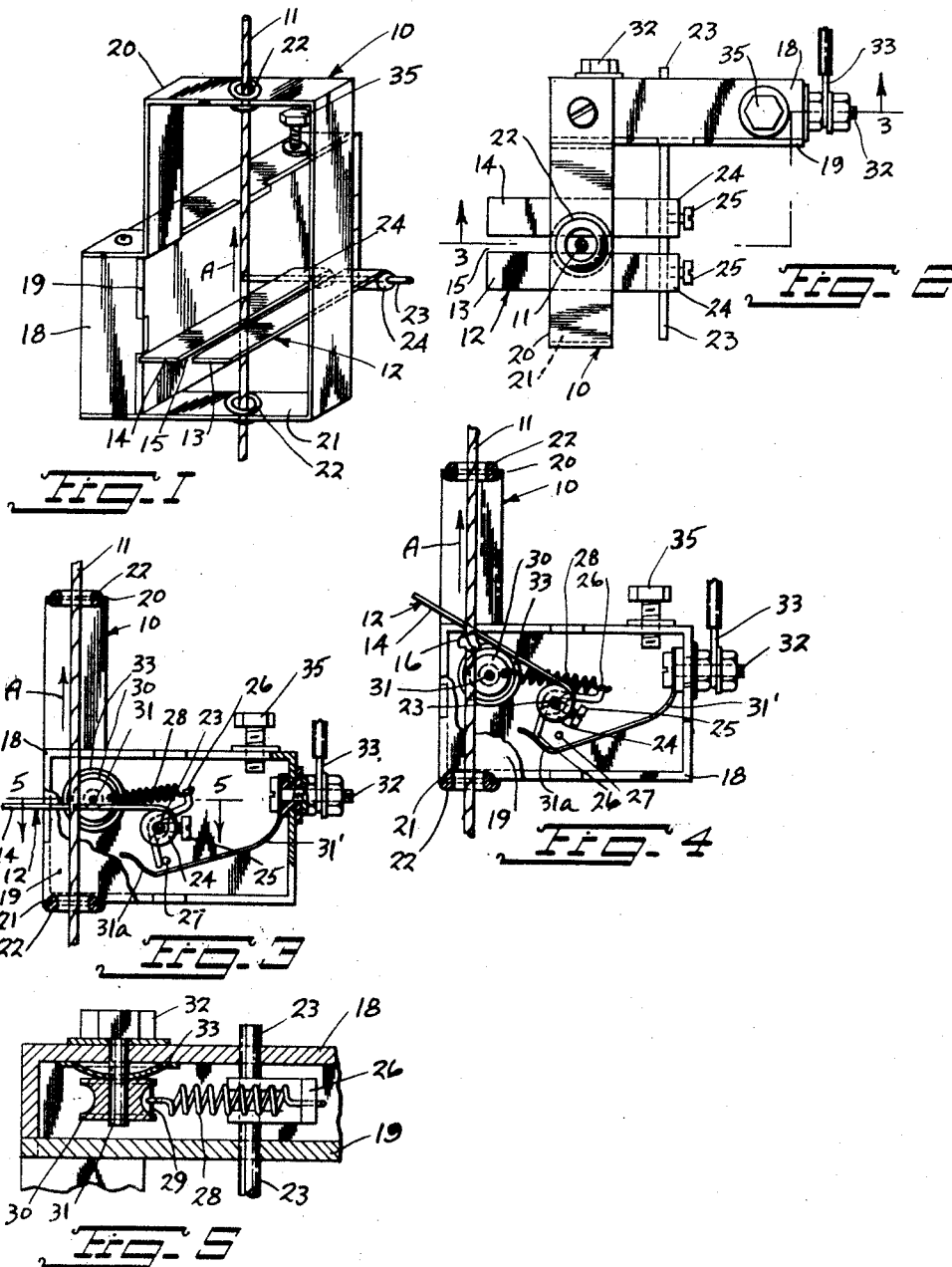
E. VOSSEN

2,329,427

STOP MOTION DEVICE

Filed Feb. 6, 1943

2 Sheets-Sheet 1



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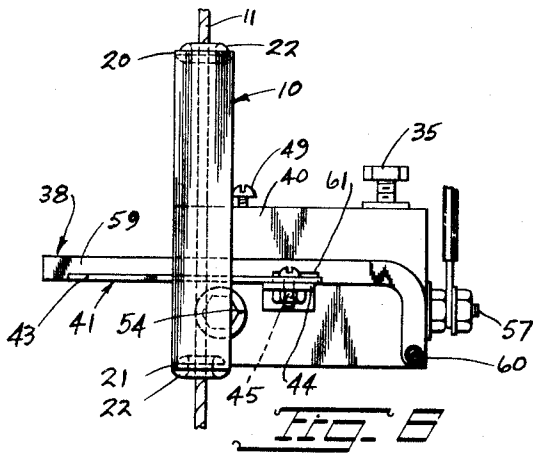
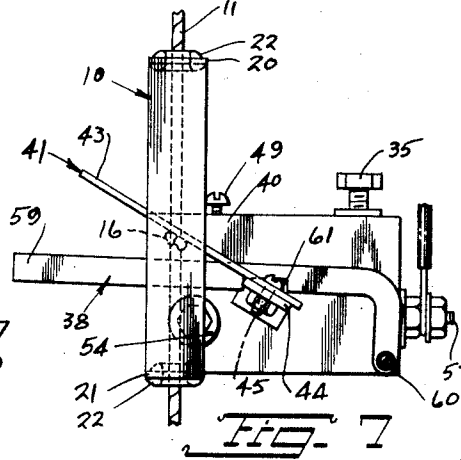
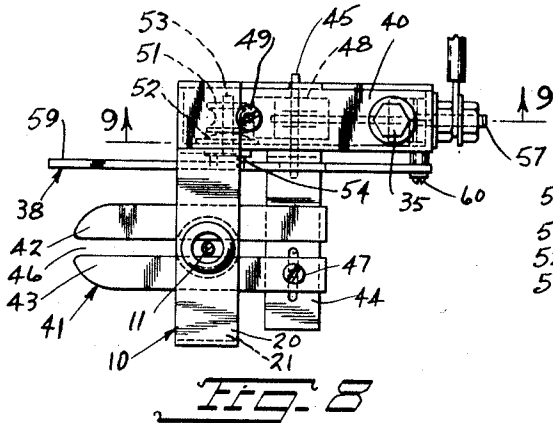
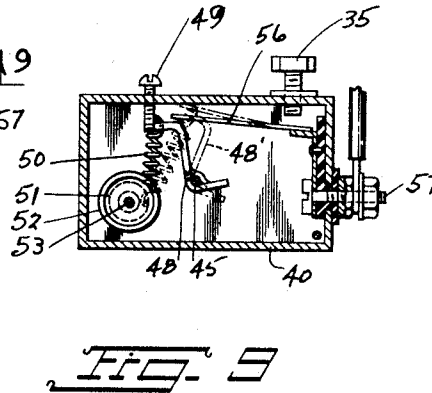
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STOP MOTION DEVICE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,329,427

STOP MOTION DEVICE

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10 Claims. (Cl. 66—163)

This invention relates to new and useful improvements in stop control devices particularly intended for knitting machines or other machines having, when operating, moving yarn and controllers for stopping said machines.

The purpose of the invention is to have the stop control device actuate the controller to stop the machine when the yarn moving through the machine is knotted, entangled, or defective to the extent of having an enlarged portion. If the machine is not stopped timely the knotted, entangled or defective portion reaches the needles of the machine, bending or breaking them and placing undue stress on various parts of the machine, particularly the adjustment and tension portions thereof.

The dominating feature of this invention resides in the construction of a stop control device for machines of the type specified capable of actuating the controller of the machine without materially changing the tension of the moving yarn. There are several types of prior stop control devices which embody deficiencies eliminated by this new invention. In one prior type of device the moving yarn is stopped dead in its tracks. This is almost as bad as allowing the knotted, entangled or defective portion to reach the needles of the machine. When moving yarn is suddenly stopped, and the machine continues turning over due to its momentum, strains will be communicated to the needles, bending or breaking the same, and to the various other parts of the machine. The yarn being stopped dead in its tracks while traveling, usually snaps apart (breaks) right at the needles where the strain is greatest. This results in a "press-off," i. e. the cloth leaves the needles and the machine becomes inoperative. To make it operative the cloth must be hung on again, needle to needle. The average machine has over 1000 needles. The time lost is very evident. Furthermore, sudden stopping of the yarn changes its tension and causes the machine to knit a defective portion before it comes to a stop. The portion is defective if the yarn is too tight.

Another type of prior device works on the principle of dropping the yarn when the tension of the yarn increases above a predetermined amount. In these devices it is calculated that when a knotted or entangled portion reaches a guide hole or porcelain eyelet, or other portion of the machine and increases the tension, that the machine should be stopped and the yarn is suddenly stopped and dropped. However, such dropping of the yarn produces a slack which in turn affects the knitting operation, producing a defective section of knitted material. The slack yarn falls down on the working parts of the machine and becomes tangled and twisted. Fur-

thermore, in these devices due to slight changes in the adjustment of the machine and the stop control device, a time is reached when the yarn keeps dropping and causing the actuation of the stop control device even though nothing is wrong. This wastes the time of an operator who must investigate the cause of stoppage of the machine. When he can find nothing wrong he merely restarts the machine.

A very important feature of this invention resides in the fact that the new stop control device will reliably function without materially affecting the speed of travel of the yarn or its tension. For this reason there will be no undue strain on the needles of the knitting machine or other machine, or other parts thereof.

It is an object of this invention to construct a stop control device as mentioned which is characterized by a lever having an open end restricted passage for the yarn to pass through and movably mounted to move away from the yarn when an obstruction on the yarn moves said lever, to cause said obstruction to relatively move out of the open end of said restricted passage. It is proposed that said lever be of sections adjustable for any weight or size of yarn the machine may use. With this construction the knotted yarn is not suddenly arrested, in fact, it is not even slightly retarded since the invention contemplates to load the lever very lightly. Therefore, no undue strains will be communicated by the yarn to the knitting needles or other parts of the knitting or other machine.

Furthermore, the invention proposes to associate a means for operating the controller for stopping the knitting or other machine when the lever mentioned in the previous paragraph is moved as specified.

The invention contemplates a particularly simple and efficient construction for the means referred to in the previous paragraph.

Another object of the invention resides in providing guide means for freely guiding the yarn which is moving longitudinally relative to itself through the said open end restricted passage in the lever.

Another object of the invention resides in the provision of simple, effective means for adjustably loading the lever with a resisting pressure so that it will be moved only in the event that a knotted, entangled or defective section of yarn reaches the lever.

More specifically, the invention contemplates pivotally mounting the lever previously referred to, and mounting it so that it is pivotal to move away from the yarn when an obstruction on the yarn strikes and moves the lever, to cause said obstruction to relatively move out of the open end of the restricted passage of the lever.

Another object of the invention resides in providing a latching means (only if desired) for catching and holding the lever in its moved position so as to keep the electric circuit closed, so that the lever must be released (manually) before the knitting or other machine can be re-started.

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

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

Fig. 1 is a perspective view of a stop control device embodying this invention.

Fig. 2 is a plan view of the device shown in Fig. 1.

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 2, with certain parts broken away to disclose the interior construction.

Fig. 4 is a sectional view similar to Fig. 3 but showing the parts in a different position.

Fig. 5 is a fragmentary horizontal enlarged sectional view taken on the line 5—5 of Fig. 3.

Fig. 6 is a front elevational view of a stop control device constructed in accordance with a modified form of this invention.

Fig. 7 is a front elevational view similar to Fig. 6 but illustrating the parts in a different position.

Fig. 8 is a plan view of Fig. 6.

Fig. 9 is a vertical sectional view taken on the line 9—9 of Fig. 8.

The stop control device for a knitting machine or other machine having moving yarn when operating and a controller for stopping said machine, in accordance with the form of the invention illustrated in Figs. 1 to 5 inclusive, includes guide means generally indicated by reference numeral 10, for freely guiding the yarn 11 of said knitting machine or other machine, which yarn moves longitudinally relative to itself. A lever 12 is used in conjunction with said guide means 10. This lever is a compound lever composed of a pair of spaced sections 13 and 14. This compound lever 12 has an open end restricted passage 15 for the yarn 11 to pass through. The lever 12 is movably mounted to move in the direction of the moving yarn, indicated by the small arrow A, and away from the yarn when an obstruction on the yarn moves against said lever to cause said obstruction to relatively move out of the open end of said restricted passage 15. In Fig. 4 an obstruction 16 is shown on the yarn 11 and is shown as having engaged and partially moved the lever 12. It should be noted that the lever 12 is pivoting upwards and that upon further upward motion of the yarn 11 the obstruction 16 will move past the lever 12 and out from the open end restricted passage 15. There is also means for operating the controller of the knitting or other machine upon said motion of the lever 12 to stop said machine. This means will be more fully described as this specification proceeds.

The stop control device is provided with a body 18 which is in the nature of a box having a removable cover 19. The guide means 10 comprises a strip of metal bent so as to have parallel top and bottom portions 20 and 21, respectively. Said strip of metal has its end portions attached

to the body 18. The top and bottom portions 20 and 21, respectively, are formed with openings through which large eyelets 22 are mounted. The yarn 11 passes through these eyelets 22. These eyelets are of large enough size so that obstructions which may form on the yarn 11 may freely pass through the eyelets without causing any increase in the tension of the yarn. The lever 12 is mounted on a spindle 23 which is turnably mounted on the body 18. The sections 13 and 14 of the said lever 12 have tubular inner end portions 24 which engage the spindle 23. Set screws 25 engage through these tubular portions 24 and serve to fixedly mount the sections of the lever 12 on the said spindle 23. The restricted passage 15 of the lever 12 may be varied by loosening the set screws 25 and moving the sections 13 and 14 of the lever towards or away from each other. In this way the stop control device may be adjusted to yarns of different diameters.

Adjustable means is provided for loading said lever 12 with a resisting pressure so that should the yarn 11 touch against the side portions of the passage 15, the lever will not accidentally move and set off the stop control device. This adjustable means includes an arm 26 fixedly mounted on the spindle 23, and located within the body 18. One end of the arm 26 normally engages a peg 27 projecting from one wall of the body 18. The other end of the arm 26 is connected with a tension spring 28 which is connected by a small pin 29 with the periphery of a small drum 30. This drum 30 is mounted on a rod 31 which is mounted on and passes through one wall of the body 18. The outer end of the rod 31 is provided with a head 32 by which it may be turned. A friction washer 33 is mounted on the rod 31 and acts between one side of the drum 30 and the adjacent face of the wall of the body 18. This friction washer holds the drum 30 in a fixed position. The tension of the spring 28 may be increased by turning the head 32 with a pair of pliers or other tool to cause a portion of the spring 28 to wind on the drum 30. The tension of the spring 28 may be cut down by turning the head 32 back again to unwind the spring 28.

The means for operating the controller of the knitting or other machine previously referred to includes a relatively stationary contact arm 31' which is insulated from and supported on one wall of the body 18 by a suitable terminal 32. An electric wire 33 is connected with this terminal and is for the purpose of being connected with the electric circuit of the controller. The contact arm 31' has an offset end portion 31a against which the adjacent end of the arm 26 will sweep when the lever 12 is moved by an obstruction on the yarn 11. Thus the arm 26 acts as a complementary contact arm for engaging the relatively stationary contact arm 31' to complete the circuit. The arm 26 is grounded to the body 18 which in turn is grounded in relation to the controller. A fastening screw 35 is mounted on the top of the body 18 by which the body may be supported on a rod or other ground of the controller.

The operation of the device is as follows:

The yarn 11 comes off from the cone-shaped spool or other supply of yarn to the knitting or other machine, and passes through the eyelets 22 and through the passage 15. The knitting machine operates in the usual way. However, when an obstruction on the yarn 11 comes along, such

as the obstruction 16 illustrated in Fig. 4, it strikes against the lever 12 pivoting the lever upwards and away from the yarn. Because the spring 28 is a very light spring the moving yarn 11 will not be materially interfered with and it will keep moving at the speed at which it was moving before the obstruction engaged and lifted the lever 12. Soon the obstruction 16 has fully lifted the lever 12 and has passed up and through the top eyelet 22.

However, when the lever 12 was lifted the contact arm 26 swept against the offset end 31a of the contact 31', closing an electric circuit to the controller for actuating the controller, which in turn stops the knitting machine. It should be noted that the knitting or other machine was immediately stopped when the obstruction 16 moved the lever 12. However, the lever 12 did not materially interfere with the motion of the yarn 11, nor did any other portion of the stop control device. Only after the controller of the knitting machine was actuated did the yarn stop moving. The stop control device must be located a sufficient distance from the needles of the knitting machine so that the obstruction 16 has not as yet reached them.

The operator investigates the obstruction and cuts it out and joins the yarn with a knitter's knot which can easily pass the needles and other parts of the knitting machine. The knitting machine is then ready to be restarted.

In Figs. 6 to 9 inclusive, a modified form of the invention has been disclosed which is substantially identical to the prior form, distinguishing merely in the fact that latch means 38 is associated with the stop control device for catching and holding the lever in its moved position. Furthermore, the stop control device itself is of a slightly different design than the prior form to illustrate that various embodiments of the invention may be made.

This stop control device includes a body 40 supporting guide means 10 for the yarn 11. This body is provided with a screw 35 by which it may be attached to a support rod. The guide means 10 is provided with the top and bottom portions 20 and 21, respectively, which in turn are provided with the eyelets 22 for guiding the yarn 11. A lever 41 composed of adjacent side sections 42 and 43 are mounted on a strip 44, which in turn is supported on a spindle 45 turnably mounted on the body 40. The lever 41 is provided with an open end restricted passage 46 through which the yarn 11 passes. The section 42 of the lever is fixedly mounted on the strip 44. The section 43 is adjustably mounted by a slot and clamp screw means 47. This adjustable mounting permits a variation of the width of the restricted passage 46. The strip 44 is fixedly connected with the spindle 45. The spindle 45 is provided with an arm 48 located within the body 40. A stop screw 49 limits pivoting of the arm 48 in one direction. A tension spring 50 connects with the arm 48 and normally urges it against the stop screw 49. The other end of the spring 50 connects with the periphery of a drum 51 which is held in various positions by a friction washer 52. The drum 51 is mounted on a rod 53 provided with an external head 54 by which the drum may be turned to adjust the tension of the spring 50.

The arm 48 acts like a radial contact arm and is cooperative with a relatively stationary contact arm 56 complementary to the contact arm 48 for controlling the electric circuit which oper-

ates the controller. The contact arm 56 is connected and supported by a terminal 57 which is insulated from and mounted on the body 40.

The latching means 38 is in the form of a gravity actuated lever 59 which is pivotally mounted at one end by a pintle 60. This lever 59 has a keeper cutout 61 which is cooperative with an edge of the strip 44 which acts like a bolt element. The construction is such that when the lever 41 pivots upwards the strip 44 engages the keeper opening 61 and is restrained from moving back. However, the lever 59 may be manually gripped and pivoted upwards to move the keeper opening 61 free from the strip 44, which then releases the lever 41.

The operation of this form of the invention is as follows:

When an obstruction on the yarn 11, such as the obstruction 16, strikes the lever 41 it pivots the lever upwards from the horizontal position shown in Fig. 6. A time is soon reached when the lever 41 has pivoted a sufficient distance so that the obstruction 16 passes out of the open end of the restricted passage 46. The lever 41 is then freed and may drop a slight distance until the keeper opening 61 catches the edges of the strip 44 holding it in an elevated position.

In the elevated position of the lever 41 the contact arm 48 was moved so that it engaged the contact arm 56, closing the circuit to the controller. The dot and dash lines 48' in Fig. 9 illustrates the latter position of the contact arm.

In other respects this form of the invention is similar to the previous form and like parts are identified by like reference numerals.

While I have illustrated and described my invention with some degree of particularity, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming 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. A stop control device for a knitting machine or other machine having moving yarn when operating and a controller for stopping said machine, comprising guide means for freely guiding yarn which is moving longitudinally relative to itself, a lever having an open end restricted passage for said yarn to pass through and movably mounted to move away from said yarn when an obstruction on the yarn moves said lever to cause said obstruction to relatively move out of said open end of said restricted passage, and means for operating said controller upon said motion of said lever to stop said machine, said lever having side sections spaced from each other and forming said open end restricted passage, and means for relatively adjusting said side sections to vary the width of said restricted passage.

2. A stop control device for a knitting machine or other machine having moving yarn when operating and a controller for stopping said machine, comprising guide means for freely guiding yarn which is moving longitudinally relative to itself, a lever having an open end restricted passage for said yarn to pass through and movably mounted to move away from said yarn when an obstruction on the yarn moves said lever to cause said obstruction to relatively move out of said open end of said restricted passage, adjustable means for loading said lever with a

resisting pressure, and means for operating said controller upon said motion of said lever to stop said machine, said adjustable means including a drum, friction means for holding said drum in various turned positions, and a spring having one end connected with said drum by which the spring may be tensioned.

3. In a stop control device for a knitting machine or other machine having moving yarn when operating and a controller for stopping said machine, a body, guide means mounted on said body for freely guiding yarn which is moving longitudinally relative to itself, a lever having an open end restricted passage for said yarn to pass through and movably mounted on said body to move away from said yarn when an obstruction on the yarn moves said lever to cause said obstruction to relatively move out of said open end of said restricted passage, and means for operating said controller upon said motion of said lever to stop said machine, said body being in the nature of a box or container, and adjustable means for loading said lever with a resisting pressure located within said container.

4. In a stop control device for a knitting machine or other machine having moving yarn when operating and a controller for stopping said machine, a body, guide means mounted on said body for freely guiding yarn which is moving longitudinally relative to itself, a lever having an open end restricted passage for said yarn to pass through and movably mounted on said body to move away from said yarn when an obstruction on the yarn moves said lever to cause said obstruction to relatively move out of said open end of said restricted passage, and means for operating said controller upon said motion of said lever to stop said machine, said body being in the nature of a box or container, and adjustable means for loading said lever with a resisting pressure located within said container, said means for operating said controller including contact arms located within said container.

5. In a stop control device for a knitting machine or other machine having moving yarn when operating and a controller for stopping said machine, comprising guide means for freely guiding yarn which is moving longitudinally relative to itself, a pivotally mounted lever having an open end restricted passage for said yarn to pass through and pivotal to move away from said yarn when an obstruction on the yarn strikes and moves said lever to cause said obstruction to relatively move out of said open end of said restricted passage, and means for operating said controller upon said motion of said lever to stop said machine, comprising a spindle connected with and turned by said lever, a radial contact arm mounted on said spindle, a relatively stationary contact arm complementary to said radial contact arm for controlling an electric circuit to operate said controller.

6. In a stop control device for a knitting machine or other machine having moving yarn when operating and a controller for stopping said machine, comprising guide means for freely guiding yarn which is moving longitudinally relative to itself, a pivotally mounted lever having an open end restricted passage for said yarn when an obstruction on the yarn strikes and moves said lever to cause said obstruction to relatively move out of said open end of said restricted passage, and means for operating said controller upon said motion of said lever to stop said machine, comprising a spindle connected

with and turned by said lever, a radial contact arm mounted on said spindle, a relatively stationary contact arm complementary to said radial contact arm for controlling an electric circuit to operate said controller, said contact arms having a relative sweeping action when engaging each other.

7. A stop control device for a knitting machine or other machine having moving yarn when operating and a controller for stopping said machine, comprising guide means for freely guiding yarn which is moving longitudinally relative to itself, a lever having an open end restricted passage for said yarn to pass through and movably mounted to move away from said yarn when an obstruction on the yarn moves said lever to cause said obstruction to relatively move out of said open end of said restricted passage, means for operating said controller upon said motion of said lever to stop said machine, and latching means for catching and holding said lever in its latter position.

8. In a stop control device for a knitting machine or other machine having moving yarn when operating and a controller for stopping said machine, comprising guide means for freely guiding yarn which is moving longitudinally relative to itself, a pivotally mounted lever having an open end restricted passage for said yarn to pass through and pivotal to move away from said yarn when an obstruction on the yarn strikes and moves over said lever to cause said obstruction to relatively move out of said open end of said restricted passage, means for operating said controller upon said motion of said lever to stop said machine, and latching means for catching and holding said lever in its latter position.

9. A stop control device for a knitting machine or other machine having moving yarn when operating and a controller for stopping said machine, comprising guide means for freely guiding yarn which is moving longitudinally relative to itself, a lever having an open end restricted passage for said yarn to pass through and movably mounted to move away from said yarn when an obstruction on the yarn moves said lever to cause said obstruction to relatively move out of said open end of said restricted passage, means for operating said controller upon said motion of said lever to stop said machine, and latching means for catching and holding said lever in its latter position, said latching means including a pivotally mounted lever manually movable for releasing the latching means.

10. In a stop control device for a knitting machine or other machine having moving yarn when operating and a controller for stopping said machine, comprising guide means for freely guiding yarn which is moving longitudinally relative to itself, a pivotally mounted lever having an open end restricted passage for said yarn to pass through and pivotal to move away from said yarn when an obstruction on the yarn strikes and moves over said lever to cause said obstruction to relatively move out of said open end of said restricted passage, means for operating said controller upon said motion of said lever to stop said machine, and latching means for catching and holding said lever in its latter position, including a pivotally mounted lever for manually releasing the latching means.