Sept. 2, 1952 E. SEIBERT 2,608,846

DEVICE FOR AUTOMATICALLY STOPPING WARP KNITTING AND SIMILAR MACHINES FOR MAKING MESH GOODS IN CASE OF RUPTURE OF THREADS

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Fig. 1.

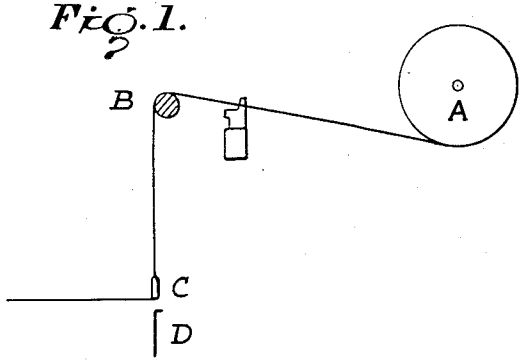


Fig. 2.

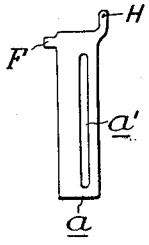


Fig. 3.

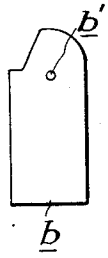


Fig. 4.

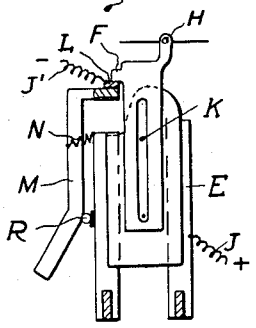


Fig. 5.

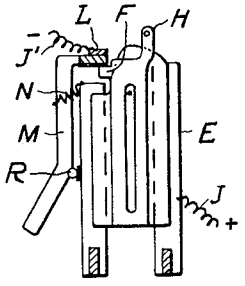
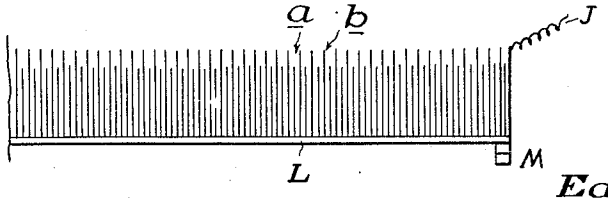


Fig. 6.



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DEVICE FOR AUTOMATICALLY STOPPING WARP KNITTING AND SIMILAR MACHINES FOR MAKING MESH GOODS IN CASE OF RUPTURE OF THREADS

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Application February 1, 1951, Serial No. 208,865
In Argentina November 29, 1950

4 Claims. (Cl. 66—163)

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The present invention relates to a device for automatically stopping warp knitting and similar machines for making mesh fabrics in case of rupture of one or more threads, the said device causing the closing of an electric circuit installed for that purpose by means of its movable parts.

The need of a device for automatically stopping such machines in case of rupture of a warp thread has long been felt. Heretofore the machine had to be watched by an operator who, in case of thread rupture, had to stop the machine by hand. As a rule, an operator looks after three machines at the most. Consequently, under these conditions when a flaw occurs in the fabric it may well average several centimeters and sometimes often much more. These flaws cannot be mended or remedied in an invisible manner, particularly if one works with silk and all kinds of artificial silk, including nylon, so that, because of the flaws, such fabrics become of less value. Inasmuch as most of the fabrics made on these machines, fabrics generally referred to as "Jersey cloth," are used for the manufacture of ladies' underwear, flaws in the fabrics cause substantial losses, that is, losses in raw material and in manufacturing output, inasmuch as garments made from defective material are often unsaleable. Even greater losses are incurred from flaws in fabrics, intended for dresses, and which are to be sold by the linear yard or meter. To be used for such purposes, the fabric must either be perfect or else can have but very few minor flaws. Until now, fabrics with no, or almost no, flaws could be obtained only by having an operator watch one machine only. Such a procedure obviously results in very high production costs.

The present invention eliminates the aforementioned disadvantages by producing means which will automatically stop the machine when a thread breaks.

For a better understanding of the invention, a practical embodiment thereof is presented in the accompanying drawing which shows the basic components merely by way of illustration and without limitation.

Figure 1 shows, diagrammatically, the operation of a warp knitting machine and the arrangement of the automatic stop device in accordance with the invention.

Figure 2 is a view of one of the thread guides.

Figure 3 is a view of a separator for the guides.

Figure 4 shows the assembly of a guide and a separator mounted on a frame provided with a contact bar.

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Figure 5 shows the same assembly in inoperative position.

Figure 6 is a diagrammatic top plan of the arrangement of an assembly of guides and separators.

Similar reference characters designate corresponding parts throughout the several figures of the drawing.

In accordance with the drawing, the thread or yarn wound on a spool A passes over tension bar B and extends down to the corresponding needle C and tongue D serving to make the fabric. The tongue pulls a thread, keeping it under tension when the machine is in operation. The new device, designated by the letter E, is interposed between the spool A and tension bar B.

The basic elements constituting the invention are illustrated in Figures 2 to 6.

Figure 2 shows the guides *a* which are flat plates with an interior slot *a'*, a lateral projection F, and a tip with an orifice H intended to receive a thread for the fabric. There is a guide for every thread of the warp, and each guide is supported by its thread as long as the thread is in proper tension. These guides are arranged in vertical position with the orifice for the thread at the top. The slot *a'* receives a fixed shaft K and the guides are separated from one another by separator plates *b* shown in Figure 3 so that the distance between two guides is exactly equal to that between their corresponding threads. The separator plates *b* are also provided with openings *b'* which receive the shaft K.

The guides as well as the separator plates are of electrically-conductive material so that by connecting one of the plates of the assembly to wire J of an electric circuit (see Figure 6), all of them will be included in the circuit. The guides can move in a vertical directions since shaft K is disposed within the interior slot *a'* and controls the limit of vertical movement of all the guides. All of these guides and separators are mounted in a frame E which also supports a contact bar L connected as at J' to the other wire of the electric circuit. Thus, when the thread or threads break and the corresponding guides drop, as shown in Figure 4, projection F comes into contact with the contact bar, closing the electric circuit which, by entering into operation, stops the machine automatically.

The contact bar can be withdrawn from supporting relation to projections F by turning its support M about its horizontal pivot axis R against the tension of spring N. This makes it possible to permit the guide to drop downward

and to hold it there by the contact bar being brought to bear from above, over and against projection F. In this position the contact bar L does not close the circuit inasmuch as its lower side or face is insulated (see Figure 5) from its support M.

The operation of the system is very simple. Each guide receives the corresponding thread. If not all threads are to be worked with, then the guides that will not be used are held in the inoperative position by the contact bear bearing down on the projections F.

When the machine is in operation, the threads are put under tension so that they will raise the corresponding guides so that they are then no longer in engagement with the contact bar, with the result that the electric circuit will be open. If a thread should break, the corresponding guide will drop. The projection of that guide will then bear against the contact bar and close the circuit so that the machine will automatically stop and a light will come on to indicate the sector in which the damage occurred.

The automatic stopping brought about by this device affords considerable improvement in the manufactured fabrics, since it prevents flaws caused by the rupture of the warp thread on its travel from the reel to the needle. It also confines flaws caused by the breaking of the needle and subsequent rupture of the thread to one or two meshes. Such flaws are slight enough to be easily mended. Furthermore, while the thread passes through the orifice of the guide, the latter catches the lint before it reaches the needle where it frequently causes flaws.

Another important advantage of this device consists in the fact that it reduces high production costs, because a machine equipped with this automatic stopping device does not require constant vigilance by a specially trained operator, inasmuch as an assistant can easily look after as many as ten machines. This means not only an improved product by also a reduction in the cost of manufacture and hence in the cost of the finished product.

It is understood that the embodiment illustrated and herein described may be modified in its construction and details without departure from the scope of the appended claims.

I claim:

1. A device for automatically stopping warp knitting and similar machines for making mesh fabrics in case of rupture of one or more threads, comprising, a frame, a plurality of flat thread controlled plates of electrically-conductive material guided to slide vertically in said frame and

forming a series, separator plates which are likewise conductors of electricity and whose thickness is substantially equal to the distance separating the threads arranged between said thread controlled plates, the said latter plates each being provided with a perforation in its upper part for receiving a thread and with an offset projection, said thread controlled plates and separator plates being included in one side of an electric circuit, and a conductor bar insulatingly mounted on the said frame parallel to the series of thread controlled and separator plates, the said bar being connected to the other side of the said electric circuit.

2. A device according to claim 1, in which the means for guiding the thread controlled plates includes a vertical slot in said plates and a perforation in said separator plates, and a shaft passing through said slots and said perforations.

3. An automatic stopping device in accordance with claim 1, in which the contact bar comprises a base of insulating material and a pivoted lever support which when manually rocked permits the horizontal displacement of said bar, and a spring for holding said lever in normal position.

4. Means for automatically stopping a knitting or like machine, comprising, a frame of electrically-conductive material, lever means pivoted to the frame and spring biased to normal position, a conductor bar insulatingly supported on said lever means and connected to one side of an electrical circuit, a plurality of plates each having a vertical slot, slidably mounted in said frame, a bar transversing said slot to limit vertical movement of said plates, an offset on each plate, a thread receiving and guiding eye on each plate and when receiving a tensioned thread holding the said offset above the conductor bar, and when the thread breaks permitting the offset to engage the bar, said plates being electrically connected in the opposite side of the circuit to the bar, and said bar being movable to drop the offsets of selected plates therebeneath to render the same inoperative.

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