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A. A. ASTILL ET AL

2,563,906

STOP MOTION

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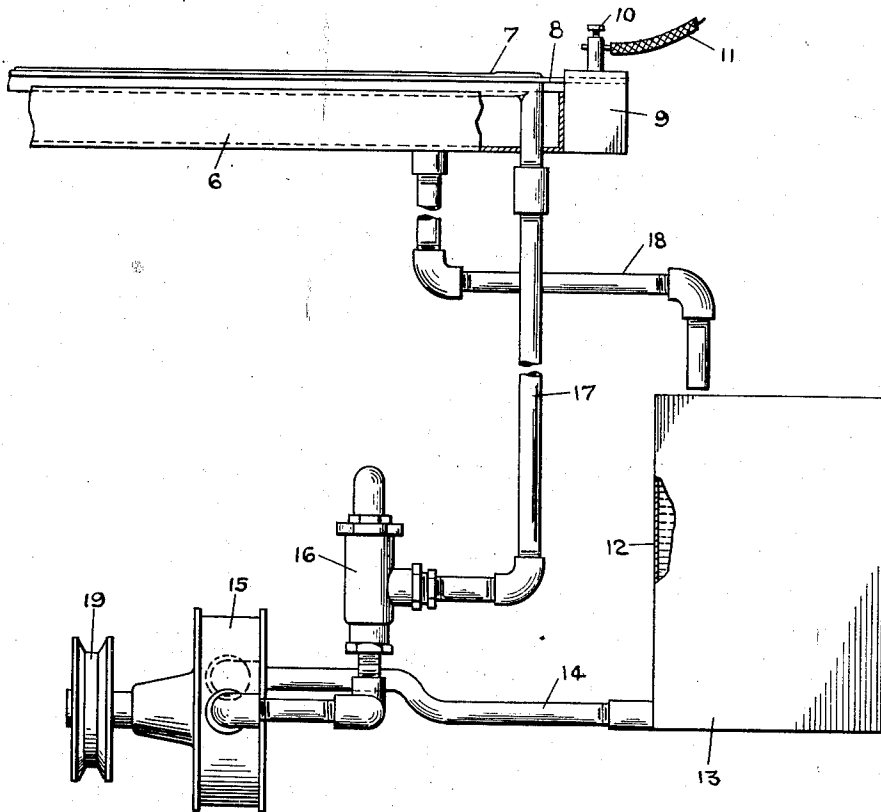


Fig. 1

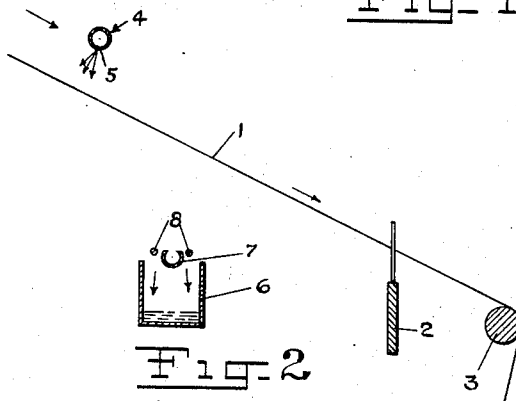


Fig. 2

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## UNITED STATES PATENT OFFICE

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## STOP MOTION

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2 Claims. (Cl. 66—163)

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This invention relates to textile machines wherein a plurality of yarns are fed thereto in the form of a warp, and relates more particularly to a mechanism employed in connection with said textile machines adapted to actuate an electrical warp stop motion upon breakage of a warp yarn so as to halt the warp feed mechanism and the machine.

Warps of individual, parallel yarns are normally subjected to a wide variety of treatments in the textile art. Thus, for example, a warp may be sized, dyed or printed, or it may be fed to a knitting machine where it is knitted into a fabric. For various causes, one or more of the yarns constituting the warp may fail while the warp is being fed to the textile machine and it is exceedingly important that the warp feed mechanism and the machine be halted immediately upon such yarn breakage and the broken yarns tied since a defective warp will, of course, produce a defective fabric whether the warp is subsequently employed for knitting or for weaving operations.

It is therefore, an important object of this invention to provide an electrically operated mechanism, including a circulating electrolyte, adapted to be employed in connection with the textile machines wherein yarn is fed thereto in the form of a warp, which is activated by the presence of one or more broken warp yarns and which will act to halt the warp feed drive means on breakage of a warp yarn and also the textile machine receiving the yarn.

Other objects of this invention will appear from the following detailed description and the accompanying drawing.

In the drawing,

Fig. 1 is a fragmentary front-elevational view, partly in section, of my novel mechanism showing a trough adapted to contain a liquid electrolyte and means for circulating the electrolyte; and

Fig. 2 is a fragmentary end view, in section, of a part of said mechanism showing the path of the warp yarns relative thereto.

Like reference numerals indicate like parts throughout the drawing.

Referring now to the drawing, and more particularly to Fig. 2, a warp of yarns indicated by reference numeral 1 is fed from a warp beam (not shown) in the direction indicated by the arrow and passes through a reed 2 and then over a tension roll 3 to the desired textile operations. Above warp 1 and substantially coextensive therewith is a pipe 4 containing air maintained under pressure. Pipe 4 is provided with a plurality of holes or slots 5 of relatively small diameter and sub-

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stantially uniformly disposed along the underside thereof at closely spaced intervals. Thus, the stream of air leaving each of holes 5 constantly exerts a downward pressure upon the moving warp 1 and tends to blow any broken yarn present in said moving warp out of the plane of the remaining unbroken yarns in a downward direction.

Extending across the full width of the warp 1 is a rectangular trough 6 having an open pipe 7 set partly therein and extending across the full length of said trough 6. Parallel to and coextensive with pipe 7 is a pair of electrically conducting wires 8 the ends of which are held in blocks 9, only one of which is shown, formed of a suitable insulating material. Wires 8 are part of a normally open electric circuit including connecting posts 10 and lead wires 11 which, when closed in a manner to be described hereinafter in greater detail, activates a suitable circuit breaker (not shown) in the warp feed drive circuit and in the machine drive circuit thus halting the warp feed and the machine.

Open pipe 7 is adapted normally to contain an aqueous or other electrolyte solution 12 stored in a reservoir 13 which is withdrawn therefrom through a pipe 14 and forced upward by a centrifugal pump 15 through a regulating valve 16 which controls the rate of flow and thence through a feed line 17 into open pipe 7, the rate of flow through pipe 7 being regulated so there is a constant overflow therefrom, but not to cause flooding of trough 6. The overflow from pipe 7 cascades over the open edges thereof and falls into trough 6 from which it is returned by gravity flow through pipe 18 to reservoir 13. Pump 15 is driven by pulley 19 rotated by any suitable means (not shown).

When a yarn in warp 1 breaks, the broken end is blown downwardly by the stream of compressed air directed on the warp 1 from pipe 4 and falls across open pipe 7 and wires 8. The cascading electrolyte solution 12 pouring over the edges of open pipe 7 rapidly wets out the broken yarn and the wetted yarn in contact with each of said wires 8 closes the electrical circuit, thus immediately stopping the warp feed drive, and any other drive means which may be operatively connected to the circuit breaker thus activated.

As suitable electrolytes which may be employed in connection with the novel mechanism of my invention there may be mentioned, for example, an aqueous solution of the dioctyl ester of sodium sulfosuccinic acid, sodium lauryl sulfate or sodium oleyl sulfate containing from about 0.5 to 1% by weight of said salts.

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It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of our invention.

Having described our invention, what we desire to secure by Letters Patent is:

1. In a textile device for operating on a travelling warp of yarns, means for guiding said warp in a given path and means for stopping the feed of said warp upon breakage of a yarn thereof, said latter means comprising an open vessel beneath and across the width of said warp, means for supplying to said open vessel electrolyte in such an amount as to maintain a constant overflow from said open vessel, electrically conducting means forming part of a normally open electrical circuit adjacent to said open vessel and extending along the length thereof, and pneumatic means comprising air under pressure directed on said warp for forcing a broken end of yarn out of the plane of the warp, the construction and arrangement being such that the broken yarn falling on the open vessel and the electrically conducting means adjacent thereto is wetted by the electrolyte and closes the normally open electrical circuit to stop the warp feed.

2. In a textile device for operating on a travelling warp of yarns, means for guiding said warp in a given path and means for stopping the feed of said warp upon breakage of a yarn thereof,

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said latter means comprising an open vessel beneath and across to width of said warp, means for supplying to said open vessel electrolyte in such an amount as to maintain a constant overflow from said open vessel, electrically conducting means comprising a pair of parallel wires adjacent to and separated by said open vessel forming part of a normally open electrical circuit and extending along the length thereof, and pneumatic means comprising air under pressure directed on said warp for forcing a broken end of yarn out of the plane of the warp, the construction and arrangement being such that the broken yarn falling on the open vessel and the electrically conducting means adjacent thereto is wetted by the electrolyte and closes the normally open electrical circuit to stop the warp feed.

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**Certificate of Correction**

Patent No. 2,563,906

August 14, 1951

**ALBERT A. ASTILL ET AL.**

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 4, line 2, for "to width" read *the width*;  
and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of October, A. D. 1951.

[SEAL]

**THOMAS F. MURPHY,**  
*Assistant Commissioner of Patents.*