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# STOP-MOTION MECHANISM FOR THREAD WORKING MACHINES

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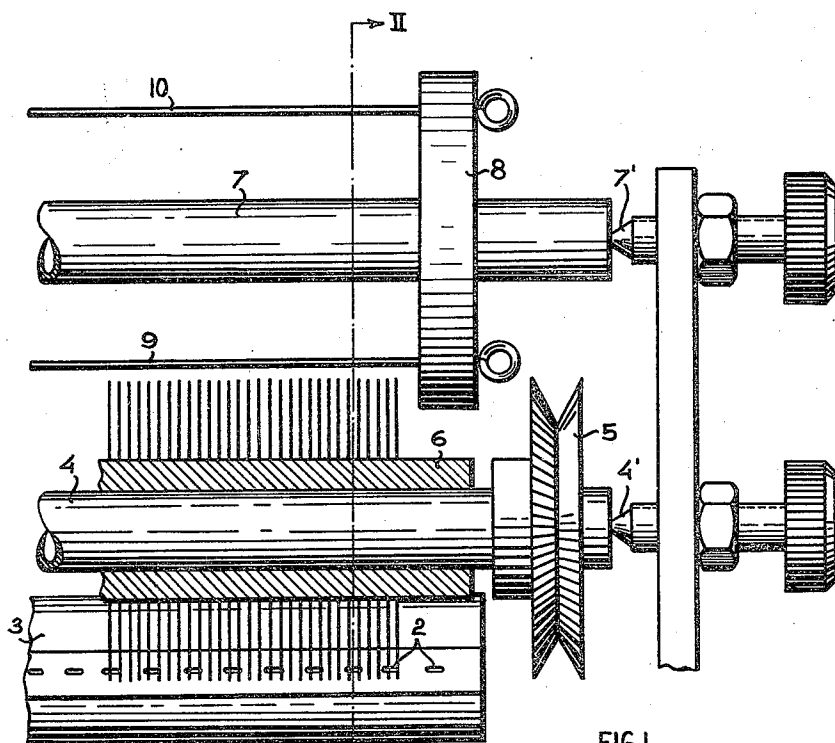


FIG. 1.

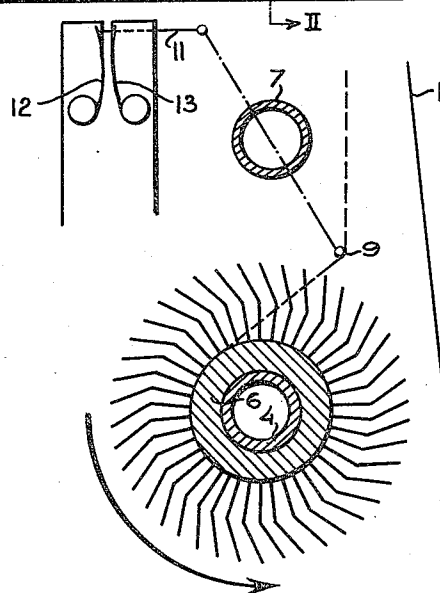
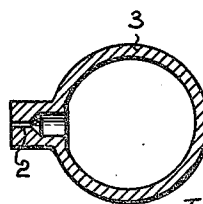


FIG.2.



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## UNITED STATES PATENT OFFICE

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## STOP-MOTION MECHANISM FOR THREAD WORKING MACHINES

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3 Claims. (Cl. 66-163)

1

This invention relates to stop-motion mechanisms for thread working machines; and more particularly has for its object to provide an improved device for stopping a warp-knitting or other machine for working a series of fine delicate threads, upon breakage of a thread.

Hitherto devices for stopping thread working machines upon breakage of a thread, have been used, comprising a series of so-called lamels through which the individual threads are passed and which upon breakage of a thread cause the machine to be stopped. These known devices, however, have various disadvantages such as the laborious threading of the individual threads through the lamels and the generation of static electricity by friction on the threads, and in particular they are not adapted for use with machines for working fine delicate threads, such as rayon and the like filaments, which are liable to be damaged by the continuous frictional contact with such lamels during normal operation.

To eliminate these and other drawbacks the present invention provides a device for the purpose referred to, in which the threads during normal operation of the machine remain entirely out of contact with any element of such device and upon breakage are only called upon to exert a very small force for bringing about the actuation of the stopping means.

To this end according to the invention there is provided on a warp-knitting frame or other machine for working threads, particularly a series of fine delicate threads, a device for stopping such machine upon breakage of a thread, said device comprising means extending along said threads and arranged for creating a continuous stream of air or other gaseous medium transverse to said threads, continuously moving catcher means extending along said threads at one side thereof, a movable member also extending along said threads at the last mentioned side thereof and in spaced relation thereto and means for stopping said warp-knitting or the like machine, said stopping means being adapted to be actuated by said movable member in response to a movement thereof caused by a broken thread being carried by said stream of air or other gaseous medium against said catcher means and being caught and so moved thereby as to engage and displace said member.

More specifically the aforesaid device comprises a nozzle extending along said threads for continuously directing a stream of air or other gaseous medium thereon, a continuously rotating

2

carded roller extending along said threads at the opposite side thereof, a rocking-frame including at least one wire or rod also extending along said threads at the last mentioned side thereof and in spaced relation thereto; and electric stopping means comprising contacts adapted to be controlled by said rocking-frame upon a rocking movement thereof caused by a broken thread being blown against and wound by said carded roller to be deflected thereby under tension about said wire or rod.

The invention will be hereinafter described with reference to the accompanying drawing, in which

Figure 1 is a fragmentary diagrammatic side elevation partly in section of one form of the improved device and Fig. 2 is a cross sectional view taken on the line II-II in Figure 1.

In Figure 2, 1 represents a series of threads, for instance the warp of a warp-knitting frame, not shown. Extending along said series on one side thereof, is a pressure-air conduit 3 having a slot-shaped nozzle 2 arranged for continuously directing a ribbon-like stream of air on said threads during operation of the machine. Facing said nozzle is a continuously rotating roller 4 mounted on centres 4' and driven by a pulley 5 (Figure 1) in the direction of the arrow, said roller also extending along said series of threads but at the opposite side thereof and being provided with carding needles 6 or other catcher means, designed for co-operation in a manner to be hereinafter described, with a light easily movable rocking-frame extending along the series of threads at the same side thereof as the roller 4. In the embodiment shown, said rocking-frame consists of a rod or tube 7 pivotably supported at its ends on centres 7' and carrying adjacent said ends transverse yokes 8 which are connected together by thin rods or wires 9, 10, the frame being so arranged relative to said carded roller 4, that the wire 9 extends parallel to and at a relatively small distance from said carded roller 4, the opposite rod or wire 10 of said rocking-frame being connected to a small rod 11 controlling a spring contact 12 for co-operation with a second contact 13, said contacts being arranged in an electric circuit containing a relay or other device for controlling the power supply to the driving means of the machine.

When the machine is in operation and breakage of a thread occurs, a free end of such thread is carried by the stream of air emerging from the nozzle 2 into the path of movement of the

rotating needles 6 to be caught thereby and wound on said roller, thereby causing the thread to be deflected under tension from its normal path, about the wire 9, thus effecting a rocking movement of the frame about the centres 7<sup>1</sup> in the sense of closing the contacts 12, 13 and thereby stopping the machine.

The device described is very sensitive and operates very quickly. It is absolutely reliable and enables the control of a plurality of machines by a single operator, such control, if desired, being aided by a system of acoustic or light signals.

As during normal operation, the threads are not in frictional contact with any element of the device and in case of breakage are only called upon to exert the very small force required to rock the light easily movable frame and to close the electric contacts, which as they only serve to establish a relay-circuit may also be very light, the device is particularly adapted for use in machines working fine delicate threads, for which problem up to now no adequate solution has been proposed.

Although in the above the invention has been described in connection with electrically operated stopping means it will be evident that the invention is not restricted thereto as mechanical means also may be used, provided their operation requires only little force.

What I claim is:

1. Stop means for textile machines and the like operative in response to strand failure, comprising an element normally positioned adjacent a portion of the strand as it is moved along the normal path of travel determined by the machine, said element being bodily movable in a direction transverse to said strand portion, means operable by said movable member, upon movement thereof, to effect stoppage of the machine, a rotatively operated carded member positioned adjacent said strand portion, and means for maintaining a continuous flow of a gaseous medium operative upon strand failure forcibly to move the relaxed portion thereof laterally into engagement with said carded member to be caught and tautened thereby, said carded member being arranged with respect to said movable element so as to cause said tautened strand portion to move said element for operating said stopping means.

2. Stop means for textile machines manipulating a plurality of substantially parallel strands comprising a rocking frame including at least one

wire normally positioned to extend adjacent and along a portion of said strands as they move along the normal path of travel determined by the machine, means operable by said rocking frame, upon movement thereof, to effect stoppage of the machine, a rotatively operated carded member positioned adjacent said strand portion and means for maintaining a continuous flow of a gaseous medium operative upon failure of at least one strand forcibly to move the relaxed portion thereof laterally into engagement with said carded member to be caught and tautened thereby, said carded member being arranged with respect to said rocking frame so as to cause said tautened strand portion to rock said frame for operating said stopping means.

3. Stop means for textile machines manipulating a plurality of substantially parallel strands comprising a rocking frame including at least one wire normally positioned to extend adjacent and along a portion of said strands as they move along the normal path of travel determined by the machine, electrically operated means to effect stoppage of the machine, a single circuit control switch element adapted to be operated by said rocking frame upon movement thereof to actuate said stopping means, a rotatively operated carded member positioned adjacent said strand portion, and means for maintaining a continuous flow of a gaseous medium operative upon strand failure forcibly to move the relaxed strand portion laterally into engagement with said carded member to be caught and tautened thereby, said carded member being arranged with respect to said rocking frame, so as to cause said tautened strand portion to move said frame for operating said switch element.

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