Aug. 24, 1948. R. R. BARNES ET AL 2,447,553

STOP MOTION MECHANISM

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Fig. 1.

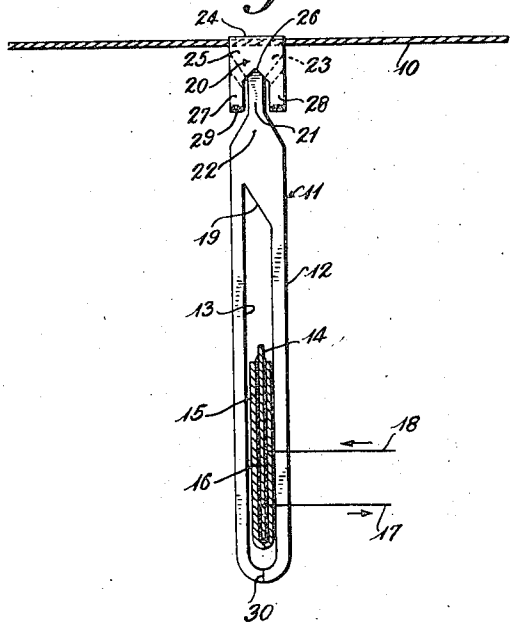



Fig. 3.

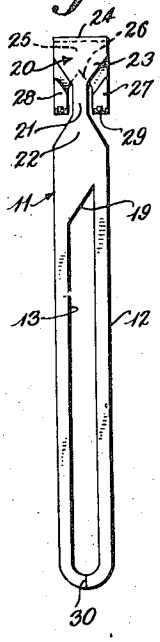



Fig. 4.

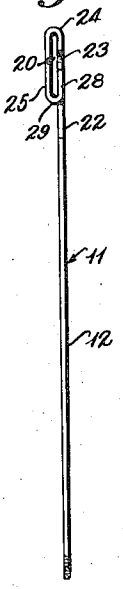
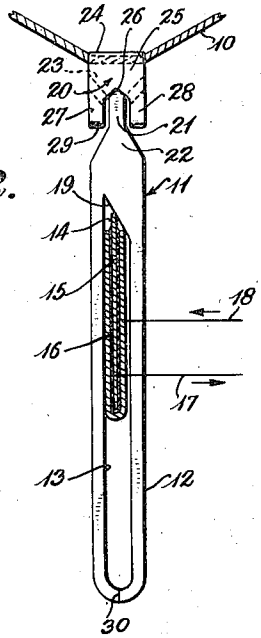



Fig. 2.




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## STOP MOTION MECHANISM

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3 Claims. (Cl. 28—51)

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This invention relates to looms, slashers, creeling apparatus and the like and is more particularly related to drop wire stop motion apparatus for detecting and localizing thread breakage in such apparatus while concurrently effecting stoppage of the machine until corrective action has been completed.

In textile apparatus such as looms, slashers and creeling machines, a large number of closely spaced parallel threads are handled in the machine and because of the difficulties encountered in locating a broken thread under such circumstances, devices have been developed to detect and indicate the location of thread breakages and at the same time to stop the machine until corrective measures have been taken. One of the most widely used devices for the foregoing purpose is the drop wire stop motion.

The drop wire is really an electrical switch which is held by the thread in circuit opening position and which, upon thread breakage, falls to a circuit closing position, thereby indicating which thread has been broken and also stopping the machine. The drop wires are supported from each of the various parallel threads by passing each thread through an eyelet in the drop wire and then leading it to the point of destination. It is, of course, apparent that this operation must be performed in cases when the machine is initially threaded up or when changing the number of ends of threads, or when tying breaks after the thread has for some reason become disengaged from the eyelet. These threading up operations have heretofore been time consuming in the textile arts where drop wires are necessary.

Quite a problem was involved by the use of the standard type of drop wire when it became necessary to change the number of ends of thread or to shift threads that had become crossed during their passage from the slasher to the beam. The threads had to be broken and taken out of the eleyets, rethreaded into other eyelets and tied together. With the use of the self-threading type hereinvolved it is a simple matter to disengage the thread from the eyelet and remove either the drop wire or the thread.

It is therefore an object of the present invention to facilitate the installation and threading of drop wires in such a way as to reduce the amount of time required in installing and threading up drop wires in machines such as slashers and looms.

It is contemplated according to the present invention to provide a self-threading drop wire so that the operator may lead each thread from its source to its destination and then quickly and conveniently pass the thread into a self-threading eyelet provided in each of the drop wires.

It is a further object of this invention to provide a drop wire with a self-threading eyelet

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which can be manufactured from a single sheet of suitable material and yet in which the eyelet will securely envelop the thread so that the operation of the drop wire is entirely reliable.

Another object of this invention is to provide a self-threading drop wire from which the thread can be easily and quickly disengaged.

Other objects and advantages of the invention will be apparent upon consideration of the following detailed description of a preferred embodiment thereof in conjunction with the annexed drawings wherein:

Figure 1 is a view in elevation of a thread supported drop wire constructed in accordance with the present invention and shown in association with conventional electrical control means;

Figure 2 is a view similar to Figure 1 but showing the position assumed by the drop wire in the event of thread breakage;

Figure 3 is a view in elevation of the drop wire taken from the opposite side thereof from Figure 1; and

Figure 4 is an end view of the drop wire.

Referring now to Figure 1, the reference numeral 10 indicates a thread passing from a source, not shown, to a destination, not shown, such as a thread passing from a storage package mounted on a creel to a beam. It is understood that the thread 10 constitutes one of many parallel threads which are being wound simultaneously onto the beam in the manner of conventional practice. In order to afford an indication of thread breakage, and in order to stop the apparatus until corrective measures have been completed, there is associated with each thread 10 a drop wire 11 having a shank portion 12 provided with an elongate aperture at 13 in which there are located electrodes 14 and 15 which are separated by insulating material 16. The electrodes 14 and 15 are entirely conventional and each is connected through electrical conductors 17 and 18 to a circuit, not shown, which serves to indicate the location of a thread break and to stop the apparatus until the broken ends have been tied.

In view of the fact that the electrodes 14 and 15 are separated by insulating material 16, it is apparent that the Figure 1 position of the drop wire is the open circuit position. The shank of the drop wire, which is of metal, is provided at the upper defining edge of the aperture 13 with a bevel 19 which in the Figure 2 position of the drop wire, causes the circuit between electrodes 14 and 15 to be closed.

The top of the drop wire is provided with a thread eyelet 20 through which the thread 10 passes. So long as the thread 10 is unbroken and is subjected to normal tension, the drop wire will be suspended and will be maintained in the Figure 1 position. Should the thread 10 break,

however, the drop wire, no longer suspended by the thread 10, will fall to the Figure 2, or circuit closing, position.

The foregoing description has been concerned with conventional phases of the present apparatus and has been included in order to clarify the improvement constituting the present invention. One improvement of the present invention relates to the structure and mode of operation of the eyelet 20 at the top of the drop wire 11. Upon reference to Figures 3 and 4 of the drawings it can be seen that the eyelet 20 is defined by the coaction of a bifurcated end of the drop wire with a narrow neck 21 between the upper end of the drop wire and its shank 12.

The width of the drop wire is gradually reduced at the upper end of the shank 12 to define a delta 22, the apex of which leads into the narrow neck 21. On the upper side of the neck 21 the width of the drop wire gradually increases again to define an inverted delta 23. At a point adjacent the base of the inverted delta 23 the material is bent around for 180° at 24 to define a side 25 lying in a plane parallel to, but spaced from, the plane of the deltas and the connecting neck 21. The side 25 at about its middle point is cut out centrally at 26 to define two tines 27 and 28. These tines are bent over for 180° at 29 to lie adjacent, but in spaced relation, to the neck 21. The ends of the tines 27 and 28 are beveled in a sense complementary to the delta 23.

The tines 27 and 28 with the neck 21 and the delta 23 define a tortuous passageway at one side of the eyelet 20. The side 25 and the bends at 24 and 29 complete this eyelet. The spaces between the tines and the neck 21 and delta 23 constitute a tortuous access opening, whereby a thread may be introduced into the eyelet 20 without passing a thread end through the eyelet.

The manner in which threading of the eyelet 20 is effected will be apparent from the foregoing description. The thread is passed underneath the neck 21, as viewed in Figure 3, and over the tines 27 and 28. It is then pulled upwardly by the operator until it can pass between tines 27 and 28 and the sloping sides of the delta 23, whereupon it will fall behind said tines. With the foregoing arrangement for threading the eyelet 20, it is apparent that it is not necessary to pass a thread end through the eyelet. Accordingly, in threading up any machine which requires drop wires, the thread can be led from its source to its destination and then passed through the eyelet of the drop wire in the manner heretofore described. Furthermore, in the event of breakage and disengagement of the thread it may be tied and then passed into the eyelet 20 which is much more convenient than the former method of passing an end through the eyelet and then effecting the tying. In case it is desired to disengage the thread from the eyelet 20, it is a simple matter to draw the thread over the tines and delta 23 and thence underneath the neck 21.

Upon reference to Figures 1, 2 and 3 it will be noted that at the bottom of the shank 12 of the drop wire 11 there is provided a slit at 30 which permits the drop wire to be passed over the top of the electrodes during installation. It is contemplated that the drop wire of the present invention be made of stainless steel, Monel, chromium plated steel, plated brass or other metal which is more or less deformable. The eyelet can



be made, as shown, integral with the remainder of the drop wire and to install the drop wire on the electrodes it is only necessary to bend the vertical sides of the shank portion 12 in opposite directions to create a large enough gap at 30 to permit the drop wire to be passed vertically over the electrodes. By this arrangement it is possible to install drop wires conveniently in inaccessible places.

While the present invention has been described with respect to a single embodiment thereof in which the entire apparatus is made from a single blank, it is apparent that various structural and dimensional modifications may be made to adapt the invention to different methods of manufacture and different types of thread handling machines.

What is claimed is:

1. In a drop wire adapted to be supported by a thread in a raised position and having a shank portion which in a lowered position of the wire, coacts with machine control means, means defining a thread eyelet including a first side connected to the shank portion, a second side connected to the first side and tines extending from the second side into the plane of the first side, said tines defining with the material of said first side slots for the passage of thread laterally into the eyelet.

2. In a drop wire adapted to be supported by a thread in a raised position and having a shank portion which in a lowered position of the wire, coacts with machine control means, means defining an eyelet including a narrow first side connected to the shank portion, a second side connected to the first side and tines extending from the second side into the plane of the first side in spaced relation thereto, the cumulative width of the tines, the narrow first side and the spaces therebetween being equal to the width of the second side.

3. In a drop wire adapted to be supported by a thread in a raised position and having a shank portion which in a lowered position of the wire, coacts with machine control means, means integral with the shank defining an eyelet, said means including a first side in the plane of the shank portion, a second side supported from the upper portion of the first side in a plane parallel to said first side and tines extending from the bottom of the second side into the plane of the first side in spaced relation to said first side and defining therewith spaces for the lateral passage of the thread into the eyelet.

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