Feb. 25, 1969 J. CVACH 3,429,146

ELECTRICAL WARP STOP MOTION FOR TEXTILE MACHINE

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Fig. 5

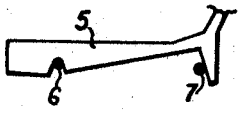


Fig. 6

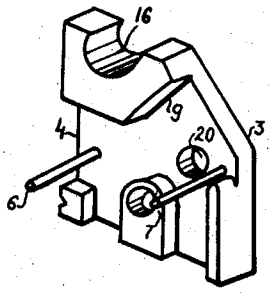


Fig. 7

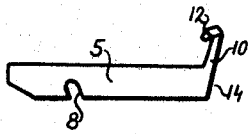
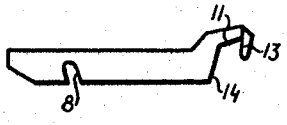


Fig. 8



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ELECTRICAL WARP STOP MOTION FOR TEXTILE MACHINE

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Fig. 1

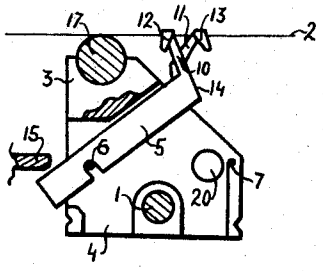


Fig. 2

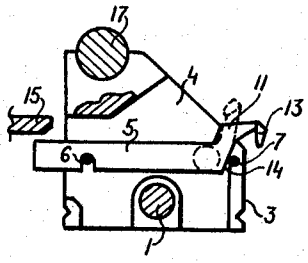


Fig. 3

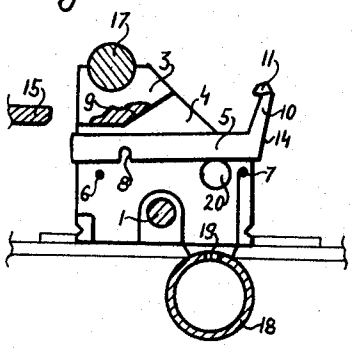
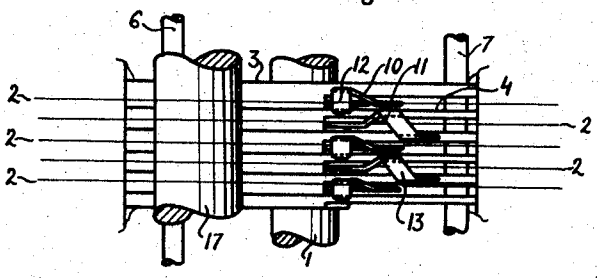


Fig. 4



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ELECTRICAL WARP STOP MOTION FOR TEXTILE MACHINE

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U.S. Cl. 66—163 6 Claims
Int. Cl. D04b *35/14;* D02h *13/08;* D03d *51/28*

ABSTRACT OF THE DISCLOSURE

A plurality of spaced support members are mounted with a pair of electrically conductive members extending between these support members. Each of the support members has a switching member pivotally mounted on one of the contact members for movement between a raised position in which the support member is hooked onto a running thread, and for gravity descent when the thread breaks so as to engage the second electrically conductive contact member and close a circuit for producing a signal.

The present invention is concerned with an electrical warp stop motion for textile machines, particularly high speed warp knitting or stitch-knitting machines for the production of non-woven textiles by stitch-knitting fibre webs.

The warp stop motions hitherto known are rather complicated and not quite reliable in their function, especially as far as their application in high speed machines is concerned.

The high-speed stitch-knitting machines hitherto known have no suitable warp stop motion at all, whereby the productivity of the machine is detrimentally affected, together with an increase of attendance costs.

The stop motion according to the present invention has the purpose to overcome said disadvantages, said stop motion being universal to such an extent, that it is possible to apply the electro-optical principle, the substance of said stop motion residing upon the fact that their switch members are situated freely swingable in the recesses of the members on the contact conductor, said switch members being furthermore equipped with an inclined switching surface, their elements for hinging into the warp threads being alternately overset in two rows, whereby parts of the switch members are arranged in the area of engagement of the batten for swinging the switch members into the position for hinging them on to the warp threads.

An embodiment of the present invention in form of example is shown in the accompanying drawings.

FIG. 1 represents a side view of one stop motion member in the scanning position, the end of the neighbouring dropper of the next stop motion member being shown simultaneously,

FIG. 2 represents a side view of one stop motion member in the switched-on position with a dropper showing a cranked neck,

FIG. 3 shows the position of the dropper during placing or removing it from the stop motion member,

FIG. 4 represents an enlarged view from the top of several members, i.e. of a part of the stop motion,

FIG. 5 is a view of a dropper part of different embodiment,

FIG. 6 a perspective view of one stop motion member, and

FIGS. 7 and 8 an embodiment of two neighbouring droppers.

Members 3 are arranged closely beside each other on clamping bolt 1, said bolt being situated transversely below the warp threads on the machine (not shown), said members being made of insulators. Members 3 are equipped from one side by a recess 4, a switch member 5 being swingingly mounted in said recess. One switch member 5 being mounted in each recess 4. The elements 3 of the stop motion are passed through by two contact conductors 6 and 7, said conductors being mounted in the known, not shown, stop motion circuit for stopping the machine and signalling yarn breakage. The switch member 5 is made of electrically conductive material in the form of a metal sheet dropper, said dropper being swingingly mounted with its recess 8—see FIGS. 7 and 8—on the contact conductor 6. The upper swinging movement of the dropper is limited by the inclined wall 9 of the recess, whereas the lower swinging movement is limited by contact conductor 7, as can be seen in FIG. 2. The ends of the droppers are in the form of necks, said necks being ended by small hooks, hinged on the warp threads. Principally, two types of droppers are used, i.e. droppers with straight necks 10 and droppers with cranked necks 11, as shown particularly in FIGS. 7 and 8, said droppers being arranged in such a way, that the hooks 12 of the droppers 5 with the straight neck 10 are situated in one row behind each other, whereas the hooks 13 of the droppers 5 with the cranked neck 11 in the other row. It will be noted that the advantage of two rows of hooks mutually overset is that it enables the processing of warp threads as each thread engages but one hook. Consequently, hooks 12 and 13 are alternately overset. This fact is advantageous not only from the viewpoint of production, but also of that of attendance, especially when laying the warp threads into hooks 12 and 13 of said stop motion. Each dropper is equipped with an inclined switch surface 14, co-operating during closing of the contact with the contact conductor 7. The droppers are made in such a way, that in the hinged position, in which they are considerably inclined, the traction acting through the dropper on the thread, is lower than the force acting on the contact conductor 7 during closing of the contact, said inclined contact surface 14 contributing to said situation and removing from the contact conductor 7 dust during the drop of the dropper and wedging itself between the contact conductors 6 and 7. Thereby a reliable contact is achieved without sparking. For imparting to the droppers the movement necessary for bringing them into the position for threading the warp threads a batten 15 of conventional design is used, said batten being displaced in the case of necessity by means of a current, not specified mechanism towards the bottom, being thereby brought into engagement with the shorter rear arms of the droppers, projecting from the stop motion members, swinging thereby said dropper into a position in which their hooks 12 and 13 project over the level of the warp threads 2. In FIG. 5, another embodiment of the dropper is shown, however, based on the same principle.

The bodies of the members 3 are of the same embodiment and have a recess 16—see FIG. 6. In their upper part, conductor 17 engaging said recess, said conductor being in contact with the warp threads 2 in order to remove their vibrations.

The stop motion can be advantageously equipped with a blasting device for removing dust from the space of the recess 4 of members 3, said blasting device being made in the form of a through-passing channel 18, with openings 19, leading into said recesses 4 from below. Channel 18 is connected to a pressure air source (not shown) and in case of necessity it is possible to blast the dust off the stop motion, regardless of warp threads being present or

not, as by blasting from below said warp threads **2** cannot be disengaged from the hooks **12** and **13**.

FIG. 3 shows the position of the dropper during depositing or removing it from the member **3** of the stop motion, without the necessity of dismounting said stop motion for this purpose.

In the member **3** of the stop motion, opening **20** is situated, which is covered by the dropped down dropper in the case of yarn breakage, thereby being possible to let the stop motion work on the photoelectric principle, in which case the light beam from the source, being arranged on one side of the stop motion, said beam passing through the openings **20** of the stop motion, is interrupted in the case of yarn breakage, whereby the photocell, being situated on the other side of the stop motion, generates the corresponding pulse for stopping the machine or signalling. The employment of a photocell in this embodiment is simplified by the fact that the space of the recess is very little lighted from outside, this fact being advantageous namely from the viewpoint of false signals.

The effective weight of the droppers can be adjusted by a suitable proportion of the weight of their arms with respect to the pivotal point, said point being given by the contact conductor **6** in such a way, that it is possible to achieve a traction of the order of 0.7 gr. of the dropper on the thread.

Because of the considerable length of the inclined contact surface of the dropper during the swinging movement into the closed position, the danger of false signals, originated by the vibrations of the machine or by the release of thread during knitting is practically eliminated.

The droppers are the only movable part of the stop motion, said fact affecting favourably the simplicity and the production costs of said stop motion.

The alternating layout of the hooks **12** and **13** is advantageous especially when the needles are closely spaced.

The stop motion according to the present invention can be made also in several sections, consisting of a higher number of members **3** including the corresponding elements.

I claim:

1. In an electric warp stop motion device for textile machines, the combination of support means including a plurality of abutting support members defining with one another respective cavities each having an upper open side; normally interrupted electric circuit means, including a rod-shaped electrically conductive pivot member extending through said support members and said cavities defined by the same; and electrically conductive sensing members each having a first and a thread-engaging second end portion, each of said sensing members being arranged in one of said cavities with said first end portion thereof pivotably and replaceably mounted on said rod-

shaped pivot member for gravity descent in response to thread breakage from a raised sensing position in which said second end portion thereof passes through said upper open side of the respective cavity and engages a thread, to a lowered signal-generating position in which the sensing member completes said normally interrupted circuit means.

2. In a device as defined in claim **1**, wherein said circuit means further comprise electrically conductive abutment means arranged in circuit with said pivot member and positioned to be engaged by the respective conductive member on movement of the same to said signal-generating position whereby said circuit is completed.

3. In a device as defined in claim **2**, wherein said conductive member is an elongated arm having an edge portion facing said pivot member and being provided in the region of said first end portion with a recess extending inwardly of said edge portion, said pivot member being received in said recess so that said first end portion of said arm is pivotably and replaceably supported on said pivot member.

4. In a device as defined in claim **2**; and further comprising limiting means arranged for limiting movement of said conductive member from said signal-generating position towards said sensing position for preventing movement of said conductive member beyond said sensing position.

5. In a device as defined in claim **2**; and further comprising blower means arranged to direct a stream of gaseous fluid at said conductive member for removing dust which may have settled thereon.

6. A device as claimed in claim **1**, wherein said support means consists of electrically insulating material.

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WM. CARTER REYNOLDS, *Primary Examiner.*

U.S. Cl. X.R.

28—51; 66—168; 139—353; 200—61.18