Dec. 26, 1950 H. PELCÉ 2,535,369

DEVICE RESPONSIVE TO THE UNWINDING OF A WEFT THREAD

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Fig.1.

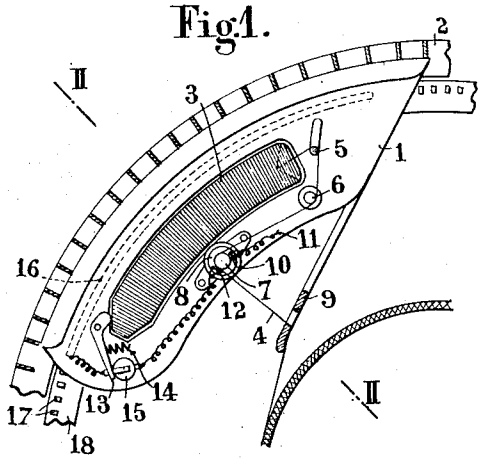


Fig.2.

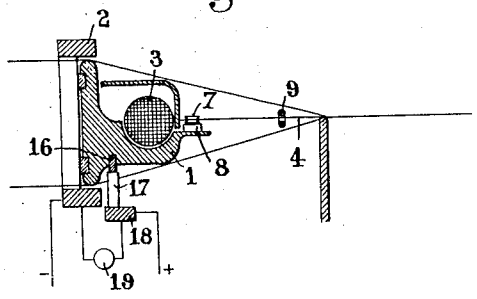


Fig.3.

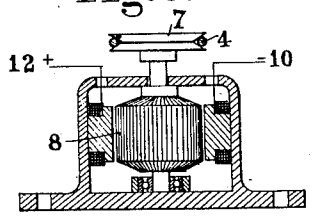
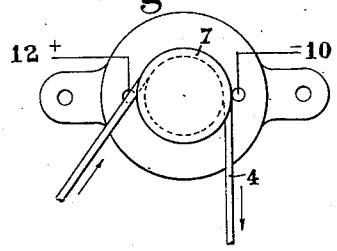


Fig.4.



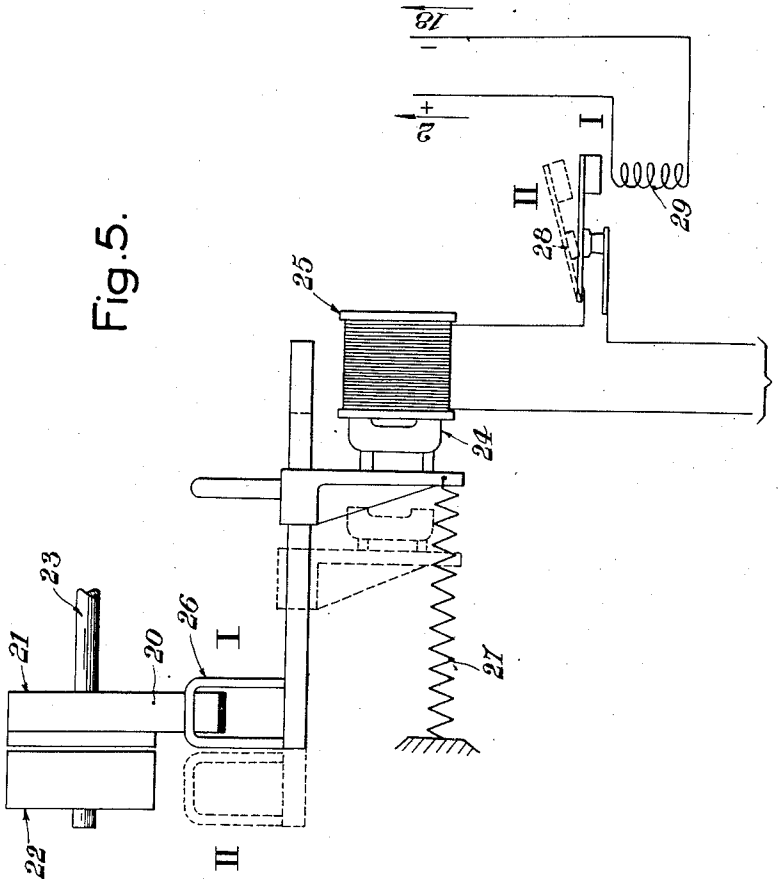
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DEVICE RESPONSIVE TO THE UNWINDING OF A WEFT THREAD

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Fig. 5.



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DEVICE RESPONSIVE TO THE UNWINDING OF A WEFT THREAD

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3 Claims. (Cl. 139—371)

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In circular weaving looms a weft stop motion is used the purpose of which is to give a warning whenever the weft thread is broken and contingently to automatically still the loom.

In all known circular loom weft stop motions a suitable, most frequently electric indicating device is kept in its set position by the tension or pull on the weft thread. Whenever the said tension sinks, or no thread is left any more, a contact will close a circuit that controls properly designed relays. The drawback with such an arrangement is that with a pull being exerted upon the aforesaid mechanism no response from the latter is to be awaited although the thread may have ceased to unwind. For instance, if the weft thread happens to break and to trail in the shed, a pull will be exerted by the trailing length of the thread, so that although no actual weaving is taking place, the weft stop motion will not respond.

The subject matter of the invention is a device adapted to perform the same function of ensuring continuousness in the weaving process except that it is responsive to the actual unwinding of the thread rather than to the pull on the same; said device is so arranged that a warning will be given as soon as the thread ceases to unwind.

In contrast to the conventional weft stop motions in which what is tested is the existence of (or the pull on) the thread, rather than the actual unwinding of the same, this device responsive to the unwinding of the weft thread is based upon dynamical principles.

The weft thread, instead of moving along in contact with a spring-loaded feeler pin as in the conventional arrangement, is trained under a definite tension round a sufficiently long arc of a small sheave (or pressed against a flat-trimmed wheel), which is rigid with the driving shaft of a small-power generator the output of which can be used for the feeding of a circuit.

In a preferred arrangement one terminal of the generator is earthed through the shuttle to the loom mass. The other terminal is insulated and connected with an insulated collector carried by the shuttle. Said collector engages the insulated shuttle track.

It follows that an electric circuit is provided between the track and the mass of a loom, through which circuit a current will flow as long as the weft thread is unwinding, whereas said circuit will be broken as soon as the unwinding ceases; it is to be understood that the reverse circuit arrangement may be used.

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It will be appreciated that the provision of such an electric circuit completed through the unwinding thread makes it possible to get a warning not only whenever the thread happens to break, but also is about to become exhausted. Nevertheless, it is preferable to be informed of the imminence of such an exhaustion before it does occur, since where such a warning is given before hand it will be possible completely to eliminate the fault consequent to the weft thread failing suddenly.

For that purpose it is only necessary to provide the end of the cop with a feeler operatively connected with a contact stud connected in series in the circuit above referred to. Although the generator may still be running, the consequent opening of the circuit will lead to the same result as the sudden exhaustion of the weft thread, and will make it possible to anticipate such an exhaustion.

Where the loom driving means (e. g. a belt adapted to run over either the fixed or the idle pulley of a pair) is held in its position by an electromagnet, it is only necessary to break the circuit for the energization of said electromagnet in order to bring the loom to rest.

Where the electric circuit completed through the unwinding thread is used to feed a relay by which the circuit through the coil of the aforesaid electromagnet is kept closed, the loom will be stopped whenever the weft thread fails to unwind. By the same reason said loom will also be stopped before the weft thread is exhausted due to the provision of the cop end feeler.

A preferred embodiment of the invention will be described hereinafter, reference being had to the appended drawing in which:

Figure 1 is a horizontal sectional view of the shuttle in engagement with the rail.

Figure 2 is a radial vertical section of the same, taken on line II—II in Fig. 1.

Figure 3 is an enlarged detail view of the generator and its driving means.

Figure 4 is a top plan view of the generator and its driving sheave.

Figure 5 is a diagrammatic view showing the driving arrangement for the loom.

The shuttle 1 slides along the rail 2; it contains a cop 3 from which the weft thread 4 unwinds. Said weft thread 4 runs over a guide hook 5, then through a tension device 6 designed to confer a certain tension upon it. Thence it is trained over a sheave 7 keyed on the shaft of a generator 8 and through an eyelet provided in a horn 9 carried by the shuttle 1 towards the warp

sheet. The respective positions of the tension device 6, the sheave 7 and the horn 9 are such that the thread will be in contact with the sheave over as much as possible of the circumference of the latter. One of the terminals 10 of the generator is earthed to the shuttle at 11 while its other terminal 12 is connected with a metal disc 15. The insulated feeler 13 consists of a small rocking lever loaded by a spring 14 that presses one of its ends against the cop windings while its other end carries a contact in sliding engagement with said disc. The lever 13 moreover is connected with an insulated metal bar 16 carried by the shuttle. Slidably engaging said bar 16 are the almost vertical strips 17 which are secured on an annular bus-bar 18 and by which the current from the generator is collected through the warp sheets.

Arranged between the rail 2 and the bus-bar 18 is a device 19 which may consist of a warning signal to be set into action as soon as current happens to fail, or of an electromagnet energized by the current. Upon said current failing the energization ceases, and a suitable mechanism is provided e. g. to shift to idle running a belt and consequently to stop the loom.

Referring to Fig. 5, power for the loom is supplied through a drive belt 20 which is adapted to engage either a fixed pulley 21 or an idler pulley 22 coaxially mounted on shaft 23. The belt 20 is movable into engagement with fixed pulley 21 to drive the loom or into engagement with idler pulley 22 to stop the loom by means of a clutch fork 26. The armature 24 of an electromagnet 25 is integral with clutch fork 26 and is urged away from electromagnet 25 by a spring 27. When the electromagnet 25 is energized, the spring 27 is under tension and the clutch fork-armature unit is in position I shown in heavy lines in Fig. 5. In this position, belt 20 rides on pulley 21 and drives the loom. Upon release of the armature 24 by electromagnet 25, the spring 27 automatically draws the unit to the left to position II (shown in broken lines), thereby shifting belt 20 to idler pulley 22 and stopping the loom. The electromagnet 25 is fed by means of a relay 28, the excitation coil 29 of which is connected to the rail 2 and to the bus-bar 18.

The loom is started by manually setting the belt on the fixed pulley 21. As the loom runs, the generator 8, driven by the weft thread, produces a current which closes the relay 28 and energizes the electromagnet 25. If the relay operating circuit is opened, the electromagnet 25 is no longer energized and under the action of spring 27, the loom is stopped.

The warning is given, or even the loom stopped, in whichever case when the generator ceases to be driven due to the thread being broken and running loose in the groove of the sheave or when the feeler, due to the cop being nearly exhausted and although the generator may still be running, has assumed such a position that the circuit is broken at the contact of said feeler.

Alternatively, the connections to the generator could be reversed, when the current from the same would be transmitted through a brush insulated from the shuttle to the rail which then would have to be insulated while the other terminal would be earthed by means of a circuit leading through the feeler contact, the shuttle and the vertical strips.

Further modifications may also be contemplated, notably in the positions and shape of the bus-bar, the location of the generator, the shape and location of the feeler. Various devices may also be contemplated for setting a signal or a clutch under the control of the breaking of the circuit. It is to be understood that such modifications and many other remaining within the scope of the present invention.

What I claim is:

1. In a circular loom, a device responsive to the unwinding of the weft thread from a cop contained in a shuttle, which comprises a small-power electric generator carried by the shuttle and actuated by the weft thread as the same unwinds from the cop so that the current generated will be cut off whenever the thread ceases to unwind, and means to stop the loom whenever the current thus generated is cut off.

2. In a circular loom, a device responsive to the unwinding of the weft thread from a cop contained in a shuttle, which comprises an electric current generator composed of a stator carried by the shuttle and a rotor, a sheave keyed on the rotor shaft, the weft thread being trained about the sheave and means to stop the loom as soon as the current generated happens to fail.

3. In a loom, a device responsive to the unwinding of the weft thread from a cop contained in a shuttle, which comprises an electric current generator composed of a stator carried by the shuttle and a rotor, a sheave keyed on the rotor shaft, the weft thread trained about said sheave, a circuit adapted to be fed with the current generated by the generator, means adapted to open the circuit as soon as the cop is about to become exhausted and means to stop the loom whenever the current generated in said circuit is cut off.

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