

[54] DEVICE FOR REGULATING THE TENSION IN A RUNNING WEB

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[22] Filed: **Dec. 6, 1973**

[21] Appl. No.: **422,368**

[30] Foreign Application Priority Data

Dec. 11, 1972 Sweden..... 16138/72

[52] U.S. Cl..... **226/44; 318/6**

[51] Int. Cl.²..... **B65H 23/22**

[58] Field of Search..... 226/44, 42, 29, 30; 318/6

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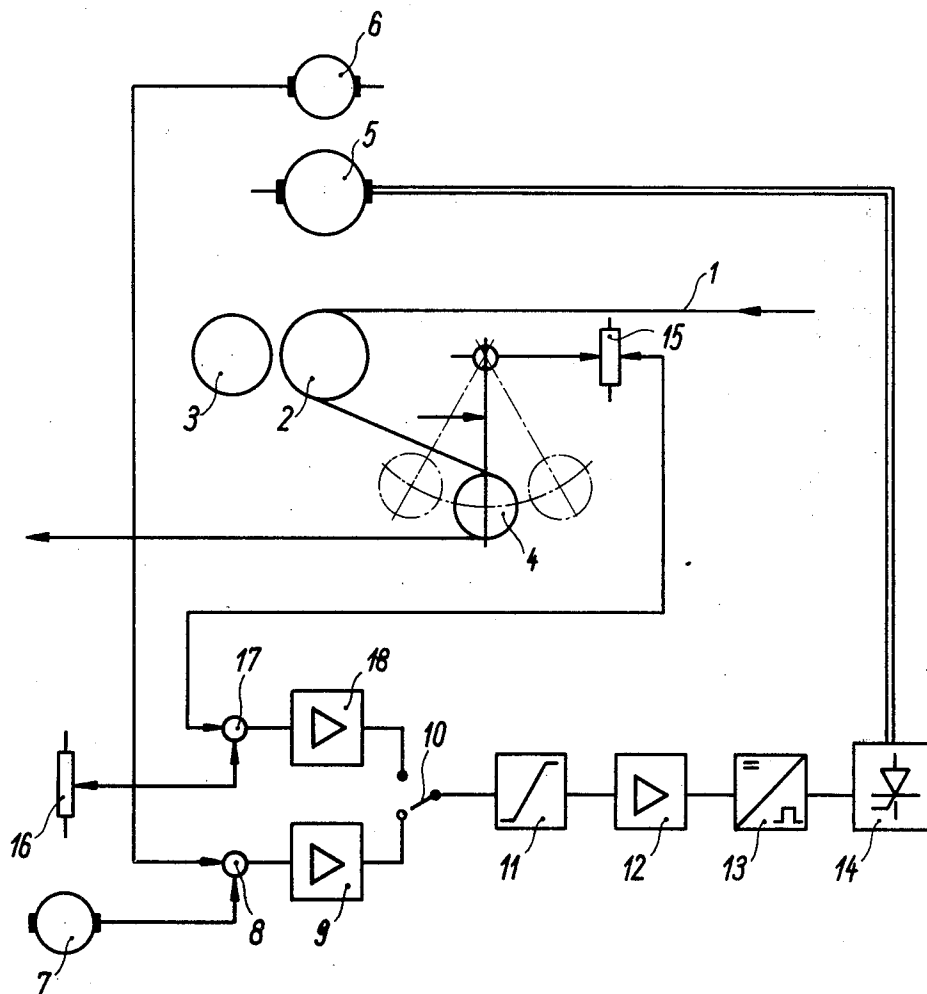
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ABSTRACT

To regulate the tension in a running web, such as a paper web entering a rotary roll printing press, the web is introduced between a take-off roller and a pressure roller and, after its passage over the take-off roller, it moves over a pendulum roller for subsequent passage to the printing press. A tachometer-generator is connected to the motor driving the take-off roller and another tachometer-generator is connected to the drive motor for the introduction of the paper web and the values obtained from these tachometer-generator are compared in a mixing point and the take-off roller motor is regulated over a comparison-speed regulator through a reversing switch and a line connected to the take-off roller motor. If the speed of travel of the web is increased, regulation of the take-off roller motor is achieved over a comparison-position regulator connected through a mixing point to two potentiometers, one connected to the pendulum roller and another providing a nominal value, the comparison-position regulator is also connected to the take-off roller motor through the reversing switch and the line.

1 Claim, 1 Drawing Figure



DEVICE FOR REGULATING THE TENSION IN A RUNNING WEB

SUMMARY OF THE INVENTION

The present invention is directed to a device for regulating the tension in a running web, such as a paper web entering a rotary roll printing press after its passage between a take-off roller and a pressure roller and, more particularly, it concerns an arrangement for comparing actual and nominal values and, based on the comparison, regulating the take-off roller motor.

It has been known to use pendulum or compensating rollers to keep the tension in a running web constant. However, it has been found that stoppages and other problems occur during the introduction and passage of the web in machines using the known pendulum or compensating roller arrangements, because these arrangements are effected over a field regulation and require a relatively long path for conditioning the pendulum or compensating rollers.

The primary object of the present invention is to overcome the shortcomings of the devices used in the past for regulating the tension in running webs.

Therefore, in accordance with the present invention, a comparison-speed regulator and a comparison-position regulator are connected to a motor for the take-off roller over a line and a reversing switch is provided in the line so that one of the regulators can be selectively connected to the take-off roller motor. A tachometer-generator is connected to the take-off roller motor and another tachometer-generator is provided connected to the main motor for the introduction of the paper web and the values obtained from these members are compared in a mixing point and conveyed to the comparison-speed regulator for the regulation of the take-off roller motor. In the line between the reversing switch and the motor for achieving the desired regulation, there is arranged in series a nominal value limiter, an amplifier, an impulse stage and a power unit. If the web is signalled to increase its speed, regulation is provided through a potentiometer connected to the pendulum roller and to another potentiometer which provide actual and nominal values to the mixing point so that the regulation of the take-off motor is effected through the nominal-actual value comparison-position regulator when the reversing switch selectively connects this regulator through the line and the members contained in the line to the take-off roller motor.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWING

The drawing is a schematic illustration of apparatus embodying the present invention.

DETAILED DESCRIPTION OF THE INVENTION

In the drawing, a paper web 1 is shown running from a roll changer, not illustrated, and passing between a take-off roller 2 and a pressure roller 3 and, after moving over the take-off roller 2, passing around a pendu-

lum roller 4 to the printing mechanism, not shown. For the introduction of the paper web, a motor 5 is connected to the take-off roller and a tachometer-generator 6 is associated with the motor 5 and another tachometer-generator 7 is connected to the main motor, not shown, for the introduction of the paper web. The values obtained from the tachometer-generators are directed to a mixing point 8 which in turn is connected to a nominal-actual-value comparison-speed regulator 9 for effecting the regulation of the motor 5. A line extends from a reversing switch 10 to the motor 5 and this line contains, in series, starting from the reversing switch, a nominal value limiter 11, an amplifier 12, an impulse stage 13, and a power unit 14. As can be noted, the reversing switch is selectively displaceable between two separate positions for effecting the regulation of the motor 5 and the control of the tension in the running web. If a signal is delivered for higher speed operation, a potentiometer 15 is connected to the pendulum roller 4 and another potentiometer 16 is provided and both of them are connected to another mixing point 17 which is, in turn, connected to a nominal-actual-value comparison-position regulator 18 for the regulation of the motor. The regulator 18 is arranged to be selectively connected through the reversing switch 10 to the line connected to the motor 5 for providing the desired regulation of the motor.

Depending on the conditions experienced in the passage of the web to the printing press, regulation of the motor 5 is selectively achieved through the connection of the reversing switch 10 to one of the regulators 9, 18.

In the arrangement embodying the invention, the regulation is effected in the armature circuit of the motor so that a sensitive, quick-acting regulation is obtained and a pendulum roller with a short path can be used to insure constant paper tension.

Not only is the regulation achieved during the introduction of the web, but also during the entire run-off of the roll carrying the web, and a constant web tension can be attained particularly with automatic gluing.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. Device for regulating the tension of a running web, such as a paper web entering a rotary roll printing press, including a take-off roller, a pressure roller associated with said take-off roller, and a pendulum roller located downstream of said take-off roller in the path of travel of the web, so that the web passes between said take-off roller and said pressure roller and over said take-off roller before it passes over said pendulum roller and onto the printing press, wherein the improvement comprises a motor for said take-off roller, a first tachometer-generator associated with said take-off roller motor for providing a first value, a second tachometer-generator associated with the main motor for pulling the web for providing a second value, a first mixing point in communication with said first tachometer-generator and said second tachometer-generator for comparing the first and second values obtained therefrom, a comparison-speed regulator in communication with said first mixing point, a line connected at one end to said take-off roller motor, a reversing switch connected to the other end of said line

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and selectively connectable to said comparison-speed regulator, a nominal value limiter, an amplifier, an impulse stage and a power unit arranged in series in said line between said reversing switch and said take-off roller motor so that the regulation of said take-off roller motor can be effected over said comparison-speed regulator and said line, a first potentiometer in operative communication with said pendulum, a second potentiometer for a nominal value, a second mixing point con-

nected to said first and second potentiometers, a nominal-actual value comparison position regulator connected to said second mixing point and selectively connectable through said reversing switch to said line so that said reversing switch can be positioned for connecting said take-off roller motor to one of said comparison-speed regulator and said comparison-position regulator.

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