

1,304,565.

The diagram illustrates a mechanical system, possibly a telegraph or signaling device, consisting of two identical units connected by a central cable. Each unit features a large wheel (1, 5) at the top, a gear (12, 21) below it, and a lever (9, 24) connected to the gear. The lever is pivoted on a point (18, 22) and has a weight (11, 23) attached to its end. A spring mechanism (13, 26) is connected to the lever and the gear. The units are connected via a central cable (3) and a series of pulleys (8, 19). The diagram is labeled with various numbers (1-29) and letters (A, B) indicating specific components and connections.

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WINDING MECHANISM.

1,304,565.

Specification of Letters Patent.

Patented May 27, 1919.

Application filed May 16, 1914. Serial No. 839,049.

To all whom it may concern:

Be it known that I, CLARK T. HENDERSON, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Winding Mechanisms, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to winding mechanisms for fabrics and other materials.

The invention may be advantageously employed in various different relations as, for example, in connection with mechanisms such as that disclosed in my co-pending application Serial No. 833,229, filed April 20, 1914. Said application discloses means for feeding a roll of material to a calendering machine and the present invention may be advantageously employed in connection therewith to rewind the material as it leaves the calendering machine. It should be understood, however, that the invention is in no wise limited to this particular use thereof.

For the purposes of illustration I have schematically illustrated the present invention as employed in the aforesaid relation and this embodiment thereof will now be described.

The drawing schematically shows a roll of material 1, fed by a mechanism 2 to a calendering machine exemplified by a plurality of sets of rolls 3, from which it is delivered to a mechanism 4 and thereby fed to a rewinding device 5.

The feeding mechanism 2 is like that disclosed in my co-pending application aforesaid, and briefly described comprises three rolls 6, 7 and 8, the rolls 6 and 8 being fixed and the roll 7 being carried by a pivoted frame 9 limited in its downward movement by a stop 10. The material upon leaving the roll 1 is first passed over the roll 6, then beneath the roll 7 and over the roll 8. The rolls 6, 7 and 8 thus constitute the slack take up, while the adjustable roll 7 acts to tension the material, the frame 9 being provided with a weight 11 to give the desired tension. The roll 6 is positively operated through gearing 12 by an electric motor 13 in a direction to unwind the material from roll 1 and feed said material to the calendering machine. The motor 13 in turn is controlled by a rheostat 14 to maintain the

amount of slack between the rollers 6 and 8 within predetermined limits, said rheostat being governed in its operation by movement of the tension roll 7. The connection between the roll 7 and the rheostat 14 includes a rope or cable 15 passing over a pulley 16 attached to the rheostat arm, said rope having at its opposite ends weights 17 and 18, the latter resting upon the frame 9. The weight 18 is heavier than the weight 17 so that as the slack in the material increases and the frame 9 descends said weight will operate the rheostat in a direction to slow down the motor 13 and stop the same if the frame descends to a certain position. On the other hand, when the slack decreases the frame 9 is raised and the weight 17 acts upon the rheostat to move the same in a direction to accelerate the motor 13. Thus provision is made for varying the speed of the feeding roll 6 in accordance with the slack conditions which, as aforesaid, maintains the amount of slack within predetermined limits while the weighted roll 7 at all times maintains the material under constant tension.

The mechanism 4 is similar in construction to the mechanism 2 and includes a slack mechanism comprising three rolls 19, 20 and 21. The rolls 19 and 21 are fixed while the roll 20 is carried by a pivoted frame 22 provided with a weight 23 and a stop 24. The material, upon leaving the rolls 3 of the calendering machine, is carried over the roll 19, then beneath the roll 20 and over the roll 21 to the rewinding device 5.

The roll 21 is driven through suitable gearing 25 by an electric motor 26 and in turn drives the rewinding device 5. As illustrated, the roll 21 is operatively connected to the device 5 by a belt 27 and a slip clutch 28 associated with the latter. The roll 21 thus acts to feed the material from the machine to the rewinding device 5 and to operate the latter, while the roll 20 maintains the material under constant tension in its passage from the machine to the rewinding device.

As will be apparent, as the diameter of the new roll of material increases the peripheral speed thereof will increase with a consequent tendency to wind the material faster than it is fed by the roll 21. The slip clutch 28, however, meets this contingency, said clutch being set to slip at a torque sufficiently low to prevent undue strain on the material.

In practice, the material may be delivered

from the calendering machine at varying speeds and it is therefore preferred to control the speed of the feeding roll 21 similarly to the feeding roll 12. To this end 5 the motor 26 is provided with a speed regulating rheostat 29 similar to the rheostat 14. The rheostat 29 has an operating cable 16 provided with weights 17 and 18, the same as 10 the rheostat 14. Thus provision is made whereby the speed of the feeding roll 21 will be proportional to the speed at which the material is delivered from the machine, and in 15 consequence the speed of the device 5 will also be proportional to the speed of delivery. Considering the mechanism as a whole it 20 will thus be observed that the material is fed from the roll 1 at a speed corresponding to the speed of the calendering machine, being at all times maintained under constant tension and that as the material passes 25 from the calendering machine to the re-winding device it is also maintained under constant tension and its speed of delivery to the device 5 is adjusted to the speed at which it is delivered from the machine. Hence the 30 material is at all times maintained under adequate tension but never subjected to excessive strain and its slack is always maintained within certain limits.

What I claim as new and desire to secure by Letters Patent is:

1. The combination with means for feeding material from a roll to a receiving machine at a speed corresponding with the 35 speed of the latter and maintaining the material as fed under a constant tension, of a

winding device, a power driven feeding device interposed between said winding device and the machine, and operatively connected to said winding device to operate the same, 40 and means automatically controlling said feeding device to vary the speed thereof and of said winding device jointly in accordance with and proportionally to the variations in slack of the material delivered by the machine while maintaining the material under 45 constant tension.

2. The combination with means for feeding material from a roll to a receiving machine at a speed corresponding with the 50 speed of the latter and maintaining the material as fed under a constant tension, of a winding device, a power driven feeding device interposed between said winding device and the machine, and operatively connected to said device to operate the same, 55 and means automatically controlling said feeding device to vary the speed thereof in accordance with the variations in slack of the material delivered by the machine, the operative connection between said feeding 60 device and said winding device including a slippage connection for permitting slippage of the latter as the roll formed thereon increases in diameter. 65

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

CLARK T. HENDERSON.

Witnesses:

TEKLA BAST,
L. A. WATSON.