Oct. 2, 1923. 1,469,284

E. E. STRAWN

BRAKE AND TENSION DEVICE

Filed March 10, 1922

Fig. 1.

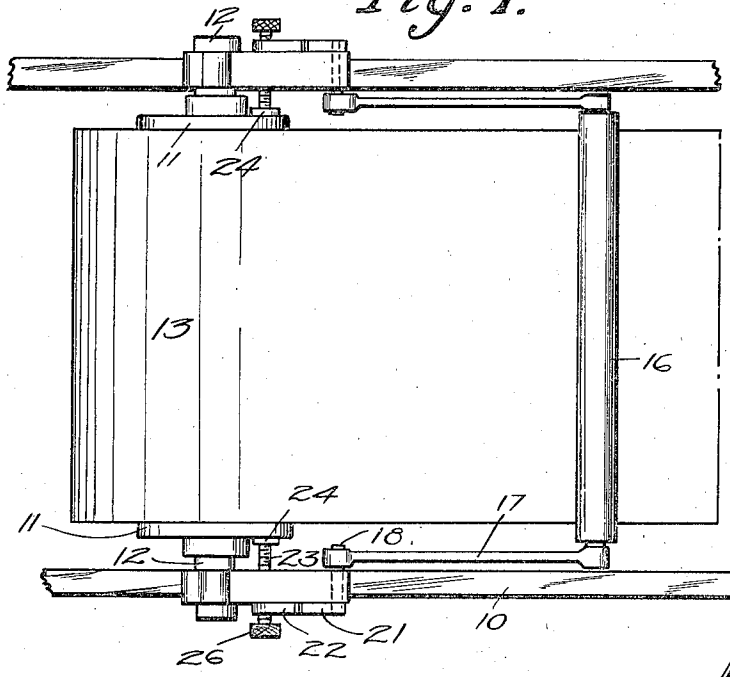


Fig. 2.

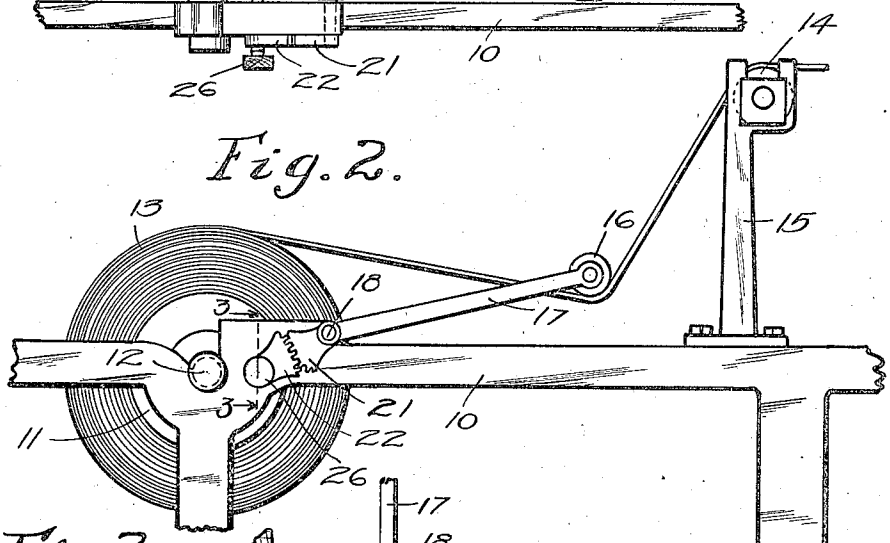
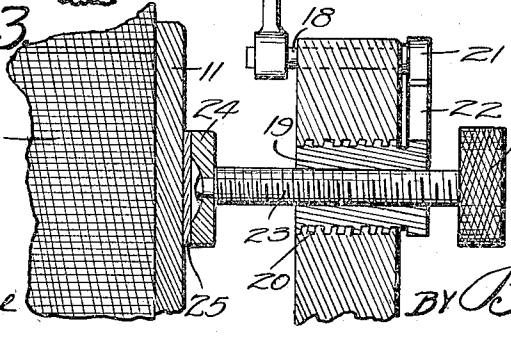


Fig. 3.



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UNITED STATES PATENT OFFICE.

ERVIN E. STRAWN, OF DES MOINES, IOWA.

BRAKE AND TENSION DEVICE.

Application filed March 10, 1922. Serial No. 542,810.

To all whom it may concern:

Be it known that I, ERVIN E. STRAWN, a citizen of the United States, and a resident of Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Brake and Tension Device, of which the following is a specification.

The object of my invention is to provide a simple, durable and inexpensive brake and tension device, peculiarly adapted for controlling a roll of paper used on a printing machine.

It is well-known that where paper is fed from a roll through a printing machine at a high rate of speed, and the machine is stopped, the momentum of the roll is likely to cause the paper to unroll more than should be the case. Then when the machine is started up again, the slack is taken up with a jerk and the paper is torn.

It is my purpose to provide a roller, which rests on the traveling strip of paper and tends to drop downwardly, when the machine stops and the movement of the paper ceases. The roller is operatively connected with my brake structure, so that when the roller moves downwardly, the brake is put into operation for preventing the further unrolling of the paper.

When the machine starts up again, the weight of the brake actuating roller on the paper strip or web maintains the strip under tension, so that the slack is not taken up with a jerk.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a top or plan view of a brake embodying my invention.

Figure 2 shows a side elevation of the same; and

Figure 3 shows a detail, vertical, sectional view taken on the line 3—3 of Figure 2.

In the accompanying drawings, whereby my invention is illustrated, I have used the reference numeral 10 to indicate generally the frame of a printing machine or the like, which supports a roll of paper and the parts of my device. The drum 11 has the flat faces at its ends, and has the spindles 12 rotatably mounted on the frame 10.

The roll of paper 13 is supported on the drum 11 and is fed from thence over a roller 14, which may be supported by brackets 15.

My improved brake and tension device consists of a roller 16 rotatably mounted on and between two parallel arms 17. The arms 17 are secured at what may be called their rear ends to spindles or shafts 18, which are arranged in alignment with each other and are rotatably mounted on the members of the frame 10.

Aligned sleeves 19 are externally screw-threaded and supported in screw-threaded openings 20 in the frame 10. The sleeves 19 are provided with internally screw-threaded portions. The internal screw-threads of the sleeves 19 are of much less pitch than the external screw-threads.

Fixed to the outer ends of the spindles 18 are gear segments 21, which are arranged to coact with gear segments 22 on the outer ends of the sleeves 19. Extended through the sleeves 19 are screw-threaded bolts or shafts 23.

On the inner end of each shaft 23 is a brake shoe, comprising a head 24 swiveled on the inner end of the shaft and having a brake pad 25 on its inner face and adapted to frictionally engage the face of the drum 11, when the shaft 23 or the sleeve 19 is adjusted longitudinally inwardly toward the drum.

On the outer end of each shaft 23 is a knurled head 26.

In the practical use of my improved brake and tension device, the device is installed as shown in the drawings and as heretofore explained.

The paper is threaded through the machine and extended underneath the roller 16 and thence over the roller 14.

Assume that the parts have been so adjusted that when the roller 16 is at its lower limit of movement, the brake shoes will be in firm engagement with the faces of the drum 11. Then when the machine is started up and the paper is pulled through, it will be seen that the slack in the paper will first be taken out, and the roller 16 will be

lifted from its lower position to a higher position.

The weight of the roller 16 will impose tension on the paper during the time the slack is being taken out, and will prevent any such jerk on the paper, as will be likely to tear it in two.

As the roller 16 is raised, the segmental gear 21 will be rotated on the shaft 18 and will operate the segmental gear 22 for rotating the sleeve 19, which will thus be screwed outwardly.

It will be understood that the screw-threads between the sleeve 19 and the frame of the machine are right-hand or left-hand threads, depending upon the location of the parts, and the necessity for screwing the sleeves outwardly, when the roller 16 is raised.

When the machine stops, the roller 16 will move downwardly, following the slack of the paper, thereby actuating the sleeve 19 for screwing it inwardly and causing the brake shoes to engage the faces of the drum 11.

It will, of course, be understood that the shafts 23 may be adjusted, as may be desired, for controlling the operation of the brake device, and also for readily permitting the brake device to be rendered inoperative.

I preferably use segmental gears on account of the saving of material and also so that if, for any reason, the roller 16 should be swung beyond a certain arc of a circle, the gears will move out of gear and be disconnected. This is in some instances desirable.

It also makes it possible to very easily shift the gears, so that different teeth of one gear may be made to engage certain teeth of the other gear for getting adjustment of the device under all circumstances.

Some changes may be made in the arrangement and construction of the various parts of my device, without departing from the essential features and purposes of my invention, and it is my intention to cover by my claims, any modified forms of structure, or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. A structure of the class described, comprising a frame, a rotary device mounted thereon, a pair of sleeves having screw-threaded axially adjustable connections with said frame, shafts having screw-threaded mounting adjustable axially in said sleeves, brake shoes on said shafts adapted to engage the rotary device, gear elements on said sleeves, a pair of arms pivoted on said frame having gear elements coacting with the respective gear elements on the sleeves, and a roller supported between said arms, whereby the raising or lowering of the roller rotates said sleeves for imparting axial movement thereto for causing the shoes to act as brakes in engagement with the rotary device.

2. A structure of the class described, comprising a frame, a rotary device mounted thereon, a sleeve having a screw-threaded connection with the frame, a shoe supported on said sleeve adjacent to the rotary device, a pivotally mounted arm, a roller supported on said arm, and means interposed between said arm and said sleeve for rotating the sleeve according to the pivotal movement of the arm for imparting axial movement to the sleeve for moving the shoe toward or from the rotary device for performing the braking function.

3. A structure of the class described, comprising a frame, a rotary device mounted thereon, a sleeve having a screw-threaded connection with the frame, a shoe supported on said sleeve adjacent to the rotary device, a pivotally mounted arm, a roller supported on said arm, and means interposed between said arm and said sleeve for rotating the sleeve according to the pivotal movement of the arm for imparting axial movement to the sleeve to bring the shoe into engagement with the rotary device to perform a braking function, said means being arranged to become inoperative when the arm swings in either direction past certain positions.

4. A structure of the class described having a frame, a rotary device mounted thereon, a sleeve having a screw-threaded connection with said frame, a brake shoe having an adjustable connection with said sleeve, a pivoted arm, a roller supported thereon, and coacting devices on said sleeve and arm, whereby the swinging of the arm rotates said sleeve in its screw-threaded mounting for imparting axial movement to the sleeve to thus move the shoe toward or from the rotary member.

5. A structure of the class described having a frame, a rotary device mounted thereon, a sleeve having a screw-threaded connection with said frame, a shoe having a mounting for axial adjustment on said sleeve adjacent to said rotary device, a bodily, swingable roller, and means for operatively connecting said roller with said sleeve for rotating the latter according to the swinging movement of the roller and thus axially moving the sleeve for causing the shoe to perform its braking function.

6. A structure of the class described comprising a frame, a rotary device mounted thereon, a pair of sleeves having a screw-threaded connection with said frame, shoes having an axially adjustable mounting on said sleeves adjacent to opposite sides of said rotary device, a pair of arms pivoted on said frame, a roller supported between

said arms and means for rotating the sleeves according to the pivotal movement of the arms and imparting axial movement to the sleeves for moving the shoes into and out of engagement with the rotary device.

7. A structure of the class described, comprising a frame, a rotary device mounted thereon, a pair of sleeves having a screw-threaded connection with said frame, shoes adjustably mounted on said sleeves adjacent to opposite sides of said rotary device, a pair of arms pivoted on said frame, a roller supported between said arms and means for rotating the sleeves according to the pivotal movement of the arms during part of said movement for thus imparting axial movement to the sleeves and causing the shoes to perform their braking function, said coacting devices being arranged to be disconnected during other parts of said movement.

8. A structure of the class described, comprising a frame, a rotary device mounted thereon, a pair of sleeves having screw-threaded connections with said frame, shoes adjustably mounted on said sleeves adjacent to opposite sides of said rotary device, a pair of arms pivoted on said frame, a roller supported between said arms and coacting segmental gear devices on said arms and sleeves for rotating the sleeves according to the pivotal movement of the arms for imparting axial movement to the sleeves and moving the shoes toward or from the rotary member in the performance of their braking function.

Des Moines, Iowa, February 3, 1922.

ERVIN E. STRAWN.