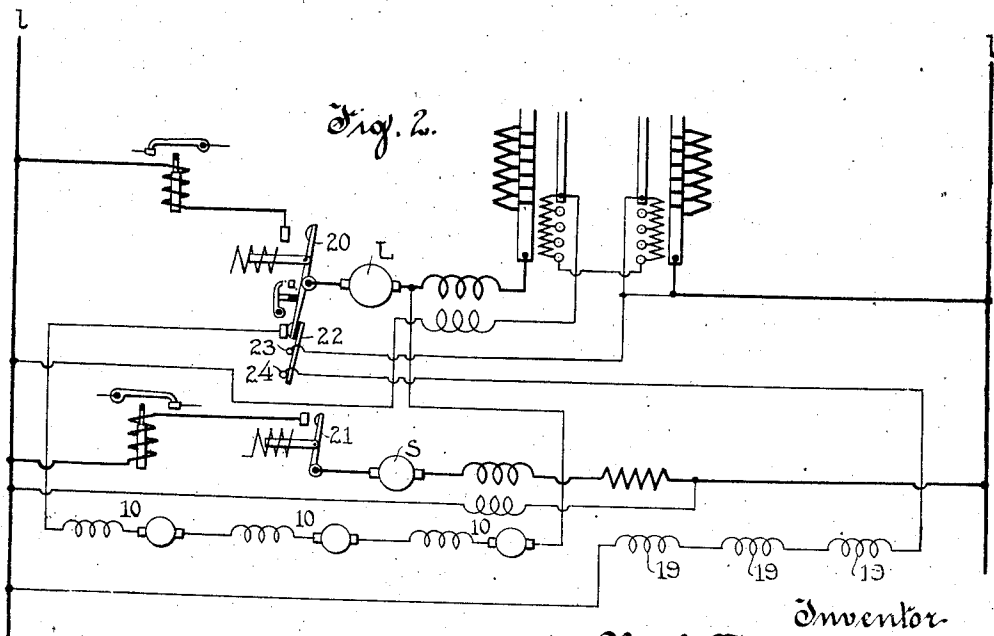
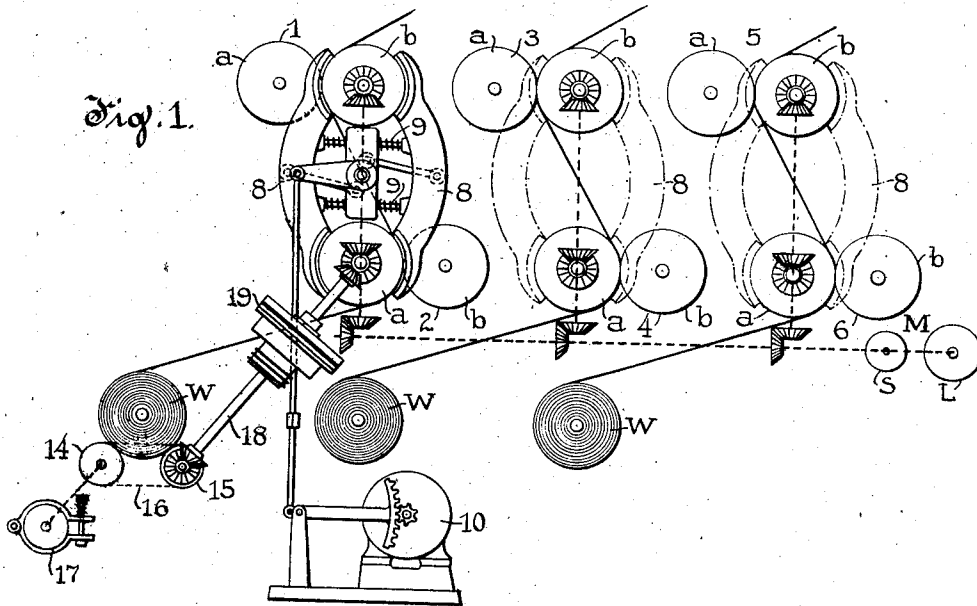


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BRAKING SYSTEM FOR PRINTING PRESSES AND OTHER MACHINES.
APPLICATION FILED AUG. 1, 1917.

1,427,461.

Patented Aug. 29, 1922.



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BRAKING SYSTEM FOR PRINTING PRESSES AND OTHER MACHINES.

1,427,461.

Specification of Letters Patent.

Patented Aug. 29, 1922.

Original application filed July 3, 1916, Serial No. 107,298. Patent No. 1,252,902, dated January 8, 1918.

Divided and this application filed August 1, 1917. Serial No. 183,837.

To all whom it may concern:

Be it known that I, CLARK T. HENDERSON, a citizen of the United States, residing at Youngstown, in the county of Niagara and State of New York, have invented new and useful Improvements in Braking Systems for Printing Presses and Other Machines, 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 braking systems for printing presses and other machines supplied with web or other material from rolls and relates more particularly to braking means for such rolls.

In my copending application, Serial No. 107,298, filed July 3, 1916, patented Jan. 8, 1918, No. 1,252,902, of which the present application is a division, there is disclosed a braking system for high speed printing presses and other machines having a high inertia which insures quick but smooth stopping thereof and the present invention has among its objects to provide means which will brake the supply roll or rolls of such a machine proportionally to the decrease in speed of the latter.

A further object is to provide roll braking means which may be brought into action at any speed of the press or other machine without undue strain on the material being fed from the roll to the machine.

A further object is to provide roll braking means including means utilizable for tensioning of the material supplied from the roll during power operation of the machine.

Other objects and advantages of the invention will hereinafter appear.

The accompanying drawing illustrates one embodiment of the invention which will now be described, it being understood that the invention is susceptible of various modifications without departing from the scope of the appended claims.

In the drawing,

Figure 1 is a schematic view of a sextuple printing press provided with braking means for both the press cylinders and the supply rolls; and,

Fig. 2 is a fragmentary diagrammatic view of a controller for the press drive and the braking means shown in Fig. 1.

Referring to Fig. 1, which is identical with the corresponding figure of said copending application, the same shows six printing couplets 1 to 6 inclusive arranged vertically in pairs and each pair supplied with a web from a roll W. The couplets are arranged in an offset relation whereby the cylinders *a* of the lower align vertically with the cylinders *b* of the upper couplets and such cylinders are subjected to a double motor drive M, including a small motor S and a large motor L. Also, one cylinder of each couplet is subjected to the action of a friction brake 8, each of said brakes being arranged to act upon two couplets. Each brake is of conventional mechanical construction and is provided with springs 9 to effect release thereof, and with a torque motor 10 for applying the same. The torque motors are, as shown in Fig. 2, and as described in said copending application, subjected to the current supplied by the motor L when driven as a generator by the press and serve to apply the brakes 8 with a varying effect approximately proportional to the kinetic energy of the press.

Referring now to the web rolls W, each of the same is supported upon two rollers 14 and 15 suitably connected as by a belt 16 for joint operation and the former having an adjustable braking device 17. Thus as the roll is revolved in unwinding it will encounter a drag in the braked roller 14 whereby the web withdrawn therefrom will be placed under a tension which may be regulated by adjustment of the device 17. On the other hand, these rollers 14 and 15 which are normally free to revolve independently of the press, are adapted to be subjected to operation by one of their respective couplets through a driving connection 18 including and controlled by an electromagnetic clutch 19. The arrangement is such that the rollers when so driven feed the web at a linear speed bearing a definite relation to the peripheral speed of the press cylinders and preferably a slightly greater speed, for ex-

ample, two per cent. Thus the drives for the rollers 14 and 15 may be established at any speed of the press without strain upon the webs and said rollers when so driven will maintain the predetermined relation between the linear speed of the web and the peripheral speed of the press cylinders.

Accordingly assuming that the cylinder braking means be brought into action at any given speed of the press, the roll braking means may be simultaneously brought into action by energization of the clutch 19, whereupon as the press slows down the web rolls will be correspondingly slowed down thus insuring against waste of material and slowing up of the press. In this connection it may be mentioned that the braking system disclosed is particularly advantageous for use in emergencies, such as upon web breakage and that in the case of high speed presses the material and time losses would be very considerable upon such occurrences in the absence of means such as described to stop the press and web roll in a very few seconds.

Referring now to Fig. 2, the same shows diagrammatically the large motor L and the small motor S, the torque motors 10 and the windings of clutches 19 and such elements of the controller disclosed in said co-pending application as are essential to an understanding of the control of the braking means. More specifically, this figure shows electromagnetic main switches 20 and 21 for the motors L and S respectively, said switches to be controlled for operation of either motor and the former to be de-energized upon web breakage. Switch 20 is of the double throw type to alternatively connect the motor L to supply lines *l*, *l'* or to establish a dynamic braking circuit across the armature of said motor, said dynamic braking circuit including the torque motors 10. Further, the switch 20 is provided with an insulated auxiliary contact 22 adapted in the dynamic braking position of said switch to bridge contacts 23 and 24 and thereby connect the clutch windings 19 across the supply line *l-l'*. Thus it will be seen that the braking motors and clutch windings will be connected in circuit immediately upon disconnection of the motor L from the supply line and will be excluded from circuit upon line connection of said motor whereby the control of both the cylinder brakes and the roll brakes will be entirely automatic.

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

1. In a braking system for a printing machine or the like supplied from a roll, in combination, braking means for the machine and control means for the supply roll to subject the latter to slow down with the machine in a given relation, said control means

including normally inactive means dependent for action upon braking of said machine.

2. The combination with a driven machine supplied with material from a roll, of braking means for said machine and means to act under the influence of said machine to subject the supply roll to slow down with said machine, the latter means including means rendering such action thereof dependent upon braking of said machine.

3. In a braking system for a printing machine having a plurality of printing couplets and a plurality of supply rolls therefor, in combination, a plurality of braking devices to brake different couplets and means to establish a driving connection between each supply roll and the couplet supplied thereby, said driving connections providing a peripheral speed of each roll equal to or greater than the peripheral speed of the couplet to which it is delivering.

4. In a braking system for printing machines or the like supplied from a roll, in combination, braking means for the machine, a roller frictionally engaging the supply roll of the machine and means to establish a drive for said roller from a part of said machine during the period of braking thereof to establish a peripheral speed of said roll bearing a definite relation to the speed of said machine and slightly in excess thereof.

5. In a control system for a printing machine or the like supplied from a roll, in combination, electro-responsive braking means for the machine, electrically controlled and normally interrupted driving connections between the machine and its supply roll and common control means for said braking means and said driving connections to effect establishment of the latter when rendering the former effective.

6. The combination with a machine supplied with material from a roll, of means to brake said machine and normally inactive means active automatically upon slow down of the machine to slow down the roll subject to control by the speed of the machine.

7. The combination with a machine supplied with material from a roll, the unwinding operation of the roll being dependent upon the pull of the material thereof by said machine, of means to brake said machine and means responsive to slow down of the machine to effect substantially proportional slow down of the roll.

8. The combination with a machine to be supplied with material from a roll, of a supporting roller for the supply roll and means to establish a drive between said machine and said roller for slowing down the roll with said machine.

9. The combination with a machine to be supplied with material from a roll, of a

supporting roller for the supply roll and means to establish a drive between said machine and said roller for slowing down the roll with said machine, said roller being operable by said machine at a peripheral speed equal to or greater than the speed of said machine.

10. The combination with a machine supplied with material from a roll, the unwinding operation of the roll being dependent upon pull of the material thereof by said machine, of means to brake said machine and means to establish a drive between said machine and its roll during slow down of the former for effecting substantially proportional slow down of the latter.

11. The combination with a machine to be supplied with material from a roll, of means to brake the roll during unwinding

thereof by said machine, means to brake said machine and means to effect additional and graduated braking of the roll upon slow down of the machine.

12. The combination with a printing machine having a plurality of printing couplets to be supplied with material from separate rolls, of individual braking means for said couplets for applying to each a braking force proportional to the speed thereof and individual control means for the supply rolls of such couplets for rendering the speed of each roll substantially proportional to the speed of its respective couplet during braking of the latter.

In witness whereof, I have hereunto subscribed my name.

CLARK T. HENDERSON.