

July 7, 1925.

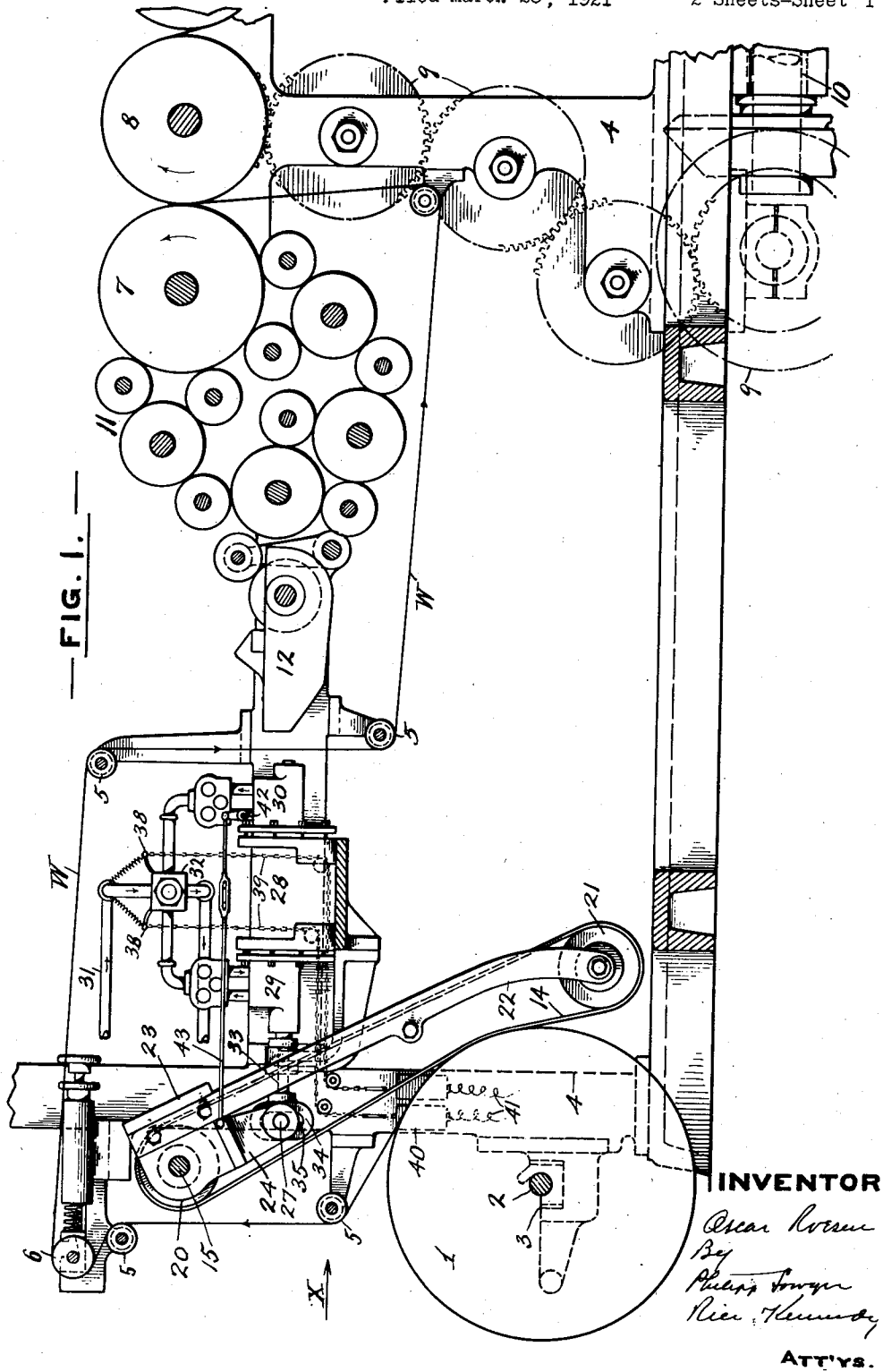
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O. ROESEN

WEB CONTROLLING MECHANISM

Filed March 28, 1921

2 Sheets-Sheet 1



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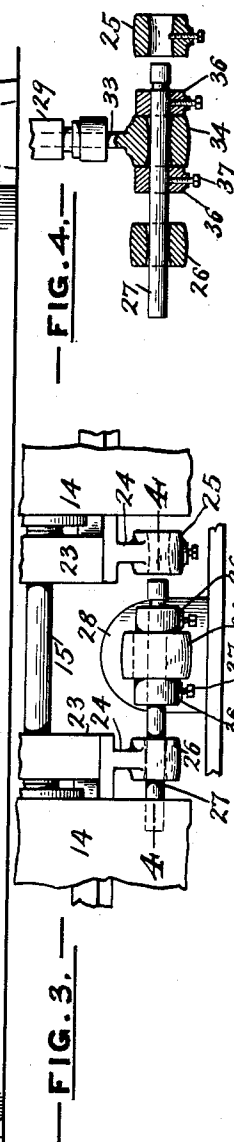
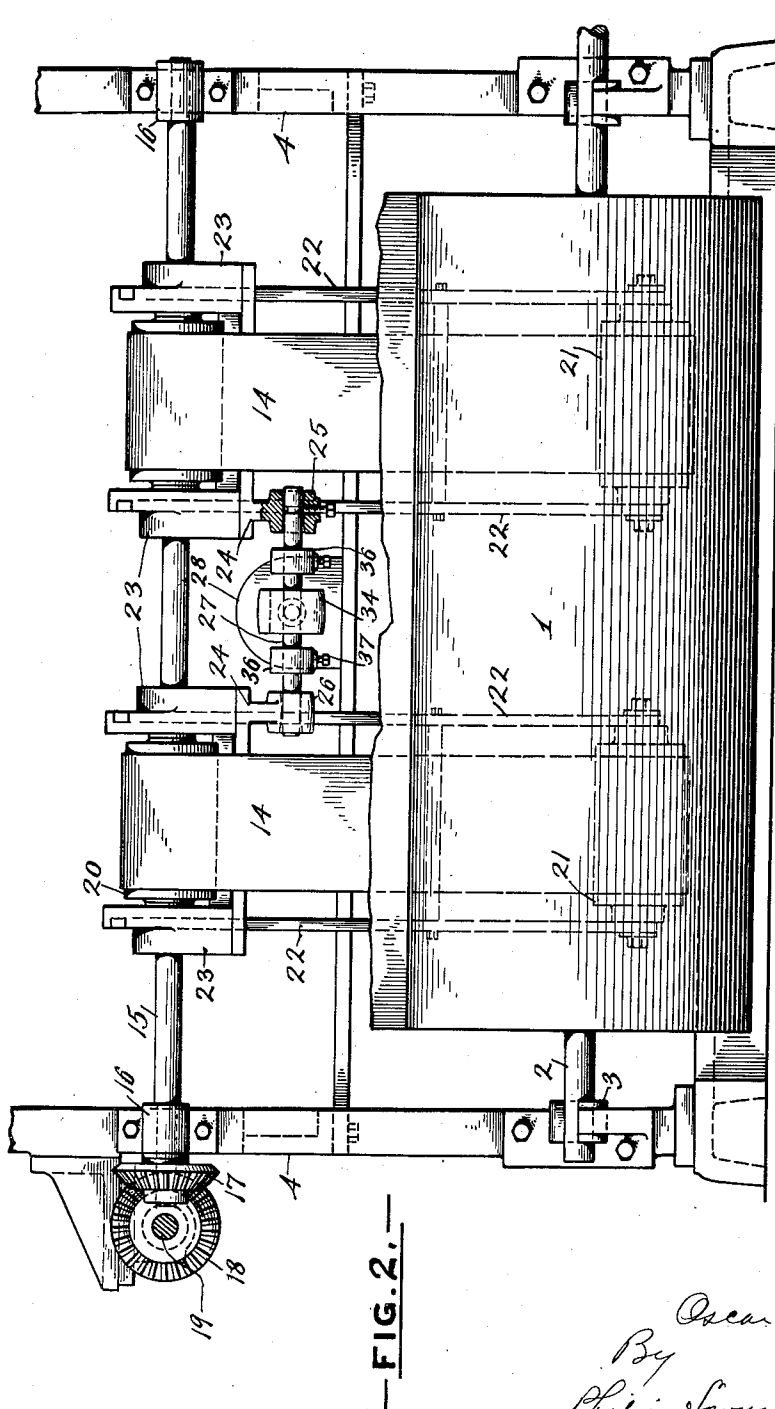
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2 Sheets-Sheet 2



INVENTOR

Oscar Noesen

By

Philip Sawyer Rice Kennedy

ATT'YS.

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UNITED STATES PATENT OFFICE.

OSCAR ROESEN, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
R. HOE & CO., INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

WEB-CONTROLLING MECHANISM.

Application filed March 28, 1921. Serial No. 456,233.

To all whom it may concern:

Be it known that I, OSCAR ROESEN, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Web-Controlling Mechanism, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in web controlling mechanism for controlling the unwinding of heavy paper rolls, such as ordinarily used in web printing machines.

It is the especial object of the present invention to produce a web controlling mechanism which will act to exert a sudden or quick braking action on the surface of the roll so as to stop the unwinding thereof in case of a break in the web or a sudden shut down of the machine to which the web is being supplied.

It is a further object of the invention to produce such a web control in which the braking pressure of the controller for effecting a quick stoppage of the roll may be varied depending on the size of the roll, so that the controller will operate to effect the maximum brake when the roll is full and heavy, the braking pressure applied decreasing as the roll decreases in size.

A further object of the invention is to produce such a web control mechanism of simple form, certain in action, and which can be installed in a machine without disarranging the web runs or necessitating changes in the mechanism of the machine, so that the control may be readily installed in machines already built if desired, as well as in new ones.

A further object of the invention is to provide such control which may be operated from any desired point in the machine, as from the control station of a printing press so that when the operator has to make a quick stop of the press he can likewise operate the web control mechanism to stop the unwinding of the roll.

A further object of the invention is to produce a web controller mechanism which may be operated to put a light tension on a web under normal running speed, to ensure an even feed of the web, or to effect the quick braking of the roll.

With these and other objects not specifically referred to, the invention consists in certain novel parts and combinations which will be described in connection with the accompanying drawings which show one preferred embodiment of the invention, and the novel features will then be pointed out in the claims hereunto annexed.

Referring now to these drawings—

Figure 1 is a side elevation partly in section, showing the improved web controlling mechanism as used in conjunction with a printing machine.

Figure 2 is an end view of the construction shown in Fig. 1 looking in the direction of the arrow *x* of that figure;

Figure 3 is a detail view, partly broken away and

Figure 4 is a section taken on line 4—4 of Fig. 3, these two figures illustrating certain detail parts of the web controlling mechanism.

Referring now to the drawings, the invention has been illustrated as used in connection with a rotary printing machine. It will be understood that it is not limited to such use, however, but is intended to be and may be used for controlling the unwinding of web rolls in other relations. As shown the web *W* is led from a web roll 1 carried on a roll spindle 2 supported to rotate freely in bearings 3 mounted on the side frames 4 of the machine. This web is led over suitable guide rolls 5 and a tension roll 6 to the printing elements of the machine shown as a form cylinder 7 and impression cylinder 8, the impression cylinder 8 being driven through a train of gears 9 from a power shaft 10 operated from any suitable source of power not illustrated. The form cylinder 7 is inked by the usual train of inking rolls 11 supplied from a fountain 12, these parts all being suitably supported in the frames 4 of the machine, before referred to.

The rolls of paper, particularly as used in printing machines, are large and heavy. As the roll is fed into the press the rolls unwind and to assist in feeding web feeding devices are usually employed which bear against the surface of the roll and exert a light tension thereon which controls the unwinding and the feed so that an even regular feed is obtained. These feeding devices are driven at the speed of the press cylinders, and the feeding devices which are usually in the

form of endless belts which take against the roll surface, take care of the feeding of the web while the machine is running at its normal speed, exerting on the roll a slight tension so as to assist in unwinding the roll and keeping the web taut. If an emergency stop is required, due to the breaking of the web, or some part of the press mechanism goes wrong and the machine is suddenly stopped for these and other reasons, this sudden stoppage, particularly where the roll is of large diameter, as in the case of a new roll, causes the roll due to its momentum to unwind, overcoming the frictional tension exerted by the belts, thus causing a slack in the web with consequent wastage of paper and very often a break in the web when the web is again picked up by the machine, which causes delay and trouble in getting the machine to again properly take the web.

In accordance with the invention, therefore, means are provided whereby in the event of a break in the web, or a sudden stoppage of the press mechanism, the paper roll or rolls will likewise be stopped from unwinding so as to prevent this slack in the web. While the particular means by which this may be done may be varied, in the best constructions and as shown, the web tension devices themselves, as the belts, are utilized to effect this braking by exerting a pressure greater than normal on the surface of the roll, so as to overcome the momentum of the roll and stop the roll from unwinding.

Various tension devices may be employed for controlling the web at its normal running speed, but as illustrated, these devices comprise endless belts 14, one or more of these belts being provided as desired or necessary, depending on the width of the roll which is being used, two such belts being ordinarily employed. These belts bear against the surface of the roll and are driven at substantially the speed of the printing couple, so that they exert a slight tension on the roll and control this unwinding and feed to the press. While these belts may be mounted and operated in various ways, in the particular construction illustrated, there is provided a shaft 15 extending across the machine and journaled in suitable bearings 16 in the side frames 4, before referred to. One end of the shaft is provided with a bevelled gear 17 which meshes with a gear 18 on a shaft 19, this shaft being driven through connections, not illustrated, from the power shaft 10 of the machine, so as to have a speed substantially that of the printing cylinders.

This shaft 15 has secured thereto driving pulleys 20 over which the belts 14 pass. The belts 14 also pass over a second set of pulleys 21, rotatably mounted in swinging arms 22 secured to journals 23 free to turn

on the shaft 15, before referred to. With this construction as the roll decreases in size the belts may be swung toward the vertical, thus decreasing the tension of the roll, this construction of controlling belts being a usual one.

These belts are arranged so as to bear on the surface of the roll with a predetermined tension or friction at the normal running speed of the roll. In case of a sudden stoppage, means are provided whereby these belts may exert a quick braking action on the surface of the roll so as to stop the roll from unwinding. These means may vary widely in construction, but in the best constructions will be operable from any desired point in the machine, as for instance, at the control station from which the operation of the printing machine is controlled, this control station not being shown, however, as it may be at any desired point in the machine.

In the particular construction illustrated two adjacent journals 23 at one side of a belt, each have secured thereto an arm 24, in which are formed journals (see Fig. 2) 25 and 26, in which is mounted a short shaft 27. By moving this shaft in and out, the arms 22 and consequently the belts, are swung toward or away from the surface of the roll and consequently any desired pressure may be brought by the belt on to the roll.

The means employed for giving this movement to the shaft will be such as to give a quick movement so that the roll may be brought to a quick stop. In the particular construction illustrated this is effected by fluid pressure and as shown there is provided a pneumatic cylinder 28 of any suitable type, having opposite ends 29, 30 to either of which compressed air may be admitted through a pipe 31 and a two-way valve 32, to cause the piston of the cylinder to move in either direction. The end of the piston rod 33 is provided with an end 34 formed with a slot 35 through which the shaft 27 passes, the end of the rod being secured in position on the shaft by locking collars 36 secured in position by set screws 37, so that as air is admitted to one end of the cylinder through the connections described, a sudden quick swinging movement may be given the arms 22 and sudden braking pressure put on the roll.

The two-way valve may be operated in any desired manner, but preferably through connections which may be manipulated by the operator from any desired point of the machine. In the particular construction illustrated, the valve is operated by arms 38 each of which is connected by flexible connections, as chains 39, to solenoids 40, connected up through conducting wires 41 to any desired point in the machine.

Where an electric control for the driving of the printing machine is employed, as is common in printing presses, the solenoids will be in circuit with the electrical control so that when the current is shut off and the machine stops one of the solenoids will be operated to throw the valve and cause the belts to exert a braking pressure on the roll.

engagement with the roll surface to stop the rotation of the roll.

3. In a web controlling mechanism for printing machines, the combination with a web roll and means for supporting it while unwinding, means for applying a normal running tension on the roll, fluid pressure operating means for forcing the tensioning means against the roll surface with a braking pressure, and electrically operating means controlling the fluid pressure means.

4. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, a driven belt contacting with the surface of the roll with a normal running pressure, and fluid pressure operated means for moving the belt against the roll surface with a sudden increased pressure.

5. In a web controlling mechanism for printing machines, the combination with a web roll and means for supporting it while unwinding, a driven belt contacting with the surface of the roll for applying a normal running pressure thereto, fluid pressure operating means for suddenly forcing the belt against the roll surface, and electrically operating means for controlling the fluid pressure means.

6. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, a driven belt contacting with the surface of the roll with a normal running pressure, fluid pressure operated means for moving the belt against the roll surface, a controlling valve therefor, a solenoid for operating the valve, and wire connections to the solenoid.

7. In a web controlling mechanism for printing machines, the combination with a web roll and means for supporting it while unwinding, of fluid pressure operating means for applying a sudden braking pressure to the roll surface, and electrically operating means for controlling the fluid pressure means.

8. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, of air pressure operated means for applying a sudden braking pressure to the roll surface to stop the unwinding of the roll, and electrically operating means for controlling the air pressure means.

9. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, of air pressure operated means for applying a braking pressure to the roll surface, a controlling valve therefor, a solenoid for operating the valve, and wire connections to the solenoid.

10. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, a driven belt contacting with the surface of the roll

10 In machines embodying the invention in its best form, means will be provided so that as the roll decreases in size the braking pressure will be decreased. As shown this is effected by connections from the swinging arms so that as the roll decreases in size and the arms consequently approach a vertical the admission of air to the side of the cylinder which throws on the braking pressure is throttled, this valve being opened its maximum extent when the roll is at its largest diameter and closing as the roll decreases in diameter. As shown, there is provided a throttling valve in the air line, indicated at 42, which is connected through a rod 43 with one of the swinging journals 23, before referred to, so that as the journals swing inwardly toward the roll the valve 42 is correspondingly throttled.

If it is desired to operate one of the belts for braking the roll, as for instance, where a half wide roll is employed, this may be effected by sliding the shaft 27 sidewise in bearings 26, as shown in Figs. 3 and 4, so as to disconnect it from one of the swinging arms.

With the construction shown and described a very efficient braking action of the roll is accomplished and a quick stop thereof effected, in that, the belts have a bearing on the surface of the rolls, as distinguished from braking the roll spindle, and while the invention has been shown and described in its preferred form, it will be understood that various changes and variations may be made in the particular construction and arrangement of the parts without departing from the invention as defined in the appended claims.

What I claim is:

1. In a web controlling mechanism for printing machines, the combination with a web roll and means for supporting it while unwinding, means in frictional engagement with the roll surface for exerting a normal running tension on the roll, and means for suddenly forcing said tensioning means into braking engagement with the surface of the roll to stop its rotation.

2. In a web controlling mechanism for printing machines, the combination with a web roll and means for supporting it while unwinding, means arranged to have a normal running tension on the roll surface, and electrically controlled means for suddenly forcing the tensioning means into braking

with a normal running pressure, fluid pressure operated means for moving the belt against the roll surface, and means for varying the fluid pressure as the roll decreases in size.

11. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, a driven belt contacting with the surface of the roll with a normal running pressure, air pressure operated means for moving the belt against the roll surface, and means for varying the air pressure as the roll decreases in size.

12. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, of air pressure operated means for applying a braking pressure to the roll surface, a controlling valve therefor, a solenoid for operating the valve, and a second valve operated on a decrease in the size of the roll for varying the air pressure.

13. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, a belt, a pivoted frame for the belt, a fluid pressure cylinder having a piston rod, and connections from the rod to the frame for moving the frame and belt against the surface of the roll.

14. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, a belt, a pivoted frame for the belt, a fluid pressure cylinder having a piston rod, connections

from the rod to the frame, a valve for controlling admission of fluid to the cylinder, a second valve, and connections from the frame to the second valve for operating it.

15. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, a belt, a pivoted frame for the belt, a pressure cylinder having a rod, connections from the rod to the frame, a valve for controlling admission of pressure fluid to the cylinder, a solenoid for operating the valve, a second valve, and a rod connecting the second valve and the frame.

16. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, a pair of belts, pivoted frames for the belts, arms on the frames, a shaft slidably journaled in two adjacent arms, a pressure cylinder having a piston rod connected to the shaft, and a controller valve for the cylinder.

17. In a web controlling mechanism, the combination with a web roll and means for supporting it while unwinding, a pair of belts, pivoted frames for the belts, arms on the frames, a shaft slidably journaled in two adjacent arms, a pressure cylinder having a piston rod connected to the shaft, a controller valve for the cylinder, a second valve, and a rod connected to the second valve and the frame.

In testimony whereof, I have hereunto set my hand.

OSCAR ROESEN.