March 4, 1958 A. N. YERRID ET AL 2,825,513

AUTOMATIC PAPER SAVER

Filed Feb. 15, 1957 2 Sheets-Sheet 1

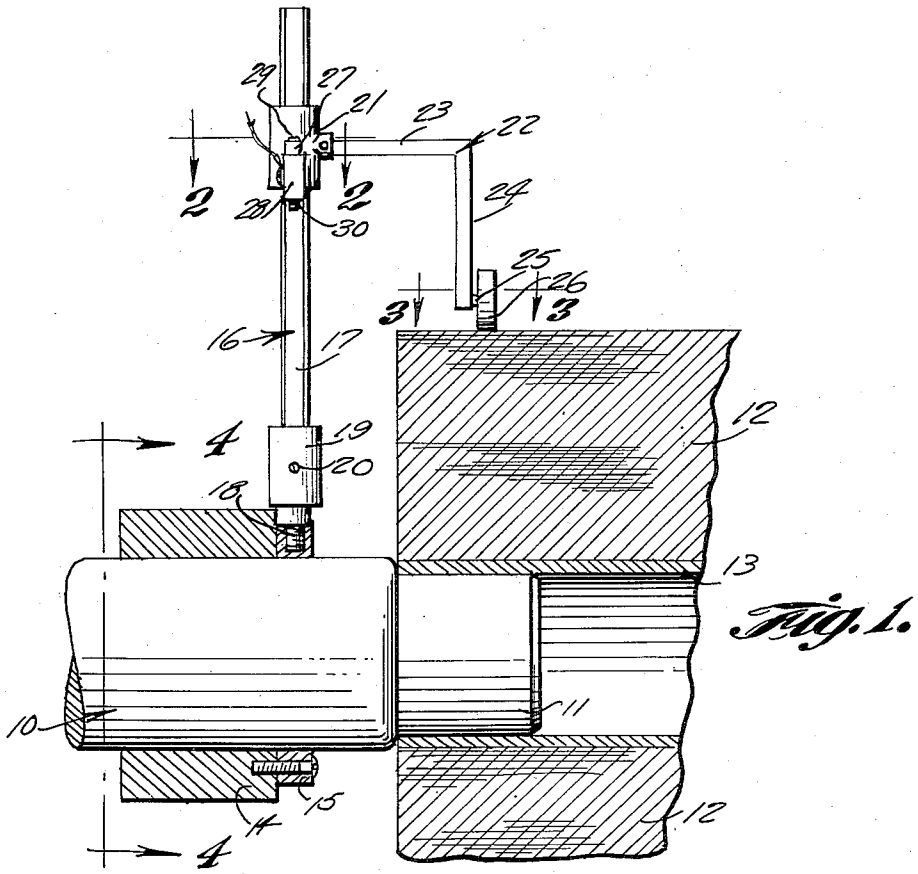


Fig. 1.

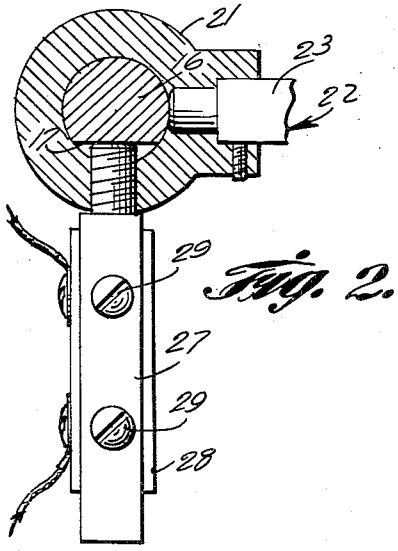


Fig. 2.

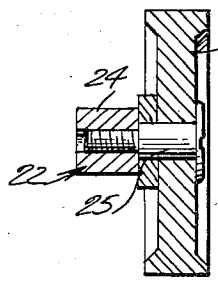


Fig. 3.

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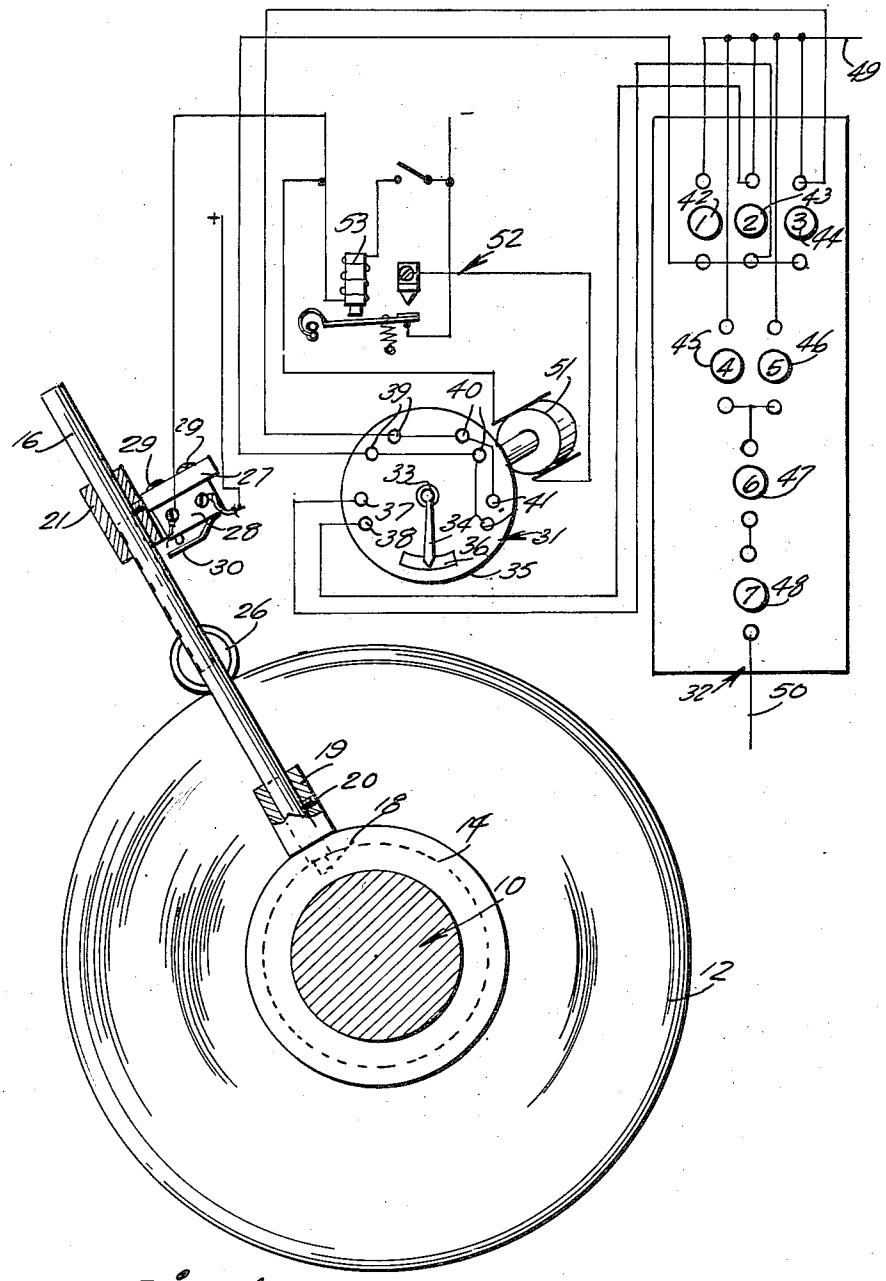


Fig. 1

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United States Patent Office

2,825,513

Patented Mar. 4, 1958

2,825,513

AUTOMATIC PAPER SAVER

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Application February 15, 1957, Serial No. 640,443

3 Claims. (Cl. 242—57)

This invention relates to the winding and unwinding art, and more particularly to a mechanism for controlling the unwinding of material such as paper from a roll.

The object of the invention is to provide a mechanism which will permit automatic control of the unwinding of material such as paper from a roll, as for example, when paper is being unwound or used in newspaper press rooms.

Another object of the invention is to provide a control mechanism which will permit paper or other material to be automatically unwound from a roll, the mechanism of the present invention including an idler wheel which is arranged in engagement with the outer periphery of the roll of paper which is being handled, so that as the diameter of the roll of paper decreases, the idler wheel will move to thereby move a switch, and when the switch moves to a predetermined position, the shaft which carries the roll of paper will be progressively slowed down and then stopped.

A further object of the invention is to provide an automatic control mechanism for controlling the unwinding of material such as paper from a roll, wherein the control mechanism is extremely simple and inexpensive to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are used to designate like parts throughout the same.

Figure 1 is an elevational view illustrating the control mechanism of the present invention, and with parts broken away and in section.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a fragmentary sectional view showing the wiring diagram of the present invention.

Referring in detail to the drawings, the numeral 10 designates a roll holding shaft which includes a reduced diameter end portion 11, Figure 1, and the numeral 12 indicates a roll of paper which is mounted on a core 13, the core 13 engaging the reduced diameter portion 11 of the shaft 10. The roll of paper 12 may be of the type which is used in newspaper press rooms or the like.

Mounted on the shaft 10 is a bearing housing 14, and arranged contiguous to the bearing housing 14 is a collar 15.

The present invention is directed to a means for automatically controlling the rotation of the shaft 10 as the paper 12 is unwound from the roll whereby the unwinding of the paper can be controlled automatically and accurately. The control mechanism of the present invention includes a rod 16 which is provided with a longitudinally extending flat surface 17, and the rod 16 is further provided with a threaded shank 18 which is arranged in engagement with the collar 15.

Adjustably mounted on the rod 16 is a sleeve 19, and a suitable securing element such as a set screw 20 extends through the sleeve 19 and engages the surface 17 of the rod 16 so that by loosening the screw 20, the sleeve 19 can be adjusted to different positions on the rod.

Also adjustably mounted on the rod 16 is a support member 21, and the support member 21 is free to move along the rod 16 as the diameter of the paper 12 changes. Extending outwardly from the support member 21 and secured thereto is an L-shaped bar 22 which includes portions 23 and 24 which are arranged at right angles with respect to each other. A trunnion 25 connects an idler wheel 26 to the portion 24 of the bar 22, and the idler wheel 26 engages the outer periphery of the paper 12. Thus, as the diameter or size of the paper roll 12 decreases, the wheel 26 will follow the movement of the paper 12 and this will permit the bar 22 and support member 21 to move due to the force of gravity, for a purpose to be later described. Extending outwardly from the support member 21 and secured thereto is an arm 27, and a conventional switch 28 is secured to the arm 27, in any suitable manner, as for example by means of screws or bolts 29, Figure 4. The switch 28 includes a spring contact arm 30 which is mounted for movement into and out of engagement with the sleeves 19, as the support member 21 moves along the rod 16 towards and away from the sleeve 19.

Electrically connected to the switch 28 is a timer 31, and a unit control mechanism 32, Figure 4. The timer 31 includes a movable shaft 33 which has a non-conductive arm 34 connected thereto, and the timer further includes a non-conductive disk 35 which has a contact plate 36 thereon. There is further provided stops 37 and 38, and terminals 39, 40 and 41.

The unit control mechanism 32 includes an on switch 42, a stop switch 43, an off switch 44, an inch switch 45, a reset switch 46, a run switch 47, and a safe switch 48. The numeral 49 indicates a line or conductor which may lead to a control panel, while the numeral 50 indicates a line which may be the direct current line.

The timer 31 further includes a sixty cycle motor 51, and there is further provided a relay 52 which includes a magnetic coil 53.

From the foregoing, it is apparent that there has been provided a means for automatically controlling the unwinding of paper from the roll 12. In use, with the parts arranged as shown in the drawings, it will be seen that the wheel 26 engages the outer periphery of the roll of paper 12. The support member 21 is free to move along the rod 16 so that as the paper is unwound or removed from the roll 12, the wheel 26 will follow the paper 12 whereby the bar 22 and support member 21 will move downwardly along the rod 16 due to the force of gravity. When the support member 21 moves down the rod 16 a sufficient distance, the spring contact 30 of the switch 28 will contact the sleeve 19 so that the mechanism for unwinding the roll 12 can be slowed down and stopped. Thus, it will be seen that there has been provided a means for automatically controlling the unwinding of the paper 12 and this means functions in such a manner as to shut off the unwinding mechanism as soon as the paper is removed from the roll. By loosening the set screw 20, the sleeve 19 can be moved to different adjusted positions on the rod 16 so that the point at which the switch 28 is actuated by the sleeve 19 can be varied or regulated as desired. The mechanism of the present invention is especially suitable for use in newspaper press rooms or the like wherein the unwinding of the paper from the roll can be accurately and automatically controlled.

Thus, it will be seen that there has been provided a means for automatically shutting off or controlling the

unwinding of paper from a roll and the mechanism is especially suitable for use in a newspaper press room. With the present invention, there will result in a saving of paper which is usually left on the core **13** of the roll in newspaper press rooms. Thus, in practically all press rooms, there is from five to twenty-five pounds of paper left on the core of each roll of paper, and the present invention can be gauged to any desired length of paper left. Thus, the device can be set so that, for example, only one and a half pounds of paper per roll is permitted to remain on the core. The present invention eliminates the necessity of a pressman running a roll of paper down by eyesight since the unwinding is controlled automatically. When the paper is run down by eyesight, the paper will often run off of the core or else too much paper will be left on the core but with the present invention the mechanism can be set so that all of the rolls are run down to the same thickness without the necessity of anyone touching the various parts.

The operation of the mechanism is as follows. As the size of the roll diminishes or decreases, the electric switch **28** moves down since the idler wheel bar **22** moves down the rod **16** as the size of the roll diminishes. The wheel **26** runs against the roll of paper and when the switch contact **30** touches the adjustable sleeve **19**, the electric timer **31** is started and this controls the switchboard. The first contact of the arm **34** reduces the speed of the unwinding mechanism by twenty-five percent, while the second contacts **40** reduces the speed by fifty percent, the first contacts being indicated by the numeral **41** in Figure 4. When the arm **34** engages the third contacts **39**, the speed is reduced on the unwinding mechanism by seventy-five percent, and when the arm **34** engages the contacts **37** and **38**, the press is automatically shut off.

As previously described, the control mechanism **32** includes the on switch **42**, as well as the other switches **43**, **44**, **45**, **46**, **47** and **48**. The disc **35** of the timer **31** is made of a non-conductive material, and similarly the arm **34** is made of non-conductive material. The parts can be made of any suitable material and in any desired shape or size.

While the present invention has been illustrated for use in connection with the handling of rolls of paper, it is to be understood that the mechanism is adapted to be used for rolls of other material besides paper.

The control mechanism of the present invention does not operate the press, the press is operated by man power, but after the press is in operation, when the paper roll runs down to a certain size, the unwinding mechanism then controls the operation of the press control panel. The wires such as the wire **49** is a hot feed from the control panel which is hooked up to start-stop members, as well as to certain other switches, and when the buttons are pushed or actuated, the circuit is completed which returns to the control panel and either makes or breaks the circuits. The wire **50** is a feed from the control panel for safety so that all power inlet to the box can be killed or stopped whereby no buttons can be operated when a person is working on the press. One of the members or boxes **32** are stationary on each unit of the press, and the elements **42**, **43**, **44**, **45**, **46**, **47**, **48** and **50** are a part of the press control box. The wires which lead into the box **32** to the buttons on both sides of the elements **42**, **43** and **44** from the control mechanism, is the complete hook-up to the newspaper press. Furthermore, different types of control boxes can be used as desired.

We claim:

1. In combination, a shaft including a reduced diameter end portion, a cylindrical core mounted on said reduced diameter end portion, a roll of paper mounted on said core, a bearing housing engaging said shaft, a collar arranged on said shaft and abutting said bearing housing, a rod including a threaded shank connected to said collar and said rod including a longitudinally extending flat surface, a sleeve adjustably mounted on said rod, a securing element extending through said sleeve and engaging the flat surface of said rod, a support member provided with an opening for slidably receiving said rod, an arm extending outwardly from said support member and secured thereto, a switch carried by said arm and said switch including a spring contact member mounted for movement into and out of engagement with the sleeve as said support member moves along said rod, an L-shaped bar extending from said support member and secured thereto, an idler wheel connected to said bar and said idler wheel being arranged in engagement with the outer surface of said roll of paper, and a timer and control mechanism electrically connected to said switch.

2. In a control mechanism for use with a roll of material, a bearing housing, a collar abutting said bearing housing, a rod including a threaded shank connected to said collar and said rod including a longitudinally extending flat surface, a sleeve adjustably mounted on said rod, a securing element extending through said sleeve and engaging the flat surface of said rod, a support member provided with an opening for slidably receiving said rod, an arm extending outwardly from said support member and secured thereto, a switch carried by said arm, said switch including a spring contact member mounted for movement into and out of engagement with said sleeve as said support member moves along said rod, an L-shaped bar extending from said support member and secured thereto, and a wheel connected to said bar and said wheel being arranged in engagement with the outer surface of said roll of material.

3. In a control mechanism for use with a roll of material, a bearing housing, a collar abutting said bearing housing, a rod including a threaded shank connected to said collar and said rod including a longitudinally extending flat surface, a sleeve adjustably mounted on said rod, a securing element extending through said sleeve and engaging the flat surface of said rod, a support member provided with an opening for slidably receiving said rod, an arm extending outwardly from said support member and secured thereto, a switch carried by said arm and said switch including a spring contact member mounted for movement into and out of engagement with said sleeve as said support member moves along said rod, an L-shaped bar extending from said support member and secured thereto, and a wheel connected to said bar and said wheel being arranged in engagement with the outer surface of said roll of material, and a timer and control mechanism electrically connected to said switch.

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