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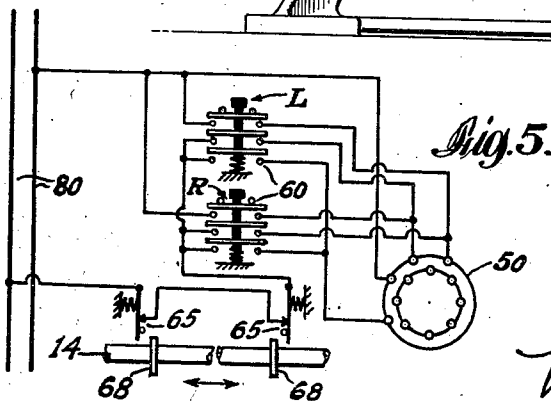
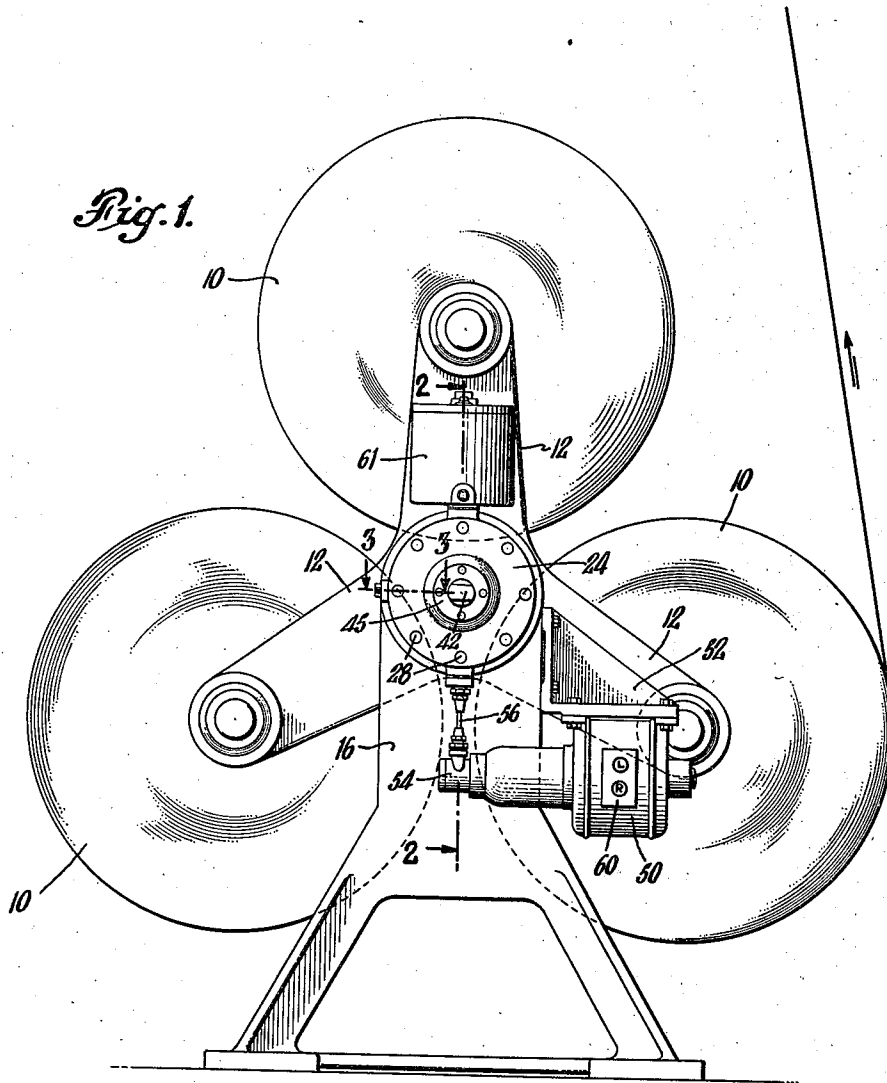
D. G. BERNARD

2,285,488

WEB ROLL FEEDING MECHANISM

Filed July 14, 1939

3 Sheets-Sheet 1



INVENTOR
David G. Bernard
BY
Wray, Timmerman & Durham
ATTORNEYS

June 9, 1942.

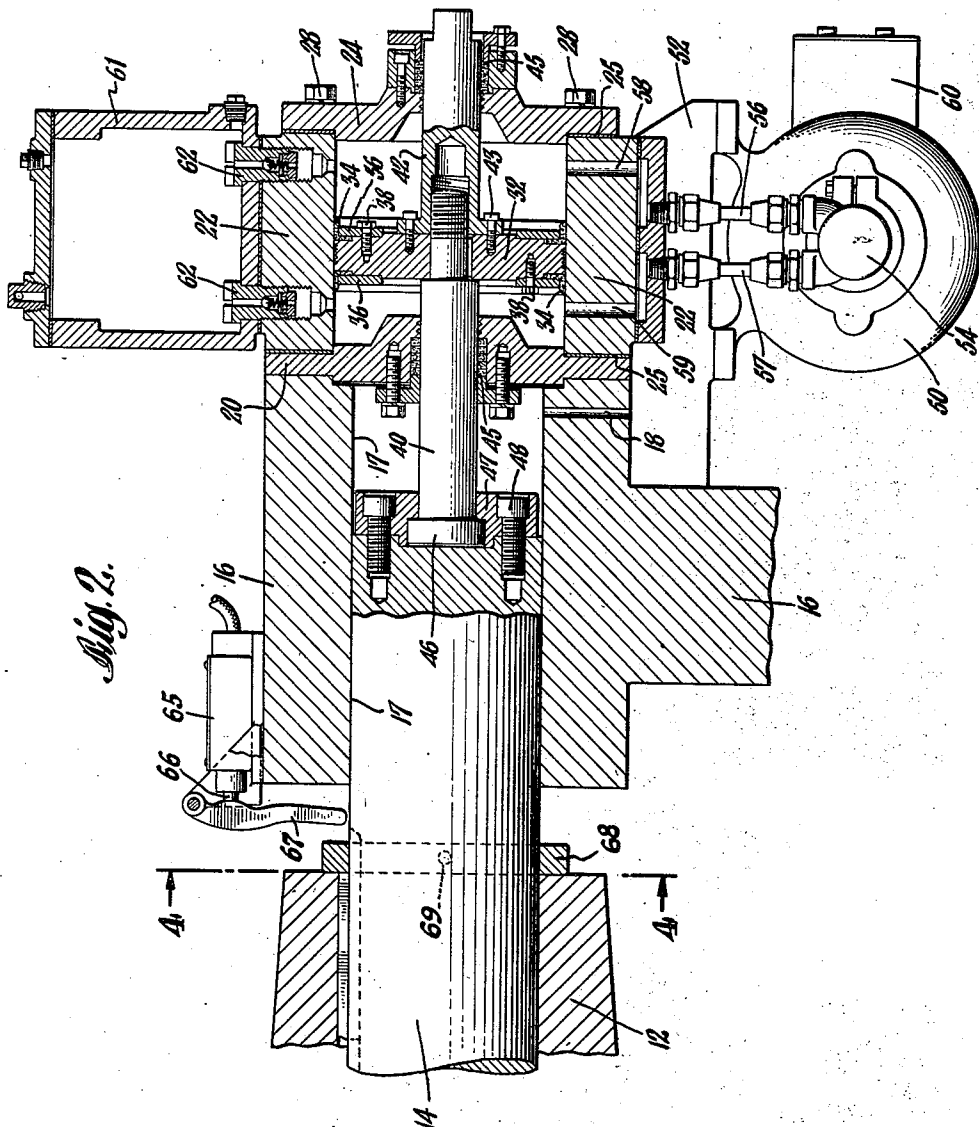
D. G. BERNARD

2,285,488

WEB ROLL FEEDING MECHANISM

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3 Sheets-Sheet 2



INVENTOR
David G. Bernard
BY
Morgan, Finckley & Wuthman
ATTORNEYS

June 9, 1942.

D. G. BERNARD

2,285,488

WEB ROLL FEEDING MECHANISM

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3 Sheets-Sheet 3

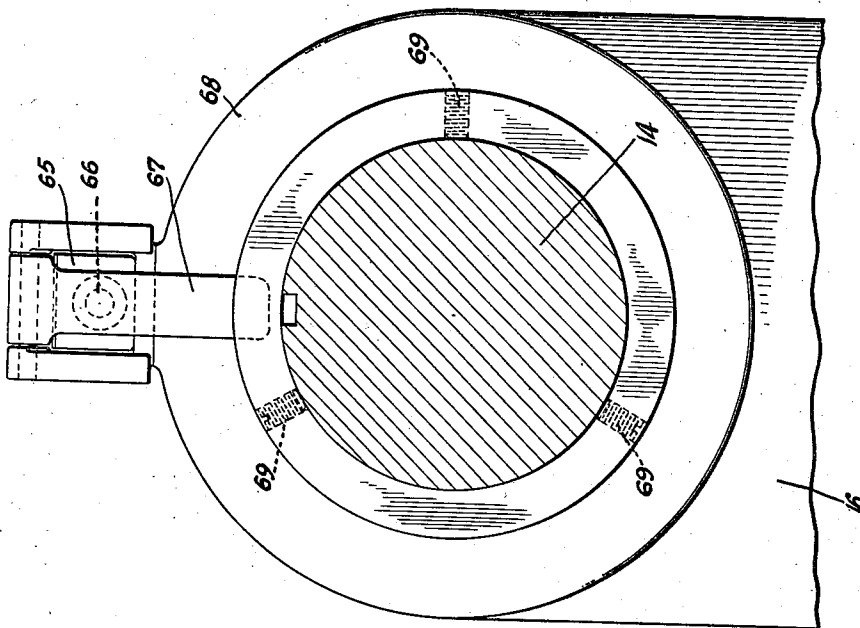


Fig. 4.

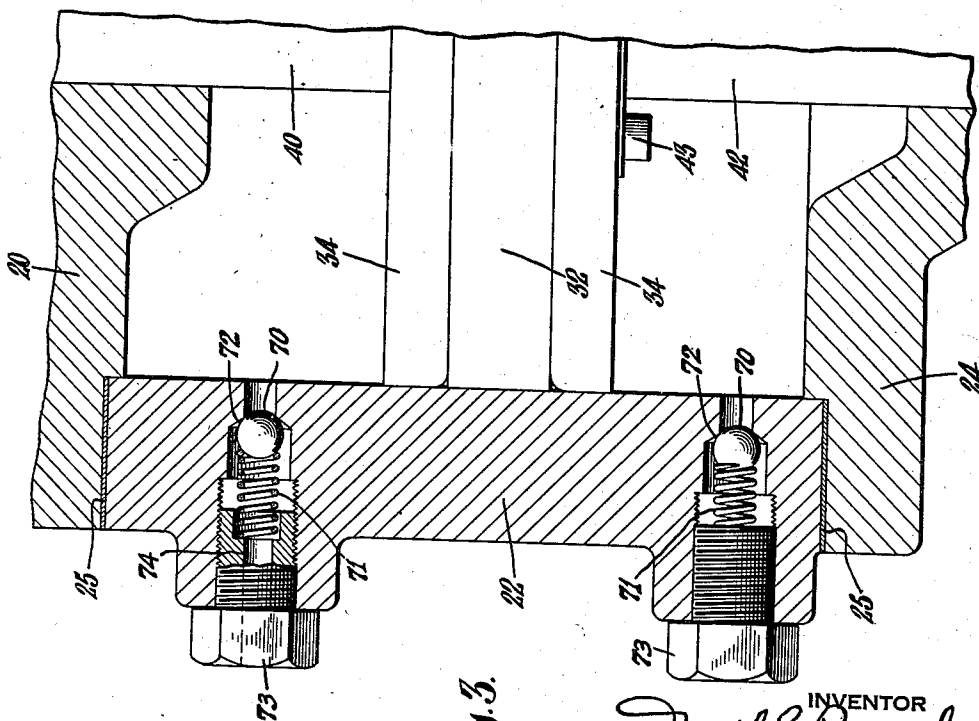


Fig. 3.

INVENTOR
David G. Bernard
BY
Morgan, Finnegan & Durham
ATTORNEYS

UNITED STATES PATENT OFFICE

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WEB ROLL FEEDING MECHANISM

David G. Bernard, Chicago, Ill., assignor to The
Goss Printing Press Company, Chicago, Ill.,
a corporation of Illinois

Application July 14, 1939, Serial No. 284,389

6 Claims. (Cl. 242—64)

The present invention relates to web roll supporting mechanism and more particularly to a novel and improved magazine reel which is axially movable to vary the side lay of the web fed therefrom.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Figure 1 is an end elevation of a magazine reel embodying the present invention;

Figure 2 is a vertical section taken on the line 2—2 of Figure 1;

Figure 3 is a detailed section of the cylinder structure taken on the line 3—3 of Figure 1 with certain parts in plan;

Figure 4 is a vertical section taken on the line 4—4 of Figure 2; and

Figure 5 is a wiring diagram showing the motor and control connections.

The present invention has for its object the provision of an improved magazine reel in which the side lay of the web fed from the web rolls may be varied with a high degree of accuracy and with rapidity. A further object is the provision of a simple and highly efficient mechanism for axially moving the reel shaft and web rolls of a magazine reel with a minimum of power, and of a mechanism which can be constructed with great economy.

In accordance with the present illustrative embodiment of the invention a plurality of web rolls are supported by means of a pair of plural armed members mounted on a reel shaft which is rotatably supported and axially movable in a pair of reel supports. Mounted on one of the supports and connected to the reel shaft so that the shaft is free to turn is a fluid pressure motor, such as a piston and hydraulic cylinder coaxial with the shaft, and supplied with liquid under pressure by means of a small, high speed, reversible electric motor driven pump which is conveniently mounted on the support just below the

cylinder. A liquid reservoir is also provided so as to keep the cylinder full of liquid, and the pump and cylinder are so interconnected that liquid is supplied to one end of the cylinder and is returned to the pump from the other end of the cylinder, while when the motor is reversed, the direction of liquid flow to and from the pump and cylinder is reversed.

The mechanism of the present invention is highly advantageous not only because of its simplicity and the elimination of splined gears and complex mechanical linkages, but also because the power may be amply provided by a very small high speed motor directly connected to a small high speed pump, and there is very little power loss in the transfer of motive power from the electric motor to the axial movement of the reel shaft. The mechanism is also much more compact than the devices of the prior art and is advantageous in that it can vary the side lay or margin of the web with a high degree of accuracy as the reel shaft and its heavy load of paper web rolls has practically no drift after the power is discontinued to the electric pump motor.

It will be understood that the foregoing general description and the following detailed description as well, are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the illustrative embodiment of the invention as shown in the accompanying drawings, the web rolls 10 are revolvably supported at the ends of the supporting arms 12 which are rotatably mounted by the reel shaft 14 which is journaled at 17 and axially movable in the main supports 16, one at each end of the shaft. Suitable and conventional means, not shown, are provided for rotating the reel arms 12 to the desired position.

In accordance with the present invention, motor operated hydraulic means are provided for moving the reel shaft 14, reel arms 12 and web rolls 10 axially of the web roll supporting mechanism so as to vary the side-lay of the web for proper side register as the web is fed to the printing press. As embodied, a hydraulic cylinder is provided at one end of the reel shaft 14 and is mounted on the outside of one of the supports 16 coaxial with the reel shaft 14. This cylinder comprises an end wall 20 covering the shaft journal 17, a cylindrical portion 22 and an outer end wall 24. Gaskets 25 are provided between the end walls 20, 24 and the cylinder 22 and these parts are held tightly together and are secured to the outer face of the support 16 by means of cap screws 28 passing through the end

plates 20, 24 and registering boxes in the wall of the cylinder 22. A vent 18 is provided through journal 17 to permit unobstructed movement of the shaft 14.

A piston is reciprocable in the cylinder and comprises the circular metal portion 32, the piston leathers 34 secured by the retaining rings 36 and bolts 38, piston rods 40 and 42. The piston is provided with a central aperture through which is passed the threaded, reduced end of piston rod 40 which is screwed into the internally threaded end of rod 42, rods 40 and 42 being of equal diameter. Rod 42 is flanged so that it may be locked to the piston by cap screws 43 and piston 32 is keyed to the reduced portion of rod 49.

The cylinder end walls 20 and 24 are provided with stuffing boxes 45 to seal the cylinder and piston rods against oil leakage.

The piston of the hydraulic motor is connected to the reel shaft 14 for relative rotation by means of the enlarged head 45 which is received within the retaining cap 47 bolted to the end of the shaft 14 by screws 48, piston rod 43 and shaft 14 being coaxial.

Motor driven pump means are provided for alternatively supplying oil to the cylinder one or the other side of the piston and for withdrawing it at a similar rate from the other side of the piston. For this purpose there is used a small, high speed reversible motor 50 mounted on a bracket 52 on the end frame or support 16 and directly connected to a reversible high pressure oil pump 54, such as an eccentric vane pump. The pump 54 is connected to the ends of the cylinder by means of pipes 56 and 57 connected respectively to the ducts 53 and 59. As oil is supplied under pressure through one of the pipes, the oil from the other side of the piston is drawn into the pump through the other pipe.

An oil reservoir 61 is mounted above the cylinder 22 and is connected to the cylinder by means of the one-way valves 62 so that both ends of the cylinder are always kept filled with oil and no oil can leak out under pressure.

The operation of the motor 50 is controlled by means of the left and right push button switch 60 and so long as one push button is held in circuit closing position, the motor and pump rotate in the corresponding direction to move the paper rolls to one end or the other. As soon as the power is discontinued, the movement of the paper rolls is checked by the oil on the other side of the piston and there is virtually no coast to the side register movement. When the motor is stopped, the oil on both sides of the piston locks the paper rolls against axial movement.

Means are also provided for limiting movement of the shaft 14 so that no damage can be caused the apparatus by holding the push buttons closed too long. A limit switch is provided on each of the hubs 16 (only one of which is shown) and comprises a switch 65 operated by reciprocation of spring pressed plunger 66 which is moved by means of pivoted finger 67, when collar 68 comes in contact with the end of the finger. Collar 68 may be held in any desired axial position by means of set screw 69 and contact of the collar with finger 67 serves to open the corresponding switch 65 to stop the motor 50 regardless of whether the appropriate push button is held closed or not. The switch 65 at the right hand end of the shaft 14 is in series with the right hand push button R, while the left hand switch 65 is in series with the left hand, or upper, 75

push button L of switch 60, thereby insuring stopping of the shaft movement, at the same time permitting the shaft to be reversely moved by closure of the other push button.

To guard against excessive pressures being built up in either end of the cylinder, relief valves are provided communicating directly with the ends of the cylinder. For this purpose, spring closed ball check valves comprising ball 70, spring 71, valve seat 72 and screw plug 73 having a vent hole 74, are mounted in tapped holes in cylinder wall 22 near each end of the cylinder and if excessive oil pressure is built up in either cylinder end, the corresponding check ball is unseated to allow some of the oil to escape until the excess pressure is relieved.

As shown in Figure 5, the motor 50 is supplied with power from the mains 80 through limit switches 65 and one or the other of the push-buttons R and L comprising the switch 60. The push-buttons R and L are reversing push-buttons, one operating the motor in one direction, the other operating the motor in the opposite direction. Both push-buttons being normally open.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. In a magazine reel, the combination of a reel shaft, web roll supporting arms mounted on the reel shaft, supports for the shaft in which the shaft is axially movable, a hydraulic piston motor mounted on one support and connected to the shaft in alinement therewith for axial movement thereof, and means mounted on the same support for alternatively supplying liquid under pressure to either end of the piston including a motor driven liquid pump.

2. In a magazine reel, the combination of a reel shaft, web roll supporting arms mounted on the reel shaft, supports for the shaft in which the shaft is axially movable, a hydraulic piston motor mounted on one support and connected to the shaft for axial movement thereof and for free rotation of the shaft, means for alternatively supplying liquid under pressure to either end of the piston including a motor driven liquid pump and means for reversing the flow of liquid from the pump.

3. In a magazine reel, the combination of a reel shaft, web roll supporting arms mounted on the reel shaft, supports for the shaft in which the shaft is axially movable, a piston connected to the shaft and coaxial thereto for free rotation of the shaft, a cylinder for the piston on the support, an oil reservoir to supply oil to the cylinder, an electric motor pump on the support and connected to supply oil under pressure to and receive oil from the cylinder on either side of the piston.

4. In a web roll paper supply mechanism, the combination of axially movable, revoluble means for rotatably supporting a plurality of rolls of paper, supports for said means, a reversible hydraulic motor mounted on one of said supports for axially moving the revoluble means, means for supplying liquid to the motor to cause its operation in either direction including a reversible electric motor, push button switches controlling the operation and direction of the electric motor and limit switches in the motor circuit and con-

trolled by axial movement of the supporting means for limiting movement of the supporting means.

5 5. In a web roll paper supply mechanism, the combination of axially movable, revoluble means for rotatably supporting a plurality of rolls of paper, supports for said means a hydraulic piston motor connected to axially move the revoluble means and a liquid pump driven by a motor and connected with the hydraulic motor by liquid supply pipes to each end of the hydraulic piston motor so that liquid may be withdrawn from one side of the piston as it is supplied to the other,

a liquid reservoir and means for automatically supplying liquid to either side of the piston as needed.

6. In a magazine reel, the combination of a reel shaft, web roll supporting arms mounted on the reel shaft, supports for the shaft in which the shaft is axially movable, a hydraulic piston motor mounted on one support and connected to the shaft in alinement therewith for axial movement thereof, and means for alternatively supplying liquid under pressure to either end of the piston including a motor driven liquid pump.

DAVID G. BERNARD.