

Jan. 3, 1956

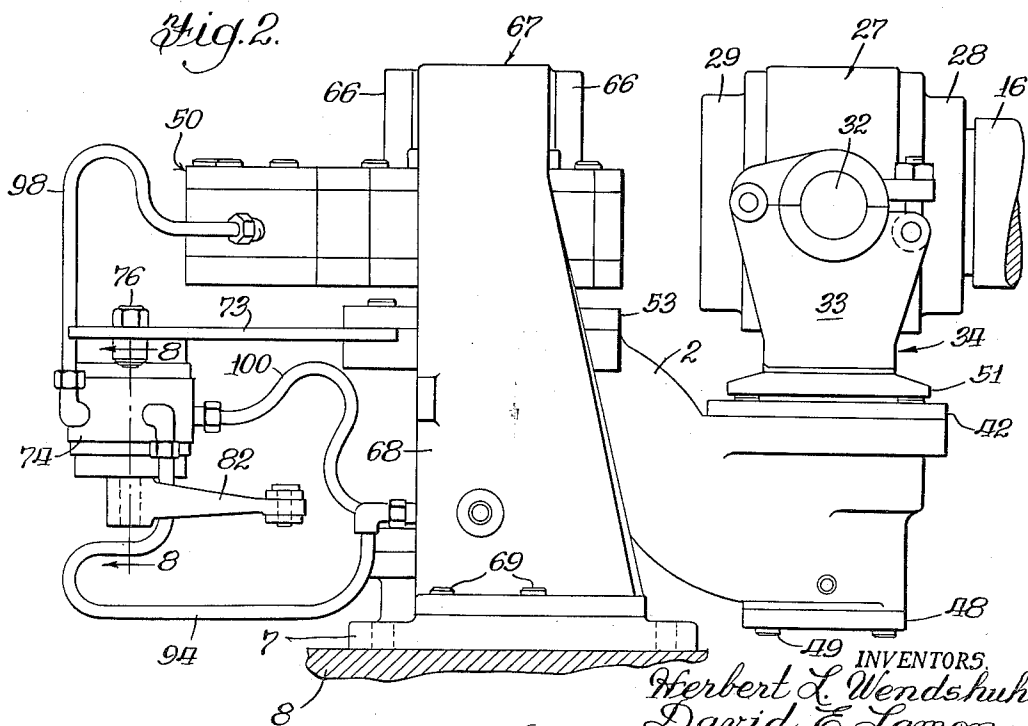
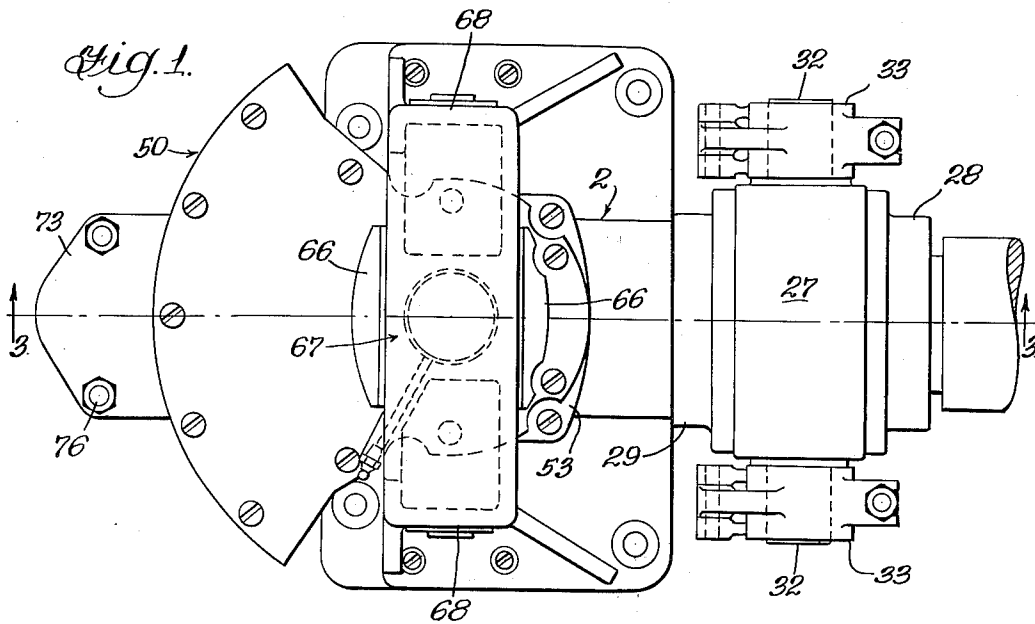
H. L. WENDSHUH ET AL

2,729,112

WIRE OR FELT GUIDE MECHANISM

Filed Feb. 4, 1954

4 Sheets-Sheet 1



INVENTORS,
Herbert L. Wendshuh
David E. Lamon
By Gary, Desmond & Parker
Attys.

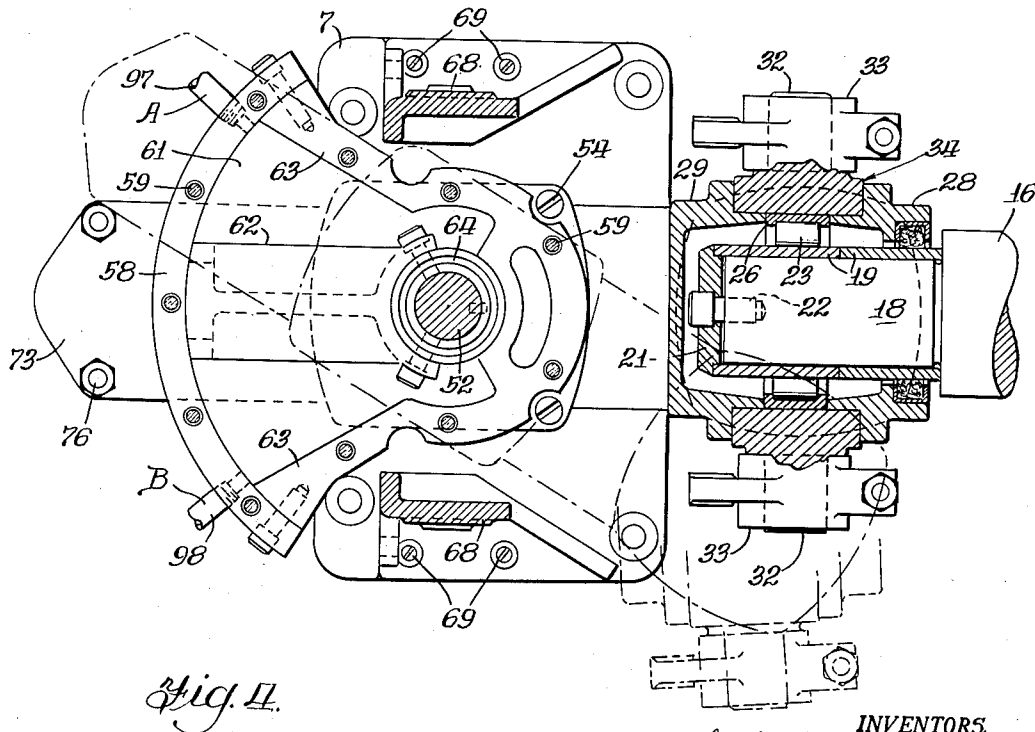
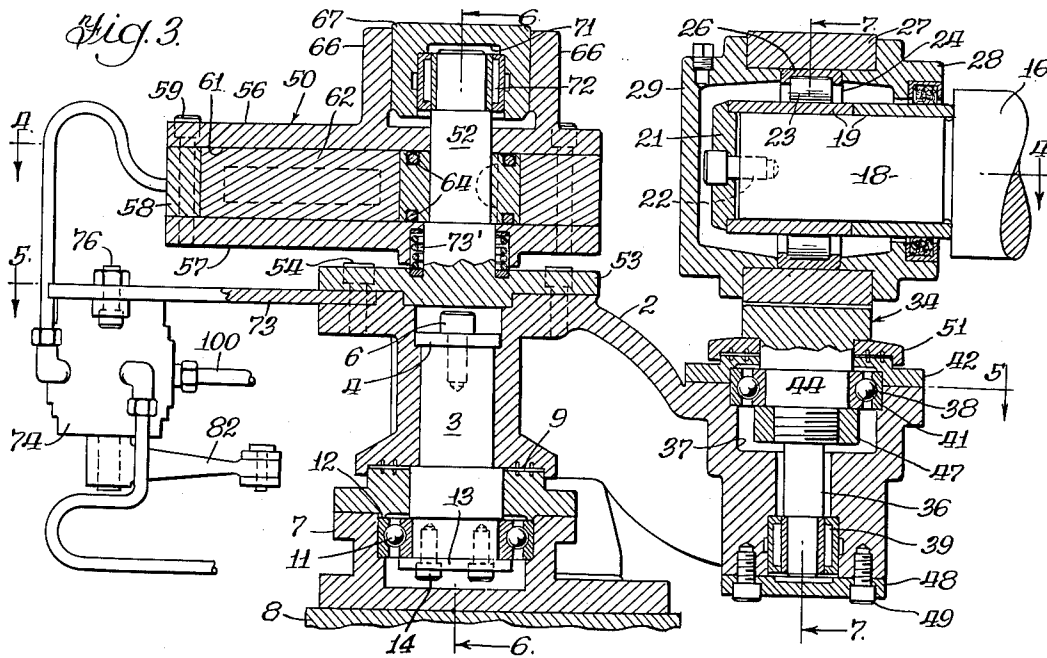
Jan. 3, 1956

H. L. WENDSHUH ET AL
WIRE OR FELT GUIDE MECHANISM

2,729,112

Filed Feb. 4, 1954

4 Sheets-Sheet 2



INVENTORS
Herbert L. Wendshuh
David C. Lamson
By Gary, Desmond & Parker
Attys.

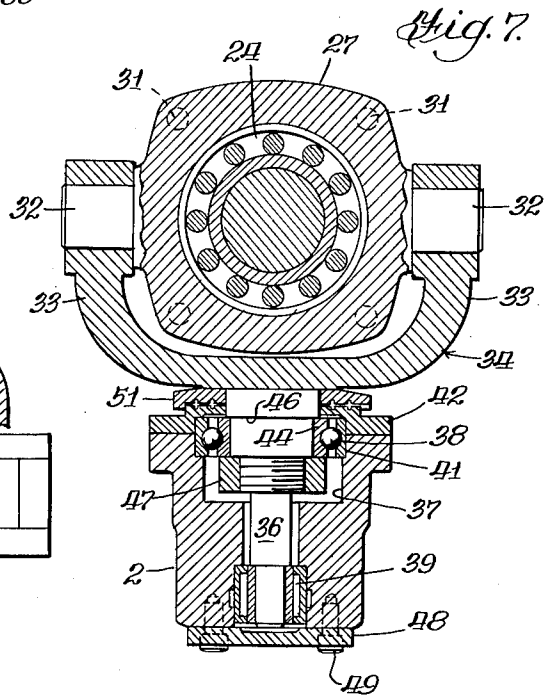
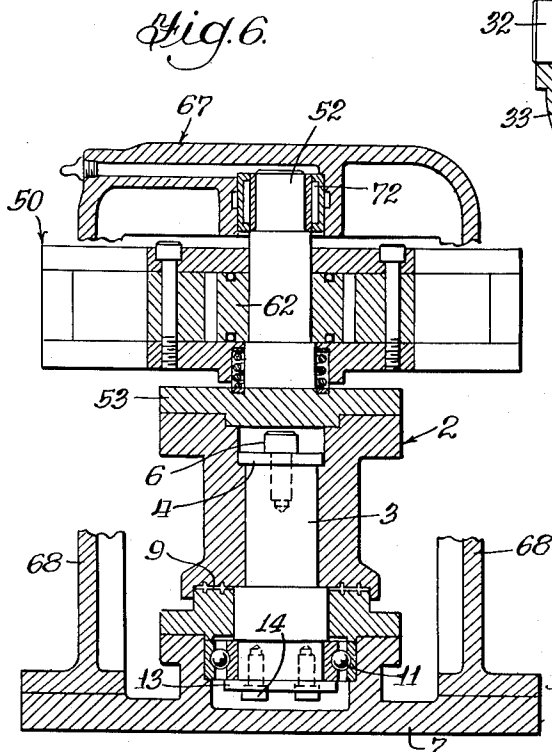
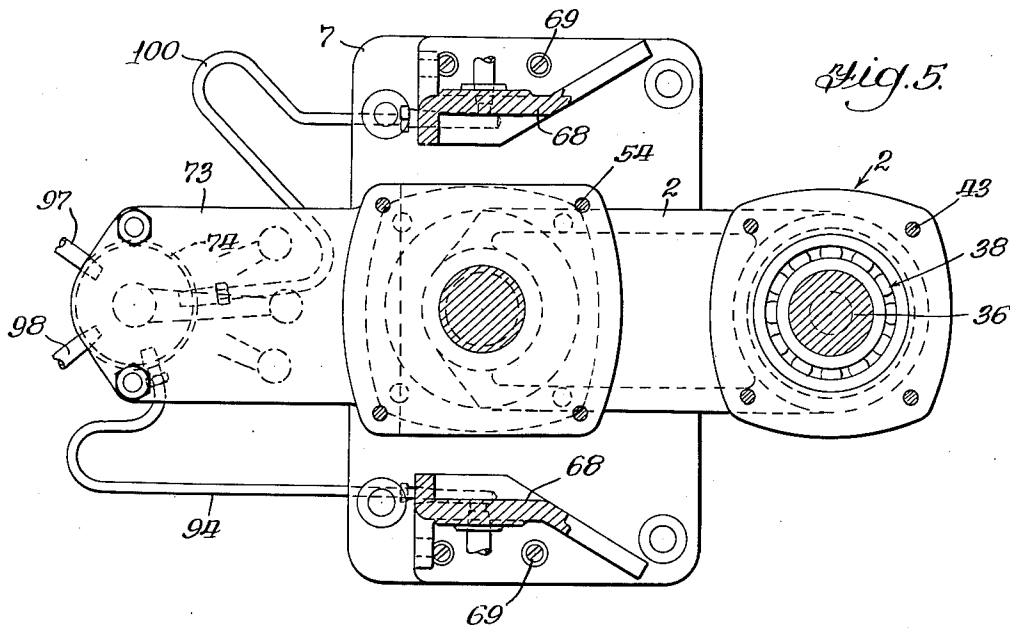
Jan. 3, 1956

H. L. WENDSHUH ET AL
WIRE OR FELT GUIDE MECHANISM

2,729,112

Filed Feb. 4, 1954

4 Sheets-Sheet 3



INVENTORS,
Herbert L. Wendshuh
David E. Lamon
By Gary, Desmond & Parker
Attys.

1

2,729,112

WIRE OR FELT GUIDE MECHANISM

Herbert L. Wendshuh and David E. Lamon, Appleton, Wis., assignors to Gilbert & Nash Company, Menasha, Wis., a corporation of Wisconsin

Application February 4, 1954, Serial No. 408,116

12 Claims. (Cl. 74—241)

This invention relates to guide mechanisms for regulating the sidewise movement of wires or felts of paper making machines and more particularly to a guide mechanism embodying a hydraulic unit operative responsive to movement of a guide palm to move one end of a guiding roll forward or backward along a line parallel to the normal line of travel of the wire or felt.

Due to the high operating speeds of paper and board machines, it is necessary to provide a guide mechanism which acts immediately to control sidewise movement of a wire or felt. It is, therefore, an object of the invention to provide a guide mechanism embodying a hydraulic motor operative from a suitable source of fluid under constant pressure, responsive to sidewise movement of a wire or felt, to immediately move one end of a guiding roll to the proper position to provide the necessary corrective action. It is also desirable to have the hydraulic motor connected to a source of fluid under constant pressure, such as a pump operated independently of the paper making machine, as the guide mechanism thus acts uniformly to apply a corrective movement to the guide roll regardless of the linear speed of the wire or felt during starting, stopping or normal operation of the machine.

It is another object of the invention to provide a guide mechanism operative to move one end of a guiding roll forward or backward along a line parallel to a wire or felt travelling along either a horizontal or vertical plane.

It is a further object of the invention to provide a guide mechanism in which the supply of fluid under pressure to the hydraulic motor is gradually decreased as one end of the guiding roll is moved to a corrected position.

A further object of the invention resides in the provision of a wire or felt guide mechanism embodying a guiding roll support arm mounted for pivotal movement in a suitable bearing bracket secured to the frame of a paper making machine, the free end of said support arm having a roll bearing support spindle journaled thereon to support one end of the wire guide roll for rotational and angular movement.

Another object of the invention resides in the provision of a valve controlled hydraulic fan motor operative responsive to sidewise movement of a wire or felt to pivot the guide roll support arm and the end of the guide roll mounted thereon to a corrective position.

This invention embodies other novel features, details of construction and arrangement of parts which are hereinafter set forth in the specification and claims and illustrated in the accompanying drawings, wherein:

Fig. 1 is a top plan view illustrating a wire or felt guide mechanism embodying features of the present invention.

Fig. 2 is a side elevational view of same.

Fig. 3 is a longitudinal sectional view taken along the line 3—3 of Fig. 1.

2

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken along the line 5—5 of Fig. 3.

Fig. 6 is a transverse sectional view taken along the line 6—6 of Fig. 3.

Fig. 7 is a transverse sectional view taken along the line 7—7 of Fig. 3.

Fig. 8 is a diagrammatic view illustrating the manner in which the guide mechanism control means operates to limit sidewise travel of the wire or felt towards the swingable end of the guiding roll.

Fig. 9 is a diagrammatic view illustrating the manner in which the guide mechanism control means operates to limit sidewise travel of the wire or felt away from the swingable end of the guiding roll.

Referring now to the drawings for a better understanding of the invention, the guide mechanism is shown as comprising a guide roll support arm 2 secured to a shaft 3 by means of a washer 4 and cap screw 6, the lower end of the shaft 3 being journaled in a base 7 adapted to be bolted to the frame 8 of a paper making machine. A space or gap is provided at 9 between the lower end of the support arm 2 and the upper end of the base 7, and the shaft 3 is engaged against upward axial movement by means of an anti-friction bearing 11 interposed between an abutment shoulder 12 on the base 7 and a retainer plate 13 secured to the shaft 3 by means of cap screws 14.

A wire or felt guiding roll 16 of a paper making machine is journaled at one end thereof within a suitable bearing 17 secured to the frame 8 of the paper making machine, the bearing 17 being designed, in a manner well known in this art, to permit angular adjustment of the roll in the manner illustrated in Figs. 8 and 9 in the drawings. The other end of the guiding roll is formed with a reduced diameter journal portion 18 having hardened metallic sleeves 19 sleeved thereover and secured thereto by means of a cap 21 and cap screw 22 to form the inner raceway for rollers 23 of an anti-friction bearing indicated generally at 24.

The outer raceway 26 of the anti-friction bearing 24 is mounted within an axial bore provided in a bearing housing 27 and is secured against axial movement therein by means of inner and outer retainer members 28 and 29, respectively, the retainer members being secured to opposite sides of the bearing housing by means of cap screws 31 (Fig. 7). Coaxial trunnions 32—32 are provided at opposite sides of the bearing housing 27 for rotational movement in bearing arms 33—33 of a guide roll bearing support 34 formed with a spindle 36. The spindle 36 is mounted for rotational and non-axial movement within a bore 37 in the support arm 2 by means of upper and lower anti-friction bearings 38 and 39, respectively. The outer race 41 of the bearing 38 is secured within the bore 37 by means of a bearing cap 42 secured to the arm 2 by means of cap screws 43, the inner race 44 of the bearing being secured between an abutment shoulder 46 on the spindle 36 and a nut 47 threaded onto the spindle. The lower end of the bore 37 is closed by means of a cap 48 secured to the arm 2 by means of cap screws 49. A cover 51 is secured to the guide roll bearing support 34 to enclose the upper end of the bearing cap 42.

A motor shaft 52 (Figs. 3 and 6) of a hydraulic fan motor 50 is formed with a flange 53 at one end thereof for driving engagement with the support arm 2, the flange being secured to the arm by means of circumferentially spaced cap screws 54. The fan motor 50 is shown as comprising upper and lower housing plates 56 and 57, respectively, clamped to opposite sides of a cylinder 58 by means of cap screws 59 to define a fan chamber 61.

A rotor or fan 62 is keyed to the shaft 52 for pivotal movement within the fan chamber 61 between the side walls 63—63 of the cylinder 58. Circular recesses are formed in opposite sides of the fan 62, concentric with the shaft 52, to receive conventional O-type sealing rings or gaskets 64 to prevent leakage of fluid from the fan chamber 61 through the shaft openings provided in the upper and lower plates 56 and 57.

The upper plate 56 of the motor 50 is provided with spaced upwardly projecting lugs 66—66 for abutting engagement against opposite sides of a bearing bracket 67 provided with spaced arms 68—68 secured to the base 7 by means of cap screws 69. The bearing bracket 67 is bored at 71 to receive an anti-friction bearing 72 sleeved over the upper end of the motor shaft 52. A helical compression spring 73' is interposed between the lower cover plate 57 and the flange 53 of the motor shaft 52 to yieldably support the motor 50.

A valve support arm 73 is secured to the arm 2 and extends rearwardly therefrom to support a four-way valve 74, the valve being secured to the arm 73 by means of bolts 76. The valve comprises a housing 77 (Fig. 8) bored to rotatably receive a cylindrical plug 78 formed with passageways 79 and 81. A control lever 82 is secured to the plug or valve element 78 to rotate the latter within the housing 77 responsive to sidewise movement of the wire or felt W relative to the guiding roll 16. Various arrangements of links and levers may be provided to actuate the lever 82 responsive to movement of a palm blade 83 which normally engages the side of the wire or felt W.

Fig. 8 in the drawings illustrates diagrammatically the link and lever arrangement comprising a bell crank lever 84 mounted for pivotal movement at 86, one arm 87 of the lever being connected through a link 88 to a palm blade 83, the other arm 89 being connected to one end of a connecting link 91 connected at 92 to the lever 82. It will be understood that any suitable link and lever arrangement may be provided to actuate the valve control lever 82 responsive to movement of the palm blade 83, and that the palm blade 83 is normally maintained in engagement against one side of the wire or felt W by suitable means, such as a tension spring 93, counterweight or the like.

In the operation of the guide mechanism thus shown and described, sidewise travel of the wire or felt W toward the swingable end of the guide roll 16, as illustrated in Fig. 8, acts through the palm blade 83 and link and lever arrangement interconnecting the latter to the control lever 82 to move the plug passageway 79 into registry with an inlet passageway 94 connected to a pump 96 to direct fluid under pressure from the pump through the outlet conduit 97 to the interior of the fan chamber 61. As the fluid under pressure enters the fan chamber 61 through the conduit 97, it causes the fan or rotor 62 to move in an anti-clockwise direction, as illustrated in Fig. 4. The support arm 2 is also turned in a counterclockwise direction to swing the free end of the guide roll 16 along a line parallel to and in the direction of movement of the wire or felt W to prevent or limit further sidewise movement of the wire or felt toward the swingable end of the guide roll. During counterclockwise movement of the fan or rotor 62, liquid passes outwardly from the fan chamber 61 through a conduit 98 and thence through the passageway 81 and the plug member 78 and thence through the passageway 100 to a tank or reservoir 99 which in turn is connected to the pump 96 through a conduit 101.

In the event the wire or felt W moves in a sidewise direction away from the swingable end of the guide roll 16, the tension spring 93 acts to move the control lever 82 in a counterclockwise direction to bring the passageway 81 of the plug member 78 into registry with the inlet conduit 94, as illustrated in Fig. 9. Fluid under pressure from the pump 96 then passes through the pas-

sageway 81 and conduit 98 into the fan chamber 61 to move the fan or rotor 62 in a clockwise direction, thereby causing the support arm 2 to swing the free end of the guide roll 16 in an opposite direction from the direction of travel of the wire or felt to prevent further sidewise movement of the latter away from the swingable end of the guide roll. As the fan or rotor 62 moves in a clockwise direction liquid within the fan chamber 61 moves through the conduit 97 through the passageway 79 and thence through the conduit 100 to the tank or reservoir 99.

While this invention has been shown in but one form, it is obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit and scope of the claimed invention.

We claim as our invention:

1. In a wire guide mechanism for a paper making machine, means including a support arm mounted for pivotal movement to rotatably support one end of a wire guide roll, means including a hydraulic fan motor and a fluid control valve mounted on said arm and operative responsive to sidewise travel of a wire to pivot said arm whereby sidewise travel of the wire is regulated, said motor comprising a fixed housing, and a rotor keyed to said support arm and enclosed within said housing.

2. In a wire guide mechanism for a paper making machine, means including a support arm mounted for pivotal movement and having a bearing structure journaled thereon to rotatably support one end of a wire guide roll, means including a hydraulic fan motor and a fluid control valve operative responsive to sidewise travel of a wire to pivot said arm whereby said bearing structure and the end of a roll supported thereon are moved to adjusted position and sidewise travel of the wire is regulated, said motor comprising a housing, a rotor keyed to said support arm and enclosed within said housing, and a fixed base to support said arm for pivotal movement.

3. In a wire guide mechanism for a paper making machine, means including a support arm mounted for pivotal movement and having a bearing structure journaled thereon to rotatably support one end of a wire guide roll, means including a hydraulic fan motor and a fluid control valve operative responsive to sidewise travel of a wire to pivot said arm whereby said bearing structure and the end of a roll supported thereon are moved to adjusted position and sidewise travel of the wire is regulated, said motor comprising a housing, a rotor keyed to said support arm and enclosed within said housing, a base to support said arm for pivotal movement, and bracket means securing the housing and base against relative pivotal movement.

4. In a wire guide mechanism for a paper making machine, means including a support arm mounted for pivotal movement and having a bearing structure journaled thereon to rotatably support one end of a wire guide roll, means including a hydraulic fan motor and a fluid control valve operative responsive to sidewise travel of a wire to pivot said arm whereby sidewise travel of the wire is regulated, said motor comprising a housing, a rotor keyed to said support arm and enclosed within said housing, a base to support said arm for pivotal movement, bracket means securing the housing and base against relative pivotal movement, said bracket means having a bearing, and a rotor shaft journaled in said bearing.

5. In a wire guide mechanism for moving one end of a guide roll along a line parallel to the direction of travel of a wire, a fixed base, a roll support arm mounted for pivotal movement on said base, a guide roll bearing to support one end of a guide roll, means on the free end of said arm to support said bearing for universal movement, and power means operative responsive

5

to lateral movement of a wire to pivot said arm, said power means comprising a hydraulic motor.

6. In a wire guide mechanism for moving one end of a guide roll along a line parallel to the direction of travel of a wire, a fixed base, a roll support arm mounted for pivotal movement on said base, a guide roll bearing to support one end of a guide roll, means on the free end of said arm to support said bearing for universal movement, power means to pivot said arm, and means operative responsive to sidewise movement of a wire to actuate said power means and pivot said arm to adjust the position of the guide roll whereby sidewise movement of the wire is regulated.

7. In a wire guide mechanism for moving one end of a guide roll along a line parallel to the direction of travel of a wire, a fixed base, a roll support arm mounted for pivotal movement on said base, a guide roll bearing to support one end of a guide roll, means on the free end of said arm to support said bearing for universal movement, power means to pivot said arm, said power means comprising a rotor keyed to said arm, a rotor housing secured in fixed position on said base, and means operative responsive to sidewise movement of a wire to actuate said power means and pivot said arm to adjust the position of the guide roll whereby sidewise movement of the wire is regulated.

8. In a wire guide mechanism for moving one end of a guide roll along a line parallel to the direction of travel of a wire, a fixed base, a roll support arm mounted for pivotal movement on said base, a guide roll bearing to support one end of a guide roll, means on the free end of said arm to support said bearing for universal movement, power means to pivot said arm, said power means comprising a rotor keyed to said arm, a rotor housing secured in fixed position on said base, and means operative responsive to sidewise movement of a wire to actuate said power means and pivot said arm to adjust the position of the guide roll whereby sidewise movement of the wire is regulated, said latter means including a fluid control valve mounted on said support arm.

9. In a wire guide mechanism for moving one end of a guide roll along a line parallel to the direction of travel of a wire, a fixed base, a roll support arm mounted for pivotal movement on said base, a guide roll bearing to support one end of a guide roll, means on the free end of said arm to support said bearing for universal movement, power means to pivot said arm, said power means comprising a rotor keyed to said arm, a rotor housing secured in fixed position on said base, means operative responsive to sidewise movement of a wire to actuate said power means and pivot said arm to adjust the position of the guide roll whereby sidewise

6

movement of the wire is regulated, said latter means including a fluid control valve mounted on said support arm, and a valve actuating arm movable in the same direction as the support arm during adjustment of the guide roll whereby the valve is gradually closed as the guide roll approaches a corrective position.

10. A wire guide mechanism comprising a guide roll, a base, a roll support arm mounted for pivotal movement on said base, a bearing to receive one end of the guide roll, bearing support means provided on the free end of said arm to support said bearing for universal movement relative to said support arm, and means operative responsive to sidewise travel of a wire to pivot said support arm and thus adjust the position of the adjacent end of the guide roll along a line parallel to the direction of travel of the wire.

11. A wire guide mechanism comprising a guide roll, a base, a roll support arm mounted for pivotal movement on said base, a bearing to receive one end of the guide roll, bearing support means provided on the free end of said arm to support said bearing for universal movement relative to said support arm, means operative responsive to sidewise travel of a wire to pivot said support arm and thus adjust the position of the adjacent end of the guide roll along a line parallel to the direction of travel of the wire, said bearing support means comprising a bearing housing provided with coaxial trunnions, a spindle journaled on the free end of said support arm, and having spaced bearing portions to receive said trunnions.

12. In a wire guide mechanism for moving one end of a guide roll along a line parallel to the direction of travel of a wire, a fixed base, a roll support arm mounted for pivotal movement on said base and having a bearing structure journaled thereon and capable of universal movement with respect thereto and serving to rotatably support one end of a line guide roll, and power means operative in response to lateral movement of the wire to pivot said arm, whereby said bearing structure and the end of the roll supported thereon are moved to adjusted position and sidewise travel of the wire is regulated.

References Cited in the file of this patent

UNITED STATES PATENTS

46,800	Wisbell	Mar. 14, 1865
593,037	Weatherbee	Nov. 2, 1897
2,553,973	Keller et al.	May 22, 1951

FOREIGN PATENTS

605,095	Germany	Nov. 3, 1934
---------	---------	--------------