

Aug. 4, 1942.

N. OBENSHAIN
AUTOMATIC BAND GUIDE

2,291,830

Filed Aug. 1, 1940

2 Sheets-Sheet 1

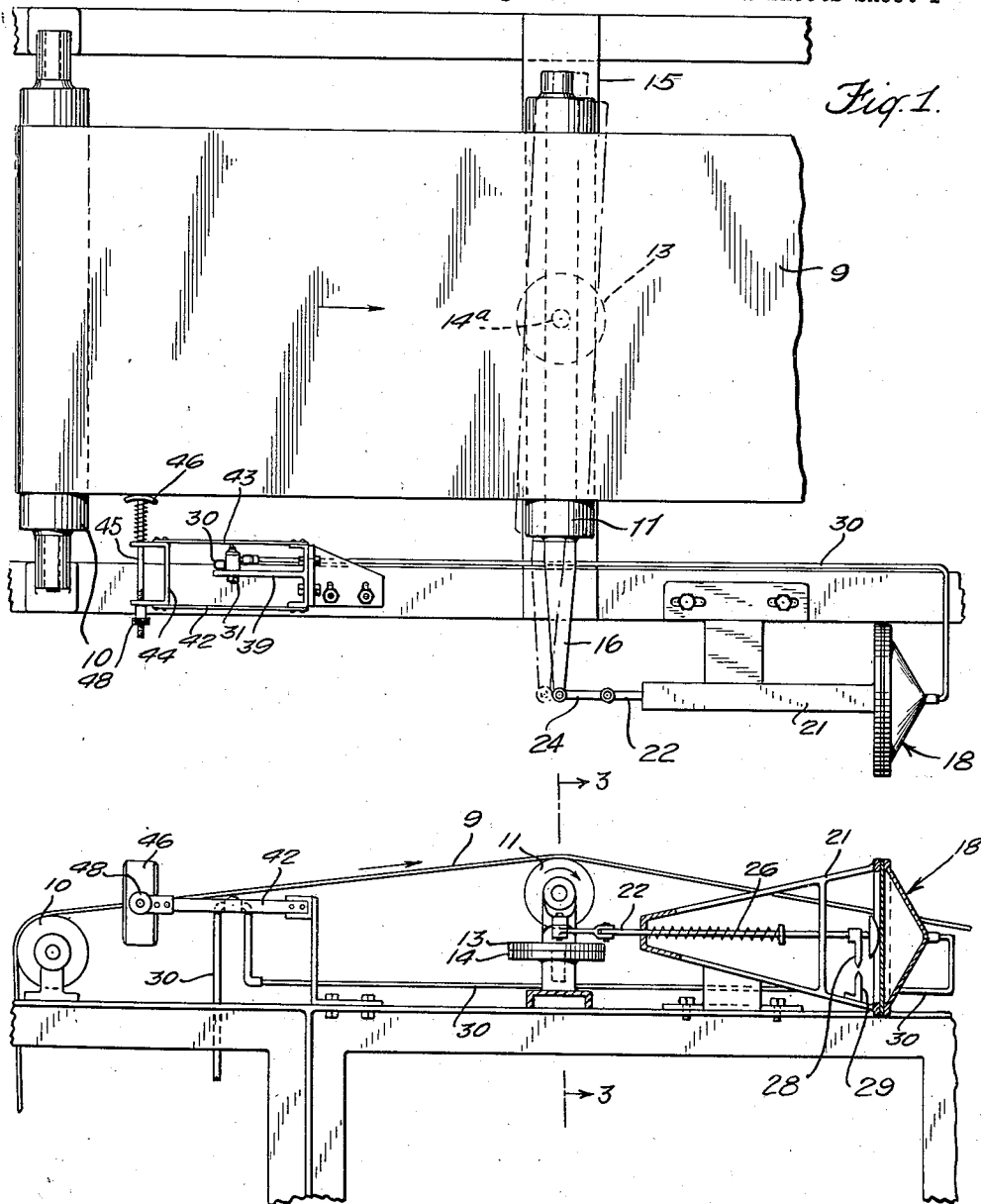


Fig. 2.

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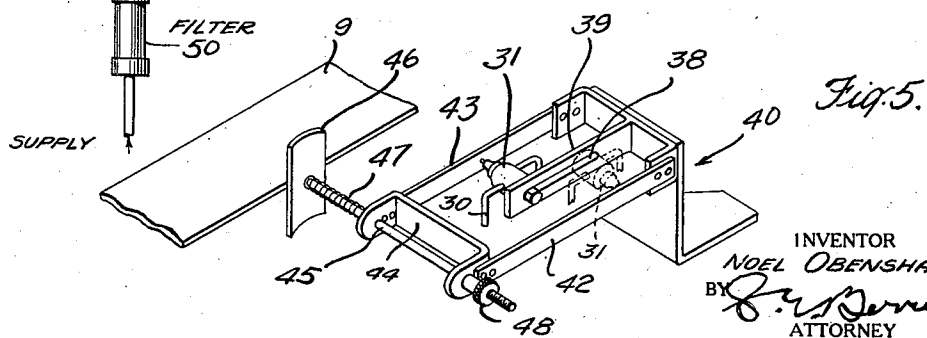
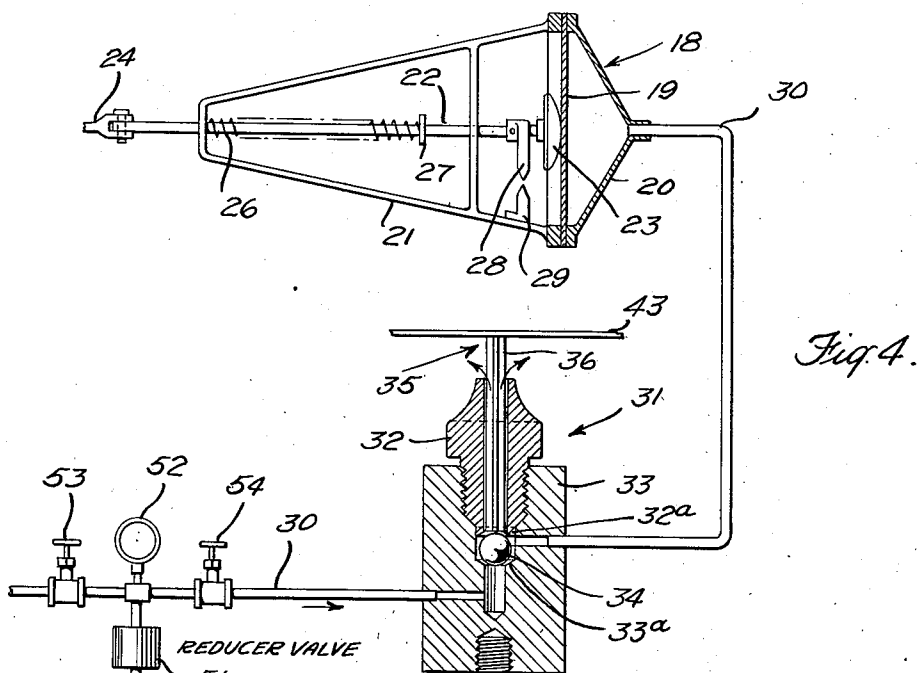
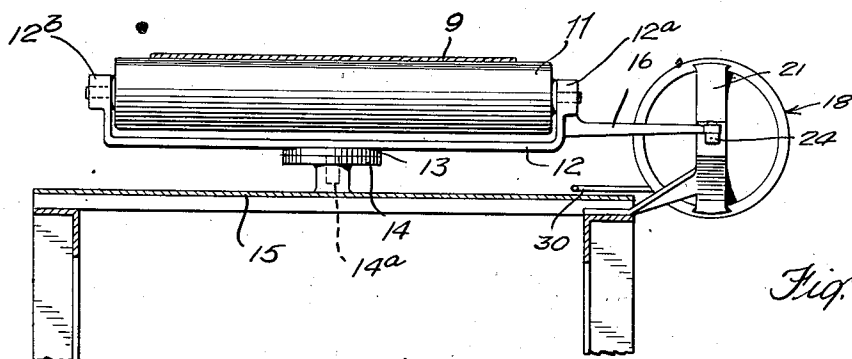
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2,291,830

AUTOMATIC BAND GUIDE

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Application August 1, 1940, Serial No. 349,116

3 Claims. (Cl. 74-241)

My present invention relates to a pneumatically operated band guide of particular application to the felts on a Fourdrinier paper making machine.

In the Fourdrinier machine for making paper, endless bands of felt are used to support the paper at different places therein, as for example, in the press section, in which water from the freshly formed sheet is extracted by pressing between rolls, and also in the drier section, wherein felt bands are used to press the paper against the drier cylinders. There is always a tendency for various reasons for the felt to get out of alignment, and heretofore guides which have been employed to move the felt back into place have been actuated by the edge of the felt without the aid of outside power. Under such circumstances it is necessary to make the felts several inches wider than would otherwise be necessary, to make sure that the felts will always cover the drying cylinders, for example, and to allow for trimming off the edges which become worn. The additional width is not only an added expense but collects oil and dirt, which is undesirable. In order to overcome the above mentioned disadvantages I have provided an automatic guide device in which displacement of the felt is caused to operate a pneumatic motor controlling a felt guide by which the position of the felt may be determined. In carrying out my invention I employ a source of air under pressure which is admitted to the motor by a valve controlled by a feeler in contact with the felt.

My invention will be best understood by reference to the following detailed description taken with the accompanying drawings, in which

Fig. 1 is a plan view of a return run of a drier felt showing my improved device installed;

Fig. 2 is a side view of the apparatus shown in Fig. 1;

Fig. 3 is a view in section on line 3-3 of Fig. 2;

Fig. 4 is an enlarged view of the motor device and control valve therefor;

Fig. 5 is a perspective view showing the air valve and mounting therefor and the feeler in contact with the felt.

Referring to the above figures, 9 is the drier felt which passes over a guide roll 10 and a control roll 11, the bearing for which is swivelly mounted, as shown in Figs. 2 and 3, such mounting consisting of a bracket 12 in which the roll is journaled (journals 12a, 12b, Fig. 3), the bracket having a bearing plate 13 supported on a stationary bearing plate 14 carried by a frame member 15. Extending from plate 13 is a stud

14a to receive which is provided a corresponding bearing leading from the plate 14. Bracket 12 also has an extending arm 16 by means of which the roll 11 is turned on its bearings 13, 14.

For accomplishing this turning movement a device is provided preferably in the form of a diaphragm motor 18 consisting of a diaphragm 19 of flexible material, an air chamber 20 on one side of the diaphragm, a framework 21, and a push rod 22 terminating in a buffer 23 at the end of said rod opposite the outer surface of the diaphragm. The opposite end of rod 22 is pivotally connected to link 24 joining arm 16.

Rod 22 also passes through the coil of spring 26 which presses the rod 22 against the diaphragm 19 by acting upon an annular abutment 27 carried by said rod. Rod 22 also has a pointer 28 which, in conjunction with the pointer 29 upon the framework 21, indicates the proper position for the rod 22 corresponding to normal operation.

The position of the diaphragm 19, and consequently of the guide roll 11, is pneumatically controlled by the following described mechanism: Pipe 30 admits air under pressure to the chamber 20 behind the diaphragm 19 from a source of supply not shown, and the flow of air is controlled by means of a valve denoted generally by 31. Valve 31 consists of a cap member 32 screw threaded into a body member 33, members 32 and 33 carrying, respectively, valve seats 32a and 33a, which receive a valve in the form of a ball 34. It will be noted that the valve 34 when seated on seat 33a closes the passage of air through pipe 30, whereas when seated against valve seat 32a, said valve establishes substantially the full pressure of air against the diaphragm 19. For controlling the position of the valve 34 a fluted plunger 35 fits into a cylindrical bore in the cap member 32. When plunger 35 is moved inwardly it presses the ball 34 against its seat 33a and cuts off the air while at the same time providing for venting of the air in the chamber 20 through the spaces between the flutings (36). It will be evident that for positions of the plunger intermediate the extremes mentioned, an intermediate pressure will be maintained against the diaphragm 19, and that such pressure will vary in accordance with the position of the plunger 35. By adjusting the position of the cap member 32 the proper amount of travel of the valve 34 may be had. The position of plunger 35, in turn, is varied in accordance with the position of the felt 9, which affects said plunger through the following preferred mechanism: Valve 31 is dis-

posed in a slot 38 in a tongue 39 of a bracket 40. Bracket 40 likewise holds a pair of flat spring members 42, 43 which also act as levers and are joined together by means of a bracket 44. Bracket 44, in turn, carries in sliding engagement therewith a plunger 45 to one end of which is attached the feeler 46 in contact with the edge of the felt 9. The nut 48 on the threaded end of plunger 45, opposed by the coil spring 47, which is stronger than springs 42, 43, is used to adjust the position of the feeler 46, thereby determining the normal position of the edge of the felt.

It will be evident from the foregoing that when the felt 9 moves to the right (Fig. 5) a slight amount it will move the bracket 44 to the right against the tension in the flat springs 43, 42. Since spring 43 is in contact with the plunger 35, this movement inward causes the air pressure in chamber 20 to be cut down, allowing the rod 22 to move to the right (Figs. 1, 2 and 3) by the action of spring 26, thereby moving the guide roll 11 out of its position of normality to the felt 9 in the direction to cause the felt 9 to be displaced a slight amount away from the feeler 46 and hence move to its proper position. Similarly, when the felt moves outwardly too far the plunger 35 is moved outwardly, admitting greater pressure of air behind the diaphragm and moving the arm 16 to the left, as for example, to the dotted position, Fig. 1, thereby causing the cylindrical axis of the guide roll 11 to be turned in the opposite direction and causing the felt to move inwardly with respect to the feeler 46.

By the use of the slotted member 39 the valve 31 may be adjusted lengthwise of the flat spring 43, whereby for a given displacement of the felt 9 the plunger 35 may be moved to a greater or less extent. It will be further evident that this adjustment controls the sensitivity of the device, whereby placing the valve 31 to the extreme left of 35 gives the maximum sensitivity (if the valve is set at too great sensitivity the felt may have a tendency to "hunt"). Flat spring 42 besides serving to support the bracket 44 may also be used to operate valve 31 by mounting the latter in the reverse position in slot 38. This position of valve 31 would be required if the position of the motor unit 18 were to be reversed.

In Fig. 4 are shown the useful accessories in connection with the air supply consisting of a filter 50, a reducing valve 51, gauge 52 and hand valves 53, 54 on the line 30.

The pivotal mounting 13, 14 for the control roll 11 above shown is well adapted for machines of comparatively narrow width. For wide machines other and less simple types of pivotal mountings standard in the art may be employed without affecting the principle of operation of my device. In view of the sensitivity of my improved device, wear on the edge of the felt is substantially eliminated, thereby permitting the use of felts no wider than the drums.

It will be understood that various changes may be made in the above described specific embodiment without departing from the spirit of my invention or the scope of the appended claims.

I claim:

1. In an automatic band guide having a feeler adapted to maintain contact with an edge of the band and a control roll for said band mounted for movement about said axis transverse to the plane of the band, and a pneumatically operated motor device for moving said roll about said axis, the improvement which comprises a source of air under pressure connected with said motor device, a plunger type valve for the control of said air and a flat spring member connected to and movable with said feeler and disposed so as to actuate said plunger.

2. In an automatic band guide having a feeler to maintain contact with an edge of the band and a control roll for said band mounted for movement about the axis transverse to the plane of the band, and a pneumatically operated motor device for moving said roll about said axis, the improvement which comprises a source of air under pressure, a mounting for said valve, and a pair of flat spring members on either side of said mounting, said spring members transmitting movement of the feeler to said valve for the actuation thereof, said mounting permitting reversal of the valve so as to be actuated by either of said spring members.

3. A device according to claim 1, in which said valve is adjustable longitudinally of said spring member.

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