

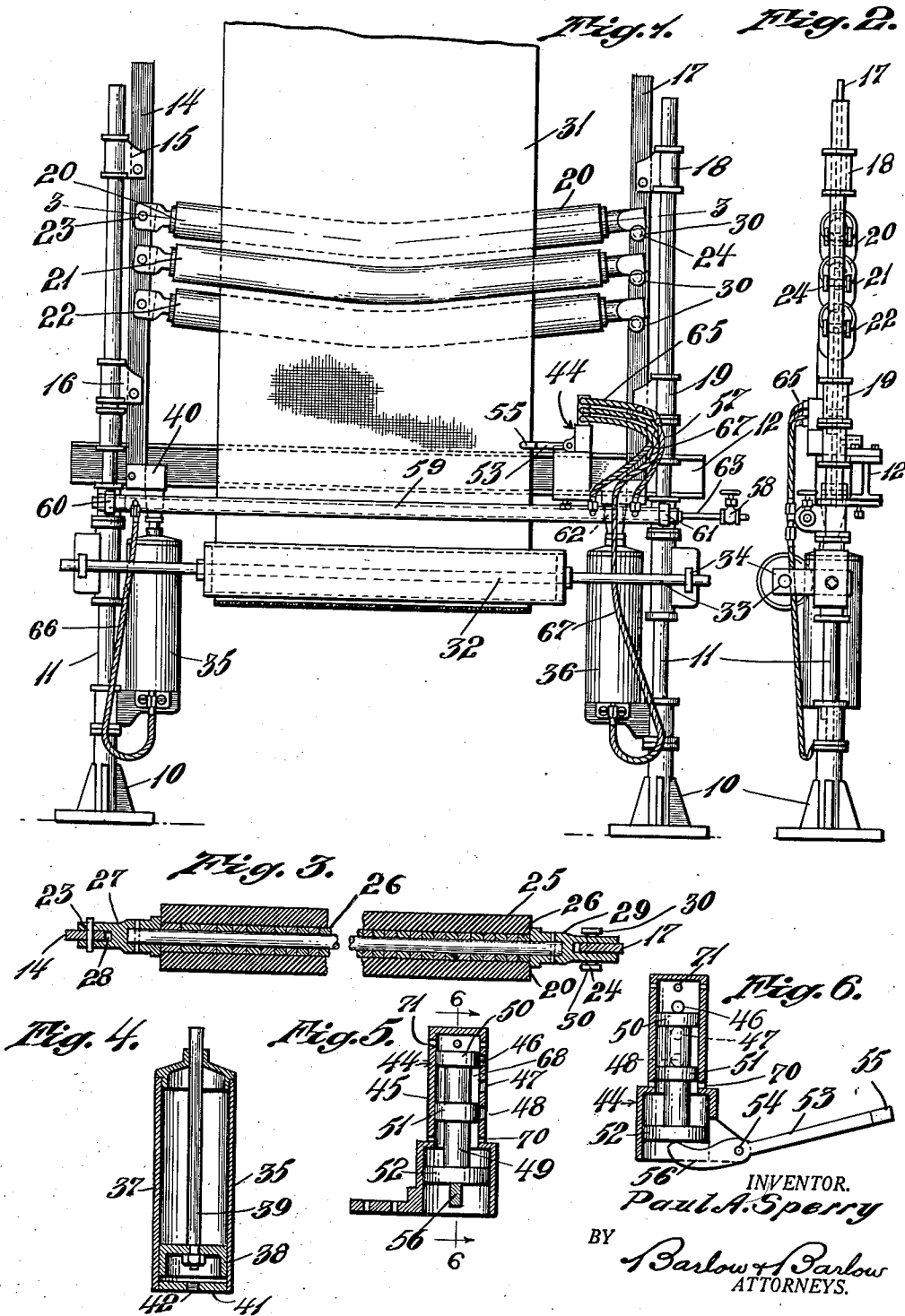
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EXPANDING AND GUIDING APPARATUS

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EXPANDING AND GUIDING APPARATUS

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1 Claim. (Cl. 26—63)

This invention relates to an apparatus for handling webs of material particularly in cloth finishing processes, and has for one of its objects the provision of an apparatus whereby a single unit may be made to both stretch and guide a web of material passing therethrough.

Another object of the invention is the provision of automatic means for moving expanding bars whereby these bars may be used for guiding a web of material passing through them.

Another object of the invention is the provision of means for moving both ends of a set of a plurality of bars in order to minimize the amount of movement necessary to accomplish a guiding action by manipulation of the bars.

Another object of the invention is the provision of a web guider which will turn out doubled-in edges of the web.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claim.

In the accompanying drawing:

Fig. 1 is an elevation showing a face view of my apparatus;

Fig. 2 is a side elevation thereof with the cloth omitted;

Fig. 3 is a horizontal sectional view through one of the bars;

Fig. 4 is a sectional view through the cylinder and piston for operating one of the supporting posts to which the bars are connected;

Fig. 5 is a sectional view through the control valve;

Fig. 6 is a sectional view through the control valve at right angles to the showing of Figure 5 and illustrating the feeler member as contacting therewith for movement thereof.

In the handling of webs of material such as are frequent in cloth finishing processes, an expander consisting of several bent or curved bars is used for stretching the cloth widthwise and taking out any folds from the edges thereof while a guider comprising a separate unit is used for directing the cloth into certain machinery for processing. My apparatus combines the function of an expander and a guider in a single unit by manipulating the curved bars of the expander so that they serve to guide the cloth in the direction of travel which it is desired the same shall take; and I arrange to manipulate these expander bars in response to a feeler member so positioned as to be engaged and moved by the edge of the traveling web when in engagement with the feeler and exerting a certain

amount of friction thereon whereby to operate a controlling mechanism for accomplishing this manipulation; and the following is a more detailed description of the present embodiment of this invention, illustrating the preferred means by which these advantageous results may be accomplished:

With reference to the drawing, 10 designates the base or standards 11 which extend vertically upwardly and are secured together by a suitable I beam 12. Together these standards and their connecting braces serve as supports for the manipulating mechanism which I use. A post 14 is vertically slidably mounted in guides 15 and 16 upon one standard 11, while a similar post 17 is slidably mounted in guides 18 and 19 on the other standard 11. A series of expander bars 20, 21 and 22 are mounted upon and extend between the posts 14 and 17, each being pivoted as at 23 to the post 14 and resting upon a suitable projection such as a pin 24 extending through the post 17, which pin may be provided with a roller or other anti-friction means if desired, so that as one post moves to a different elevation than the other, each of the bars will swing about its pivot 23 and slide longitudinally of itself along or with reference to the pin 24.

The expander bars are curved downwardly in a vertical plane in a known manner, as illustrated in the drawing, so that portions at either side of the center extend substantially at an angle to each other from the center, and as a web of material tends to run at right angles to the longitudinal axis of a bar or roll with which it contacts, the opposite edges of the material tend to move apart to expand it to such an extent that should any folds or creases occur these will be stretched out of the material while passing between these bars. I have here shown three bars so that the cloth passes over two and under one, but the exact number of bars is immaterial so long as the cloth is caused to frictionally contact therewith sufficiently to cause the expanding action.

Each of these bars is provided with a rubber sleeve 25 which has a plurality of graphite bushings 26 driven therein to contact with the bar, there being about a sixteenth of an inch clearance between the bushing and the bar so that an easy rolling contact is provided as the cloth turns the sleeve which rotates on the bar.

Each end of the bar is provided with a mounting member 27 which is bifurcated as at 28 to extend along opposite sides of the post 14 where it is pivoted by a pin 23 passing through the

opposite ears and the post. The opposite end member 29 is similarly constructed and extends along the sides of the bar 17, but at this end it rests upon a projection or pin 24 provided with opposite heads 30 and which pins may or may not turn in the bar 17 or be provided with anti-friction means.

The web of material 31 is passed over the bars 20 and 22 and beneath the bar 21 and as the centers of these bars are all in alignment or in the same plane, this weaving of the web through the bars will cause it to firmly contact all of these bars as it is drawn over them. The web may extend about a guide roll 32 suitably mounted on shaft 33 supported in bearings 34 mounted upon the standard 11, and from this point extends to the machine where it is to be processed or to a packaging apparatus to which it is to be delivered.

In order that the expander may also serve as a guider, I have arranged to move the guide bars 20, 21 and 22 which are curved downwardly in a vertical plane so as to perform this guiding action and for this purpose I have illustrated compressed air actuated cylinders 35 and 36 which are of identical construction, although electric or other means may be used. In Figure 4, I have shown one of these cylinders including a cylindrical shell 37 with a piston 38 and piston rod 39 therein, which piston rod through a suitable bracket 40 is connected to the movable post 14 so that as the piston 38 is raised to move the rod 39 the post 14 will also be raised in response thereto. The bottom 41 of this cylinder is provided with a threaded opening 42 to which the pressure pipe leads. The actuating cylinder 36 is of duplicate construction and is similarly connected to the post 17.

A control valve designated generally 44, see Figures 5 and 6, consists of a casing 45 having three ports 46, 47 and 48. A plunger 49 is equipped with heads 50 and 51 which may obstruct certain of the ports while the space between the heads may serve to direct the flow of air from the middle port to another port, as desired. This slide is weighted as at 52 so as to fall by gravity when no pressure is exerted thereon by the air and is unsupported by a feeler 53 which is pivoted at 54 and bifurcated at 55 to receive the marginal edge of the work or web of material. The opposite end 56 of this feeler bears against the bottom surface of the plunger for actuation thereof.

The port 47 is connected by hose 57 to some external source of pressure supply which is controlled by valve 58. For convenience in conducting the operating fluid, I have provided a metal tube 59 which is rigidly supported at 60 and 61 upon the standards 11. This tube is suitably obstructed at its ends and also obstructed as at 62 so that the supply pipe 63 will lead into the end of the tube to supply pressure through the hose 57 to the middle port 47 of the control valve. A connecting hose 65 connects the port 46 with the tube 59 on the opposite side of the obstruction 62 so that pressure may be conveyed from the port 46 through the hose 65 through tube 59 and then through hose 66 to the opening 42 at the bottom of the cylinder 35. The port 48 is connected by hose 67 directly to the opening 42 in the bottom of cylinder 36.

The operation of the mechanism is as follows:

When a web of cloth is running in its desired path of travel, there will be just sufficient fric-

tion or contact on the feeler 53 to balance the weight of the plunger 49, and the air pressure which is delivered to port 47 will exert a balanced effect on the plunger by there being equal areas on the heads 50 and 51 with which it contacts. Consequently, any pressure of air will not tend to move the plunger 49. Assuming that this cloth should tend to travel to the right, as viewed in Figure 1, it would then exert a greater pressure on the feeler finger 53 and drag it downwardly, it being understood that the cloth is traveling down, as shown in Figure 1. This will swing the feeler 53 about its pivot 54 and force the plunger 49 upwardly, thereby uncovering the port 48 and permitting the ports 47 and 46 to be connected through the space 68 between the heads 50 and 51. Thus, the compressed air will enter port 47 and be forced out through port 46 and through conduit 65, tube 59, and hose 66 so as to raise the piston in cylinder 35, while at the same time any air which might be trapped between the piston and cylinder 36 would be permitted to escape through hose 67, through port 48 and out through the vent 70 in the valve casing so that this piston will be lowered in the cylinder 36, while the piston in the opposite cylinder will be raised. This will cause the desired tilting of the bars to cause the cloth to move towards the left or nearer to its desired straight line of travel, and as this occurs, the feeler fingers 53 will swing about its pivot being followed by the weighted plunger 49 until the position shown in Figure 5 is again assumed. Should, however, the cloth move too far to the left or in the other direction and relieve all friction on the feeler, the weight would then move the slide so that the ports 47 and 48 would be connected and the port 46 would be uncovered, in which case the air pressure coming through port 47 will be directed through port 48 and through the hose 67 to the bottom of the cylinder 36 beneath its piston and cause that piston to raise, while the same time permitting exhaust of the cylinder 35 through the hose connection 66, tube 59, hose connection 65 through the port 46 and out through the vent openings 71 in the top of the valve casing, thus there would be a raising of the post 17 and a lowering of the post 14 until the cloth again engages the feeler finger with sufficient friction to drag it downwardly and push up the plunger 49, and this action would occur back and forth until an equilibrium were established and the cloth restored to traveling in its desired direction centrally of the guide and expanding bars above described.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claim.

I claim:

In an apparatus for handling webs of material, a plurality of bars for contacting the web of material for expanding the same, and means for moving all of said bars for guiding the direction of travel of said web of material, said means comprising at one end a movable supporting post to which all of said bars are pivoted, and a movable supporting post at the other end provided with projections on which the other ends of said bars rest for sliding movement thereon.

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