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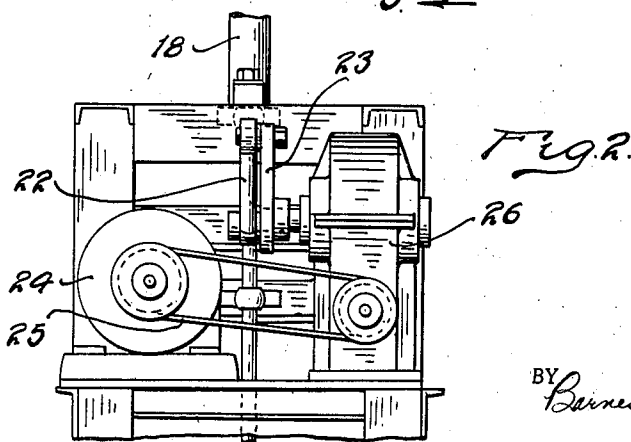
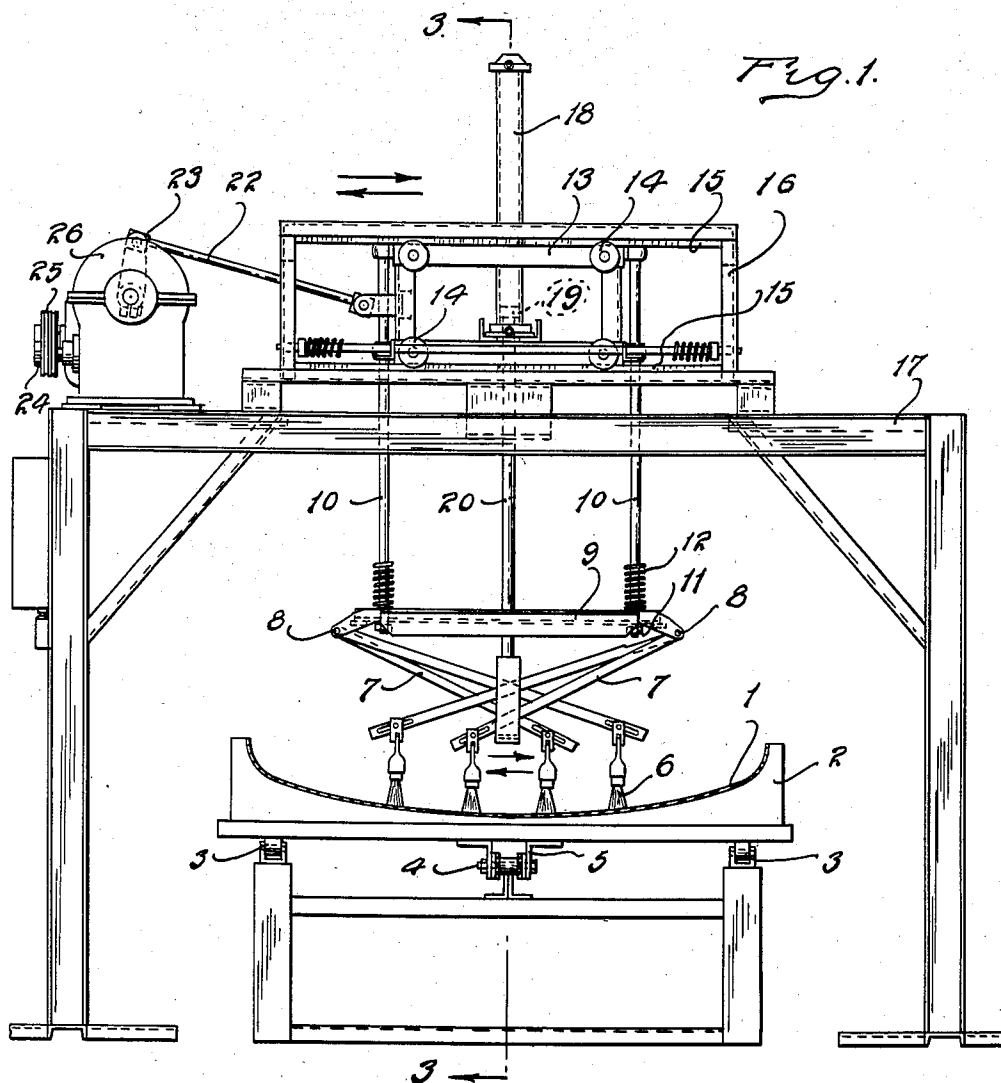
W. D. CHILTON

2,340,933

MATERIAL HANDLING DEVICE

Filed Aug. 3, 1940

6 Sheets-Sheet 1



Feb. 8, 1944.

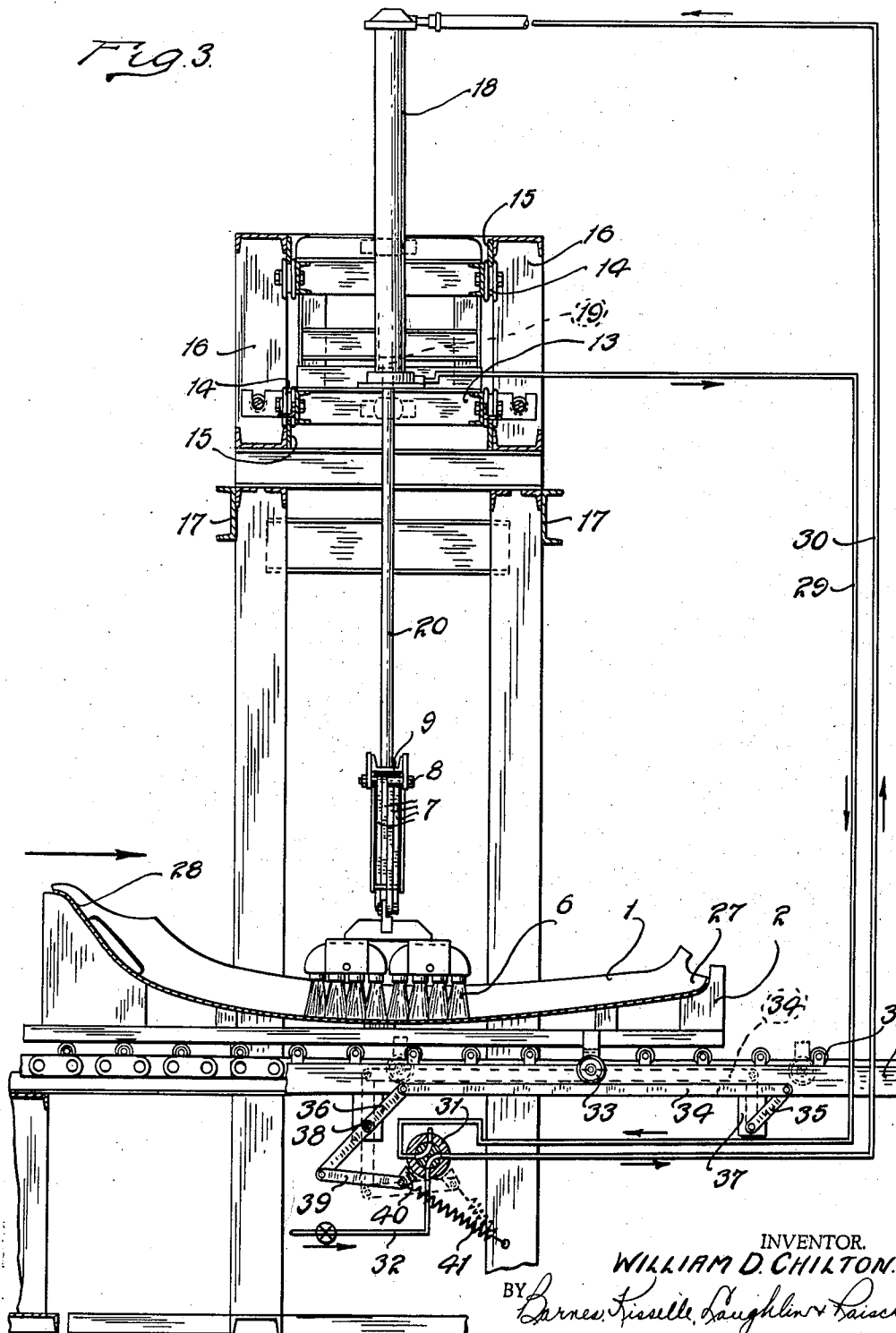
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MATERIAL HANDLING DEVICE

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6 Sheets-Sheet 2



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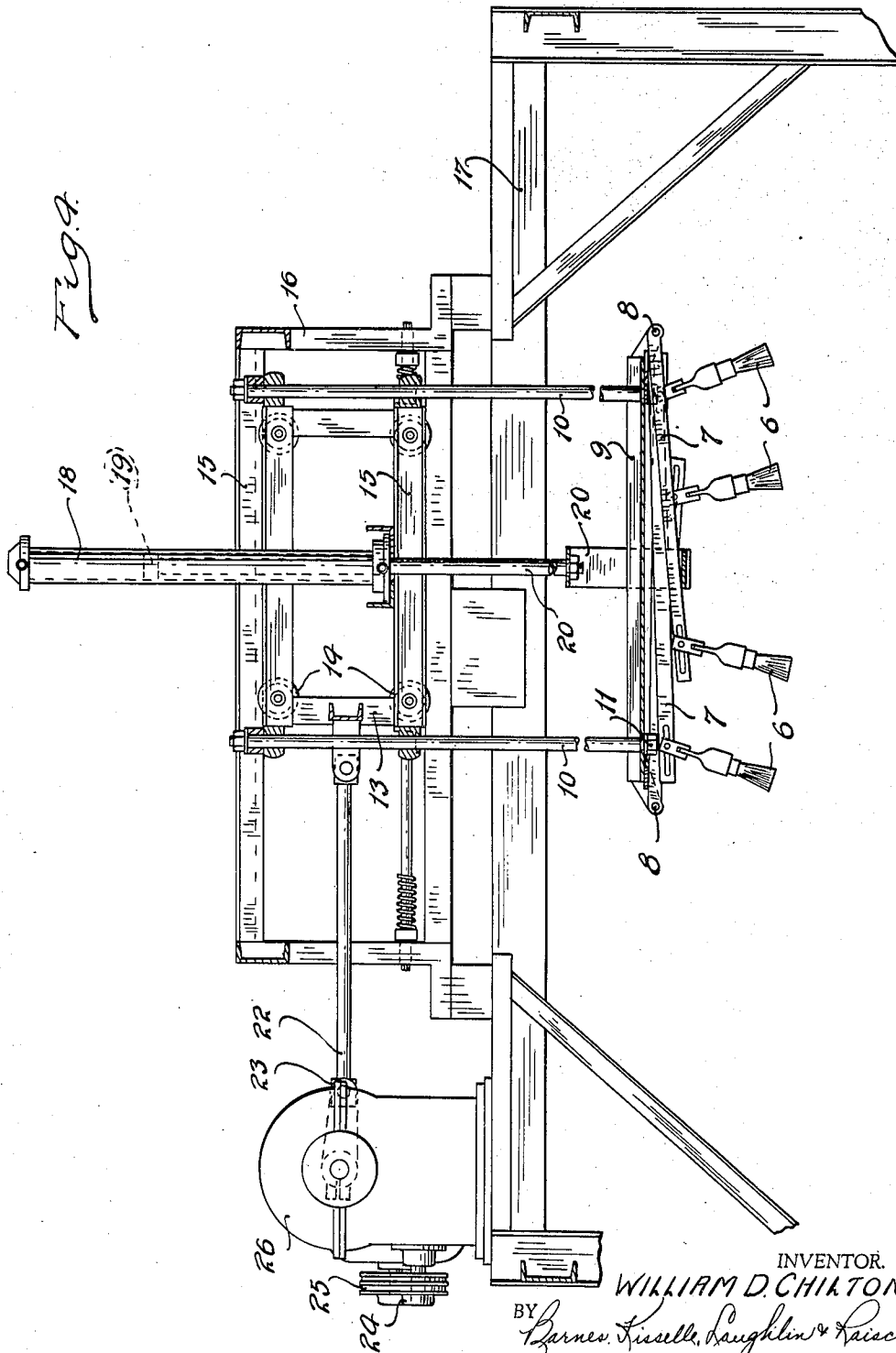
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MATERIAL HANDLING DEVICE

Filed Aug. 3, 1940

6 Sheets-Sheet 3



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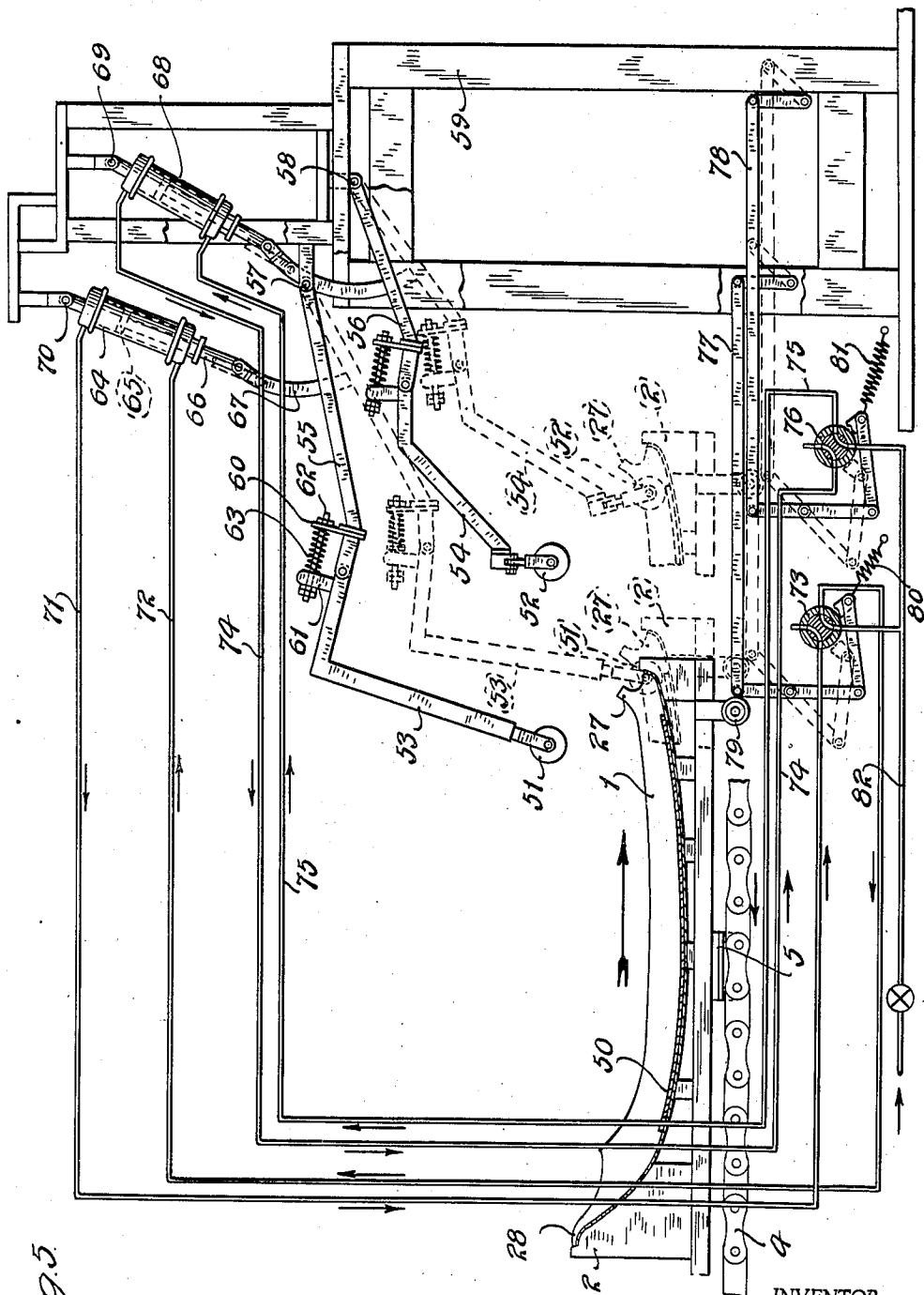


Fig. 5

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MATERIAL HANDLING DEVICE

Filed Aug. 3, 1940

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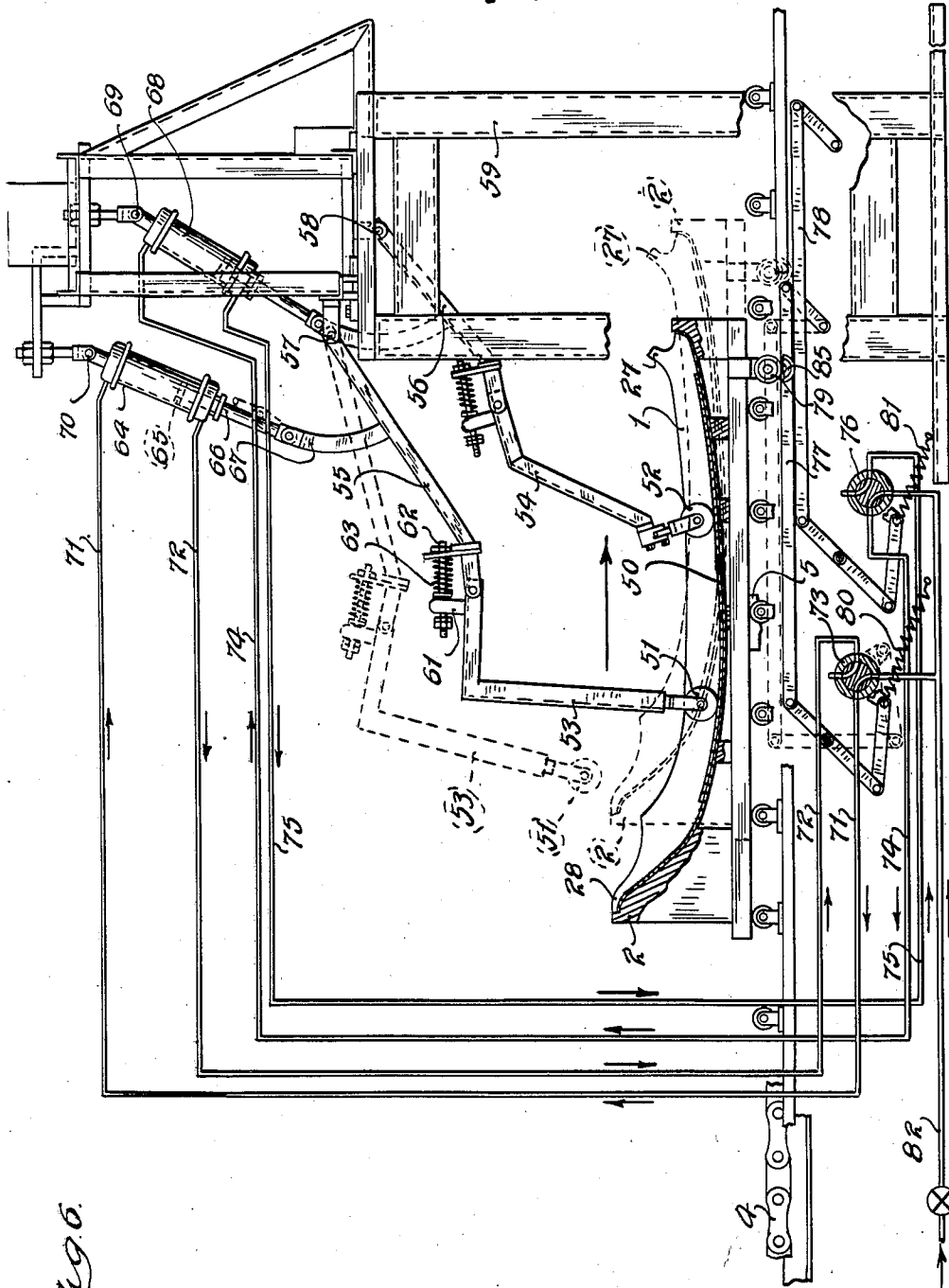


Fig. 6.

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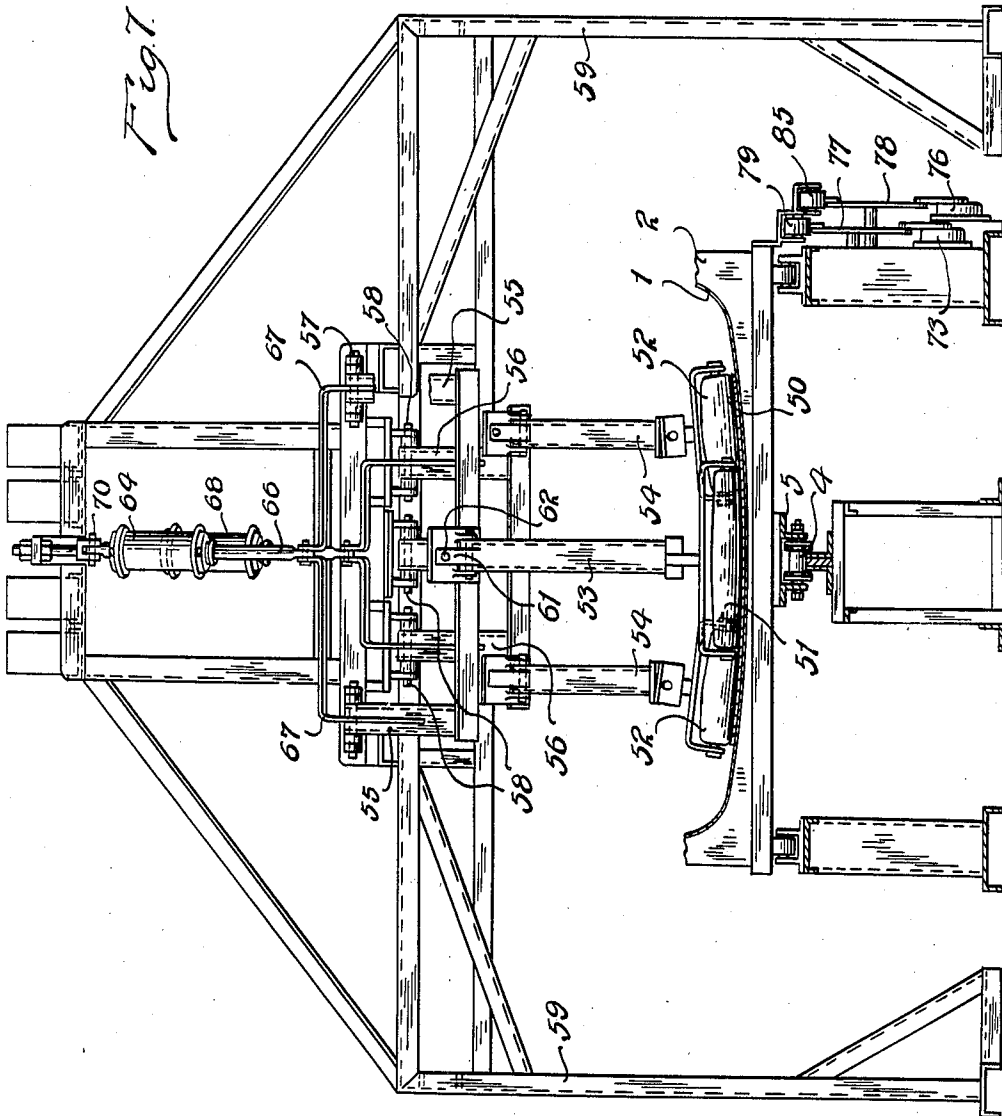
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MATERIAL HANDLING DEVICE

Filed Aug. 3, 1940

6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

2,340,933

MATERIAL HANDLING DEVICE

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Application August 3, 1940, Serial No. 350,973

6 Claims. (Cl. 154—41)

This invention relates to a method and apparatus for applying sound deadening material to metal vehicle body panels.

In the manufacture of sheet steel automobile bodies it has become a common practice to cement a layer of sound deadening and heat insulating material on the inside of the panel. A form of material commonly used for sound deadening and heat insulating purposes comprises a soft, flexible pad of melted fibers bound together with an adhesive such as asphalt. It has been common practice to manually apply this insulating material to the body panels after the several body panels were welded together to form a body. This prior method was slow, cumbersome and inefficient.

It is the object of this invention to produce a method and apparatus for applying the sound deadening material to the panels before they are welded into an integral body which is more simple and efficient than the method heretofore practiced.

The method practiced and the apparatus used briefly comprises a continuously moving conveyor upon which the sheet metal panels are carried. Cement is first applied to the panel, then automatically spread, the pad then applied to the cemented face of the panel and automatically rolled down to smooth out the pad and effect a good bond between the pad and the metal panel.

In the drawings:

Fig. 1 is a front elevation showing the mechanism for spreading the cement on the panel and showing a vertical transverse cross section of the conveyor and sheet metal body roof panel.

Fig. 2 is a detail showing the drive for the mechanical brushing apparatus.

Fig. 3 is a section along the line 3—3 of Fig. 1.

Fig. 4 is a front elevation of the mechanical brushing apparatus showing the brushes raised.

Fig. 5 is a side elevation showing the conveyor, body panel and the rollers for rolling down the pad, the rollers being raised to clear the forward end of the panel.

Fig. 6 is a view similar to Fig. 5 showing in the full lines the rollers rolling down the pad and a dotted line showing of one of the rollers raised to clear the upwardly curved rear end of the panel.

Fig. 7 is a transverse vertical section of the rolling and conveying apparatus.

Referring more particularly to the drawings it will be seen that the sheet metal panel 1 is carried by a jig 2 drawn along upon a pair of roller tracks 3 by means of a conveyor chain 4 secured

to the jig 2 by brackets 5. For purposes of description the sheet metal panel 1 is shown as the roof panel of an all metal body.

The panel 1 is loaded in the jig by hand with the bottom side of the panel up. Preferably the conveyor chain 4 moves continuously so that the jig 2 is traveling along the conveyor while the several operations are performed upon the panel 1. After the panel 1 is lowered into the jig 2, cement is applied in gobs to the surface of the panel 1 either by hand or by any well known cement applicator gun. After the cement has been applied to the panel, the conveyor carries the panel beneath a cement spreading machine comprising a plurality of brushes 6 which reciprocate transversely of the panel 1 and brush the cement evenly over the face of the panel. The brushes 6 reciprocate transversely of the direction of travel of the panel and, of course, the panel is traveling continuously during the brushing operation in the direction of the arrow, Fig. 3.

The brushes 6 are mounted upon a plurality of arms 7 which are pivotally supported as at 8 upon a support member 9. The support member 9 is mounted upon the rods 10. The rods 10 pass through enlarged openings in the member 9. The member 9 is held upon the rods 10 by the nuts 11 and held down thereupon by the compression springs 12. The rods 10 are fixed at their upper ends to the reciprocating carriage 13 mounted upon rollers 14 which go back and forth upon the tracks 15. The tracks 15 are fixed on the frame 16 which in turn is fixed to the main stationary frame 17. A cylinder 18 is fixed upon the reciprocating carriage 13. The cylinder is provided with a piston 19 and piston rod 20. The lower end of the piston rod 20 is secured to a U shaped support member 21 which passes around the support member 9 and arms 7.

The carriage 13 is connected by means of a rod 22 with a rotating crank 23. The crank 23 is continuously rotated by an electric motor 24, belt 25 and gear reduction 26. Thus, as the crank 23 rotates this causes the carriage 13 to reciprocate on the tracks 15. As the carriage 13 reciprocates, the brushes 6 likewise reciprocate across the panel 1 in the direction of the arrows, Fig. 1.

It will be noted that the panel 1 is curved upwardly at its front and rear ends as at 27 and 28 respectively. Therefore it is necessary that the brushes 6 be raised as the front end 27 of the panel passes into the cement spreading machine, then lowered to spread the cement and then raised again to clear the rear end 28 of the panel 21. The raising and lowering of the

brushes 6 is controlled automatically through air cylinder 18 which is connected by lines 29 and 30 with a valve 31. Valve 31 is connected by means of line 32 with a source of air under pressure. Valve 31 is arranged to be automatically operated by the jig 2.

To this end the jig 2 is provided with a roller 33. A rail 34 is pivotally connected at one end to link 35 and at the other end to lever 36. Link 35 is pivotally supported on bracket 37 fixed on the roller conveyor 3 and lever 36 is pivotally supported on the bracket 38 fixed on the roller conveyor 3. Link 35 and lever 36 always hold the rod 34 horizontal. The lower end of bracket 38 is connected by link 39 with the arm 40 fixed to the rotary valve 31.

In the absence of a jig 2, rod 34 is held in its uppermost position by tension spring 41 and lever 36 and link 35 are positioned vertically. At this time air line 32 is connected through rotary valve 31 with air line 29 thereby raising the piston 19 and brushes 6 to the position shown in Fig. 4. This position of the valve is shown in the dotted lines, Fig. 3. Shortly after the forward end 27 of the panel passes under the brushes 6, roller 33 strikes lever 36 thereby swinging the same clockwise, Fig. 3, and rotating the valve 31 so that line 30 is now connected with air line 32 (full line showing, Fig. 3) thereby admitting compressed air into the upper end of the cylinder to lower the piston 19 and brushes 6 into contact with the panel 1. At this time line 29 is open to exhaust through valve 31. Since the brushes 6 are continuously reciprocating, they properly brush or spread the cement evenly over the face of the panel 1 as it travels to the left, as indicated by the arrows, Fig. 3.

As the rear end 28 of the panel approaches the brushes 6, roller 33 rolls off of rail 34 thereby permitting tension spring 41 to again return lever 36, link 35 to vertical position and rotate valve 31 so that air line 32 again connects with air line 29 to raise the brushes and air line 30 is exhausted to atmosphere. The brushes being raised, they are free to clear the rear end of the panel 1 as it passes by.

After the cement or other adhesive has been properly spread on the panel 1, a pad or layer of insulating material 50 is laid by hand upon the cement covered portion of the panel 1. The conveyor chain as it continuously moves, next moves the forward end 27 of the panel beneath rollers 51 and 52. Rollers 51 and 52 are carried by arms 53 and 54 respectively. Arms 53 and 54 are pivotally connected to levers 55 and 56 respectively which in turn are pivotally supported as at 57 and 58 respectively upon the stationary frame 59 of the pad rolling machine. A limited hinging movement is permitted between arms 53 and 55 and arms 54 and 56 by virtue of a cushion in the form of a bracket 60 fixed to one arm and a bracket 61 fixed to the other arm. A rod 62 is fixed to one bracket and has a sliding connection with the other bracket. A coil compression spring 63 is threaded over the rod 62 between the brackets 60 and 61 which cushions the limited hinging movement between the levers.

Arm 55 is controlled by an air cylinder 64 having a piston 65 and connecting rods 66 connected with arm 55 by bracket 67. Arm 56 is similarly connected with an air cylinder 68 pivotally supported on the frame 59 as at 69. Cylinder 64 is pivotally supported on the frame as

at 70. Cylinder 64 is connected by means of air lines 71 and 72 with rotary valve 73. Cylinder 68 is connected by means of lines 74 and 75 with rotary valve 76. Each of the valves 73 and 76 are controlled by a mechanism identical with that for controlling valve 31.

This mechanism for valve 73 will be generally designated 77 and for valve 76 will be generally designated 78. Mechanism 77 and 78 will be offset from the mechanism shown for operating valve 31 and will be operated by rollers 79 and 85 mounted on jig 2 and offset from each other (Fig. 7) and from roller 33. When the jig 2 is not passing through the pad rolling machine, tension springs 80 and 81 will hold the devices 77 and 78 in the full line position, Fig. 5, so that air lines 71 and 74 are open to atmosphere. Line 72 is connected with air pressure line 82 through valve 73 and valve 76 connects air line 74 with atmosphere and air line 75 with the compressed air line 82. Thus, all of the rollers 51 and 52 are raised. As soon as roller 79 strikes device 77, valve 73 is shifted so that line 71 is now connected to compressed air line 82 and line 72 is open to atmosphere (full line showing, Fig. 6), thereby causing roller 51 to lower down upon the pad 50. At this time, of course, the forward end 27 of panel 1 has passed beyond roller 51.

As the jig travels on, the front end of the panel 1 passes beneath raised rollers 52 and roller 85 now strikes device 78, thereby operating air valve 76 so that line 74 is connected to pressure air line 82 and line 75 is open to atmosphere thus causing rollers 52 to be lowered upon the pad 50 as the pad travels beneath the rollers 51 and 52 which exert pressure on the pad 50. The pad 50 is rolled or ironed smooth and pressed securely down upon the panel 1 and cemented to the panel. Just before rollers 51 and 52 reach the rear end of the panel 1, rollers 79 and 85 respectively roll off of devices 77 and 78 respectively thereby permitting the tension springs 80 and 81 to again return the valves 73 and 76 to their initial positions (full lines, Fig. 5) thereby connecting lines 72 and 75 with the pressure air line 82 and lines 71 and 74 with atmosphere. This permits air cylinders 64 and 68 to raise the rollers 51 and 52 so that they will clear the rear end 28 of the panel 1 as it passes beneath the rollers.

I claim:

1. In an apparatus for applying a sound deadening and insulating pad to a sheet metal vehicle body panel after a surface of the panel has been coated with cement, a support for said panel, a conveyor for moving the support along a predetermined course, a roller for rolling the pad against the surface of the panel, a control member moved along said course by said conveyor, and means controlled by said control member for automatically moving the roller against the pad after the forward end of the panel has passed by the roller and for retracting the roller from the pad after the pad has been rolled against the surface of the panel.

2. In an apparatus for applying a sound deadening and insulating pad to a sheet metal vehicle body panel after the surface of the panel has been coated with cement, a support for said panel, a conveyor for moving the support along a predetermined course, a roller for rolling the pad against the surface of the panel, a swinging arm for supporting the roller, and power means controlled by control means moved along said

course by the conveyor for automatically swinging the arm and roller against the pad after the forward end of the panel has passed by the roller and for raising the roller after the pad has been rolled against the surface of the panel.

3. In an apparatus for applying a sound deadening and insulating pad to a sheet metal vehicle body panel after a surface of the panel has been coated with cement, a support for said panel, a conveyor for moving the support along a predetermined course, a roller for rolling the pad against the surface of the panel, power means for raising and lowering the said roller, and a control mechanism for said power means including cooperating members carried by the panel support for automatically operating said power means as the front end of the panel passes under the roller to bring the roller into rolling and pressing engagement with the pad and to retract the roller from the pad before the rear end of the panel reaches the roller.

4. In an apparatus for applying a sound deadening and insulating pad to a sheet metal vehicle body panel after a surface of the panel has been coated with cement, a support for said panel, a conveyor for moving the support along a predetermined course, and pressure ironing means for pressing the pad against the surface of the panel and ironing the same smooth as the panel and pad pass beneath the ironing means, and power means controlled by control means moved along said course by the conveyor for automatically moving the ironing means against the pad after the forward end of the panel has passed by the ironing means and retracting the ironing means from the pad before

the rear end of the panel reaches the ironing means.

5. In an apparatus for applying a sound deadening and insulating pad to a sheet metal vehicle body panel after a surface of the panel has been coated with cement, a support for said panel, a conveyor for moving the support along a predetermined course, a roller for rolling the pad against the surface of the panel, and fluid pressure operated means for applying the roller against the pad and retracting the same from the pad, and control mechanism including a fluid valve actuated by said support whereby the roller is applied to the pad as the forward end of the pad passes under the roller and is retracted from the pad as the rear end of the pad passes under the roller.

6. In an apparatus for applying a sound deadening and insulating pad to a curved sheet metal vehicle body panel having its forward and rear ends higher than its intermediate portion, a jig for supporting said panel, a conveyor for continuously moving the jig along a predetermined course, a roller having a curvature corresponding to that of the panel for rolling the pad against the surface of the panel, a control member moved along said course by said conveyor, and means controlled by the said control member for automatically lowering the roller upon the pad after the forward end of the panel has passed the roller and for raising the roller from the pad after the pad has been rolled against the surface of the panel whereby the roller clears the elevated rear end of the panel.

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