Dec. 26, 1939. A. G. LEONARD, JR 2,184,619

SHINGLE MAKING MACHINE

Filed July 3, 1936 2 Sheets-Sheet 1

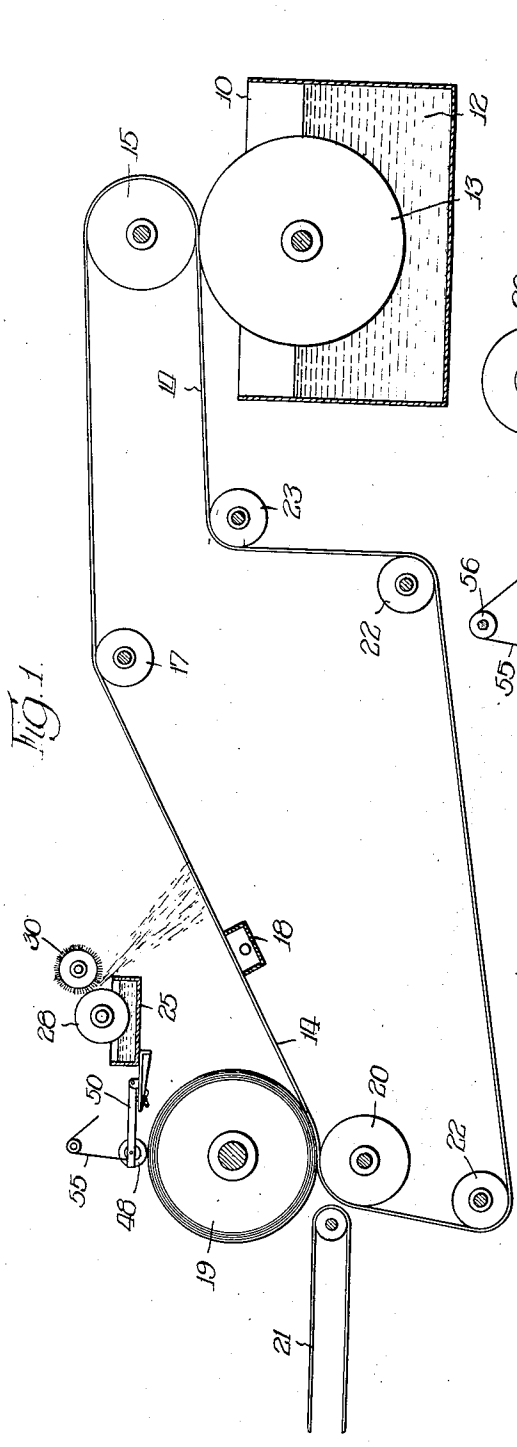


Fig. 1.

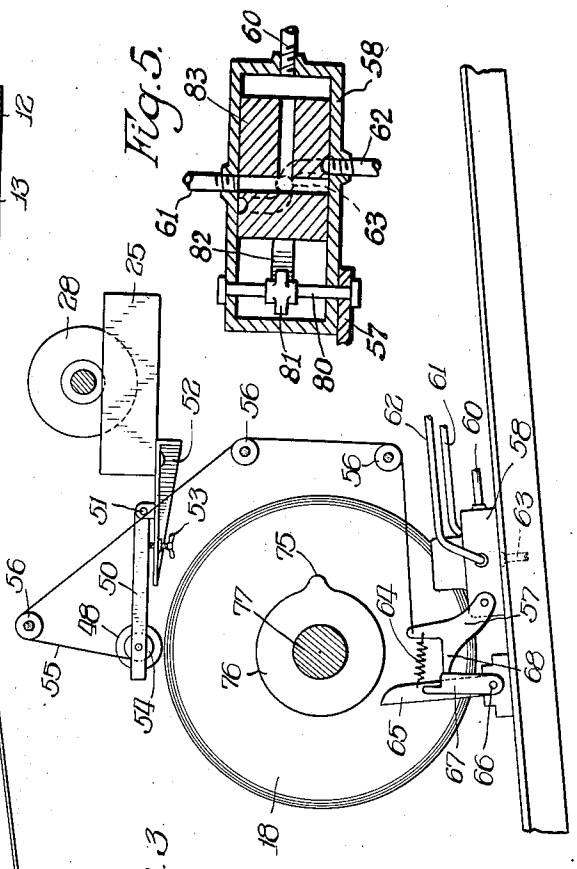


Fig. 5.

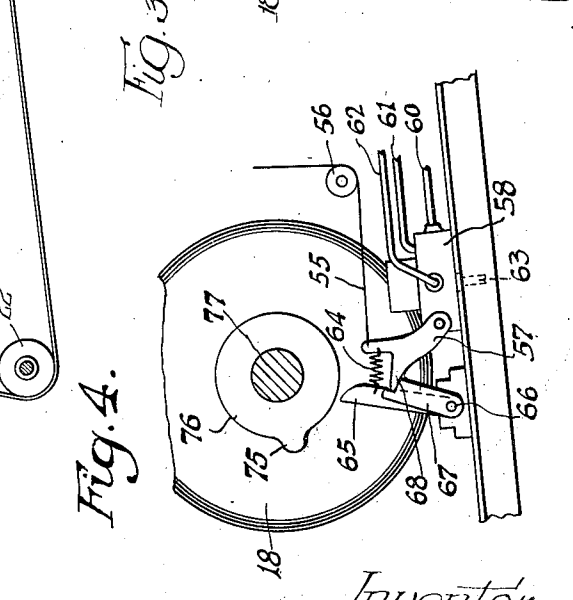


Fig. 3.

Fig. 4.

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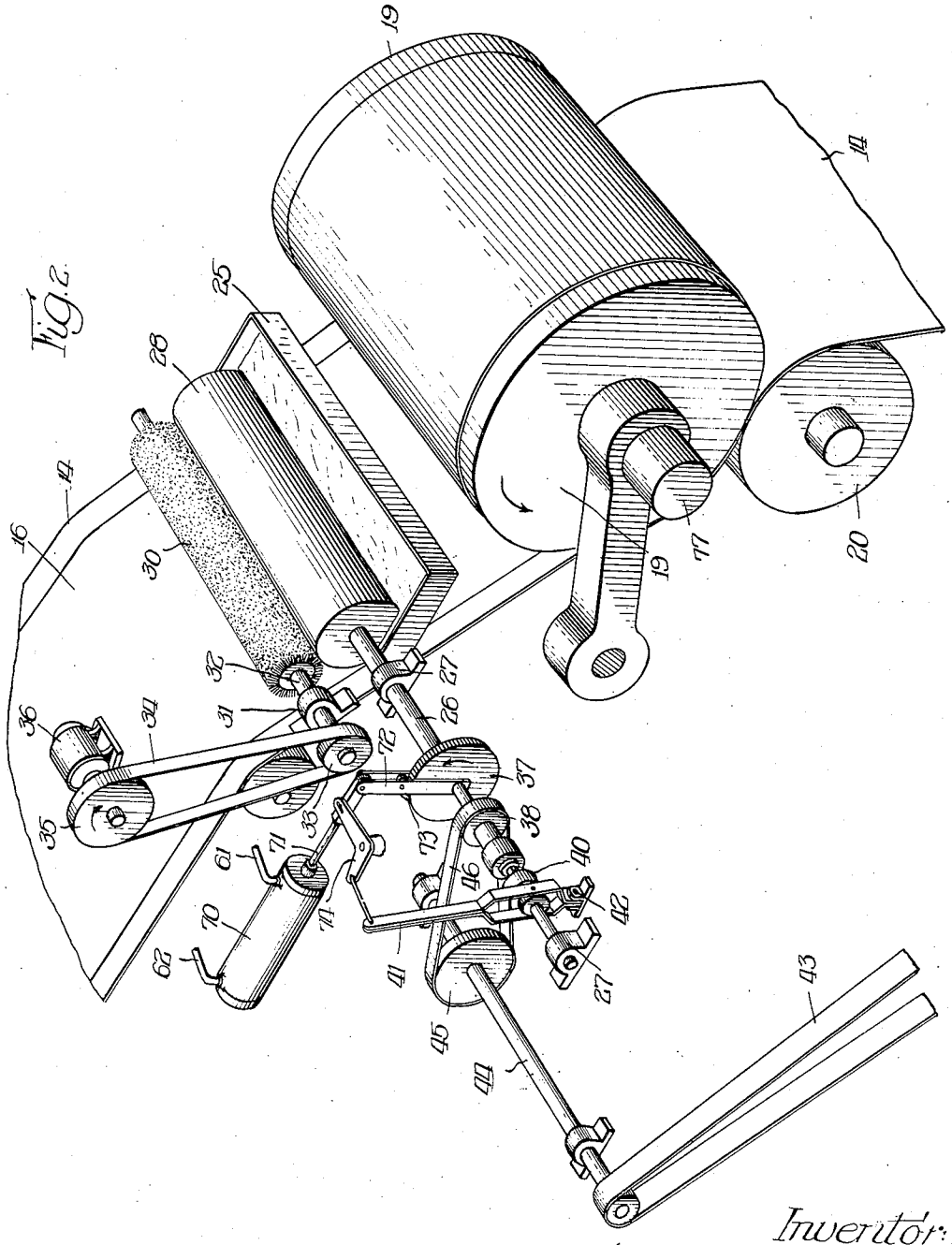
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SHINGLE MAKING MACHINE

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Fig. 2.



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UNITED STATES PATENT OFFICE

2,184,619

SHINGLE MAKING MACHINE

Arthur G. Leonard, Jr., Wilmington, Ill., assignor, by mesne assignments, to The Lehon Company, Chicago, Ill., a corporation of Illinois

Application July 3, 1936, Serial No. 88,758

5 Claims. (Cl. 92—67)

The invention relates to apparatus for making asbestos shingle stock or any similar material which is formed by accumulation of successive layers.

The invention is particularly concerned with the making and coloring of shingle stock formed from asbestos fibers and cement, which is transferred as a wet mixture to an endless cloth band by an operation known as couching in the paper making art, and which forms a relatively thin layer or web of the cement-asbestos mixture on the endless cloth band. As shown in my patent, No. 2,010,308, granted August 6, 1935, an accumulation roll is used on which the wet paper-like web of the cement-asbestos mixture is accumulated until the desired thickness is secured, whereupon the ply-board thus formed is stripped from the roll and delivered to conveying means.

After the ply-board has been subjected to pressure to force out most of the water and then dried, a very satisfactory stock for shingles is secured, which, however, is of a dull gray color although the shade of the stock may be varied by adding coloring ingredients to the mixture. This, however, materially increases the cost of the resulting product and is unnecessary as only the surface of the stock need be colored. Therefore, the primary object of the invention is to produce shingle stock of cement and asbestos which will have one surface thereof colored by the application of a colored coating thereto during manufacture.

A further object of the invention resides in the provision of distributing means for the color mixture which will have operation intermittently, thus applying a color coating to the surface of the web at predetermined intervals.

With these and various other objects in view the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended thereto.

In the drawings which illustrate an embodiment of the invention and wherein like reference characters are used to designate like parts—

Figure 1 is a diagrammatic view illustrating apparatus for forming ply-board in combination with means for applying a color coating thereto in accordance with the invention;

Figure 2 is a fragmentary perspective view showing the apparatus for operating the color distributing means;

Figure 3 is an elevational view of the accumulation roll showing structure for controlling the operation of the color distributing means;

Figure 4 is a fragmentary elevational view of the control structure of Figure 3 shown in its other position of operation; and

Figure 5 is a sectional view showing the interior construction of the four-way valve providing the control means for the clutch.

The invention is illustrated in connection with apparatus for producing ply-board from a mixture of cement and asbestos fibers which is first transferred to an endless cloth band in a relatively thin continuous web. This web is accumulated on a roll until the desired thickness is secured, whereupon the ply-board thus produced is stripped from the roll and the process repeated. This apparatus essentially consists of a vat or container 10 for the cement-asbestos mixture 12, a large proportion of the mixture being water so that the same can be readily transferred from a mixing tank (not shown) to the vat 10. Rotatably journalled within the vat 10 is a drum 13 having a periphery formed by a fine wire mesh fabric. A section of the periphery of the drum is subjected to vacuum to cause the mixture in tank 10, that is, the asbestos fiber and cement, to adhere to the wire fabric forming a relatively thin coat on the exterior of the drum. The character of drum above described is well known and the operation of transferring the material adhering to the wire fabric is known as couching.

The endless band 14 is suitably supported by a roller 15 directly over the drum 13 so that the band contacts the periphery of the drum and picks up the coating which is deposited on the band as a wet paper-like web, indicated in Figure 2 by numeral 16. The web travels over a small supporting roller 17, over the vacuum means 18, which removes from the web excess moisture, and between an accumulation roll 19 and a lower supporting roller 20. At this point the web is caused to accumulate on the roll 19 until the desired thickness is secured, whereupon the ply-board produced is severed and stripped from the roll. The conveyor 21 removes the ply-board which has a length equal to the circumference of the accumulation roll to hydraulic means, not shown, where the ply-board is pressed to remove the remaining moisture and is subsequently cut into shingle size and dried. From the supporting roller 20 the cloth band travels under rollers 22 over rollers 23 to rollers 15, where it again functions to remove the web from the drum 13.

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The apparatus for applying a coating of color to the web is shown in Figure 2 and comprises a trough or fountain 25 containing the coloring composition which may comprise a mixture of cement and water to which has been added a coloring ingredient to produce the color desired for the shingle stock. The shaft 26 journalled by bearings 27 supports the fountain or supply roller 28 within the fountain 25 so that when the roller is rotated the composition in the fountain is picked up by the surface of said roller. Located adjacent the supply roller 28 is a distributing roller 30, suitably journalled by bearings 31. Shaft 32, which supports the distributing roller, is provided with pulley 33 connected by endless belt 34 with the driving pulley 35, rotated by an electric motor 36. Fixed to shaft 26 is a ratchet wheel 37, while loosely mounted so as to have independent rotation on said shaft is a pulley 38. Associated with said pulley is a clutch designated in its entirety by 40 and which is actuated by lever 41 having pivotal connection with a support as at 42. The power for driving the supply roller 28 is supplied by the belt 43, driven by a motor or other prime mover, not shown. Said belt drives shaft 44 to which is fixed pulley 45 operatively connected with pulley 38 by the belt 46. Since pulley 38 rotates independently of shaft 26, driving of this shaft and therefore of roller 28 depends upon the position of the clutch lever 41. When the lever is positioned to connect shaft 26 with pulley 38 the supply roller 28 will be rotated to supply the coating composition in fountain 25 to the distributing roller 30, which is continuously rotated by motor 26. However, when the lever is located so as to disconnect shaft 26 from pulley 38 the supply roller 28 will remain at rest and although the distributing roller 30 may continue to rotate no coloring composition will be supplied to the web.

As previously explained, the wet paper-like web on the endless cloth band accumulates on the roll 19 until the desired thickness is secured. When this is stripped from the roll the resulting product has a smooth surface which was in contact with the roll. This provides the exterior surface for the shingles. Therefore, it is only necessary to supply the coloring composition to the web for the first layer accumulated on the roll, as successive accumulated layers merely add to the thickness of the resulting shingle stock. The means controlling the operation of the supply roller 28 is shown in Figure 3 and consists of a roller 48 supported by arms 50 pivotally secured at 51 to a projecting support 52. Means in the form of a threaded screw 53 is provided for adjusting the position of the arms 50 so that the roller 48 can be variably spaced with respect to the periphery of the accumulation roll 19. The roller drives a spool 54 on which is wound the cable 55 extending over suitably mounted pulleys 56 and being fastened to the upper end of lever 57. Said lever forms the operating member of a four-way valve 58 connecting with an air supply pipe 60 and having the pipes 61 and 62 leading therefrom. An exhaust 63 extends from the base of the valve. Lever 57 is joined by the spring 64 to an arm 65 fixed to the rotatable shaft 66. Also secured to said shaft is a latching lever 67 which in normal position contacts with the extension 68 of the lever 57. Oscillating movement of lever 57 will rotate shaft 80 journalled by the four-way valve and having fixedly secured thereto the segment 81 which meshes with the rack 82. Movement in an axial direction is thus imparted to the piston 83 of the four-way valve to control admission of air to the pipes 61 and 62. It will be observed that when the piston is in the position shown in Figure 5, air will be supplied to pipe 61, whereas, pipe 62 will have connection with the exhaust 63. When the piston is located in its extreme right hand position of movement air will be supplied to pipe 62 and pipe 61 will have connection with the exhaust. The pipes 61 and 62 lead to air cylinder 70, Figure 2. The piston rod 71 of said cylinder is pivotally connected to the upper end of arms 72 having oscillating movement on shaft 26. Said arms carry a ratchet 73 having contact with the periphery of the ratchet wheel 37 and which is positioned so as to prevent reverse rotation of the supply roller 28. A bell crank 74 operatively connects the piston rod 71 with the lever 41 and upon outward movement of the piston rod the lever is oscillated in that direction to disconnect pulley 38 from shaft 36. When the piston rod is returned or moves inwardly lever 41 is oscillated in the opposite direction to connect the pulley and shaft, resulting in rotation of the supply roller 28.

In accordance with the invention, actuation of the clutch is controlled through the four-way valve and in timed relation with the rotations of the accumulation roll. For purposes of illustration it may be assumed that twenty rotations of the roll are necessary to accumulate the necessary layers of web to produce ply-board of the required thickness. However, the means for applying the color coating need be operated only for the first layer accumulated on the roll. This is the function of the roller 48 which is caused to rotate when the layers have accumulated on the roll 19 to the desired thickness. The cable is thus caused to wind up on spool 54 until the lever 57 of the four-way valve is oscillated in a direction toward the right, Figure 3. This movement of the lever 57 will actuate the four-way valve and the lever will be held in oscillated position as shown in Figure 4 by action of the latch 67. The four-way valve will supply air to pipe 61, leading to the front end of cylinder 70, producing actuation of the piston rod, rocking of lever 41, and consequently the clutch, to cause rotation of the supply roller 28. The composition in the fountain 25 is picked up by the surface of said roller and supplied to roller 30 formed of stiff wire bristles. This roller is rotated at a high speed and the coloring composition is in effect sprayed onto the surface of the web. The color coating will be applied to the web for one complete revolution of the accumulation roll when the bulbous portion 75 on cam 76 fixed to shaft 77 and rotating with the roll strikes the arm 65. This returns lever 57 and latches the same in normal position. Rotation of the four-way valve results in exhausting the air in pipe 61 and supplying air to pipe 62 which connects with the end of cylinder 70. The piston rod is therefor caused to move outwardly, actuating the clutch to discontinue the drive to the supply roller.

The roller 48 is not rotated until the ply-board on the roll 19 is the proper thickness. This produces operation of the means applying a color coating to the web which at that time is located substantially below the mechanism. This portion of the web will form the first layer accumulated on roll 19 as the ply-board is sev-

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ered and stripped from the roll immediately after the roller 48 is rotated.

The invention is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawings, as various other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. Apparatus for making shingle stock comprising an accumulation roll on which said stock is formed by the accumulation of several layers of relatively thin web, coating means for spraying a coating on one surface of said web, a drive for said coating means including a clutch, and control means for actuating the clutch, said control means being in turn actuated by the stock on the accumulation roll when the same reaches a predetermined thickness.

2. Apparatus for making shingle stock comprising an accumulation roll on which said stock is formed by the accumulation of several layers of relatively thin web, coating means for spraying a coating on one surface of said web, said means including a supply roller and a distributing roller contacting the periphery of said supply roller, a drive for rotating the supply roller including a clutch, and control means for actuating the clutch, said control means being in turn actuated by the stock on said accumulation roll when the same reaches a predetermined thickness.

3. Apparatus for making shingle stock comprising an accumulation roll on which said stock is formed by the accumulation of several layers of relatively thin web, coating means for spraying a coating on one surface of said web, said means including an intermittently operating supply roller and a distributing roller contacting the periphery thereof, a fountain associated with the supply roller and containing a coating composition, means continuously rotating said distributing roller, a drive for said supply roller including a clutch, and control means for the clutch actuated by the stock on the accumulation roll when the same reaches a predetermined thickness whereby the supply roller is operated intermittently.

4. Apparatus for making shingle stock comprising an accumulation roll on which said stock is formed by the accumulation of several layers of relatively thin web, coating means for spraying a coating on one surface of said web, said means including a supply roller and a distributing roller contacting the periphery thereof, a drive for rotating said supply roller including a clutch for connecting or disconnecting the drive, means continuously rotating said distributing roller and at a peripheral speed greater than the peripheral speed of the supply roller when said roller is operating, and control means for the clutch having actuation to connect the drive when the stock on the accumulation roll reaches the predetermined thickness.

5. Apparatus for making shingle stock comprising an accumulation roll on which said stock is formed by the accumulation of several layers of relatively thin web, coating means for spraying a coating on one surface of the web, said means including a supply roller, a fountain containing a coating composition and journalling said supply roller, a distributing roller having contact with the periphery of the supply roller, a drive for rotating said supply roller including a clutch for connecting or disconecting said drive, means continuously rotating said distributing roller and at a peripheral speed greater than the peripheral speed of the supply roller when said roller is operating, control means for said clutch, said control means having actuation to connect said drive when the stock on the accumulation roll reaches a predetermined thickness, and means rotated by said accumulation roll for causing actuation of the control means to disconnect the drive through said clutch.

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