March 19, 1935. A. G. LEONARD, JR 1,995,032

APPARATUS FOR MAKING ROOFING

Filed May 7, 1932

Fig. 1.

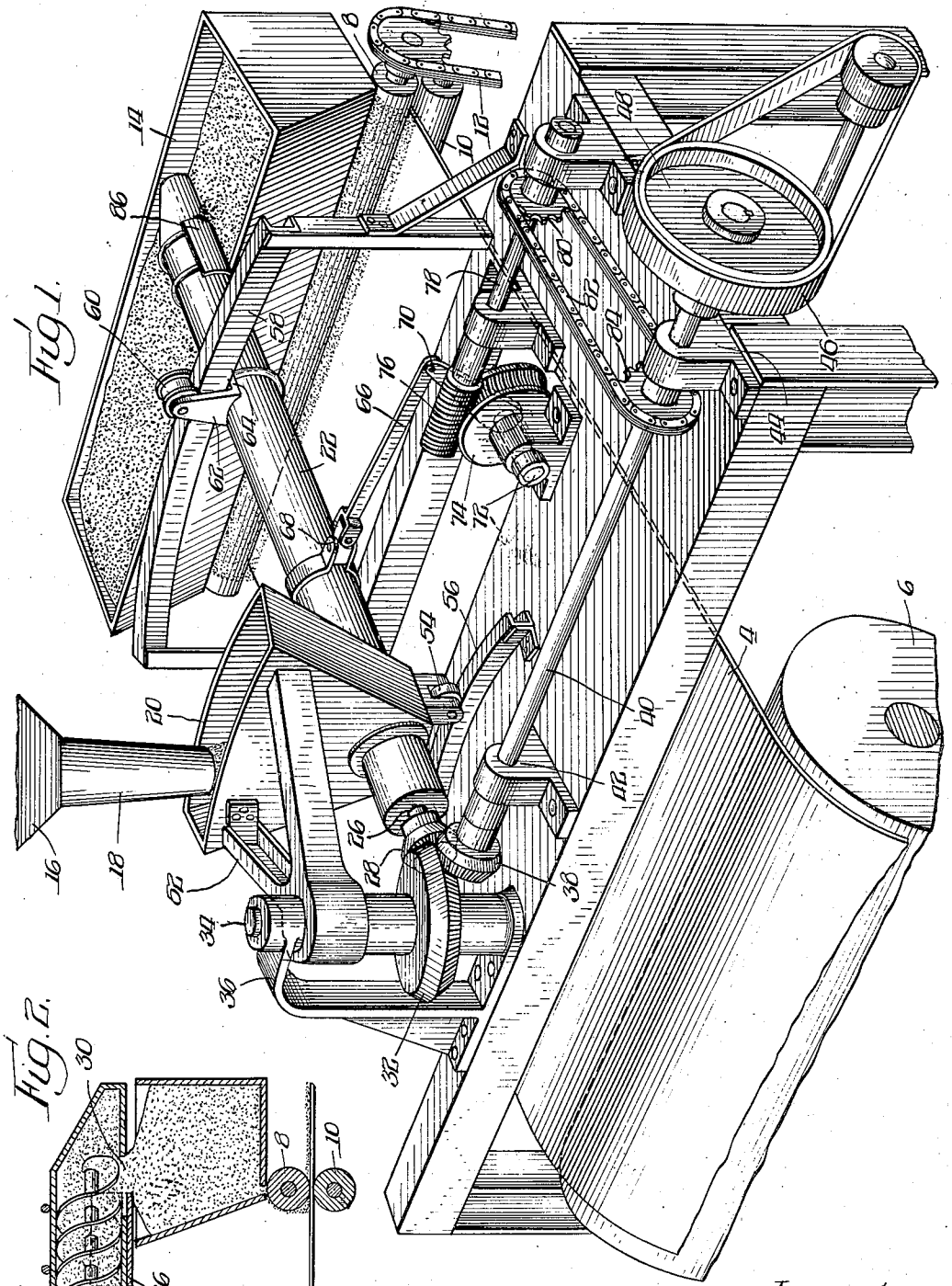


Fig. 2.

Inventor:
Arthur G. Leonard Jr.
By Wilkinson, Huxley, Byron & Knight
Attys.

Patented Mar. 19, 1935 1,995,032

UNITED STATES PATENT OFFICE

1,995,032

APPARATUS FOR MAKING ROOFING

Arthur G. Leonard, Jr., Wilmington, Ill., assignor to Orenda Corporation, Chicago, Ill., a corporation of Illinois

Application May 7, 1932, Serial No. 609,955

11 Claims. (Cl. 91—59)

This invention relates to the manufacture of roofing or the like, and has been illustrated as embodying apparatus for, and the process of surfacing the roofing by applying granular slate to a strip of felt freshly coated with asphalt.

Granulated slate, and other such surfacing materials usually have intermixed therewith a material amount of powdery material which sifts through the larger granules and therefore appears on the roofing in an excess quantity along a line which passes directly below the feeding nozzle. In other words, if the surfacing material is fed into the trough from a single spout to the center thereof the granular material will flow over to the ends of the trough but the powdery material will sift straight down, with the result that the roofing surfaced from the ends of the trough will be relatively free from powder, whereas the roofing fed from the center of the trough underneath the feeding spout will be supplied with powder in considerable excess of the normal amount. For this reason it has been necessary in the past to exercise special care in separating powdery materials from the granulated surfacing material and in maintaining this separation. The present invention overcomes this difficulty by providing a uniform feed of the surfacing material to far parts of the trough and accomplishes this result through means which are relatively simple and economical in construction and operation, and thoroughly dependable.

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, drawing and claims appended hereto.

In the drawing, which illustrates an embodiment of the device, and wherein like reference characters are used to designate like parts,

Figure 1 is a perspective view illustrating the principal portions of one form of apparatus embodying this invention; and

Figure 2 is a sectional view of a detail of the construction.

Although my invention may take many forms, only one has been chosen for illustration. This form has been illustrated as a machine for surfacing or sprinkling sheet 4 which is supplied over a roll 6 which may form a part of the apparatus for coating the sheet 4 with asphalt. This sheet 4 with its upper surface freshly coated with asphalt is fed between the feed rolls 8 and 10 which are constantly driven by any suitable means, as a chain 12. Located above the feed roll 8 or at any other suitable point, is a sprinkling trough 14 illustrated with diagrammatic simplicity and which may or may not be provided with special means for uniformly controlling the delivery of a layer of surfacing material to the sheet 4. For the purpose of supplying the granular material to the sprinkling trough 14 there may be provided a large bin 16 only a fragment of which is shown. This bin may be provided with a pipe 18 for delivering the granular material to any point desired. Although this pipe 18 has been shown in a vertical position, this may be varied, it being merely necessary that the pipe 18 be sufficiently inclined for the granular material to flow therethrough. The pipe 18 conducts the surfacing material into the hopper 20 which is either of arcuate shape as shown, or is of such other shape as will properly receive the nozzle of the pipe 18 in spite of the arcuate movement of the hopper 20. The nozzle of the pipe 18 is preferably located slightly below the top of the hopper 20 or close enough thereto so that when the hopper 20 is full no further granular material will flow from the pipe 18.

The bottom of the hopper 20 opens into a screw conveyor tube 22 in which is arranged a screw 24 of any suitable form. The screw 24 is provided with a shaft 26 extending through the rear of the tube 22 on which shaft is mounted a bevel gear 28 which is turned in a manner to be described. As the screw 24 is rotated it moves the material toward the forward end of the feed tube 22 at the front end of which is provided an opening 30 through which the surfacing material falls into the sprinkling trough 14. The flow of the surfacing material is automatically shut off by its own friction when the surfacing material in the sprinkling trough and under the opening 30 reaches its maximum capacity, as shown in Figure 2. In the claims the term "feed tube unit" has been used as including other types of conveying tubes and two or more tubes which move together as a single unit.

As previously stated the screw 24 is rotated by the bevel gear 28. This bevel gear is in turn rotated by a larger bevel gear 32 mounted on a shaft 34 in a suitable bracket 36. The bevel gear 32 is rotated by a third bevel gear 38 mounted on a shaft 40 suitably journaled as at 42 and 44. The shaft 40 is driven by a belt 46 and pulley 48 on the shaft 40, or by other suitable friction driving means. The tension of the belt 46 is such that it will slip either on the belt 48 or on the driving pulley whenever the feeding of the surfacing material is stopped, as shown in Figure 2. When the surfacing is thus prevented from feeding its resistance to the turning of the screw 24 greatly increases, so that the adjustment of the belt need not be extremely delicate in order to be reliable.

The feed tube 22 and the hopper 20 are mounted for rotation as a unit about the axis of the shaft 34. For this purpose, the hopper 20 is provided with a bracket 52 which is rotatably mount-

ed on the shaft 34 and with rollers 54 which run on arcuate track 56. The feed tube 22 is supported at its further end by suspension from the arcuate beam 58 by the roller 60 in the manner shown. The roller 60 is mounted in the stirrup-shaped bracket 62, the base 64 of which may be in either sliding contact with the beam 58 or preferably may be spaced therefrom slightly under normal feeding conditions. When the feeding is stopped, as shown in Figure 2, the screw 24 exerts a downward pressure on the surfacing material which has an upward reaction on the feed tube 22, so that the base 64 of the stirrup bracket 62 may be pressed upwardly against the beam 58.

The feed tube 22 is oscillated back and forth on the supports described by means of a connecting rod 66 which is pivoted at one end by a universal connection to the collar 68 around the feed tube, and at the other end to the crank 70 mounted on the shaft 72, on which is also keyed the worm gear 74. The worm gear 74 is driven by worm drive 76 on a shaft 78 which is turned by the sprocket 80, chain 82 and the sprocket 84 keyed to the shaft 40.

If desired, there may be provided an adjustable guard 86 to regulate the size of the opening 30 in order that the speed at which the surfacing material is fed may not be much in excess of the speed at which it is used.

Operation

The feeding apparatus is driven through the belt 46 by a separate motor or by a pulley which is driven in conjunction with the chain 12 driving the surfacing apparatus. The belt 46 through the pulley 48 rotates the shaft 40. This shaft through the bevel gears 38, 32 and 28 drives the screw 4. The turning of the screw 24 feeds the surfacing material from the hopper 20 through feed tube 22 and into the sprinkling trough 14. The surfacing material may be fed into the hopper 20 by gravity from the bin 16. The shaft 40 also turns the shaft 78 by means of the sprockets 80 and 84 of the chain 82. The shaft 78 through the worm drive 76 and the worm gear 74 turns the crank 70. The crank 70 by means of the connecting rod 66 oscillates the feed tube 22 back and forth in its radial movement to distribute the surfacing material in uniform manner from end to end of the sprinkling trough 14. When the trough has been filled up so that the further feed of the surfacing material is stopped, as shown in Figure 2, then the increased resistance to the turning of the screw 24 causes the belt 46 to slip, with the result that the entire feeding mechanism stops. As soon as the surfacing material in the sprinkling trough 14 has been used up sufficiently to permit the further feeding of the surfacing material, the feeding apparatus starts up again. The feeding movement of the screw 24 and the oscillating movement of the feed tube 22 start simultaneously so that once the material leaves the feed tube 22 it has substantially no lateral movement in the sprinkling trough 14. In other words, the surfacing material drops straight down from the point at which it leaves the feed tube 22 to the point at which it falls on the roofing sheet.

Since the entire surfacing material falls straight down there is no chance for an uneven distribution of the finer particles such as powdered slate or dust. Since all the powder that is in the surfacing material is distributed evenly over the roofing, the presence of a reasonable amount of powder will have no injurious effect whatever, and it is therefore possible to discontinue the expensive and troublesome methods of maintaining the surfacing material absolutely free from such powdery material.

It is to be understood that many other embodiments of the invention, including some in improved form, will be apparent, and in the course of time more will be devised by those skilled in the art. It is not desired that this invention be limited to the details described, for its scope includes all such forms or improvements as come within the spirit of the following claims, construed as broadly as the prior art will permit.

What is claimed is:

1. The art of surfacing roofing with a uniformly colored mixture of full size surfacing granules and fines, which includes feeding the said mixture in a single narrow stream into a long sprinkling trough extending across the zone being sprinkled, shifting said stream back and forth along substantially the entire length of the trough and feeding the mixture by said stream at such speed as to cause it to pile up in said trough and keep piled up throughout the length of the trough; permitting said mixture to drop uniformly from all the length of said trough, and drawing the roofing under said trough whereby it is surfaced with substantial uniformity.

2. Surfacing apparatus for roofing comprising a sprinkling trough arranged to sprinkle granular surfacing material along an extended line and at a restrained rate of flow; and feeding means for said trough including a laterally extending feed tube mounted for arcuate rotation about a given point and provided with an outlet remote from said point and an inlet adjacent to said point, means for oscillating the outlet portion of said feed tube back and forth along said trough, and means supplying surfacing material to said inlet and through said feed tube to said trough faster than the rate of flow from said trough until said material is piled up in said trough entirely across its length and thereafter fast enough to keep said material so piled up; said feed tube being driven by a friction device which is adjusted to slip when the surfacing material is backed up against said feed tube; and said outlet being located within the angle of repose of said material in said trough.

3. Surfacing apparatus for roofing comprising a sprinkling trough arranged to sprinkle granular surfacing material along an extended line and at a restrained rate of flow; and feeding means for said trough including a laterally extending feed tube mounted for arcuate rotation about a given point and provided with an outlet remote from said point and an inlet adjacent to said point, means for oscillating the outlet portion of said feed tube back and forth along said trough, and means supplying surfacing material to said inlet and through said feed tube to said trough faster than the rate of flow from said trough until said material is piled up in said trough entirely across its length and thereafter fast enough to keep said material so piled up.

4. Surfacing apparatus for roofing comprising a sprinkling trough arranged to sprinkle granular surfacing material along an extended line and at a restrained rate of flow; and feeding means for said trough including a feed tube mounted for arcuate rotation about a given point and provided with an outlet remote from said point and an inlet adjacent to said point, means for oscillating the outlet portion of said feed tube substantially horizontally back and forth along said trough, and means supplying surfacing material to said inlet and through said feed tube to said trough

faster than the rate of flow from said trough until said material is piled up in said trough entirely across its length and thereafter fast enough to keep said material so piled up.

5. Surfacing apparatus for roofing comprising a sprinkling trough arranged to sprinkle granular surfacing material along an extended line and at a restrained rate of flow, and feeding means for said trough including a single feed tube unit mounted for arcuate rotation about a given point and provided with an inlet adjacent to said point and an outlet remote from said point and at such position in or slightly above said trough that said granular material cannot overflow said trough from said outlet, means oscillating as a unit the outlet portion of said feed tube unit back and forth along said trough, and means supplying surfacing material to said inlet and through said feed tube unit to said trough faster than the rate of flow from said trough until said material is piled up in said trough entirely across its length and sufficiently below any momentary position of said outlet, to choke said outlet and thereafter as fast as it is used.

6. Surfacing apparatus for roofing comprising a sprinkling trough arranged to sprinkle granular surfacing material along an extended line and at a restrained rate of flow; and feeding means for said trough including a sole single feed tube unit mounted for arcuate rotation about a given point and provided with an outlet remote from said point and an inlet adjacent to said point, means oscillating as a unit the outlet portion of said feed tube back and forth along said trough, and means supplying surfacing material to said inlet and through said feed tube unit to said trough faster than the rate of flow from said trough until said material is piled up in said trough entirely across its length and thereafter just at the speed it is used.

7. Surfacing apparatus for roofing comprising a sprinkling trough arranged to sprinkle granular surfacing material along an extended line and at a restrained rate of flow; feeding means supplying surfacing material to said trough faster than the rate of flow from said trough until said material is piled up in said trough entirely across its length and thereafter just fast enough to keep said material so piled up; said feeding means comprising a screw conveyor provided with an inlet and an outlet spaced therefrom, and mounted for movement of its outlet portion along said sprinkling trough; oscillating means for oscillating said outlet portion back and forth along substantially the entire length of said trough; means for operating said screw conveyor substantially in proportion to the movement of said oscillating means; and means for feeding surfacing material to the inlet of said screw conveyor.

8. Surfacing apparatus for roofing comprising a sprinkling trough arranged to sprinkle granular surfacing material along an extended line and at a restrained rate of flow; feeding means supplying surfacing material to said trough faster than the rate of flow from said trough until said material is piled up in said trough entirely across its length and thereafter just fast enough to keep said material so piled up; said feeding means comprising a conveyor provided with an outlet and mounted for movement of its outlet portion along said trough, said conveyor having an operating part and feeding surfacing material in proportion to the operation of said operating part; and driving means for oscillating said outlet portion back and forth along substantially the entire length of said trough and for simultaneously and substantially proportionately operating said operating part of the conveyor to cause the feeding of surfacing material to said trough substantially in proportion to the movement of said outlet portion.

9. Surfacing apparatus for roofing comprising a sprinkling trough arranged to sprinkle granular surfacing material along an extended line and at a restrained rate of flow; feeding means supplying surfacing material to said trough faster than the rate of flow from said trough until said material is piled up in said trough entirely across its length and thereafter just fast enough to keep said material so piled up; said feeding means comprising a conveyor provided with an outlet and mounted for movement of its outlet portion along said trough, said conveyor having an operating part and feeding surfacing material in proportion to the operation of said operating part; and driving means for oscillating said outlet portion back and forth along substantially the entire length of said trough and for simultaneously and substantially proportionately operating said operating part of the conveyor to cause the feeding of surfacing material to said trough substantially in proportion to the movement of said outlet portion; said driving means including a slippage device which is adjusted to slip when the feeding means is obstructed by surfacing material piled up in said trough, and said outlet being located within the angle of repose of said material in said trough.

10. Surfacing apparatus for roofing comprising a sprinkling trough arranged to sprinkle granular surfacing material along an extended line and at a restrained rate of flow; feeding means supplying surfacing material to said trough faster than the rate of flow from said trough until said material is piled up in said trough entirely across its length and thereafter just fast enough to keep said material so piled up; said feeding means comprising a conveyor provided with an outlet and mounted for movement of its outlet portion along said trough, said conveyor having an operating part and feeding surfacing material in proportion to the operation of said operating part; and driving means for oscillating said outlet portion back and forth along substantially the entire length of said trough and for simultaneously and substantially proportionately operating said operating part of the conveyor to cause the feeding of surfacing material to said trough substantially in proportion to the movement of said outlet portion, said driving means including an element which becomes inoperative when a predetermined amount of surfacing material has piled up in said trough.

11. The art of surfacing roofing with a uniformly colored mixture of full size surfacing granules and fines, which includes feeding the said mixture in a single feeding zone into a long sprinkling trough extending across the zone being sprinkled, shifting said feeding zone back and forth along substantially the entire length of the trough and feeding the mixture by said feeding zone at such speed as to cause it to pile up in said trough and keep piled up throughout the length of the trough; permitting said mixture to drop uniformly from all the length of said trough, and drawing the roofing under said trough whereby it is surfaced with substantial uniformity.

ARTHUR G. LEONARD, JR.