Aug. 13, 1935. J. L. WETTLAUFER 2,011,098

METHOD OF AND APPARATUS FOR TREATING SHINGLE ELEMENTS

Filed March 7, 1932 2 Sheets-Sheet 1

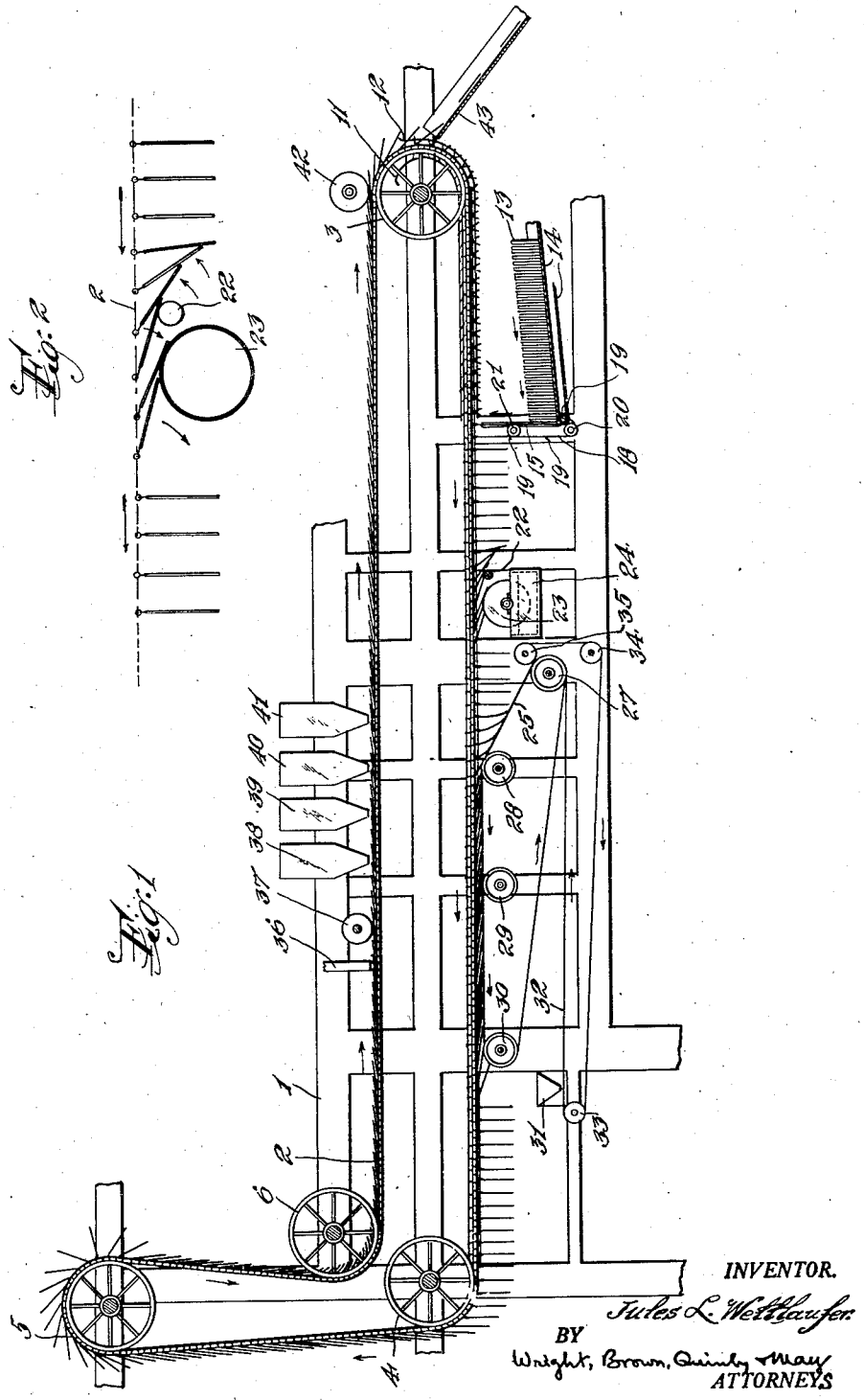

Fig. 2

Fig. 1

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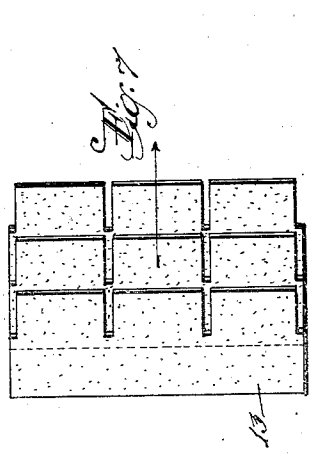

Fig. 1

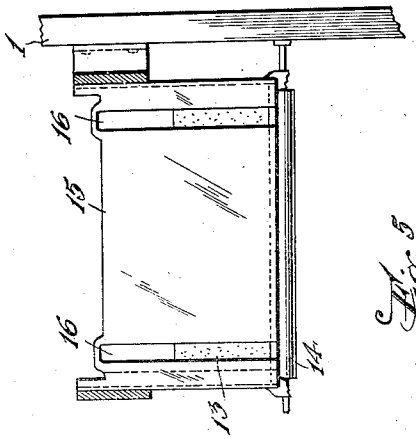

Fig. 5

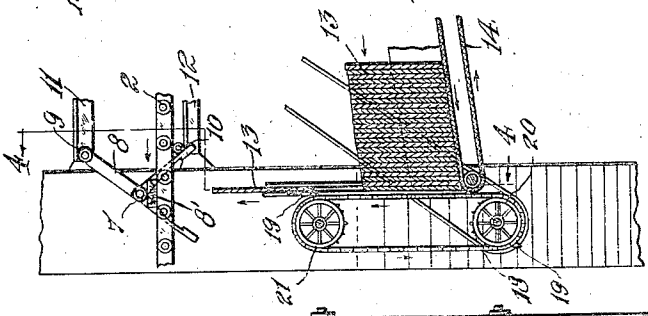

Fig. 3

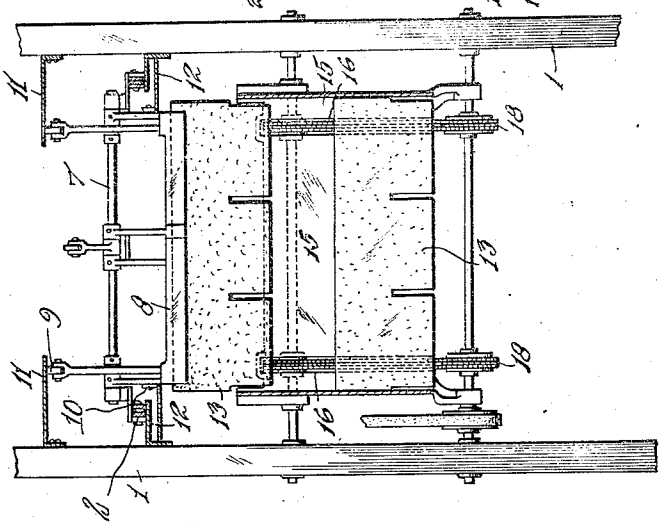

Fig. 4

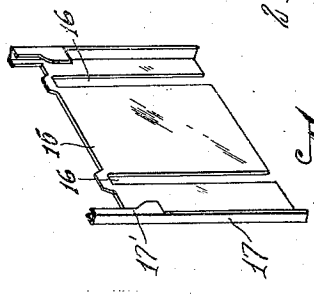

Fig. 6

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UNITED STATES PATENT OFFICE

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METHOD OF AND APPARATUS FOR TREATING SHINGLE ELEMENTS

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Application March 7, 1932, Serial No. 597,136

11 Claims. (Cl. 91—18)

This invention relates to the production of shingles or shingle strips and is more particularly concerned with a method of and apparatus for sealing the edges and thickening the butt portions of shingles or shingle strips comprising a felted fibrous foundation made waterproof by saturating and coating with a suitable waterproofing substance such as asphalt or the like.

In the manufacture of shingles or shingle strips of the character above referred to, a sheet of felted fibrous material is saturated with low melting point asphalt, coated with high melting point blown asphalt, surfaced on one or both sides with crushed mineral or other wear-resisting material and severed into shingle elements of the desired shape and size. The coating and surfacing on elements thus prepared is evenly distributed throughout the entire area thereof. Such elements have a thin, flat, unsubstantial appearance. Furthermore, fibers are exposed along the cut edges of the elements which absorb moisture during wet weather causing the elements to swell and crack thereby diminishing the waterproofing qualities of the roof and shortening the life of the elements.

These objectionable features can be obviated by cutting blanks from a coated and surfaced sheet of roofing material and subjecting the pre-cut blanks to a coating and surfacing operation whereby the butts are thickened and the edges are sealed.

Moreover by applying a relatively thin film of coating and fine mesh surfacing material to the sheet before the blanks are cut therefrom and applying a relatively thick film of coating and coarse mesh surfacing material to the butts and edges of the pre-cut blanks, the objectionable features above mentioned can be eliminated without materially increasing the amount of coating and surfacing used heretofore in the manufacture of elements possessing these objectionable features.

This invention has for its object the provision of a method of and an apparatus for sealing the exposed edges and thickening the butt portions of roofing units, such as individual shingles or shingle strips which have been formed of either unsaturated felt or felt which has been saturated, coated and surfaced as hereinbefore described.

A further object of the invention is the provision of a method of and means for automatically handling pre-cut shingles or shingle strips and carrying them through coating and surfacing operations.

Further objects and advantages of my invention will be manifest from the following description in conjunction with the accompanying drawings of which:

Figure 1 is a diagrammatic side elevational view of apparatus embodying my invention.

Figure 2 is a diagrammatic view showing the details of one of the coating operations.

Figure 3 is a view partly in cross section of a feeding device forming part of the apparatus shown in Figure 1.

Figure 4 is an elevational view, along the line 4—4, of the mechanism shown in Figure 3.

Figure 5 is an elevation of an end plate forming part of the mechanism shown in Figures 3 and 4 and associated elements.

Figure 6 is a perspective view of the plate shown in Figure 5.

Figure 7 is a view showing the arrangement of the elements during one of the coating and surfacing operations.

Referring to the drawings, the numeral 1 indicates a suitable frame upon which the apparatus is mounted. The numeral 2 indicates a pair of parallel endless chain conveyors adapted to run on sprocket wheels 3, 4, 5, and 6 and connected at spaced intervals by rods 7 having suitable clamps or grippers 8, pivotally mounted thereon. The rods 7 are spaced apart at such a distance that when the clamps are holding a series of shingles or strips in a substantially horizontal direction, each shingle will overlap the adjacent preceding shingle so as to expose only that portion of the preceding shingle which it is desired to coat, as illustrated in Figure 7. The clamps 8 have rollers 9 and 10 adapted to coact respectively with suitably located tracks or cam surfaces 11 and 12 to open the clamps at the proper time and place. The clamps are usually retained in closed position by suitable coil springs 8'. The shingles 13 are placed on a suitable conveyor 14 in bundles with the butt edges downward. The conveyor 14 slopes at a slight angle in order to permit the shingles to be carried forward by gravity. At the forward end of the conveyor 14 is a stop plate 15 having vertical slots 16 adjacent the sides thereof extending substantially to the top of the plate. The plate 15 is slightly longer and of substantially greater depth than the shingle elements and has flanges 17 along its side edges. As shown in Figure 6, the upper portion of each of the flanges 17 may be provided with a lip 17' to form guide channels for the side edge portions of strip shingles which are moved upwardly against the face of the plate 15. These guide channels are spaced above the

lower edge of the plate 15 a distance slightly greater than the height of a strip shingle, and may project above the upper edge of the plate as shown. A pair of vertically disposed endless link chains 18, having lugs 19 spaced apart at distances not less than the depth of a shingle element, are arranged to travel around sprocket wheels 20 and 21 so that vertical stretches of these chains are adjacent to the rear face of the plate 15 and register respectively with the slots 16. The lugs 19 are thus adapted to project through and travel in the slots. When a number of strip shingles are supported by the conveyor 14 in the position illustrated in Figure 3 and the conveyor chains 18 are driven in the proper direction, a pair of lugs 19 engage the bottom edge of the strip shingle next to the plate 15 and elevate it edgewise. The side edge portions of the shingle are then guided by the guiding flanges 17 and lips 17' until the shingle is in a position to be gripped by a pair of clamping jaws 8. The conveyors 2 and the chains 18 are so timed that an open clamp will be in position to receive an element at the moment when the element is ready to be gripped. It will be apparent that more than two slots 16 and two chains 18 may be used, if necessary, for the elevation of elements from the conveyor 14. The engagement of the rollers 9 and 10 with the cam rails 11 and 12 is such that the clamps 8 reach the clamping position with their jaws held open to receive an element fed upwardly from below. At the clamping position, the rollers 9 and 10 ride clear of the cam rails 11 and 12, permitting the springs 8' to snap the clamp jaws shut on the upper portion of an element, the element being then carried along with the conveyor 2.

The shingle elements firmly held by the clamps pass over an idle roll 22 and then over a coating roller 23 to which a waterproofing material such as asphalt is fed from a suitable tank 24, and which may be rotated slowly in a clockwise direction. The conveyors 2 are spaced at such a distance from the coating roll 23 that as the shingles pass over the roll, substantially only the butt portion of one face of the shingle, i. e., the portion of the shingle which will be exposed when the shingle is laid on a roof, is coated, together with the butt edges. The roll 22 serves to prevent contact between successive shingles when in contact with the coating roll. After passing the coating rolls, the shingles, held in a vertical position, then move into contact with an upwardly sloping stretch of a conveyor belt 25 carrying suitable granular material. The belt 25 travels around a series of rolls 27, 28, 29, 30, arranged as shown below the conveyor 2. The granular material is fed from the hopper 31 to a belt conveyor 32 which passes around rolls 27, 33, 34, and 35. As the belt 32 passes around the roll 27 in contact with the belt 25, the granular material is transferred to the latter. The slope of the belt 25 between the rolls 27 and 28, preferably about 22½°, is such that the granular material will not slide backward thereon. Instead of placing the feeding hopper 31 above the belt 32, the hopper may be placed above the belt 25 between the drums 27 and 28 and should be placed close to the surface of the belt in order to feed an even stream thereon as the belt travels forward. As the shingle elements successively come in contact with the belt 25, the butt ends first touch the belt. The sloping stretch of the belt converges toward the conveyor 2, causing the butt portions of the elements to rock rearwardly so as to approach a horizontal position on the grit-surfaced belt, thereby causing the coated portion of the butt to be covered with comminuted material. The speed of the belt 25 is preferably slightly less than that of the conveyor 2 in order to prevent the butt edges of the shingle elements, as they come in contact with the surface of the belt, from pushing the grit downwardly thereon and exposing bare surfaces of the belt. This difference in speed will ensure adequate surfacing of the shingle strips as they contact with the belt 25. Excess granular material from the belt 25 falls back into the hopper 31. After passing clear of the belt 25, the shingles, carried by the conveyors 2, pass around the sprocket wheel 4 and ascend toward the elevated wheel 5. As the shingles pass around the sprocket wheel 5 and begin to descend, they flop over so that the face of the shingle which has not been coated is outermost. The conveyors 2 then pass around sprocket wheel 6 and travel in a direction substantially horizontal or slightly inclined thereto with the shingle elements in overlapped relation and the uncoated faces of the butt portions uppermost. While in this position, the elements are conveyed under a spray or other suitable device 36 for applying coating material to the elements. The elements then pass beneath a suitable roll 37 to doctor the coating and then beneath hoppers 38, 39, 40, 41, which apply wear-resisting material such as crushed slate, slag or the like of suitable colors to the elements. As the elements pass around sprocket wheel 3, they are subjected to a pressing action by means of drum 42 to firmly embed the wear-resisting material in the coating. As the clamps pass around the sprocket wheel 3, the rollers 9 and 10 engage with the tracks 11 and 12 causing the clamps to open and release the shingles which are permitted to fall onto the slide 43 from whence they are conducted away to be stored and packed.

In accordance with the process outlined, it will be seen that each element is coated on both faces of the butt portion and on the exposed edges. However, if it is desired to coat only one surface of the butt portion together with the exposed edges of the element, either coating operation may be omitted. Thus it will be seen that my apparatus and process are adapted for coating one or both faces of the elements together with the exposed edges.

If it is desired to coat first while the shingles or strips are in overlapping relation, the direction of travel of the conveyor can be reversed. In that case, it will be apparent that the positions of the coating device 36 and the surfacing hoppers 37 to 41 will have to be interchanged as well as the surfacing belt 25 and the roll 22. The cams or tracks 11 and 12 would be positioned between the surfacing belt and the conveyor 14.

The strips shown in the drawings are of the well known square butt type. Shingle elements of other shapes and sizes may be similarly treated in accordance with my invention, the particular strips shown in the drawings being only for purposes of illustration without any intention of limiting the invention thereto.

I claim:—

1. A process for treating shingle elements, comprising swingably gripping a series of elements in succession, coating one face of said elements, arranging the gripped elements in overlapping relation with a portion of the opposite face of each element exposed to a coating means and coating the exposed portions.

2. A process for treating shingle elements, which comprises gripping a series of elements in a substantially vertical position, advancing the series toward a coating means, transferring a film of waterproofing substance to one face of each of said elements, overlapping the gripped elements so as to expose a portion of each of the opposite faces of said elements and applying waterproofing substance to said exposed portions.

3. A continuous process of the character described, comprising suspending a series of shingle elements in spaced relation, coating and surfacing a portion of one face of each of said elements, arranging the thus coated and surfaced elements in overlapped relation and coating and surfacing the exposed portions of the opposite faces and the exposed edges of said elements.

4. A continuous process for treating shingle elements, comprising swingably gripping a series of elements in a substantially vertical position, successively transferring a film of waterproofing substance to a portion of one face of each of said elements, applying wear-resisting material to the coated portions, subsequently arranging the gripped elements in overlapped relation with a portion of the uncoated face of each of said elements exposed to a coating means, applying a coat of waterproofing substance to the exposed portions and edges of said elements and applying wear-resisting material to said coated portions.

5. Apparatus of the character described, comprising means for gripping a series of shingle elements, means for coating one face of each of said elements, means for overlapping the elements while gripped and means for coating the unlapped portions of the opposite faces of said elements.

6. Apparatus of the character described, comprising means for gripping a series of shingle elements, means for advancing said elements while gripped in a substantially vertical position, means for transferring a film of waterproofing substance to one face of each of said elements, means for overlapping the gripped elements, means for advancing the overlapped elements in a substantially horizontal position with the opposite faces exposed to a coating means, and means for coating the unlapped portions of said last mentioned faces.

7. A process for treating shingle elements, which comprises continuously advancing a series of elements, coating at one point of advance of said series a portion of one face of each of the elements passing said point, surfacing the coated areas with grit at a second point in said advance, guiding the elements into overlapping relation such that portions of the untreated faces are exposed, coating said exposed face portions, surfacing the coated areas, and thereafter discharging said shingles successively from said series.

8. A continuous process for treating shingle elements, comprising gripping a series of elements in spaced relation, advancing the gripped elements edgewise in overlapping relation, butt edges forward, and applying molten asphalt and grit in succession to the advancing gripped elements.

9. A continuous process for treating shingle elements, which comprises gripping a series of elements in spaced relation, treating one face of each gripped element, inverting each successive gripped element butt edge over head portion, and treating the opposite face of each said element.

10. A process for treating shingle elements, which comprises gripping a series of roofing elements in spaced relation, overlapping said elements so that the head portion of one face of each element is lapped by the next element, treating the unlapped portions of said faces, reversing the direction of overlap, and treating the unlapped portions of the opposite faces.

11. A process for treating shingle elements, which comprises gripping a series of roofing elements in spaced relation, overlapping said elements so that the head portion of a face of each element is lapped by the next preceding element in said series and the butt portion of said face is exposed, treating the exposed portions of said faces, rocking the gripped shingle elements in the series so that the head portion of the opposite face of each element is overlapped by the next following shingle in said series and the butt portion of said opposite face is exposed, and treating the exposed portions of said opposite faces.

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