Jan. 20, 1953 R. PATTERSON 2,625,978

INSULATED SHINGLE PRODUCING MACHINE

Filed March 23, 1949 3 Sheets-Sheet 1

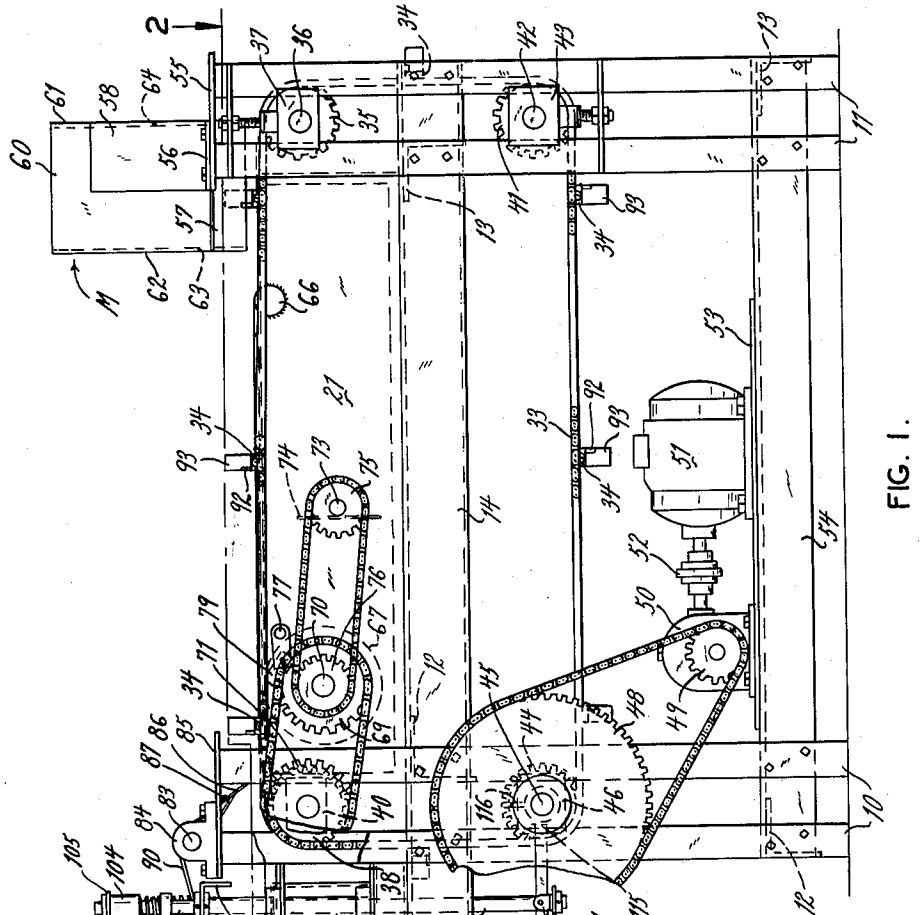


FIG. 1.

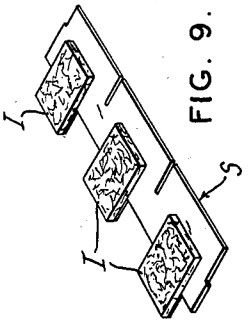


FIG. 9.

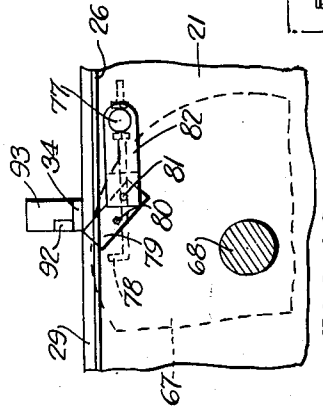


FIG. 10.

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INSULATED SHINGLE PRODUCING MACHINE

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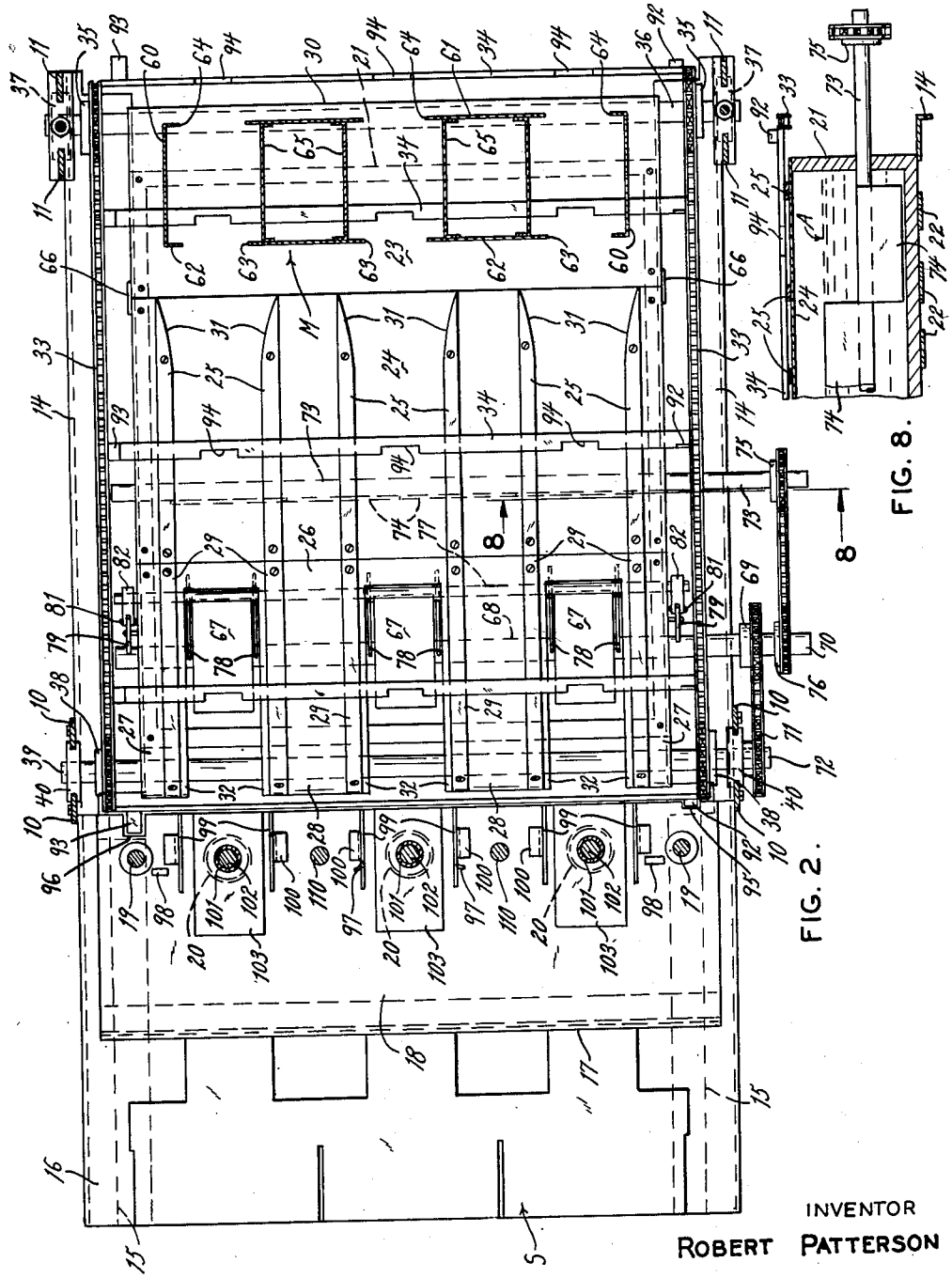


FIG. 2.

FIG. 8.

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INSULATED SHINGLE PRODUCING MACHINE

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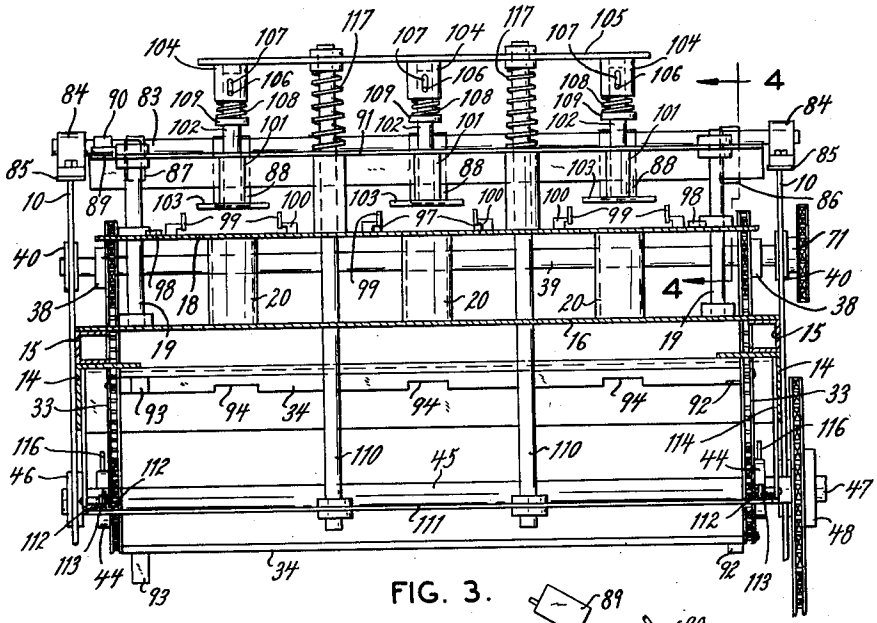


FIG. 3.

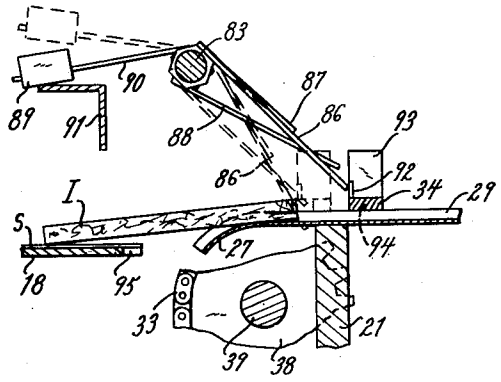


FIG. 4.

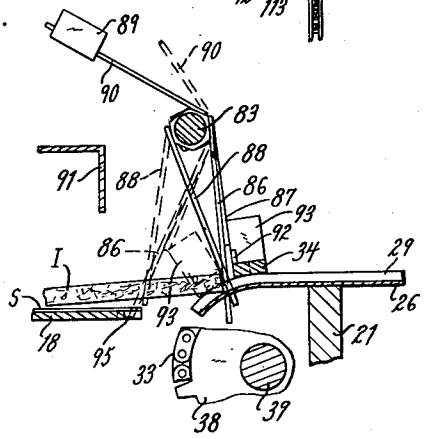


FIG. 5.

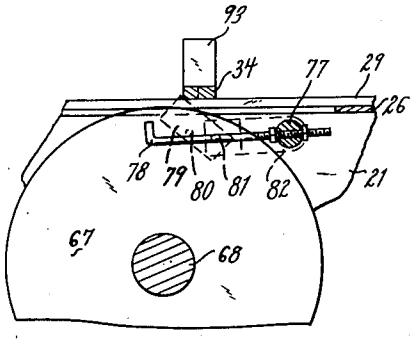


FIG. 6.

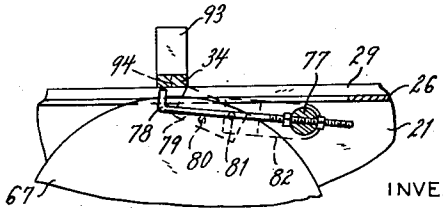


FIG. 7.

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UNITED STATES PATENT OFFICE

2,625,978

INSULATED SHINGLE PRODUCING MACHINE

Robert Patterson, Memphis, Tenn., assignor to Multi Shingle Corporation, Memphis, Tenn., a corporation of Tennessee

Application March 23, 1949, Serial No. 83,007

16 Claims. (Cl. 154—1.6)

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This invention is directed to improvements in a machine or apparatus for producing insulated shingles for use in the construction and building industry.

There is a definite and pressing need for a combination shingle having insulation affixed thereto in such manner that the ordinary act of laying the shingles, either as a roofing or siding covering, carries with it the establishment of an underlying layer of insulation. As a consequence, the use of insulated shingles effects a pronounced economy, and it is an object of this invention to provide a machine or apparatus for producing insulated shingles on a mass production basis, thereby achieving further economy.

It is a further object of this invention to provide a production machine which operates rapidly and effectively to bring pre-cut slabs of an insulating material into proper relation with the shingles and to unite the same by the application of an adhesive material and with the aid of a moderate degree of pressing.

It is another object of the present invention to provide an insulated shingle production machine or apparatus which embodies improved means for processing the several parts of the final article in a simple and effective series of operations, thereby effecting a considerable saving in labor and cost of manufacture.

It is another object hereof to provide a production machine having improved features of construction and operation, as will hereinafter be more fully described.

These and additional objects and advantages will be more specifically pointed out in the course of the detailed description relating to a presently preferred embodiment of the invention, as the same is disclosed in the accompanying drawing, wherein:

Fig. 1 is a longitudinal elevation view of the machine which forms the basis of this invention, certain parts being broken away to show details of the assembly;

Fig. 2 is a top plan view of the present machine as seen along the section line 2—2 of Fig. 1;

Fig. 3 is a transverse sectional elevational view, as taken along line 3—3 of Fig. 1;

Fig. 4 is an enlarged, fragmentary and sectional elevational view of means for transferring insulation slabs from the conveyor to the shingles, the view being taken at line 4—4 in Fig. 3;

Fig. 5 is a view similar to Fig. 4, but illustrating the function of the transfer means;

Fig. 6 is an enlarged and fragmentary sectional

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elevation of means adapted to apply and regulate the application of adhesive to the insulation slabs;

Fig. 7 is a view similar to Fig. 6, but illustrating the function of the regulating means;

Fig. 8 is a fragmentary and transverse sectional elevational view of the means for agitating the adhesive material contained in the tank reservoir, the view being taken at line 8—8 in Fig. 2;

Fig. 9 is a perspective view of the insulated shingle article produced by the instant machine; and

Fig. 10 is a fragmentary view similar to Fig. 6 showing the regulating means.

Reference will now be made to Figs. 1, 2 and 3 for an understanding of the present machine. The frame structure of the machine comprises vertical members arranged in spaced pairs at each of the corners, so that the front pairs of members 10 and the rear pairs of members 11 are oppositely aligned transversely of the machine. These members are connected by suitable upper and lower transverse angle members 12 at the front and similarly located members 13 at the rear. The frame also includes a pair of longitudinally directed, side angle members 14 which are transversely spaced and secured to the respective vertical pairs of members 10 and 11 in position to project forwardly of the front members 10. A channel member 15 is carried on the upper surface of the inturned angle leg of each of the members 14, and a plate 16 spans the width of the machine to rest upon these channels and provide a platform upon which a stack of the shingles S (Fig. 9) may be placed. At the rear margin of the plate 16, a vertical support means 17 is arranged to support the front margin of a platform 18 which extends toward the front ones of the vertical members 10 so that its rear margin is open therebetween. The rear zone of platform 18 is rigidly supported upon laterally spaced posts 19 secured thereto and resting upon the rear zone of the platform 16. Additional intermediate supports are provided, and are constituted by the enlarged cylindrical columns 20 arranged in a preferred spaced order as will appear hereinafter.

A rectangularly shaped, enlarged reservoir or open top tank 21 (Figs. 1, 2 and 8) is supported along its opposite longitudinal bottom margins by the inturned flange legs of the elongate members 14. The front and rear transverse bottom margins of this tank rest upon the respective cross-angle members 12 and 13 (Fig. 1), so that the tank is firmly and fully supported about its

bottom margins and rests in a substantially horizontal position within the frame structure. This tank 21 is adapted to contain a supply of a suitable adhesive material, usually kept at about the level shown at A in Fig. 8. A suitable adhesive material is asphalt, and in order that it may be held in a desired fluid condition, the tank is equipped with electrical heater strips 22 disposed along its bottom surface. The tank 21 is shown for simplicity as having thickened walls for aiding in the retention of heat, but a doublewall tank with insulation between the walls will serve as an equivalent thereof.

The open top of the asphalt reservoir or tank 21 is adapted to be closed by a conveyor platform of sectional construction, such that the loading of the tank may be accomplished by removal of one section without disturbing other sections. This platform serves as a tank cover to protect the asphalt and as a surface for supporting the insulation slabs I (Fig. 9) during their conveyance through the machine. In Figs. 2 and 8, the conveyor platform cover over the tank is comprised of a solid plate member 23 having a clear upper surface, an adjacent and removable intermediate plate member 24 having a continuous surface upon which a series of guide rail sections 25 are secured, and a third plate member 26 having a continuous rear surface portion adjacent the member 24 and a forward portion suitably cut-away or longitudinally notched to form laterally spaced plate extensions 27 of relatively narrow extent and a pair of intermediate and spaced plate extensions 28 of relatively wider extent than the outer extension 27. This third member 26 carries a series of guide rail sections 29, each of which is arranged in longitudinal extension of and abutment with corresponding rail sections 25 on the intermediate member 24. It can be seen in Fig. 2 that the plate member 23 overhangs the rear transverse wall of the tank 21 to provide a suitable entrance lip 30 for the conveyor mechanism, later to be described. The several rail sections 25 on plate member 24 are arranged in matched pairs identified by the oppositely directed beveled entrance faces 31, thereby defining the entrance for each of three parallel guide-ways. The guide-way rail sections 29 carried by the notched plate member 26 are spaced from the notch margins so that a narrow lip surface 32 remains for effective marginal support of the insulation slabs I which are moved through the guide-ways. The end portions of plate extensions 27 and 28 overhang the front transverse wall of the tank 21 and are downwardly curved to act as exit lips for the conveyor mechanism. The rail sections 29 carried by these plate extensions are similarly curved for a like purpose, as may be better seen in Figs. 4 and 5.

The conveyor mechanism associated with the above described conveyor platform and guide rail assembly is comprised of a pair of laterally spaced and parallel endless chain belts 33, these belts 33 have a plurality of flights attached thereto, and each of these flights consists of a carrier or push bar element 34 spanning the belts 33. The conveyor belts 33 have a working span or pass across the tank 21, as defined by the vertically adjustable sprockets 35 carried on a common shaft 36, the shaft 36 being mounted in suitable bearing blocks 37 adjustably carried by and between the vertical members 11 (Fig. 2). The opposite end or exit of this conveyor pass is defined by the fixed sprockets 38 mounted on a common shaft 39 bearinged in fixed blocks 40 carried by and between the vertical members 10. The sprockets 38 are preferably fixed in position so that they maintain the desired path of travel of the flight bar elements 34 over the curved lip of the plate extensions 27 and 29, see Figs. 4 and 5.

The conveyor mechanism has a pair of idler sprockets 41 (one only being shown in Fig. 1) carried on a common shaft 42, the shaft being supported in adjustable bearing blocks 43 carried by the vertical members 11, as shown. The drive for the conveyor comprises sprockets 44 mounted on a common shaft 45 (Figs. 1 and 3). This drive shaft 45 is disposed in fixed bearing blocks 46 carried by the vertical members 10, and one end of the shaft is extended at 47 to mount an enlarged sprocket 48 at the outer side of the frame. The sprocket 48 is chain connected with a power output sprocket 49 (Fig. 1) of a speed reduction gear unit 50. The reduction gear unit 50 is detachably connected with an electric motor 51, as by the coupling 52. The reduction gear 50 and motor 51 are secured to a suitable platform 53 carried on the angle member 54 which serves to tie together the bottom portions of members 10 and 11. The electrical power supply for the motor 51 and such controls as may be required or desired have not been shown, in order to simplify the structural details of the machine.

The means for feeding pre-cut slabs I of the insulation material, of the character indicated in Fig. 9, includes a magazine assembly M (Figs. 1 and 2) which is bodily removably secured to bearing pads 55 positioned on top of the pairs of vertical members 11. The attachment is effected (one side only being shown in Fig. 1) by a laterally projecting wing plate 56 resting on the pad 55 and fixed to the side angle member 57 of the magazine M. A brace plate 58 is also used to strengthen the assembly. The magazine proper is formed of an outer casing sheet set vertically and bent to form an open bottom, rectangular container having opposite side walls 60, a back wall 61 and a front wall 62. As may be seen in Fig. 2, the front wall 62 is notched in its lower zone to provide three sight openings 63 for observance of the loaded condition of the same. The back wall 61 is also notched in its upper zone to provide three openings 64 by which a stack of insulation slabs I may be placed therein. The interior of the magazine casing is suitably divided into three compartments by a plurality of partitions 65, so that each compartment in which insulation slabs are placed includes a back wall loading notch 64 and a front wall sight opening 63. The magazine assembly M is located above the top surface of the tank cover plate 23 a distance (Fig. 1) which is slightly greater than the thickness of the insulation slabs I, whereby the stack of slabs in each compartment rest upon the plate 23, with only the lowermost one of such slabs in position to be pushed off the bottom of the stack. When this is done, the stack will fall by gravity to expose the next slab. It will also be observed that each compartment of the magazine M is aligned with one of the conveyor guide-ways (Fig. 2), whereby the insulation slabs are properly conditioned for movement thereto.

The conveyor flight bars or carrier elements 34 are adapted to pass between the bottom of the magazine M and the surface of plate 23 so that each carrier 34 engages three exposed insulation slabs at one time and pushes such slabs off the bottom of the stacks for entrance at beveled faces 31 to the guide-ways. Since the guide rails 25 and

29 lie above the plane of plates 24 and 26, there has been provided fixed cam means 66 (Figs. 1 and 2) at each side of the tank 21, the cam means acting to elevate the carrier elements 34 for subsequent sliding passage over the rails 25 and 29.

Means for applying a coating of the adhesive material to each of the insulation slabs, as the same are carried along the working pass of the conveyor by elements 34, includes spaced roller members 67 mounted on a common shaft 68 bearinged in the tank walls such that the rollers are partly immersed in the adhesive material and carry a surface film thereof during rotation. Scraper means (not shown) may be fixed in the tank 21 to regulate the thickness of the film, and other means may be employed to clean the rollers as they reenter the body of adhesive, so that the working surface of each roller is kept in condition. These rollers 67 are disposed in the zone of the notches of the plate 26 (Fig. 2) and have their upper surface running slightly above the horizontal top plane of the plate 26 for positive contact with the insulation slabs. Each roller 67 presents an effective adhesive applying surface which is not as wide as the width of the insulation slabs moved thereover by an amount found to be effective in preventing the spread of the adhesive to the conveyor or fixed plate members. Roller operation is effected by a drive sprocket 69 (Fig. 2) fixed on the extension 70 of the shaft 68, the sprocket 69 being chain driven from a sprocket 71 fixed to the extended end 72 of the conveyor sprocket shaft 39.

Means for continuously agitating the adhesive material in tank 21 comprises the shaft 73 carrying a plurality of paddle blades 74 (Figs. 1, 2 and 8) which effect a continuous transfer of the more fluid stratum of adhesive near the bottom of the tank toward the upper stratum. This is important to maintain a uniform fluid condition of the adhesive, especially when using asphalt which tends to harden or solidify rather rapidly. The shaft 73 has a sprocket 75 on its outer end and this sprocket is chain-connected with a sprocket 76 (Fig. 2) fixed on the roller shaft extension 70.

In conjunction with the use of narrow rollers 67 to limit lateral spread of the adhesive, means is also provided for terminating the application of the adhesive at a point just prior to full or complete passage of the insulation slabs past the line of roller contact. The terminating means operates to elevate or lift each slab at the proper time, thus positively breaking contact with the roller. The preferred means comprises a rock shaft 77 spanning the width of tank 21 and located ahead of the rollers 67, as may be seen most clearly in Figs. 2, 6, 7 and 10. This rock shaft 77 carries a plurality of adjustable fingers 78 arranged in pairs at the opposite end faces of each roller 67. Thus, there are six such fingers 78, and each finger is movable upwardly in the space or gap formed between the roller end faces and the adjacent margins of the guide-way lip portions 32 (see Fig. 2). Each pair of fingers 78 acts to lift one of the insulation slabs, and for this purpose the free ends of the fingers have been adjusted to move in an arcuate path close to but at one side of the vertical center line of the roller axis. The operation of the shaft 77 is made responsive to movement of the carrier elements 34 at a predetermined point in the approach thereof to the zone of the rollers 67. For this purpose, a pair of trigger elements 79 are pivoted at the outer side of the tank 21 (Figs. 2 and 10) on pivot pins 80. One end of these triggers normally project above the plane of the conveyor platform (Figs. 6 and 10) so as to lie in the path of the carrier element 34. The opposite ends of the triggers are relatively loosely pivotally connected by pins 81 with the crank arms 82 fixed to the opposite ends of the shaft 77. A specific showing of one such trigger assembly is shown in Figs. 6, 7 and 10, and reference will now be made thereto. The trigger mechanism is so mounted that the combined weight of the fingers 78 acts to rotate the shaft 77 and crank arm 82 in a direction for holding the triggers 79 in cocked position of Fig. 6. Upon contact being established between the trigger 79 and carrier element 34, it can be appreciated that the trigger will be rotated downwardly about its pivot pin 80 to move the crank arm 82 upwardly, causing rotation of shaft 77 in an opposite direction (clockwise), such as to raise the fingers 78 (Fig. 7) sufficiently to break contact between the rollers and the overlying insulation slabs. Thus, the application of adhesive material to the slabs is desirably terminated at a point just short of the trailing margin of the slabs. The trigger 79 is automatically restored to cocked position (Fig. 6) after the carrier element 34 has passed beyond it, thereby conditioning the same for operation by each succeeding carrier element.

Referring particularly to Figs. 1, 3, 4 and 5, it can be seen that the plane of the conveyor guide platform across the top of tank 21 is located above the plane of the shingle supporting platform 18, and the two levels are separated by a gap or space which permits the carrier element 34 to pass downwardly through the gap on its return or idle pass to the zone of the magazine M. A swingable or rockable mechanism has been provided adjacent this gap zone to effect the proper transfer of the insulation slabs I from the conveyor to position upon a shingle placed on the platform 18. The mechanism includes a rock shaft 83 carried in end bearings 84 upon bearing pads 85 at the upper ends of the vertical members 10. Near one end of the shaft, a timing lever or finger 86 has been positioned to project into the path of movement of the carrier element 34. A second lever or finger 87, near the opposite end of the shaft 83, projects toward the path of travel of the carrier element 34, but this finger is somewhat shorter than timing finger 86 and is set at a different angular attitude. The intermediate span of rock shaft 83 carries three working fingers 88 all set at the same angular attitude and each being aligned with one of the conveyor guide-ways for the insulation slabs. The fingers 88 are at a different angular attitude relative to fingers 86 and 87, and from a comparison of the location of fingers 88 relative to guides 99 in Fig. 3 with the relative longitudinal spaced alignment of the guides 99 with the several notches in plate 26 formed between the supporting lips or surfaces 32, as in Fig. 2, it will be appreciated that each finger 88 swings through the end zone of the aligned notch in plate member 26 beyond the adhesive coating rolls 67. Further inspection of Fig. 5 will reveal that fingers 88 pass below plate 26. The rock shaft 83 with its several finger elements is normally maintained in the full line shown of Fig. 4 by means of a counterweight 89 carried by the weight arm 90, and the angular position is determined by the weight 89 resting on an angle member 91 as a stop. Member 91 will

be further described presently in connection with Figs. 1 and 3.

In cooperation with the above rockable mechanism, each bar element 34 is provided with an upstanding abutment element 92 fixed at the proper end zone for travel into engagement with timing finger 86. The opposite end of each bar 34 carries an enlarged abutment element 93 positioned for engagement with the finger 87. Each bar element 34 is provided also with three spaced notches 94 which are aligned with the respective fingers 88, and these notches are in the leading edge so that the fingers 88 may enter the same and assume positions of engagement behind the insulation slabs brought thereto by the bar elements.

Observe that the full line position of the parts in Fig. 4 illustrates the normal attitude of the same at the moment a bar or carrier element 34 has advanced so that the abutment element 92 attains contact with timing finger 86. As the conveyor travel continues, the element 92 rocks or swings the several fingers against the gravity load of counterweight 89 to the broken line position, such that the fingers 88 are brought into the notches 94 and begin to pick up the insulation slabs. Finger 87 and abutment element 93 are not yet in engagement. At this point, the insulation slabs I have reached their transfer stage and the leading margins are now resting on the tab surfaces of the shingle S supported on platform 18.

The full line showing of Fig. 5 is still another position of advanced conveyor movement at the point where abutment element 93 attains engagement with the finger 87. Observe that the fingers 88 are now in full control over the insulation slabs I and have effected an advance thereof ahead of the carrier element 34. The broken line showing of Fig. 5, illustrates the final position of the transfer mechanism when the insulation slabs I have been fully transferred to the platform 18 and the abutment element 93 is beginning to ride downwardly and part engagement with finger 87. Subsequent travel of the conveyor moves the carrier element 34 through the gap between the tank 21 and rear margin of the platform 18. In Fig. 2, the platform margin is suitably notched at 95 and 96 to permit unobstructed passage of the respective abutment elements 92 and 93. As soon as element 93 and finger 87 break engagement, the counterweight 89 drops to the angle member 91 and automatically restores the mechanism for the next operation in response to the carrier element 34 next in line.

The proper assembly of the three insulation slabs I upon each shingle S is regulated by means now to be described. In Figs. 2 and 3, it can be seen that the shingle platform 18 is provided with a centrally located and laterally spaced pair of alignment cam elements 97 which are adapted to guide the center one of the shingle tabs during the placement thereof upon the platform 18. Once this tab is received between these cam elements 97, the shingle is then pushed toward the rear margin of the platform, and is brought to a proper inward position upon abutment of the opposite wing portions of the shingle with spaced stop blocks 98. At this time the three tabs of the shingle are located above the vertical columns 20 (Figs. 2 and 3). Each shingle tab now lies between and below a pair of laterally spaced guide fins 99 being carried on support elements 100 fixed to the platform 18. The guide fins 99 are vertically directed and extend to the rear margin of the platform 18 so that the adjacent pairs thereof act to guide the oncoming insulation slabs over the shingle tabs.

The next operation of the present machine is to exert a compressive load on the insulation slabs so as firmly to unite the same with the shingle tabs and complete the assembly of the insulated shingle combination. The means provided to carry out the pressing operation includes the transversely directed angle member 91 supported at its opposite ends upon the upper ends of the vertical extensions of posts 19. This member 91 carries spaced sleeve guides 101, each located centrally of the pairs of guide fins 99. Each guide sleeve receives a vertically movable rod 102, at the lower projecting end of which is secured a platen or pressing plate 103, and the plate 103 moves between the adjacent guide fins 99. The upper end of each platen rod 102 is received in a sleeve socket element 104 fixed to a common carriage member 105. The rod end portion received in the socket 104 carries a pin 106 which projects through a socket slot 107 to prevent angular displacement thereof. Each platen rod 102 is resiliently urged downwardly to the limit of movement of pin 106 in slot 107 by a spring 108 disposed between the fixed socket and a collar 109 on the rod. This yieldable connection of each rod 102 with the common carriage member 105 permits the several plates 103 to assume positions accommodated to the slight variations of insulation slab thickness which normally occurs.

The carriage member 105 for the three press plates 103 is downwardly actuated from its normal raised position (Figs. 1 and 3) by a pair of draw rods 110 secured to member 105 by suitable collar elements, and directed to pass through apertures in platform 18 for similar connection with a transversely directed draw bar 111. The draw bar 111 carries at its outer ends, angle bracket assemblies 112 which are pivotally connected with respective levers 113. The pivot connection of lever 113 with the draw bar 111 is effected intermediate the length of the lever, as may be seen in Fig. 1. Since there are two such levers 113, the single showing thereof in Fig. 1 may be taken as typical for both. Lever 113 is normally horizontally directed from a pivot connection at the lower end of a hanger member 114, the latter being fixed upon a convenient portion of the angle member 14. The free end 115 of the lever lies adjacent the hub zone of the sprocket 44 on drive shaft 45 and is directed to have contact with a tappet element 116 fixed in the said sprocket hub. Thus, once in each full revolution of the shaft 45, the tappet element 116 engages the end 115 of lever 113 and pivots the same about hanger 114 until the lever and tappet eventually break contact. During this lever operation, the draw rods 110 are downwardly displaced against the force of restoring springs 117, and this action serves to depress each of the platens or plates 103. This press operation is suitably timed to occur when the insulation slabs I have reached or are about to attain the intended position of final assembly with the shingle S. The springs 117 act to restore the press mechanism to its normal position for subsequent operations.

From the foregoing description, it should be clear and obvious in what manner the present machine performs the several steps in the production of insulated shingles. The improvements reside in those individual and cooperative

means, parts, elements or sub-assemblies which are necessary to the successful operation of the machine. It is expected that substitution of equivalent parts may be made herein without departing from the scope of the claims hereafter appearing.

I claim:

1. In a machine for producing insulated shingles, a conveyor mechanism having flights thereon adapted for moving insulation slabs in successive order from a stack thereof, a shingle supporting platform located beyond said conveyor mechanism for receiving the insulation slabs, transfer mechanism operated periodically by the conveyor flights during successive movement of the insulation slabs toward said platform, said transfer mechanism effecting a positive transfer of the insulation slabs from said conveyor to the shingles on said platform, a supply of adhesive material, and means in contact with the supply of adhesive for applying a coating of the adhesive material upon the insulation slabs as the same are moved by said conveyor, said applying means being positioned in the path of movement of the insulation slabs.

2. In a machine for producing insulation shingles, conveyor mechanism having spaced carrier elements adapted for moving insulation slabs in spaced succession from a stack thereof, a shingle supporting platform spaced from said conveyor, the shingles on said platform receiving the insulation slabs, insulation slab transfer mechanism successively operated by each carrier element in its movement toward said platform for effecting positive transfer of the insulation slabs from said conveyor to the shingles, a supply of adhesive material, and roller means for applying a coating of the adhesive material upon the successive slabs as the same are moved by said conveyor, said roller means being positioned in the path of movement of the insulation slabs.

3. In a machine for producing insulated shingles, conveyor mechanism having spaced carrier elements adapted for moving insulation slabs in spaced succession from a stack thereof, a shingle supporting platform spaced from said conveyor mechanism and upon which the shingles are placed to receive the successive insulation slabs, an insulation slab transfer device periodically operated by movement of said carrier elements for effecting positive transfer of the insulation slabs from said conveyor mechanism to the shingles placed on said platform, a supply of an adhesive material, and adhesive applying means operating with said conveyor mechanism for applying a coating of the adhesive material upon the insulation slabs as the same are moved by said conveyor mechanism.

4. In a machine for producing insulated shingles, conveyor mechanism having flights thereon adapted for moving insulation slabs from a stack thereof in spaced succession, a supply of an adhesive material, adhesive applying means operated by said conveyor mechanism for applying a coating of the adhesive material upon the successive insulation slabs, shingle supporting platform adjacent said conveyor mechanism toward which the adhesively coated insulation slabs are conveyed, means adjacent said platform automatically actuated by said conveyor flights for transferring the insulation slabs to the shingles on said platform, and pressing means cooperating with said platform, said pressing means being operated by said conveyor mechanism in successively timed relation with transfer of the slabs for compressively uniting the adhesive coated insulation slabs and shingles.

5. In a machine for producing insulated shingles, an endless conveyor mechanism, carrier elements secured to said conveyor in spaced relation, a conveyor platform over which said carrier elements move, an insulation slab magazine adapted to direct the slabs upon said conveyor platform and from which the slabs are successively removed by said carrier elements, a shingle supporting platform located beyond said conveyor and conveyor platform in the direction of conveyor movement, insulation slab transfer means positioned between said conveyor and shingle platforms, said transfer means being automatically, successively operated by said carrier elements to effect the transfer of the insulation slabs from said conveyor to said shingle platform, a supply of an adhesive material, and adhesive applying means located in advance of said transfer means for applying a coating of the adhesive material to the insulation slabs as the same are moved by said conveyor along said conveyor platform.

6. In a machine of the character described, endless conveyor mechanism, spaced carrier elements on said conveyor, said conveyor being movable through a working pass and a return idle pass, magazine means for feeding insulation slabs into the working pass of said conveyor for successive pick-up by said carrier elements, a shingle supporting platform adjacent the conveyor working pass to receive the insulation slabs therefrom, a supply of an adhesive material, adhesive applying means adjacent the conveyor working pass for applying a coating of the adhesive material to the insulation slabs moved therealong, and transfer means operated by successive carrier elements, during the approach of the successive insulation slabs toward said platform, for transferring the slabs onto the platform for adhesive union with the shingles placed thereon.

7. In a machine for the manufacture of insulated shingles, a conveyor movable through a work zone, spaced carrier elements on said conveyor for moving insulation slabs in spaced succession through such work zone, a shingle supporting platform located beyond the conveyor work zone to receive the insulation slabs, the successive slabs being received upon shingles placed upon said platform, a reservoir for adhesive material located adjacent the conveyor work zone, conveyor operated roller means carried by said reservoir in running contact with the adhesive material to apply a coating of adhesive to the insulation slabs, and means operated by each of said carrier elements approaching said roller means for terminating the adhesive coating action of said roller means, said last means including insulation slab lifting elements and trigger means connected with said lifting elements and projecting into the path of said carrier elements.

8. The combination in a machine of the character described, of a reservoir for an adhesive material, conveyor mechanism having a path of travel adjacent said reservoir, carrier elements on said conveyor arranged in spaced relation for moving insulation slabs along the path in spaced succession, adhesive applying means in contact with the adhesive and extending into the path of insulation slab movement to apply an adhesive coating during slab engagement with said applying means, and periodically operated means to terminate engagement of the successive slabs with said adhesive applying means, said last

means including an element swingable to a position moving the insulation slab out of engagement with said adhesive applying means, and trigger means connected with said swingable element and normally projecting into the path of said conveyor for operation by successive ones of the carrier elements to effect periodic actuation of said element.

9. The combination in a machine of the character described, of a conveyor, spaced carrier elements on said conveyor adapted to move insulation slabs on said conveyor in spaced succession, a shingle supporting platform adjacent said conveyor to receive the slabs, and means adapted for transferring the successive slabs from said conveyor to a position upon shingles supported by said platform, said transferring means including an element periodically movable into engagement with the successive slabs for urging the latter onto the shingles, and lever means connected with said element and movable from a position normally projecting into the path of movement of said carrier elements, the successive carrier elements effecting lever movement from said projecting position.

10. The combination in a machine of the character described, of a conveyor mechanism adapted to move insulation slabs in spaced succession to a zone of discharge, a shingle supporting platform in the zone of discharge upon which the slabs are delivered by said conveyor, an adhesive supply, means in contact with the adhesive for applying an adhesive coating upon the successive slabs, and pressing mechanism effective to compress the slabs upon shingles supported by said platform and effect the adhesive union thereof, said pressing mechanism including an actuating member periodically actuated by said conveyor mechanism in timed relation with the successive delivery of the slabs upon the shingles for effecting the union thereof.

11. Apparatus for producing shingles having insulation elements adhesively secured thereto comprising a frame structure providing a guideway for directing the movement of the insulation elements, a magazine for the insulation elements positioned in advance of one end of said guideway, a support for shingles carried by said frame spaced from the opposite end of said guideway, insulation element moving means on said frame including an element engageable with an insulation element for pushing the latter from said magazine along the guideway, said pushing element being adapted to pass through the space between said shingle support and guideway, means operably disposed on said frame adjacent said opposite end of the guideway for engaging and transferring the insulation past the space and onto a shingle resting on said support, said transfer means being operated by said pushing element, a supply of adhesive, and adhesive coating means disposed in contact with the supply of adhesive and in the path of movement of the insulation elements along said guideway.

12. The apparatus set forth in claim 11 wherein said insulation element moving means includes endless drive means and a plurality of pushing elements attached to and spaced along said drive means to engage and push successive insulation elements along the guideway, and said transfer means includes means automatically, gravitationally positioning the transfer means, after operation by each pushing element, for engaging the succeeding insulation elements.

13. Apparatus for producing insulated shingles comprising an endless conveyor mechanism, frame structure carrying said conveyor, magazine means carried by said structure for supplying insulation slabs thereto in successive order, platform means for guiding the slabs along a span of said conveyor toward a zone of discharge from the conveyor, a shingle support spaced from the conveyor discharge zone, a transfer device on the structure adjacent the conveyor discharge zone for transferring the slabs across the space and onto a shingle placed on said support, said transfer device being operated by said conveyor mechanism in timed relation with conveyor operation for moving the slabs to the shingles on said support, a coating roll located in the span of said conveyor mechanism, rotary drive means for said roll actuated by said conveyor mechanism to apply a coating of an adhesive on a surface of the slabs, a supply of adhesive contacted by said roll, and pressing mechanism for pressing the coated slabs onto the shingles on said support, said pressing mechanism having an operating member actuated by said conveyor mechanism automatically as each slab reaches position on a shingle on said support.

14. Apparatus as defined in claim 13, and further including carrier elements on said conveyor and mechanism operably disposed adjacent said coating roll for terminating the application of the adhesive to the slabs, said terminating mechanism being actuated in response to movement of said conveyor carrier elements.

15. In apparatus for producing insulated shingles, a frame structure providing a support to receive the shingles, conveyor means on said frame for moving insulation slabs toward the shingle support, a bar element attached to said conveyor means for engaging and moving the insulation slabs, and transfer mechanism operably carried on said frame in position for transferring the insulation slabs beyond the reach of said conveyor bar element and into position on a shingle located on said support, said transfer mechanism including an element swingably carried on said frame for engaging the slabs to urge the latter into position on a shingle, and a lever connected with said swingable element and extending into the path of movement of said bar element for engaging therewith to be moved thereby and effect operation of said swingable element in timed relation with movement of said conveyor means.

16. In apparatus as defined in claim 15, and further characterized in that said lever is arranged to be released from its engagement with said bar element upon continued movement of said conveyor means, and said transfer mechanism includes a weighted arm connected with said lever, said arm being operable to effect automatic restoring movement of said lever and connected swingable element, upon release by each bar element, to a position engaged with sub sequent slabs moved by succeeding bar elements.

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REFERENCES CITED

The following references are of record in the file of this patent:

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