

March 23, 1937.

J. L. WETTLAUER

2,074,445

APPARATUS FOR SURFACING ROOFING

Filed July 31, 1929

3 Sheets-Sheet 1

Fig. 1

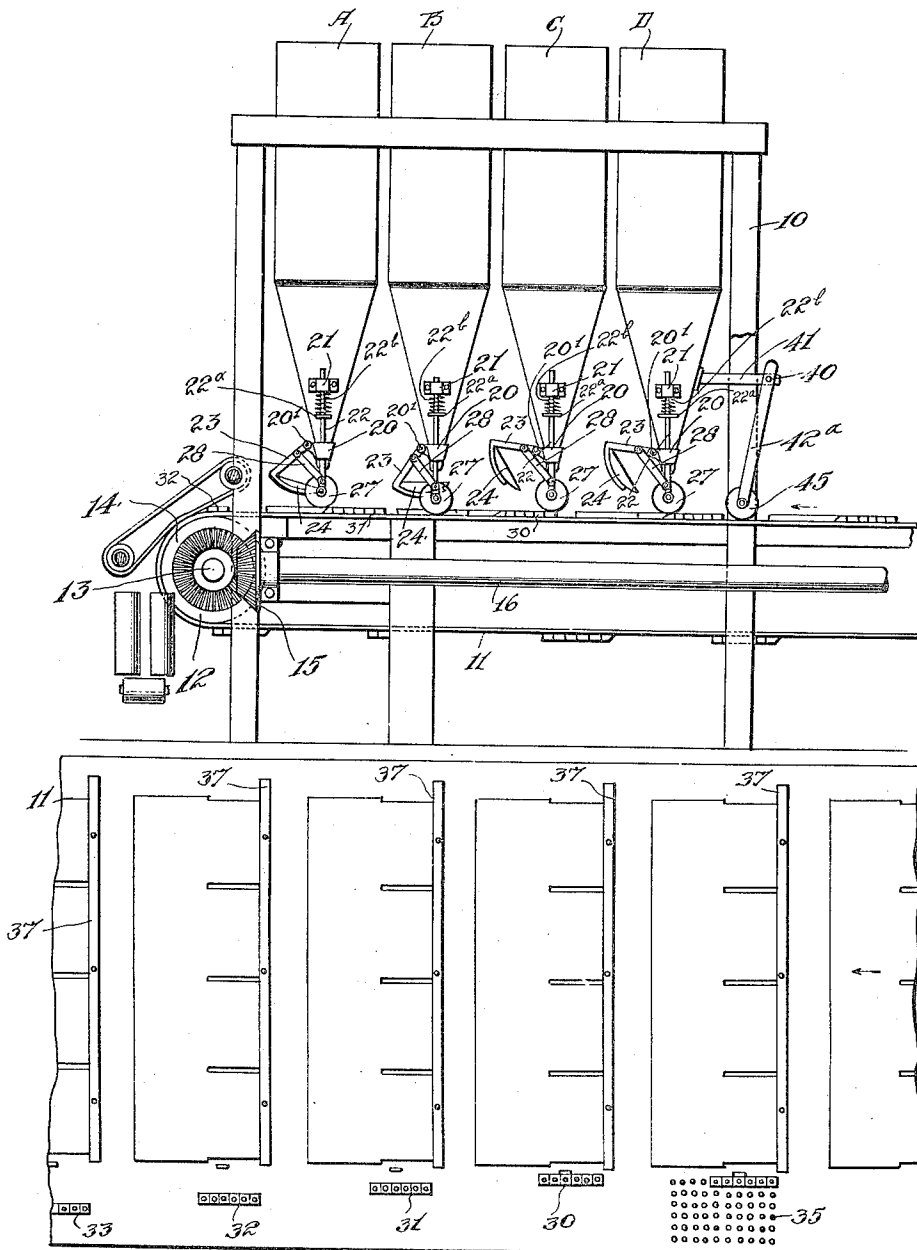


Fig. 2

INVENTOR
Jules L. Wettlaufer
BY
Samuel Stearns
ATTORNEY

March 23, 1937.

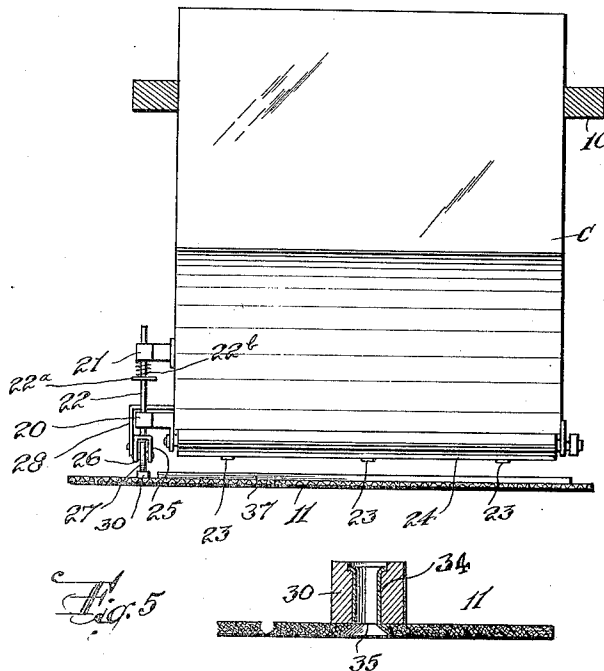
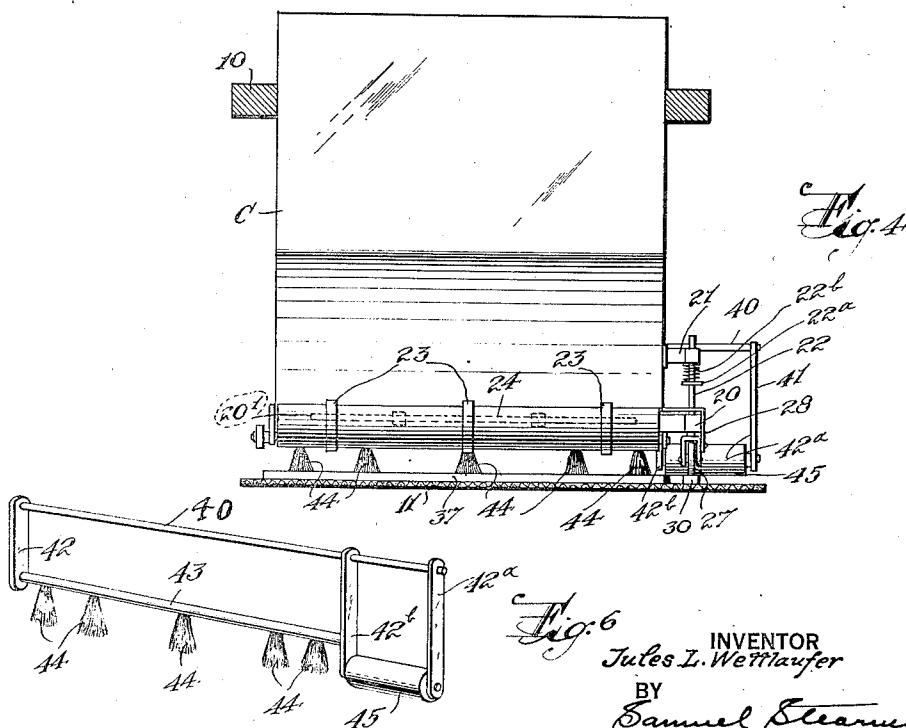
J. L. WETTLAUER

2,074,445

APPARATUS FOR SURFACING ROOFING

Filed July 31, 1929

3 Sheets-Sheet 2



INVENTOR
Jules L. Wettruffer
BY
Samuel Stearns
ATTORNEY

March 23, 1937.

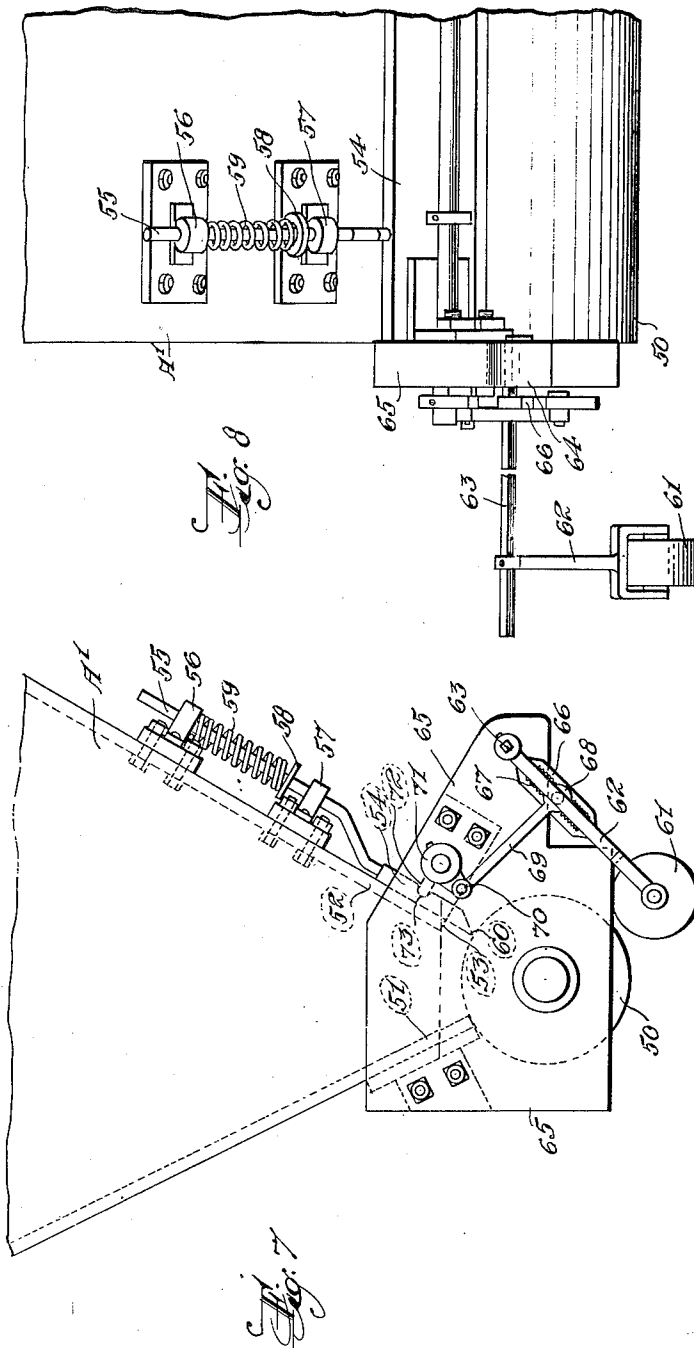
J. L. WETTLAUER

2,074,445

APPARATUS FOR SURFACING ROOFING

Filed July 31, 1929

3 Sheets-Sheet 3



INVENTOR
Jules L. Wettlaufer.
BY
Samuel Stearns
ATTORNEY

UNITED STATES PATENT OFFICE

2,074,445

APPARATUS FOR SURFACING ROOFING

Jules L. Wettlaufer, Belmont, Mass., assignor, by
mesne assignments, to The Patent and Licens-
ing Corporation, Boston, Mass., a corporation
of Massachusetts

Application July 31, 1929, Serial No. 382,534

14 Claims. (Cl. 91—43)

This invention relates to surfacing of asphaltic prepared roofing, and particularly to improvements in apparatus for applying comminuted or granular surfacing material to a roofing base for the production of roofing elements such as shingles or shingle strips in which the coloring of the surfacing material on one of the shingles or shingle strips differs more or less from that on a number of the other shingle elements in the manufacture.

In the roofing industry the demand for ornamental and harmonious color effects on the roof has made it necessary to manufacture the roofing elements with surfacing of a number of different colors on various ones of the elements so that when the roof is covered with elements thus surfaced, the desired ornamental appearance will be secured. In the commercial manufacture of the most prominent type of the so-called multi-colored roofing, it has hitherto been necessary to manufacture shingles surfaced with one of the desired colors in one run, and separately manufacture the shingles of the other desired colors in separate runs, and thereafter to assemble the shingles from the separate runs into packages according to a predetermined plan such that when they are taken from the packages and applied on the roof in the usual way, the desired ornamental appearance will be had.

The primary object of my invention is to provide mechanism whereby to eliminate the necessity of manufacturing the shingles of the different colors in separate runs with the subsequent necessity of assembling the shingles from the different runs into composite packages or bundles composed of the shingles from the various runs.

Another object of the invention is to construct apparatus of this character that will be entirely flexible in practical use and to design the same in such a way that with any given number of colors to be employed, a much larger number of completed shingles may be delivered by the machine with a continually varying sequence in the colors of the succeeding shingles so that the shingles may be packaged directly as they are taken from the machine.

Other objects and advantages of the invention will be readily apparent to those skilled in the art from the drawings and from the more detailed description which is to follow.

In the drawings,

Figure 1 is a view in side elevation of an apparatus for carrying out the invention,

Figure 2 is a plan view of part of the mechanism,

Figure 3 is an end elevation of one of the hoppers,

Figure 4 is a similar view of the apparatus at one end thereof,

Figure 5 is a detail of the mechanism for actuating the releasing or discharging means associated with the hoppers,

Figure 6 is a detail in perspective of mechanism for properly positioning the elements to be surfaced immediately prior to their arrival beneath the surfacing mechanism,

Figure 7 is a side elevation of modified mechanism for releasing the mineral surfacing material from the hoppers and

Figure 8 is a partial view in end elevation of the mechanism shown in Figure 7.

The mechanism of my present invention has been particularly designed for surfacing asphaltic prepared roofing such as the usual form of saturated felt coated on a surface or both surfaces thereof, with high melting point blown asphalt within which is partially imbedded a masking layer of comminuted or granular mineral surfacing material, which serves also to provide the decorative appearance for the roof. It should be understood, however, that the mechanism is capable of use for surfacing other types of roofing where similar ornamental effects are desired, such for example, as asbestos cement shingles or the like.

Referring first to Figures 1 to 6 of the drawings, I have shown four separate hoppers, designated as A, B, C and D, for containing the differently colored minerals which are to be used. These hoppers may be supplied either with mineral of one color or they may be partitioned transversely thereof to provide a number of compartments and each of these compartments may be supplied with minerals or mixtures of minerals of different shades or colors, according to whether the elements are to be surfaced with a uniform color throughout the lengthwise extent thereof, or whether they are to be surfaced with a plurality of differently colored bands running transversely and extending for uniform or different transverse widths thereof. These hoppers will generally be of sufficient length to provide a stream which will completely cover the usual form of strip shingles, these ordinarily being a maximum of 36" in length. Where individual shingles are manufactured with hoppers of this length, it will be necessary only to confine the mineral in the several hoppers to different portions thereof such that it will be discharged di-

rectly upon and cover the shingles to be surfaced.

The hoppers are supported on suitable framework 10. At a convenient distance below the lower ends of the hoppers I provide an endless horizontal conveyor 11, such as an endless belt or chain driven by a pulley 12 mounted upon a shaft 13, the latter being journalled in suitable bearings at one end of the framework, and the conveyor belt passing around another pulley at a substantial distance from the opposite end of the supporting framework. The pulley 12 may be driven by a bevelled gear 14 meshing with a drive pinion 15, carried by a shaft 16 which may be rotated from any convenient source of power.

In the embodiment shown in Figures 1 to 6, each of the hoppers has fixed upon one of its end faces, and near the lower end thereof, vertically spaced bearing brackets 20, 21, for supporting and guiding a vertically sliding rod 22 actuated and functioning in a manner to be more fully described hereinafter. The brackets 20, 21 of the several hoppers are staggered laterally one to another for a purpose as will presently appear. Fixed upon each of the rods 22, intermediate the brackets is a collar 22a, and helical springs 22b are mounted on the rods and confined between the collars 22a and the brackets 21, these springs normally tending to urge the rods downwardly. An arm 23 connected at its outer end with a mineral collecting and discharging pan 24 is swingably supported from each lower bearing bracket 20. The vertically sliding rods 22 at their lower ends carry an inverted U-shaped or bifurcated bracket 25, the depending legs of which are perforated to provide bearings for an idle shaft or pintle pin 26 carrying a small wheel 27. The lower end of the hoppers in this embodiment are formed with an opening of suitable dimension to provide a continual flow of the mineral therefrom, or this lower end of the hoppers may be provided with a feed roll spaced from the walls of the hopper to enable the mineral to be discharged therefrom in a continual flow. In either case, the pans 24 are arranged to be positioned beneath the discharge openings of the hoppers during certain intervals of time to receive the mineral therefrom and thereafter to be moved to a position for discharging the mineral collected in the pans onto the face of the shingle element to be surfaced. This swinging movement of the pans, under the vertical sliding movement of the rods 22 is effected through link 28 pivotally connected to the bracket 25 and also to the arm 23 adjacent the upper end thereof.

Provision is made on the conveyor belt 11 which supports and carries the shingle elements to be surfaced beneath the hoppers, to actuate the rods 22 for vertical movement and thereby control the movement of the pans 24. According to the embodiment of the invention as shown on the drawings, this actuating means on the belt comprises a series of lugs 30, 31, 32, 33, spaced at regular intervals longitudinally of the belt and extending for a distance longitudinally thereof corresponding to the transverse dimension of the shingle elements to be surfaced. Thus, as illustrated in Figure 2, wherein I have shown for purposes of illustration, the usual form of square-butt strip shingle, these lugs are of a length corresponding substantially to the butt portion of the shingle strips, namely, the transverse distance between the butt edge thereof and the upper ends of the slots in the strips defining the shingle-simulating tabs thereof. These lugs are of sufficient height

to protrude upwardly of the belt during its passage beneath the hoppers for a sufficient distance to elevate one or more of the wheels 27, and thus move the rods 22 upwardly against the force of the springs 22b, and thereby swing the pans 24 to the discharging position. In order to vary the length of these actuating lugs, they are each made up of a number of lug elements individually secured as by means of spring clips 34 to perforations 35 formed along one margin of the conveyor belt. These perforations in the belt extend not only longitudinally thereof, but also transversely, so as to provide a plurality of rows of perforations whereby the lugs may be positioned in various ones of these rows and in staggering relationship transversely of the belt, whereby to actuate the rods 22 of the several hoppers in predetermined order or sequence. Thus, the lugs secured in one longitudinal alignment along the belt may be positioned in vertical alignment with the wheel 27 on one or more of the hoppers, so as to actuate the discharge pans of these hoppers, and to have no effect upon the discharge pans of the other hoppers, and similarly, the lugs in the other rows may be staggered at predetermined intervals, such that the lugs in the several longitudinal rows may actuate the wheel or wheels 27 that are in vertical alignment therewith, at regular or irregular intervals of time, predetermined according to the sequence in which the colors are to be deposited on the successive elements. In Figure 2 I have shown only a small section of the perforations 35, for the sake of clearness, but it will be understood that these extend in the several rows, as shown throughout the length of the belt.

The shingle elements may be supplied to the belt in any convenient way, and in order to position them properly so that the desired areas thereof will receive the granular material from the hoppers upon actuation of the releasing means therefore by the corresponding lugs, transverse stop bars or rods 37 are secured to the belt at regularly spaced intervals with the forward longitudinal edge of each bar in transverse alignment with the rear end edge of each successive lug 30-33. In order to cause the successive roofing elements supported on the belt and lying thereon in the spaces between successive stop bars 37, to be properly positioned against these stop bars so as to receive the mineral released from the hoppers as already described, I provide mechanism comprising a shaft 40 supported in bearings at the outer ends of braces 41 extending from the rear face of the leading hopper of the series. This shaft has secured thereon, arms 42, 42a and an intermediate arm 42b adjacent the arm 42a. A rod 43 carrying spaced brushes or similar elements 44, is fixed between the arm 42 and the intermediate arm 42b, the latter as well as the arm 42a, extending downwardly below the shaft for a substantial distance corresponding approximately to the height of the brushes 44 and provided with openings forming bearings for an idle roller 45. This idle roller is of sufficient length to be actuated by the lugs in all the longitudinal rows. As the leading edge of a shingle or shingle strip lying between adjacent stop bars 37, comes in contact with the brushes 44, the latter will engage said edge of the shingle and cause the shingle to be brought into contacting engagement with the forward edge of the succeeding stop bar. Inasmuch as the idle roller 45 will rise up and travel over each of the lugs 30 to 33, in every longitudinal

row of lugs, the brushes 44 will thereby be elevated above the surface of each shingle, and prevented from contact with the asphalt coated areas thereof for, as will be understood, each of the lugs extends for a distance lengthwise of the belt corresponding to the transverse coated areas of the shingles.

In Figures 7 and 8 I have shown a modified arrangement for discharging the mineral from the granules upon the desired areas of the shingles or shingle strips. According to these figures, the hoppers as for example A-1, are provided with a rotatable feed roll 50 at their lower open ends, the surface of this roll being substantially in contact at all times with the wall 51 of the hopper. The opposite wall 52 of the hopper has its lower edge 53 spaced a considerable distance from the surface of the roll, this space being adapted to be opened and closed by a reciprocating gate 54 extending across this face of the hopper and carrying upwardly extending rods 55 slidable within bearings 56 and 57 secured to the face of the hopper by suitable brackets. A retaining collar 58 is secured to the rod 55 above the bearing 57, and a helical spring 59 is confined between this retaining collar and the lower face of the bearing 56, the spring normally tending to force the gates 54 downwardly so that the lower edge 60 thereof is in contact with the surface of the feed roller 50, thereby preventing the flow of mineral from the hopper. In order to actuate the gates 54 to mineral releasing position in synchronism with the movement of the belt carrying the shingle strips, I provide each of the hoppers with a lift wheel 61 similar to the wheels 27 and actuated by lugs on the belt in the manner already described. In the form shown in Figures 7 and 8, the wheels 61 are carried by arms 62 secured to a square shaft 63 extending laterally of the hoppers for a considerable distance and having their inner ends rounded to be accommodated within bearings 64 formed near the outer ends of the bracket plate 65 fixed at the lower ends of the hoppers. An elongated crank arm 66 is fixed at its upper end upon the shaft 63 so as to rotate therewith, this crank arm having a centrally elongated closed end slot 67, the side edges of the slot being serrated as indicated. This serrated slot is adapted to accommodate a similarly serrated knuckle or bolt 68 formed at the lower free end of a link 69, the upper end of which is in pivotal connection as at 70, with one arm of a bell-crank lever 71, the other arm 72 of which freely engages an arcuate opening 73 formed in the rear face of the gate 54. The operation of the release mechanism as shown in Figures 7 and 8, will be clear to those skilled in the art. As will be understood, when the wheel 61 comes into contact with and is raised by one of the lugs on the belt, the arm 62 will be caused to move slightly in an upward clockwise direction to rotate the shaft 63 and the crank arm 66. Through the connecting link 69 the bell crank lever 71 will similarly rotate in a clockwise direction and thus cause the gates 54 to move upwardly and away from the surface of the feed roller 50 against the force of the springs 59, thereby permitting the mineral to be discharged from the hoppers during the time that the wheels 61 ride upon the actuating lugs. Upward movement of the gates 54 serves to compress the helical spring 59, when the wheel 61 has cleared the co-operating lug, the spring 59 will assume normal position and thereby force the gates 54 into contact with the surface of

the associated feed roller 50, and likewise restore the wheel 61 to normal position in readiness to be actuated by the succeeding lug in the same longitudinal alignment on the belt. By adjusting the position of the knuckle or bolt 68 within the serrated slot 67, the angle of throw of the bell crank lever 71, may be adjusted to provide for controlling the quantity of mineral discharged from the hoppers during each individual actuation of the gates 54 to open position. The positioning of the wheels 61 of the several hoppers, to actuate the release mechanism for the hoppers according to a predetermined sequence, by co-operation with the respective lugs in the several longitudinal rows thereof, may be readily effected by adjusting the position of the arm 62 upon the square shaft 63, so that the lugs in any longitudinal row of lugs upon the belt may actuate the release mechanism of the respective hoppers, in the desired sequence and at predetermined intervals.

Having thus described several embodiments of my invention, it should be understood that numerous changes or modifications may be made therein, without departing from the spirit of the invention as defined in the appended claims.

I claim as my invention:

1. Apparatus for applying comminuted surfacing to asphalt coated roofing, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, a carrier for conveying roofing elements to be surfaced in succession beneath said hoppers, means on the carrier for positioning the elements at predetermined spaced intervals thereon means for discharging the granules from said hoppers, and independent means controlled by the movement of the carrier to actuate said discharge means at predetermined intervals whereby the successive elements will be covered with granules discharged from predetermined ones of said hoppers, and means for partially embedding the granules thus discharged in the surface of the roofing elements.

2. Apparatus for applying comminuted surfacing to asphalt coated roofing, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, a carrier for conveying roofing elements to be surfaced in succession beneath said hoppers, means on the carrier for positioning the elements at predetermined spaced intervals thereon means for discharging the granules from said hoppers, and independent means controlled by the movement of the carrier to actuate said discharge means at predetermined intervals whereby the successive elements will be covered with granules discharged from predetermined ones of said hoppers, said actuating means being operable to discharge said granules from the hoppers during a portion of the travel of said roofing elements beneath the predetermined hopper discharging granules thereon, and means for partially embedding the granules thus discharged in the surface of the roofing elements.

3. Apparatus for applying comminuted surfacing to asphalt coated roofing, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, a carrier for conveying roofing elements to be surfaced in succession beneath said hoppers, means on the carrier for positioning the elements at predetermined spaced intervals thereon means for discharging the granules from said hoppers and means on said carrier to actuate said dis-

charge means independently and at predetermined intervals, and means for partially embedding the granules thus discharged in the surface of the roofing elements.

4. Apparatus for applying comminuted surfacing to asphalt coated roofing, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, a carrier for conveying roofing elements to be surfaced in succession beneath said hoppers, means on the carrier for positioning the elements at predetermined spaced intervals thereon means for discharging the granules from said hoppers, said carrier having means thereon for independently actuating said discharge means intermittently and at predetermined intervals, and means for partially embedding the granules thus discharged in the surface of the roofing elements.

5. Apparatus for applying comminuted surfacing to asphalt coated roofing, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, a carrier for conveying roofing elements to be surfaced in succession beneath said hoppers, means on the carrier for positioning the elements at predetermined spaced intervals thereon means for discharging the granules from said hoppers, said carrier having means thereon for independently actuating said discharge means intermittently and at predetermined variable intervals, and means for partially embedding the granules thus discharged in the surface of the roofing elements.

6. Apparatus of the character described, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, a carrier for conveying roofing elements to be surfaced in succession beneath said hoppers, means for discharging the granules from said hoppers, and means on said carrier to actuate said discharge means, said actuating means being adjustable on the carrier whereby to actuate said discharge means at predetermined variable intervals.

7. Apparatus for applying comminuted surfacing to asphalt coated roofing, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, said hoppers having independently actuatable discharge means, a conveyor for progressively moving roofing elements to be surfaced beneath said hoppers, means on the conveyor for positioning the elements at predetermined spaced intervals thereon and mechanism on said conveyor for actuating said discharge means at predetermined intervals, and means for partially embedding the granules thus discharged in the surface of the roofing elements.

8. Apparatus for applying comminuted surfacing to asphalt coated roofing, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, said hoppers having independently actuatable discharge means, a conveyor for progressively moving roofing elements to be surfaced beneath said hoppers, means on the conveyor for positioning the elements at predetermined spaced intervals thereon and actuating members on said conveyor at regularly spaced intervals longitudinally thereof and in predetermined staggered positions transverse-ly of said conveyor for actuating said discharge means, the actuating members in the same longitudinal alignment being adapted to actuate the discharge means for one of said hoppers, and means for partially embedding the granules thus discharged in the surface of the roofing elements.

9. Apparatus for applying comminuted surfacing to asphalt coated roofing comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, said hoppers having discharge means to release the granules therefrom, a conveyor for progressively moving roofing elements in succession beneath said hoppers, means on the conveyor for positioning the elements at predetermined spaced intervals thereon and means on the conveyor for independently actuating said discharge means whereby to discharge mineral from said hoppers onto predetermined ones of said elements in synchronism with the movement of the elements, and means for partially embedding the granules thus discharged in the surface of the roofing elements.

10. Apparatus of the character described, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, said hoppers having discharge means to release the granules therefrom, a conveyor for progressively moving roofing elements in succession beneath said hoppers, and a series of longitudinal rows of spaced actuating members on the conveyor for actuating selected ones of said discharge means at predetermined intervals.

11. Apparatus of the character described, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, said hoppers having discharge means to release the granules therefrom, a conveyor for progressively moving roofing elements in succession beneath said hoppers, and a series of longitudinal rows of spaced actuating members on the conveyor, the actuating members of each longitudinal row being adapted to actuate the discharge means of one of said hoppers at predetermined spaced intervals.

12. Apparatus of the character described comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, said hoppers having discharge means to release the granules therefrom, a conveyor for progressively moving roofing elements in succession beneath said hoppers, a series of longitudinal rows of spaced actuating members on the conveyor, all of said members in one longitudinal row being adapted to actuate the discharge means of one of said hoppers at predetermined variable intervals independently of the actuation of the discharge means of the other hoppers by the actuating members in the other of said rows.

13. Apparatus for applying comminuted surfacing to asphalt coated roofing, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, means for conveying a series of shingles beneath said hoppers, means on said conveying means for positioning the elements at predetermined spaced intervals thereon and means operable to release the granules in definite timed relation to the positioning of the shingles on the conveying means whereby to release the granules from one of said hoppers while one of said shingles passes thereunder, and to release the granules from another of said hoppers while another shingle of the series passes under the last named hopper, and means for partially embedding the granules thus discharged in the surface of the roofing elements.

14. Apparatus for applying comminuted surfacing to asphalt coated roofing, comprising a plurality of hoppers for maintaining separate supplies of differently colored mineral granules, means for conveying a series of shingles beneath

the hoppers, means on said conveying means for positioning the elements at predetermined spaced intervals thereon and means operable to release the granules in definite timed relation to the positioning of the shingles on the conveying means whereby to release the granules from one of said hoppers to deposit the same upon one of said

shingles and to release the granules from another of said hoppers and deposit the same upon another shingle of the series, and means for partially embedding the granules thus discharged in the surface of the roofing elements.

JULES L. WETTLAUER.