

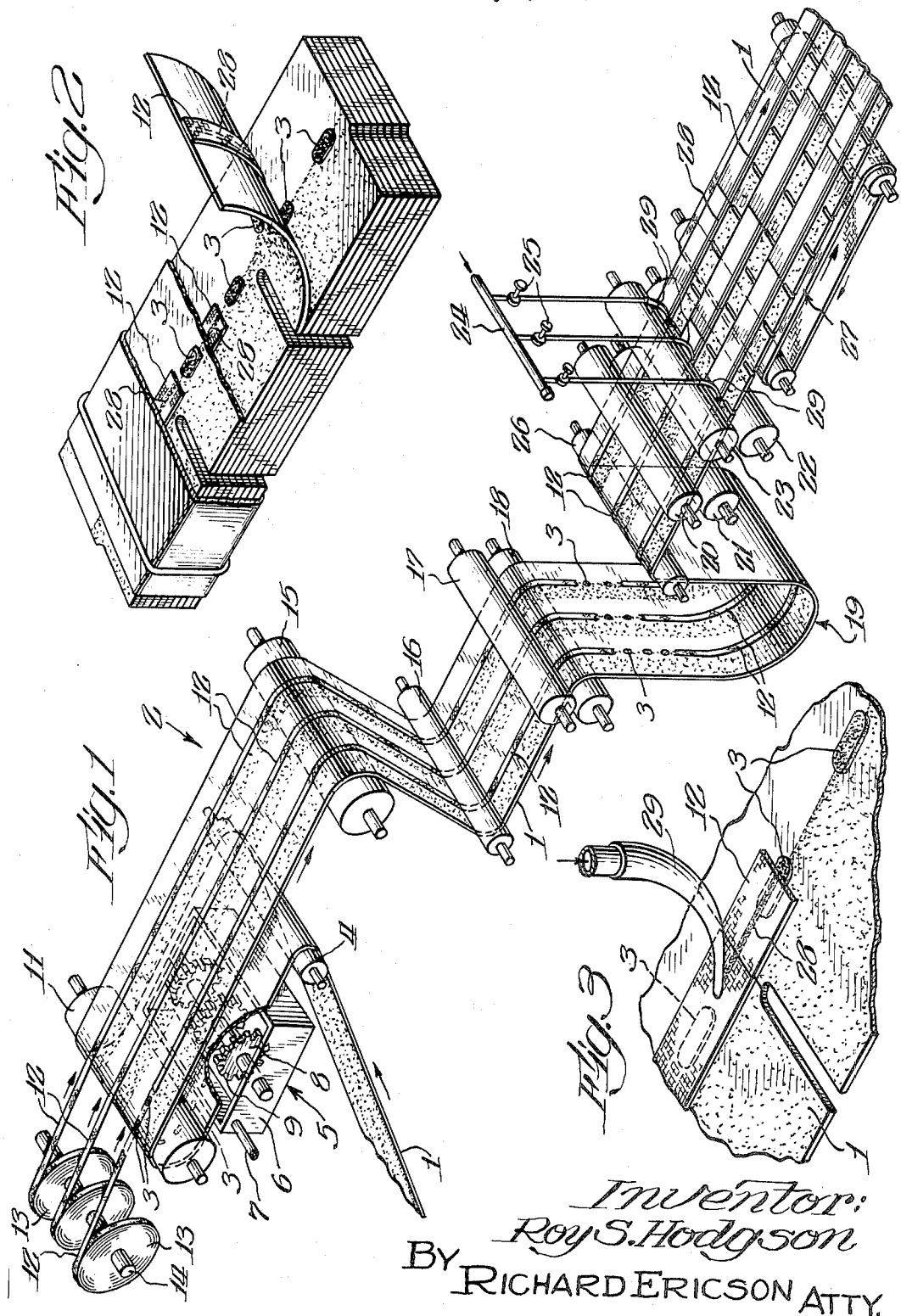
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MANUFACTURE OF SELF SEALING SHINGLE AND BUNDLE

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MANUFACTURE OF SELF SEALING SHINGLE AND BUNDLE

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This invention relates to the manufacture of self sealing shingles and more particularly to improvements in the process of manufacturing said shingles for packaging into a bundle.

In Patent No. 3,042,193 there is disclosed a bundle for self sealing flexible asphalt strip shingles, such as those of the butt type which are usually formed from asphalt saturated and coated fibrous felt strips. Each shingle has a head portion and a bottom or exposed portion which is divided into sections or butts by vertical slots or cut-outs. The surface of the coated portion is usually covered with granules. The granules used on the head portion are sometimes of different size and color than those used on the exposed butts. These shingles are usually applied in overlapping relation with the major portion of the butts exposed.

As mentioned in the above identified patent, it is necessary, in order to minimize the tearing or the raising of the shingle under a severe wind, which may cause a leak, to seal down the butt portion of the shingle. This is best accomplished by the application of an adhesive band, which may be continuous or discontinuous as spots, to the head portion above the exposed butt portion of the same shingle during its manufacture so that the butt portion of the upper course of shingles will adhere thereto when the shingles are applied in overlapping relation. Shingles of this type are referred to as self sealing shingles.

The adhesive band is ordinarily made of asphalt or a blend of asphalts or other bituminous materials which are rendered effective as an adherent by atmospheric heat or solar radiation usually at a temperature above 80° F. Such types of adhesives would cause an adherence of the shingles together while stacked in a bundle for shipping. In order to prevent this, a band of nonadherent material is also applied to the back of the shingle and so positioned that, when the shingles are bundled face to back, a nonadhering band will register over an adhesive band as set forth in the above mentioned patent. Further, it is preferred to have the sealing and adhesive band extending lengthwise along the center of each shingle, especially when there is a variation in the thickness of the shingle so as to permit half of the shingles used to make a bundle to be turned so that half of the thicker portion extends along each longitudinal edge. A centrally located adhesive band is sometimes undesirable.

As also mentioned in the above identified patent, the nonadhering band, which can be applied as a liquid such as molten wax or which may be a tape, is applied to the back of the shingle and the adhesive self sealing band is applied to the face over the layer of granules while the shingles are a continuous strip in the machine. Since the self sealing adhesive band is usually of a tacky nature, great care is required to prevent this self sealing band from fouling up rolls and equipment before the shingles are ultimately bundled. If some means could be established by which this could be prevented a decided advance in the art would ensue.

The bundle set forth in the patent is an improvement over that of the prior art, for the nonadhering band, whether it is applied as a liquid or sheetlike in nature, remains adhered to the back of the adjacent shingle. In effect the removal of the upper shingle pulls off the nonadhering sheetlike band from the surface of the lower

self sealing band when it is taken from the bundle. The procedure followed in certain bundles used in the past required that the pull off strip be removed from over the adhesive band while on the job. This is an inconvenient step for the applicator while upon the roof. It is also messy.

It is therefore an object of this invention to provide a means for preventing the fouling of a roofing machine with self sealing adhesive bands applied to the shingle material prior to cutting and bundling.

It is also an object of this invention to simplify the application of the nonadhering band to the shingle during its manufacture so that there is no need to assure a registration of the back nonadhering band over the front self sealing band.

It is an added object of this invention to provide a novel method of continuously applying both the self sealing and the nonadhering bands to the granule side of the roofing and still permit the adjacent shingle to pull off the nonadhering band from the self sealing band when it is removed from the bundle.

It is a further object of this invention to provide a bundle for self sealing shingle in which the nonadhering band is secured to the back of the adjacent shingle while in the bundle.

It is a still further object of this invention to provide a bundle for self sealing shingles of different thickness along opposite longitudinal edges in which the self sealing adhesive band need not be centrally located and still permit a portion of the thicker edge to be positioned along one longitudinal edge of the bundle and the remaining along the opposite edge.

Various other objects will readily occur to those skilled in the art of which this invention is a part.

This invention is best understood by means of the drawing in which:

FIGURE 1, is a schematic arrangement of the portion of a roofing machine needed to practice this invention and shows the various essential steps from the application of the self sealing bands to immediately after the cutters,

FIGURE 2, shows how the shingles are bundled following the method set forth in this invention, and

FIGURE 3, is an enlarged view of FIGURE 1 showing the application of the tape adhering band to the nonadhering band.

The objects of this invention are accomplished by a novel method of applying the self sealing and nonadhering bands. Instead of applying the nonadhering band to the back of the asphalt strip from which the shingles are to be cut as practiced in the past, it is applied to the upper or exposed portion of the shingle after the application of and over the self sealing band before the latter has a chance to touch a portion of the machine. This limits the nonadhering band to a tape such as cloth, paper or metal which has been rendered nonadherent to the adhesive band by a suitable repellent self sealing band such as silicone, stearic or palmitic acid, waxes, etc. While the tape is nonadherent to the adhesive and is readily removed there is sufficient adherence to retain it in place as it passes through the machine thus preventing the sealing band from becoming loosened. An adhesive band is then applied to the top of the tape so that it will adhere to the back of the adjacent shingle when it is in the bundle and be removed therewith. If the machine uses a pair of rolls to cut the strip into individual strips, it is desirable, but not necessary, to apply the tape adhesive band immediately after the last step in the formation of the shingle and before the separating and speed up section.

The following detailed description of this invention is set forth as an example of a preferred embodiment thereof so as to enable one skilled in the art to practice the invention and is not to be construed in any way as a limitation thereof other than as defined by the appended claims. This invention can be readily adapted to the usual strip asphalt shingle roofing machine. Since this machine is well known in the art only that portion thereof which is relevant to the invention will be described in detail. The machine is only modified after the application of the granules. The detail covering the saturation of the felt with asphalt, the coating of the saturated felt with asphalt and the subsequent addition of the granules is well known; these need not be described. The subject of this invention involves only that portion of the machine after the application of the granules.

FIGURE 1, shows a schematic and perspective view of that portion of a strip asphalt shingle roofing machine needed in carrying out this invention. In this figure, 1 is that portion of the strip shingle which ordinarily would pass through to the cutting section but which is now bypassed through the self sealing adhesive application section 2 positioned prior to the cutting section. In this section, a series of spots 3 of the appropriate type self sealing adhesive is applied over the face or granule side of the strip to form the self sealing adhesive band. The granule coated strip 1 enters this section over the idler roll 4 and passes with the granule or exposed face down over the self sealing adhesive spot applicator apparatus 5. This consists of the reservoir 6, filled with the adhesive in a fluid condition through the inlet 7, and three, if three rows of shingles are formed from one strip, revolving adhesive spots applicators 8. A portion of such applicator is positioned below the level of the adhesive so as to collect a portion thereof upon the teeth 9 and deposit it upon the face of the strip in the proper position to become a self sealing band upon the face of the finished shingles cut therefrom. An applicator is more clearly shown by a portion of the strip thereover being cutaway. These applicators do not require a separate drive as they can be driven by contacting the moving strip 1, though better formed spots are usually deposited when the applicators are driven.

After the application of the self sealing adhesive spots, the strip passes around the roll 11 where the nonadhesive bands 12, consisting of narrow bands of especially treated paper, from the rolls 13, are applied over each self sealing band. These rolls are mounted upon the spindle 14 and are positioned slightly below the level of the upper portion of the roll so that there is a slight pressure of the tape upon the adhesive spots during application. A roll can also be used to assure contact. However, excessive pressure upon the spots in this position before they have cooled will cause them to flatten out. The relative portion of the tape and the self sealing band are shown by the removal of a portion of the tape in various positions in the figures.

The strip then passes around the roll 15, over the idler roll 16, between the pair of pull through rolls 17 and 18, the loop 19, the idler roll 26 and hence through the feed rolls 20 and 21 for the cutter. The sheet is then simultaneously slit into 3 streams, the cutouts formed and the shingles cut to the proper length by the cutter roll 22 acting against an anvil roll 23.

Immediately after leaving the cutting section, and while the shingles are upon the inspection or take-off belt 27, a continuous narrow strip or band of adhesive 28 is applied along the center and top of each tape from the nozzles 29 shown in detail in FIGURE 3. These are fed from the manifold 24 connected to a source of liquid adhesive, not shown. The flow of the adhesive can be controlled by the valves 25. Any suitable adhesive can be used, such as an aqueous dispersion of a copoly-

mer of vinyl acetate and a long chain acrylate, sold as Gelva TS-100 by the Shawinigan Resin Company. The exact amount of the aqueous dispersion adhesive applied can vary between wide limits, however, sufficient must be used to assure proper adhesion of the tape to the back of the single in the bundle. About one pound of the above emulsion per 1000 lineal feet of tape, should be sufficient. The tape adhesive can be applied in spots for economy purposes. It can also be applied by printing or by means of a spray nozzle.

After the application of the tape adhesive band, the remaining operation is the same as that of a regular strip shingle machine which includes the speedup and separating section and the bundling apparatus. These are not shown as they are well known in the art and need not be described in detail.

In collecting the shingles in the pans for subsequent bundling, the upper shingles slide over the lower such that a portion of the adhesive band applied over the tape used to form the nonadhering band may be smeared by the upper shingle. This should not cause any difficulty as the adhesive is merely spread thereby. If an excessive amount is carried along by the forward edge of the upper shingle then the amount of adhesive should be decreased somewhat and/or the pans notched so as to prevent the excessive adhesive from collecting thereon.

When the shingles are in the bundle, the adhesive band secures the tape to the back of the adjacent shingle as shown in FIGURE 2 and in FIGURE 3 of the above identified patent. The granule face of the last shingle contacts a portion of the enclosing carton so that the nonadhering band or release tape is removed with the carton. If the carton does not extend completely around the shingles, such as shown in FIGURE 3 of the patent then the shingles must be packed face down so that the adhesive band on the tape will contact the carton.

Various types of strip material can be used as the nonadhering band 12; a specific example is a creped parchment paper known as Puckered Brown Whalehide, treated upon one side with Dow Corning Company, No. 22 silicone and manufactured by the KVP Company. Likewise while an asphalt blend can be used as the self sealing band, any other suitable adhesive will suffice. With a very tacky self sealing adhesive, a tape is much preferred as the nonadhering band particularly to form a bundle following this invention.

From the above description of a preferred embodiment of this invention, it is apparent that the method of applying the nonadhering band as a tape over the sealing spots shortly after their application to the granule surface followed by the application of a band of adhesive to the top of the tape after the cutting roll so that the tape is adhered to the back of the adjacent shingle when in the bundle is a marked advance in the art of making and packaging a self sealing shingle. It is obvious from this procedure that none of the rolls after the application of the self sealing adhesive band will be fouled thereby, a marked advance in the art. In addition, following this invention, it is no longer necessary to register the nonadhering band when applied to the back with the adhesive spots upon the face nor need the band extend down the center when bundling thick butt shingles, the butt portion being thicker than the head portion so that half of the butt portion extends along each edge to form a bundle of more uniform overall thickness. When the nonadhering band is applied over the self sealing band before bundling there is no need to assure registration of the back to face portions. Thus, applying the tape over the adhesive band or spots shortly after application following this invention, it is possible to place them in any desired location. Care must be followed so that the nonadhering band is not stuck to the back of an adjacent shingle over the cutouts.

Various modifications can be made in practicing this invention without departing from the scope thereof.

For example, the nonadhering band can be made from cloth, paper, or even metal. Various other types of nonadhering material beside silicone can be applied to the contacting surface of the nonadhering band or tape to effect a ready release of the tape from the self-sealing band, such for example as the waxes, wax-polyethylene mixtures, stearates and other materials repellent to the self sealing adhesive as set for in the above identified patent.

Further modifications can be made in the application of the tape adhesive band. It might be expedient to apply this adhesive before the cutting section, such for example as when there is a speedup section immediately after the strip is cut into individual shingles. Actually, this adhesive may be applied at any time after the tape. It is also within the scope of this invention to add this adhesive band to the face of the tape opposite from that having the nonadhering surface treatment before forming into a roll 13; the nonadhering treatment will prevent the sticking of the tape together while in the roll.

In all of the above modifications where there is a contact between the adhesive and parts of the roofing machine it may be necessary to provide means to prevent the adhesive from fouling these parts such as by treating or recessing them. Since there is such a small amount of this adhesive, as compared with that used to form the self sealing band, it is possible to use each contacting part as a spreader.

The most important step is to add the tape adhesive band to the nonadhering tape prior to the bundling of the shingle so that the nonadhering band will be adhered to the next adjacent shingle and removed therewith.

In the above description of this invention no driving or control means, supports, tanks, pumps, etc. are shown for the roofing machine; such are well known to those skilled in the art of which this invention is a part and need not be described.

I claim:

1. The method of preparing self sealing strip shingles, characterized by a self sealing adhesive band extending lengthwise thereof and a nonadhering, adhesive release band contacting said adhesive band for bundling comprising applying narrow bands of a self sealing adhesive along the face side of a continuously moving strip of roofing material, applying a sheetlike nonadhering band over said self sealing adhesive band with an adhesive release surface contacting said adhesive band, applying band of a tape adhering adhesive over the face of said sheetlike nonadhering band and stacking self sealing strip shingles formed from such strip in face to back relation into a bundle whereby each of said nonadhering bands is adhered to the back side of an adjacent shingle and is removed from over said self sealing band when said adjacent shingle is removed therefrom.

2. The method of preparing the self sealing strip shingle and bundle claimed in claim 1 with the added step of extending an enclosing carton over the said band of tape adhering adhesive on the exposed face side of the last shingle in the said bundle whereby the nonadhering band upon the face side of the last shingle in the bundle is removed with said enclosing carton.

3. The method claimed in claim 1 in which said tape adhering adhesive is applied to said sheetlike nonadhering

band prior to the application of said nonadhering band over said self sealing adhesive band.

4. The process for preparing self sealing shingles for bundling comprising, applying a band of self sealing adhesive over the face of a continuous moving strip of roofing material to form self sealing shingles, applying a nonadhering sheetlike band over said self-sealing band, applying band of adhesive over said nonadhering band prior to the bundling of self sealing shingles cut from said strip whereby said nonadhering band will adhere to the adjacent shingle when said shingles are in said bundle in face to back relationship and be removed therewith when said adjacent shingle is removed from said bundle.

5. The method of forming a bundle of self sealing strip shingles placed in face to back relation and having a band of self sealing adhesive applied to the face side of each shingle with a sheetlike band substantially nonadherent to said self sealing band between the said self sealing band and the back of and adhered to an adjacent shingle in said bundle, comprising forming a continuous moving strip of roofing material, applying a narrow band of a self sealing adhesive over the face side of said roofing, applying a sheetlike nonadhering band over said self sealing adhesive band with an adhesive release surface contacting said self sealing adhesive band, applying a band of a tape adhering adhesive over the face of said sheetlike band, cutting said strip of roofing material into strip shingles, stacking said strip shingles into a bundle in face to back relation whereby said sheetlike nonadherent band is between said self sealing band and the back of an adjacent shingle and adhered thereto so that said nonadhering band is removed from said self sealing adhesive band with said adjacent shingle; enclosing at least the portion of said bundle containing the exposed face of said strip shingle with a carton whereby the nonadhering band on said face shingle is adhered to said carton with said tape adhering adhesive and removed therewith.

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