May 5, 1959 P. S. BETTOLI ET AL 2,885,073

PACKAGING OF SELF-SEALING SHINGLES

Filed Aug. 8, 1958

FIG. 3

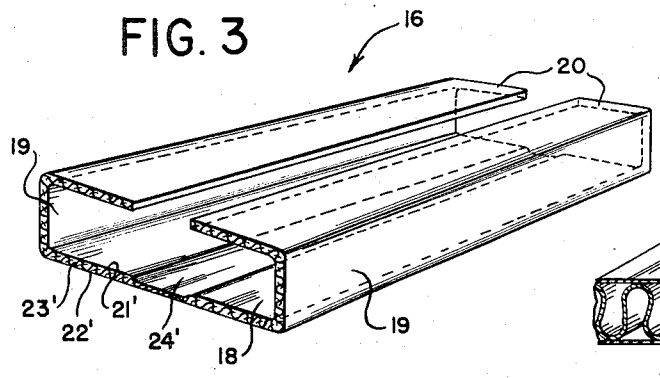


FIG. 5

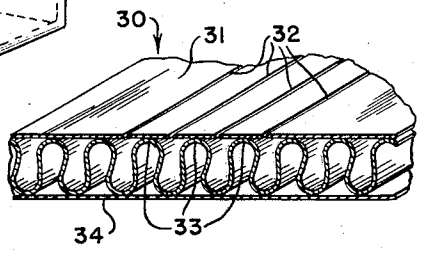


FIG. 2

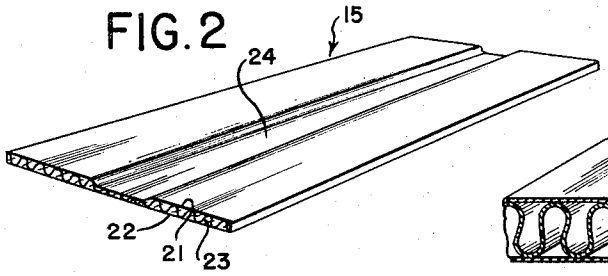


FIG. 6

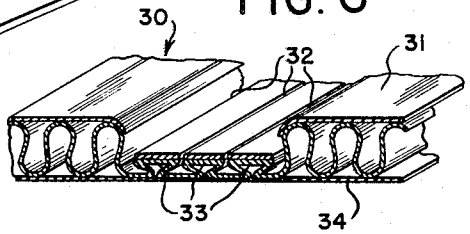


FIG. 4

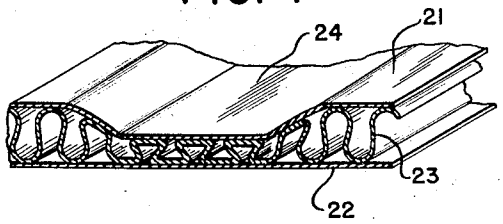
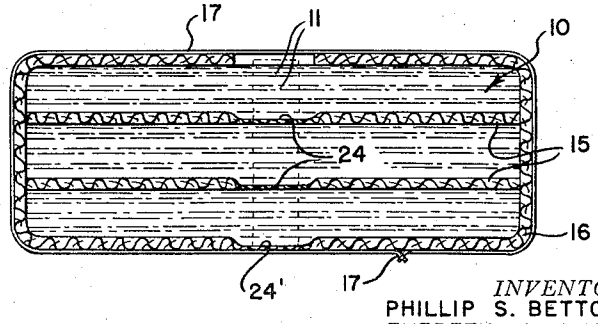


FIG. 1



INVENTORS.
PHILLIP S. BETTOLI
BY EVERETH L. LYONS

ATTORNEYS

Pennie Edmonds Morton Barrows & Taylor

United States Patent Office

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PACKAGING OF SELF-SEALING SHINGLES

Phillip S. Bettoli, Belle Mead, N.J., and Evereth L. Lyons, Riverdale, N.Y., assignors to The Ruberoid Co., New York, N.Y., a corporation of New Jersey

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4 Claims. (Cl. 206—60)

This invention relates to packaging of self-sealing shingles having adhesive material applied thereto, and, more particularly, to improvements in packages for such shingles which compensate for the cumulative added thickness of the shingles due to the adhesive to prevent undue pressure from being applied to the adhesive and to protect the shingles from sagging and bending.

Self-sealing shingles are characterized by having a bituminous adhesive material applied along a narrow path extending longitudinally of the shingle. When such shingles are laid in overlapping courses on a roof, the adhesive material is interposed between the lower edges of the butts of one course and the head portions of the shingles of the course beneath; and with exposure to solar heat the adhesive cements each butt to the head portion of the lower course. Shingle butts cemented in this manner are effectively protected from wind damage.

Since the temperature required to activate the adhesive and cement the shingles together is only that to which they are heated by the sun, the shingles become cemented to one another within a short time after being applied. It is in this sense that they are self-sealing. However, the bituminous adhesive material can also be activated at even lower temperatures when subjected to sustained high pressure and the danger therefore exists that a stack of shingles in a package might become cemented together before they are put to use. This danger is increased when the shingles are arranged with the patches of adhesive superimposed one above the other, and since these patches are of substantial thickness, the cumulative thickness of the stack through the adhesive is substantially greater than elsewhere. This results in placing the adhesive under greater pressure than the other parts of the shingles, so that the shingles may become cemented together (particularly if the package should be inadvertently heated in storage) or the adhesive patches can be flattened beyond their intended thickness. Such is particularly likely to occur when a number of packages are piled one above the other, as is the common storage practice.

In our United States Patent No. 2,822,085, issued February 4, 1958, we have described a package for self-sealing shingles which has been found to be very effective for preventing unintended cementing together of the shingles. In that package, the shingles are stacked in such a manner that the adhesive material on each shingle is directly above that on the shingle beneath. Pallets in the form of flat rectangular sheets of corrugated board are inserted at spaced intervals between relatively small stacks of shingles; and these pallets have die-cut slots or openings corresponding substantially in position, size and arrangement to the lines or dots of adhesive patches on each shingle. The slots in the pallets compensate for the thickness of the adhesive material and to relieve it of undue pressure. A wrapper of corrugated board is wrapped about the stack of shingles and pallets to secure them in a bundle. The bottom wall of the wrapper may have slots cut in it similar to those in the pallets.

It has been found, however, that the structural strength of the pallets and wrapper is seriously impaired by die-cutting the slots. Since the adhesive material is disposed in dashes or dots along a path extending longitudinally of the shingle for substantially its entire length, the slots in the pallets and wrapper element must extend a corresponding distance, and should (but obviously cannot) extend for their entire lengths, in order to be fully effective. As a result, the wrapper and pallets are subject to damage, especially while being shipped and handled before being assembled into shingle packages. In particular they are subject to being compressed edgewise, for the narrow bridge sections at the ends of the slots are not strong enough to resist such compression very well; and such edgewise compression may narrow the slots to such an extent as to render them ineffective for their intended purpose. In addition, the die-cutting of slots in the pallets and wrapper adds considerably to their cost, because it imposes an extra operation in their manufacture and they must be accurately indexed with respect to their width and length.

It is a major purpose of the present invention to provide a package of self-sealing shingles in which compensation for the added thickness of the adhesive extends throughout their entire length, using pallets and a wrapper of increased mechanical strength and lower cost. The package of self-sealing shingles contemplated by the invention comprises a wrapper, preferably of corrugated board, having a bottom wall, a pair of substantially parallel side walls, and a top flap along the upper edge of each side wall foldable inwardly upon the contents of the wrapper. A stack of shingles, each having at least one deposit of adhesive material located thereon in a predetermined position and arrangement along a relatively narrow path extending lengthwise of the shingle, is supported in face-to-back relationship on the bottom of the wrapper. The shingles are stacked in the package with the adhesive material of each in the same relative position. Positioned on the first stack are additional stacks of shingles, with each additional stack supported on a pallet of corrugated board. The shingles of each additional stack are disposed so that their deposits of adhesive material are arranged in the same relationship to one another as those on the shingles of the first stack. Each pallet (and preferably the wrapper also) has a portion of its corrugations crushed substantially flat, preferably throughout its entire length, to form at least one longitudinally crushed strip of lesser thickness than the re-remainder of the pallet or wrapper. This crushed strip is positioned with relation to the path along which the adhesive material is deposited to accommodate and compensate for the cumulative added thickness of the stacks of shingles due to the deposit of adhesive material on each shingle. The corrugations normally will be arranged lengthwise of the package, though in some cases they may extend lateraly across the pallets and wrapper. If the normal is the case, several adjacent parallel corrugations are crushed, while in the latter case, the crushed strip will extend across all the corrugation.

While it is possible simply to crush the corrugations of the board along the desired path, there will be less spring-back of the crushed corrugations, and a greater reduction in thickness along the crushed strip, if one face of the board (assuming the board is double-faced) is slit for its full length between each of the adjacent crushed corrugations.

Preferred embodiments of the invention are described below with reference to the accompanying drawings, in which—

Fig. 1 is an end elevation of a package of self-sealing shingles according to the invention;

Fig. 2 is a perspective of one of the pallets made ac-

cording to one embodiment of the invention, showing its longitudinal crushed strip portion;

Fig. 3 is a perspective of a wrapper made according to the same embodiment of the invention as the pallet of Fig. 2, showing its longitudinal crushed strip portion along its bottom wall;

Fig. 4 is a perspective showing on an enlarged scale the form of the crushed strip of the pallet of Fig. 2 and the wrapper of Fig. 3;

Fig. 5 is a perspective showing on an enlarged scale the slitting of one face of a pallet or wrapper preparatory to crushing to form the crushed strip of an alternative embodiment of the invention; and

Fig. 6 is a perspective similar to Fig. 5 showing the longitudinal slit portion after it has been crushed.

In Fig. 1, self-sealing shingles of the type packaged according to the invention are indicated in phantom by the reference numeral **10**. Each shingle is substantially rectangular in shape and is shown here in end view. One or more patches of bituminous adhesive material **11** is applied to each shingle in a prescribed position and arrangement with respect to the side edges of the shingle, along a relatively narrow path extending lengthwise of the shingle. On the other side of each shingle directly opposite the path of the adhesive patches a strip of anti-stick parting material preferably is applied to aid in preventing the shingles from sticking together when they are stacked.

In the package of Fig, 1, the shingles **10** are arranged one above the other in stacks with pallets **15** disposed between the stacks. Each of the pallets is of substantially the same length and width as the shingles themselves. In order to minimize handling when the shingles **10** are laid, they are often arranged in the stacks with the same side up and all with the butts to one side of the package. This arrangement may be varied, however, by positioning the center stack with the butts on the headlap side of the two adjoining stacks; but in any case the strips of adhesive are superimposed one above the other as shown in Fig. 1. A wrapper **16** is folded around the outside of the stacks of shingles and pallets, and the entire package is bound with wires or metal straps **17**.

One embodiment of one of the pallets **15** is shown in detail in Fig. 2. It is formed of a flat rectangular sheet of double-faced corrugated board, the faces of which are defined by paper liners **21** and **22** adhesively attached to each side of a paper corrugated element **23**. The corrugations of the corrugated element **23** are disposed lengthwise with respect to the rectangular pallet, though as indicated above they may extend crosswise. The upper surface of the pallet is flattened by crushing along a longitudinal strip portion **24** throughout the length of the pallet. This crushed strip is positioned similar to the path along which the patches of adhesive material are applied to the shingles **10** but is a little greater in width than that path. The crushed strip **24** preferably is formed by simply compressing the corrugated sheet between pressure rolls in a continuous operation before it is cut into rectangles of the proper size.

One form of wrapper **16** is shown in detail in Fig. 3. It is preferably formed from a flat sheet of double-faced corrugated board comprising opposed paper liners **21'** and **22'** adhesively secured to each side of a corrugated element **23'**. The corrugated board of which the wrapper **16** is formed is preferably scored longitudinally to facilitate folding it as shown to provide a bottom wall **18**, parallel side walls **19**, and a pair of top flaps **20**. The corrugations of the wrapper extend lengthwise of the shingles it is designed to enclose. The flaps **20** are foldable inwardly upon the contents of the wrapper, preferably leaving their opposed edges spaced apart along the path of the adhesive patches on the shingles by a distance slightly greater than the width of such path.

The bottom wall **18** of the wrapper **16** is crushed longitudinally to form a crushed strip **24'** similar in width and

position to the crushed strip **24** of the pallets **15**. The crushed portion **24'** extends the full length of the wrapper bottom wall, and advantageously is formed by a continuous roll-crushing operation prior to cutting the wrapper elements from the board stock.

In Fig. 4 the general appearance of the crushed strip portions **24, 24'** is shown in detail. The individual corrugations of the corrugated element **23** along the crushed strip may be deformed and reduced to substantially less than half their original height, thereby netting a reduction in the thickness of the corrugated board along the crushed strip portion to less than half that of the adjoining uncrushed portions.

There is, of course, some tendency for the crushed strip portions **24** and **24'** to spring back. In order to minimize this tendency, an alternative embodiment of the invention contemplates slitting one face of the corrugated board prior to or simultaneously with the crushing operation. Such alternative embodiment (which may be utilized in either the pallet or the wrapper or both) is illustrated in Figs. 5 and 6. Fig. 5 shows a fragmentary segment of corrugated board **30** such as may comprise either a pallet similar to that shown in Fig. 2 or the bottom wall of a wrapper similar to that shown in Fig. 3. One face **31** of the board is slit longitudinally, as indicated at **32**, on each side of the several adjacent corrugations **33** which are to be crushed. The opposite face **34** of the board is left intact. Fig. 6 shows the segment of board after the corrugations between the slits have been crushed. Here again the crushed corrugations are reduced to substantially less than half their original height, with the result that the thickness of the crushed strip is less then half that of the uncrushed board. Both slitting and crushing preferably are performed as continuous operations by means of slitting and crushing rolls prior to cutting the pallet or wrapper blanks from the board stock.

An advantage of slitting preparatory to crushing as shown in Figs. 5 and 6 is that somewhat greater reduction in thickness along the crushed strip can be attained. Also, the edges of the crushed strip are more sharply defined. However, the slitting requires an extra operation in the manufacture of the pallets and wrappers, and is not always necessary.

It is to be noted that Figs. 4, 5 and 6 each shows only three corrugations crushed to form the crushed strip. In this respect the drawings are simplified and schematic, for in general a considerably greater number of corrugations will be crushed. For example, in a typical case, using corrugated board of "A" flute having corrugations spaced $1\frac{1}{32}$ inch from peak to peak, the width of the crushed strip to accommodate the adhesive patches on the shingles will be about 2½ inches. This will require crushing at least seven adjacent corrugations. However, apart from being schematic in this quantitative respect, the drawings clearly show the form of the pallet, the wrapper and the package of shingles.

Although in both of the previously described embodiments of this invention the adhesive strip is positioned lengthwise along the center of the shingle, and thus the crushed, or slit and crushed, portions of the pallets are also disposed lengthwise along the center of the pallets, it will be understood that the wrapper and pallets may be easily modified to package shingles upon which adhesive is laid in some other arrangement. For example, adhesive is sometimes disposed on the under-side of the butt edges of the shingles, so that when they are stacked there is an accumulation of thickness at the outside edges of the stack. The package contemplated by this invention can be adapted to such shingles by crushing, or slitting and crushing, strips along the outer edges of the pallets. Also, the wrapper can similarly be crushed, or slit and crushed, along the outer edges of both the bottom wall and along the top flaps adjacent the parallel side walls.

Since the crushed or crushed and slit portions extend the full length of the pallets and wrapper, adhesive may

also be applied the full length of the shingles or at random spots anywhere along a path extending the full length of the shingles. Previously, with die-cut pallets and wrappers, adhesive could not be applied at the very edge of the shingles since the bridge portions of the wrapper and pallets could not provide relief in those areas.

Another feature of the package contemplated by this invention is that the bottom wall of the wrapper provides an unbroken cover for the enclosed shingles if the package is laid with its flap side down. Thus, if the shingles are stored under the direct rays of the sun, the top-most package of shingles may be positioned with its bottom wall facing upwardly to insulate the adhesive in the package. With a die-cut wrapping, of course, this is impossible since the strip of adhesive on the outer-most shingle in the package would be exposed through the cut-out portion of the wrapping.

Furthermore the pallets and wrappers of the new package are more economical to make than are those which require accurately located die-cut perforations, and they are less subject to damage due to edgewise compression during shipping and handling. In all these respects the invention provides notable advantages in the packaging of self-sealing shingles.

We claim:

1. A package of self-sealing shingles comprising a wrapper having a bottom wall, a pair of substantially parallel side walls, and a top flap along the upper edge of each side wall foldable inwardly upon the contents of the wrapper, a stack of shingles supported in face-to-back relationship on the bottom of the wrapper, each shingle having at least one deposit of adhesive material located thereon in a predetermined position and arrangement along a relatively narrow path extending lengthwise of the shingle, the shingles being stacked with the adhesive material of each in the same position, at least one additional stack of like shingles positioned on the first stack, each additional stack being supported on a pallet of corrugated board, the deposits of adhesive material on the shingles of each additional stack being disposed in the same relationship to one another as those in the shingles of the first stack, each pallet having a portion of its corrugations crushed substantially flat to form at least one longitudinally crushed strip of lesser thickness than the remainder of the pallet, said longitudinal crushed strip being positioned with relation to the path along which the adhesive material is deposited to accommodate and compensate for the localized cumulative added thickness of the stacks of shingles due to the deposit of adhesive material on each shingle.

2. A package of self-sealing shingles comprising a wrapper of corrugated board having a bottom wall, a pair of substantially parallel side walls, and a top flap along the upper edge of each side wall foldable inwardly upon the contents of the wrapper, a stack of shingles supported in face-to-back relationship on the bottom of the wrapper, each shingle having at least one deposit of adhesive material located thereon in a predetermined position and arrangement along a relatively narrow path extending lengthwise of the shingle, the shingles being stacked with the adhesive material of each in the same position, an additional stack or stacks of like shingles positioned on the first stack, each additional stack being supported on a pallet of corrugated board, the deposits of adhesive material on the shingles of each additional stack being disposed in the same relationship to one another as those on the shingles of the first stack, each pallet and the wrapper having its corrugations extending lengthwise of the shingles, and each pallet and the wrapper bottom wall each having several adjacent corrugations crushed substantially flat to form a longitudinally crushed strip of lesser thickness than the remainder of the pallet, said longitudinal crushed strips being positioned with relation to the path along which the adhesive material is deposited to accommodate and compensate for the localized cumulative added thickness of the stacks of shingles due to the deposit of adhesive material on each shingle.

3. A package of self-sealing shingles comprising a wrapper having a bottom wall, a pair of substantially parallel side walls, and a top flap along the upper edge of each side wall foldable inwardly upon the contents of the wrapper, a stack of shingles supported in face-to-back relationship on the bottom of the wrapper, each shingle having at least one deposit of adhesive material located thereon in a predetermined position and arrangement along a relatively narrow path extending lengthwise of the shingle, the shingles being stacked with the adhesive material of each in the same position, at least one additional stack of like shingles positioned on the first stack, each additional stack being supported on a pallet of double-faced corrugated board, the deposits of adhesive material on the shingles of each additional stack being disposed in the same relationship to one another as those on the shingles of the first stack, each pallet having one face slit longitudinally between each of several adjacent corrugations and having the corrugations between said slits crushed substantially flat to form a longitudinally crushed strip of substantially lesser thickness than that of the remainder of the pallet, said crushed strip being positioned with relation to the path along which adhesive material is deposited to accommodate and compensate for the localized cumulative added thickness of the stacks of shingles due to the deposit of adhesive material on each shingle.

4. A package of self-sealing shingles comprising a wrapper of double-faced corrugated board having a bottom wall, a pair of substantially parallel side walls, and a top flap along the upper edge of each side wall foldable inwardly upon the contents of the wrapper, a stack of shingles supported in face-to-back relationship on the bottom of the wrapper, each shingle having at least one deposit of adhesive material located thereon in a predetermined position and arrangement along a relatively narrow path extending lengthwise of the shingle, the shingles being stacked with the adhesive material of each in the same position, at least one addition stack of like shingles positioned on the first stack, each additional stack being supported on a pallet of double-faced corrugated board, the deposits of adhesive on the shingles of each additional stack being disposed in the same relationship to one another as those on the shingles of the first stack, each pallet and the wrapper having its corrugations extending lengthwise of the shingles, and each pallet and the wrapper bottom wall each having one face slit longitudinally between each of several adjacent corrugations and having the corrugations between said slits crushed substantially flat to form a longitudinal crushed strip of substantially lesser thickness than that of the remainder of the pallet, said longitudinal crushed strips being positioned with relation to the path along which adhesive material is deposited to accommodate and compensate for the localized cumulative added thickness of the stacks of shingles due to the deposit of adhesive material on each shingle.

No reference cited.