Aug. 11, 1942. C. K. ROOS 2,292,774

METHOD OF MAKING RIGID BUILDING ELEMENTS

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Fig. 1.

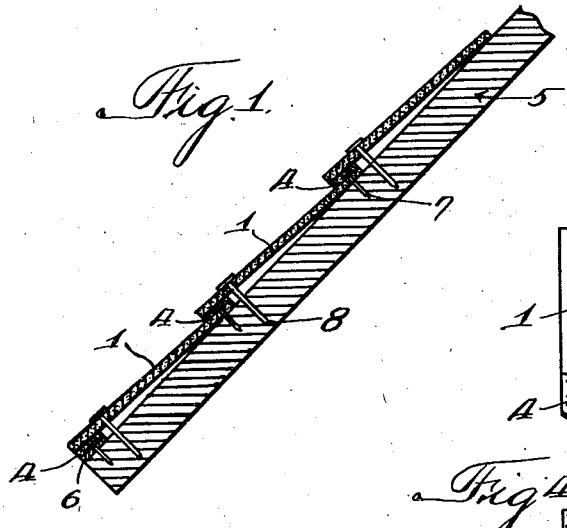


Fig. 2.

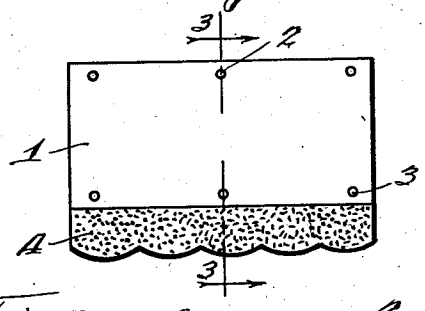


Fig. 4

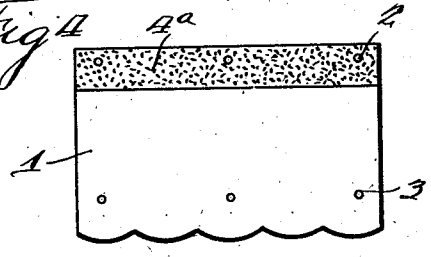
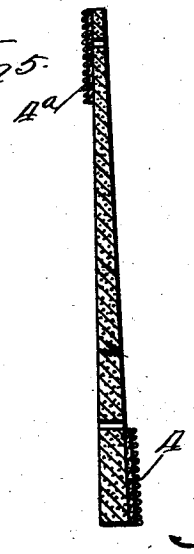


Fig. 3.



Fig. 5.



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Fig. 6.

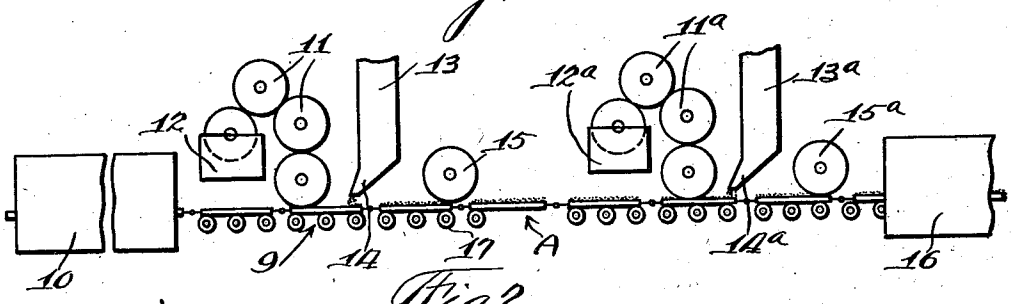


Fig. 7.

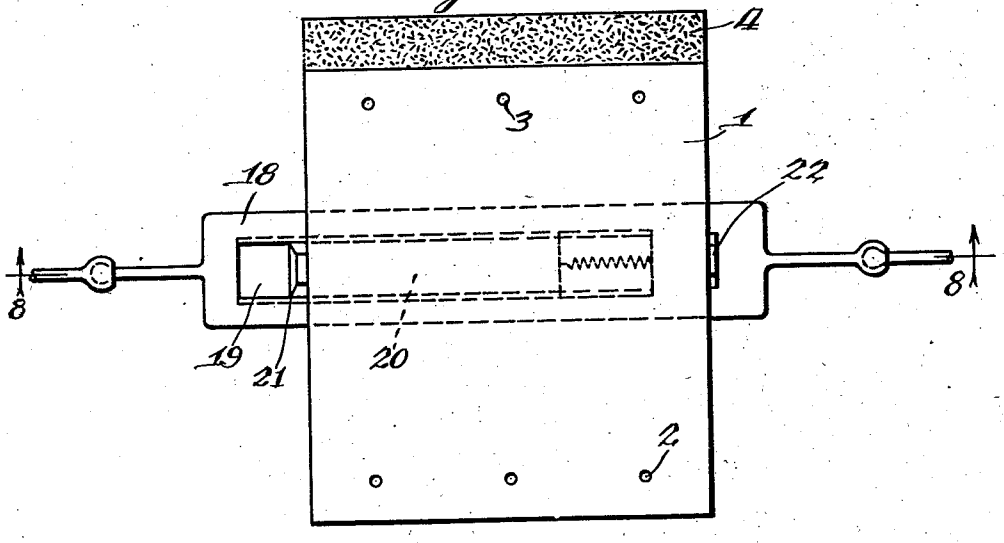


Fig. 8

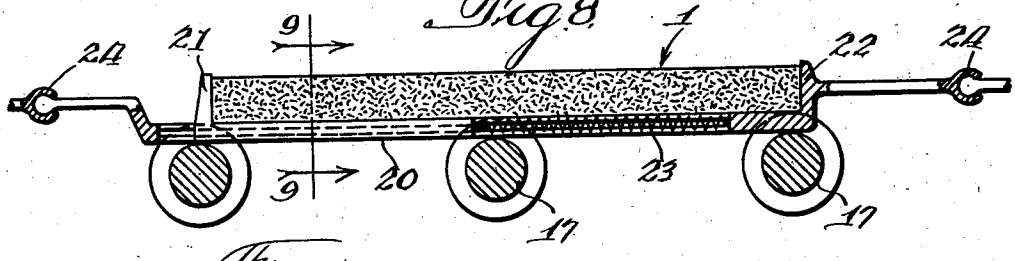
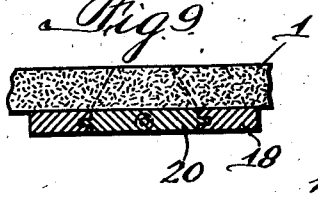


Fig. 9



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2,292,774

METHOD OF MAKING RIGID BUILDING ELEMENTS

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Application August 31, 1938, Serial No. 227,614

1 Claim. (Cl. 117—24)

This invention relates to rigid building elements, and more particularly to an improved type of rigid asbestos cement shingle and the like and process for making the same.

The term "rigid covering element" as used in this specification is intended to include fractile roofing and siding elements of various types and forms wherein rigidity is an important factor, such as slate shingles and siding, clay roof tile, and the like, and particularly asbestos cement shingles and the like, as distinguished from asphalt roofing and siding either in shingle strips or roll form.

The rigid types of covering elements may be applied by the Dutch, French, or American methods. Frequently two or more of these methods may be combined to form an artistic variation. However, regardless of the methods by which they are applied to a building structure, they must overlap, whereby a portion of each rigid element surface is covered by another element to provide a weatherproof construction.

The rigid, fractile elements of this invention are commonly secured by fasteners such as nails driven through preformed holes in the rigid covering element.

In applying asbestos cement siding or roofing, the workman starts at the bottom and then laps the next course over a portion of the bottom course and continues this method of application to the upper course or row. The overlap is preferably about 1¼ inches and the nail holes are so arranged on the rigid covering elements that the nails do not strike the overlapped edge of the underlying course.

When fastening rigid elements, such as asbestos cement shingles or siding to a wall structure or roof, it is necessary that the nails be driven in with sufficient force to provide a snug fit between the overlapping elements. However, due to the fragile and brittle nature of asbestos cement shingles and the like, the workman will frequently over estimate the force to be applied by the hammer and thus break the shingle. This is a source of irritation to the workman who must remove the nails and replace the broken element with a new one, and also results in excessive costs for material and installation.

On the other hand, if the workman does not drive home the nails with sufficient force to provide a snug fit, the building will not be weatherproof and moisture will be admitted to the structure which the covering was intended to protect. Thus decay sets in with a resulting destruction of property and material loss to the owner.

Also, if the rigid covering elements are not secured snugly, the wind may cause them to rattle, to the annoyance of the occupants, and, because of the fragile nature of the rigid covering elements, they will often crack or be damaged to an extent that requires replacement. It is, therefore, an object to provide a substantially soundproof covering element for building structures.

In many cases, if the rigid types of covering elements are fitted snugly and nailed securely in a manner to provide a weathertight fit, the structure itself, due to climatic conditions such as humidity and temperature changes, will set up strains and stresses within itself and subsequently loosen or crack the elements, and thus destroy their usefulness as a protection against the weather.

Furthermore, rigidly secured shingles, particularly of the slate type, will break loose and fall from the structure and endanger the lives of the occupants as well as the passerby. Once moisture is allowed to penetrate underneath the overlapping elements, it is an easy matter for frost to cause further prying apart and loosening to the extent that they may be rattled or torn off by the wind.

It is, therefore, an object of the present invention to provide a rigid covering element, particularly of the asbestos cement shingle type, which may be nailed securely in place without danger of breaking the element and wherein a resilient means is provided to cushion the effect of hammer blows and to maintain an effective seal between overlapping elements and prevent moisture entering therebetween, irrespective of variations in the structure itself which may be caused by weather conditions.

A further object is the provision of a wall structure including a rigid covering element of the character described, whereby the element may easily and conveniently be secured to a support without danger of cracking or breaking the element, thereby preventing the losses usually attendant during the attaching operation and providing a soundproof and weatherproof assembly.

A further object is to provide means whereby expansion and contraction of the building structure will not materially affect the weather protective qualities of the firmly attached rigid covering elements.

It is also an object to provide a means to prevent the rattling of rigid covering elements and

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thereby remove a source of annoyance to the occupants of the structure.

The invention also provides an effective means whereby the ingress of moisture by way of overlapped rigid covering elements is prevented.

Further objects will be apparent from the specification and the appended claim.

In the drawings:

Figure 1 is a sectional view through a roof having shingles illustrating one embodiment of this invention applied thereto.

Fig. 2 is a bottom view of one of the shingles illustrated in Figure 1.

Fig. 3 is a transverse sectional view taken on a line substantially corresponding to line 3—3 of Fig. 2.

Fig. 4 is a top view of a shingle similar to that illustrated in Fig. 2 but with the cushioning and sealing element applied to the opposite side and adjacent the opposite edge.

Fig. 5 is a sectional view through a slightly different embodiment in which a strip of weatherproof cushioning material is applied to each side of the shingle adjacent opposite edges.

Fig. 6 is a diagrammatic view illustrating a suitable mechanism for applying the weatherproof cushioning material to rigid covering elements, particularly such as illustrated in Figs. 1 to 5, inclusive.

Fig. 7 is a top view of a portion of the shingle conveyor and illustrates a portion of the drag chain with one of the shingle elements supported thereon.

Fig. 8 is a longitudinal sectional view taken on a line substantially corresponding to line 8—8 of Fig. 7 and illustrates the method of clamping a shingle on a drag chain link.

Fig. 9 is a detailed sectional view taken on a line substantially corresponding to line 9—9 of Fig. 8.

Referring to the drawings in detail, the embodiment illustrated in Figs. 1, 2, and 3 comprises a rigid shingle in the form of an elongated slab 1. This slab is preferably tapered as illustrated in Fig. 3 although it may be of the same thickness throughout or assume various forms to conform with requirements. The slab is provided with a row of preformed holes 2 adjacent its upper edge and a second row of holes 3 adjacent its lower edge, although preferably more remote from the edge than the holes 2.

The shingle is provided with a comparatively narrow strip of resilient cushioning material 4 such as felt, cork or the like which may cover substantially the entire overlapping portion of the shingle when it is applied to a roof or side wall as illustrated in Fig. 1.

In applying the shingles to a roof structure 5, the workman starts at the bottom and secures a cant strip 6 to the structure to give the proper pitch to the shingles. He then lays the first course of shingles on the cant strip and the succeeding courses are applied as shown in Fig. 1 and secured by means of nails 7 through the upper row of holes and nails 8 through the lower row of holes.

The row of holes 3 is preferably positioned so that the nails 8 are closely adjacent the upper edge of the lower shingle so that the upper shingle may be snugly secured and the cushioning material 4 compressed to provide a weatherproof and soundproof joint. The cushioning material 4 is preferably in strip form after being applied to the shingle and is secured thereto by means of a sticky adhesive, preferably asphalt or similar material.

The cushion may comprise a suitable material such as cork, either in sheet or granular form, indented felt, sponge rubber, plain rubber, or other suitable materials of a like nature. The purpose of this material is to allow the workman to use sufficient force in driving home the nails so that an effective weatherproof seal is provided and the shock of the hammer blows is absorbed sufficiently to prevent the rigid fragile shingle from cracking. It will be apparent that the shock-absorbing and sealing coat may be applied over the entire undersurface of the shingle if desired. However, it is preferable to provide it only in strip form at the bottom of the shingle, as shown in Fig. 2. It is apparent that, if the felt or other resilient cushioning material is in the strip form shown, the workman may drive the nails in with considerable force, which will compress the cushioning and sealing material without danger of breaking the shingles.

Fig. 4 illustrates a slightly modified form in which a cushioning strip 4a, similar to that previously described, is applied to the outer surface of the upper edge of the shingle as shown. This strip is, of course, properly secured by means of a suitable adhesive in the same manner as the strip 4 except that it is on the upper outside edge of the shingle instead of on the lower inside edge. In this embodiment the holes 2 may be in the same relative position in the shingle as shown in Fig. 2 and may extend completely through the resilient strip. The holes 3 are, of course, in the same position as previously described and the shingle is applied in the same manner as shown in Fig. 1. Either construction provides a suitable cushioning effect to absorb the hammer blows and also provides an efficient weatherproof seal.

The strip may be of any desired thickness and is of advantage in providing a thick butt effect on the shingled roof or side wall. It will be understood that the cushioning strip may be applied in sheet form by means of a suitable adhesive, or a coating of suitable adhesive such as asphalt or the like may be applied to the surface of the shingle and granular material such as cork granules may be applied to this adhesive to form a thick coating in the form of a strip which is illustrated and described.

In Fig. 6 is illustrated diagrammatically a suitable apparatus for applying the strips. The particular embodiment shown in Fig. 6 is adapted to apply granular material. However, it will be obvious that strip material may be applied by substituting a roll of the strip material for the spouts or containers illustrated in Fig. 6, which latter are used for directing the granular material onto the shingles as they are moved by the conveyor.

The apparatus for applying the strips comprises a conveyor 9 on which the shingles are mounted and may be moved either intermittently or continuously, as desired. The shingles are mounted on the conveyor and are first passed through a preheating chamber 10 by which they are brought to a predetermined temperature for coating. The asphalt or other adhesive is then applied by means of a series of heated rolls 11, one of which is mounted in an adhesive container 12. A supply of cork granules or other suitable resilient granular material is maintained in the container 13 and supplied to the coated

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surface by means of a spout 14 as the shingles pass thereunder.

The spout 14 is arranged to deliver a predetermined amount of the granular material to form a complete coating of a predetermined thickness on the asphalt or other adhesive while it is still in a tacky condition. The shingles then pass under a pressure roll 15 which presses the granules into the tacky asphalt or other adhesive to form a permanent resilient layer.

In some cases it is desirable to apply a strip of the weatherproof material adjacent each edge of the shingle and on opposite sides thereof as illustrated in Fig. 5. The conveyor 9 is therefore constructed in such a manner that, after the shingle passes beyond the pressure roll, it may be inverted and the process just described may be repeated for applying the granule coating to the opposite side of the shingle. The apparatus for performing this function may be similar in all respects to that previously described and comprises an adhesive container 12*a*, adhesive applying roll 11*a*, a granular container and spout 13*a* and 14*a*, respectively, and a pressure roll 15*a*. After the shingles have been coated, they may be passed through a cooling chamber 16 which may be provided with artificial cooling means such as fans and in which the shingles remain until the adhesive becomes sufficiently cool to keep the granules imbedded therein.

The conveyor 9 is supported on suitable transverse rollers 17 whereby the shingles are maintained in a position suitable for the application of the adhesive and the cork granules. The conveyor is so constructed that, when a shingle arrives at the zone marked A, the shingle and its support may be rotated to invert the shingle while retaining the surface to be coated in substantially the same plane.

One of the links of the conveyor is illustrated in Fig. 7 with a shingle slab 1 mounted thereon and comprises an elongated link 18 having an elongated slot 19 therein, in which is mounted a slidable jaw member 20. This member is provided with an upwardly extending jaw 21 which co-operates with a similar jaw 22 on the link to clamp the shingle slab therebetween. A spring 23 is secured to the slidable member 20 and to the link as shown, whereby the shingle slab may be securely clamped in position as shown. The central portion of the link is preferably depressed as illustrated so that, when the link and slab thereon are rotated, the surface of the slab on which the coating is to be applied will always be in substantially the same plane. The links are provided at their ends with ball and socket joints 24 so that each individual link may be easily rotated. The rollers 17 may be grooved as shown in Fig. 8 to enable the depressed portion of the link to pass therethrough. The two coating mechanisms illustrated in Fig. 6 may be properly spaced and the rollers 17 may be omitted for a predetermined distance between the mechanism so that the shingle and link thereon may be rotated after a strip on one side has been coated and in order to position the shingle for applying a coat on the opposite side and adjacent the opposite edge.

Modifications may be made without departing from the spirit of the invention and it is desired, therefore, that the invention be limited only by the prior art and the scope of the appended claim.

Having thus described this invention, what is claimed and desired to be secured by Letters Patent is:

The process of manufacturing weatherproof and shock-absorbing shingles comprising continuously advancing a stream of aligned closely adjacent rigid asbestos shingles in transverse relation in said stream, heating said advancing stream of shingles, applying a narrow strip of adhesive along one edge of said advancing stream, applying a coating of resilient granular material to said adhesive under pressure, successively inverting said advancing shingles in said stream in a manner to retain their alignment, applying a second narrow strip of adhesive to the same side of said stream, and applying a coating of resilient granular material to said second strip of adhesive under pressure.

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