July 14, 1936. S. P. MILLER 2,047,741

SIDING ELEMENT AND PROCESS OF MAKING SAME

Filed June 14, 1933

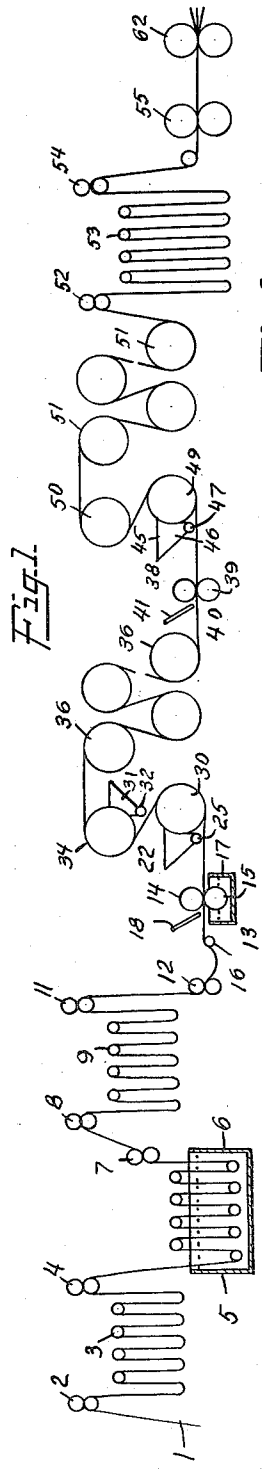


Fig. 1.

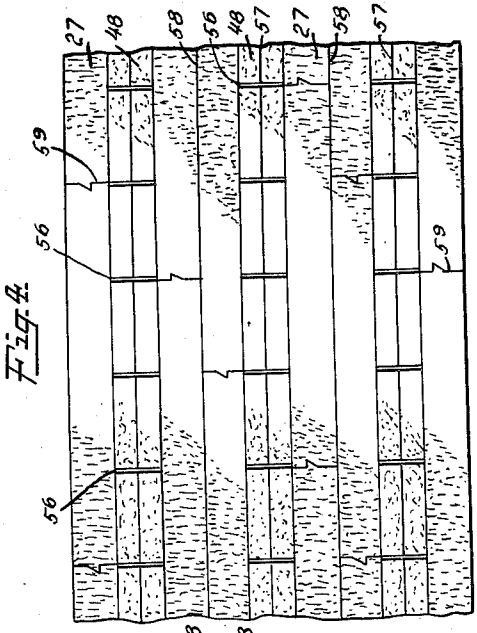


Fig. 4.

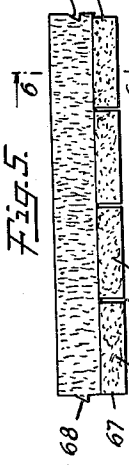


Fig. 5.

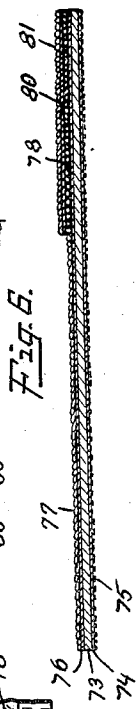


Fig. 6.

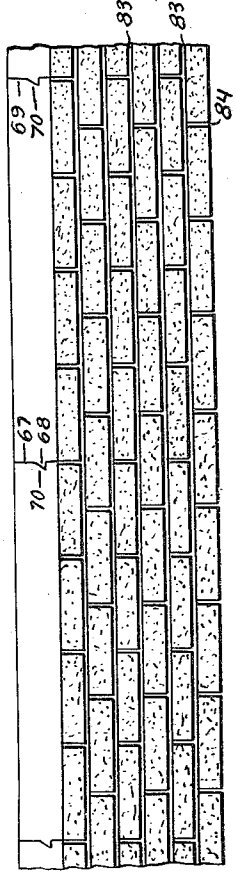


Fig. 7.

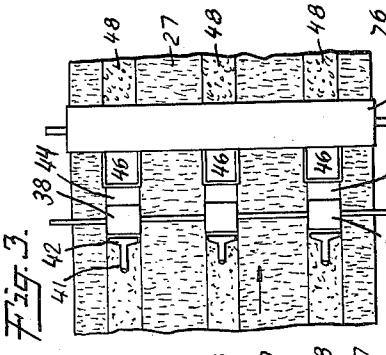


Fig. 3.

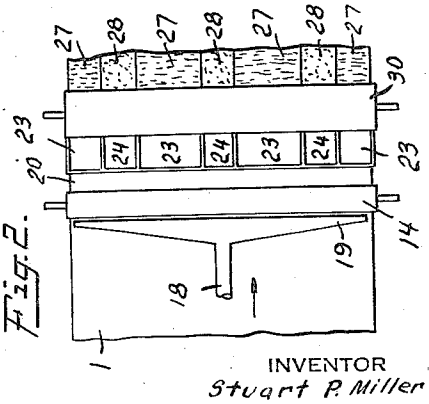


Fig. 2.

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SIDING ELEMENT AND PROCESS OF MAKING SAME

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7 Claims. (Cl. 91—68)

This invention is directed to siding elements and more particularly to siding elements of the felt base type coated with waterproofing material and surfaced with granular material. The term siding elements is used in a broad sense and is intended to include roofing shingles or elements as well as elements applied to a wall.

One object of the invention is to provide in strip form a durable, light weight, weather-resistant siding element which can readily be applied to walls or other surfaces and which, when applied in overlapping courses, simulates the usual brick wall. This invention comprehends a ready and efficient procedure for making such siding elements as well as the elements themselves.

Another object of this invention is to provide a durable, well bonded, light weight siding element in which non-mineral material, such as ground coke, is applied to a coated base, the non-mineral material on the exposed portion of the element having an overlay coating of waterproofing material surfaced with granular material.

Other objects and advantages will appear from the following detailed description of my invention.

It has been proposed to manufacture felt base siding elements, such as "brick siding", by coating both sides of a bitumen-saturated felt base with bituminous coating material, such as asphalt, applying mineral grit, such as crushed slate, to the coating on both sides of the element, and thereafter applying a second coating of bituminous material and a second surfacing of mineral grit on that portion of the element adapted to be exposed to the weather. A brick and mortar effect was obtained by using differently colored mineral grit in the first and second surfacing operations, the exposed portion of each element being surfaced with brick colored mineral grit.

In accordance with a preferred form of my invention the weather side of a coated felt base is surfaced over the body or unexposed portion with mineral grit and over the exposed or tab portion with non-mineral material. An overlay coating of waterproofing material, such as asphalt, is applied over the non-mineral material and is in turn surfaced with mineral grit, contrasting in color with the mineral grit on the body portion of the base. While ordinarily both coatings will be of the same bituminous material, my invention is not limited thereto. Both coatings may be alike or different, bituminous or non-bituminous; or one may be bituminous and the other non-bituminous. Among the latter coatings may be mentioned paints, enamels, lacquers, resins (natural and synthetic), hydraulic cement, and the like. As the non-mineral surfacing I prefer to use ground coke such as ground pitch coke, ground coal coke, or ground petroleum coke. Other non-mineral materials such as sawdust, wood flour, ground cork, ground hard rubber, vegetable carbon, and bone charcoal may be used.

The siding of my invention possesses several distinct and important advantages over sidings heretofore known and used. The use of non-mineral surfacing material between the first and second layers of waterproofing material, such as asphalt, results in a stronger and more durable bond between these layers particularly as compared with sidings having a mineral grit layer between the coating layers. I have found that a firm bond results between the asphalt and intermediate coke layers. This may be attributed to a large extent to the fact that the coating material penetrates and becomes firmly anchored and embedded in the numerous pores and crevices in the coke particles. Moreover, the present siding can be manufactured at a reduced cost since mineral grit is more costly than non-mineral material employed in the manufacture of the element of this invention, such as ground coke. Furthermore, the ground coke and other non-mineral materials employed, materially reduce the weight of the elements, resulting in economies in shipping, handling and application of the elements to a wall or other surface.

For a better understanding of the invention reference should be made to the accompanying drawing wherein is shown by way of illustration a preferred embodiment of the invention and in which:

Fig. 1 is a side elevation, somewhat diagrammatic in character and shows the steps involved in the manufacture of the siding elements of this invention;

Fig. 2 is a fragmentary plan view of the first coating and surfacing apparatus, a portion of the sheet being shown in plan for the sake of clearness and to indicate the relative positions of the mineral surfaced and non-mineral surfaced portions of the sheet;

Fig. 3 is a fragmentary plan view of the second coating and surfacing apparatus a portion of the coated and surfaced sheet being shown in plan for the sake of clearness;

Fig. 4 is a fragmentary plan view of a finished coated and surfaced sheet and indicates the lay-out for cutting the sheet into individual elements;

Fig. 5 is a plan view of a siding element and illustrates a preferred embodiment of this invention;

Fig. 6 is a vertical section taken along the line 6—6 of the siding element of Fig. 5; and

Fig. 7 is a fragmentary plan view of a number of overlapping courses, each composed of siding elements of this invention laid in abutting relationship.

Referring to the drawing, with particular reference to Fig. 1, a sheet of fibrous material 1, which may be and preferably is of the usual roofing felt made of rag fiber, paper stock, or other fibrous material with or without suitable fillers as are well known in this art, is fed by feed rolls 2 from the usual paper making machine or felt roll into a looping device 3. From the looping device 3, rolls 4 feed the sheet into any suitable type of saturating apparatus, indicated generally by the reference numeral 5. Saturating tank 6 may contain suitable cementitious waterproofing composition, such as asphalt or other bituminous material, utilized for the impregnation and saturation of roofing felts.

Rolls 7 and 8 feed the saturated sheet to a second looping device 9. The passage of the saturated fibrous sheet or base through the looping device 9 gives the saturant an opportunity to dry and to thoroughly impregnate the base. Rolls 11 and 12 feed the saturated sheet from the looping device 9 to the coating appliance, indicated generally by the reference numeral 13, having a pair of coating rolls 14 and 15. Feed rolls 12 are preferably driven at substantially the same average peripheral speed as the coating rolls 14 and 15. A sufficient amount of slack should be provided and maintained between the driven rolls 12 and guide rolls 16 over which the sheet passes before entering the bite of the coating rolls 14 and 15 to prevent the sheet from being injured upon slight momentary variations in the relative rates of rotation of driven rolls 12 and coating rolls 14 and 15. Coating roll 15 is rotatably mounted in a tank 17 which may contain bituminous material, such as asphalt or other cementitious waterproofing substance, suitable for coating roofing felt.

As the sheet 1 passes between coating rolls 14 and 15, the under side of the sheet is completely coated by roll 15. Waterproofing material is applied to the top of the sheet by means of a supply pipe 18 equipped with a discharge spout 19 of a width approximately equal to that of the sheet, as shown in Fig. 2. The coating material is spread uniformly over the top and bottom surfaces of the sheet as it passes between the coating rolls 14 and 15 in the form of a top coating layer 20 and a rear or seal-back coating.

Immediately after leaving the coating appliance 13 and while the coating material is still soft and tacky, the coated sheet passes under a surfacing device or hopper 22 extending across the width of the sheet. This hopper is divided transversely of the sheet into separate alternate compartments 23 and 24 which contain respectively mineral surfacing material, such as crushed slate, and non-mineral surfacing material, such as ground coke. The surfacing materials are showered by means of the usual distributing roll 25 onto the coated base passing thereunder and adhere thereto in parallel bands extending lengthwise of the sheet. The hopper compartments are so arranged that the edges of the mineral surfaced bands or lanes 27 abut against the edges of adjacent non-mineral surfaced lanes 28 thereby covering substantially the entire surface of the sheet with surfacing material.

In the preferred embodiment of the invention disclosed in Fig. 2 of the drawing the hopper is shown divided into seven compartments, four compartments 23 for holding granular mineral material and three compartments 24 for holding non-mineral granular material. All of the compartments are of the same width except the two inner compartments for holding mineral granules, and these are of a double width.

After being surfaced, the sheet passes about reversing roll 30 which functions to partially embed the mineral and non-mineral granules in the tacky and plastic coating. Any excess granules fall from the surfaced sheet into compartments 23 and 24 from whence they were showered onto the coated sheet.

In the continued passage of the surfaced sheet, it travels next under hopper 31. Powdered talc, mica, or other anti-stick composition capable of rendering the back of the sheet non-cementitious is deposited in hopper 31 and is discharged therefrom by distributing roll 32 onto the seal-back coating in the form of a talc surfacing layer covering substantially the entire width of the sheet. The talc covered sheet then passes over reversing roll 34 which partially embeds the talc in the seal-back coating and imparts a smooth surface to the back of the sheet. Excess talc falls from the sheet as the latter passes from reversing roll 34 over a series of calender rolls 36 where the product is given an opportunity to cool.

From the calender rolls 36 the sheet, now having a single coating and single surfacing on both the top and under sides, is passed between coating rolls 38 and 39 of the second coating device indicated by the reference numeral 40. Upper coating roll 38 is preferably divided into three sections each of a width equal to that of a non-mineral surfaced lane of the sheet and each positioned so that it will contact with one of these lanes as the sheet passes thereunder. Waterproofing material from any suitable source is applied to the top of the sheet by means of feed pipes 41 equipped with discharge spouts 42. As shown in Fig. 3, these feed pipes and spouts are preferably three in number, and are positioned over the sheet so as to feed the waterproofing material onto the non-mineral surfaced portions of the sheet. The width of each discharge spout is approximately equal to that of the non-mineral surfaced lane over which it is positioned. Coating material which is discharged from the spouts is spread uniformly in the form of coating lanes 44 over the non-mineral surfaced portions of the sheet as the surfaced sheet passes between the coating rolls.

Immediately after leaving the second coating appliance and while the second coating is still soft and tacky, the sheet passes under a second surfacing device 45. As shown in Fig. 3, this device consists of three hoppers 46 each adapted to hold mineral grit and each equipped with a distributing roll 47. Mineral grit, such as crushed slate, preferably of a color contrasting with the color of the mineral granules fed from compartments 23, is deposited in these hoppers and is showered by means of the distributing rolls onto the freshly coated lanes and adheres thereto in the form of mineral-surfaced bands 48. The thus surfaced sheet then passes about reversing roll 49 which functions to partially embed the grit in the lanes 44 of plastic coating material. Any granules or particles which may fall on the ad-

joining mineral-surfaced bands 27 do not adhere thereto and when the sheet leaves reversing roll 49 such granules and the excess granules on the second surfaced bands 48 fall therefrom back into the hoppers 46.

The double-coated and double-surfaced sheet next passes over a reversing roll 50 to the drying and pressing rolls 51. Feed rolls 52 feed the sheets from the pressing rolls into a looping device 53 where the product is given an opportunity to cool. From the looping device 53 the surfaced sheet passes through rolls 54 to cutting cylinders 55. These cylinders simultaneously cut rows of slots 56 in the double coated and double surfaced portions of the sheet as shown in Fig. 4. The individual slots of each row are of a length preferably equal to the width of the double surfaced bands 48. The sheet is simultaneously cut longitudinally along longitudinal lines 57 intersecting the slots 56 midway between the ends thereof and also along lines 58 coinciding with median lines of the two wider mineral-surfaced bands 27. Simultaneously with the longitudinal cutting operation the base is cut transversely along lines indicated by the reference numeral 59.

The transverse cuts 59 are spaced apart a distance corresponding to the length of the desired element and are of such a shape, as shown in Fig. 4, that one transverse edge of each element is formed with a triangular projection while the other transverse edge is provided with a complemental recess. Preferably the slotting and the longitudinal and transverse cutting operations are accomplished by passing the surfaced base through cutting rolls which substantially simultaneously make all the cuts, but they may be formed in any desired order, the slotting operation preceding or following the cutting of the base into longitudinal strips. From the cutting cylinders 55, the cut sheet passes through knocker and ejector cylinders 62 of any well known type which remove any portions of the material cut out to form slots 56 which may adhere to the cut sheets. From the tab ejector mechanism the individual siding elements pass to suitable stacking appliances (not shown).

The siding element resulting from the above described operations is shown in Figs. 5 and 6. That portion of each element adapted to be exposed to the weather when laid is provided with a series of cut outs or slots 65 defining a plurality of brick simulating tabs 66. Side edge 67 is formed with a triangular projection 68 and the other side edge 69 has a complemental triangular recess 70. Each element consists of a felt base 73 having a seal back coating 74 of bituminous water-proofing composition, such as asphalt, rendered non-cementitious by the application thereto of a layer of powdered talc or mica dust 75. The top side of the unit is substantially completely covered by coating 76. The coating on that portion of the upper face of the shingle which is adapted to be covered when laid, i. e., the body portion, has a surfacing of mineral grit 77 while the exposed portion, i. e. the tabs, has a surfacing of non-mineral granules 78, such as ground coke. A second coating 80 of waterproofing composition overlies the non-mineral surfacing on the tabs and a surfacing of mineral grit 81 is partially embedded in the surface of this coating.

The element of Figs. 5 and 6 is designed to be laid in overlapping courses with the triangular projection 68 snugly fitting within the recesses 70 of a contiguous element in the same course as shown in the top course of Fig. 7. Hence, the triangular projection and complemental recess aid in aligning the elements in each course. The elements are so laid that the forward edges of the elements of one course lie a short distance above the upper edges of the brick shaped tab portions of the elements of the next underlying course. Application of the siding elements in this manner results in black or gray (the color of the mineral grit covering the body portion) longitudinal slots 83 and transverse slots 84 contrasting with the brick-simulating surfacing material on the tabs. The brick-simulating surfacing material may be red, yellow, or other color but preferably is of such a size and texture that the surfaced tabs will give the appearance of bricks set in mortar. As appears from Fig. 7, the resultant arrangement of the elements resembles a brick wall.

It will be noted that the siding element of this invention involves substantially no waste in its manufacture, can be readily applied even by unskilled workmen, and when applied in the intended manner simulates a brick wall. The use of non-mineral surfacing material, such as ground coke, between the two layers of coating material results in a stronger and more durable bond between these layers and consequently a more durable element. Moreover, since non-mineral material, such as powdered coke, costs less than mineral grit, the siding of this invention is more economical to manufacture than the usual double mineral-surfaced siding. Furthermore, the elements of this invention are lighter in weight than those heretofore produced and accordingly can be more readily and economically handled, shipped, and applied.

In connection with the foregoing description and illustration of the siding of this invention and the method of making this siding, it should be understood that they are merely for the purpose of clarifying an understanding thereof. Various changes and modifications may be made within the scope of this invention. Although, as described, the second coating is fed onto the sheet by means of feed pipes and discharge spouts the coating could be applied by means of a coating roll having raised portions extending around its periphery adapted to contact with the sheet and apply a layer of coating material thereon.

In some cases it may be desirable to surface the first coating on the top side of the sheet entirely with non-mineral solid material such as ground coke, sawdust, wood flour, ground cork, ground hard rubber, bone, charcoal, vegetable carbon, etc. The tab portions are then given a second coating of waterproofing composition and a surfacing of mineral granules.

Since certain other changes in carrying out the process and in the constructions set forth may be made without departing from the scope of this invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. The process of making siding elements having rectangular tabs along one longitudinal edge thereof, which comprises completely coating a felt base with bituminous material, completely surfacing the coated base by partially embedding alternate longitudinal bands of mineral grit and ground coke in the bituminous material, coating the bands of ground coke with spaced longitudinal lanes of bituminous material, the bituminous material applied during said first and second

coating steps entering the pores and crevices of said coke and bonding firmly therewith, surfacing said lanes with brick-simulating mineral granules, cutting rows of spaced slots through the longitudinal lanes surfaced with brick-simulating granules, and cutting transversely through the mineral grit covered lanes and longitudinally along lines intersecting the rows of slots to form said elements.

2. The process of making siding elements having rectangular tabs along one longitudinal edge thereof, which comprises completely coating one face of a saturated felt base with bituminous material, continuously applying bands of crushed mineral grit to the longitudinal marginal portions of the base with an edge of each band substantially coinciding with a side edge of the felt base, simultaneously applying bands of crushed mineral grit to the intermediate portion of the base, the intermediate bands of crushed mineral grit being of a width substantially double that of the marginal bands and being spaced apart and substantially parallel to each other, simultaneously applying ground coke to the lanes between the grit surfaced portions of the base, continuously coating the coke surfaced lanes with bituminous material, continuously partially embedding brick-simulating mineral granules in said bituminous material, cutting rows of slots through the lanes having brick-simulating mineral granules partially embedded therein, said slots being of a length approximately equal to the width of the brick-simulating mineral surfaced lanes, cutting the base longitudinally substantially midway between the intermediate grit surfaced lanes, and also midway between the slots of each row and also transversely through the grit surfaced lanes, the transverse cuts being spaced apart a distance corresponding to the length of the individual siding element.

3. A siding element adapted to be laid with other like elements in overlapping courses, the elements of each course being in abutting relationship, comprising a felt base coated with bituminous material having tabs along one longitudinal edge thereof, said tabs being separated by slots, mineral granules partially embedded in the bituminous material on the upper longitudinal portion of the element, coke granules partially embedded in the bituminous material on the tab portions of the element, bituminous material covering the coke granules on the tab portions of the element, the bituminous material of both said first and second coating layers entering the pores and crevices of said coke granules thereby forming a firm bond between the coating layers and the coke surfacing, and mineral granules partially embedded in said bituminous material, said mineral granules contrasting in color with the mineral granules on the upper longitudinal portion of the element, the slots between the tabs extending up from the lower edge of the element to a depth coextensive with the double coated and double surfaced portions of the element.

4. The process of making the siding elements which comprises coating one face of a fibrous sheet with a layer of cementitious waterproofing material, thereafter partially embedding carbonaceous granules in the coating layer, applying a second layer of cementitious waterproofing material over the layer of carbonaceous granules, the waterproofing material of said coating layers entering into the pores and crevices of said carbonaceous granules and bonding firmly therewith, partially embedding mineral surfacing material in the second layer of waterproofing material and cutting the sheet into siding elements.

5. The process of making siding elements which comprises completely coating one face of a felt base with a layer of cementitious waterproofing material, thereafter completely surfacing the base by partially embedding alternate longitudinal bands of mineral surfacing material and ground coke granules in said layer of waterproofing material, coating the bands of coke surfacing granules with a second layer of cementitious waterproofing material, the waterproofing material of said coating layers entering the pores and crevices of said coke particles, thereby creating a firm bond between said coating layers and said coke layer, surfacing said second layer of coating material with mineral surfacing material and cutting the resultant sheet into siding elements.

6. A siding element comprising a fibrous base, a coating of cementitious waterproofing material on one face of said base, ground coke surfacing material partially embedded in said layer of waterproofing material, a second layer of waterproofing material covering the portion of the base exposed when laid, said layers of waterproofing material entering the pores and crevices of said coke and creating a firm bond therebetween and mineral surfacing material partially embedded in the second layer.

7. A siding element comprising a flexible base having tabs along one longitudinal edge of the body portion thereof, one face of said base being completely covered with a layer of bituminous waterproofing material, coke granules partially embedded in the waterproofing material on the tabs, mineral surfacing material partially embedded in the waterproofing material covering the body portion of the base, a layer of waterproofing material overlying the granular coke surfacing material on the tabs, waterproofing material of both said first and second coating layers entering the pores and crevices of said coke layers thereby firmly uniting said coating layers to said coke layer and mineral surfacing material partially embedded in said second layer of waterproofing material.

STUART PARMELEE MILLER.