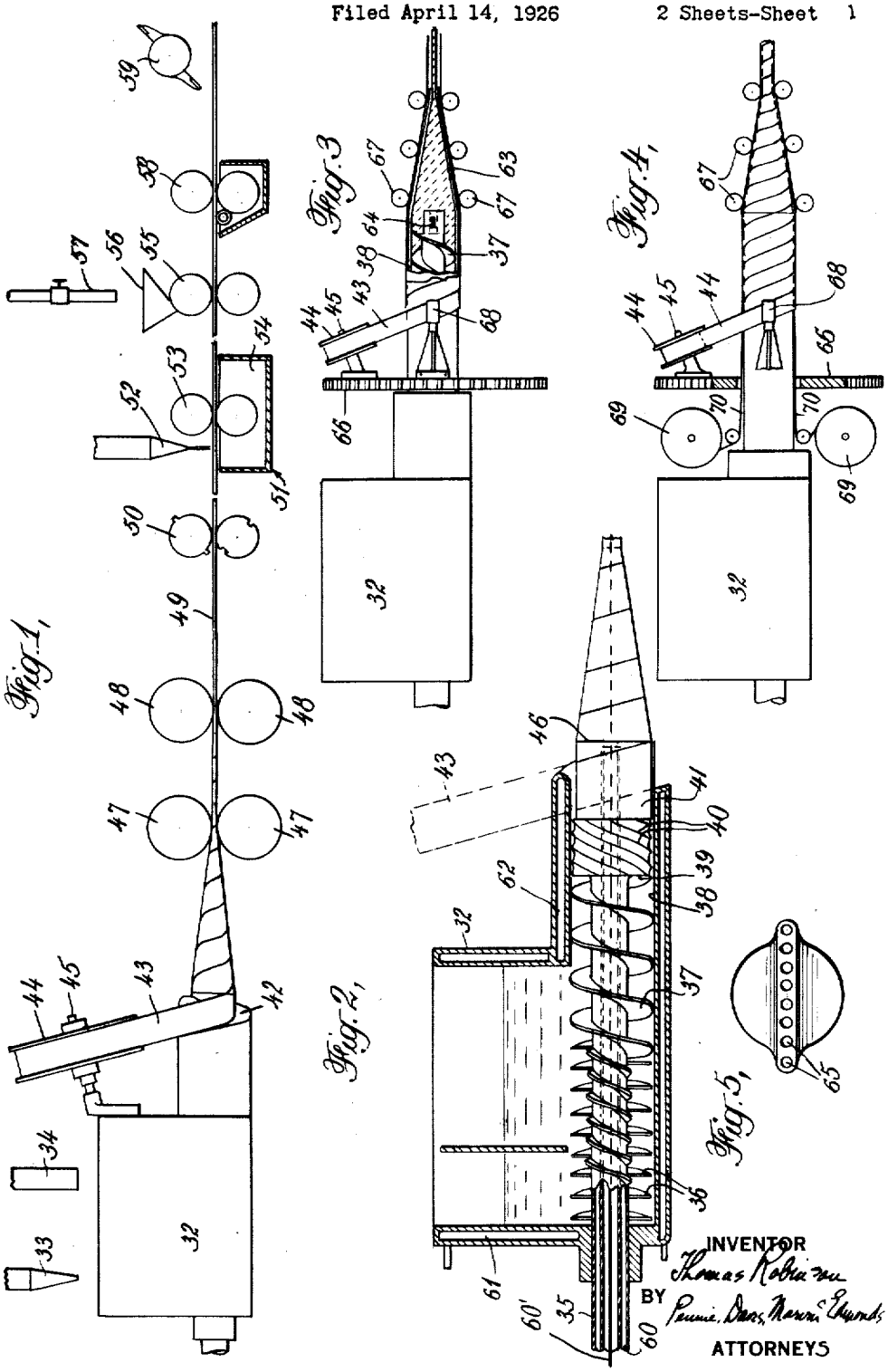
July 10, 1928. 1,676,351

T. ROBINSON

PREPARED ROOFING AND METHOD OF MAKING

Filed April 14, 1926 2 Sheets-Sheet 1



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Filed April 14, 1926 2 Sheets-Sheet 2

Fig. 6,

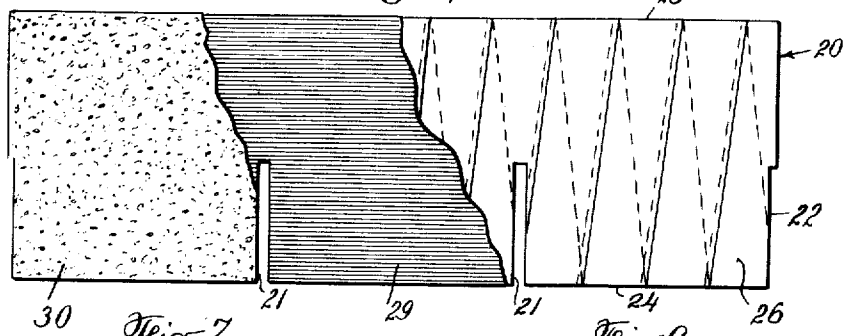


Fig. 8,

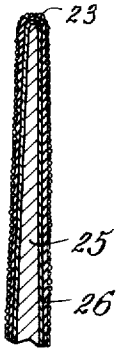


Fig. 7,

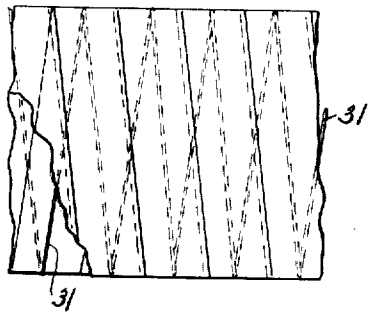
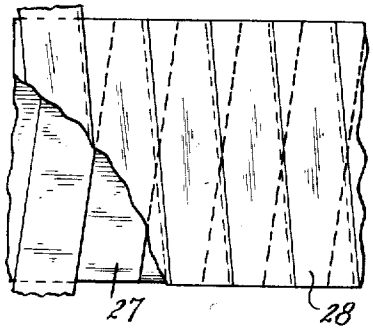


Fig. 9,



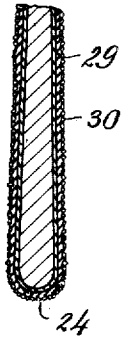


Fig. 10,

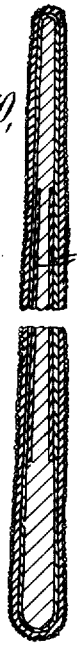


Fig. 11

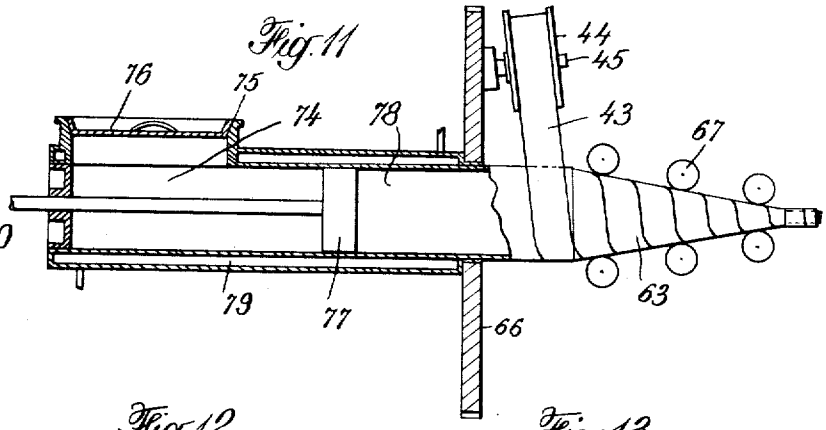


Fig. 12,

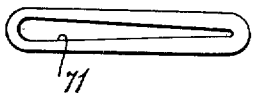
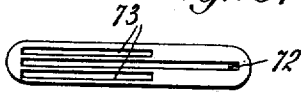


Fig. 13.



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Patented July 10, 1928. 1,676,351

UNITED STATES PATENT OFFICE.

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PREPARED ROOFING AND METHOD OF MAKING.

Application filed April 14, 1926. Serial No. 101,877.

This invention relates to roofing materials, and has to do more particularly with an improved material which may be produced in a wide variety of forms, such as shingles, tiles, board, strips, and the like, and also with a process and apparatus by which this material may be cheaply produced at a high output rate.

So-called "prepared" roofings are now in wide use and have to a large extent displaced wooden shingles. Such roofings are made of various materials, but the product which is most extensively manufactured consists of a foundation layer of rag or asbestos felt, impregnated with waterproofing compounds, such as asphalt, and faced with a surfacing layer of crushed slate or other mineral matter. This material is commonly made in the form of multiple or strip shingles, which are equivalent to three or more single shingles, and these shingle strips are laid in courses on the roof in the usual manner.

While such felt roofing materials are cheaper than wood shingles, and offer greater resistance to fire, they are not altogether satisfactory, owing to the fact that they are relatively thin, so that the exposed butt ends do not give a roof covered with them the customary appearance of an ordinary wood shingled roof. A more important objection is that exposure of such materials to the elements results in the volatilization of the lighter oils in the impregnating compositions and this permits rotting or deterioration of the felt which is followed by warping or curling of the exposed portions. This renders the roof unsightly and may extend to the point where leakage occurs. The felt, moreover, is a large item in the cost of production, but up to the present, no entirely satisfactory substitute for this material has been developed.

The present invention is directed to the provision of a roofing material which is cheaper to produce than the impregnated mineral surfaced products now used, and which is more satisfactory in appearance, has a greater durability, and is equally fireproof and easy to lay. This new material is capable of being produced in any of the common roofing forms and its manufacture may be carried on at a high output rate.

The new material comprises a core or base of a plastic character, which is waterproof and becomes substantially rigid on settling. This core may consist of various materials, as, for example, of a mastic consisting of finely divided mineral material and a bituminous product such as asphalt. The core formed to the desired shape is wholly encased within a jacket which is preferably a continuous wrapping of helical shape laid on the core while the latter is being produced. Such a jacket may be made by winding a strip of impregnated paper about the core and this jacket may include a suitable reinforcement such as a wire. After the wrapping is laid on the core, the wrapping and such parts of the core as are exposed are coated with a sealing layer of a waterproofing compound of suitable physical properties, and then a wear surface may be applied on such parts of the element as may be desired. This element may be made in any desired shape by properly forming the core but is of greatest utility, no doubt, in the form of the ordinary strip shingle of commerce.

The new material affords numerous advantages over the old, in that the use of felt or other similar material of a relatively expensive character is entirely dispensed with, but in addition, this new roofing product is capable of production continuously and at a high output rate by a process and apparatus also forming part of the invention. As cheapness of production is at present an essential in any commercial roofing product, I have devised the new material with that end in view and the new process of manufacture is one which is particularly suited for commercial application.

According to this process, the ingredients of which the base or core are made up are mixed and subjected to agitation to an extent sufficient to secure homogeneity; then this mixture is extruded through an orifice of suitable shape by the application of pressure, and as the core leaves the orifice, the jacket is wound about. Preferably, the extrusion process is carried on continuously, forming a core of indefinite length which is encased within its jacket as rapidly as it is formed. The jacketed core is then led through shaping devices which give it a shape appropriate for the product to be made, and there-

after the core is led through coating devices, and, if desired, a wear surface is applied. The finished core is now cut into units of the required size and these units prepared for distribution.

The apparatus by which this method of producing the new elements is practiced may take various forms, but one example includes a housing containing a screw arranged to agitate the mixture forming the core and to discharge it from a suitable orifice. The screw terminates at the discharge end in a mandrel which projects beyond the housing and in the operation of the device a continuous tubular layer of material is forced along the surface of the mandrel. Near the latter is a supply of the jacket material, and it is laid about the tubular layer as the latter is forced along the mandrel. This jacket serves to encase and support the tubular core, and the enclosed core is discharged from the end of the mandrel and at once passes through shaping rolls which consolidate the core tube into a web of suitable cross-section. Beyond the first shaping rolls are others which give the encased core the final shape, and the core is then led through devices which cut notches in one edge, in the event that strip shingles are to be the final product. From the notching cutters, the core with its jacket passes through coating devices, and finally receives its wear surface and final coating and is cut into units of the desired length.

For a better understanding of the invention, reference will be made to the accompanying drawings, in which,

Fig. 1 is a diagrammatic view illustrating the production of the new material,

Fig. 2 is a longitudinal vertical section of apparatus for extruding the core material,

Fig. 3 is a view in side elevation of a modified extrusion mechanism, a part of the device being shown in section,

Fig. 4 is a view similar to Fig. 3, showing a slightly modified form of apparatus,

Fig. 5 is an end view of one type of extrusion nozzle which may be used with the apparatus illustrated in Figs. 3 and 4,

Fig. 6 is a plan view of a three-unit shingle made in accordance with the present invention, parts of the covering layers being broken away,

Fig. 7 is a view of a part of an element produced in accordance with the present invention, illustrating the use of a reinforcing strand,

Fig. 8 is a transverse section through the element shown in Fig. 6,

Fig. 9 is a view similar to Fig. 7, but showing the use of two wrappings laid about the core,

Fig. 10 is a view similar to Fig. 8, but showing a modified product having internal longitudinal reinforcements,

Fig. 11 is a view partly in section and partly in elevation of a modified extrusion apparatus, and

Figs. 12 and 13 are end views of nozzles which may be used with the extrusion apparatus in substitution for the nozzle shown in Fig. 5.

Referring now to these drawings, the new roofing product is shown in one form in Fig. 6, this product being a strip shingle of the shape and size now widely sold commercially. The element 20 consists of a strip of generally oblong shape, for example 10″ x 36″ approximately, and having notches 21 cut in its forward edge. Notches of half size are cut in the end of the strip as at 22, and when a plurality of these strips are laid end to end on the roof in overlapping courses, with the rear ends of the cutouts of one course concealed by the forward ends of the shingles of the course above, the roof has the appearance of being covered with single shingles spaced apart in the usual manner.

The element 20 is preferably made of tapering cross-section, its rear edge 23 being relatively thin and its forward edge 24 having a considerable thickness. When such an element is laid on the roof, the forward edge 24 is exposed and on account of its increased thickness it gives the element an appearance of solidity which is highly desirable and greatly increases its marketability.

This element consists of a core 25 which may be made of numerous materials. The core is a hardened plastic composition, and is preferably waterproof. Among the materials which may be used for the purpose are bituminous mastics consisting of a bituminous substance, such as asphalt and fibrous or granular materials, such as crushed slate, asbestos, or asbestos sand, which is a commercial product and consists of fine asbestos particles mixed with small quantities of gangue. Asbestos cement compositions which harden on setting, may also be used and if desired the core material may include small quantities of neat cement. Probably the most satisfactory material for the purpose consists of asphalt and asbestos sand, and this material is mixed in proper proportion so that when it sets it will have a considerable rigidity. The asphalt and asbestos sand are both comparatively cheap products available in large quantities, and are easily handled in the manufacture of the core.

About the core is laid a jacket 26 which consists of a wrapping continuously laid about the core, as, for instance, in a number of partially overlapping convolutions, as illustrated in Fig. 6. It is preferable, in producing this jacket, to employ a webbing or strip of material, such as an impregnated paper, which is relatively narrow so that a

large number of convolutions of the strip are required to cover the core. This jacket, when complete, covers the front and rear faces of the core and also extends around the front and rear edges. The only joints in the jacket are those which occur where two convolutions are partly overlapped and as will readily be seen, these joints are covered by the sealing layer.

If desired, the jacket may consist of more than one layer of the strip, as shown in Fig. 9, where the under layer 27 is wound in one direction helically about the core and the outer jacket 28 is wound helically but in the reverse direction. Numerous materials may be employed for the production of the jacket, as, for example, coarse paper, either impregnated or not impregnated, strips of asbestos paper, burlap, or various other products of this type. Preferably the jacket is made of a relatively narrow strip, so that a number of convolutions are required to cover the core and the core is strengthened by the increased thicknesses of the material at the joints, these thicknesses forming ribs. By using a narrow strip, a large number of such reinforcing ribs are produced from one end of the core to the other, and by winding the strips helically about the core, the application of the jacket is a simple operation. The jacket may be generally designated as a flexible fibrous material.

Enclosing the jacket with the core inside of it, is a sealing layer 29 which may be of various materials of a waterproof character, and the selected material should preferably be one which will harden on setting and will withstand solar heat. For this purpose, there are various grades of asphalt, such as "blown" asphalt, which meet the requirements. Preferably in the production of the article the notches 21 are produced prior to the application of the sealing layer, so that the layer covers such portions of the core as are exposed in the operation of cutting the notches. After the sealing layer is applied, a wear surface 30 of suitable material may be affixed by means of the sealing material. Wear surfacing materials suitable for the purpose are crushed slate, sand, fine gravel, and other materials of this general type.

If desired, the core may be strengthened by the application of a reinforcing strand, such as a wire 31, which is preferably wound about the core a plurality of times and may be conveniently applied at the same time that the jacket is put in position. Preferably the reinforcing strand will be laid inside the jacket, so that it will be pressed into the core material while the latter is soft, and will thus not form ridges in the finished product. By wrapping the reinforcing material about the core at the same time the jacket is applied, the reinforcement will extend about the core a number of times and give the finished product a considerable rigidity.

In the production of the new product, which, it is to be understood, may be made in various forms other than the strip shingle referred to, the process followed is illustrated diagrammatically in Fig. 1. The ingredients of the core are introduced into an agitator chamber 32 and may be supplied by nozzles 33 and 34. For example, in the production of an article containing a core of asbestos sand and asphalt, the asphalt may be introduced through the nozzle 33 and sand through the spout 34. In the agitator chamber is a shaft 35 carrying beater blades 36, this shaft being suitably driven from any convenient source of power. The rotation of the shaft causes the materials to be thoroughly stirred and mixed within the chamber and beyond the beater blades the shaft carries a worm 37, arranged to convey the material through an outlet extension 38. Near the end of this extension the shaft carries a mandrel 39 which fits relatively closely within the extension and is formed with ribs 40 of helical shape which extend about the mandrel. Beyond the ribs the mandrel has a cylindrical part 41 and the outlet extension is cut away as indicated at 42, so that a narrow web 43 drawn from the supply roll 44 mounted on a stud 45 at any convenient part of the machine, may be wrapped about the core as the latter is formed.

In the operation of the device, the asbestos sand and asphalt within the hopper chamber 32 are thoroughly mixed and agitated, then forced along by the conveyor screw 37 and continuously discharged through the channels between the ribs 40. The material forced outwardly through these channels is laid in the form of a plurality of narrow strips on the surface of the cylindrical part of the mandrel 41, and as these strips are carried over the surface of the mandrel the rotation of the latter draws the jacket strip 43 from the supply and causes the strip to be continuously wound about the core. Beyond the end 46 of the cylindrical portion of the mandrel, the core, which is now of tubular form, adheres to the inner surfaces of the strips and the tube, consisting of the core encased in the wrapping, may collapse slightly. The collapse is assisted by driven shaping rolls 47 through which the core with its encasing wrapper next passes. These rolls are driven at the proper speed with reference to the production of the wrapped core so that no tension is placed on the core but it passes through the rolls as rapidly as it is formed. These rolls cause the core material within the wrapping to be consolidated and force the wrapping into intimate contact with the core. If the fin-

ished product is to have a tapering cross-section, the pass through the rolls will be of tapering shape corresponding in general to the cross-section of the product. Beyond the rolls 47 are finishing shaping rolls 48, also driven at proper speed with reference to the production of the core with its jacket, so as to exert no drawing action, and these rolls 48 further compact the core and give the product its final cross-sectional contour.

In the event that strip shingles are to be made, the continuous wrapped core 49 coming from the shaping rolls, next passes through notching cutters 50, which are of suitable form and are operated at the proper speed so as to produce cut-out notches in the edge of the core, these notches being of the desired shape and spacing. Beyond the notching cutters the encased core passes through coating devices, generally designated 51. These devices may include a nozzle 52 through which the sealing material is applied to one face of the core, and beyond this nozzle are rolls 53, one of which runs in a vat 54 and applies the sealing material to the under surface of the core. The coated material is next led through a coating device, generally designated 55 and arranged to apply the wear surfacing material. This coating device includes a hopper 56 into which the material flows from a spout 57 and the material is deposited on the face of the coated core and embedded therein by the action of the rolls. Beyond the coating device 55 is another device generally designated 56 which may apply talc or other similar material to the rear face of the strip. Beyond the device 58 is a cutting device, illustrated diagrammatically at 59, by which the strip is cut into units of any desired length. These units are then prepared for shipment, as by being bundled together.

It will be observed that according to this process the core material is continuously extruded through an orifice to form a tube, which is wrapped in the core material as rapidly as it is formed. The tube encased in the wrapping is then collapsed so that the core is compacted into a solid mass, and thereafter the jacketed core is shaped to appropriate form, notched, coated with the desired materials, and then cut in suitable lengths. In the collapse of the core, the air which is contained therein must be permitted to escape, and for this purpose the shaft 35 is made hollow, as shown in Fig. 2. If desired, the opening through the shaft may be taken advantage of to insert a reinforcing member 60′ into the core during its formation. This reinforcing member may be of any suitable material, as, for instance, it may take the form of a strip of paper or burlap, and it will occupy the center of the core in the finished product, extending from end to end thereof.

The shaft may also be provided with a jacket as indicated at 60, by which steam or other heating medium may be admitted so as to heat the shaft and also the mandrels 39 and 41. Similarly, the mixing hopper 32 may be jacketed, as indicated at 61, and the extension 38 may also be jacketed, as indicated at 62. This heating is not necessary in connection with some core materials, as, for example, I have found it possible to extrude mixtures of asphalt of proper characteristics and asbestos sand substantially at room temperature. In the operation of the device also, the parts soon become heated up to a sufficient extent to permit the continuous extrusion of the material without interruption due to stiffening.

In Fig. 3 there is illustrated a modified form of the extrusion device, and in this device the extension 38 is provided with a tapering outlet nozzle 63, the shaft 35 being supported within the outlet extension 38 in a suitable bearing bracket 64. The material forced through the extension by the conveyor screw 37 passes outwardly through the nozzle 63 and leaves the latter through a suitable orifice. For example, the nozzle may have a series of holes 65 arranged in a row, as shown in Fig. 5, so as to produce a series of rods of the core material laid side by side in a plane. In order to wrap the core, the supply roll 44 is carried on a stud 45 which is mounted on a rotary plate 66, this plate being rotated from any suitable source of power. The wrapping web 43 is drawn from the supply and wrapped around the extension 38, producing a jacket in the form of a spirally wrapped tube which is moved over the surface of the extension by guide and feeding rolls 67 driven from any suitable source of power. The plate 66 may also be provided with a guide roll 68 mounted on a suitable bracket and arranged to lay the web properly in position. The shape of the nozzle 63 varies in cross-section, but its circumferential dimension remains substantially the same, so that the spiralled jacket tube laid by the rotation of the plate 66 will encase the core tightly after being led off the end of the nozzle. From the end of the extension 63 the extruded core and its wrapping are passed through rolls 47, 48, and the other devices, according to the process as previously described.

To provide reinforcement for the material, supply rolls 69 may be employed, these rolls being mounted on stationary axes at any convenient point and the strips being drawn from them over the surface of the extension 63 so as to be encased within the spiral wrapping 43. In the formation of the finished article, the strips 70 drawn from the supply roll 60 will lie on either face of the core against the inner surface of the wrap-

ping, as illustrated in Fig. 10. Instead of using an outlet orifice, as shown in Fig. 5, those illustrated in Figs. 12 and 13 may similarly be used. That shown in Fig. 12 is in the form of a narrow elongated slot 71, thicker at one end then at the other, and giving the core a tapering cross-section. In Fig. 13 there is shown a somewhat similar orifice plate in which there are three slots, a central slot 72 of considerable length, and shorter slots 73 placed on either side of the latter at one end thereof. The core produced by the extrusion of the material through the slots 72 and 73 is of a form which permits a tapered article to be readily formed from it.

In Fig. 11 there is shown a non-continuous extrusion apparatus, in which there is a chamber 74 having an outlet opening 75 which may be covered by a closure member 76. Within the chamber is a reciprocating plunger 77 and the chamber has a tapering outlet extension 63 similar to that shown in Fig. 3. The wrapping of the jacket is also carried on in the same manner as is illustrated in connection with the apparatus shown in Fig. 3. The apparatus shown in Fig. 11 is operated by withdrawing the plunger 77 to its extreme retracted position, whereupon a charge of the material is introduced through the opening 75. The closure is then put in place and the plunger 77 driven forward to extrude the material through the outlet orifice. A block of the material always remains in the end of the chamber beyond the piston at 78, so that no breaks in the core result from the intermittent operation. The chamber in which the piston moves may be jacketed, as indicated at 79.

The finished product produced in indefinite lengths may have a surfacing of granular material on both faces, as indicated in Figs. 8 and 10, or the granular wear surface may be applied only over the face which is to be exposed to the weather, or, if desired, only over a part of that face. The rear face is normally covered with talc or some other material so that the articles may be bundled together without sticking. It is preferable to produce the product in tapered cross-section so that the elements, when in place on the roof, appear to have thick butts, and in some instances it may be desirable to make use of the reinforcing wire 31. This is applied with the mechanism illustrated by drawing wire from a supply and laying it beneath the web 43 as the latter is laid about the core or about the tubular extension 63. Also, instead of using a single wrapping strip, two supplies may be employed and these may be arranged for delivery so that the successive thicknesses of the wrapper are wound helically about the core but have the reverse lay.

The new product affords numerous advantages over the present impregnated felts, owing to the fact that there is no material used in this construction which is subject to deterioration. All the materials employed are relatively cheap and are available in large quantities. These materials are capable of being handled in the apparatus described without difficulty, and the product may be produced continuously at a high output rate. While the product is illustrated in the form of a strip shingle, it is evident that it may be produced in the form of individual shingles or of strips, boards, and other products. In the formation of tiles, the product is cut up into individual shingles and then these are pressed to the configuration of tiles by suitable pressing operations. Preferably the product used for the formation of tiles will have the metal reinforcement so that it may be strengthened and retain its configuration for an indefinite period. The new material is capable of being cut without difficulty and it may be readily punctured by nails when it is to be laid. The material is not brittle and although it is relatively rigid, it has a sufficient degree of flexibility so that it will conform to any slight irregularities in the roof surface. The material has an indefinite life, since all the core is encased both in the continuous wrapping as well as in the sealing layer. In materials which it has been attempted to produce heretofore, consisting of a core and a jacket, the jacket has not been continuous, but has simply been in the form of a strip which is laid over the surface of the core and affixed thereto. Such products are not satisfactory because the core and jacket readily separate and the jacket does not add strength or rigidity to the core.

I claim:

1. A roofing element which comprises a core of hardened plastic material and a continuous wrapping enclosing the core and covering both faces and its front and extending around rear edges.

2. A roofing element which comprises a core of hardened plastic material and a wrapping laid helically about the core to encase the latter.

3. A roofing element which comprises a core of hardened plastic material, a reinforcement wrapped about the core, and a wrapping wound about the core and enclosing the reinforcement.

4. A roofing element which comprises a core of hardened plastic material and a continuous wrapping wound about the core a plurality of times, and providing a jacket therefor.

5. A roofing element which comprises a core of hardened plastic material and a continuous wrapping of fibrous sheet material wound about the core from one end to the

other, and providing a jacket therefor which covers both faces and opposite ends of the core.

6. A roofing element which comprises a core of hardened plastic material and a wrapping of waterproof material wound helically about the core.

7. A roofing element which comprises a core of hardened plastic material having a tapering cross-section from one edge to the other and a continuous wrapping extending over both faces of the core and around the said edges.

8. A roofing element which comprises a core of hardened plastic material, a wrapping enclosing both faces of the core and its front and rear edges and a reinforcement extending over both faces of the core and around its front and rear edges.

9. In a roofing element, the combination of a core and a continuous reinforcing member extending across both faces of the core and around its front and rear edges.

10. A roofing element which comprises a core of hardened plastic material, a reinforcement wrapped about the core and a jacket enclosing the core and reinforcement.

11. A roofing element which comprises a core of hardened plastic material of a waterproof character and a wrapping laid about the core in a plurality of partially overlapping convolutions.

12. A roofing element which comprises a core of hardened plastic material containing asphalt and a continuous wrapping of flexible fibrous material impregnated with a waterproofing substance laid about the core to enclose the latter in a plurality of convolutions.

13. A roofing element which comprises a core of hardened plastic material, a reinforcement for stiffening the core, wrapped around and extending throughout the length of the latter, and a wrapping laid about the core to encase the core and the reinforcement.

14. A roofing element which comprises a core of hardened plastic material, a continuous wrapping wound about the core a plurality of times and a continuous sealing layer enclosing the wrapping.

15. A roofing element which comprises a core of hardened plastic material, a continuous wrapping wound about the core a plurality of times, a continuous sealing layer enclosing the wrapping, and a layer of surfacing material applied over the sealing layer.

16. A roofing element which comprises a core of hardened plastic material, and a continuous wrapping wound about the core a plurality of times, the core and wrapping having cut-out portions forming notches in one edge of the element.

17. A method of producing roofing elements which comprises forming a core of plastic material, and continuously wrapping the core within a jacket wound about the core in a plurality of partially overlapping convolutions.

18. A method of producing roofing elements which comprises continuously forming a core of plastic material by an extrusion operation and wrapping the core as rapidly as it is formed in a jacket wound about the core in a plurality of partially overlapping convolutions.

19. A method of producing roofing elements which comprises forming a core of plastic material, encasing the core in a jacket as rapidly as it is formed, shaping the jacketed core and cutting it into selected lengths.

20. A method of producing roofing elements which comprises continuously forming a core of plastic material by an extrusion operation, encasing the core in a jacket as rapidly as it is formed, shaping the jacketed core and cutting it into selected lengths.

21. A method of producing roofing elements which comprises continuously forming a core of plastic material by an extrusion operation, winding a jacket strip about the core as rapidly as it is formed in a plurality of partially overlapping convolutions, shaping the jacketed core to vary its cross-section, and cutting the shaped jacketed core into selected lengths.

22. A method of producing roofing elements which comprises continuously extruding plastic material through an orifice to form a core of indefinite length, winding a jacket strip helically about the core as it is formed, shaping the jacketed core and cutting it into selected lengths.

23. A method of producing roofing elements which comprises extruding plastic material through an orifice to form a tubular core, winding a jacket strip in successive convolutions about the core as rapidly as it is formed, collapsing the jacketed core by subjecting it to pressure to fill the central void and cutting the jacketed core into selected lengths.

24. A method of producing roofing elements which comprises forming a core of plastic material, wrapping a reinforcing strand about the core, encasing the core and strand in a jacket and cutting the core, wrapped and encased, into selected lengths.

25. A method of producing roofing elements which comprises continuously forming a core of plastic material, laying a reinforcement on the surface of the core, and wrapping a jacket strip about the core to cover the reinforcement, this jacket strip extending over both faces and the front and rear edges of the core.

26. A method of producing roofing elements which comprises continuously form-

ing a core of indefinite length, continuously wrapping a jacket strip about the core in a plurality of convolutions, cutting spaced notches in one edge of the wrapped core and cutting the wrapped core into selected lengths.

27. A method of producing roofing elements which comprises continuously forming a core of indefinite length, continuously wrapping a jacket strip about the core in a plurality of convolutions, applying a coating to the jacketed core, and cutting it into selected lengths.

28. A method of producing roofing elements which comprises continuously forming a core of indefinite length, continuously wrapping a jacket strip about the core in a plurality of convolutions, applying a coating to the jacketed core, affixing a layer of granular material to the jacketed core, and cutting the jacketed core into selected lengths.

29. A method of making roofing elements, which comprises continuously forming a core of plastic material of indefinite length, winding a reinforcing member helically about the core, and wrapping the core and reinforcing member in a jacket strip laid helically thereover.

30. A roofing element comprising a core of hardened plastic material, and a continuous wrapping enclosing the core and covering both faces and extending around its front and rear edges, the core and the wrapping having cut-out portions forming notches in one edge of the element.

31. A roofing element which comprises a core of hardened plastic material of oblong shape, the core having a tapering transverse cross-section, and a continuous wrapping enclosing the core and extending around both faces at its front and rear edges, the core and the wrapping having cut-out portions forming notches in the longitudinal edge of the element having the greater thickness, these notches extending toward the other longitudinal edge and terminating centrally of the element.

32. A roofing element which comprises a core of oblong shape having its transverse cross-section tapering whereby the thickness of the core at one longitudinal edge is substantially greater than that at the other, a continuous wrapping wound about the core a plurality of times, the core and the wrapping having cut-out portions forming notches in the longitudinal edge of greater thickness, these notches extending toward the opposite longitudinal edge, and a surfacing of granular material affixed to one surface of the wrapped core.

33. A roofing element which comprises a core of oblong shape having a greater thickness at one longitudinal edge than at the other, a continuous wrapping wound about the core in a number of convolutions which cover both faces of the core and extend around both longitudinal edges, cut-out portions forming notches in the longitudinal edge of greater thickness, a coating of sealing material applied over the wrapping, and a layer of granular material forming a wear surface on one face of the wrapped core, this material being affixed to the core by the sealing layer.

In testimony whereof I affix my signature.

THOMAS ROBINSON.

CERTIFICATE OF CORRECTION.

Patent No. 1,676,351. **Granted July 10, 1928, to**

THOMAS ROBINSON.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, line 55, for the word "settling" read "setting"; page 5, lines 111 and 112, claim 1, strike out the words "its front and extending around rear edges" and insert instead "extending around its front and rear edges"; page 6, line 79, claim 19, after the word "comprises" insert the word "continuously"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of August, A. D. 1928.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)

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27. A method of producing roofing elements which comprises continuously forming a core of indefinite length, continuously wrapping a jacket strip about the core in a plurality of convolutions, applying a coating to the jacketed core, and cutting it into selected lengths.

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