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C. S. FLEMING

ROOFING MATERIAL

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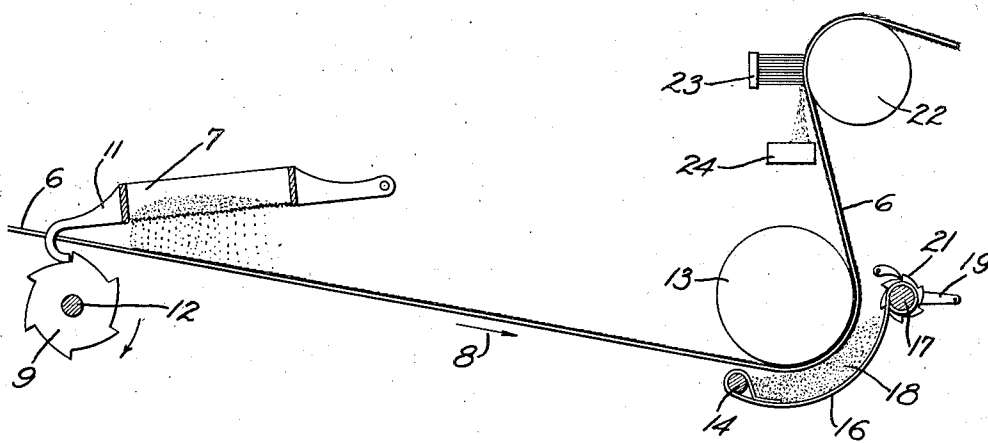


Fig. 2

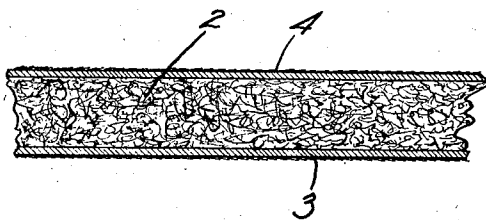


Fig. 1

WITNESS

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UNITED STATES PATENT OFFICE.

CORNELIUS S. FLEMING, OF BERKELEY, CALIFORNIA, ASSIGNOR TO THE PARAFFINE COMPANIES, INC., OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF DELAWARE.

ROOFING MATERIAL.

Application filed November 28, 1921. Serial No. 518,281.

To all whom it may concern:

Be it known that I, CORNELIUS S. FLEMING, a citizen of the United States of America, and a resident of Berkeley, in the county of Alameda and State of California, have invented a new and useful Roofing Material, of which the following is a specification.

My invention relates to roofing materials and particularly to roofings comprising a fibrous base impregnated with bituminous compound and surfaced with a wearing coating on one or both sides of generally harder bituminous material.

One of the objects of the invention is the production of a roofing having greater attractiveness and much greater durability than ordinary roofings of the same general type. Another object is the provision of a roofing material capable of being packed for sale in rolls which does not embody a heavy percentage of material which adds little or nothing to the value of the material as roofing but which has hitherto been found necessary to prevent the convolutions of the roll from sticking together.

My invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of my invention. It is to be understood that I do not limit myself to the showing made by the said description, as I may adopt variant forms of my invention within the scope of the claim.

Fig. 1 is a sectional view taken thru a piece of roofing made in accordance with my invention, the scale of the component portions being somewhat exaggerated to more clearly indicate the structure. Fig. 2 is a side elevation of a portion of the machine on which my roofing is manufactured. The view is largely in diagram.

In the manufacture of ordinary felt roofings, a fibrous base of felted material is impregnated with a bituminous compound and then a harder wearing coating of bituminous compound is applied. In order to prevent the material from sticking together in the rolls in which it is customarily sold, the surface of the wearing coating is sprinkled, before it has hardened, with finely divided soapstone, limestone, mica, slate, or other mineral powder. Sometimes wood flour has been used for the purpose. After the roof has been laid, this material washes away or

is blown from the roofing and is of little value in imparting durability or wearing qualities to the product. For one square, that is 100 square feet, of roofing made according to the usual practice about 2½ pounds of wood flour must be used to coat the roofing on both sides, or, if soapstone is used about five pounds is required. Thus it will be seen that in a roll of roofing containing one square and weighing 42 pounds there will be but 39½ pounds of felt and asphaltic material in the roll, the remainder being the wood powder used to prevent adhesion, or, if soapstone is used, the purchaser actually receives but 37 pounds of roofing material.

I have found that one of the substances commercially known as bronzing powders may be substituted in this surface coating for the soapstone or other mineral matter or wood flour with marked advantages. The material preferred is aluminum bronze powder which imparts a silver-like appearance to the roofing when laid. The grade of aluminum bronze known as "fine" is well adapted for the purpose, although coarser grades may be used, and as little as 4 ounces of it is sufficient to coat one square of roofing on both sides. This quantity will effectually prevent the sticking of the material in the roll and it shows no tendency toward absorption into the coating materials on the base fiber even when stored in warm locations. It will thus be seen that in a 42 pound roll of my roofing, the purchaser receives nothing but roofing, 41¾ pounds of felt and asphaltic material and ¼ pound of metallic surfacing which greatly enhances the wearing qualities of the roof.

Bronzing powder is in the form of finely divided flakes and when applied to the roofing material in accordance with my invention the overlapping flakes spread out scale-like over the surface of the wearing coating on which they are adhesively and securely held. As the weather, including in the term sunlight, the oxidation of the air and the impact of rain, is the cause of deterioration in bituminous roofing, anything which serves as a complete covering of the bituminous coating and which forms overlapping plates or flakes and is opaque, as is metal, acts to keep weather influences entirely away from the bituminous material and herein lies the reason for the high durability characteriz-

ing my roofing. Mica, it is true, forms flakes upon the surface to which it is applied but the mica coating is transparent and the light striking thru to the bitumen sets up photo-chemical reactions which break down the bitumen and release the mica flake from its adhesion. The fact that the metallic coating achieved in my process is especially effective in preventing deterioration of the underlying bituminous layers is evidenced in the failure of such coatings to "check" or "crocodile" on exposure when surfaced with the metallic powder.

In Fig. 1 I have shown a section of roofing made in accordance with my invention. The base material 2 may be roofing felt saturated with a semi-solid asphalt or it may be a burlap saturated or partially saturated with asphalt or oils and having further quantities of asphalt or bituminous compounds forced into its meshes. If desired this base or foundation material may also be a bituminous composition in sheet form but not involving a fibered, felted, or woven sheet or fabric as a foundation. That is, it may be a composition, plastic at elevated temperature and rolled or otherwise fabricated into sheet form suitable to be a base for roofings. Or, it may be a plurality of individual sheets cemented or secured together by suitable means as by an asphaltic cement. Upon the surface of the base material are applied coatings 3 of bituminous compounds. Such a coating may be prepared by melting and applying with rollers, "D" grade California asphaltum, which may have incorporated in it fillers of powdered mineral, or may be mixed with other bituminous materials properly to temperate it and give it durability. This coating may be applied to only one side of the base if desired. The coating may assume the form of that illustrated in United States Letters Patent No. 1,357,920 granted to Herbert Abraham, Nov. 2, 1920, in which the coating contains unfelted fiber and constitutes the major part of the roofing, being applied to but one side of the base felt. Upon the surface of the wearing coat 3 is applied the finely flaked metallic particles or bronzing powder 4 in sufficient quantity to secure a "one flake deep" coverage. The minute flakes 4 tend to remain in place on the surface instead of sinking into the body of the material and are applied before the wearing coating has fully hardened. Not only is the durability of the roofing wonderfully increased by the coating of metallic flakes but a building material is secured of genuinely attractive appearance and capable of artistic treatment wholly new in prepared roofings. Copper bronze powder may be used to secure a copper red effect, or gold bronze to give a golden color to the roofing.

In Fig. 2 I have shown, largely in dia-

gram, an apparatus which, when incorporated with the usual roofing making machine, may be used to make my roofing. The apparatus shown in Fig. 2 is installed in the roofing making machine at the point where the sheet of roofing or web has left the coating rolls. At this point the web 6 has already received a substantial coating of a relatively hard bituminous compound applied over the impregnated or saturated felt or fabric which constitutes the base of the finished product. This coating of wearing material has not yet fully hardened after being spread in a heated condition and is adapted to receive and retain a powdered or granular material sprinkled upon it. This is accomplished by means of a vibrating box 7 from the foraminated bottom of which the flaked metallic particles are sifted over the web 6 as it passes below the box in the direction shown by the arrow 8. The box is pivoted at one end and is shaken by a multi-toothed cam 9 on each side of the web 6 and arranged to be engaged by arms 11 extending from the free end of the box. The cams 9 are both fixed on a shaft 12 rotated by suitable connection with a convenient portion of the roofing making machine and as the cams revolve the box rises and falls thus effecting a sprinkling of the contents of the box upon the web. If that grade of bronzing powder known as "fine" is used the bottom of the box 7 may be formed of 60-mesh wire. A speed of 100 revolutions per minute of a six point cam, and 100 feet travel per minute for the roofing will give good results.

After receiving a coating of the finely flaked material on its upper surface, the web passes around a water-cooled drum 13 to which it is prevented from adhering by the powdered material already applied. Means are provided at this point for applying a coating of the metallic powder to the underside of the web. Secured to a rod 14, suitably supported below the drum 13, and extending below and partially around the drum is a receptacle 16 comprising a canvas or other fabric sheet or bag, the upper end of which is rolled about a roller 17. A quantity 18 of the fine flaked material to be applied is placed in the receptacle so that as the web 6 passes about the drum 13 its outer surface is brought into intimate contact with the powder and is thoroughly coated thereby. From time to time the roller 17 is turned as the quantity of powder decreases to bring the receptacle 16 closer to the drum. Any suitable means may be used for the control of the roller 17, such as the crank 19 and ratchet 21.

From the drum 13, the web, now having a coating on both sides, passes over a drum 22, and a brush 23 engaging the surface to which the coating was first applied, removes

any surplus which falls into a box 24 from which the accumulations are removed from time to time. Usually no surplus powder adheres to the underside of the web, but if necessary a brush similar to the brush 23 may be arranged against the back or underside of the web so as to brush the surplus powder, if any, back into the receptacle 16.

10 It is of course obvious that only one side of the web may be treated instead of both sides since the side of the roofing next to the sheathing boards is not subject to weather exposures and under ordinary conditions need not be given the protective metallic coating.

15 When it is desired to dull the effect of the bronzing powder, a proportion of powdered soapstone or other inert powder may be used to replace some of the bronzing powder. Of course the wearing qualities of a

roofing so made are not equal to one in which the surface is coated only with the metallic flakes, but even with considerable admixture of the soapstone, the color is still highly attractive, and under some conditions, the factor of cost may make the dilution of the metallic powders advisable.

I claim:

A roofing having a base of fibrous material, a coat of bituminous material on the fibrous material, a surface coating of finely flaked metallic particles adhesively retained by the bituminous coat in overlapping relation, in a manner characterized by the sprinkling of said particles on the bituminous coat when the bituminous coat is in a softened heated condition.

In testimony whereof, I have hereunto set my hand.

CORNELIUS S. FLEMING.