106. COMPOSITIONS, COATING OR PLASTIC.

Cross Reference

Examiner

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PROCESS FOR MARKING FELT AND THE RESULTANT PRODUCT

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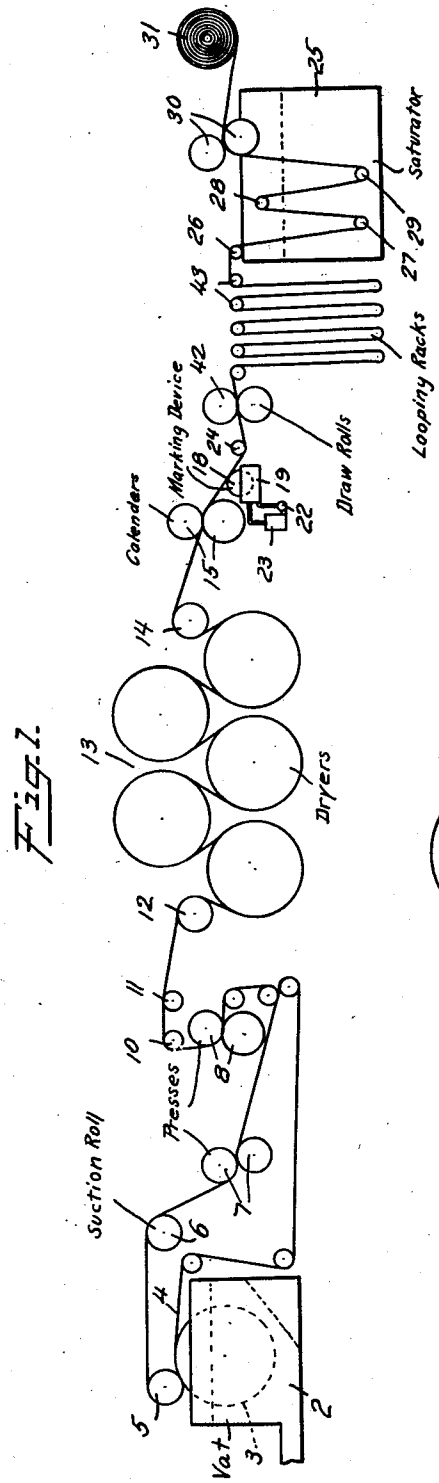

Fig. 1.

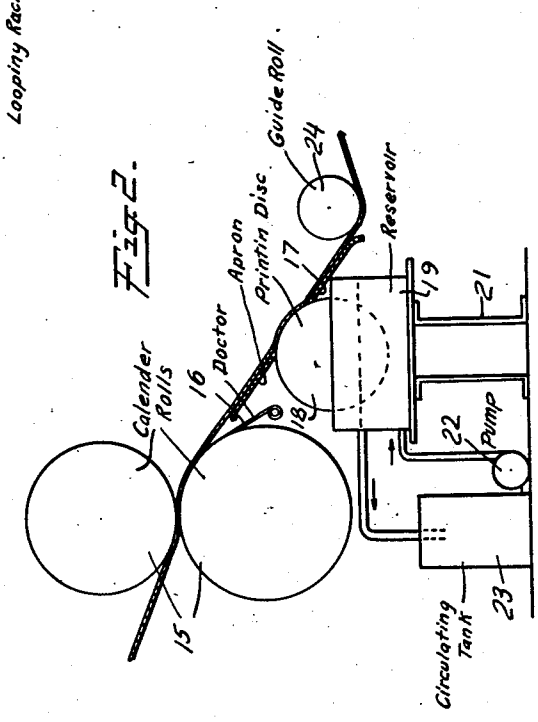

Fig. 2.

William R. Menshon
INVENTOR

BY Fabian Schley
ATTORNEY

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PROCESS FOR MARKING FELT AND THE RESULTANT PRODUCT

William R. Menshon, Roselle Park, N. J., assignor to The Barrett Company, New York, N. Y., a corporation of New Jersey

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15 Claims. (Cl. 91—67.9)

This invention relates to marking designs, guide lines, trade-marks, or other indicia upon fibrous material, such as roofing felt. More particularly, the invention is directed to the application of ruled guide lines or other indicia to roofing and other fibrous material; to the resultant fibrous material; and to apparatus for applying the indicia to felt or other sheet materials.

One object of the present invention is to provide coal tar, oil tar, asphalt or other bituminous saturated felt or other fabric, such as woven fabric, with ruled guide lines or other indicia thereon. Another object is to provide a process for applying guide lines or other indicia to felt or other fibrous roofing base, which may be saturated with waterproofing substances, such as asphalts, coal tar, coal tar pitch, or other bituminous materials, in such manner that the indicia are not obliterated by the saturating and coating material. Other objects and advantages will appear from the following detailed description.

In accordance with this invention, felt or other fibrous sheet materials are built up in the usual manner from rag, wood pulp, and other fibers into a continuous sheet. This sheet is dried in its passage through the usual press and dry rolls. While in substantially dry condition and before leaving the paper making machine, a suitable marking medium, as for example, any well-known paint or ink which will show through and not be completely obliterated by the waterproofing substances to which the fibrous base is thereafter subjected, is applied to the sheet. In the manufacture of roofing elements involving the saturation of a fibrous sheet with bituminous materials, such as asphalt or coal tar pitch, I have found that the application of a suspension of a metallic powder in a silicate, preferably a suspension of aluminum powder in a sodium silicate solution, results in indicia which apparently show through the bituminous saturant. Thereafter, the marked sheet may be saturated with waterproofing substances, as for example asphalt, or coal tar, or pitch, and finally rolled up for further treatment or sold as such as roll roofing.

In the manufacture of coal tar saturated felt for roofing, as heretofore practiced, the felt base, as it came from the felt making machine, was saturated with coal tar, and immediately upon leaving the saturating bath, after expressing the excess coal tar, and while still wet and tacky, was rolled up into roll form. Largely due to the wet and tacky nature of the coal tar saturated felt, it has been found impractical to provide coal tar saturated felt with guide lines or other indicia in the normal course of manufacture of such felt. Not only does the present invention comprehend the production of coal tar saturated felt with indicia on a face thereof, but it provides a process which, without involving reorganization of existing coal tar saturated felt manufacturing apparatus, permits the production of improved, marked, saturated felt in a simple and efficient manner.

The invention will be described more fully hereinafter in connection with the accompanying drawing, which is somewhat diagrammatic in character and on which—

Fig. 1 shows an arrangement of apparatus for practicing the process of this invention; and

Fig. 2 is a side elevation, partly in section of one form of marking device for applying a suspension of a pigment to dry felt.

In the accompanying drawing, there is shown a vat 2, containing fibrous stock, such as rag, paper, or other fibrous material, from which the felt or other fibrous sheet is made. A foraminous cylinder or cylinder mold 3 dips into the furnish in vat 2. Rotation of the foraminous cylinder 3, in known manner, causes the formation of a sheet of desired thickness on the cylinder. This sheet is transferred by cylinder 3 to wet felt or wet blanket 4 by the action of the couch roll 5 which rides on the surface of the cylinder mold. The sheet is carried on the wet felt over the suction roll 6 and through press rolls 7 and 8 where excess water is removed by vacuum and by pressing, respectively. From the press rolls 8 the sheet passes over idler rolls 10 and 11, around guide roll 12 to drying rolls 13. Upon leaving the last drying roll the sheet passes around a guide roll 14 and through calender 15 where it is smoothed. Doctor blades 16 prevent adherence of the sheet to the lower calender roll. In the usual roll roofing operations, the sheet from the calender rolls is passed to a reel (not shown) where it is wound up into a roll of usual diameter. When one reel is filled, the sheet is broken at the reel side of calender roll 15 and started on a second reel. Both reels may be driven by a slip-belt or other suitable means of maintaining constant linear speed with a constantly increasing diameter, and the sheet is kept under tension between the reels and the calender rolls. The structure of the sheet forming and drying apparatus may be of any well known type and consequently further description thereof is considered unnecessary.

In accordance with this invention, the sheet from the calender rolls 15 passing to the aforementioned reels, or the sheet in the embodiment of the invention disclosed in Fig. 1, leaving the calender rolls passes over apron 17 and marking discs 18 where designs, marks such as guide lines, or other indicia are applied thereto. In the embodiment of the invention disclosed, ruling disc 18 provides a guide line on one face of

the sheet parallel to and spaced from a longitudinal edge thereof. Disc 18 is preferably positioned slightly above the normal line of travel of the felt, which in passing over the disc, causes a film of marking medium carried thereby to be absorbed by the felt sheet. Rotation of the disc or other printing roll, in accordance with the invention disclosed in Fig. 2 of the drawing, is accomplished by the frictional contact between the sheet and the disc, linear movement of the sheet causing rotation of the disc so that the peripheral speed of the disc is the same as the linear speed of the sheet. Disc 18 dips into reservoir tank 19, containing a marking medium, the reservoir being mounted on suitable support 21. If a suspension of pigment in a solution is utilized as the painting medium, the pigment is maintained in suspension by discharging it from reservoir 19 into a circulating tank 23 which communicates with pump 22. The pump forces the material from tank 23 into the reservoir 19. Circulating the suspension through the reservoir 19 prevents settling of the pigment.

In the embodiment of the invention involving the application of the marking media to the sheet before it is fed to the reel, the felt is maintained under tension and in frictional contact with the marking or printing disc 18 by the tension exerted thereon by means of the pull of the reels. In the embodiment of the invention shown on the drawing the felt is maintained under tension by the action of the driven draw rolls 42, disposed to the right (viewing Fig. 1) of the marking device. After receiving the marking medium from the marking roll 17, the felt sheet passes under a guide roll 24, through driven draw rolls 42, over looping rolls 43 to a saturating vat 25 containing coal tar pitch, asphalt or other waterproofing substance. The looping rolls 43 permit accumulation of the sheet, so that machine stops on the saturating machine for the purpose of removing saturated felt product rolls of a convenient and commercial size, will not interfere with the continuous uninterrupted operation of the sheet forming and printing machine. Instead of passing through a saturating vat, the sheet may be passed under sprays of saturant or otherwise saturated.

As shown in Fig. 1, depicting one type of saturating vat, the sheet passes over roll 26, down through the waterproofing material, about roll 27, up through the waterproofing medium, around roll 28, down through the waterproofing substance, about roll 29, up through the waterproofing medium, between press or squeeze rolls 30, which serve to draw the sheet through the saturating bath and to remove excess saturating material. It will be noted that the rolls 27 and 29 are suitably mounted in tank 25, near the base thereof, and rolls 26 and 28 are disposed above the level of the saturating material in tank 25. In its passage through vat 25, the sheet is thoroughly saturated and coated with waterproofing substances such as bituminous material. The saturated felt is then drawn through the squeeze or press rolls 30 to remove excess saturant and then wound on product rolls 31.

The thus saturated sheet may be unwound, passed through the usual shearing knives, and then again wound into product rolls. If the sheet is wound into a roll after marking, and thereafter unwound and saturated in any desired manner, it may, after marking and before saturation, be unwound and passed through the usual trimming knives to trim the edges. If desired the sheet may be trimmed first and thereafter marked.

The marking medium used may be any of the various household paints, such as lead, zinc, or iron compounds in linseed oil; varnish; shellac; ink; or any other substances which produce a mark which will show through the waterproofing medium subsequently applied to the sheet and will not be obliterated thereby. White paints and red iron base paints have been found particularly suitable marking media. Preferably, aluminum or other metallic powders may be used as the pigment in this marking or painting composition. Aluminum powder is preferred because of its lustre and brightness and because the bitumen does not readily adhere to it. It forms readily visible indicia upon application to felt and subsequent saturation thereof with bituminous material. Any aluminum bronzing powders utilized in the manufacture of aluminum paints may be used as the pigment of this composition. The metallic powder is incorporated in the soluble silicate, such as sodium silicate, forming a suspension of aluminum powder in the silicate. The silicate functions as a dispersing agent, maintains the metallic powder in suspension, and acts as an adhesive to bond the metallic marking material with the felt, fibrous or other base to which the composition is applied Further, the silicate, upon application to the fibrous base, glazes or sizes the portion of the felt to which it is applied, imparting to this portion of the fibrous material a distinctive appearance as compared with the remaining portion. The composition may be prepared by agitating and intimately mixing aluminum powder, silicate of soda, and water in the proportions hereinafter indicated, and thus forming a suspension of aluminum powder in a dilute solution of silicate of soda.

One composition found to give excellent results in the marking of roofing felt or similar materials was made by mixing 1 pound of aluminum powder, ½ gallon of silicate of soda of 42.5° Baumé, and ½ gallon of water, corresponding to 1 part by weight of aluminum to 2.27 parts by weight of solid silicate of soda (Na_2SiO_3), and 7.71 parts by weight of water. The above ingredients were thoroughly mixed and thereafter applied to the felt by means of printing or marking discs, rotating in a tank containing the suspension and contacting with the felt.

Another composition found to give satisfactory results in the marking of roofing felt before saturation contained 1 pound of aluminum powder, 1 gallon of silicate of soda of 42.5° Baumé, and 1½ gallons of water, corresponding to 1 part by weight of aluminum to 4.54 parts by weight of solid silicate of soda, and 19.55 parts by weight of water.

Suspensions of aluminum powder in silicate of soda containing not more than one part by weight of aluminum powder to every two parts by weight of silicate of soda and seven parts by weight of water, I have found, are admirably suited for painting, printing, or marking indicia on dry felt or other fibrous materials. Preferably, the ingredients are mixed in the proportion of one part by weight of aluminum powder to from two to four and one-half parts by weight of solid silicate of soda, and from seven to twenty parts by weight of water.

Since the cost of aluminum powder, at the present market prices, is approximately 46 times that of silicate of soda and the cost of water is negligible, it will be appreciated that, from the

commercial and economic points of view, a composition having maximum amounts of water and silicate of soda and minimum amounts of aluminum powder is preferable. I have found that a satisfactory dilute suspension may be formed by mixing aluminum powder, silicate of soda, and water in the proportions indicated. It will be noted that in the examples given above, the amounts of silicate of soda and water greatly preponderate over the amount of aluminum powder in suspension.

Silicate of soda, on the heavier than water Baumé scale, of a specific gravity greater or less than 42.5° Baumé may be used. The 42.5° Baumé silicate of soda represents a grade of silicate readily obtainable on the market. If silicate of soda of higher specific gravity is used, the amount of water added may be proportionately increased, and conversely, if silicate of soda of lower specific gravity is employed, the amount of water introduced into the mixture is correspondingly reduced.

In practice it has been found that felt or other fibrous material may be efficiently and economically provided with guide lines by the process of this invention and thereafter saturated. Roofing material, such as coal tar saturated felt, which, as above indicated, could not heretofore be provided with guide lines or other indicia thereon, in accordance with this invention has been formed with indicia of a distinct and permanent character.

The invention has been described with relation to marked roofing material having marks which would ordinarily be placed on the weather or exposed face of the material, but it will be obvious that either or both faces of the roofing material may be marked in accordance with this invention. Instead of applying one guide line, as shown, by means of disc 18, a series of discs spaced in parallel relation may be used to apply a series of parallel guide lines.

The term "indicia" used in the specification and claims is intended to include spacing marks, guide lines, trade-marks, decorative, and other marks, applied to a sheet for decorative, identification, or utilitarian purposes.

Since changes in carrying out the process and in the product of this invention may be made without departing from the scope of the invention, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense. In particular, while there has been set forth above a description of apparatus by which the invention may be practiced, it will be understood that other apparatus may be used.

I claim:

1. A process for the production of bitumen saturated base having indicia thereon, which comprises applying a suspension of metallic powder in a dilute silicate solution to the base to form the indicia thereon, and thereafter saturating the base with bituminous material.

2. A process for the production of coal tar saturated felt having indicia on the face thereof, which comprises continuously forming a sheet of felt, continuously applying a suspension of metallic powder in a dilute silicate solution onto a face of the felt sheet to form the indicia thereon, and thereafter continuously saturating the resultant felt sheet with coal tar.

3. A process for the production of bitumen saturated felt having indicia on the face thereof, which comprises continuously forming a sheet of felt, continuously applying a suspension of aluminum powder in a sodium silicate solution to the felt sheet to form the indicia thereon, and thereafter continuously saturating the felt sheet having indicia thereon with bituminous material.

4. A process for the production of coal tar-saturated roofing material having ruled guide lines on the face thereof, which comprises continuously forming a sheet of roofing felt, drying said sheet, applying a suspension of aluminum powder in a dilute sodium silicate solution to said sheet to form a guide line thereon, and thereafter saturating the resultant sheet with coal tar.

5. A process for the production of fibrous material saturated with a waterproofing substance and having indicia thereon, which comprises applying a metallic suspension in a silicate solution to the fibrous material to form the indicia before waterproofing said fibrous material, and thereafter waterproofing said fibrous material.

6. A process for the production of bitumen saturated felt having indicia on a face thereof, which comprises applying a suspension of aluminum powder in a sodium silicate solution to a sheet of felt to form the indicia, and thereafter saturating the felt with bituminous material.

7. A coal tar saturated roofing element having a guide line composed of aluminum powder and silicate on a face thereof, and a weatherproofing saturant on said face.

8. Bitumen saturated roofing having guide lines painted on its weather face, the paint consisting of an aluminum powder and an adhesive medium.

9. Bitumen saturated roofing felt having indicia on a surface thereof, the indicia being formed by applying a suspension of aluminum powder in sodium silicate to felt before saturation thereof with bitumen.

10. A process for the production of roofing material having indicia on the face thereof, which comprises applying a suspension of aluminum powder in a dilute sodium silicate solution to the roofing material, and thereafter saturating the roofing material having said suspension thereon with waterproofing material.

11. Bitumen saturated felt roofing having a guide line on its weather face bonding with the felt base and comprising an aluminum powder and an adhesive medium and covered with bitumen.

12. Bitumen saturated roofing having a guide line painted on its weather face, the paint consisting of a metallic powder suspended in silicate solution.

13. Coal tar saturated roofing having a guide line painted on its weather face, the paint consisting of a metallic powder suspended in a silicate solution.

14. Bitumen saturated felt having indicia on a surface thereof, the indicia being formed by the application of a suspension of a metallic powder in a silicate solution to the felt before the saturation thereof with bitumen.

15. A process for the production of coal tar saturated felt having a ruled guide line thereon, which comprises depositing, without substantial indentation of the felt, a marking substance on the sheet of felt to form the guide line thereon and thereafter saturating the marked felt sheet with coal tar, the marking substance applied to the felt being of such color and character that the coal tar saturant does not readily adhere thereto and a visible guide line on the resultant felt roofing results.

WILLIAM R. MENSHON.