

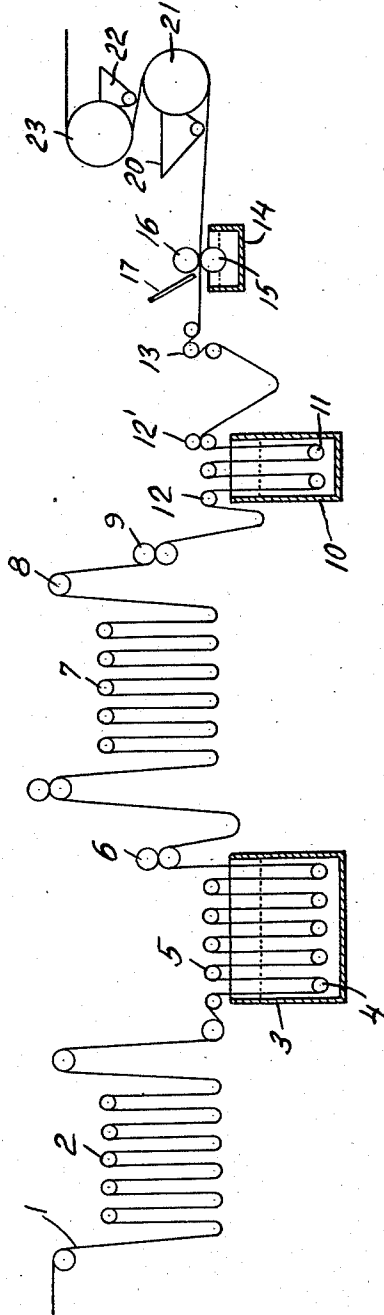
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PROCESS OF WATERPROOFING SHEET MATERIAL

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PROCESS OF WATERPROOFING SHEET MATERIAL

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1 Claim. (Cl. 91—70)

This invention relates to the saturation and coating of sheet material with waterproofing material and more particularly, to a process of saturating and coating roofing felt with bituminous material such as asphalt, coal tar pitch, coal tar and the like.

In accordance with heretofore conventional practice in the preparation of bitumen saturated and coated roofing felts, the felt sheet was saturated with asphalt or other bituminous material, then passed through a looping rack where a partial drying of the saturant took place, and then coated on both sides with asphalt, usually of a somewhat higher melting point than the asphalt saturant. In such operation the asphalt or other bituminous saturant with which the felt is impregnated cools during the passage of the sheet to the coating appliances with consequent contraction of the saturant, leaving surface voids in the sheet. When the coating material is applied a portion of the air or other gases contained in the surface voids of the saturated felt escape through the coated surface, resulting in the imparting of a pitted imperfect finish to the product surface. The remainder of the air and other gases, such as water vapor, is retained in the voids of the coated felt sheet and in an effort to escape forms bubbles within the coating layer. When such roofing is exposed to the weather the action of the elements causes the entrained gases to form blisters on the surface of the roofing resulting in an unsightly appearance and materially decreasing the effective life of the roofing.

One object of this invention is to provide a process of saturating and coating roofing felt which does not have the disadvantages of prior practice hereinabove pointed out and which results in the production of a saturated and coated roofing sheet of improved appearance and durability. Other objects and advantages will be apparent from the following detailed description.

In accordance with this invention, the felt sheet is saturated with the usual asphalt or other bituminous material such as tar or coal tar pitch, and the saturated sheet is then given an initial coating treatment with a higher melting point waterproofing material such as asphalt or coal tar pitch. The waterproofing material employed in the initial coating step may be substantially the same as that used in the final coating step or of somewhat lower melting point. It is preferably maintained at a somewhat higher application temperature as compared with that employed in the final coating treatment. In the

preferred embodiment of the invention, the saturated sheet is immersed in the initial coating material one or more times and passed there-through so as to effect a prolonged contact between the coating material and the saturated sheet. The combination of higher temperature as compared with the temperature maintained in the final coating treatment, with prolonged contact between the sheet and the coating material, functions to effect the substantially complete removal of all air and gases contained in the surface voids of the saturated felt. The felt thus coated with a relatively thin film of coating material is passed through the final coating appliances where it is again coated with asphalt or other waterproofing material. The coating applied in the final coating step bonds with that initially applied, resulting in a somewhat better bond between the coating and the saturant as compared with operations in which the coating is applied in a single step to a saturated felt base.

In the accompanying drawing forming a part of this specification the single figure represents somewhat diagrammatically, an arrangement of roofing appliances for practicing the process of this invention.

In the drawing, reference character 1 indicates a web of sheet material such as felt which may come from a felt-making machine or from a roll of felt not shown. The web 1 passes through a looping rack 2, and then through a saturating tank 3. Suitable immersing rolls 4 are immersed in the saturant and rolls 5 disposed above the saturant in tank 3. As the sheet passes over the rolls 4 and 5 it is repeatedly immersed in the saturant. A bituminous saturant such as asphalt having a melting point of 100° F. to 200° F. may be maintained in the saturating tank 3 in liquid condition at a temperature of from 375 to 475° F., but preferably at about 425° F. in the case of asphalt having a melting point of 145° F. Squeeze rolls 6 serve to extract excess saturant contained in the saturated sheet. From the squeeze roll 6 the sheet is fed through a looping rack 7 where partial cooling and setting of the saturant takes place. Feed rolls 8 feed the sheet from the roll 6 to the primary or initial coating unit 10.

Coating unit 10 may contain a bath of coating material such as asphalt having a melting point of from 175° F. to 225° F. The asphalt or other waterproof coating material in this bath is preferably maintained in heat-liquefied condition at a temperature of from 410 to 460° F. During the passage of the saturated sheet through the bath

over the guide rolls 11 and 12 and through squeeze rolls 12' to remove excess coating, prolonged contact between the hot coating material in the primary coating unit and the saturated sheet takes place, thus insuring the substantially complete removal of air and gas from the saturated sheet. The sheet leaves the primary coating unit with a thin film of coating on each side thereof, and substantially free of vapor, gas and air and is threaded through stationary guide pipes or bars 13 to the final or secondary coating unit 14.

The coating unit 14 may consist of a coating roll 15 partially immersed in coating material in the bath 14. Roll 15 is arranged to be rotated, so as to continuously bring a fresh film of coating material into contact with the moving sheet. A second coating roll 16 disposed above roll 15 is supplied with coating material by means of a spout 17 of a width approximately equal to that of the sheet. The coating material in bath 14 and that supplied through spout 17 may be asphalt having a melting point of 200° F. to 230° F. This coating material as applied to the sheet is preferably maintained at a temperature somewhat below the temperature of the coating material in the primary coating unit 10. The coating material in the coating tank 14 and that delivered through spout 17 may be maintained at a temperature of from 390° F. to 435° F.

From the final coating unit, the coated sheet may pass under a hopper 20 containing granular material which is showered onto the sheet. The thus surfaced sheet then passes under and over a roll 21 which functions to embed the granular material in the coating layer, to which it is applied. If desired granular material or suitable anti-stick material such as soapstone may be applied to the back of the sheet by means of a hopper 22. From hopper 22 the sheet passes under and over a second roll 23, from whence it passes to cooling drums, finishing rack and to the shingle cutters or roll winder (not shown).

From the above description of the invention the advantages thereof should be evident. It will be noted that by passing the sheet through the initial coating material at an elevated temperature, in prolonged contact therewith, air and water vapor in the surface voids and in the felt base are eliminated so that when the final coating is applied, a uniformly coated sheet in which the coating is well bonded to the saturant results.

It is to be understood that this invention is not restricted to the present disclosure, otherwise than defined by the appended claim.

I claim:

A four-step process of saturating and coating roofing felt with asphalt involving the following steps in the order named (1) repeatedly immersing the felt in a bath of asphalt of a melting point of from 100° F. to 200° F. maintained at a temperature of 375° F. to 475° F. to impregnate the felt with the asphalt, (2) cooling the impregnated felt by prolonged exposure to the air immediately after it emerges from said bath of asphalt to cause contraction and partial setting of the asphalt within the felt, (3) passing said impregnated felt directly from the cooling stage over and under rolls located above and below the surface of a bath of asphalt of a melting point of 175° F. to 225° F. maintained at a temperature of 410° F. to 460° F. whereby the felt is subjected to prolonged contact with the asphalt so that the voids of the felt are filled with asphalt and a thin film of the asphalt is applied to each side of the felt, and (4) applying to said felt, after it emerges from said coating bath, a stream of heat liquefied, bituminous coating material of a melting point of 200° F. to 230° F. maintained at a temperature of 390° F. to 435° F., which temperature is lower than the temperature of said coating bath.

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