Dec. 4, 1934. R. MACLEAN 1,982,679

ROOFING

Filed Sept. 2, 1930 2 Sheets-Sheet 1

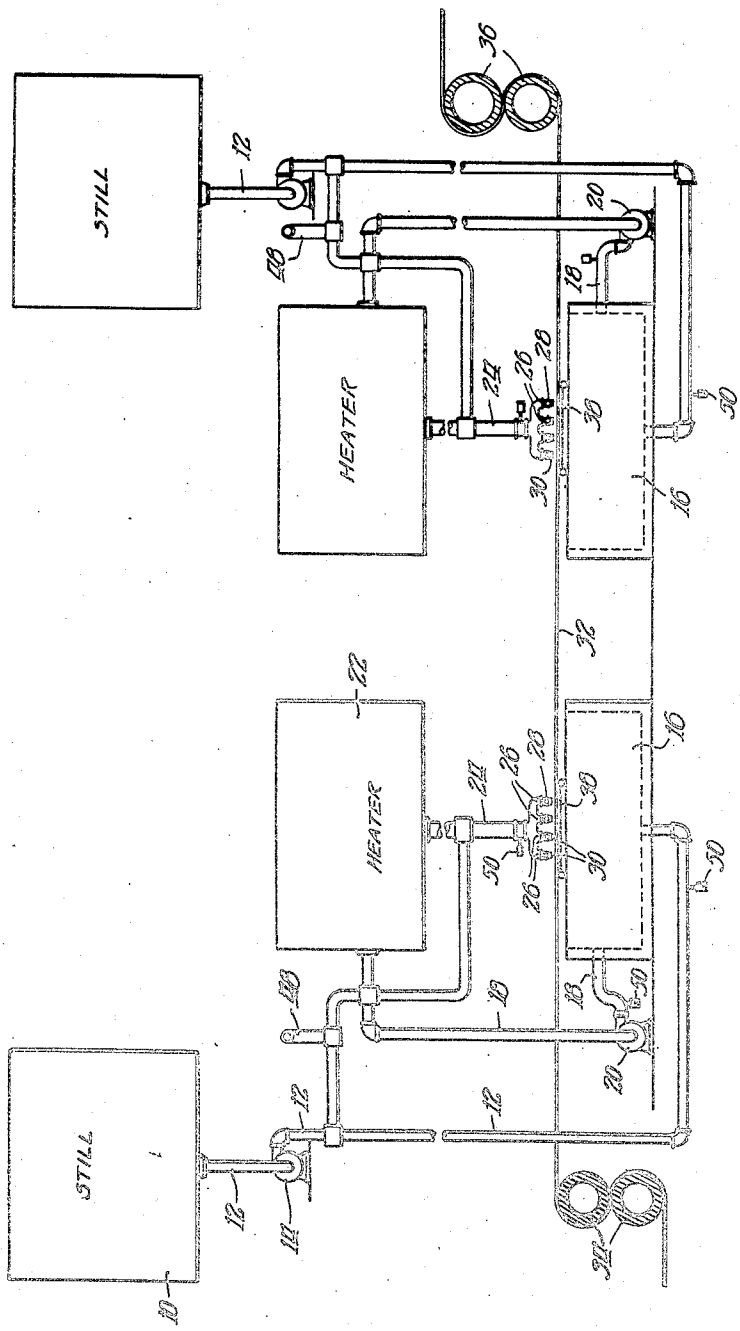


Fig. 1

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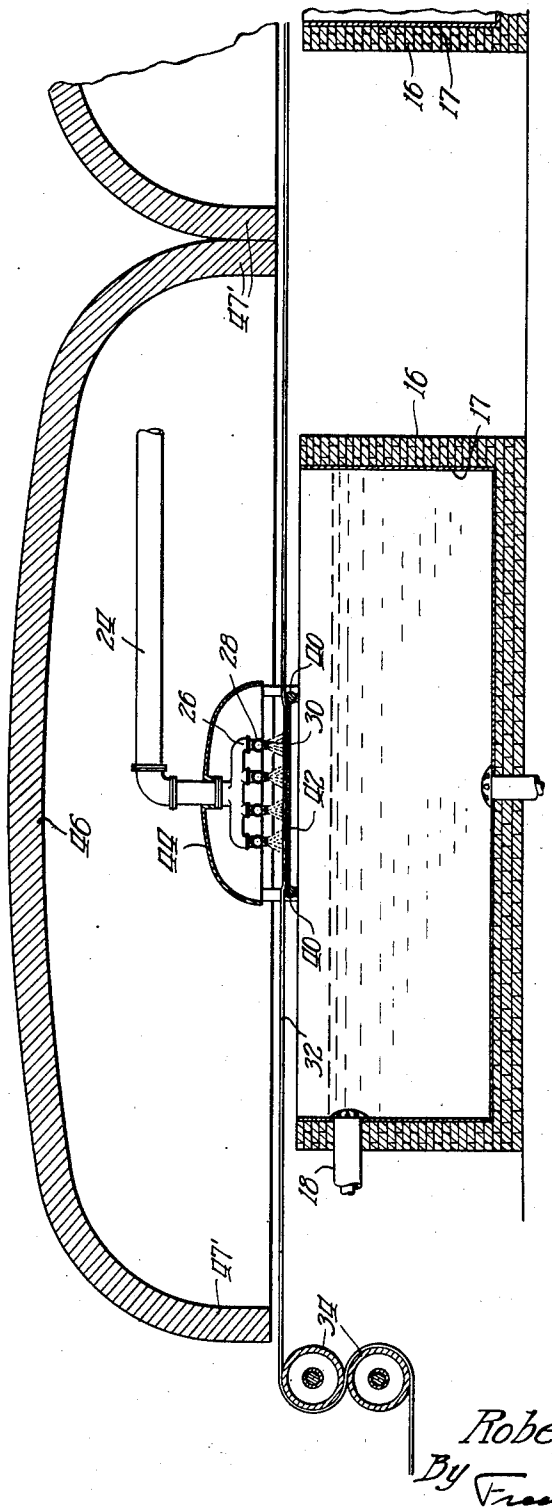


Fig. 2

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UNITED STATES PATENT OFFICE

1,982,679

ROOFING

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Application September 2, 1930, Serial No. 479,234

3 Claims. (Cl. 91—70)

My invention relates to the production of prepared roofing material and includes among its objects and advantages an increase in the thoroughness with which materials such as felt paper can be impregnated with waterproofing material such as melted tar or asphalt.

In the accompanying drawings:

Fig. 1 is a more or less diagrammatic view, illustrating my improved means for carrying out the method disclosed herein;

Fig. 2 is a central, vertical section through an installation embodying my invention, portions thereof being broken away for the purpose of better illustration.

In the embodiment of the invention selected for discussion, a moving strip of porous material such as roofing felt is first heated to eliminate the moisture content and reduce the amount of air in the pores of the material and then subjected to the thrust or impact of a jet of hot fluid material of sufficient dimensions and traveling with sufficient velocity so that at the point of impact there will be a material area where a mass of fluid unmixed with air impinges violently against the surface of the sheet. This impact is delivered on one side only so that the air remaining in the pores of the sheet can find an exit at the other side.

Referring to the drawings, I have indicated in Fig. 1 a plant consisting of two units, one for saturating the strip with comparatively light saturants and the other for saturating the strip with heavier saturants, the strip having first been saturated with lighter saturants while passing through the first unit.

Each unit comprises a still 10 in which the viscous saturant is heated up to a point at which it is more or less fluid, but not so hot that it will "flash" when it comes in contact with the air. A pipe 12, having a force pump 14 therein, conducts the liquid saturant from the still to the receiving tank 16. The discharge of the pump 14 is regulated so as to maintain a level of saturant in the tank 16 above the outlet pipe 18. A pump 20 in this pipe forces the saturant into the heater 22 where the saturant is kept under the proper temperature for best results. This temperature is, of course, determined by the character of the saturant itself and, as stated above, it should not be heated to a temperature too close to its "flashing" point. A discharge pipe 24 leads from the heater 22 and terminates in a number of branches 26, each of which is connected with a manifold 28 that supplies the liquid saturant to a series of outlets or nozzles 30 secured in its lower side.

Means are provided for drawing a strip 32 of roofing material beneath the vents, or ejections produced by the nozzles 30. This means is here shown as comprising two rolls 34 for withdrawing the paper strip from a looping mechanism, the details of which are well known to those skilled in this art. These rolls are hollow and means are provided for admitting steam to their interior and for withdrawing condensed water therefrom in a manner well known to those skilled in this art, so as to heat the paper strip before it passes through the remainder of the saturating mechanism. This heating is for the purpose of displacing some of the occluded air in the strip so as to enable the saturant more readily to penetrate entirely through the strip. Two other rolls 36 may be used for drawing the strip through the saturating mechanism and these rolls may constitute cooling the saturant with which the strip has just been impregnated. Supports 38 may be placed over each receiving tank for supporting the strip against the pressure exerted by the jets issuing from the nozzles 30.

The tanks 16 comprise an outer wall of brick and a lining 17 of sheet metal. The support for the strip comprises a pair of spaced rollers 40, the opposite ends of which are mounted in bearings, and between these rollers I support a strip of screen 42 that will form a firm support for the traveling strip, but at the same time permit the ready flow of excess saturant into the tank 16.

For the purpose of confining the splash from the jet nozzles that might otherwise escape, I enclose the manifolds and nozzles in a metallic shield 44, and for the purpose of preventing injury to the workmen, that might result from a sudden "flash" escaping from the tank 16 or the shield 44, I provide each tank with an inverted bowl-shaped enclosure 46. The edges of the enclosure 46 extend down to a point adjacent the plane of the top of the tank 16, and the ends 47' extend downwardly to form baffles adjacent to, but spaced from, the corresponding ends of the tank 16. These baffles are spaced sufficiently from the ends of the tank to enable a workman to gain access to the tank.

The nozzles in each manifold are placed sufficiently close together so that the streams of fluid from adjacent nozzles build up a fluid body on the strip of felt paper through which the moving material from the surface moves into contact with the felt by which it is forcibly deflected. At the point of deflection there is a heavy pressure devel-

oped tending to force the material into and through the felt.

From the above description it will be apparent that in operating the plant shown in Fig. 1, the unit at the left-hand side may be used for impregnating the felt strip with the light saturants, such as are in common use for making strip roofing, but if it is desired to use heavier or more viscous saturants for making roofing material better suited for the manufacture of prepared shingles, the unit shown at the right-hand side of this figure will be placed in operation to supplement the action of the first unit, that is, the felt strip will first be passed through the unit at the left-hand side of Fig. 1, where it will be saturated with a comparatively light saturant, and will then pass to the unit shown at the right-hand side of Fig. 1, where it will be treated with a heavier saturant.

From the above description it will be apparent that the pressure with which the issuing from the nozzles 30 impinges upon the strip 32, passing through the saturating mechanism, will depend upon the pressure maintained in the heater 22 by the pump 20. By regulating the pump 20 the pressure on the felt may be adjusted so as to force the material to permeate through to the other side, without pressing so hard as to tear or break the felt.

Inasmuch as slight cooling of the saurants employed very considerably increases their viscosity, I prefer to enclose all of the piping in a steam jacket fed through a pipe 48 or in any other desired manner. The condensate from this heating system may be discharged through suitable valves 50.

Without further elaboration, the foregoing will so fully explain my invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

This application is a continuation in part of my copending application Serial No. 100,636, filed April 8, 1926, now Patent 1,816,596.

I claim:

1. The method of saturating a strip of roofing felt which comprises supporting the strip at a plurality of closely spaced points, sliding the strip past said points of support, and striking the strip only on one side opposite said points of support with a jet of saturant of sufficient velocity to force saturant completely through said strip by its own forces alone.

2. A method according to claim 1, in which the strip is held horizontal and the jet moves vertically downward and forms a pool or bath on the moving strip, through which bath the jet proper passes on its way to the strip.

3. The continuous method of saturating a continuous strip or roofing felt, which comprises moving the strip longitudinally, striking the moving strip on one side only with a jet of saturant of sufficient velocity to force saturant completely through said strip by its own forces alone, and supporting the moving strip opposite the place of impact by contact with a plurality of closely spaced points of support, whereby the felt is able to endure the impact without tearing, but at the same time adequate exit spaces are left for the saturant exuding from the supported side of the strip.

ROBERT MACLEAN.