

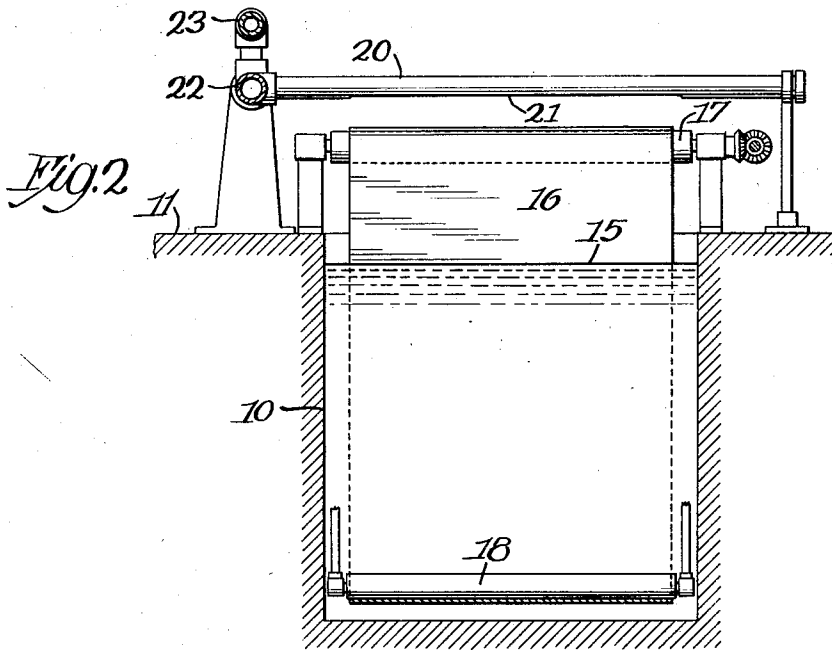
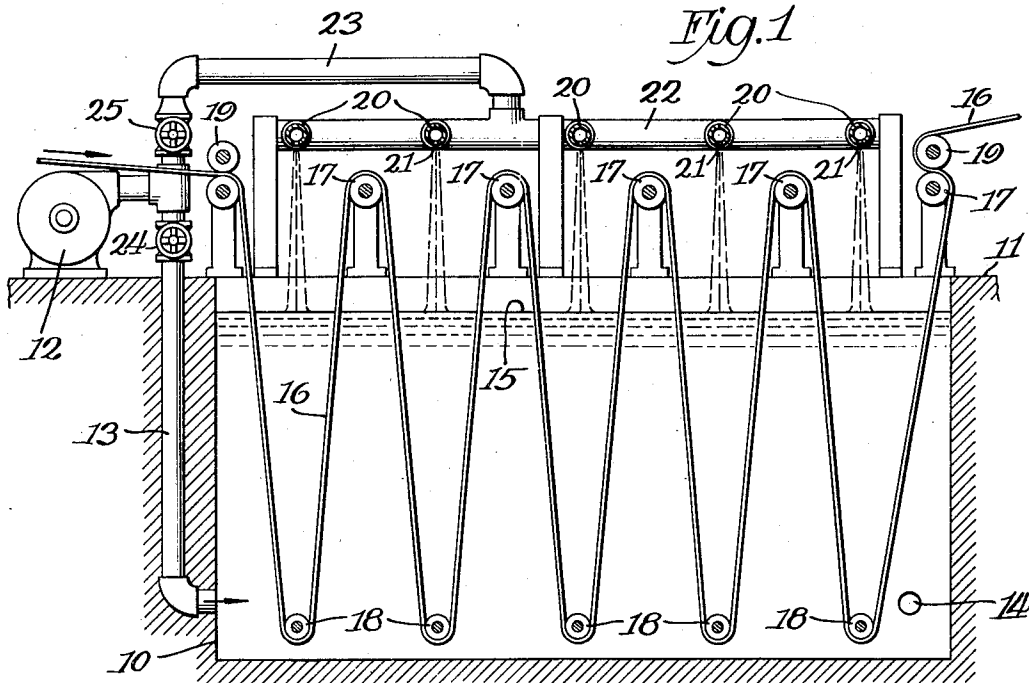
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E. A. LEONARD

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SATURATION OF SHEETS

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## UNITED STATES PATENT OFFICE

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## SATURATION OF SHEETS

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In the manufacture of prepared roofing, waterproof sheeting and insulating fabrics and papers, and such like, when the bibulous base, or foundation sheet, is passed through the hot asphaltic compound, or other saturant, moisture and gases in the sheet forms bubbles in the saturant, and produces an effect commonly known as boiling, which reduces the effective depth of the tank, prevents proper observation of the level of the saturant and entails expensive delays.

The principal object of this invention is to reduce the boiling to an ineffectual degree, and is accomplished by breaking the bubbles as they appear on the surface of the saturant.

The preferred apparatus is illustrated somewhat diagrammatically in the accompanying drawings, in which

Fig. 1 is a longitudinal, vertical section through a saturator equipped according to the invention; and

Fig. 2 is a transverse vertical section of the same.

But neither this specific illustration nor the correspondingly specific description should be considered as limiting the scope of the claims, for it is realized that other forms of apparatus and different procedure, embodying the basic features of the invention, may be used with like results.

In these drawings 10 indicates a tank for saturant located below the floor line 11. In the manufacture of prepared roofing, for example, it is supplied with an asphaltic compound by a pump 12 drawing from a still, not shown, and delivering through a pipe 13 adjacent to the bottom of the tank 10. Another pump, not shown, withdraws the saturant through a pipe 14 adjacent to the opposite end of the tank, and returns it to the still. By proper adjustment of the pumps, and the temperature of the still, the level of the saturant is maintained approximately as indicated at 15, and the temperature at about 400° F.

A continuous foundation sheet 16 is passed through the saturant a number of times by being looped about a series of upper rolls 17, mounted adjacent to the top of the tank, and a series of lower rolls 18, mounted adjacent

to the bottom of the tank. The upper rolls 17 are driven in unison, and adjustable driving rolls 19 cooperate with the end rolls 17 to assist in giving the sheet a proper movement through the saturator. Apparatus of this general character is very familiar, and a full description may be found in the patent to Cumfer, No. 1,508,959 of September 16, 1924.

In applying the invention as here illustrated, I mount a series of pipes 20 above and in staggered relation to the rolls 17 so that saturant escaping from orifices 21 in the bottom of these pipes will, by the combined force of gravity and the pressure in the pipes, impinge upon the surface of the saturant in the tank in the zones between the lines where the sheet enters into and rises out of the saturant.

The pipes 20 are fed by a header 22, the intermediate portion of which is connected by a pipe 23 with the pump 12. Valves 24 and 25 permit the pressure in the pipes 13 and 23 to be adjusted to suit conditions.

The orifices 21 are preferably in the form of slots, slightly enlarged from left to right in Fig. 2 to permit uniform delivery notwithstanding the unavoidable drop in pressure, but they may be given a variety of forms. A plurality of perforations have been successfully used, but there is a greater tendency for them to become clogged and, although this may be relieved by striking the pipes with a mallet, it entails a duty on the attendant and introduces possible human error that is best avoided.

During their descent, the sheets of saturant issuing from the slots spread sufficiently to cover the zones referred to and liberate the volatile contents of the bubbles.

The adjustment of the pressure in the pipe 23, and, therefore, in the pipes 20, is arrived at empirically and is correct when no appreciable apparent rise in the level of the saturant in the bath takes place.

I claim as my invention:

1. In a saturator, a tank for saturant, a series of pipes spaced apart with respect to the vertical and delivering saturant to the tank in corresponding zones, a series of upper loop-forming rolls, each located in the

vertical space between two adjacent pipes and a lower series of loop-forming rolls located in the tank, whereby a sheet passed alternately about the upper and lower rolls  
5 may form a series of loops, alternate ones of which open upwardly and span the zone of delivery by corresponding pipes.

2. In a saturator, a tank for saturant, a series of upper rolls spaced apart with respect to the vertical, a series of lower rolls  
10 adjacent to the bottom of the tank and also spaced apart with respect to the vertical, and a series of delivery pipes for saturant above the surface of the liquid alternating with the  
15 upper rolls.

3. In a saturator, a tank for saturant, two series of upper and lower loop-forming rolls for directing a sheet in a series of loops into and out of saturant in the tank, and means  
20 for showering saturant on the surface of the saturant in the tank between the entry of a loop into and its exit therefrom.

4. In a saturator, a tank for saturant, means for delivering a shower of saturant  
25 to the surface of the saturant in the tank in a zone transverse thereto, and means to pass a sheet to be saturated downwardly into the saturant at one side of said zone and upwardly out of the saturant at the opposite  
30 side thereof.

5. The process of saturating bibulous sheets which includes passing a sheet downwardly into and upwardly out of a body of saturant and showering the surface of the  
35 saturant between the entry and exit of the sheet therefrom.

6. In an impregnating device having a tank of heated impregnating compound, means to prevent vapors and gases released  
40 by the substance to be impregnated from causing foaming and ebullition which includes a conduit and discharge orifices therefor arranged to project a supply of the impregnating compound upon the exposed surface of the same compound in the tank.  
45

7. Means to prevent foaming and ebullition in impregnating tanks having a liquid impregnating compound therein, including  
50 a conduit opening near the bottom of said tank, a pump, a distributing conduit located above the tank and discharge openings therefor whereby streams of impregnating compound are directed upon the surface of the liquid to destroy the bubbles thereon as they  
55 are formed.

8. An impregnating device having a tank adapted to contain a heated liquid impregnating compound, means to introduce material to be impregnated into the compound  
60 and to withdraw the same therefrom and means to prevent gases and vapors released from the material within the body of the liquid from causing foam upon the surface of the liquid.

65 9. In an impregnating process wherein the

introduction of the material to be impregnated releases large volumes of vapors and gas in the impregnating liquid, the step of destroying bubbles and foam caused by the ebullient gases which consists in showering  
70 the surface of the liquid with a supply of the same liquid, whereby the bubbles are destroyed by mechanical impact.

In testimony whereof I affix my signature.

EDWARD A. LEONARD.