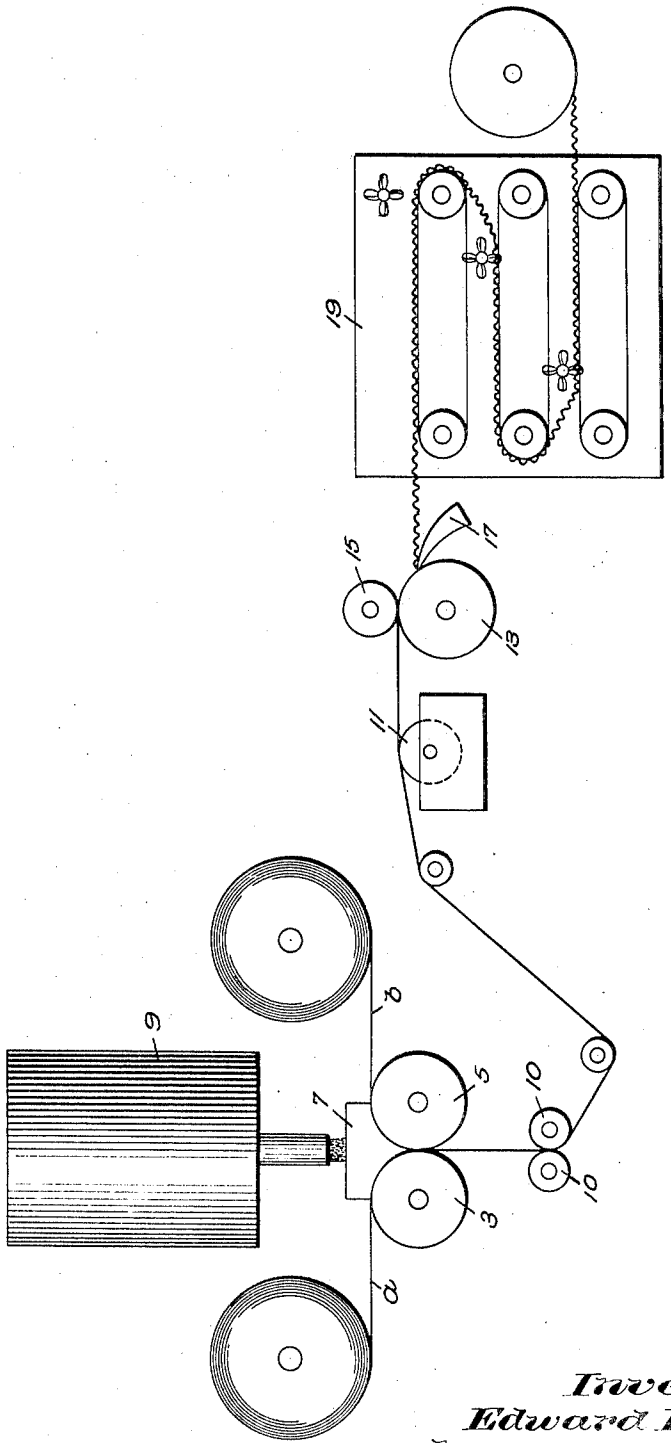
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E. H. ANGIER

CRÊPING PAPER

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Inventor:
Edward H. Angier,
by Emery, Booth, Jamney & Varney
Attys.

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EDWARD H. ANGIER, OF FRAMINGHAM, MASSACHUSETTS.

CRÊPING PAPER.

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This invention relates to a method of producing crêped paper embodying a layer of waterproofing material such, for instance, as asphalt. It finds particular application to the production of crêped duplex paper comprising two paper layers cemented together by an intervening waterproofing layer.

The invention will be well understood by reference to the following description of a preferred method of preparing a duplex paper in accordance therewith when taken in connection with the accompanying drawing diagrammatically illustrating the same.

Duplex paper for wrapping and packing purposes consisting of two sheets of substantial paper, such, for instance, as kraft paper, cemented together by a layer of asphalt, commonly the pitchy residue of petroleum distillation, applied in melted form is well known. Such paper may be crêped by the roll and doctor crêping process essentially as described in the patent to Arkell, No. 790,021, granted May 16, 1905. For this purpose a completed duplex paper has been saturated thoroughly in water, deposited on a crêping roll and pressed into firm adherence thereto and then crowded back on itself by a doctor blade cooperating with the roll which at the same time stripped the paper from the roll in crêped or crinkled condition. In this process a very thorough saturation is necessary to penetrate the paper and prepare it for the crêping operation. In particular it is necessary to employ a hot bath both to assist the saturation of the paper, since the sizing thereof resists the penetration of moisture, and also to soften the solid asphalt layer between which has a certain stiffness and unless heated in this manner will not conform properly to the crêping roll or be sufficiently fluid to permit the crêping operation to be efficiently effected. In this saturation a part of the sizing of the paper is removed.

In accordance with my invention I duplex and crêpe paper as a continuous process. Waterproofing material in a watery vehicle is applied in fluid form to the paper which is immediately crêped. Thus instead of coating the paper with melted asphalt I may utilize an emulsion prepared by mixing the asphalt with clay, such as bentonite, and beating it into water. Referring to the drawing, I there illustrate two webs of paper *a* and *b* as drawn from supply rolls and passing down between a pair of horizontally arranged rolls 3 and 5 in face to face relation. Suitable end walls 7 are placed near the ends of the rolls and define with the opposed cylindrical surfaces of the rolls a trough-like structure. The asphalt emulsion in the form of a thick fluid, almost a paste in consistency, may be delivered to this trough from a suitable container diagrammatically illustrated at 9 and is thus fed to the opposed faces of the webs *a* and *b* overlying the sides of this trough. The spacing of the rolls 3 and 5 will accurately determine the amount of the emulsion which is thus introduced between the two layers of paper. Passing from the pair of rolls 3 and 5, the two webs *a* and *b* may then be passed through a pair of squeeze rolls 10. These will cause the two webs to cohere with considerable tenacity and will also assist in driving the water which forms the vehicle of the asphalt emulsion into the paper. An emulsion of this character is a mechanical mixture as distinguished from a solution and it seems probable that the paper blots out, as it were, a certain amount of the moisture and that the pressure of the squeeze rolls may squeeze some of the moisture out from the solid matter in a way which may be figuratively compared to the squeezing of water from a sponge. In any event the compound web passing from the squeeze rolls has considerable coherence and the paper is damp and in a good condition for crêping.

The compound web may be moistened on the outside, as by means of a coating roll 11, to secure its proper adhesion to the crêping roll and, if desired, this moistening may be effected by means of water containing size or dextrin or like material having adhesive properties. The web is then led to the crêping roll 13 against which it is firmly pressed by a squeeze roll 15 and is crowded back on itself while adhering to the crêping roll by means of the doctor blade in well known manner. The crêped duplex web is then dried in any suitable manner as indicated by the diagrammatic showing of the drier 19 and may be rewound for use.

The asphalt emulsion may be prepared in any desired quantities and stored and diluted as necessary for use when desired. In the crêping process as described no heat need be employed, an expensive and oppressive feature of those processes in which the asphalt

is applied in a melted condition and in which hot water is required to saturate the duplex paper. The layer of emulsion carried in the compound web *a—b* to the crêping apparatus has at that time no stiffness and heat is not necessary to prepare it for the crêping operation. It will be noted that the prolonged soaking of the paper in a saturating bath is done away with as moisture is introduced with the asphalt emulsion between the layers of the paper. When introduced in this manner it penetrates readily and may be distributed through the body of the paper in the manner described. Probably a lesser amount of water is required properly to prepare the paper for the crêping operation but, certainly, the softening of the paper by the crêping operation in a uniform manner is more readily and conveniently effected than in the case where dry completed duplex paper is passed through a saturating bath. The crêped product is distinguishable from the product prepared by the old method, having a more leathery and tough appearance and feeling.

I have described in detail one particular method by which my invention may be practiced. Obviously the details described are not essential to the invention in its broader aspects but may be considerably varied without departing from the spirit of the invention.

What I claim as new and desire to secure by Letters Patent I shall express in the following claims:

1. A method of producing waterproofed crêped paper which comprises applying waterproofing material in a watery vehicle to the paper simultaneously to wet the same and to distribute the waterproofing material thereover, crêping the moist paper and drying the same to expel the vehicle and to deposit the waterproofing material.

2. A method of producing crêped waterproof duplex paper which comprises introducing between layers of paper waterproofing material in a water vehicle simultaneously to wet the paper and to distribute the waterproofing material thereover, crêping the moist layers as one and drying the same to expel the vehicle and to deposit the waterproofing material.

3. A method of producing crêped duplex paper which comprises duplexing two layers of paper with pitch suspended in a watery vehicle, crêping the product while softened by such vehicle and drying the crêped product.

4. A method of producing crêped paper which comprises leading together two paper webs, pouring an asphalt emulsion between them, pressing them together, leading the connected webs directly to a crêping apparatus and drying the crêped product.

5. A method of crêping paper comprising applying to the paper a pitch emulsion both to provide a coating for the same and to soften it by the moisture of the vehicle, depositing the moist paper on a crêping roll, crowding it back on itself while adhering to said roll and drying the resulting product.

6. A method of crêping paper comprising introducing a layer of emulsified pitch between two layers of paper, pressing together the layers to cause them to cohere and to assist the wetting of the paper by said emulsion, causing the compound layer to adhere to a crêping roll, crowding it back on itself while adherent thereto and drying the crêped product.

In testimony whereof, I have signed my name to this specification.

EDWARD H. ANGIER.