Aug. 10, 1926. 1,595,637

W. M. WHEILDON

WATERPROOF PAPER AND METHOD OF PRODUCING THE SAME

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Fig. 1.

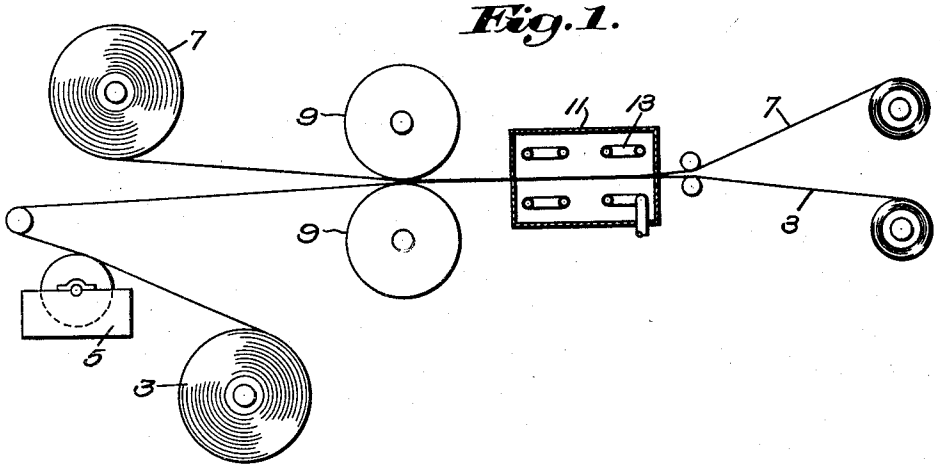
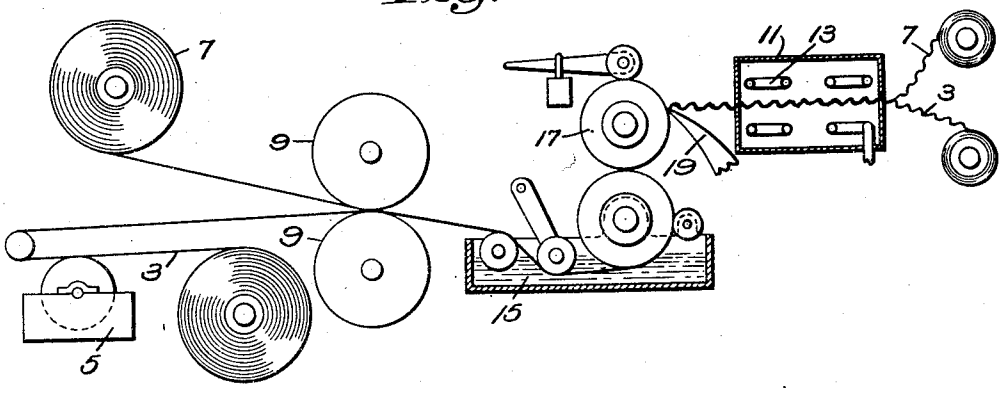


Fig. 2.



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UNITED STATES PATENT OFFICE.

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WATERPROOF PAPER AND METHOD OF PRODUCING THE SAME.

Application filed June 16, 1921. Serial No. 478,138.

This invention relates to waterproof papers and to a method of producing the same. The more particular purpose is to provide a waterproof paper of substantial strength adaptable for wrapping purposes and yet one which may be of relatively light weight. The invention is also particularly applicable for producing in waterproof form papers which are converted, that is, subjected to the action of some mechanism or process to change their properties from those of ordinary finished paper.

My invention will best be understood by reference to the following description taken in connection with the accompanying drawings, wherein:—

Fig. 1 is a diagrammatic view illustrating a method of producing waterproof paper; and

Fig. 2 is a similar view illustrating the production of waterproof craped paper.

The nature of the improved waterproof paper which forms the subject of my invention may be conveniently understood by a description of a method of making the same. Referring, therefore, to Fig. 1, I there show at 3 a roll of paper which is preferably of the kind known as kraft or similar paper having a body of substantial strength as contrasted with loose felt-like and bibulous material. One face of the web 3 may be coated with a suitable waterproofing material having adhesive properties and for this purpose I prefer to use what is known as black asphalt, a bituminous product which is the pitchy residue of oil distillation. A second web of paper 7 is led from its supply roll and superposed on the coated face of the web 3 and the two are united by means of squeeze rolls 9, thus providing a duplex web consisting of sheets of paper with an intervening layer of asphalt, the whole presenting at the outside clean surfaces of paper and forming an easily handled unit. The duplex web is then subjected to heat as indicated diagrammatically in Fig. 1 by the drier chamber 11 containing steam pipes 13 to such extent as to melt the fusible asphalt and to absorb it into the body of the two sheets 3 and 7. This process is carried on until the asphalt coating is substantially entirely absorbed and the two sheets 3 and 7 then readily separate and may be wound up separately as indicated at the right of the figure.

The resulting product is a paper which, while it may be relatively thin, is of a strong, resistant character like ordinary kraft paper and which is saturated with pitch. That is, the pitch is absorbed completely into the body of the paper to provide an impervious layer. By saturation I do not mean that the maximum possible amount of pitch is applied to the paper. In fact the best results are obtained from the use of a lesser amount of waterproofing material giving the paper adequate water-resisting properties while leaving it non-tacky and in a condition wherein it may be readily handled. The process described makes it possible to predetermine the amount of waterproofing material applied to the paper. The coating originally applied to the sheet 3 is drawn in to the body of the paper in such a way that the improved waterproof paper presents a non-tacking surface. That is, the asphalt is not on the outside of the paper in such a manner that it may stick to or smear adjacent articles on which the paper is used.

My invention is particularly applicable to the production of papers which are in some way processed and, in particular, where this process entails a wetting of the original finished paper the results are particularly advantageous. Thus in Fig. 2 of the drawing I there show diagrammatically the production of waterproof craped paper of a nature similar to that described in Fig. 1 but also provided with crapes to render the same expansible and elastic. The two webs of paper 3 and 7 as before are united by an intervening layer of asphalt. The completed duplex web may then be passed through the saturating bath 15 of a craping machine of ordinary type, caused to adhere to the craping roll 17 and while adherent thereto crowded back on itself by the doctor blade 19, the moist web being craped by the action of the doctor in well known manner. The moist craped web then passes to the drying chamber 11. The web is dried and the crinkling made permanent but the heating is continued as before in such manner that the asphalt is absorbed completely by the paper so that the webs 3 and 7 may be separated, each as a single craped

thickness of paper efficiently waterproofed.

It will be noted that by the process described the waterproofing material is inserted between the webs 3 and 7 and the resulting duplex web can be acted upon by machinery such, for example, as a craping machine without any danger of the asphalt smearing or gumming any of the machine parts. Furthermore, while the waterproofing is placed between the two webs of paper, it offers no resistance to the softening of these outside webs by the saturating bath 15 in order to make the paper fit for craping. Thereafter the necessary drying step for drying the craped paper is combined with the heating which causes absorption of the asphalt with resultant economy. The soaking of the paper for craping purposes also opens the pores thereof and renders it more penetrable by the waterproofing pitch which is later absorbed into the same.

The material produced by the process illustrated in Fig. 2 is a single thickness of strong paper, waterproof but having a non-tacking surface which is irregularly craped. The rough surface of ordinary craped paper causes difficulties if it is attempted to waterproof the material after craping. In the present instance the asphalt is uniformly applied to the uncraped sheet and all parts are treated with the same. On the other hand, if a single sheet of uncraped material were effectively waterproofed, it would resist the softening action of the bath 15 of the craping machine or this bath would adversely affect the waterproofing material and perhaps cause it to run and smear and gum the machine parts. In the present instance this does not take place and the two webs 3 and 7 absorb the waterproofing material after they have been craped, which waterproofing material has been applied before the craping operation in such a manner that it does not adversely affect that operation.

Having thus described in detail the particular embodiment of my invention shown by way of example in the accompanying drawing, what I claim as new and desire to secure by Letters Patent I shall express in the following claims.

Claims:—

1. A waterproof paper consisting of a crinkled base impregnated with pitch and having a non-tacking surface.

2. The method of preparing craped waterproof paper comprising connecting two layers with fusible adhesive waterproofing material, wetting the duplex layer and craping the same and then heating it to absorb the material in the layers and separating them.

3. The method of preparing in waterproof form sheet material which is finished by a process involving wetting the same characterized by joining two layers of unprocessed sheet material by fusible adhesive waterproofing material, processing the assembly and then heating them to absorb the waterproofing material into the layers and separating them.

4. The method of preparing in waterproof form paper which is converted by the action of mechanism thereon characterized by joining two layers of unprocessed material by waterproofing adhesive to provide a duplex unit which may be handled by such mechanism without smearing or gumming of the same, processing the duplex unit, and therafter absorbing such adhesive into the layers and separating the same.

5. The method of preparing paper having bituminous waterproofing material absorbed into the body thereof comprising assembling two sheets with said waterproofing material interposed and heating the assembly to absorb the material into the sheets.

6. The method of preparing paper having bituminous waterproofing material absorbed into the body thereof comprising superficially coating a sheet with such material, applying a second sheet thereof and heating the assembly to absorb the material into the sheets.

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

WILLIAM M. WHEILDON.