

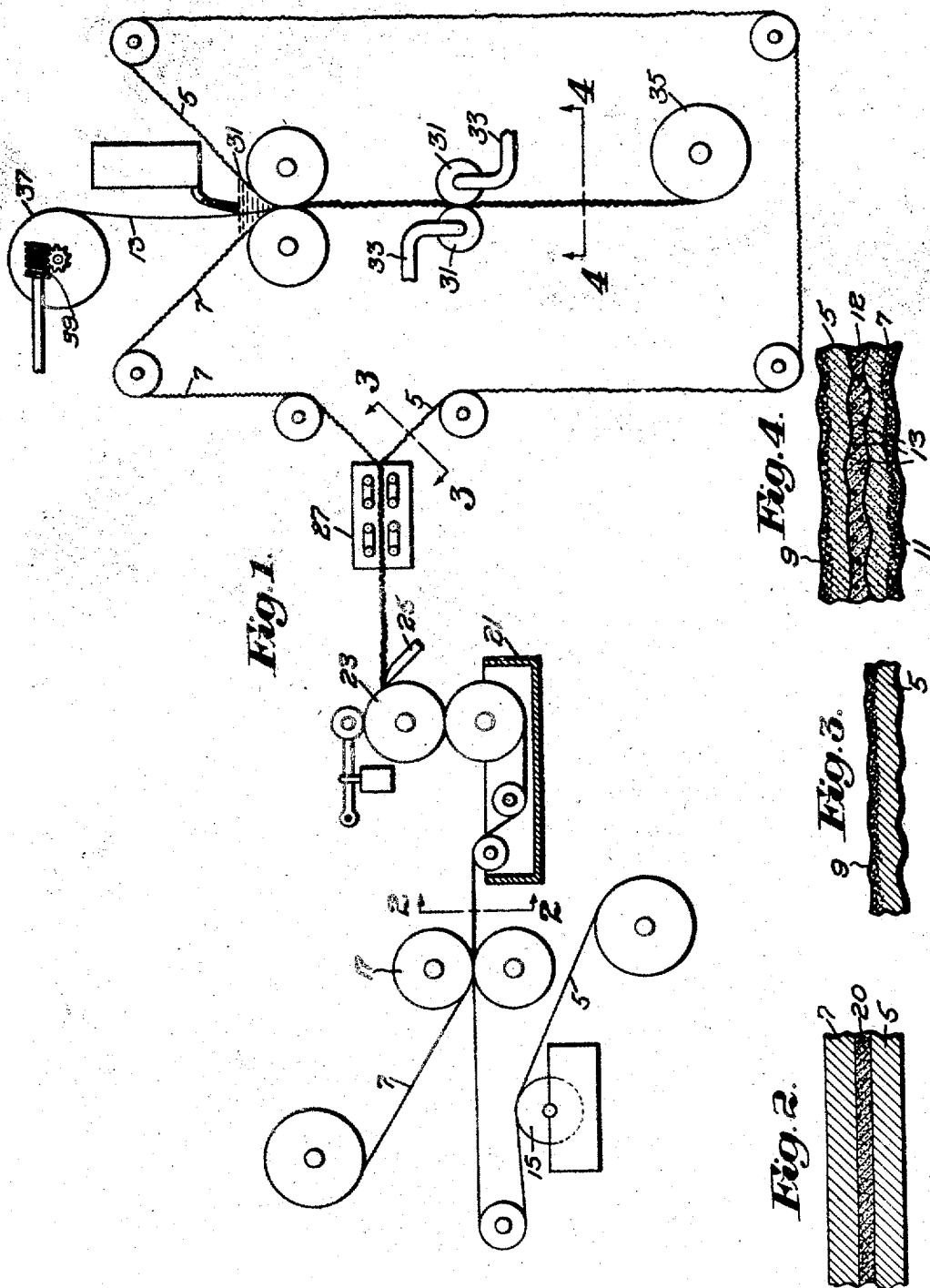
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E. H. ANGIER

1,974,594

REINFORCING PAPER

Original Filed Nov. 29, 1930



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UNITED STATES PATENT OFFICE

1,974,594

REENFORCING PAPER

Edward H. Angier, Framingham, Mass., assignor
to Edward H. Angier, as trusteeOriginal application November 29, 1930, Serial
No. 499,065. Divided and this application De-
cember 29, 1931, Serial No. 583,621

3 Claims. (Cl. 154-2)

This invention relates to the production of re-
inforced sheet material such as paper reenforced
with textile strands, which may be woven to-
gether into a fabric, and the object is to provide
an improved method of preparing such paper, for
example, for use as a building paper which will
have superior qualities of cohesiveness, strength
and resistance.

My invention will be well understood by refer-
ence to the following description of an illustrative
embodiment thereof taken in connection with the
accompanying drawing, wherein:—

Fig. 1 is a diagrammatic view of a process for
producing a paper such as referred to; and

Figs. 2, 3 and 4 are broken, fragmentary, dia-
grammatic sections through the product at vari-
ous stages of the process, as indicated by the sec-
tion lines 2—2, 3—3 and 4—4 of Fig. 1 respec-
tively.

I have herein disclosed my invention as a step
in the production of the type of paper disclosed
in my application Serial No. 499,065, filed Nov.
29, 1930, of which this application is a division.
The product shown in Fig. 4 comprises an ex-
pansible paper consisting of two craped sheets.

In the preferred form of the invention illus-
trated in the accompanying drawing I provide
(see Fig. 4) an expansible paper consisting of
two craped sheets 5 and 7, each of which is im-
pregnated with water-resisting material which
may be black asphalt or similar bituminous ma-
terials or mixtures forming at the outer face
of each sheet and absorbed, substantially con-
tinuous film 9 and 11 respectively, the surface
of the paper, however, not being tacky or sticky
to the touch; the two sheets 5 and 7 receiving
between them a layer of water-proofing ma-
terial 12, which layer may carry embedded in
the body thereof strands 13, preferably reticu-
lated into a fabric, which will serve to reenforce
the assembly as a whole and also to position
the intervening layer 11, as will appear as the
description proceeds.

The construction of the paper will be more
fully understood from a description of Fig. 1
wherein I have illustrated diagrammatically and
as if a continuous process a method of produc-
tion. It will be understood that the process need
not be thus continuous and that various fea-
tures illustrated may or may not be used in all
cases. For instance, I have herein disclosed the
sheets 5 and 7 in the completed product as be-
ing rendered expansible by craping but for cer-
tain purposes the product may be made with
plain inexpandible paper.

Referring now to Fig. 1 of the drawing, two webs
5 and 7 of sheet material, which conveniently
may be a strong-bodied paper of the kraft type,
are led from supply rolls, one, such as 5, over a
coating roll 15 which supplies a regulated amount
of waterproofing material of an adhesive char-
acter such as asphalt or other bituminous ma-
terial to a face thereof and the two of them are
pressed together by squeeze rolls 17 with the as-
phalt layer 20 between them, as illustrated in Fig.
2. This duplex assembly is in condition to be
prepared for craping by being wetted in the water
tank 21 and led over and pressed against the crap-
ing roll 23 to be crowded back on itself and craped
by the doctor blade 25 in well known manner.
The duplex craped assembly may be then led
through a heating chamber 27 which may fuse
the intervening film 20 causing it to be absorbed
in the adjacent faces of the webs 5 and 7, and
the two craped webs may then be separated, as
indicated in Fig. 1 at the right of the chamber 27.
In Fig. 3 is shown diagrammatically one of the
two resulting sheets. The face of this web 5 which
formerly opposed the web 7 has absorbed into it
a portion of the material 20, as indicated by the
stippling 9, and the other web 7 has similarly ab-
sorbed into it a quantity of the coating material,
as indicated by the stippling 11. I prefer so to
control the amount of material 20 and the heat-
ing that the absorbed material only partly pene-
trates the webs as indicated in Fig. 3, and, while
none of it remains to form a tacky surface on what
in the finished product will be an exterior face,
the material at 9 and 11 only superficially enters
the body of the web and forms substantially a
continuous film resisting penetration of moisture.

The uncoated faces of the webs 5 and 7 are then
united with an intervening layer 12 of asphalt or
the like between them, and I have herein shown
them as led down through the bite of a pair of
rolls 29 between which rolls is maintained a pool
31 of fluid asphalt. From these rolls the two
webs thus united and duplexed may be led through
a pair of rolls 31 which are heated as indicated
diagrammatically by the showing of the steam
pipes 33, and the assembly thus heated sufficiently
to draw part of the intervening layer 12 into the
body of the paper not previously impregnated with
the material supplied from the layer 20 and now
appearing in the form of the films 9 and 11. The
amount of asphalt supplied is so generous and
the heating is so carried on that the intervening
layer 12 is not completely absorbed into the two
sheets as is the layer 20 but remains as a substan-

tial continuous layer between the two webs, as indicated in Fig. 4.

In Fig. 1 I have also illustrated diagrammatically an improved method of combining strand material 13 with a multi-ply paper. This strand material 13, which may take the form of a loosely woven fabric such as burlap of about $\frac{3}{8}$ " or $\frac{1}{4}$ " mesh, may be fed from a supply roll 37 through the pool 31 of impregnating material in such manner that the sheet of strands is impregnated and also picks up and carries with it a substantial layer of the molten material before contacting with the webs. The reinforcing material 13 is preferably supplied slackly, as indicated diagrammatically in the figure by the showing of a drive 39 for roll 37.

When a reinforcement of strands is incorporated in a paper structure in the manner described, it is not merely pasted between the two webs or to their faces but, as illustrated in Fig. 4, is embedded in the layer 12 of waterproofing material. An important function of such a material under these circumstances is to position such a layer between the two webs 5 and 7 to resist displacement or flow thereof in such manner as might leave thin or bare spots between the two webs.

The improved product shown is applicable to various uses. Among them may be mentioned, in the case where the webs 5 and 7 are paper material of strong body, use as a building paper to be embodied in a building structure, as described in my application Serial No. 499,064, filed Nov. 29, 1930. In this case the webs 5 and 7 are preferably craped as shown so that the material may expand under the strains which the building undergoes after erection. The substantial layer of material 12 interposed between the webs serves to seal about the nails or similar fastenings by which the paper is secured in position in the structure.

I am aware that the invention may be embodied

in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive; reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

I claim:

1. A method of preparing reenforced waterproof paper which comprises leading opposed webs of paper downwardly in converging path to a horizontal line of opposition along which they are pressed together, maintaining a pool of adhesive waterproofing material in the trough formed between the webs and leading spaced reinforcing strands through the pool to said line.

2. A method of preparing reenforced waterproof paper which comprises leading opposed webs of paper downwardly in converging path to a horizontal line of opposition along which they are pressed together, maintaining a pool of adhesive waterproofing material in the trough formed between the webs and leading an open-meshed reticulated reinforcement defining substantial spaces between the elements thereof through said pool whereby its elements are saturated and it picks up a layer of said material and then past said line between the webs with the layer of material carried thereby.

3. A method of preparing reenforced waterproof paper which comprises leading opposed webs of paper downwardly in converging path to a horizontal line of opposition along which they are pressed together, maintaining a pool of adhesive waterproofing material in the trough formed between the webs and leading first through the pool a sheet of spaced strands adapted to pick up and to hold between the individual strands a layer of the material and then past said line between the webs.

EDWARD H. ANGIER.

CERTIFICATE OF CORRECTION.

Patent No. 1,974,594.

September 25, 1934.

EDWARD H. ANGIER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, line 33, for "and absorbed" read an adsorbed; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of October, A. D. 1934.

(Seal)

Leslie Frazer
Acting Commissioner of Patents.

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