

No. 768,834.

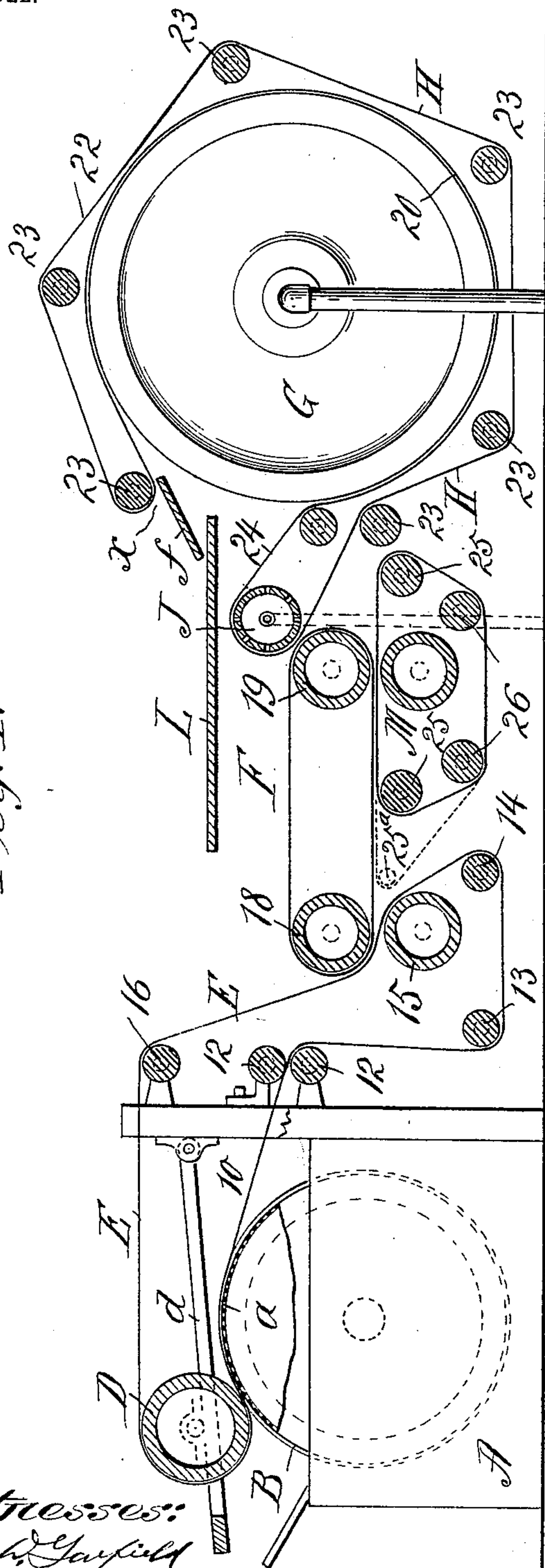
PATENTED AUG. 30, 1904.

J. WALSH.
PAPER MACHINE.

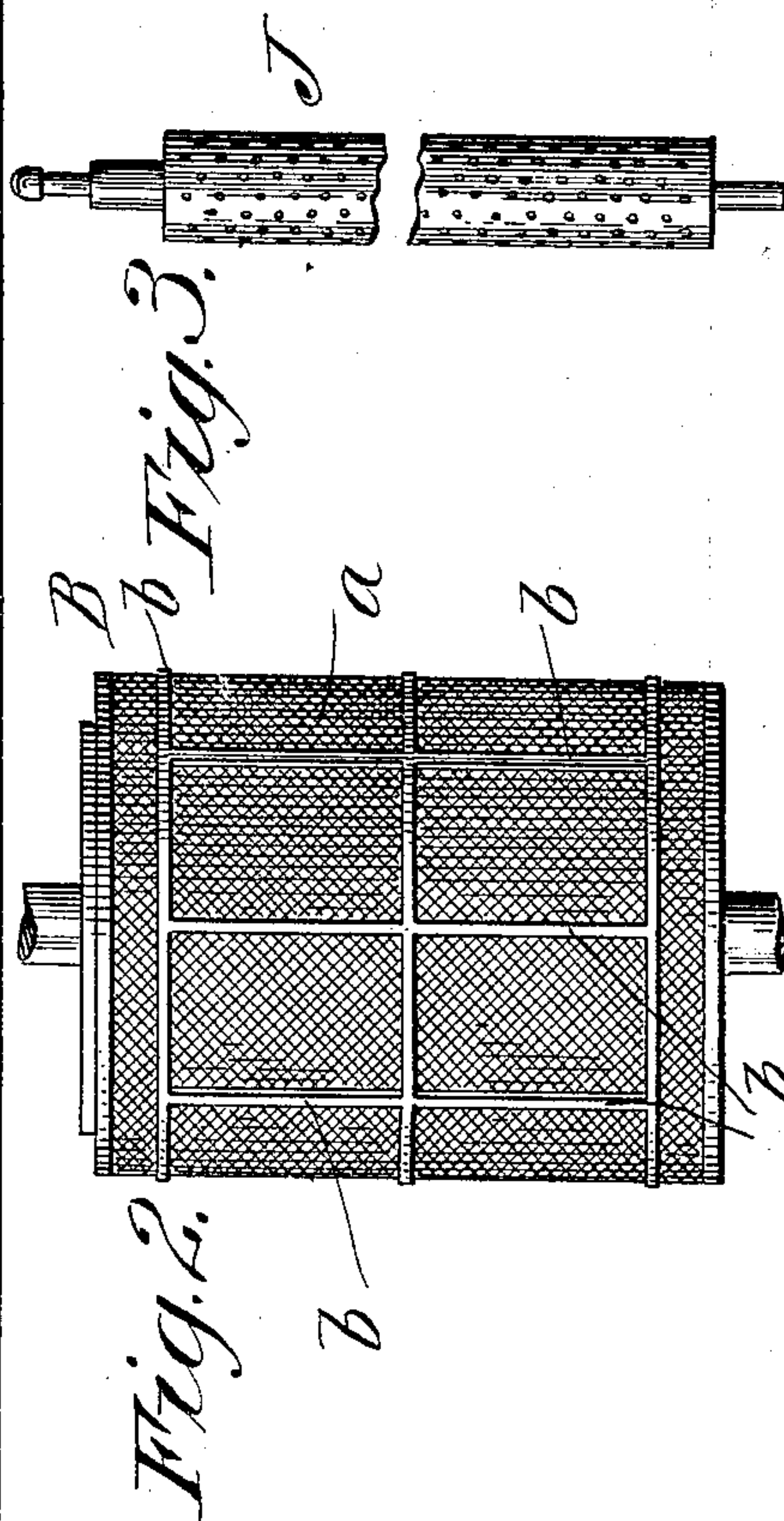
APPLICATION FILED OCT. 21, 1903.

NO MODEL.

Fig. 1.



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UNITED STATES PATENT OFFICE.

JAMES WALSH, OF HOLYOKE, MASSACHUSETTS.

PAPER-MACHINE.

SPECIFICATION forming part of Letters Patent No. 768,834, dated August 30, 1904.

Application filed October 21, 1903. Serial No. 177,837. (No model.)

To all whom it may concern:

Be it known that I, JAMES WALSH, a citizen of the United States of America, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Paper-Machines, of which the following is a full, clear, and exact description.

This invention relates to improvements in paper-making machines of the cylinder type, the object thereof being to provide a machine for the production of paper of unusual simplicity in construction and organization and efficiency in operation.

Another object is to render the machine capable of producing individual sheets of paper in rapid succession.

The invention consists in the combination and arrangement of parts and the construction of certain of the parts, all substantially as hereinafter fully described, and set forth in the claims.

In the drawings, Figure 1 is substantially a vertical sectional view as taken centrally through the length of the machine. Fig. 2 is a plan view of the cylinder. Fig. 3 is a plan of the suction-cylinder.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A indicates the vat or tank for the paper-pulp, having rotatably partially submerged thereon on a horizontal axis the cylinder B, as usual, the peripheral wall *a* of said cylinder being constituted by a screen or other foraminous material. The screened peripheral wall of the cylinder has divisional strips *b*, which may be of metal, such as solder, or the same may be constituted by a non-metallic substance.

D represents the coucher-roll mounted in journal-bearings on the hinged supporting-frame *d* therefor and arranged to roll peripherally adjacent the cylinder.

E represents an endless felt having a width approximately that of the length of the cylinder, the same running around the coucher-roll, the lower course 10 thereof upon the upper unsubmerged part of the cylinder, then between the pair of rolls 12 12 outside of the vat, thence downwardly to and partially

around the roll 13, forwardly to and around the roll 14, thence with a return course toward the vat upwardly and rearwardly partially around the roll or cylinder 15 to and around the guide-roll 16, the upper course of this felt band or belt returning to and around the coucher-roll.

Above and adjacent the roll 15 is a roll 18, forwardly beyond which and axially parallel therewith is a similar roll 19, around which rolls 18 and 19 is a comparatively wide belt or band F, which advantageously may be of flexible rubber or similar composition of rubber, and this rubber band F in its passage around and under the roll 18 and adjacent the roll 15 is brought in practice in proximity to or surface contact upon the felt band or apron E.

G represents a drier-drum having steam inlet and outlet, as usual, and around the same is disposed in a peculiar manner an endless felt band or apron H, an inner loop-like course 20 thereof nearly encircling and in surface contact against the periphery of the drier-drum, while the outer course 22 thereof is guided around and supported by the series of rolls 23, a looped portion or bight 24 of this felt running around in contact with the periphery of a suction-cylinder J, horizontally mounted axially parallel with and adjoining the one, 19, of the pair of rubber blanket-supporting rolls or cylinders 18 and 19.

L represents a table horizontally located above the suction-box and roll 19 and in a position to receive the sheets of paper completed thereupon after the same are brought off from the drier-cylinder G, *f* representing a guide to lead the sheets from between the endless carrier-band H and the drier-cylinder onto the table.

M represents an endless band or apron, which may be of felt or other suitable material, the upper course of which runs between and is supported by the pair of rolls 25 25, and the said upper course of this band or apron M is in facewise contact with and next under the whole or a portion of the under course of the aforementioned rubber apron F, the dotted-line representation of a roll 25^a indicating a guide-support for a looped part

of the apron M, closely in relation to the pair of rolls 18 and 15, which arrangement may be carried out, if desired, in preference to that shown by the full lines.

5 It has been deemed unnecessary to here illustrate mechanism for imparting the rotary motion to the various cylinders and rolls, which motion, of course, is understood as imparting the progression to the endless bands
10 or aprons mentioned, and in the drawings for the purpose of clearness of indication of the courses of contiguous portions of some of the endless bands or aprons such contiguous portions are represented as in slight separation—as, for instance, where the apron E
15 comes to proximity between rolls 18 and 15 with the apron F and where the apron M is in facewise proximity to the under course of the apron F; but these approximate parts
20 are understood in actual construction and operation as running in facewise contact, except of course when sheets of paper are carried thereupon.

In the operation the stuff or pulp taken
25 from the vat A onto the peripherially-screened cylinder having screen-stoppering strips b, and thereby having the laid-on web individualized or produced after being transformed finally
30 into separate sheets, is carried off at and then around the coucher-roll and horizontally forwardly and then downwardly to contact with the under course of the apron F, to which the web-sheets will adhere or be caused to adhere, the apron E having its course of de-
35 parture at the roll 15 away from the said lower course of the rubber or otherwise-constituted apron F. The web-sheets forwardly produced along and with the course of the apron F are carried at the roll 19 to and face-
40 wise against the felt apron H, which has its running course around the suction-cylinder J, such apron now carrying the nearly-completed sheets of paper around on the circumferential surface of the drier-cylinder between
45 such surface and the inner course 20 of the said felt apron, the sheets emerging at x onto the support L therefor.

The apron H may be of such a light and porous kind of felt as not to defeat the suc-
50 tion action exerted in and by the suction-cylinder J on the web-sheets directly through such felt at its portion in running contact around and upon the suction-cylinder.

The web-forming and paper-making opera-
55 tion carried out by this machine for the production of the sheets initially individualized at the cylinder because of the subdividing-strips b of refractory or non-porous substance insures the making of paper of as fine or
60 coarse quality as desired and as corresponds to the stuff or pulp employed in a highly satisfactory and rapid manner, and the sheets will have the edges thereof rendered somewhat even or feathery and with the character-
65 istic of deckle-edged paper.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a paper-machine, the combination with a pulp-vat, the cylinder, an endless apron and
70 a coucher-roll, and one or more further supporting and guiding rolls for said apron, whereby the latter has its course of movement therearound and around the coucher-roll, and with a portion thereof in contact
75 against an upper portion of the cylinder, of a second endless apron, and rolls therefor, one of which and a portion of the apron therearound adjoins the first-named apron, a drier
80 and an endless carrier, running therearound, and a suction-cylinder around which a loop of said carrier runs, and which is in proximity to one of the rolls for the said second apron.

2. In a paper-machine, the combination with the vat, the cylinder, the endless apron E, and
85 the coucher-roll and other rolls pertaining to said apron and around which it runs, a pair of rolls 18 and 19, the one 18 having its position adjoining a course of said apron, and the apron
90 F running around said rolls 18 and 19, and a suction-cylinder adjacent and coacting with said apron F and one of the rolls therefor.

3. In a paper-machine, the combination with the vat, the cylinder, the endless apron E and
95 the coucher and other rolls pertaining to said apron and around which it runs, a pair of rolls 18 and 19, the one 18 having its position adjoining a course of said apron, and the apron
100 F running around said rolls 18 and 19, an endless apron M having its upper course in running proximity to the lower course of the apron F, and supporting and guiding rolls for said apron M.

4. In a paper-machine, in combination, a pulp-vat, the cylinder, an endless apron E, and
105 the coucher-roll, and one or more further supporting and guiding rolls, for the said apron, whereby the latter has its course of movement therearound and with a portion thereof in contact against an upper portion of the cyl-
110 inder, a second endless apron F, and rolls therefor, one of which and a portion of the apron therearound adjoins the first-named apron, a drier-drum, a series of rolls 23, arranged thereabout, and a suction-cylinder in
115 proximity to one of the rolls for the said second apron, and an endless carrier around the said drum, said series of rolls 23 and around the suction-cylinder and comprising an inner course in contact against the drier-drum and
120 an outer course in contact on the series of rolls 23, said inner and outer courses merging one into the other at and around the suction-cylinder.

5. In a paper-machine, the combination with
125 the pulp-vat, and the cylinder, having its peripheral wall composed of a screen-like material provided with non-porous portions extending in web-dividing lines thereupon, an endless apron for receiving and carrying the
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successive sheet-webs, and suction means for withdrawing the moisture from the sheet-webs.

6. In a paper-machine, the combination with
5 the pulp-vat and the cylinder, having its peripheral wall composed of a screen-like material provided with non-porous portions extending in web-dividing lines thereupon, an
10 endless apron for receiving and carrying the successive sheet-webs, suction means for withdrawing the moisture from the sheet-webs, and a drier-drum, and means for carrying the sheets from the web-carrying apron and suction means around on the surface of said drum.

7. In a paper-machine, in combination, the
15 pulp-vat, the cylinder rotatable therein, and having its peripheral wall constituted by screen-like material having web-separating portions of non-porous material thereon, the
20 coucher-roll D adjoining the cylinder, and the roll 15 remote therefrom and further rolls 12, 13, 14, and 16, and the endless apron E in running engagement around and relatively to the said rolls, the pair of rolls 18 and 19, one
25 of which adjoins the roll 15, and the endless apron F of rubber, running therearound, the apron M located below and with a course thereof next to the lower course of the apron F, and supporting guide-rolls for said apron,
30 the suction-cylinder J adjacent the roll 19, the drier-drum located forwardly beyond the aforementioned appliances, and having a series of guide-rolls 23, disposed thereabout and separated therefrom, and an endless felt apron H
35 arranged in the form of a double-coursed loop, a bight of which runs around suction-cylinder, the inner course thereof extending therefrom in contact on the periphery of the drier-drum, while the outer course thereof is in
40 running contact around the said series of

guide-rolls 23, all arranged for operation substantially as and for the purposes set forth.

8. In a paper-machine, in combination, the
pulp-vat, the cylinder rotatable therein, and having its peripheral wall constituted by 45 screen-like material having web-separating portions of non-porous material thereon, the coucher-roll D adjoining the cylinder, and hinged frame *d* therefor, the roll 15 remote from roll D, and further rolls, 12, 13, 14, and 50 16, and the endless apron E in running engagement around and relatively to the said rolls, the pair of rolls 18 and 19, one of which adjoins the roll 15, and the endless apron F running therearound, the apron M located 55 below and with a course thereof next to the lower course of the apron F, and supporting guide-rolls for said apron, the suction-cylinder J adjacent the roll 19, the drier-drum located forwardly beyond the aforementioned ap- 60 pliances, and having a series of guide-rolls 23, disposed thereabout and separated therefrom, an endless felt carrier-apron H arranged in the form of a double-coursed loop, a bight of which runs around suction-cylinder, the 65 inner course thereof extending therefrom in contact on the periphery of the drier-drum, while the outer course thereof is in running contact around the said series of guide-rolls 23, the support L adjacent the drier-drum and 70 onto which the carrier-apron H delivers the sheets of paper, and a guide *f* between the carrier-apron H and said support.

Signed by me at Springfield, Massachusetts,
in presence of two subscribing witnesses.

JAMES WALSH.

Witnesses:

WM. S. BELLOWS,
A. V. LEAHY.