

March 16, 1937.

L. D. SMILEY

2,073,654

PAPER MANUFACTURE

Original Filed April 14, 1930 2 Sheets-Sheet 1

Fig. 1

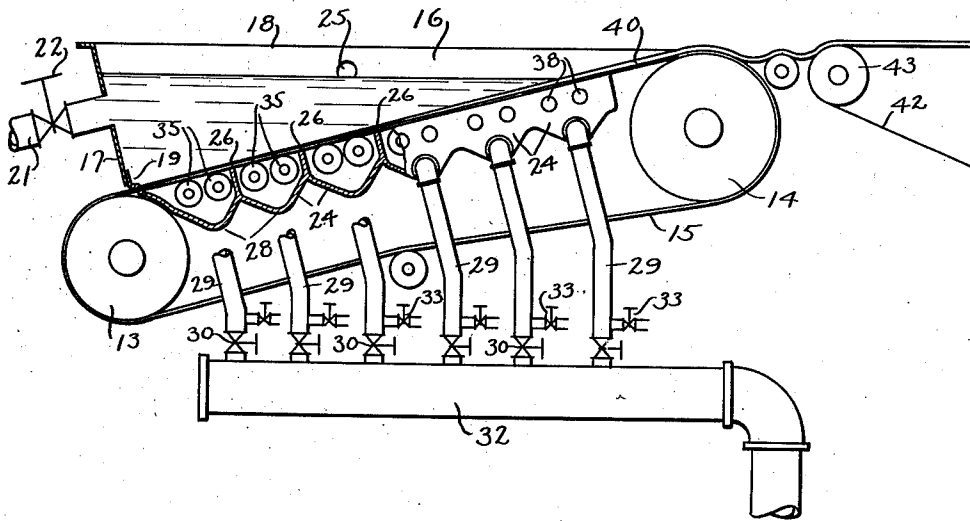
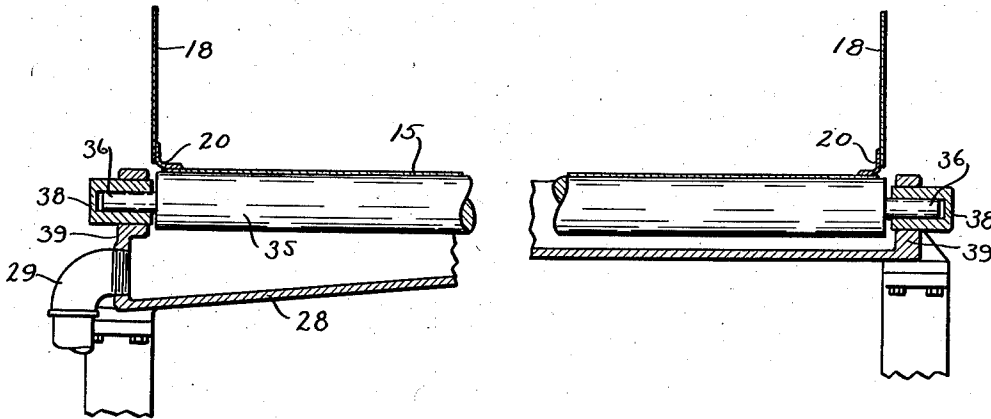


Fig. 2



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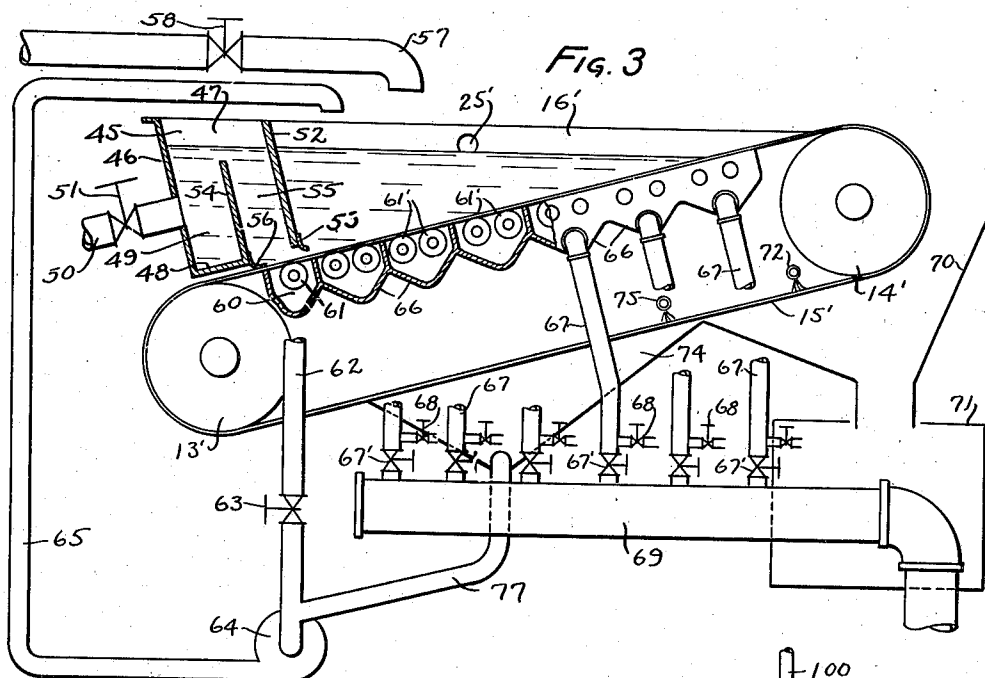
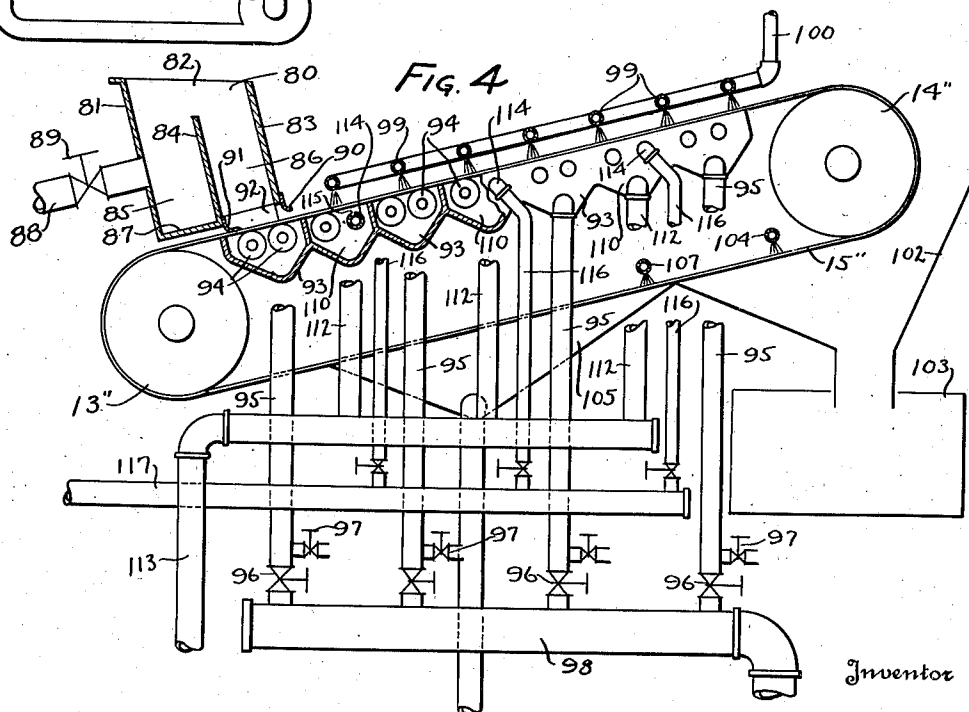
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PAPER MANUFACTURE

Original Filed April 14, 1930 2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,073,654

PAPER MANUFACTURE

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Application April 14, 1930, Serial No. 444,113
Renewed June 11, 1934

25 Claims. (Cl. 92—39)

This invention relates to the manufacture of paper.

One of the principal objects of the invention is to provide a method of forming a fibrous web, which is simple and economical in operation, is readily controlled, permits of ready variation in the thickness and other characteristics of the web while insuring a rapid formation, and provides a paper or board of good quality.

Another object of the invention is to provide a method of filtering and recovering suspended fibers and solid materials from the effluent of paper making machines which is simple, economical, and highly efficient in operation.

A further object of the invention is the provision of a method of washing or thickening fibrous stock which is highly effective in operation and permits the handling of large quantities of material in a relatively short interval of time.

Still another object of the invention is the provision of apparatus for carrying out the above methods.

Other objects and advantages of the invention will be apparent from the following description, the attached drawings and appended claims.

In the drawings which disclose preferred embodiments of the invention—

Fig. 1 is a diagrammatic view of a paper making machine constructed in accordance with this invention;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a diagrammatic view of a filter constructed in accordance with this invention; and

Fig. 4 is a diagrammatic view of a washer constructed in accordance with this invention.

In the drawings, in which like characters of reference designate like parts throughout the several views thereof, there is illustrated in Figs. 1 and 2 a paper making machine having a pair of rotatably mounted rolls 13 and 14, one of which is adapted to be driven from a suitable source of power, not shown. An endless perforate belt or wire 15 is trained about the rolls 13 and 14, which have their axes positioned parallel to one another and with one roll arranged at a lower elevation than the other to provide an inclined forming surface for the upper stretch of the wire. The traveling belt 15 is preferably constructed with a relatively heavy mesh lower wire for strengthening purposes and an overlying wire of finer mesh such as is used for Fourdrinier machines.

A box like structure 16 is mounted above and over the wire for maintaining a pool of fluid material or stock above and supported upon the wire. The box like structure 16 is in effect an open bottomed vat having an end wall 17 and oppositely positioned side walls 18. Suitable sealing means such as flexible deckles are pro-

vided between the lower edges of the walls of the container 16 and the surface of the upper stretch of the wire over which the vat is positioned. The deckles are made of some suitable flexible material such as rubber, one of them being shown at 19 to provide a seal between the bottom edge of the rear wall 17 and the surface of the wire 15, and side deckles being shown at 20 extending between the side walls 18 and the wire 15. Material is supplied to the vat by a pipe 21 having a suitable control valve 22. The arrangement is such that a pool of fluid material, such as paper forming stock, accumulates above the perforate traveling wire 15 to a substantial depth as indicated at 23. Due to the inclination of the wire, the pool is deepest adjacent the end of the vat at which the wire enters, while the opposite portion of the traveling wire 15 emerges from the pool before it contacts with the upper roll 14. Means are provided, such as the overflow pipe 25, for maintaining a controlled depth of fluid material within the vat 16.

Material such as paper forming stock is supplied to the vat 16 to make up for that used in the formation of a web and to maintain the pool of stock supported on the wire at the desired depth. In formation, liquid content of the lower portion of the pool of stock passes through the perforate wire 15 while suspended fibers are caught and form a mat or web on the surface of the wire. To accelerate the withdrawal of liquid and formation of the web suitable means such as the suction boxes 24 are provided. The suction boxes preferably comprise a series of integrally formed open top compartments supported by the machine frame and positioned adjacent the under side of the wire, providing a support for the wire beneath the area covered by the vat. Common side walls 26 separate the adjacent compartments. The suction boxes are provided with inclined bottom walls 28, and pipe connections 29 connect the lower portion of each compartment to a suitable source of suction. Each suction pipe 29 having a control valve 30 is attached to a common suction header 32 which may be connected to a vacuum pump or to a barometric leg. A valved opening 33 is provided in each suction pipe 29 between the suction compartment and the valve 30 for the admission of air to its respective suction line. This construction together with the separate control valves 30, provides for independently regulating the degree of suction in each of the suction boxes. Rotatable rolls 35 having journals 36 mounted in suitable bearings 38 within the side walls 39 of the suction box structure, are positioned to contact with the upper stretch of the wire 15 to support this wire and prevent frictional drag on the upper ends of the suction box compartments. During operation, a pool of paper forming

stock of controlled depth is maintained within the vat 16 by regulation of the valve 22 in the inlet pipe 21 and through the provision of the overflow pipe 25, which may be adjustably mounted to vary the depth of the pool of stock. The traveling wire moves beneath the maintained pool of stock while liquid of the stock is withdrawn through the wire to build up a paper web thereon. The formation may be readily controlled to provide a web of desired thickness by varying the speed of the wire, by controlling the degree of suction effective on the wire, by varying the depth of the pool of stock maintained upon the wire or by varying the consistency of the stock supplied to the pool. By controlling the speed of the wire to a relatively low speed, such for example as about five to ten feet per minute, a relatively thick board web is effectively formed at a considerably faster rate than is the case with conventional machines heretofore used in the manufacture of thick board of this character, such as building board. Or by running the machine at relatively higher wire speeds, other types of thinner board or paper webs may be produced. The formed web, indicated at 40, is then carried by the wire upwardly out of the pool of fluid stock and over the roll 14, where it is transferred to a traveling conveyor belt 42 supported on suitable guide rolls, one of which is shown at 43, for transporting the formed web 40 to subsequent treating mechanism, such as is customarily used in the manufacture of board or paper, including presses, driers, etc.

In Fig. 3 is illustrated a construction of filter embodying the features of the present invention. By way of example, there is shown a save-all filter construction through which the effluent or white water from a paper forming machine may be passed for the recovery of solid materials. The effluent of a paper forming machine comprises a very dilute suspension of filler and short fibers and due to the relative fineness of the solid materials contained in the effluent, it is difficult to handle and filter with a satisfactory recovery of the suspended solid materials. As shown, the filter comprises a traveling wire 15' which is suitably supported upon the rolls 13' and 14', one of which is adapted to be driven from a suitable source of power. An open bottomed vat 16' is provided for maintaining a pool of unfiltered material above the upper stretch of the wire 15'.

In advance of the vat 16' is a compartment 45 which may be formed integrally with the vat. This compartment has a rear wall 46, side walls 47, and a bottom wall 48 forming a chamber 49 to which fibrous material, such as paper forming stock containing a relatively high proportion of long fibered pulp, is introduced by pipe 50 having control valve 51. At its forward end the compartment 45 is provided with a partition 52 separating it from the pool of effluent within the vat 16'. The lower end of partition 52 is spaced from the traveling wire 15', and is provided with an adjustable slice 53. An intermediate overflow baffle 54 is positioned within the compartment, separating the closed bottomed chamber 49 from the open bottomed chamber 55 overlying the wire, a flexible deckle 56 being positioned between the lower end of partition 54 and the wire. Additional side deckles are provided for the side walls 47, and the side walls of vat 16'. A supply pipe 57 having a control valve 58 serves to introduce effluent or other material to be filtered to the vat 16'.

A plurality of suction compartments are positioned beneath the traveling wire. As shown, the first suction compartment 60 is substantially coextensive with the forming zone beneath the compartment 55 where a filter mat of fibrous stock is first formed. This compartment, within which is rotatably mounted a table roll 61, is connected by discharge pipe 62 having control valve 63 with the suction side of a suction pump 64 for producing an independently controlled degree of suction within this compartment for the rapid formation of the filter mat. The discharge side of pump 64 is connected with pipe 65, which discharges into vat 16'. Other suction compartments 66 are positioned beneath vat 16', and are connected by separate discharge pipes 67 having control valves 67' and vacuum breakers 68 to a common suction main or gravity leg 69, each of these compartments having one or more table rolls 61' rotatably mounted therein.

During operation, fibrous stock is admitted to the compartment 49 and flows upwardly over baffle 54 and then downwardly through compartment 55 and beneath the slice 53 at the desired speed, which is preferably coordinated with the wire speed. The liquid of the stream of stock rapidly drains through the wire to form a fibrous mat upon the surface of the traveling wire 15' prior to its entry into the filtering zone of the vat 16'. Liquid draining through the wire into suction compartment 60 in this filter mat forming zone generally contains a substantial amount of fiber, which escapes through the wire in the initial rush of liquid. This material is passed to vat 16' where such fiber is recovered. At the same time, effluent or liquid suspension to be filtered is admitted by pipe 57 in controlled amount to maintain a pool of effluent of the desired depth upon the filter mat, the maintenance of the controlled depth being assisted by the provision of an overflow pipe 25'. The filter mat thus formed effectively retains the short fibers and filler carried in suspension in the contents of the vat 16' as the liquid of the effluent passes through the mat and the wire. The mat and the solid material carried thereon are transported upon the wire out of the pool of effluent and around the upper roll 14' from where the thickened material falls or is dislodged into a trough or hopper 70 leading to a stock chest 71. Material adhering to the wire is dislodged by a fluid jet 72 which is directed against the upper side of the lower stretch of the wire. A second trough or hopper 74 is provided adjacent the trough 60 and additional spray pipes 75 are provided to flush and thereby clean the wire and remove any remaining material from the interstices thereof. The material collected in trough 74 may, as shown, be flushed into a pipe 77 connected to a pump 64, which forces the diluted material through pipe 65 discharging into vat 16' to be refiltered.

In Fig. 4 is illustrated a construction of washer embodying the features of the present invention, which may be effectively used in the washing and thickening of fibrous stock. The washer comprises an endless wire 15'' which is suitably supported upon rolls 13'' and 14'', and may be inclined as shown. A vat 80 is mounted above the upper stretch of the wire adjacent roll 13''. This vat has a rear wall 81, side walls 82, a front wall 83, and an intermediate overflow baffle 84 dividing the interior of the vat into compartments 85 and 86. The compartment 85 is provided with a bottom wall 87, and the stock to be

washed and thickened is introduced into this compartment by pipe 88 having a control valve 89. The lower end of front wall 83 is spaced from the wire, and is provided with an adjustable slice 90. Flexible deckle strips 91 and 92 are mounted between the wire and the lower ends of the baffle wall 84 and the side walls 82 respectively.

A plurality of suction compartments 93 having rotatable table rolls 94 mounted therein, are positioned beneath the wire, and are connected by separate pipes 95 having control valves 96 and vacuum breakers 97 with a common suction main or gravity leg 98. Beyond the vat 80 and above the wire are positioned a plurality of spray pipes 99 extending transversely of the wire, these pipes being supplied with suitable washing liquid from a common pipe 100. These spray pipes are arranged to direct sprays of washing liquid upon the mat opposite the suction compartments 93. Intermediate several suction compartments 93 are other drain compartments 110 connected by separate discharge pipes 112 to a common drain 113. Within each of the compartments 110 is a fluid pressure pipe 114 extending transversely beneath the wire, and having a plurality of ports or a longitudinal slot 115 for directing a fluid blast, such as an air blast, upwardly against the wire and the fibrous mat thereon. Each pipe 114 is connected by a valve controlled pipe 116 to a common header 117 which communicates with a source of air or other fluid under pressure, such as a fan blower. As shown, the drain compartments 110 with fluid pressure pipes therein, alternate with the suction compartments 93, although different arrangements could be used.

During operation, material such as paper stock is fed into the compartment 85 of vat 80 and then overflows baffle 84 and flows downwardly in the open bottomed compartment 86 and beneath slice 90 onto the traveling wire 15". Liquid contained therein passes through the traveling wire as the solid material or pulp forms a mat on the surface of the wire which is carried along with the wire. Washing liquid is directed on the formed mat by the jets 99, serving to wash out and replace liquor or impurities contained in the fibrous mass, while the mat is at the same time thickened to the desired consistency by draining of the contained liquid through the wire, as assisted by the suction effective in the suction compartments.

Fluid blasts, such as air blasts, are directed upwardly against the wire and the mat thereon from the pipes 114 intermediate several of the suction compartments to fluff up and loosen the mat on the wire, thereby permitting a more effective washing action opposite the succeeding spray and suction compartment. The washing and withdrawing of liquid through the mat in one direction alternating with the forcing of a fluid such as air through the web in the opposite direction gives a superior washing action.

The washed and thickened mat then passes with the wire around the upper roll 14" from where it drops or is dislodged into a trough or hopper 102 discharging into stock chest 103. Material adhering to the wire is dislodged into hopper 102 by a fluid jet 104 which is positioned adjacent the top side of the lower stretch of the wire. A second trough 105 may be provided adjacent the trough 102 and a jet 107, positioned similarly to the jet 104, provided to remove any material still adhering to the wire, to clean the wire before it passes around the roll 13" and again under the vat 80. Material discharged

into trough 105 may be supplied to a suitable save-all filter to recover the solid content thereof, if desired.

While the methods herein described, and the forms of apparatus for carrying these methods into effect, constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise methods and forms of apparatus, and that changes may be made in either without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. In the manufacture of paper and the like, the method which comprises introducing a fibrous stock upon a perforate traveling member, the liquid in the stock draining through the perforate traveling member while the fibrous material is caught by the member to form a fibrous web thereon, moving the traveling member with the web thereon beneath a maintained pool of effluent and supporting the pool upon the formed web carried by the perforate traveling member, the liquid of the effluent draining through the web and the perforate member as the suspended solid materials of the effluent are caught by the web and filtered from the liquid, removing the perforate member with the web carried thereby out of the maintained pool of effluent, directing fluid jets upon the perforate traveling member to remove the formed web and filtered material therefrom, directing additional fluid jets upon the perforate traveling member to remove additional material adhering thereto, and returning the removed additional material to the pool of effluent to be refiltered.

2. In the manufacture of paper and the like, the method of washing and thickening pulp stock and the like which comprises introducing pulp stock in a stream upon a traveling perforate member, the liquid of the stock draining through the traveling perforate member while fibrous material is caught to form a web thereon, moving the traveling perforate member with web carried thereby out of the web forming zone, directing a spray of washing liquid upon the formed web and withdrawing liquid from the web by suction downwardly through the perforate traveling member, directing a fluid blast upwardly through the perforate member and web carried thereby, and then again directing a spray of washing liquid upon the formed web and withdrawing liquid from the web by suction downwardly through the perforate member.

3. A pulp washer and thickener of the character described, comprising an endless traveling wire, spaced rotatable rolls for supporting said traveling wire, means for introducing a stream of pulp stock upon the upper stretch of said traveling wire between said rotatable rolls to form a web thereon, a plurality of spaced jets positioned above said upper stretch of the wire beyond said pulp stock introducing means for directing sprays of washing liquid upon said web carried by the wire, means for supplying washing liquid to said spaced jets, suction compartments beneath said upper stretch of the wire for assisting formation of said web and for assisting the withdrawal of washing liquid from said web, a fluid jet positioned beneath said wire intermediate two of said suction compartments for introducing a fluid blast upwardly through said wire and web carried thereby, and means for supplying a fluid under pressure to said fluid jet.

4. Paper stock treating apparatus of the character described comprising a traveling foraminous surface, means for maintaining a pool of fibrous stock of substantial depth upon the foraminous surface from which fibrous material is deposited to form a mat upon the foraminous surface, means for maintaining a pool of white water separate from the pool of stock, of substantial depth upon the mat thus formed upon the foraminous surface, a plurality of suction compartments positioned beneath the foraminous surface within the confines of the maintained pools, means for moving the foraminous surface beneath the maintained pools of stock and white water, while subjecting the mat thereon to the suction influence of at least one of said suction compartments to draw the white water through the preformed mat and thereby filter entrained fibers from the white water.

5. The method of thickening the pulp stock which comprises introducing pulp stock upon a traveling forming wire to form a mat thereon, subjecting the forming mat to suction to withdraw liquid therefrom while moving the traveling wire with the mat carried thereby out of the mat forming zone, subjecting the formed mat to a fluid blast directed upwardly through the forming wire to partially dislodge the mat while it is still carried along by the traveling wire and to assist in the drying thereof, and then again subjecting the mat to suction while still carried along by the travelling wire and after being acted upon by the fluid blast.

6. The method of washing and thickening pulp stock, which comprises introducing pulp stock upon a traveling wire to form a mat thereon, directing a spray of washing liquid upon the formed mat, then directing a fluid jet upon the formed mat to partially dislodge the mat from the wire, and again subjecting the formed mat to a washing liquid.

7. The method of washing and thickening pulp stock, which comprises introducing pulp stock upon a traveling wire to form a mat thereon, moving the traveling wire with the mat carried thereby out of the mat forming zone, and subjecting the formed mat alternately to washing liquid sprays directed downwardly upon the mat and fluid jets directed upwardly through the wire to partially dislodge the mat thereon while subjecting the mat to suction.

8. A paper machine of the character described, comprising an endless traveling wire, spaced rolls for supporting said wire, the upper portion of one of said rolls being at a substantially higher elevation than the upper portion of the other of said rolls, whereby the upper stretch of said wire is inclined, an open bottomed vat having a rear wall and opposed side walls mounted above and over the upper stretch of said wire for maintaining a pool of stock of substantial depth above and supported upon said wire, a partition in said vat forming therein separate compartments of which the travelling wire forms the bottom, from one of which stock is deposited upon the traveling wire to form a mat thereon, and from the other of which white water is filtered through the preformed mat to collect thereon stock fibers entrained in the white water, means for moving said wire to produce travel of the formed mat from beneath the stock compartment, past the white water compartment and therebeyond, and suction boxes beneath the wire for assisting in the formation and drying of the web formed on

said wire as it moves beneath and out of the maintained pool of stock.

9. A paper machine of the character described, comprising an endless traveling wire, spaced rolls for supporting said wire, the upper portion of one of said rolls being at a substantially higher elevation than the upper portion of the other of said rolls, whereby the upper stretch of said wire is inclined, an open bottomed vat having a rear wall and opposed side walls mounted above and over the upper stretch of said wire for maintaining a pool of stock of substantial depth above and supported upon said wire from which stock solids are deposited onto the wire to form thereon a mat of stock material, a second vat mounted over and above said upper stretch of the wire for maintaining a pool of white water of substantial depth above and supported upon said wire, to be filtered through the mat of stock material carried by the wire upon which stock fibers carried by the white water are collected, means for moving said wire to produce travel of the wire from the lower roll in an upwardly inclined path toward the upper roll, the wire moving in said inclined path out of mat forming position beneath the stock material vat to present the formed mat in filter position beneath the white water vat and thence in a discharge position therebeyond and a plurality of suction boxes beneath the upper stretch of said wire for assisting in the formation and drying of the web formed on said wire as it moves beneath and out of the maintained pool of stock.

10. The herein described method of making paper or the like, including maintaining a pool of liquid stock upon a foraminous movable conveyor extracting the liquid content thereof by applying suction to the under side of the movable conveyor and catching the fibrous material thereon to form a web, carrying the web comprising the collected material from beneath the pool of stock by advancement of the conveyor, washing the web of collected material prior to removal from the conveyor, washing the conveyor after removal of the web and filtering the wash water through the preformed web of fibrous material upon the conveyor to collect thereon the fibrous material washed from the conveyor.

11. In a paper stock treating apparatus, an upwardly traveling inclined foraminous conveyor, means for maintaining a pool of quiescent liquid stock of graduated depth thereon including baffle means for minimizing agitation of the stock, suction means for maintaining a subatmospheric pressure beneath the foraminous conveyor within the confines of the pool, and means for progressively moving the foraminous conveyor beneath the maintained pool of stock.

12. In a paper stock treating apparatus, a traveling foraminous conveyor, means for maintaining a pool of liquid stock of substantial depth upon said conveyor including a settling compartment into which the stock is delivered, a baffle over which the stock overflows from the settling compartment, and a second baffle under which the stock flows to the conveyor, the effect of which is to minimize agitation and permit the solid content of the stock to settle onto the conveyor by gravity, suction means for maintaining a subatmospheric pressure beneath the conveyor within the confines of the maintained pool of stock, means for progressively advancing the conveyor and means for varying the degree of suction to which the conveyor is subjected throughout the length of the pool.

13. In a paper stock treating apparatus, a traveling foraminous conveyor, means for maintaining a pool of stock of substantial depth upon said conveyor including a vat divided into a bottomed compartment into which the stock is delivered and a bottomless compartment beneath which the conveyor travels and from which the stock flows onto the conveyor, an intermediate baffle wall over which the incoming stock overflows from the bottomed to the bottomless compartment, and a slice at the outlet from the bottomless compartment regulating the depth of flow of stock therefrom onto the conveyor, means for progressively advancing the conveyor beneath the pool, suction means for maintaining a subatmospheric pressure beneath the conveyor throughout and beyond the extent of said pool, and means for varying the degree of said subatmospheric pressure throughout different portions of the conveyor.

14. The method of thickening paper stock including progressively moving a foraminous conveyor beneath a quiescent pool of liquid stock and therebeyond permitting the solid content of the stock to settle by gravity onto said conveyor to form thereon a mat of stock material while subjecting the underside of the traveling conveyor to subatmospheric pressure to withdraw liquid therefrom, subjecting the mat of stock material upon the conveyor to a water spray beyond the pool to dislodge deposited material carried by the conveyor and subjecting said deposited material to further suction effect to extract water therefrom.

15. The method of paper stock treatment including depositing fibrous material upon a traveling foraminous conveyor to form a web thereon, subjecting the under side of the conveyor to subatmospheric pressure to effect extraction of liquid from the deposited web, directing water jets upon opposite sides of the formed web to loosen the web upon the conveyor, and subjecting the formed web to washing action.

16. In a paper stock treating apparatus, a traveling conveyor, means for maintaining a quiescent pool of liquid stock on the traveling conveyor onto which a web of stock is deposited by gravity, including a vat divided into a receiving compartment into which the stock is received, a second compartment into which the stock overflows from the receiving compartment and having a restricted outlet at its bottom and a depositing compartment into which the stock is discharged from the second compartment for which depositing compartment the conveyor forms a traveling bottom.

17. A pulp depositing apparatus wherein a deposit of pulp material is made upon a traveling conveyor characterized by a vat for liquid stock, a partition dividing the vat into a receiving compartment closed at its bottom into which the stock is delivered and a discharge compartment open at its bottom into which the stock overflows the partition, and from the bottom of which the stock is discharged onto the traveling conveyor.

18. A pulp depositing apparatus wherein a deposit of pulp material is made upon a traveling conveyor characterized by a vat for liquid stock, relatively spaced partitions dividing the vat into a receiving compartment into which the stock is delivered, a delivery department into which the stock overflows from the receiving compartment

and a deposit compartment into which stock is discharged from the bottom of the delivery compartment, and in which a quiescent pool of liquid stock is maintained, the said conveyor forming a bottom for said deposit compartment upon which the solid content of the liquid stock is deposited by gravity.

19. In a paper making apparatus, a traveling foraminous conveyor, a vat for liquid stock discharging onto the conveyor whereby a mat of fibrous material is deposited thereon, a succession of suction chambers over which the conveyor travels by which excess liquid is extracted from the deposited mat of material, and a succession of fluid pressure jets arranged to discharge alternately upon the top and bottom of the mat as it is conveyed over the suction chambers.

20. In a paper making apparatus a traveling foraminous conveyor upon which a mat of pulp material is deposited and a succession of fluid pressure discharge conduits discharging fluid under pressure first on the under side of the mat to partially dislodge and loosen the material from the conveyor and discharging subsequently on top of the loosened mat of material.

21. In a paper making apparatus a traveling foraminous conveyor, upon which a mat of pulp material is deposited, a succession of water spray discharge nozzles discharging water onto the top of the deposited mat of material and a succession of fluid pressure discharge nozzles discharging under pressure against the under side of the deposited mat of material for dislodging and loosening the material from the conveyor preparatory to receiving the water spray discharge on top thereof.

22. In a paper making apparatus a traveling foraminous conveyor upon which a mat of pulp material is deposited, and a series of fluid pressure discharge nozzles discharging onto the mat of material and subjecting the deposited material to alternating upwardly and downwardly directed pressures.

23. In a paper making apparatus, a traveling conveyor upon which a mat of pulp material is deposited, a series of spray nozzles discharging water onto the top of the deposited mat, and means for dislodging and loosening the material from the conveyor preparatory to receiving the water discharge thereon.

24. The herein described method, including the steps of progressively forming a mat of paper stock material, washing the formed mat, extracting the wash water and aqueous portion of the stock material, returning the extracted water to the top of a newly formed portion of the mat from which the water is again extracted to thereby collect on the mat portions of usable stock entrained in the water.

25. The herein described method, including the steps of depositing a mat of paper stock upon a forming wire, subjecting the mat to suction for extraction of water therefrom, directing an air blast against the underside of the formed mat for loosening the mat material, thereafter directing a washing spray on top of the loosened material, and finally directing a further fluid discharge through the forming wire against the contiguous side of the mat for removing the mat from the forming wire.

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