

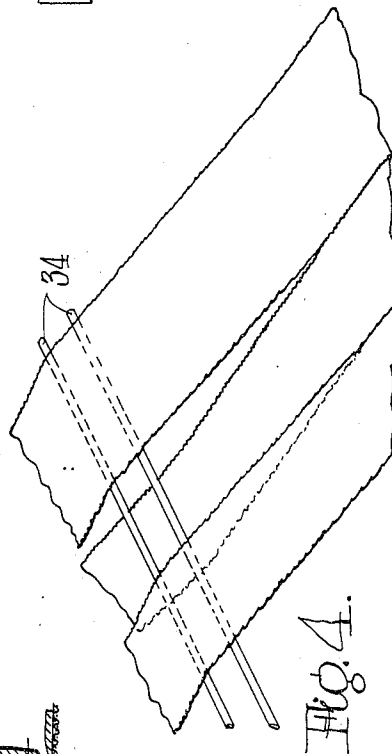
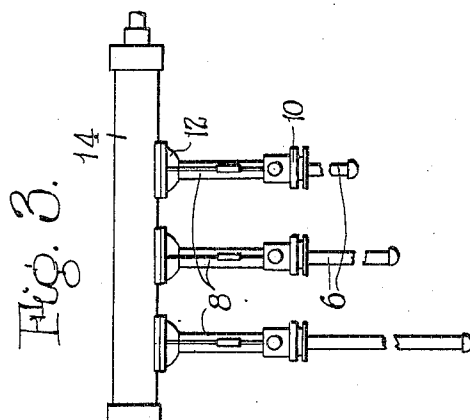
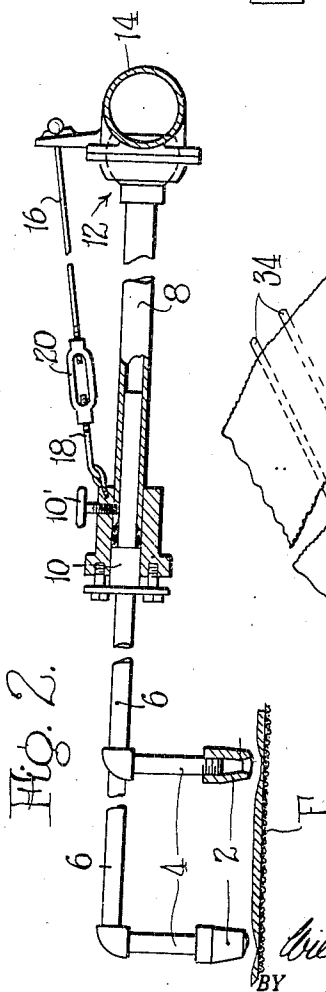
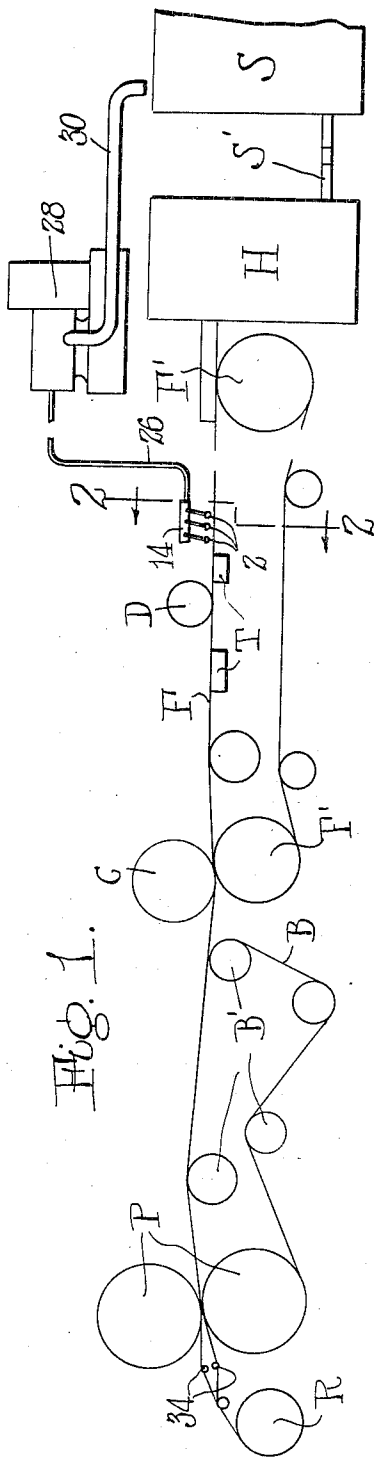
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ART OF MAKING DECKLE EDGE PAPER

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ART OF MAKING DECKLE EDGE PAPER

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This invention relates to the art of paper manufacture, and is directed more particularly to the method of and apparatus for producing deckle edge paper.

5 The principal object of the invention is the provision of a method and apparatus for producing continuous webs of paper having edges of gradually decreasing thickness to form the deckle edges and is accomplished by removing portions of the web therefrom which according to another object of the invention is returned to the supply of web-forming material to avoid waste.

15 The novel features of the invention are adapted for broad application, but will be described in the form at present preferred in connection with the accompanying drawings, in which

20 Fig. 1 is an elevational view showing in a diagrammatic way one form of a paper making apparatus which embodies the novel apparatus of the invention.

Fig. 2 is an enlarged detail sectional elevational view taken on the line 2—2 of Fig. 1.

25 Fig. 3 is a plan view of the parts shown in Fig. 2, and

Fig. 4 is a small scale perspective view of means for separating paper deckled by the novel method of the invention.

30 Referring to the drawings the invention will now be described in detail.

In Fig. 1 I have shown in a diagrammatic way one form of a paper-making apparatus in order to facilitate a clear understanding of the invention.

35 In detail there is represented a Fourdrinier wire belt F that is supported and driven by drums or rolls F' and which receives on its upper run paper-making material commonly called "stuff" from a head box H. This head box or flow chest and its associated parts is arranged to deliver a desired amount of "stuff" to the belt and is supplied from a control box S. The control box in turn receives its supply of material from beaters (not shown) and may deliver to the flow chest in the ordinary way as by a conduit S'.

45 The material is carried forwardly by the belt over suction boxes T and beneath a dandy roll D and is finally acted upon by a

couch roll or rolls C and led as a web onto a felt apron B so as to pass between coacting press rolls P. Finally it is led to the first roll R of a drier. In this way the stuff consisting of fibers and water and oftentimes coloring material such as a pigment is delivered to the belt and freed of water by the suction boxes to form a web and finally acted upon by couch and press rolls and delivered to drying apparatus to provide a continuous web of paper.

55 According to the novel features of the invention, the deckle edge is formed while the web is in a wet condition and is produced by removing a portion of the fibers of the web while the said web is being fed forwardly by the belt.

This may be accomplished by providing a suction nozzle or nozzles disposed just above the web so that as the web travels therepast the fibers are removed from the main body of the web to provide gradually tapering portions or zones in the web which are of tapering thickness and which extend as stripes longitudinally of the web.

60 One form of apparatus for performing this important step of the method will now be described. Suction nozzles 2 carried by depending pipes 4 may be disposed just above the web of paper and are supported by the pipes 4 which are connected to the ends of substantially horizontal pipes 6 that are slidable and oscillatable in supporting pipes 8. Suitable stuffing boxes 10 associated with the pipes 6 and 8 are provided for making a tight joint therebetween while the pipes 8 at their inner or rear ends are movably connected as by the ball and socket construction indicated at 12 to a header 14. Rods 16 and 18 connected to the header and stuffing boxes have their inner ends in threaded engagement with turnbuckles 20 so that as the turnbuckles are turned in one direction or the other the pipes 8 may be raised or lowered so as to move the nozzles towards and away from the web. Binding screws 10' associated with the stuffing boxes are arranged to clamp the pipes 6 against a sliding or rotating movement. The header 14 is connected by a pipe 26 to a suction device such as a pump

28, the discharge from which is conducted as by a conduit 30 to some part of the apparatus as for instance the control chest S.

The nozzles are preferably disposed at a point where the web is in such condition that fibers thereof may be drawn by suction through the nozzles and delivered back to the stuff supply. In the embodiment of the invention shown the nozzles are located adjacent the first suction box but it will obviously be desirable in some cases to locate the nozzles at another point in order to obtain the desired suction effect.

The nozzles are movable up or down with reference to the web as well as laterally thereof and they may swing back and forth since the pipe 6 is slidable and rotatable in the pipe 8. With this arrangement it is possible to obtain various effects and provide webs of various widths as will appear.

According to the mode of operation as the web travels past the nozzles the fibers forming the web are removed therefrom by suction so as to gradually thin out the web as shown in Fig. 2. It may be desirable to remove all of the fibers down to the belt and in that way separate the web longitudinally or to remove them to a point where the adjacent edges of adjacent portions of the web are only nearly separated. These various effects will be within the skill of the operator since the nozzles are adjustable with reference to the web so as to vary the suction effect.

As the web proceeds forwardly from the suction devices, it is acted upon by the suction boxes, couch and press rolls, etc., which perform their particular function so that the web which has been acted upon by the nozzles may emerge from the press rolls for the drying operation.

In order to insure a separation of the adjacent webs, I provide one or more transverse separators 34 which may be in the form of rods or the like spaced apart so that as in Fig. 4 adjacent portions of the web may pass over the upper and under the lower rods. This operation may not be necessary where the suction removes the fibers so as to actually separate the web but will be desirable where the portions of the web are joined by a thin layer of fibers as shown in Fig. 2. In that case the separators will function to pull the portions of the web apart and enhance the deckle edge effect.

As stated, the nozzles may be moved laterally of the web so as to provide webs of various widths. Also they may be swung into various positions of angular adjustment and raised or lowered, all of which will enable the operator to obtain various deckle effects.

As one feature of the invention, the deckle effect is obtained by an actual removal of the fibers as distinguished from a displacement thereof. By the removal step the deckle is

formed by the gradually decreasing thickness of the web and there is no discoloring of the web or other injury thereto.

As another feature that part of the web or the fibers removed is returned to the stuff supply whereby economy in operation is effected.

The invention may be practiced in connection with various forms of paper-making apparatus and the means for carrying out the invention may be varied within wide limits without departing from the spirit and scope thereof. Therefore I prefer to be limited, if at all, by the appended claims rather than by the foregoing description.

What I claim is:

1. Apparatus for manufacturing deckle edge paper comprising in combination, a movable paper making member for receiving paper making stuff, means for delivering stuff thereto, a suction apparatus and a nozzle connected thereto which is disposed above said member for sucking stuff therefrom as it moves therepast to separate a web formed by said stuff longitudinally and thereby provide separable webs and a transversely disposed separating device for receiving opposite sides of adjacent separable webs for moving them in directions opposed to the planes of their surfaces to effect separation thereof at their adjacent edges.

2. Apparatus for manufacturing deckle edge paper comprising in combination, a movable paper making element and means for flowing paper making stuff thereonto, a suction apparatus and a nozzle connected thereto which is disposed adjacent a face of said member for sucking stuff therefrom as it moves therepast to separate a web being formed on said member and provide a plurality of separable portions or webs, a pair of transverse members against which the opposite sides of adjacent web portions bear and which operate to separate adjacent web portions by moving them in opposite directions.

3. The method of producing deckle edge paper which consists in, flowing paper making fibrous stuff onto a movable web forming member to form a wet web, moving the web past the nozzle of a suction apparatus which has a relatively narrow orifice to remove fibers of the web entirely from the forming member along a longitudinal line to provide separate webs having adjacent deckle edges and then in moving adjacent webs in opposite directions opposed to the planes of their surfaces to separate said webs entirely from one another.

4. The method of producing deckle edge paper which consists in, flowing paper making fibrous stuff onto a movable web forming member to form a wet web, moving the web past the nozzle of a suction apparatus which has a relatively narrow orifice to remove

fibers of the web entirely from the forming member along a longitudinal line to provide separate webs having adjacent deckle edges and then in moving adjacent webs in opposite directions opposed to the planes of their surfaces to separate said webs entirely from one another and in returning fibers removed from the web to the supply of paper making stuff being flowed onto the web forming member.

5. The method of producing deckle edge paper which consists in, carrying paper making fibrous stuff in a wet condition on a movable web forming member to form a wet web, moving the web past the nozzle of a suction apparatus which has a relatively narrow orifice to remove fibers from the web and forming member along a longitudinal line to provide separate webs having their adjacent edges deckled and then in moving adjacent separate webs relative to one another to separate said webs entirely from one another.

6. The method of producing deckle edge paper which consists in, supplying paper making fibrous stuff in a wet condition to a movable web-forming member to form a web, moving the web past the nozzle of a suction apparatus which has a relatively narrow orifice to remove fibers of the web from the web and web forming member along a longitudinal line to provide separate webs having adjacent deckle edges, in moving adjacent webs in opposite directions to separate said webs from one another and in returning the fibers removed from the web to the supply of stuff.

In testimony whereof I affix my signature.

WILLIAM J. LAMORY.