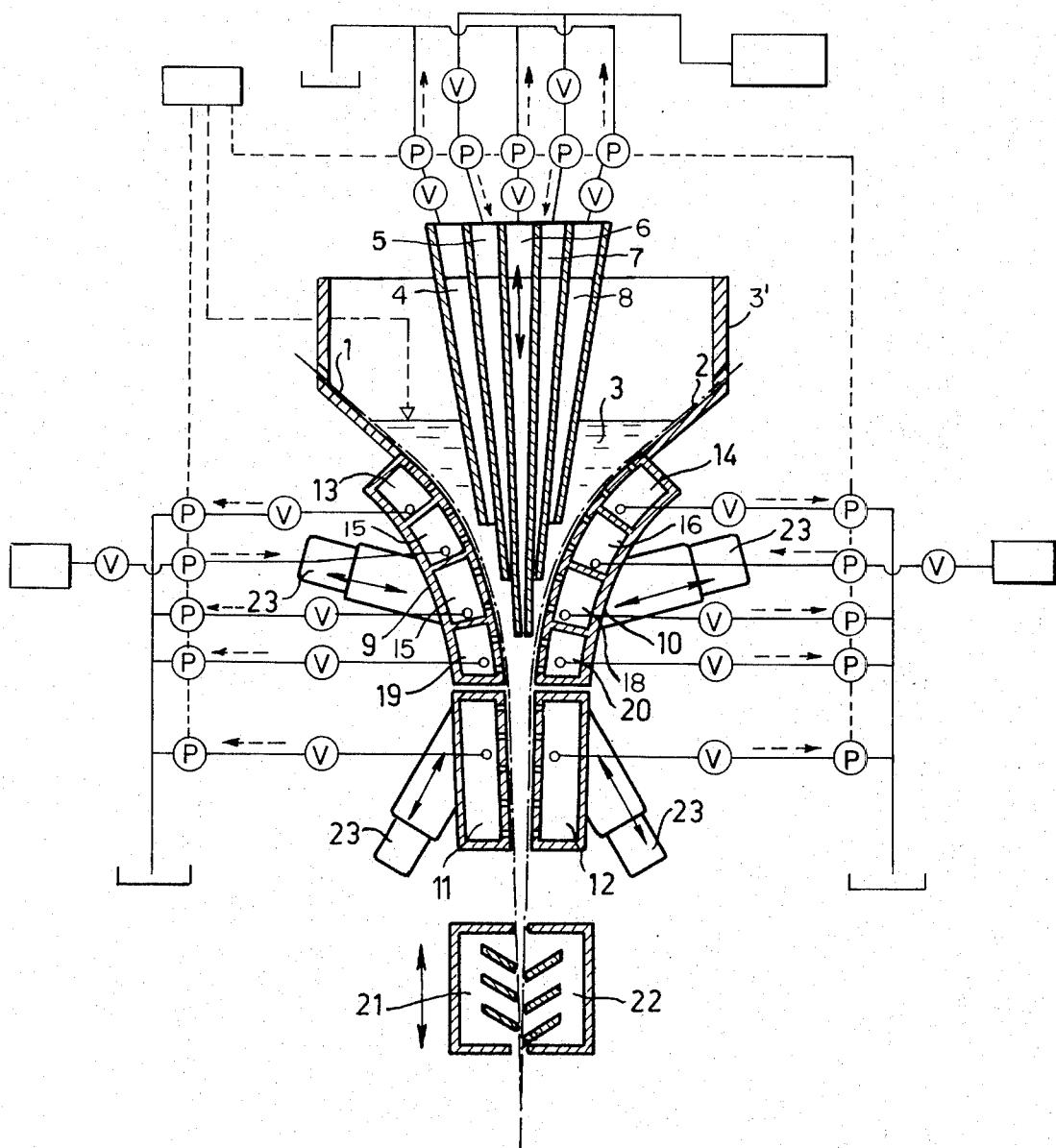


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TWIN WIRE PAPERMAKING MACHINE WITH VIBRATORS CONNECTED
TO SUCTION AND LIQUID DELIVERY BOXES LOCATED
BENEATH THE CONVERGING WIRES
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TWIN-WIRE PAPERMAKING MACHINE WITH VIBRATORS CONNECTED TO SUCTION AND LIQUID DELIVERY BOXES LOCATED BE-NEATH THE CONVERGING WIRES

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6 Claims

ABSTRACT OF THE DISCLOSURE

A twin-wire papermaking machine wherein separate foraminous wires converge towards one another while passing over separately controlled, convex domed suction boxes and thereafter join together to form the fibrous web therebetween as the wires pass over opposing foils. Between some of the separately controlled suction boxes are located liquid discharge boxes for injecting liquid into the fibrous suspension contained between the converging wires. Vibrators are connected to the suction and liquid discharge boxes for oscillation at an angle of between about 20 and 50 degrees to the plane of the wire passing thereover. Slurry passages (which may be oscillated also) are located beneath the slurry contained between the converging wires and function to deliver as well as remove slurry.

BACKGROUND OF THE INVENTION

The invention relates to a papermaking machine with at least one traveling wire with a sheet formation area in which on one side of the wire a sheet is formed by deposition of fibres from a suspension, and on the other side of the wire liquid is sucked away, with passages for suspension, opening against the one side of the wire, and channels for liquid, opening against the other side of the wire.

With a known papermaking machine, the suspension is fed to the wire through passages opening against the wire and arranged consecutively in the direction of wire travel. In a similar way, the liquid from the suspension is sucked away through channels on the other side of the wire, arranged consecutively in the direction of wire travel. By regulating the supply of suspension, and the removal of liquid through the respective channels the deposition of fibres on the wire can be controlled.

The purpose of the invention is to make possible a better control over the deposition of fibres on the wire. For the type of papermaking machine described at the outset, the problem is solved, according to the invention, by using at least one of the suspension passages for removing suspension from the wire, or by using at least one of the liquid channels for feeding liquid to the wire or by use of both of these expedients.

Since zones within the sheet formation area, i.e. in the immediate neighborhood of the wire, are arranged in which suspension is removed from the wire, the desired direction and amount of fibre deposition on the wire can be easily achieved. By arranging zones on the side of the wire opposite to the sheet, from which liquid is not removed but into which liquid is fed, the fibres already deposited on the wire can be loosened again.

If it is desired to counteract the tendency of the fibres to orient themselves in the direction of wire travel, it is advantageous to set the channel walls and the passage walls into oscillations of periodic frequency above 800 per minute, the direction of oscillating lying preferably at an angle of at least 20 degrees relatively to the plane of the wire.

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It is of advantage to include regulating devices to control the quantities of suspension or liquid, respectively, flowing in the channels and passages.

A very advantageous machine is obtained if the liquid channels are situated in a box, of the type commonly used as a suction box, the wire-supporting wall of the box being convex domed. The wire then remains pressed against the box due to wire tension, even within the zone of liquid flowing towards the wire.

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BRIEF DESCRIPTION OF THE DRAWING

In the drawing, with the help of which the invention is described in detail, an embodiment of the invention is shown in simplified manner. The figure shows a vertical section, in the direction of wire travel, through the sheet formation area of a papermaking machine.

DESCRIPTION OF THE PREFERRED EMBODIMENT

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Two wires 1 and 2 pass through the sheet formation area and come together in a double wire section. Between the wires 1 and 2 is a bath 3 of suspension, contained in a headbox 3', out of which a sheet is formed by fibre deposition on the wires 1 and 2. Five passages 4, 5, 6, 7 and 8 open into the bath 3. The passages 4, 5, 6 open into the bath 3 in the immediate neighborhood of wire 1, with their mouths arranged consecutively in the direction of travel of wire 1. The passages 8, 7, 6 open into the immediate neighborhood of wire 2, with the channel mouths arranged consecutively in the direction of travel of wire 2.

On the other side of wires 1 and 2 are situated boxes 9, 10 and 11, 12 respectively. The box 9 is subdivided into channels 13, 15, 17, 19, and the box 10 into channels 14, 16, 18, 20.

At the end of bath 3, i.e. just before the two wires 1 and 2 come together, are situated foils 21 and 22.

Of the suspension passages 4 to 8, the passages 5, 6, 7 are for feeding suspension while the passages 4 and 8 remove suspension from the neighborhood of wires 1 and 2, respectively. However, if desired the passages 5 and 7 could be used for removal of suspension.

While the channels 13, 17, 19 and 14, 18, 20 of the boxes 9 and 10, respectively serve as suction channels to suck away liquid from the suspension, the channels 15 and 16 of these boxes deliver liquid to the wires 1 and 2, respectively. This back flow of liquid into the bath 3 could be from the channels 17 and 18, or could be repeated in the channels 19, 20.

The passages 4 to 8 and channels 13 to 20 and for the channels of the boxes 11 and 12, serve as supplies or as returns as indicated by the arrows in the drawing. Each flow connection includes a pump P having a valve V in its inlet whereby the flow rate may be controlled.

55 In addition, the formation of the sheet can also be influenced by oscillating the channel walls and passage walls at periodic frequencies above 800 per minute. Vibrators 23 for this purpose are fitted to the boxes 9, 10, 11 and 12. The vibrator for the walls of channels 4 to 8 is not shown in the drawing.

60 The direction of oscillating is shown in the drawing by double arrows. The direction of oscillating is at an angle of at least 20 degrees relatively to the plane of the wire, i.e. for suction boxes 9 and 10 at an angle of about 50 degrees, for suction boxes 11 and 12 at an angle of 30 degrees, and for the walls of passages 4 to 8 at angles of from 20 to 30 degrees.

Under "papermaking machine" in the sense of the invention is also understood a machine for producing a paper-like sheet, for example a machine for production of non-woven webs.

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I claim:

1. In a papermaking machine of the twin wire type including two traveling wires, a headbox, means to supply a liquid suspension of fibres to said headbox, the headbox having bottom walls over which corresponding wires travel and converge toward one another and means to withdraw liquid from said suspension through said wires and through said bottom walls the improvement which comprises:

(a) means to deliver liquid of suspension into said headbox through at least one bottom wall and the corresponding wire; and

(b) oscillating means connected to vibrate said means to deliver liquid at a frequency above 800 cycles per minute,

(c) the direction of the oscillation being at angle of at least 20° to the direction of wire travel.

2. The machine defined in claim 1 including:
means regulating the rate of flow of liquid through said means to deliver the liquid.

3. The machine defined in claim 2 including:
means to remove a portion of the liquid suspension of fibres from said headbox through a flow path having an inlet in said headbox adjacent the surface of said wire.

4. The machine defined in claim 1 including:
means to remove a portion of the liquid suspension of fibres from said headbox through a flow path having an inlet in said headbox adjacent the surface of said wire.

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5. The machine defined in claim 4; and
means regulating the rate of flow of the liquid suspension of fibres removed through said flow path.

6. The machine defined in claim 1 in which:
said means to supply liquid of suspension comprises a box having a convex, wire supporting surface.

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