COMMONWEALTH OF AUSTRALIA
PATENTS ACT 1992-69

COMPLETE SPECIFICATION
In support of the Convention Application made by

YHINEET PAPERITEHTAAT OY JYLHAVAARA

(herinafter referred to as the applicant) for a Patent
for an invention entitled:

"A FIBRE DISTRIBUTION METHOD AND DEVICE FOR A DRY
PAPER MACHINE"

[Inventors' Names and Addresses]

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do solemnly and sincerely declare as follows:

1. I am authorised by the applicant for the patent to make this declaration on its behalf.

2. The basic application as defined by Section 141 of the Act was made in FINLAND on the 20th day of April, 1983, by

YHINEET PAPERITEHTAAT OY JYLHAVAARA

[Application Numbers and Dates]

3. KAILEVI RIHIINEN, of Simnantie 4-6 B, 23380 Saaksjarvi, and PAAVO HYVARINEN, of Lehtikuusentie 4 C 19, 48400 Kotka 40, both in Finland.

are the actual inventors of the invention and the facts upon which the applicant is entitled to make the application are as follow:

The applicant is the assignee of the said actual inventors.

4. The basic application referred to in paragraph 2 of this Declaration was the first application made in a Convention country in respect of the invention the subject of the application.

DECLARED at Valkeakoski
this fourteenth day of June 1983

Yhineet Ppaperitehtaat Oy Jylavaara

To: THE COMMISSIONER OF PATENTS.
COMMONWEALTH OF AUSTRALIA

Patents Act 1952-1969

CONVENTION APPLICATION FOR A PATENT

We, YHTYNEET PAPERITEHTAAT OY JYLHAVAARA, of P. O. Box 30, 37601 Valkeakoski, Finland

hereby apply for the grant of a Patent for an invention entitled: A FIBRE DISTRIBUTION METHOD AND DEVICE FOR A DRY PAPER MACHINE which is described in the accompanying complete specification. This application is a Convention application and is based on the application numbered 831344 for a patent or similar protection made in Finland on 20th April 1983.

Our address for service is Messrs. Edwd. Waters & Sons, Patent Attorneys, 50 Queen Street, Melbourne, Victoria, Australia.

DATED this 18th day of April 1984.

YHTYNEET PAPERITEHTAAT OY JYLHAVAARA

by

W. F. Dancer
Claim

1. A fibre distribution method for a dry paper machine, in which method fibres are made to spread evenly in the web to be formed in a transverse direction, characterized in that the air/fibre mixture is led into a long pipe-shaped distribution element from one end and that the fibre/air mixture is blown out from the distribution element through an essentially open side by means of air nozzles in the distribution element.
A FIBRE DISTRIBUTION METHOD AND DEVICE FOR A DRY PAPER MACHINE

The following statement is a full description of this invention, including the best method of performing it known to us.
The subject of this invention is a method and device for dry paper machine fibre distribution of the web in the transverse direction.

In the paper industry dry paper machine it is important to achieve the desired transverse fibre profile in the dry paper web to be made. In order that a certain profile may be achieved the formation of the web must be under control and regulation over the full web width.

In the formation part of the stuff track of a conventional dry paper machine the fibre distribution equipment for the control of the transverse fibre distribution (the profile) are based on the use of either suction air control in the machine transverse direction e.g. by means of valves, or by use of a sheet or similar device in the machine transverse direction to control the secondary air used in forming the web.

The control of fibre distribution in the transverse direction is not usually very successful with these designs because mechanical control elements are not fundamentally very precise, since they are subject to malfunction and require servicing. In addition their passive control mode makes them insensitive to local disturbance in the fibre air mixture, as in fibre bunching and other concentration malfunctions.

For the abovementioned reasons the distribution of fibres in the transverse direction using conventional equipment is not very successful, as the variations in the transverse direction of the web are typically 5 - 10%.

The purpose of this invention is to eradicate the aforementioned drawbacks and achieve a fibre distribution method and relevant equipment that distributes the fibre in the direction transverse to the formation wire evenly into the desired stuff track, in order to achieve this effect it is characteristic to the method according to this invention that the air/fibre mixture is led into a long pipelike distribution element at one end, the air/fibre mixture being blown out of its essentially open side with the aid of the bozzles in the element.
It is characteristic to one advantageous mode of application according to the invention that the distribution of the air/fibre mixture while it is blown out of the distribution element is adjusted by separately regulating the air pressure of each nozzle.

It is characteristic to the method according to this invention applied to the distribution equipment of a dry paper machine, that the fibre distribution equipment consists of a long pipelike distribution element, to one end of which the air/fibre mixture can be led and from the essentially open side of which the air/fibre can be blown cut and that the distribution element is furnished with air nozzles at 50 - 250 mm intervals. By regulation the blowing pressure of the air nozzles so that the air/fibre mixture blown into the distribution element is evenly distributed along its length, a control system free of mechanical operations is achieved, which in addition efficiently mixes the air/fibre mixture to disperse possible local fibre concentrations.

It is characteristic to several advantageous modes of application of fibre distribution equipment in accordance with the invention that the distribution element is formed of pipe cut along its longitudinal section. This is a simple and cheap means of achieving an operationally serviceable distribution element, in which the longitudinal cut form the gap through which the fibres directed to the wire are blown.

It is characteristic to several modes of application of fibre distribution equipment that the pressure of each air nozzle is regulated as desired by separately operated devices and measured by separate measuring elements.

The invention is described more precisely in the following example with the aid of reference to the accompanying drawings.

Figure 1 represents a cross-section of a distribution element in accordance with the invention in which the distribution element essentially consists of pipe cut along the longitudinal section and pressed to size somewhat from the sides.
Figure 2 represents the pipe illustrated in Figure 1 as seen from one side.

The air and fibre mixture is led in from one end of the distribution pipe 1 (in Fig. 2 for example from the right). The pipe is cut through along its entire length and pressed somewhat from the side to size so that a longitudinal opening 5 is formed in it. Blowing nozzles 2 are installed in pipe 1, typically at about 100 mm separation distances. The air pressure coming to each nozzle can be regulated with the aid of valve 3 and pressure can be read from meter 4. The feed lines to the nozzles are led outside pipe 4 in a separate casing.

The distribution speed of the air/fibre mixture led into pipe 1 is regulated by valves 3 which control the blown pressure of nozzles 2 to such a value that an equal quantity of fibres per unit time evenly leaves the opening 5 along the length of pipe 1. When the desired transverse fibre distribution has been achieved, the readings of meters 4 are recorded in order that the same result can be easily repeated at a later date.

To expert persons in this field it is clear that the various modes of application of the invention are not only limited to the example put forward above but may be varied within the framework of the patent claims hereinafter put forward.
Figure 1

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A fibre distribution method for a dry paper machine, in which method fibres are made to spread evenly in the web to be formed in a transverse direction, characterized in that the air/fibre mixture is led into a long pipe-shaped distribution element from one end and that the fibre/air mixture is blown out from the distribution element through an essentially open side by means of air nozzles in the distribution element.

2. A method in accordance with Claim 1 characterized in that the distribution of the air/fibre mixture upon leaving the distribution element is regulated by adjusting the blowing pressure of each said air nozzle individually.

3. A dry paper machine fibre distribution element intended for use in carrying out either of method claim 1 or 2 characterized in that the fibre distribution unit comprises a long pipe-shaped distribution element to one end of which is led the air/fibre mixture to be distributed and having an essentially open side from which the air/fibre is exited, and that the distribution element is furnished with air nozzles spaced apart by distances between 50 to 250 mm.

4. A fibre distribution element in accordance with claim 3, characterized in that the distribution element is composed of longitudinally cut pipe.

5. A fibre distribution element according to claim 3 - 4, characterized in that the pressure of each air nozzle is adjustable as desired by separate operating devices and measured by a separate measuring element.

DATED this 18th day of April 1984.
YHTYNEET PAPERITEHTAAT OY JYLHAVAARA

EDW. WATERS & SONS
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