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(54) METHOD OF AND DEVICE FOR THE PNEUMATIC SPINNING OF YARN

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 NICZYCH, a State Enterprise organised and
 existing under the laws of Poland, of Lodz,
 5 55/59 Wolczanska Str., Poland, do hereby
 declare the invention, for which we pray
 that a patent may be granted to us, and the
 method by which it is to be performed, to
 be particularly described in and by the
 10 following statement:

This invention relates to a method and a
 device for the pneumatic spinning of yarn
 from natural and synthetic fibres.

A method of pneumatic spinning known
 15 heretofore consists in admitting fibres
 entrained by air into a non-rotational or
 stationary spinning chamber where they are
 set into rotating motion by air jets, and
 producing appropriate peripheral velocities
 20 in a section of the chamber where the yarn
 is to be formed and twisted by gathering of
 fibres from a sort of whirling ring thereof,
 whereafter the produced yarn is discharged
 from the chamber.

The device for putting said method into
 25 practice consists of a cylindrical, non-
 rotational or stationary chamber, which
 communicates at one of its ends with a
 source of vacuum, and is closed at the other
 30 of its ends by the cylindrical insert from
 end to end through which extends an axial
 channel through which the spun yarn is dis-
 charged. In the peripheral wall of the cham-
 ber, and in communication with the source
 35 of vacuum, are air-supply ducts which
 extend tangentially to the inner wall surface
 of the chamber, and a fibre delivery
 channel.

The rate of spinning is proportional to
 40 the peripheral velocities within the zone
 where the fibre ring is being formed in the
 spinning section of the chamber.

The whirl core developed in the centre
 of the chamber mitigates against appro-
 45 priate formation of said zone by the peri-

pheral velocities, however, this whirl core
 becoming stabilized on the lower surface of
 the insert, and—from the other side—at the
 inlet to the suction source.

According to the present invention, we 50
 provide a method of pneumatically spinning
 yarn inside a cylindrical, non-rotational
 spinning chamber closed at one end by a
 cylindrical insert incorporating a yarn-dis-
 charge channel and communicating at its 55
 other end with a source of vacuum through
 which loose fibres are drawn by suction into
 the chamber to be subjected to the action
 of air streams whirled into the chamber
 interior with the whirl core centred on the 60
 axis of the chamber comprising restraining
 blades mounted on the inner end of the
 cylindrical insert and guide blades fitted to
 the wall of the spinning chamber at the
 inlet to the vacuum source in order to 65
 inhibit the rotational velocity of air
 particles whirled into the chamber interior
 thereby to reduce the velocity in the whirl
 core.

Also according to the present invention, 70
 we provide a device for pneumatic spinning
 of yarn from loose fibres, comprising a
 cylindrical, non-rotational spinning chamber
 communicating through one of its ends with
 a source of vacuum, and closed through the 75
 other of its ends by a cylindrical insert in-
 corporating a yarn discharge channel and
 provided with peripheral ducts to supply air
 and also with a fibre delivery channel,
 restraining blades mounted on the inner end 80
 of the cylindrical insert, and guide blades
 fitted to the wall of the spinning chamber
 at the inlet to the vacuum source, in order
 to inhibit the rotational velocity of air par-
 ticles whirled into the chamber interior in 85
 operation of the device and thus reduce the
 velocity in the whirl core.

With the method and the device accord-
 ing to this invention, appropriate velocity
 distribution becomes possible in the section 90

of the chamber where the yarn is formed from the ring of rotating fibres, and thus the rate of spinning can be increased accordingly.

5 An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings, in which Fig. 1 is a longitudinal section through a device for the pneumatic spinning of yarn from loose fibres, and Fig. 2 is an underneath plan view as seen from the vacuum source.

Referring to the drawing, the device according to the invention comprises a cylindrical, non-rotational or stationary spinning chamber 1, which is restricted at one of its ends by a cylindrical insert 2 having a coaxial cylindrical boss 3 projecting from its end leading in the direction of insertion. This insert 2 is provided with a channel 4 extending along the axis of the insert and from end to end thereof. Spun yarn 5 is discharged to the outside of the chamber through said channel 4. At the other of its ends the chamber 1 communicates via suction duct 6 with a vacuum source (not shown). The chamber 1 has peripheral ducts 7 to supply air thereto and which can be arranged in any section of the chamber, and a fibre delivery channel 8 which is located in the upper part of the chamber. The ducts 7 extend tangentially to the inner wall surface of the chamber 1. The cylindrical insert 2 is provided at its lower face or end with radial restraining blades 9 to inhibit the velocity in the whirl core. The cylindrical insert 2 is widened at its end 14 leading in the direction of insertion and has at that end a peripheral depending skirt 13 which shrouds the radial restraining blades 9 and defines with the boss at said end 14 an annular recess in which the blades 9 are located. Peripherally-spaced and longitudinally-extending guide blades 11 are fitted to the wall chamber 1 at the inlet end of the suction duct 6 the guide blades 11 being in planes radial of the longitudinal axis of the duct 6. The blades 9 and 11 have a ram effect on the air particles whirling inside the whirl core at the lower surface of the insert 2 and at the inlet end of the suction duct 6, and improve the distribution in the field of velocities, especially in favour of an increase in the velocities at the wall of the spinning chamber 1.

In use of the device described, air supplied through the ducts 7 is sucked away through the suction duct 6, whereby the ducts 7 cause whirling of the air inside the chamber 1. Because of the restraining blades 9, a proportion of the air particles swirling within the whirl core is obstructed and thereby causes the internal pressure in the core to increase and the direction of air flow to change, whereby the rotational velocity in the whirl core is reduced.

The fibres delivered through the inlet channel 8 in consequence of the air draught produced by the source of vacuum, form a sort of a ring 12 swirling over the inner wall of the chamber 1. To start spinning a length of yarn is introduced into the chamber 1 through the axial channel 4. When rotating, the free end of this length associates with swirling fibres, gathering and twisting them. The spun yarn 5 is then discharged out of the chamber.

Reference is made to our co-pending patent applications nos. 7756/77 (Serial No. 1567681), 8052/77 (Serial No. 1567682) and 8957/77 (Serial No. 1567683).

WHAT WE CLAIM IS:—

1. A method of pneumatically spinning yarn inside a cylindrical, non-rotational spinning chamber closed at one end by a cylindrical insert incorporating a yarn-discharge channel and communicating at its other end with a source of vacuum through which loose fibres are drawn by suction into the chamber to be subjected to the action of air streams whirled into the chamber interior with the whirl core centred on the axis of the chamber comprising restraining blades mounted on the inner end of the cylindrical insert and guide blades fitted to the wall of the spinning chamber at the inlet to the vacuum source in order to inhibit the rotational velocity of air particles whirled into the chamber interior thereby to reduce the velocity in the whirl core.

2. A device for pneumatic spinning of yarn from loose fibres, comprising a cylindrical, non-rotational spinning chamber communicating through one of its ends with a source of vacuum, closed through the other of its ends by a cylindrical insert incorporating a yarn discharge channel, and provided with peripheral ducts to supply air and also with a fibre delivery channel, restraining blades mounted on the inner end

- of the cylindrical insert, and guide blades fitted to the wall of the spinning chamber at the inlet to the vacuum source, in order to inhibit the rotational velocity of air particles whirled into the chamber interior in operation of the device and thus reduce the velocity in the whirl core.
- 5 3. A method of pneumatically spinning yarn from loose fibres, substantially as hereinbefore described with reference to the accompanying drawing. 15
- 10 4. A device for pneumatic spinning of

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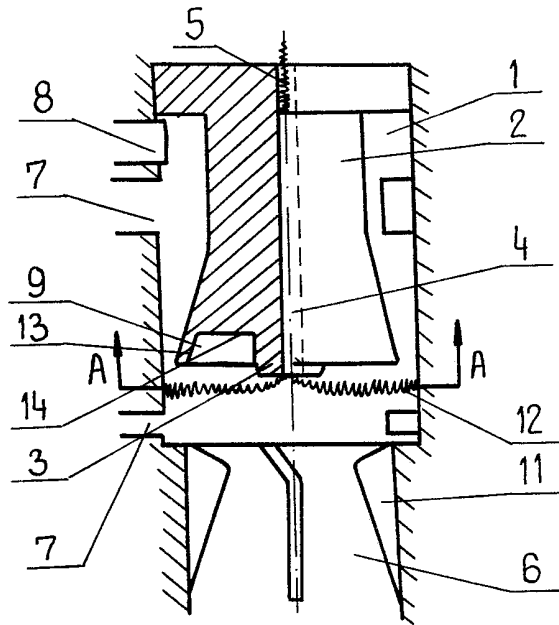


Fig. 1

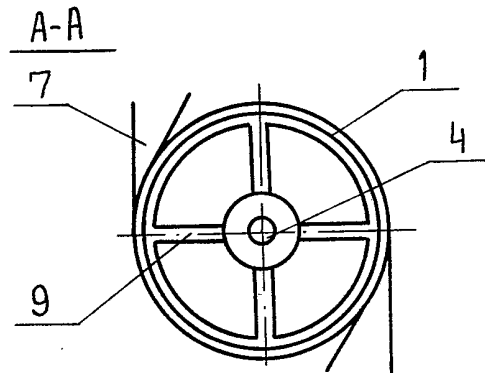


Fig. 2