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(54) AN OPEN END SPINNING UNIT

(71) We, TELDIX G.M.B.H., of 36 Grenzhofer Weg, Heidelberg 6900, Federal Republic of Germany, a German Body Corporate 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 following statement:—

The invention relates to an open-end spinning unit comprising a spinning rotor, a bearing unit for the spinning rotor fixed to the machine and suction means for creating a gas flow from fibre inlet and thread removal openings to a suction opening.

A similar open-end spinning unit is known, for example, from German Offenlegungschrift 2 135 525. Besides a common drive for a number of separate spinning units driven by a common drive belt spinning units have also become known comprising an integral electric motor as a drive (German Offenlegungschrift 2 404 291).

Particularly in the case of individual drives, but also in the case of a common drive, it is important to reduce the power required by the units. This is more important in the individual drive because an increased power consumption also involves the generation of greater heat, the removal of which brings problems with the relatively small dimensions of the units under consideration.

The invention seeks to lower the power consumption required for the drive of a spinning unit.

According to the invention, there is provided an open-end spinning unit comprising a spinning rotor having a spinning bowl, a bearing unit fixed to a stator, and a drive for the spinning rotor, the stator parts surrounding the outer surface of the spinning bowl forming an outer chamber, suction means for forming a flow of gas from the inner chamber of the spinning bowl past its front edge into the outer chamber, and fixed covering elements within the outer chamber and arranged around the spinning bowl to form an annular gap therewith such that the flow of gas slides past the covering elements and is kept to a large extent, away from the outer surface of the spinning bowl.

This invention acknowledges the fact that a substantial part of the power required for the drive is consumed in the form of air friction losses which occur because the fibre feed air current passes along the outer surface of the spinning bowl. The conclusion which is drawn from this to arrange mechanical means in the region of the outer surface of the spinning bowl so that the flow of gas is deflected and no longer passed along the outer surface of the spinning bowl. These mechanical means may be attached to the fixed part of the unit but it is also possible to mount them on the opening flap of the spinning unit. Preferably, a ring is fixed onto one part of the stator of the spinning unit and reaches at least to the gap at the outer surface of the spinning bowl in the vicinity of its front edge, thus shutting off the area surrounding the rotor from the gas flow area with the exception of the gap. It is favourable if the ring is so matched to the contour of the spinning bowl with its side facing the outer surface of the spinning bowl that there is only a small gap remaining between the two. In fact it is advantageous in terms of power to have only a small cushion of air between the rotating and the fixed parts.

The size of the gap should be selected such that the spinning rotor, which may be transversely offset crosswise and of performing wobbling motions because it has a floating mounting, does not in any event run on the ring.

If — as, for example, is known from German Offenlegungschrift 2 404 241 — the motor providing the individual drive has an external rotor then in accordance with a further modification of the invention, care may also be taken to see that this rotor which may be a cone-shaped rotor or any other non-external rotor lying within the casing of the unit lies in the area shielded from the flow of air, so that additional air friction losses due to a stream of air flowing past are avoided. It has been shown that in certain circumstances up to 20% of the drive power may be saved per spinning

unit.

The invention will now be described in greater detail, by way of example, with reference to the drawing, the single figure of which shows an open-end spinning unit, in accordance with the invention, with an integral drive motor.

The stator of an open-end spinning unit is designated by 1 in the drawing, this stator accommodating a bearing unit 2 which is resiliently (floatingly) suspended in an opening 3 by means of "O" rings 4. The rotor, comprising the spinning bowl 5 and the motor rotor 6, carrying magnets 7, is mounted by means of the pin 8 on this bearing unit. The drive winding 13 lies opposite the magnets 7. Air may flow into the inside of the unit through a thread withdrawal opening 9, out of which the thread passes, and through a lateral opening, which is not visible, through which the fibres to be spun are fed to the rotor. A source of reduced pressure is connected to an opening 10 so that on the inside of the spinning bowl, air flows to the opening 10 via recesses in a cover 11 of the unit. In order to lower the air friction losses, a ring 14 is set on the stator 1 with its contour matched to the contour of the outer surface of the spinning bowl and arranged at only a small spacing therefrom. The ring 14 is arranged such that only the small gap 15 connects an inner annular chamber 16 with an outer chamber 17. Thus there is no possibility of the air flow of air produced by the reduced pressure coming into contact with the outer surfaces of the spinning bowl 5 and the rotor 6. As a result, a substantial lowering in the power consumption is achieved in relation to a rotor which is not so shielded.

The ring 14 may be screwed or — as indicated at 18 in the drawing — may be fixed by means of a bayonet or sliding connection to the stator 1.

The narrow gap 15 between the ring 14 and the spinning bowl 5 also has the additional advantage that the floatingly mounted spinning bowl 5 is stabilised, i.e. that wobbling motions of the entire rotor are at least reduced.

The air in the gap thus acts as a gas bearing.

WHAT WE CLAIM IS:—

1. An open-end spinning unit comprising a spinning rotor having a spinning bowl, a bearing unit fixed to a stator, a drive for the spinning rotor, the stator parts surrounding the outer surface of the spinning bowl forming an outer chamber, suction means for forming a flow of gas from the inner chamber of the spinning bowl past its front edge into the outer chamber, and fixed covering elements within the outer chamber and arranged around the spinning bowl to form an annular gap therewith such that the flow of gas slides past the covering elements and is kept to a large extent, away from the outer surface of the spinning bowl.

2. A unit according to claim 1, wherein the covering elements comprise a ring arranged to form the gap with the bowl at the outer surface of the spinning bowl in the vicinity of its front edge.

3. A unit according to claim 2, wherein the ring is matched in its contour to the external wall of the spinning bowl and extends close thereto.

4. A unit according to claims 2 or 3, wherein the rotor includes a cone-shaped or cylindrical rotor part of the spinning bowl to form the rotor part of the drive motor for the unit, this rotor part being situated in a space connected to the space containing the gas flow only by the gap.

5. An open-end spinning unit substantially as described herein with reference to the drawings.

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1587180 COMPLETE SPECIFICATION

1 SHEET *This drawing is a reproduction of the Original on a reduced scale*