Oct. 10, 1967 D. GRUET 3,345,814

DEVICE FOR WINDING YARN ONTO A SPOOL BY MEANS OF A RING

Filed Oct. 18, 1965 2 Sheets-Sheet 1

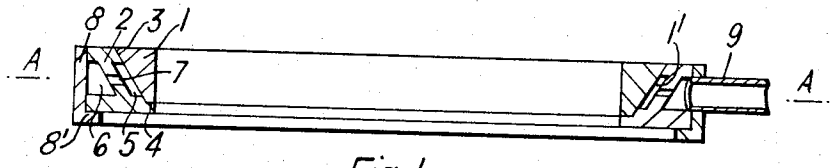


Fig. 1.

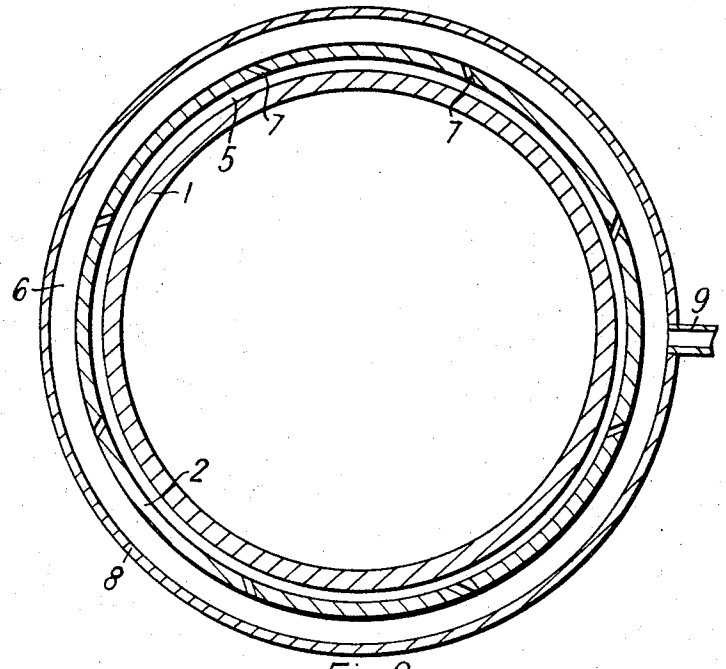


Fig. 2.

Inventor
Daniel Gruet
By
Cushman, Darby & Cushman
Attorneys

Oct. 10, 1967 D. GRUET 3,345,814

DEVICE FOR WINDING YARN ONTO A SPOOL BY MEANS OF A RING

Filed Oct. 18, 1965 2 Sheets-Sheet 2

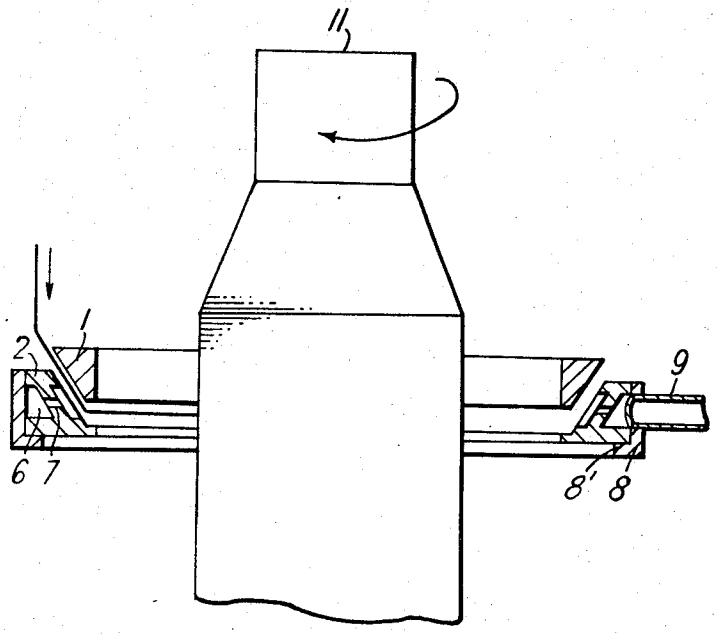


Fig. 3.

Inventor
Daniel Gruet
By
Cushman, Darby & Cushman
Attorneys

United States Patent Office 3,345,814
Patented Oct. 10, 1967

3,345,814

DEVICE FOR WINDING YARN ONTO A SPOOL BY MEANS OF A RING

Daniel Gruet, Ecully, France, assignor to Societe Rhodiaceta, Paris, France, a corporation of France

Filed Oct. 18, 1965, Ser. No. 497,249
Claims priority, application France, Nov. 26, 1964, 996,416
3 Claims. (Cl. 57—124)

ABSTRACT OF THE DISCLOSURE

The invention provides a winding device for use in textile apparatus, in which a ring is caused to float in a surrounding ring carrier by a cushion of air supplied from a ring carrier. The outer periphery of the ring and the corresponding inner periphery of the ring carrier are downwardly convergent frusto-conical surfaces of identical conicity, providing vertical support and stable horizontal centering of the ring.

The present invention relates to a device for winding-on by means of a ring, in textile machines.

In the textile industry, it is current usage to wind-on a yarn while simultaneously imparting twist thereto. To this end, the conventional device comprising a ring and traveller is generally utilized. The productivity of a device of this kind is limited by the limit linear velocity of the traveller on the ring, due to the friction of the said traveller on the ring.

In order to overcome this disadvantage, it has recently been proposed to utilize a winding-on device operating with a ring but without a traveller and wherein the ring-carrier and the ring are suitably magnetized, the ring being maintained in a "floating" condition, such that an annular gap, into which the yarn passes, is left between the ring-carrier and the ring. In order to produce a device of this kind, it is necessary to have annular magnets which are radially magnetized in a homogeneous fashion, and this is difficult to achieve in a perfectly satisfactory manner.

According to the invention there is provided a device for winding yarn onto a spool, such device comprising a circular ring positionable within an annular ring-carrier so that the lateral surface of the ring can be in close contact with the inner surface of the ring-carrier and means for connecting the inner surface of the ring-carrier to a source of gas under pressure whereby the ring may be lifted out of contact with the ring-carrier by the gas.

Advantageously, when the device is not functioning, the ring bears on a portion of the surface of the ring-carrier. The support of the ring is achieved by interposition of a gaseous film between the oppositely-positioned faces of the ring-carrier and the ring.

According to a preferred embodiment of the invention, a ring-carrier is used which is formed with a frusto-conical inner surface and has a shoulder on its lower portion, the ring being, in the inoperative state, perfectly in contact with the conical inner surface. Conduits for the inflow of the gaseous fluid may be provided to open out on the conical inner surface, so that, when the said conduits are connected to a source of gas under pressure, for example compressed air, a film of air is formed between the ring-carrier and the ring, which is thus lifted above the ring-carrier. When the ring has been lifted to a sufficient height, the yarn is able to pass through the film of air before being wound on a vertical spindle.

In order that the invention may more readily be understood, the following description is given, by way of example, with reference to the accompanying drawings, in which:

FIGURE 1 is a side elevation, in section of a device according to the invention, as seen in the inoperative position;

FIGURE 2 is a section taken along A—A of FIGURE 1; and

FIGURE 3 is a view similar to FIGURE 1, showing the device in the operative postion, surrounding a winding-on spindle.

Detailed description of invention

Referring to the figures, there is illustrated a ring **1** having a frusto-conical lateral surface **1'** which has a smooth finish. An annular ring-carrier **2** is formed with a cooperating conical bore **3** and has an inwardly directed annular shoulder **4** on its lower portion, the surface **1'** and bottom face of the ring being, in the inoperative state, perfectly in contact with the conical bore **3** and shoulder **4**. Formed in the centre of the bore is an annular recess **5**. The external portion of the ring-carrier is formed with an annular groove **6**. A series of conduits **7** provides for the passage of the gas from the annular groove towards the recess **5**. The conduits **7** are advantageously inclined relatively to the radial direction, so as to bring about the rotation of the ring **1**. A surrounding sealing ring **8** closes the groove **6**, thus forming an annular distributor, an inwardly directed rim **8'** extending under the ring-carrier and permitting mounting of the latter on the ring-carrying table of the machine, to which a raising and lowering movement is imparted. An inlet tube **9**, adapted to be connected to a source of gas under pressure, passes through the ring **8** to be in communication with the groove **6**. It is possible, if desired, to utilize a plurality of tubes **9** for the inflow of gas, so as to obtain improved regularity in the distribution of the gas in the conduits **7**.

The relative position of the different members when the device is functioning is illustrated in FIGURE 3. Under the action of the pressure of the gas supplied to the tube **9**, the ring **1** is raised slightly from the ring-carrier **2**. The inclination of the tubes **7** with respect to the radial direction causes the inwardly flowing gas to impinge on the ring **1** in such a way as to cause it to rotate in a clockwise direction as seen in FIGURE 2. The yarn **10** is passed into the gap between the ring-carrier and the ring and is wound on a vertical spindle or spool **11** which is rotated as indicated. The yarn **10** is wound on the spindle **11** whilst remaining in close contact with the outer surface of the ring **1** and rotating with the ring in the gap between the ring and the ring-carrier.

The device according to the invention permits the winding-on of yarns at high speed. Furthermore, it is not necessary to adjust the weight of the ring in accordance with the count of the yarn, as in the conventional system utilizing a ring and traveller.

The device according to the invention may be used in all cases, in place of the conventional winding-on system utilizing a ring and traveller, for example in continuous twisting frames, for the winding-on of synthetic yarns after drafting, or for the assembly of a multiplicity of threads.

I claim:

1. In a textile machine, a device for winding yarn onto a spool, said device comprising: a circular ring; means defining a downwardly convergent frusto-conical lateral surface to said ring; an annular ring carrier; an inner surface to said ring carrier of corresponding and co-operating frusto-conical form to the frusto-conical surface of said circular ring; and means for connecting the inner surface of said ring carrier to a source of gas, whereby the lateral surface of said ring may be lifted out of contact with the inner surface of said ring carrier by the

gas, said yarn passing through the gap between the lateral surface of said ring and the inner surface of said ring carrier.

2. A device specified in claim 1 and further including means defining an annular recess in the inner surface of said ring carrier.

3. In a textile machine, a device for winding yarn onto a spool, said device comprising: a circular ring; means defining a downwardly convergent frusto-conical surface on said ring; an annular ring carrier, inner and outer surfaces to said ring carrier, said inner surface being of corresponding and cooperating frusto-conical form to the frusto-conical surface of said circular ring, whereby said lateral surface of said ring may rest in close contact with said ring carrier; means defining an annular recess in the inner surface of said ring carrier; means defining an annular groove in the outer surface of said ring carrier; a plurality of conduits in said ring carrier, each extending in a direction inclined to its respective radius and in the same sense, said conduits connecting said annular recess on said inner surface and said annular groove on said outer surface; a sealing ring surrounding said ring carrier and defining, with said annular groove, an annular chamber, and at least one pipe connection for connecting said annular chamber to a source of gas under pressure, whereby gas passing in said annular chamber flows through said conduits and into said inner groove in said inner surface, effective to lift the lateral surface thereof from contact with said inner surface of said ring carrier and rotate said ring, the yarn being adapted to pass in the gap between said inner surface of said ring carrier and said lateral surface of said ring.

References Cited

UNITED STATES PATENTS

2,796,726	6/1957	Klein	57—124 X
2,907,165	10/1959	Adams et al.	57—75
2,932,152	4/1960	Jackson	57—124 X
3,045,417	7/1962	Wayson et al.	57—120
3,205,647	9/1965	Matsui	57—124

FRANK J. COHEN, *Primary Examiner.*

J. PETRAKES, *Examiner.*

A. J. SIDOTI, *Assistant Examiner.*