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Wehling et al.

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[54] **APPARATUS AND METHOD FOR SPINNING YARNS COMPOSED OF FIBER BLENDS**

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[51] **Int. Cl.** **D01h 1/12**

[58] **Field of Search** 57/58.89–58.95, 156

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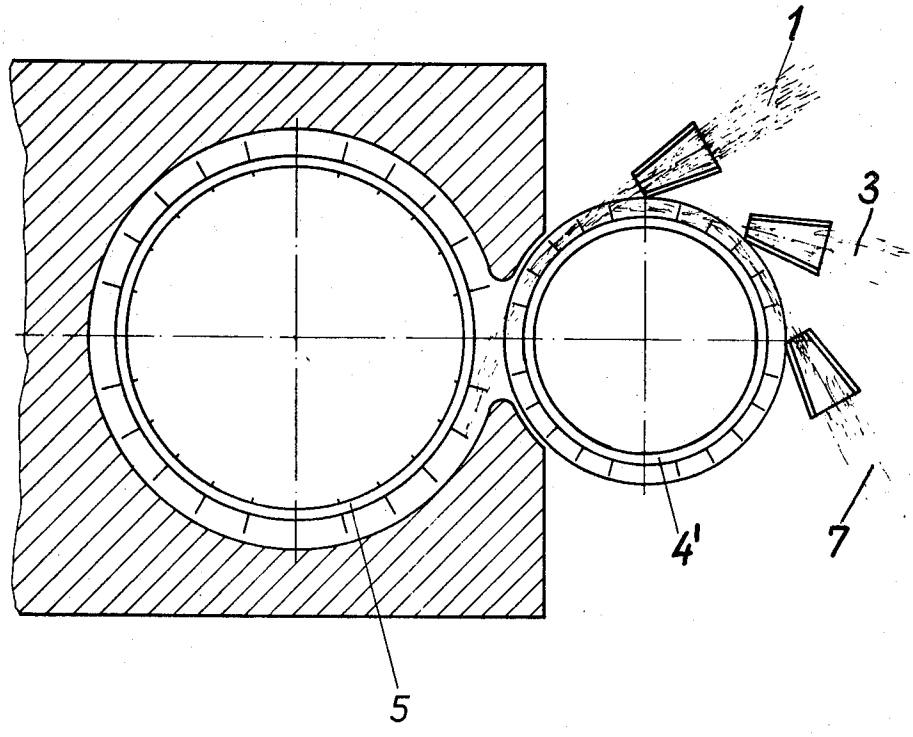
[57] **ABSTRACT**

For spinning yarn, composed of a blend of fibers having respectively different properties, in an open-end spinning machine including a turbine and a break-up roller which is supplied with fiber rovings via one or more feed rollers, each different type of fiber is individually supplied in the form of a stream of rovings to the feed roller.

5 Claims, 4 Drawing Figures



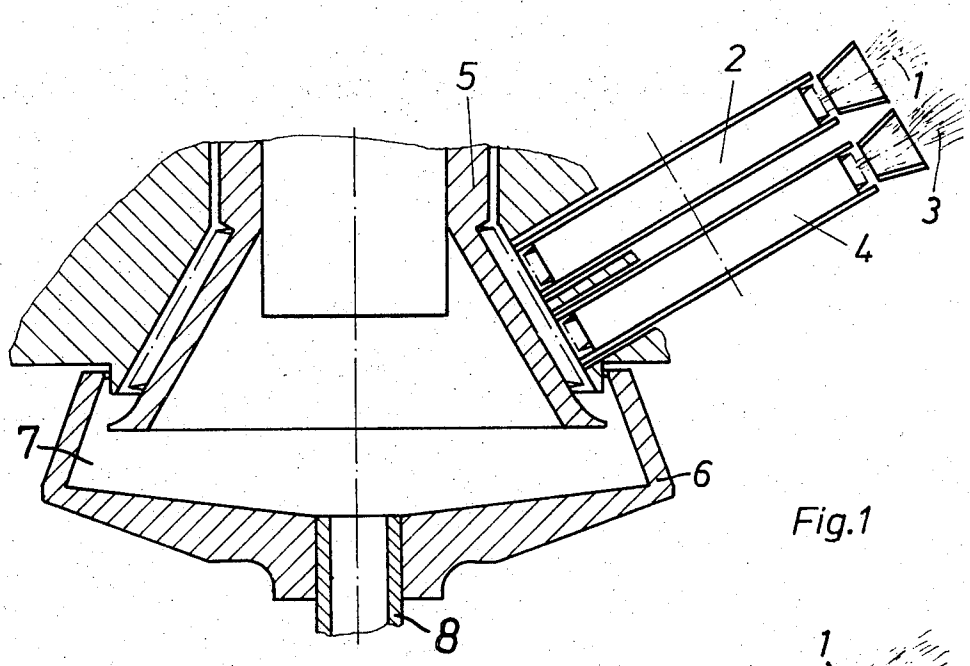


Fig.1

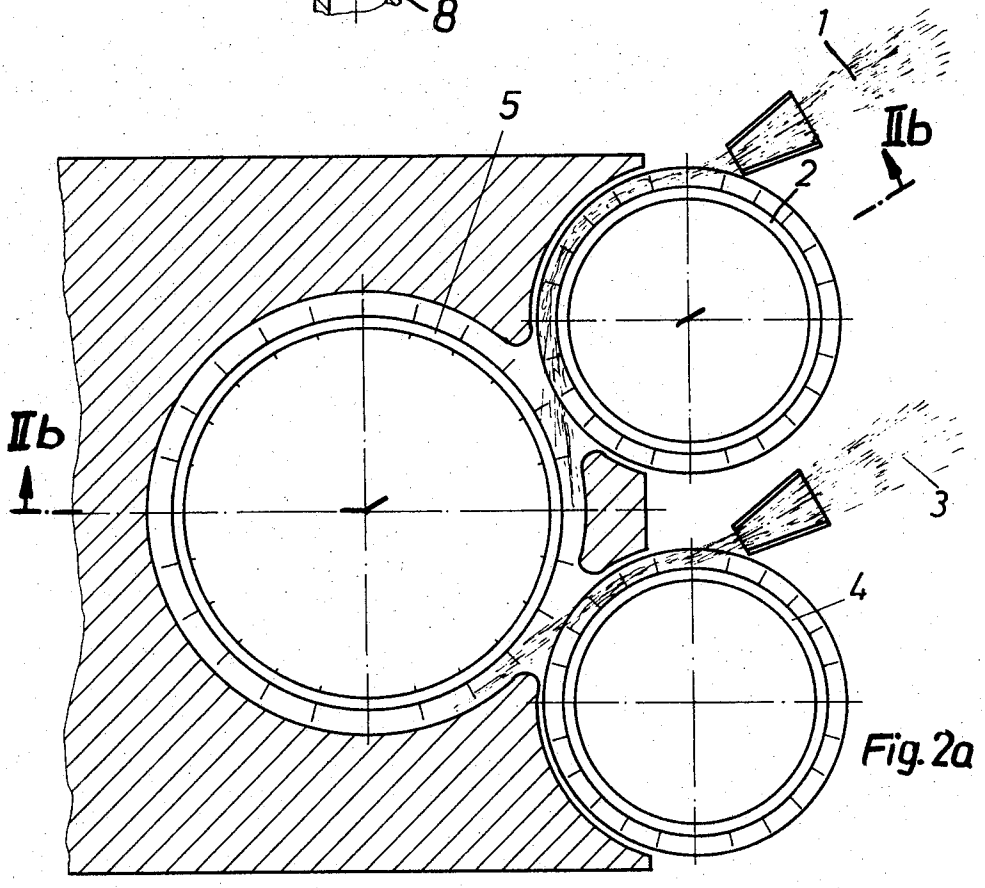


Fig.2a

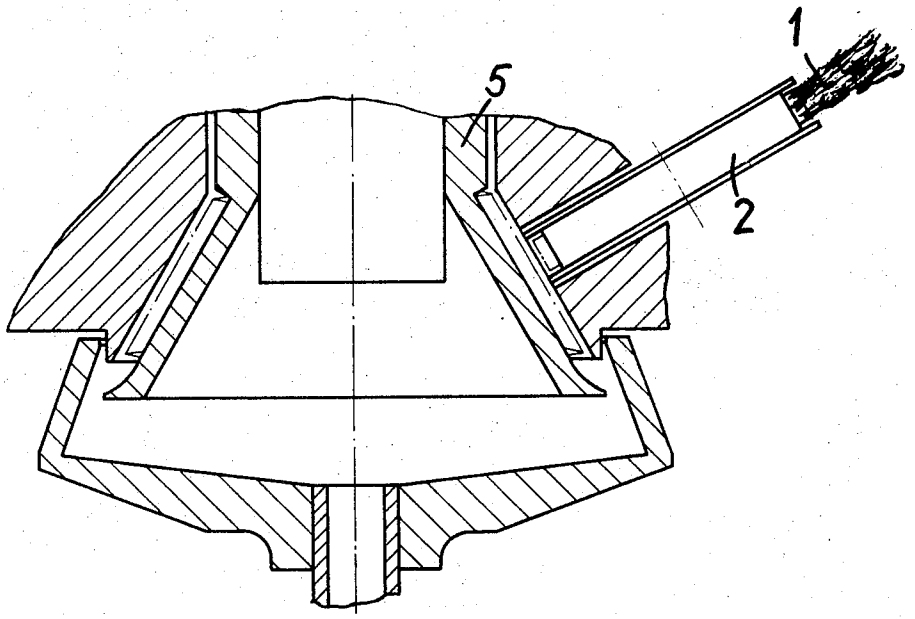


Fig. 2b

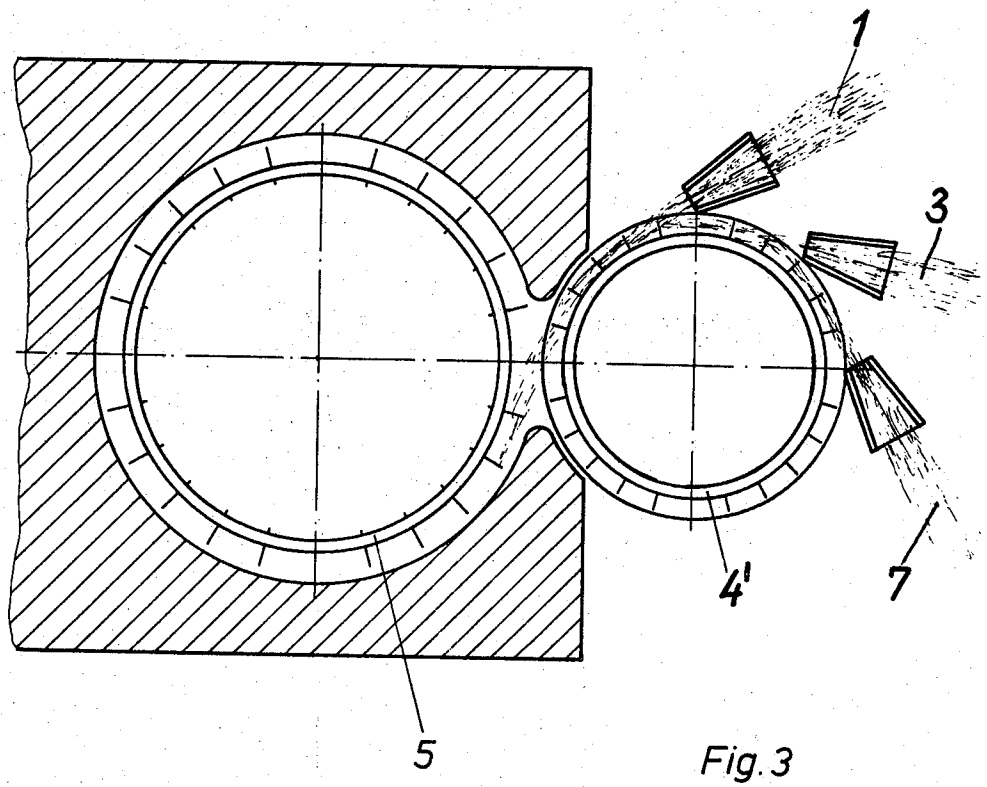


Fig. 3

APPARATUS AND METHOD FOR SPINNING YARNS COMPOSED OF FIBER BLENDS

BACKGROUND OF THE INVENTION

The present invention relates to a method and apparatus for producing yarns, particularly from fibers having different properties, in an open-end spinning machine.

The invention more particularly relates to the spinning of yarns from fibers which differ with respect to denier, length, type and color, wherein the spinning is performed in open-end spinning machines which include a break-up roller and a spinning turbine arranged coaxially with respect to the break-up roller, and the fiber material used is in the form of processed rovings.

In the prior art methods for producing yarns from different fibers, the desired mixture of the various fibers was prepared before or during the production of the rovings to be used in the spinning machine. The rovings to be introduced into the spinning machine were thus already composed of the mixture of fibers which the finished yarn was to contain.

In this type of yarn production in an open-end spinning process, a roving composed of a given mixture of fibers is guided over a feed roller to the break-up roller of the open-end spinning machine. The roving is then broken up into individual fibers by the break-up roller. Due to centrifugal force produced by the roller, and the flow of air, the individual fibers then enter the so-called fiber collecting trough of the spinning turbine of the open-end spinning machine in a certain mixing ratio. From there the fibers are removed through the center of the spinning turbine as a yarn.

SUMMARY OF THE INVENTION

It is a primary object of the present invention to improve such spinning processes.

A further object of the invention is to increase the degree of control which can be imposed on the resulting product.

A more specific object of the present invention is to produce yarns in an open-end spinning machine from fibers having different properties, where the individual types of fibers are supplied in the form of individual, unmixed rovings.

These and other objects are accomplished according to the present invention by feeding the fibers which have such different properties, in the form of individual rovings to one or a plurality of feed rollers disposed ahead of the break-up roller of the open-end spinning machine. The individual rovings each consist of fibers all having a particular individual property, it being of course also possible to have fibers with different properties mixed together.

Thus, the present invention involves having fibers with respectively different properties present in individual, independent rovings and mixing these independent rovings together only during the introduction into the break-up roller of the open-end spinning machine.

The individual rovings composed of fibers with respectively different properties are introduced to the break-up roller of the spinning machine by means of a separate feed roller for each roving. Each of the feed rollers may be operated at a respectively different feed speed so that a certain mixing ratio with respect to the input of the fibers can be realized. As an alternative to giving different feed speeds to the individual feed rollers, the mixing ratio with respect to the individual types of fibers can also be varied or set in a certain way, if all the feed rollers have the same feed speed, by supplying the feed rollers with roving masses of different densities.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal cross-sectional view of an open-end spinning machine according to the invention having two superimposed feed rollers.

FIG. 2*a* is an axial cross-sectional view of an open-end spinning machine according to the invention having two feed rollers arranged at the periphery of the break-up roller.

FIG. 2*b* is a cross-sectional view taken along line II-*b*—II*b* of Fibure 2*a*.

FIG. 3 is a longitudinal cross-sectional view of another open-end spinning machine according to the invention having a single feed roller and a triple input of rovings to this feed roller.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the apparatus shown in FIG. 1, two rovings 1 and 3 each containing respectively different fibers are separately introduced to the break-up roller 5 of an open-end spinning machine via feed rollers 2 and 4. Roller 5 is of standard construction and is mounted and rotated in a known manner. This roller is provided with a series of axially extending, radially spaced fins, as shown, which act to break up the streams of rovings.

At the break-up roller 5 the rovings 1 and 3 are broken up into individual fibers and these individual fibers mingle with one another. The mixed individual fibers then reach the so-called fiber collecting trough 7 of a spinning turbine 6 via whose center, or extrusion bore, 8 they are then extruded or expelled as yarn. Turbine 6 is also constructed, mounted and rotated according to principles and procedures which are standard and well-known in the art.

The feed rollers 2 and 4 may be superimposed relative to their axes of rotation, as shown in FIG. 1. As shown in FIG. 2, the feed rollers 2 and 4 may just as well be arranged adjacent one another along the periphery of the break-up roller.

The principles of the present invention can also be employed by providing a single feed roller 4', as shown in FIG. 3, and by supplying this feed roller with individual streams of rovings 1, 3 and 7, each consisting of respectively different fibers.

The devices supplying streams 1, 3 and 7 in the various illustrated embodiments can, in practice, be constituted by any arrangements currently employed in the industry for supplying a stream of rovings of a single material or a mixture of materials.

When several streams of rovings are supplied to the input region of break-up roller 5 in any of the ways shown in the Figures, rovings from the several streams will form a suitably homogeneous mixture as they travel along the conical break-up surface of roller 5 and through collecting trough 7.

Practical embodiments of the invention can be assembled from known, commercially available spinning turbines, constituting units 5 and 6, feed rollers, constituting units 2, 4 and 4', and devices capable of supplying streams of rovings 1, 3 and 7.

Various other combinations can be made, within the scope of the invention, of the illustrated arrangements. Thus, for example, arrangements such as those shown in FIGS. 1 and 2 can be provided with more than two feed rollers or one or both rollers of these illustrated embodiments could be supplied with more than one stream of rovings.

According to the invention, the following speed conditions may, for instance, occur at feed rollers 2 and 4:

Feed roller 2 feeds a stream of roving 1 weighing 2 g/m at a speed of 0.5 m/min.

Feed roller 4 feeds a stream of rovings 3 weighing 2.4 g/m at a speed of 1.25 m/min.

This gives a feed weight of 1 g/min. at feed roller 2 and of 3 g/min. at feed roller 4. The mixing ratio of the fibers in the yarn is thus 1:3.

It will be understood that the above description of the present invention is susceptible to various modifications, changes and adaptations, and the same are intended to be comprehended within the meaning and range of equivalents of the appended claims.

We claim:

1. In a process for spinning yarn formed of a blend of different types of fibers, the fiber types differing from one another with respect to at least one property, in an open-end spinning machine composed of a rotating break-up roller and a spinning turbine rotating coaxially with the roller, at least one feed roller being provided to deliver a stream of rovings of such fibers to the break-up roller, the improvement comprising supplying each different type of fiber separately to the at least one feed roller.

2. In apparatus for spinning yarn formed of a blend of different types of fibers, the fiber types differing from one another with respect to at least one property, the apparatus including an open-end spinning machine composed of a rotating break-up roller and a spinning turbine rotating coaxially with the roller, and at least one feed roller rotatively mounted for delivering a stream of rovings of such fibers to the break-up roller, the improvement comprising means supplying each different type of fiber separately to said at least one feed roller; whereby the different types of fibers become mixed together only subsequent to being supplied to said at least one feed roller.

3. An arrangement as defined in claim 2 wherein there are a plurality of said feed rollers and said means supply at least one different type of fiber to each said feed roller.

4. An arrangement as defined in claim 3 further comprising means for rotating said feed rollers are rotated at respectively different speeds.

5. An arrangement as defined in claim 2 wherein there is a single feed roller and said means supply the different types of fibers separately to said feed roller.

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