

# United States Patent [19]

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[54] APPARATUS FOR THE SPINNING OF STAPLE FIBERS IN A RINGLESS MANNER

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[58] Field of Search ..... 57/58.89-58.95

[56]

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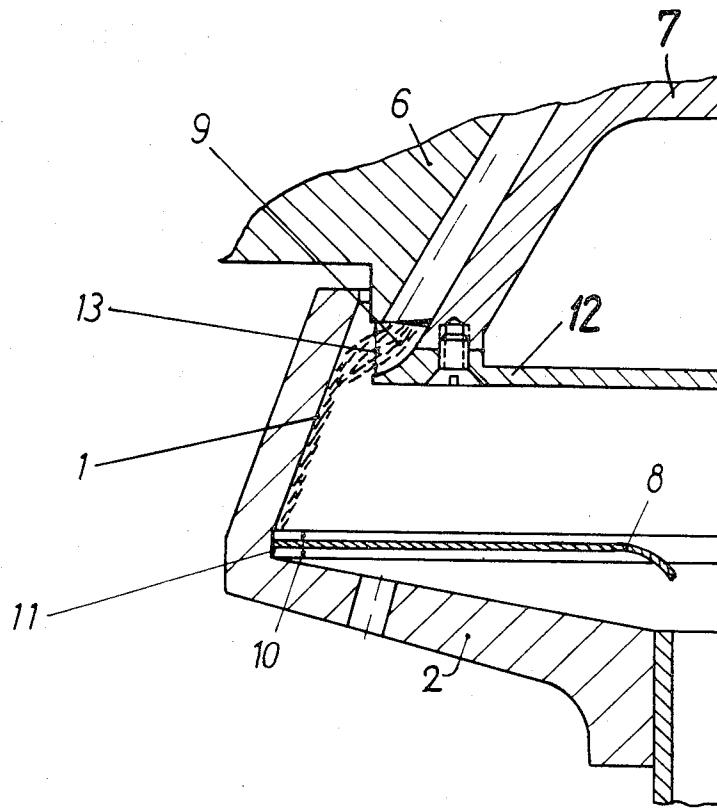
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[57]

## ABSTRACT

An apparatus for use in connection with the spinning of staple fibers in a ringless manner, in which the fibers withdrawn from a sliver by an opening-up roller are by means of a centrifugal disc at the bottom of said roller conveyed and directed upon an inlet wall portion of a spinning turbine.

8 Claims, 3 Drawing Figures



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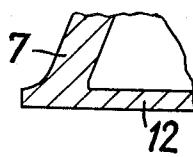


Fig. 2a

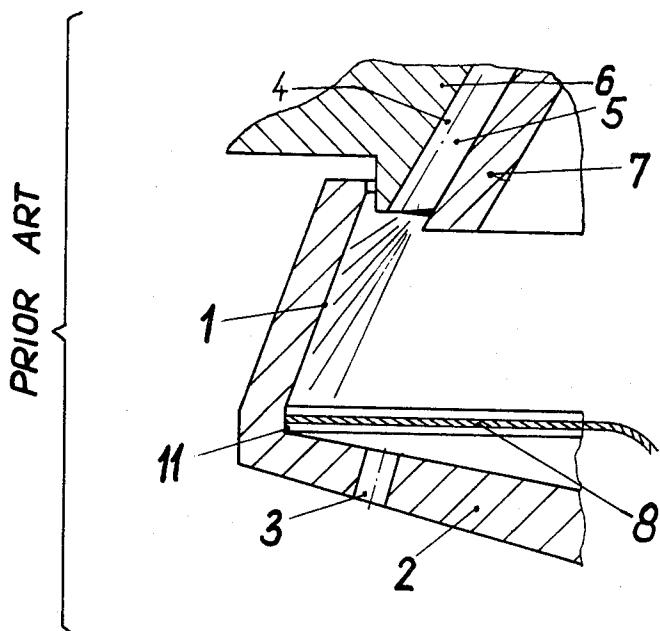


Fig. 1

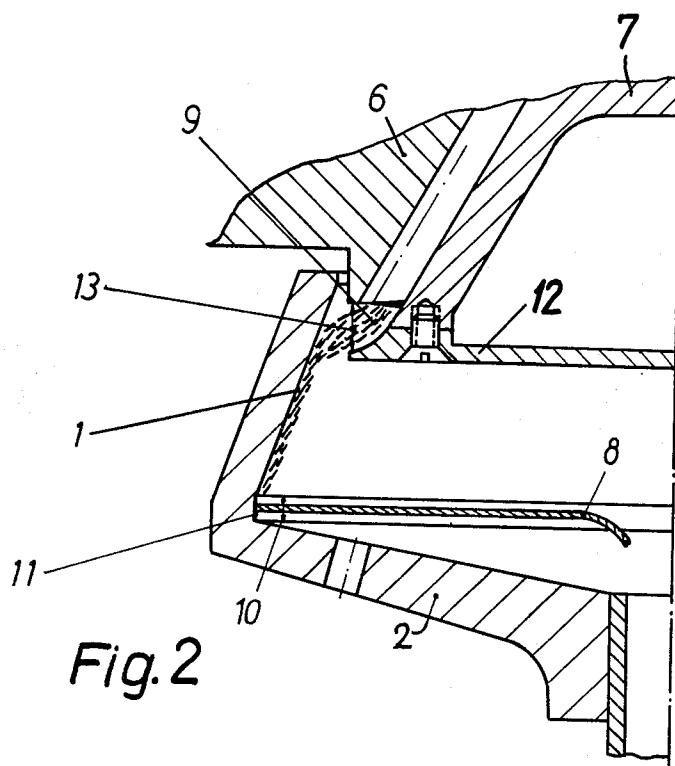


Fig. 2

## APPARATUS FOR THE SPINNING OF STAPLE FIBERS IN A RINGLESS MANNER

The present invention relates to a device for feeding into a spinning chamber fibers removed from a sliver when spinning staple fibers in a ringless manner, said device comprising a rotatable below atmospheric pressure spinning turbine and a carding device.

With this known feeding operation with an opening-up roller arranged coaxially with regard to the spinning turbine, the opened-up or loosened fibers are over a sector fed to the inlet part of the spinning turbine. In this connection, not only centrifugal forces acting upon the individual fibers occur, but also air will be drawn in whereby the fibers during the known opening-up operation can be fed into the entire inlet part of the spinning turbine, and a non-homogeneous yarn may be formed so that the usefulness of the finished thread or yarn is greatly reduced.

It is, therefore, an object of the present invention to provide a device which during a spinning of staple fibers in a ringless manner will feed into a spinning chamber fibers removed from a sliver while overcoming the above mentioned drawbacks and which will make it possible to feed the fibers only to the front portion of the inlet part and then to convey the fibers to the spinning turbine.

These objects and other objects and advantages of the invention will appear more clearly from the following specification, in connection with the accompanying drawing, in which:

FIG. 1 shows the principle of the prior art arrangement.

FIG. 2 shows the improved feeding system according to the invention.

FIG. 2a represents a portion of a modified centrifugal disc-opening-up roller combination according to the present invention.

The device according to the invention is characterized primarily in that a needle-free centrifugal disc has its outer periphery shaped so, preferably conically or concavely arc-shaped, that it will direct and convey the fibers onto an adjacent portion of the turbine inlet wall along which the fibers will then slide into a fiber collecting trough. This centrifugal disc which rotates together with the opening-up roller may be arranged exchangeably on the opening-up roller, but if desired, may also consist of one piece therewith.

Referring now to the drawing in detail, reference may first be had to the prior art as illustrated in FIG. 1. According to this known device, when spinning fiber slubbing in a ring-free manner with the opening-up roller 7 coaxially arranged with regard to the under atmospheric pressure spinning turbine 2, the opened-up fibers are, through an annular passage 4, conveyed over a sector (sektoral) to the inlet part 1 of the spinning turbine 2. After leaving the annular passage 4 and after being caught by the inlet part 1 of the spinning turbine 2, the fibers are accelerated and conveyed into a fiber-collecting trough 11. The said fiber collecting trough 11 must be kept at a sufficiently great distance with regard to the feed-in zone of fibers in conformity with the fiber length.

Inasmuch as with this process due to the respectively present bodies of rotation, not only the centrifugal forces act upon the individual fibers, but also air is drawn through the bores 3 provided in the spinning tur-

bine bottom at the flange side and through the passage 4 between the needle field points 5 and the opening-up roller housing 6, it will be appreciated that with the heretofore known design 7 of the opening-up roller, the fibers may be fed into the entire inlet part 1 of the spinning turbine. This results in an uncontrolled depositing of individual fibers on the thread 8 being formed whereby a non-homogeneous yarn is obtained so that the usefulness of the finished thread is greatly reduced.

10 An improved fiber feeding according to the present invention is shown in FIG. 2. According to FIG. 2, a needle-free centrifugal disc 12 which extends in substantially radial direction with a concavely arc-shaped periphery is so arranged at the end of the mantle of the 15 conical opening-up roller 7 that the disc 12 either together with the opening-up roller forms a single unitary part (FIG. 2a), or in the form of a separate disc is arranged on the mantle of the opening-up roller (FIG. 2).

This centrifugal disc 12 is intended to cover up the 20 zone of the fiber infeed 13 with regard to the zone of the yarn withdrawal 10 to a greater extent. On the other hand, the centrifugal disc 12 is intended to feed the fiber infeed 13 to the spinning turbine 2 only at the 25 front portion of the inlet part 1, which front portion may have a length of from 10 to 30 millimeters and preferably has an inclination of from 10° to 40° with regard to the fiber collecting trough 11. From this zone 13, the fibers coming from the opening-up roller 7 will, after having been grasped by friction by the inlet part 30 1 of the lower than atmospheric pressure spinning turbine 2, slide along the conical inlet part 1 of the spinning turbine 2 into the fiber collecting trough 11. From here the said fibers are in the form of spun yarn 8 withdrawn to the center of the turbine 2.

35 At the same time, in conformity with the yarn number or yarn size to be spun, the number of the fibers to be fed in, the number of the crepe or crimp, and in conformity with the fiber titer or denier and the spacing between the needle field upper edge 5 and the opening-up 40 roller housing 6, the spacing between the outer diameter of the centrifugal disc 12 and the spinning turbine inlet part 1 is adjusted by a non-illustrated adjusting device so that the fibers can unimpededly reach the fiber collecting trough 11 of the spinning turbine 2. The 45 diameter of the centrifugal disc 12 must be so selected that an opening of the spinning chamber for purposes of cleaning the same or remedying a thread break will still be possible by folding over or withdrawing the spinning turbine 2 together with its housing.

50 It is, of course, to be understood that the present invention is, by no means, limited to the particular showing in the drawing, but also comprises any modifications within the scope of the appended claims.

55 What we claim is:

1. For use in connection with the spinning of staple fibers in a ringless manner, an apparatus which includes: a rotatable spinning turbine having an inlet wall portion, rotatable opening-up roller means for withdrawing fibers from a sliver, and centrifugal disc means connected to said roller means for rotation therewith, said roller means and said disc means being arranged adjacent said inlet wall portion, and the outer periphery of said disc means facing toward said inlet wall portion for directing fibers withdrawn by said roller means onto said inlet wall portion.

60 2. An apparatus according to claim 1, in which said inlet wall portion defines a round chamber, and in

which said centrifugal disc means is rotatably arranged within said round chamber.

3. An apparatus according to claim 2, in which the outer periphery of said disc means tapers in a direction away from said spinning turbine.

4. An apparatus according to claim 1, in which said centrifugal disc means is detachably and exchangeably connected to said roller means.

5. An apparatus according to claim 1, in which said centrifugal disc means forms a single unitary piece with 10 said roller means.

6. An apparatus according to claim 1, in which the outer periphery of said disc means has a concavely arc-shaped portion facing toward said inlet wall portion.

7. An apparatus according to claim 1, in which said 15

inlet wall portion tapers in the direction toward said disc means at an angle within the range of from 10° to 40°.

8. An apparatus according to claim 1, in which said spinning turbine has fiber collecting trough means at one end of said inlet wall portion, and in which the extension of said inlet wall portion from that end thereof which is remote from said fiber collecting trough means in the direction toward said trough means by a distance within the range of from 10 millimeters or 30 millimeters represents substantially the only area upon which the fibers are directed by said disc means and from where they slide into said trough means.

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