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E. J. GRISET, JR
CONTINUOUS SPINNING METHOD

2,881,906

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Fig. 4.

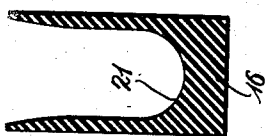


Fig. 1.

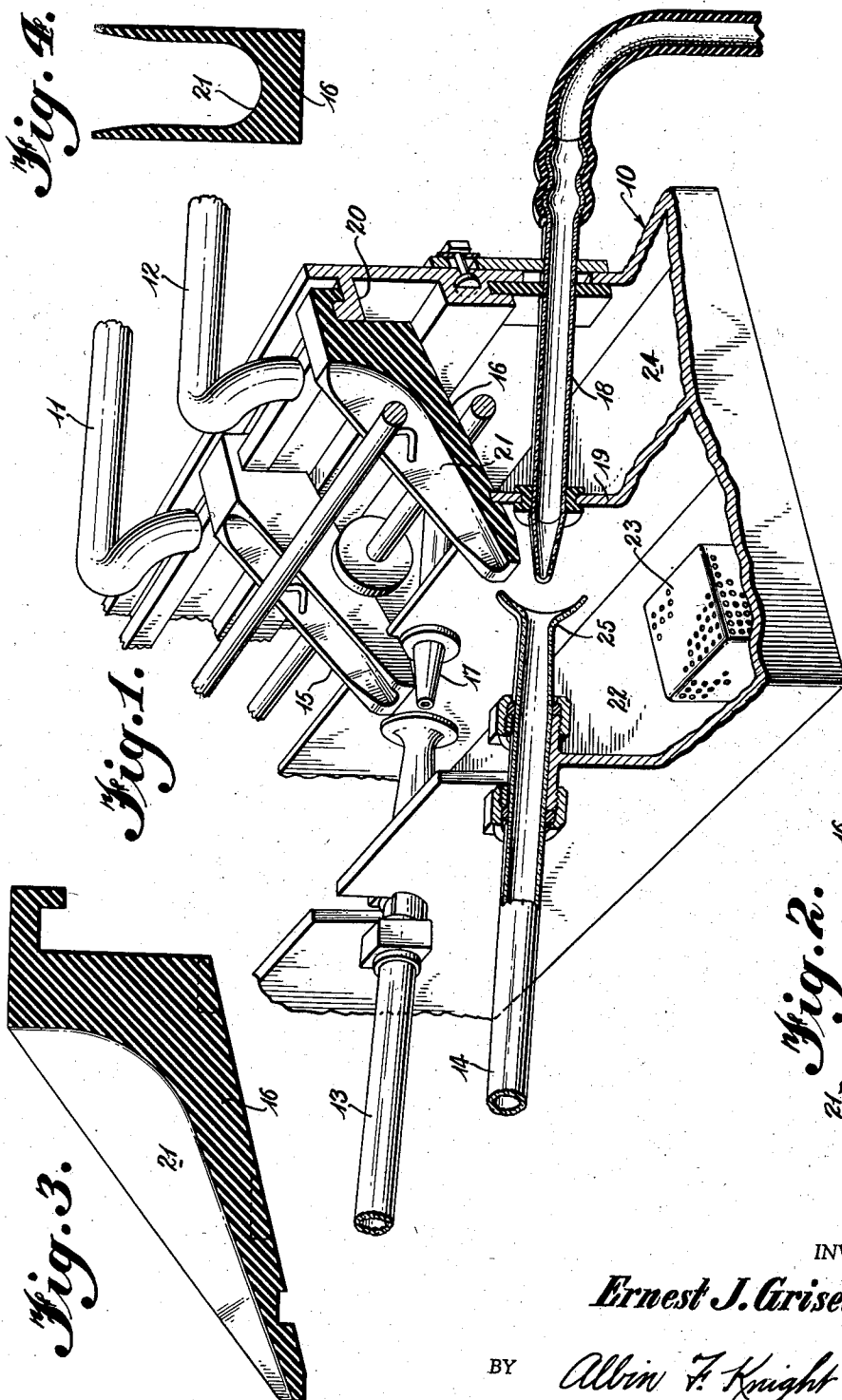


Fig. 3.

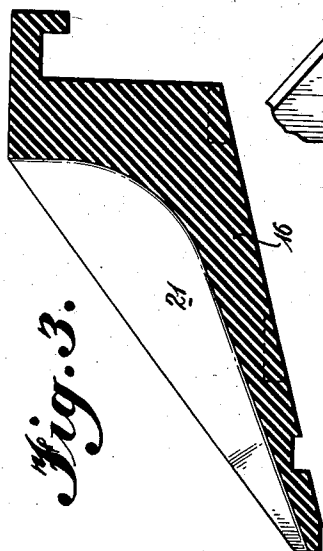


Fig. 2.



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CONTINUOUS SPINNING METHOD

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1 Claim. (Cl. 203—1)

This invention relates to tube spinning of rayon and more particularly to a method for the spinning in or threading of tows or other high denier yarns or threads.

In application Serial No. 324,948, filed December 9, 1952, now Patent No. 2,725,277, issued November 29, 1955, which is owned in common with this application, there is shown apparatus for the continuous tube spinning of rayon yarns or tows. The apparatus includes a series of tubes arranged in linear series with a liquid recovery and transfer box at the end of a tube and the beginning of the next tube of the same series. Each transfer box includes a deflector plate which, during spinning in, guides yarn and liquid from the exit end of one tube into the mouth of the next.

While the apparatus described above has, in general, been quite satisfactory, in the spinning in of very large tows the guiding function of the deflector is not accurately enough performed and considerable waste is produced incident to the failure to spin in.

It is an object of this invention to overcome the foregoing difficulties and to provide a method for tube spinning which is characterized by its capacity to reliably spin in very heavy tows.

Other objects and advantages of this invention will be apparent upon consideration of the following detailed description of an embodiment thereof in conjunction with the annexed drawings wherein:

Figure 1 is a fragmentary perspective view of a portion of a transfer box for a linear series tube spinning machine, showing tow deflectors constructed according to the teachings of the present invention;

Figure 2 is a top plan view of one of the deflectors of Figure 1;

Figure 3 is a view in section taken on the line 3—3 of Figure 2; and

Figure 4 is a view in section taken on the line 4—4 of Figure 2.

In the drawings, the transfer box 10 serves to connect the exit or discharge ends of tubes 11 and 12 with the mouths or entry ends of tubes 13 and 14, respectively. During spinning in, the yarns issuing from the tubes 11 and 12 are guided by deflectors 15 and 16, respectively, to the mouths of tubes 13 and 14. Tube 13 is supplied with liquid by a nozzle 17 and tube 14 is supplied with liquid by a nozzle 18. The deflectors are arranged to slide on guideways 19 and 20 to and from the bridging position shown and a position out of registry with the linear series of tubes.

The apparatus as thus far described is shown and described in said Patent No. 2,725,277. A review of the operation of the equipment can be had by discussing the operations involving a single pair of tubes in the linear series such as the tubes 12 and 14. During spinning in, tow and its accompanying treating and propelling liquid issuing from the tube 12 are guided by the trough or groove 21 in the deflector 16 to the flared mouth of the tube 14. Adjacent to the mouth of the tube 14 there is a suction zone caused by the action of nozzle 18 and the

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flared mouth of tube 14. The yarn is sucked into tube 14 for further propulsion and aftertreatment with the liquid issuing from the nozzle 18. The liquid from the tube 12 falls into the receptacle 22 which is defined by the outer walls of the transfer box 10 and the partition 19. This liquid is removed through strainer 23.

After spinning in, the deflectors 15 and 16 are shifted to a position out of registry with the ends of tubes 11 and 12 and the liquid issuing from those tubes is recovered in a receptacle 24 while the yarns continue to move into the respective next tube of the linear series.

The tubes 11 to 14, inclusive, are quite large in diameter and are intended to handle tows of, for example, around 30,000 denier. Consequently, the liquid stream issuing from them is very large and the capacity of the deflector grooves or trough has to be very great. It was found that merely a wide trough, apparently adequate to handle the flow from a tube such as 12 to a tube such as 14, was not adequate during spinning in due to the restrictions such as at 25 near the mouth of spinning tubes such as 14. These restrictions require a highly accurate alignment of the yarn issuing from the deflector trough in order that spinning in may be reliably accomplished.

After much experimentation, there was worked out an adequate flow passage or deflector trough for handling high denier tow. One of these is illustrated at 21 in conjunction with the deflector 16, and another appears in conjunction with the deflector 15. The deepest portion of the deflector trough 21 lies under the discharge end of the feed tube, see Figure 3. The trough is of U-section and its width is the same from its beginning at the right hand end of Figure 3 to a point about three quarters of the way from the right hand end to the left hand end of Figure 3. Here the groove becomes narrower and shallower, see Figures 2 and 3, and the effect of the narrowing or converging of the sides of the trough of the deflector plate is to bring about much improved registry of the tow and treating liquid with the mouth of the next succeeding tube of the linear series. The effect of the narrowing of the trough in the deflector is to focus the stream of liquid and the mass of yarn for better spinning in.

A suitable deflector according to this invention had a $1\frac{1}{16}$ " wide trough which tapered to about $\frac{3}{8}$ " at the discharge end. This trough was about $6\frac{1}{4}$ " long and was suitable to handle a tow of 30,000 denier.

What is claimed is:

The method of threading high denier tow in a series of aftertreating zones comprising the steps of continuously propelling said tow through a first zone by the use of a flowing stream of an aftertreating liquid, changing the direction of flow of the liquid and tow discharging from said first zone from alignment with the exit end thereof into alignment with the entrance end of a second zone, focusing the flowing stream of aftertreating liquid to facilitate threading of said high denier tow into the entrance end of the second zone, and thereafter passing the tow freely from the first zone into the second zone while recovering liquid discharging from said first zone.

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