May 2, 1939. P. ESSELMANN ET AL 2,156,723

CRIMPING DEVICE

Filed June 17, 1938 2 Sheets-Sheet 1

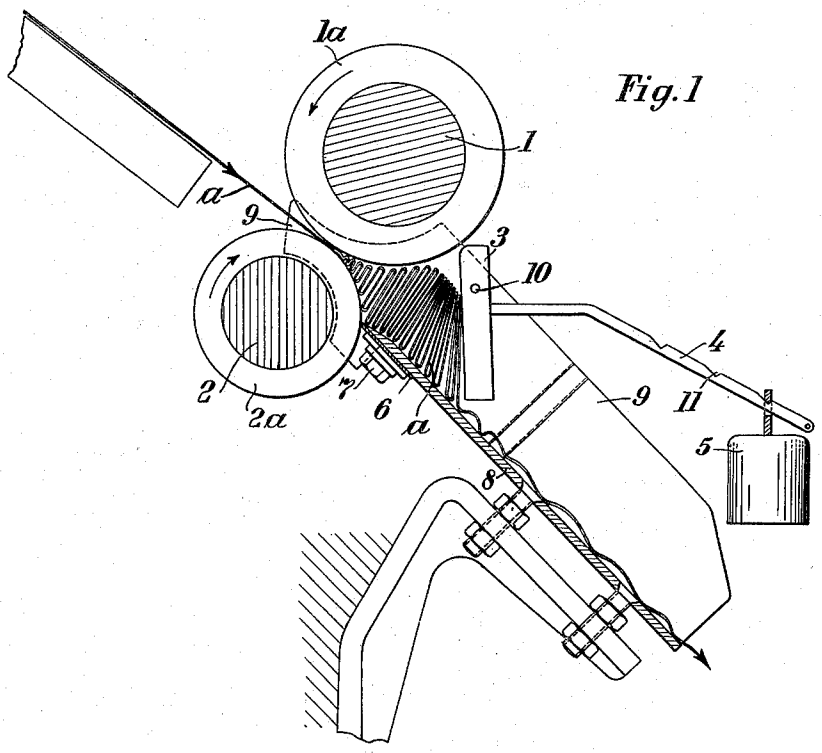
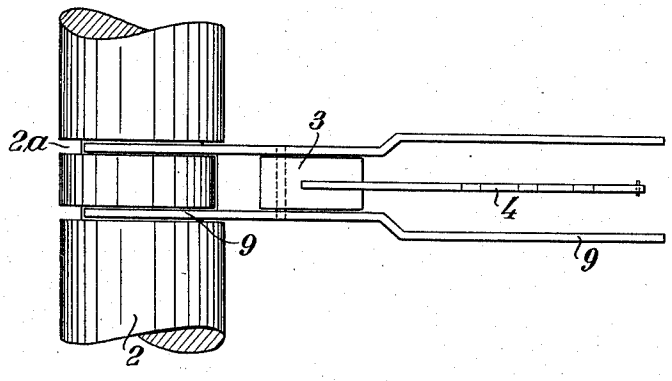


Fig. 1

Fig. 2



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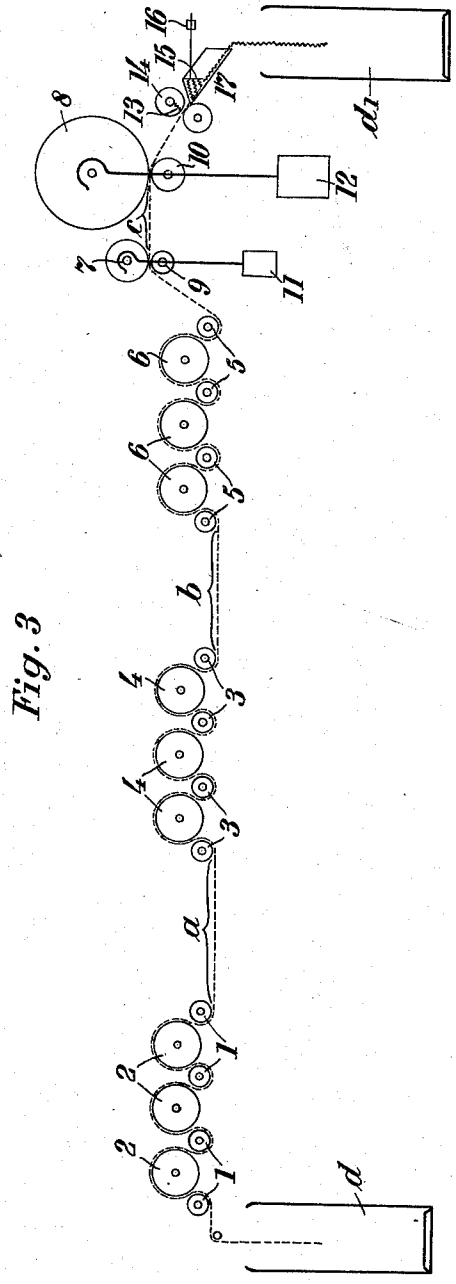


Fig. 3

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UNITED STATES PATENT OFFICE

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CRIMPING DEVICE

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Application June 17, 1938, Serial No. 214,268
In Germany June 23, 1937

2 Claims. (Cl. 19—66)

This invention relates to a device for crimping a torn sliver of rayon staple fibers.

In the art of manufacturing rayon staple fiber it has been proposed to produce an endless and extensible sliver by tearing the individual fibers, of which the sliver consists, in a continuous manner. Similar tearing processes have been described in connection with the production of slivers from fibers of the best variety.

It is an object of the present invention to provide a device which is capable of producing an improved sliver ready for making yarn from an endless or continuous bundle of artificial fibers.

A further object of the invention is the provision of an improved device for crimping an extensible sliver composed of torn staple fibers.

The device according to this invention is characterized by a collecting trough immediately attached to the delivery rollers of the tearing or drafting apparatus, said collecting trough engaging the delivery rollers by means of its tongue-shaped ends fitting into grooves of said delivery rollers, said collecting trough being closed on the other side by means of a trap weighed down by a controllable weight, which trap opens when the pressure inside the trough produced by the bunched-up fibers rises to a predetermined value and allows the crimped sliver to escape.

Reference is made to the accompanying drawings in which Figure 1 is a sectional view of the crimping device,

Figure 2 is a partial plan view of the crimping device, and

Figure 3 is a diagrammatical view of the tearing or drafting device including three drafting sets and a crimping device.

The general lay-out of the process carried out on this apparatus is as follows:

With reference to Figure 3 *d* is a can in which the continuous bundle of artificial fibers is contained and transported. The bundle is led onto a multiple draft device comprising, for instance, 3 series of rollers 1—2, 3—4, 5—6. The speed of these rollers is so arranged that each subsequent combination runs faster than the foregoing series. The rollers 1, 3 and 5 are driven while 2, 4 and 6 are kept rotating by the bundle of fibers itself, which engages the rollers frictionally. Rollers 1, 3 and 5 may be fluted, i. e. the roller surface may be provided with grooves parallel to the axis of the roller. The first tearing occurs between the aggregates 1—2, and 3—4, the tearing distance being *a*. The bundle is reduced to a sliver in which the individual fibers are of comparatively long and uneven staple length. A second tearing therefore occurs between the aggregates 3—4 and 5—6, the tearing distance in this case being reduced to *b*. These preliminary tearing operations already lead to a sliver having a more or less uniform staple length. They are characterized by the feature that the individual fibers are broken with as little damage as possible, since the unloaded rollers 2, 4, 6 exert only a minimum of pressure on the bundle of fibers. In order to remove the last remnants of unbroken fibers the sliver is led onto a further tearing aggregate 7, 8, 9, 10. Again the smaller rollers 9, 10 are driven while rollers 7 and 8 are adapted to assert the pressure necessary to break the fibers in the sliver. For this purpose these rollers are kept down by the weights 11 and 12. The tearing distance is *c*, which is still shorter than *b*. It has proved that for these short tearing distances the weighted rollers are better adapted than the drafting devices 1, 2 etc. They ensure a complete reduction of the sliver to the desired short staple length. The torn sliver is now led to the crimping device (13 to 17 inclusive). This crimping device is shown on a large scale in Figures 1 and 2.

In Figure 1 *a* denotes the extensible sliver produced by a tearing, 1 and 2 are the rollers by which the sliver is fed into the collecting trough 9. The trough is closed on the one end by the rollers 1 and 2, the tongue-shaped end pieces of the trough fit into grooves 1*a* and 2*a* of these rollers. A leather tongue 6 affixed to the bottom 8 of the trough 9 by means of the screw 7 tightly closes the trough to prevent an escape of fibers from between the roller 2 and the bottom of the trough 8. A trap 3 is pivotally suspended between the walls of the collecting trough 9. It pivots about the turning point 10. A lever arm 4 is connected with said trap carrying a weight 5, by means of which the pressure in the trough may be altered by changing the position of the weight within the grooves 11.

In Figure 2 which is a plan view of a part of the structure shown in Figure 1 with roller 1 omitted, it is shown how the walls of the collecting trough 9 fit into the grooves 2*a* of the roller 2. The arrangement of the trap 3 with its lever 4 is also shown.

What we claim is:

1. In an apparatus of the character described a device for crimping a continuous sliver of rayon staple fibers comprising, in combination, two delivery rollers having peripheral grooves transversely to the direction of the longitudinal axis, a collecting trough having two tongue-shaped

end pieces reaching into said grooves in said delivery rollers, a trap pivotally suspended within said collecting trough, said trap being capable of closing that side of the collecting trough which is not closed by the delivery rollers, a lever affixed to said trap carrying a weight, and a leather-tongue affixed to the bottom of said collecting trough and extending towards the undermost of said delivery rollers.

2. In an apparatus of the character described a device for crimping a continuous sliver of rayon staple fibers comprising, in combination, two delivery rollers having peripheral grooves transversely to the direction of the longitudinal axis, a collecting trough having two tongue-shaped end pieces reaching into said grooves in said delivery rollers, a trap pivotally suspended within said collecting trough, said trap being capable of closing that side of the collecting trough which is not closed by the delivery rollers, and a lever affixed to said trap carrying an adjustable weight.

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