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APPARATUS FOR PRODUCING EXTENSIBLE SLIVER OR ROVING OF RAYON STAPLE FIBERS

Filed Dec. 7, 1938

Fig. 1

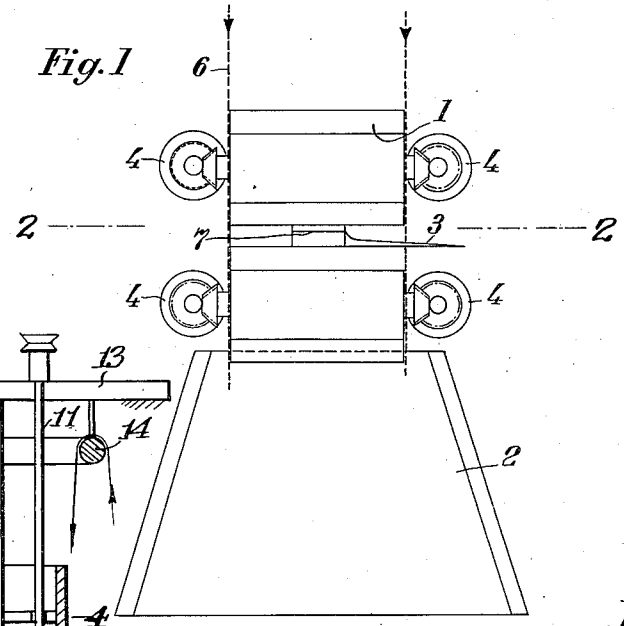


Fig. 3.

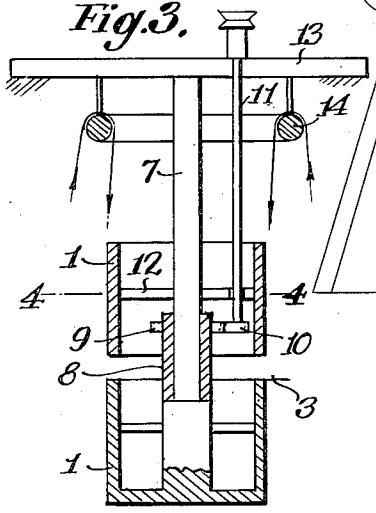


Fig. 4.

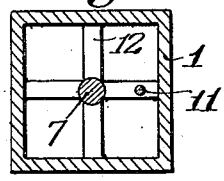
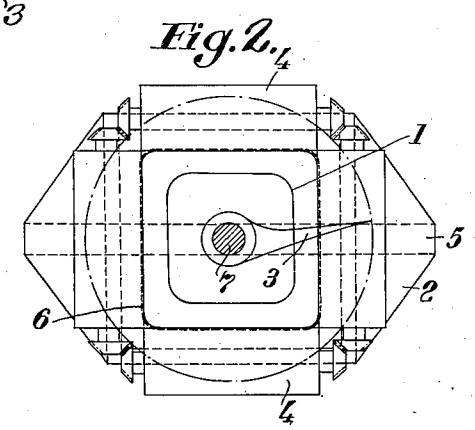


Fig. 2.



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APPARATUS FOR PRODUCING EXTENSIBLE SLIVER OR ROVING OF RAYON STAPLE FIBERS

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Application December 7, 1938, Serial No. 244,427
In Germany December 13, 1937

4 Claims. (Cl. 164—60)

This invention relates to an apparatus for producing an extensible sliver from a bundle of continuous rayon fibers.

The copending U. S. patent application Ser. No. 244,426 filed December 7, 1938, describes the cutting of a tubular assembly of continuous rayon filaments while retaining the parallel position of the filaments by guiding the assembly over a cylindrical support and cutting it by means of a rotating circular knife along a helical line. The apparatus described in that application is characterized by a round core over which the fiber bundles are drawn in tube form, guiding means, and a cutting means rotating around said core and cutting the fibers by pressing against the core. The unstretched tubular assembly thus cut is then folded together, whereby a uniform overlapping engagement of the cut fibers is obtained; if several such flat slivers cut on a helical line are superimposed, and preferably with a certain displacement of the layers with respect to each other the whole is then stretched, there is procured an enhanced uniformity of the distribution of the cut fibers in the sliver.

The present invention has for an object the provision of an apparatus, which will cut the tubular assembly of filaments along a helical line from the inside of the tube.

A further object resides in the provision of an apparatus which is simple and inexpensive in construction.

Still further objects of the invention will appear from the following detailed description.

Reference is made to the accompanying drawing in which

Figure 1 is a diagrammatic front elevation of the apparatus,

Figure 2 is a view in section taken along the line 2—2 of Figure 1,

Figure 3 shows in diagrammatic cross sectional elevation a driving means for the knife rotating in the interior of the guiding core, and

Figure 4 is a cross sectional view on line 4—4 of Figure 3.

In the apparatus according to the present invention the knife is journalled within the guiding core and protrudes beyond the periphery thereof so as to engage the travelling tubular assembly of the filaments and to cut it along a helical line.

With this apparatus it is not necessary that the guiding core which does not have the function of supporting the assembly as a counter-surface for the operation of the knife should have a cylindrical form. Instead, it may have a prismatic form, for instance that of a square prism or a hexagonal prism. This permits a simplification in the construction of the guiding and forwarding means of the device, since the assembly is led over flat surfaces both before and after the cutting operation.

When a square prismatic or other polygonal form is used, the scythe cut produces a slight waviness of the helical cut which favors the overlapping engagement of the ends of the fibers in the sliver.

Advantageously, the knife has the shape of a scythe and is mounted to rotate about the axis of the guide; however, several rotating knives may be used instead of a single knife.

The shape of the funnel must in this case also be suited to the guiding body by having an upper opening of the same cross section; the exit opening is formed for the purpose of folding together the helically cut tubular band, that is to say the length of the slit corresponds with half the periphery of the upper opening of the funnel.

Referring now to the drawing, in Figure 1, 1 is the square sectioned guiding body, 2 is the funnel and 3 is the scythe-shaped knife. The parts 4 have the purpose of holding the tubular assembly of the fibers before and after the cutting operation against the outer surface of the guide and feeding it downwards. The lower end of the funnel 2 is formed by the slot 5.

The tubular assembly of fibers indicated by 6 is fed downwards in the direction of the arrows, guided and held by the rollers 4. 14 is an annular guide which directs the fibers to the rollers 4. It is cut along a helical or nearly helical line by the knife 3 rotating about axis 7. From there it is led into the funnel 2 which flattens it without bunching and lays the formed roving down on a suitable transporting device e. g. a conveyor belt.

Figures 3 and 4 show an example of a device for driving the knife 3 in the guide 1, Figure 4 being a section on line 4—4 of Figure 3. The stationary shaft 7 carries a body 1 which is made in two parts separated from one another by the gap constituting the path of the knife. The knife 3 is fixed to the sleeve 8 which can rotate on the shaft 7. On the sleeve is keyed a gear wheel 9 which is driven by a pinion 10 on the shaft 11. The upper part of the guide 1 is carried by a spider 12 fixed to the stationary shaft 7. The latter is fixed in the frame 13 of the machine above the guide 1.

We claim:

1. Apparatus for producing an extensible sliver or roving of rayon staple fibers by cutting a continuous sliver, while maintaining the original parallel position of the individual fibers, comprising in combination a fixed guiding core composed of two main pieces, a cutting implement inside said core rotating between said main pieces and adapted to cut a tube-like assembly of continuous filaments drawn over said core in its longitudinal direction, and guiding means holding said tube-like assembly of filaments against said core.

2. Apparatus for producing an extensible sliver or roving of rayon staple fibers by cutting a continuous sliver, while maintaining the original parallel position of the individual fibers, comprising in combination a fixed guiding core composed of two main pieces, a cutting implement inside said core rotating between said main pieces and adapted to cut a tube-like assembly of continuous filaments drawn over said core in its longitudinal direction, guiding means holding said tube-like assembly of filaments against said core, and a guiding funnel at the lower end of said core adapted to receive and flatten into a sliver said tube-like assembly of cut filaments, said guiding funnel having a slot shaped lower end, the length of said slot being about one half the peripheral dimension of said core.

3. Apparatus for producing an extensible sliver or roving of rayon staple fibers by cutting a continuous sliver, while maintaining the original parallel position of the individual fibers, comprising in combination a fixed guiding core having a polygonal cross section composed of two main pieces, a cutting implement inside said core rotating between said main pieces and adapted to cut a tube-like assembly of continuous filaments drawn over said core in its longitudinal direction, and guiding means holding said tube-like assembly of filaments against said core.

4. Apparatus for producing an extensible sliver or roving of rayon staple fibers by cutting a continuous sliver, while maintaining the original parallel position of the individual fibers comprising in combination a fixed guiding core composed of two main pieces, a knife of a form resembling a scythe rotating between said main pieces and adapted to cut a tube-like assembly of continuous filaments drawn over said core in its longitudinal direction, and guiding means holding said tube-like assembly of filaments against said core.

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