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MANUFACTURE OF ARTIFICIAL STAPLE FIBERS

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Fig. 1.

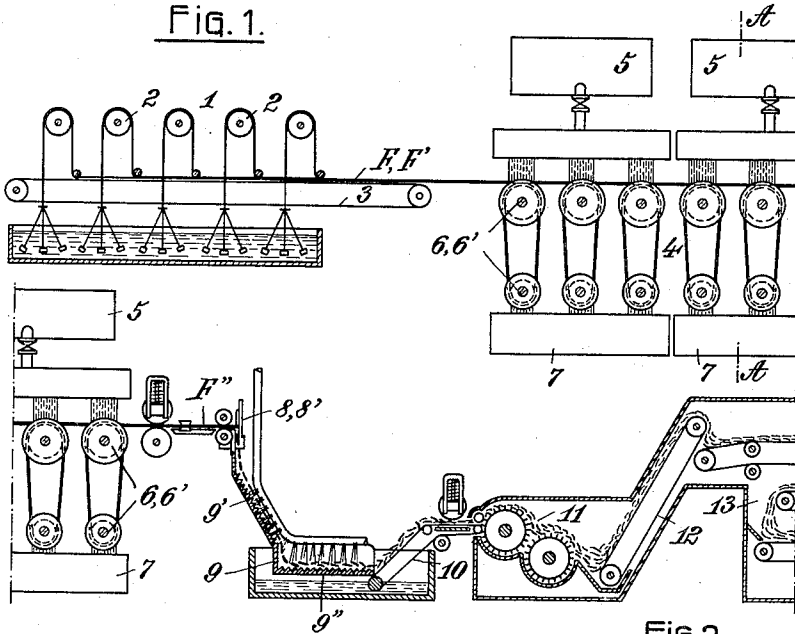


Fig. 2.

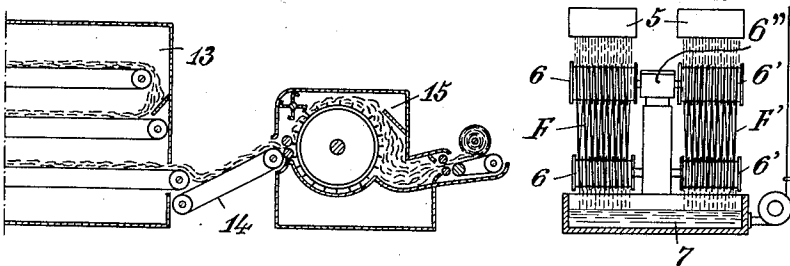
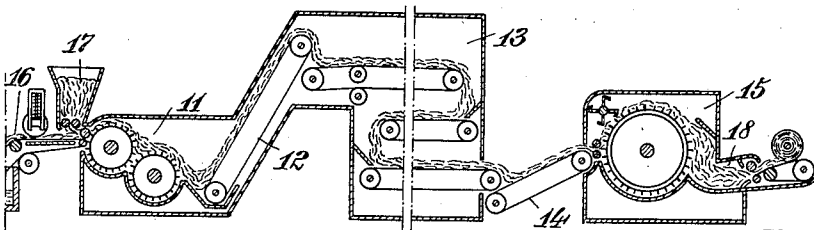


Fig. 3.



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MANUFACTURE OF ARTIFICIAL STAPLE FIBERS

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3 Claims. (Cl. 18—8)

The invention relates to a process and plant for the manufacture of staple fibers from artificial threads, more particularly artificial threads produced from viscose or other cellulose derivatives. In this plant, the cutting of the threads to staple length is carried out after the after-treatment and before drying. Due to the fact that the drying takes place on the comparatively short staples and not on the continuously running bundle of threads, the material is afforded a better opportunity of shrinking and twisting so that the final product produced according to this form of construction has a far higher stretching capacity than when the cutting of the staples takes place on the previously dried bundles of fibre. The cut staples may be subjected to an additional treatment by softening or curling agents before they are introduced into the drier.

The above mentioned features and advantages as well as other features and advantages will be more fully disclosed in the following specification reference being had to the accompanying drawing forming a part of this specification, in which:—

Fig. 1 is a diagrammatical side view of a plant for carrying out my process, partly in section.

Fig. 2 is a sectional view of the part of the plant in which the threads are treated with a liquid, taken on line A—A of Fig. 1.

Fig. 3 is a diagrammatical side view of another embodiment of a part of the plant provided with an additional feeding device to admix cotton staples to the artificial silk staples.

In Figures 1 and 2, the threads (for example artificial silk threads) spun in the spinning machine 1 on both sides thereof are led over rollers 2 to a band conveyor 3 situated in the centre of the machine and carrying them in the form of two bundles of threads F and F' out of the spinning machine and into the after-treatment machine 4. The latter is made in two parts (see the section A—A of the machine in Figure 2). The bundle of threads F is after-treated on one side of the machine and the bundle of threads F' on the other side. This subdivision of the after-treatment machine into two parts is important, because experience has shown that the after-treatment of the continuously running bundles of threads requires careful attention and occasional intervention on the part of the attendants, the accessibility being in that case limited by the length of the arm. Subdivision in two parts in this case renders it possible in a very simple manner to attend the machine from two sides, so that in such an after-treatment

machine it is possible to attain double the capacity of the known constructions, in which attention is only possible from one side.

The after-treatment comprises in the known manner a sequence of a plurality of treatment steps. After-treatment in the sense used and claimed herein includes such known steps as washing, bleaching and so forth, and is not intended to include simply moistening the threads with water. The after-treatment liquids are introduced into upper tanks 5, trickle down along the bundles of thread F and F', running over the pairs of rollers 6 and 6' at spinning speed, collect in the lower tanks 7 and are pumped back therefrom again into the upper tanks 5 (and are regenerated, replenished and so forth according to requirements). The two bundles of thread run after the manner of the ropes in pulley block tackle from one end of the pair of rollers 6, 6' to the other end, so that despite the high speed of the thread, the bundles of thread can remain a considerable time in each treatment stage, which time is longer, the greater the number of times the bundles of thread are passed round the rollers. The rollers 6, 6' are supported as at 6''.

From the last pair of rollers, the two bundles of thread, still running continuously, arrive at the cutting apparatus in front of which they are united to form a single bunch F''. The cutting apparatus comprises two independently operating cutting devices 8 and 8', which are mounted in a fixed position and which may be designed for example in the form of rotating discs each provided with three radially mounted cutting blades, the latter co-operating with a stationary counter-blade.

The staples produced in the cutting apparatus consist (in the case of large machines) of many thousands of adjacent individual threads, which in accordance with their method of production lie parallel to and comparatively firmly against each other. In order to open this mass of fibers well, which is very desirable for the subsequent treatment, the staples are now subjected to a longer or shorter spraying with water or other suitable liquids (reviving, curling or the like liquids), which split up and, so to speak, float the adhering staples. In the constructional example according to Figure 1 this takes place in the trough 9, which comprises a steep part 9' and a horizontal or substantially horizontal part 9''. Both parts have a roughened bottom in order to prevent the staples from being washed away too rapidly. The length, inclination and nature of the bottom of the flotation trough, and also the

direction of the sprays, are factors the choice of which determines the length of time the staples are to remain under the sprays, and which are to be selected according to requirements.

5 From a loosening device 9, the staples are carried by a conveyor band 10 into a preliminary opener 11. Thence, the staples are led by the endless band 12 into the drying chamber 13 where they are dried to the desired degree.
 10 Thereupon, the staples are carried by the conveyor device 14 to the opener 15, in which the staples are again subjected to further loosening, which in this case takes place in the dried condition, and is still more effective than the first
 15 loosening in the moist state, so that the staples leave the opener 15 in the state of a wadding-like web. This enables them to be spun in the same way and in the same devices as natural fibers, more particularly cotton.

20 In the embodiment shown in Figures 1 and 2, the construction of the preliminary opener 11, the drying chamber 13 (together with its interior arrangement), the opener 15 and the corresponding conveying devices is similar to the construction of said devices as usually employed in the
 25 cotton treatment art.

If it is desired to admix cotton staples to the artificial silk staples, the parts 11, 13, 14 and 15 of the plant as shown in Fig. 1 are replaced by
 30 the construction as shown in Fig. 3. An additional feeding device 17 is arranged in front of the entrance of the preliminary opener 11 and delivers cotton staples to the flow 16 of the subsequently treated artificial silk staples carried by the conveyor band 10. The mixture of cotton
 35 and artificial silk staples is opened by the device 11 and carried by the band 12 to the drying chamber 13. The conveyor band 14 delivers the dried staples into the opener 15, which discharges a

mixture 18 of artificial silk and cotton staples. Special mixing devices (not shown) may be arranged, if desired, in order to produce a still more homogeneous mixture of artificial silk and cotton staples.

I claim:

1. A continuous process for the manufacture of staple artificial fibers which comprises spinning continuous threads, subjecting said threads, whilst continuously running, to an after-treatment such as washing, bleaching and so forth with treating liquids and continuously cutting said threads while still moist with the after-treatment liquids to form staples.

2. A continuous process for the manufacture of staple artificial fibers which comprises spinning a plurality of continuous threads, separating said threads into at least two portions and subjecting said portions separately to an after-treatment such as washing, bleaching and so forth with treating liquids, uniting said portions of threads and cutting them, while still moist with the after-treatment liquids to form staples.

3. Plant for the continuous manufacture of staple rayon fibers comprising means for spinning continuous threads in separated allotments, a set of drums for each allotment over which the thread is adapted to pass, means for after-treating with liquid the threads of each allotment while on the drums, means for supporting said drums, said supporting means being located between said sets of drums, to make each drum accessible from its outer side, means to unite the allotments after they pass over the sets of drums and further means to cut staples from the united allotments while still moist from said after-treatment.

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