

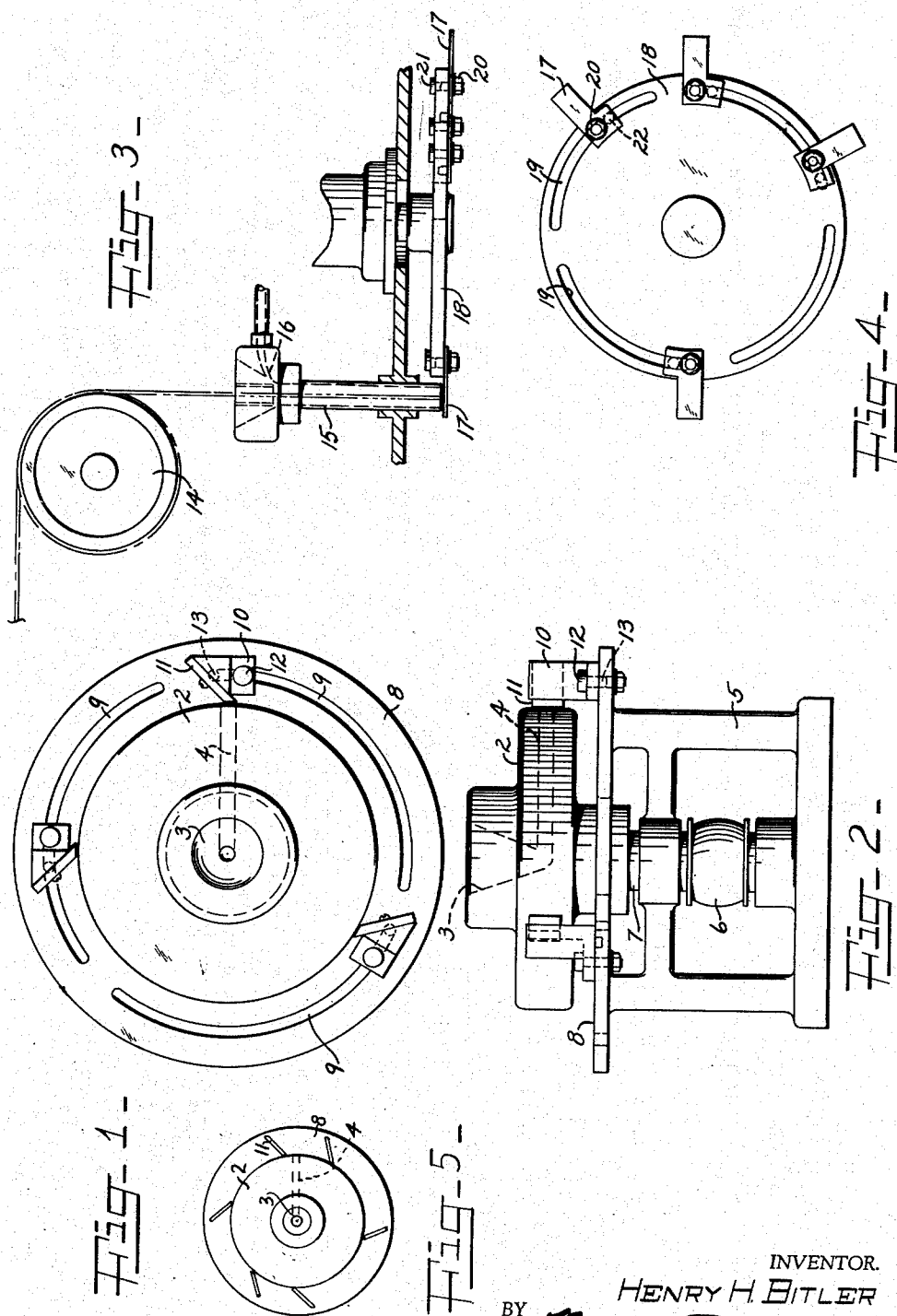
Sept. 22, 1942.

H. H. BITLER

2,296,252

STAPLE FIBER CUTTING MECHANISM

Filed March 12, 1942



INVENTOR.
HENRY H. BITLER
BY *Thomas R. O'Malley*
ATTORNEY.

UNITED STATES PATENT OFFICE

2,296,252

STAPLE FIBER CUTTING MECHANISM

Henry H. Bitler, Moylan, Pa., assignor to American Viscose Corporation, Wilmington, Del., a corporation of Delaware

Application March 12, 1942, Serial No. 434,335

12 Claims. (Cl. 164—61)

This invention relates to a cutting mechanism for producing directly from a more or less continuous filamentary material, a staple fiber product containing fibers of various lengths. It has been found that a better distribution of the different-length fibers can be obtained, and at less cost, when the mixture is produced directly by the cutting instrument itself. Such mixtures are of advantage in producing spun yarns of the worsted type and also in making yarns having irregular formations, such as flakes, slubs, and the like.

In general, the invention involves a mechanism for feeding continuous filamentary material, such as a tow, yarn, or other bundle of continuous filaments, at any selected constant longitudinal rate and bringing it into cutting relationship with a plurality of irregularly spaced cutting elements. This can be done with either stationary or moving cutting elements as will appear hereinafter.

In the drawing, illustrative of the invention, Figure 1 is a plan view of one form of the device,

Figure 2 is elevational view of the device of Figure 1,

Figure 3 is an elevational view of a modified form of the invention, and

Figure 4 is a bottom view of the cutting device of Figure 3.

Figure 5 is a plan view of a modification.

As shown in Figures 1 and 2, the invention may be applied to the Beria type staple fiber cutter which comprises the rotatable disk 2 having the axial channel 3 serving as an entrance for the filamentary material fed thereto, this axial channel communicating with a radial channel 4 for directing the filamentary material outward with respect to the rotatable member. This member is supported for rotation within a suitable stand 5. A pulley 6 may be provided upon the shaft 7 connected to the rotatable member for driving it. An annular plate 8 is mounted upon the stand and is provided with slots 9 adjacent its periphery. These slots are adapted to accommodate holders 10 for the knives 11, which holders may be fastened to the plate by means of a bolt 12 extending through the slot and may be prevented from turning about the axis of the bolt by means of a lug 13 depending from the base of the holder into the slot.

The several holders with their respective knives may be adjusted and set in any desired position about the periphery of the disk. By setting the knives so that different lengths of arc extend between adjacent knives, a different length of time will elapse between successive cuttings when the rotatable member is operated at constant speed. The device thereby provides an

efficient and readily changeable mechanism for producing directly mixtures of staple fibers having fibers of various lengths therein. While three knives are shown in Figure 1, two or more knives, may be used, the greater the number employed, the greater the number of distinct fiber lengths in the product, provided that the length of the arcs between knives are varied. If desired, several groups of knives may be employed about the circumference of the disk, the distances between the several knives in any given group being different within that group but being identical with the distances between corresponding knives of each of the other groups so that the arrangement of the knives about the disk may involve one or more repetitive sequences. This is diagrammatically illustrated in Figure 5 which is a top view corresponding to the device of Figure 1 with two repetitive sets of three knives each.

Ordinarily, the tow or filamentary bundle may be fed to the rotatable member by a constant speed roll which limits and maintains constant the feed of the filamentary material radially of the rotatable disk. However, this constant speed feeding roll may be replaced by an idler roll so that reliance may be had entirely upon centrifugal force developed in the filamentary material as it passes through the rotating disk and outwards of the disk into the path of the knives. If desired, the passage of the filamentary material through the channels of the disk may be assisted by a jet or blast of fluid, such as water or air directed into the mouth 3 of the disk.

Figures 3 and 4 show a filamentary material being fed by a metering godet 14 about which the tow may be lapped one or more times, into a tubular feeding device 15, passage through which is assisted by means of a jet of fluid, such as of water or air directed around the filamentary material in the direction of travel by means of the nozzle 16. As the filamentary bundle emerges from the tube 15, it is cut into staple fibers by means of a plurality of knives 17 which are fixed to a rotatable disk 18. The disk is provided with slots 19 and the knives may be fastened thereto by means of a nut 20 and bolt 21 extending through the slot, a suitable lug 22 projecting from the shank of the knife into the slot to prevent rotation of the knife about the bolt. By rotating the disk carrying the knives at constant speed, and maintaining the delivery of filamentary material at a constant rate, any desired distribution of lengths of staple fibers may be obtained in any given mixture by selecting the desired number of knives and arranging them at appropriate distances apart within the slots of the disk.

While preferred embodiments of the invention have been disclosed, it is to be understood that changes and variations may be made without

departing from the spirit and scope of the invention as defined by the appended claims.

What I claim is:

1. In apparatus of the character described, means for feeding continuous filamentary material at a constant speed in the direction of its length and means for bringing it into operative relationship with a plurality of cutting elements having different spaces therebetween.

2. In apparatus of the character described, means for feeding continuous filamentary material at a constant speed in the direction of its length, means for bringing it into operative relationship with a plurality of cutting elements having different spaces therebetween, and means for adjusting the distances between said knives.

3. In apparatus of the character described, a rotatable member, a channel in said member for guiding filamentary material outwardly therefrom, and a plurality of cutting elements disposed at unequal distances apart about the periphery of said member for cutting the filamentary material extending outwardly from said member.

4. In apparatus of the class described, a rotatable member having a channel therethrough for feeding filamentary material substantially radially of said member by centrifugal force, means for rotating said member, and a plurality of cutting elements disposed at unequal distances apart about the periphery of said member.

5. In apparatus of the class described, a rotatable member, a plurality of cutting elements disposed at unequal distances apart about the periphery of said member, means for adjusting the distances between said cutting elements, and a channel in said member for guiding filamentary material outwardly therefrom into the plane of said cutting elements.

6. In apparatus of the class described, a rotatable member having a channel therethrough for feeding filamentary material radially of said member by centrifugal force, means for rotating said member, a plurality of cutting elements disposed at unequal distances apart about the periphery of said member, and means for adjusting the distances between said elements.

7. In apparatus of the class described, a rotatable cutting means, cutting elements disposed on said means at unequal distances apart, means for rotating said cutting means, and means for feeding filamentary material transversely of the path of said cutting elements.

8. In apparatus of the class described, a rotatable cutting means, cutting elements disposed on said means at unequal distances apart, means for rotating said cutting means, means for adjusting the distances between said cutting elements, and means for feeding filamentary material transversely of the path of said cutting elements.

9. In apparatus of the character described, a rotatable member, a plurality of cutting elements disposed at unequal distances apart about the periphery of said member, means for adjusting the distances between said elements, and a channel in said member for guiding filamentary material outwardly therefrom.

10. In apparatus of the character described, a rotatable member having a channel therethrough for feeding filamentary material radially of said member by centrifugal force, means for rotating said member, a plurality of cutting elements disposed about the periphery of said member, and means for adjusting the distances between the cutting elements.

11. In apparatus of the character described, a rotatable cutting means, cutting elements disposed about the periphery of said means, means for adjusting the distances between said elements, means for rotating said cutting means, and means for feeding filamentary material transversely of the path of said cutting elements.

12. In apparatus of the class described, a rotatable member having a channel therethrough for feeding filamentary material substantially radially of said member by centrifugal force, means for rotating said member and a plurality of cutting elements comprising at least two similar groups, the elements in the individual group being disposed at unequal distances apart about the periphery of said member.

HENRY H. BITLER.