May 4, 1965 R. SEIZ 3,181,201

SPINNERETTE FOR THE PRODUCTION OF COMPOSITE THREADS

Filed Oct. 30, 1962

FIG. 1

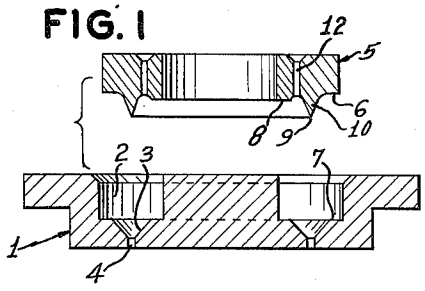


FIG. 2

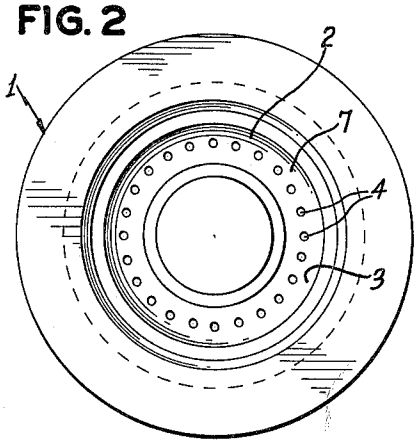


FIG. 3

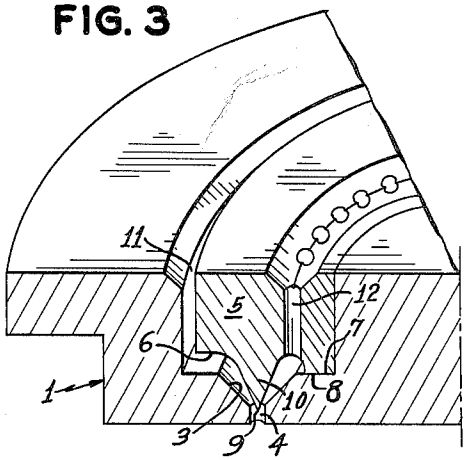


FIG. 4

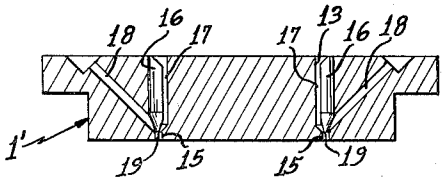


FIG. 5

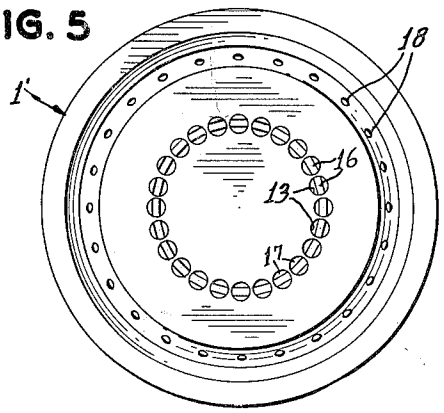


FIG. 6

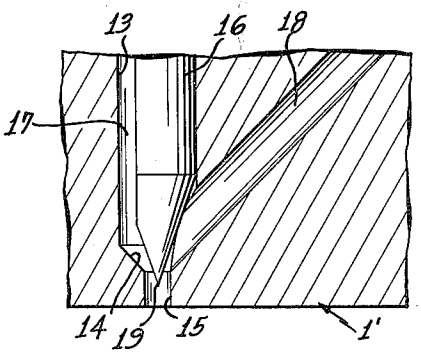
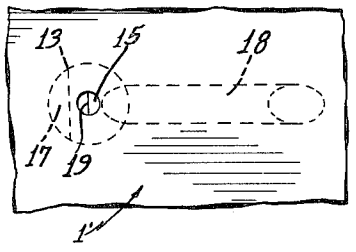


FIG. 7



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3,181,201

SPINNERETTE FOR THE PRODUCTION OF COMPOSITE THREADS

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1 Claim. (Cl. 18—8)

The present invention deals with a spinnerette for the production of a composite threads and more particularly with a spinnerette for the production of curled artificial threads composed of combined materials, e.g. two materials suitable for the production of composite threads.

Heretofore the production of composite threads was accomplished by means of spinning tubes anchored in a spinning head so that materials suitable for forming threads could be introduced from various feed chambers, each being connected with a spinning tube so that the mass leaving the spinnerette opening in the bottom of the spinnerette formed a composite thread comprised of one or several cores within a mantel or outer covering. In such case threads were produced whose core had a composition different from that of the mantel and which had certain advantages on the basis of different compositions with regard to carrier qualities of a fabric or web made therefrom as well as the advantage of fabricating the fabric or web compared with threads of a uniform nature and composed of a single thread forming material.

It is an object of the present invention to produce a spinnerette for the production of composite threads which in contrast to the known core-type threads is not composed of a core and a jacket of different composition but is made of at least two fibers longitudinally joined and unseparably connected whereby the threads are distinguishing in their chemical as well as physical technological qualities and whereby threads are produced whose component fibers show, e.g., by optical means such difference that webs made therefrom are characterized by special effects.

It is another object of the invention to provide apparatus capable of forming a composite thread whose component fibers or filaments show different co-efficients of expansion, especially a curling of the artificial thread and also a wool-like character of the artificial thread.

The wool-like charter of the artificial fibers or threads has always been desirable to the trade and has been considered as an especially important quality. However, known processes of filament production and "after-treatment" have not provided a particularly efficient or practical production of threads of the type herein contemplated. In accordance with this invention, there is provided a spinnerette means whereby the wool-like characters of the artificial thread is provided simultaneously in one operation together with the extrusion of the thread. The advantageous solution of the problem to produce a spinnerette for the production of composite threads in accordance with this invention is hereinafter more particularly described.

Other objects and advantages of the invention will become apparent from the description hereinafter following and the drawings forming part hereof, in which:

FIGURE 1 illustrates an exploded cross-sectional view of one form of spinnerette in accordance with the invention,

FIGURE 2 illustrates a top view of the spinning disk of FIGURE 1,

FIGURE 3 illustrates a partly cross-sectional and partly isometric view of the composite spinnerette of the invention,

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FIGURE 4 illustrates a cross-sectional view of a modified form of spinnerette according to the invention,

FIGURE 5 illustrates a top view of FIGURE 4,

FIGURE 6 illustrates a fragmentary enlarged view of the spinnerette according to FIGURE 4, and

FIGURE 7 illustrates a fragmentary bottom view of a spinnerette according to FIGURE 6.

Regarding FIGURES 1–3 a spinnerette disk 1 is provided with an annular recess 2 formed through a top surface thereon, with its lower portion communicating with a V-shaped annular groove 3 attenuated toward the bottom of the spinnerette and with a plurality of circumferentially spaced openings or capillaries 4 communicating through the bottom of the disk with the groove 3. An annular insert member 5 is provided for insertion into the recess 2. The annular insert is provided on its bottom surface with a peripheral shoulder 6. The bottom of the recess 2 is provided with seats 7 on both sides of the V-shaped groove 3. The annular insert 5 is provided with a second shoulder 8 on a bottom portion thereof adjacent the central opening of the annular insert. An annular V-shaped projection 10 extends from the bottom of the insert 5 into an apex 9. In assembly the insert 5 is mounted in the recess 2 with the shoulders 8 resting on seats 7 and with the apex 9 positioned and terminating in an upper portion of the openings or outlets 4 with the inner walls of the central opening abutting the walls of the central ungrooved portion of the disk 1. The outer diameter of the insert 5 is less than the outer diameter of the recess 2 so that when the insert is mounted in the recess 2 there is an annular passage 11 between the outermost recess wall and the outermost insert wall. A plurality of circumferentially spaced bores 12 are formed through the thickness of the insert at a location between the annular V-shaped projection 10 and the inner insert shoulder 8. Having assembled the composite spinnerette as described above, a first spinning mass is passed into the annular opening 11, and a second spinning mass is passed through the circumferentially spaced bores 12 and both masses pass each along one side of the projection 10 toward the apex 9 and both masses merge in the outlets 4 below the apex 9 and internally of the opening 4 above the bottom of the spinnerette disk. The length of the outlets or capillaries 4 can be varied in accordance with the need or as desired, and the cross section of the opening may be either circular or non-circular. FIGURES 4 through 7 illustrate a modified form of spinnerette according to the invention in that the annular insert member may be substituted by individual insert members. The spinnerette disk 1′ in this modified form is provided with a plurality of circumferentially spaced inlet bores 13 communicating with a conical-shaped portion 14 and with an outlet 15 through the bottom of the disk communicating with the conical portion 14. An elongated insert body 16 is tapered, and the tapered, portion is inserted into the inlet bores 13. The insert is of less diameter than the inlet bore, and thereby provides an inlet channel or passage 17 between the inner wall of the bore 13 and the outer surface of the insert 16. The insert 16 is provided with a taper such that one side of the tapered portion is longer than the other side. The disk is provided with a V-shaped annular recess circumscribing the inlet bores 13 and radially spaced from the inlet bores. A passage 18 communicates with the V-shaped recess and with the inlet bores 13 at the location of the conical portion 14. The longer tapered side of the insert 16 is positioned adjacent the intersection of the passage 18 and bore 13 at the location of the conical portion 14. Both the passages 17 and 18 communicate with the outlet 15, and in mounted position the apex 19 of the insert 16 is positioned in the upper portion of the outlet 15 above the bottom of the spinnerette disk 1′. It

is apparent that the passage 18 are positioned angularly relative to each other. As in the form described with respect to FIGURES 1 to 3, first and second spinning masses are passed through passages 17 and 18 and are joined together in the outlet opening below the apex 19 and above the bottom of the spinnerette disk.

The spinnerette according to the invention is not only suitable for the production of composite threads formed of at least two materials and longitudinally joined to form a composite filament by the wet spinning process, but it is also suitable for the production of composite threads by the melt spinning process, i.e. for the formation of threads from high molecular organic materials.

Various modifications are contemplated within the scope of the appended claim.

What is claimed is:

A spinnerette for the production of composite threads comprising a disk-shaped member having an annular recess formed in the top surface thereof, an annular groove formed in the bottom of the recess, a plurality of circumferentially spaced outlets formed in the bottom surface of the disk-shaped member and communicating with the groove, an annular insert member mounted in the recess, the annular insert having an annular projection extending from the bottom thereof into the groove, a first spinning mass passage means between a wall of the recess and a wall of the insert and communicating with the groove along one side of the projection, a plurality of circumferentially spaced inlets formed through the insert and communicating with the groove along the other side of the projection forming a second spinning mass passage, the first and second passages intersecting at a location below the projection and above the bottom surface of the disk-shaped member.

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