

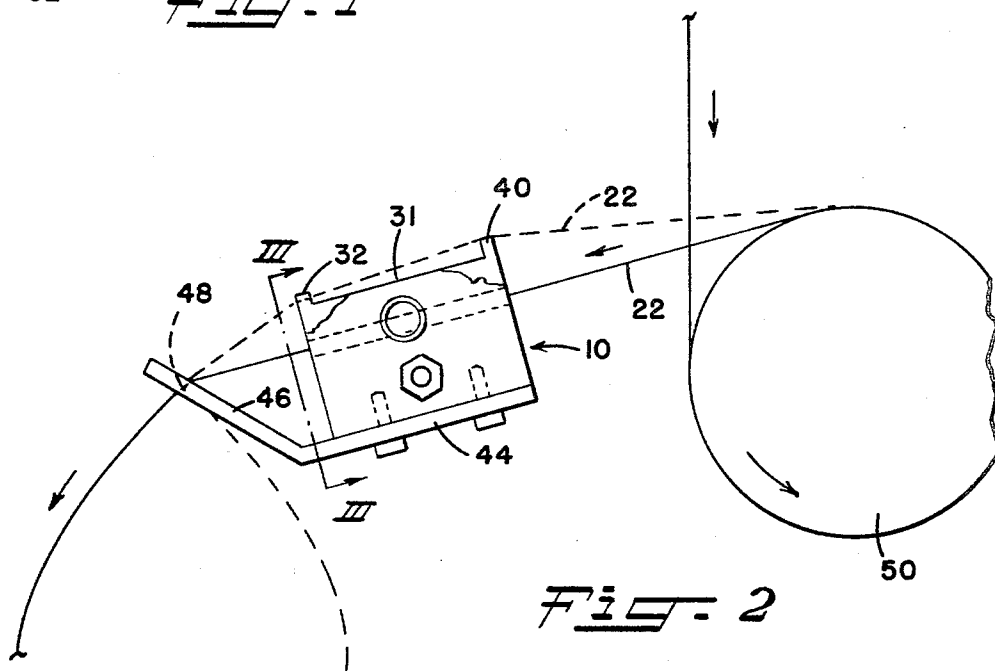
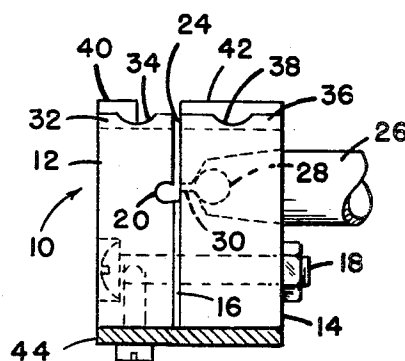
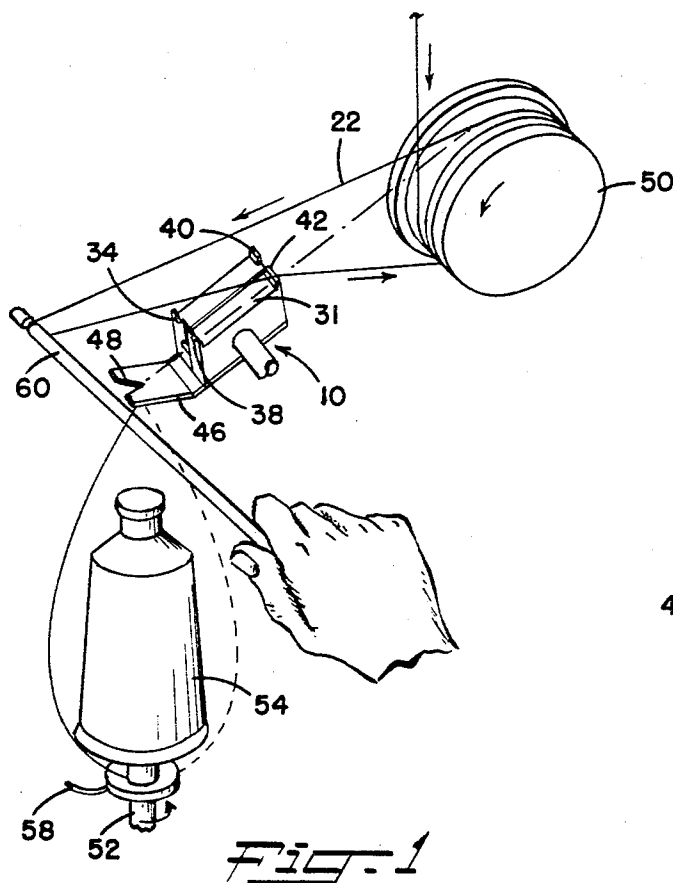
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LACING GUIDE

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1

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LACING GUIDE

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ABSTRACT OF THE DISCLOSURE

In a system wherein a running yarn strand is subjected to treatment in a tube-like passageway which has a lacing slot communicating therewith, guides are provided for assuring that the yarn is laced through the lacing slot and the passageway at the beginning of a run and for causing the yarn to re-enter the passageway should it be accidentally displaced therefrom during a run.

BACKGROUND OF THE INVENTION

(1) Field of the invention

The invention relates to the textile field and particularly to the manufacture of yarn, especially synthetic yarn. More particularly the invention relates to a yarn treating system which includes an apparatus having a tube-like passageway through which the traveling yarn runs and wherein guides are provided for insuring proper lace-up of the apparatus and for causing the yarn to return to its proper course through the passageway should it become accidentally displaced therefrom.

(2) Description of the prior art

The manufacture of artificial yarns such as acetate, rayon, nylon, polyester, etc. basically involves extruding a filament forming composition through a downwardly directed spinneret or jet and at some point below the spinneret collecting the extruded product, which is usually in the form of a multiplicity of very fine filaments, on a suitable collecting device such as a bobbin or the like. Sometimes the filaments are twisted together during collection and sometimes not. Since the extrusion takes place continuously and the collecting operation must be interrupted from time to time, as when a fully wound bobbin is replaced by an empty one, a godet is generally provided between the spinneret and the bobbin whereby the yarn passes once or a few times around the godet on the way to the bobbin during the winding of the yarn onto the bobbin and is permitted to wind around and build up on the godet during doffing or changing of the bobbin. The godet may be employed to impart a jet stretch to the filaments or may serve merely to forward the filament bundle and as a temporary collecting device during doffing of the bobbin. Between the godet and the bobbin, the filament bundle or yarn is often subjected to a treatment of some sort to change a physical or chemical characteristic thereof. For example, the strand may be subjected to a blast of air to cause the filaments to become entangled whereby the strand acquires a coherency or integrity which enables it to be subsequently handled in the manner of a twisted yarn, without in fact being twisted. This entanglement treatment or others involving the use of an air or steam blast is generally carried out while the strand is passing longitudinally through a tube-like passageway. Often the passageway has communicating therewith a lacing slot to facilitate the introduction of the strand into the passageway. It will be understood that the strand becomes disassociated with the treating apparatus each time the bobbin is changed and while the strand is winding up on the godet.

The usual procedure when changing bobbins is for the

2

operator to capture a loop of yarn from the godet and connect the loop to the rotating bobbin whereupon that portion of the loop being fed from the godet begins to wind onto the bobbin and that portion of the loop extending back to the godet is broken. When a yarn treating device in the form of a tube-like passage having a lacing slot is employed between the godet and the bobbin, that portion of the yarn loop being fed toward the bobbin by the godet is usually supported by a temporary guide until such time as the yarn begins to wind up on the bobbin whereupon the operator lifts the running yarn from the temporary guide and places it in the lacing slot from whence it is drawn down into the treating passageway due to the tension imposed by the bobbin. Particularly when the yarn is of low denier the running strand is hard to see and some times the operator forgets to lift it into the lacing slot before going on to change the next bobbin. Furthermore, particularly when the treatment involves the use of air under pressure, the yarn is sometimes blown out through the lacing slot and then continues to wind onto the bobbin without being properly treated until such time as an operator manually reinserts it into the lacing slot and since the running yarn is hard to see, this accidental displacement is apt not to be noticed.

SUMMARY OF THE INVENTION

The present invention assures that the yarn is properly laced through the yarn treating passageway at all times while it is being collected on the bobbin or the like.

It is an object of this invention to provide a yarn treating apparatus which includes a yarn treating passageway having a lacing slot communicating therewith with an improved guide means which assures that the yarn is properly laced through the treating passageway and which causes the yarn to automatically return to the passageway should it become accidentally displaced therefrom.

Another object of the invention is to provide a yarn treating system which includes a godet for delivering yarn to a windup apparatus and a yarn treating device between the godet and the windup apparatus with an improved means for assuring that the yarn is properly laced through the yarn treating device.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an isometric view showing the manner of leading a running yarn from a godet to a collecting bobbin and lacing the yarn through a treating device located between the godet and the bobbin;

FIG. 2 is a side elevational view showing in a full line the normal path of the yarn through the treating device and in a dotted line the path of the yarn during the start up of an operation; and

FIG. 3 is a sectional view taken along the line III—III of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The yarn treating device chosen to illustrate the invention is a tangler indicated generally at 10. The purpose of the tangler is to cause the filaments of the yarn passing therethrough to become interlaced or intertwined or tangled together so that after the treatment the filaments are no readily separated and the yarn may be used for weaving, knitting or the like without the necessity of a twisting operation. However, it is to be understood that the invention is also applicable to other yarn treating devices which have a structure somewhat similar to the illustrated tangler but which impart some treatment other than tangling.

As illustrated, the tangler 10 comprises two main members 12 and 14 having a thin shim 16 located therebetween and held together by a bolt 18 or the like. Member 12 has an open-sided tube-like passageway 20 therethrough

3

through which the yarn strand 22 runs during the normal treating operation. The shim 16 extends from the bottom of the device up to a point even with the lower edge of the open side of passageway 20 whereby the space between the two members 12 and 14 above the passageway serves as a lacing slot 24 by means of which the yarn may be readily laced through passageway 20 without having to be threaded endwise therethrough. Connected to a bore in member 14 is a compressed air conduit 26 from which air is discharged into a passage 28 which has one or more small openings 30 aligned with the yarn treating passageway 20. It is the action of the air discharged through openings 30 which causes the entanglement of the filaments of the yarn. It is apparent that the two body members 12 and 14 and the shim 16 may be integrally formed if desired and in the following claims such parts are referred to collectively as the "main body" of the yarn treating device or apparatus.

As best seen in FIG. 1, the top face 31 of the yarn treating device is substantially flat and the lacing slot 24 opens through this flat face. At one end of slot 24 an upwardly directed ledge 32 is provided and this ledge has a groove 34 in the top edge thereof. Ledge 32 extends transversely of slot 24 and terminates immediately adjacent said slot. Aligned with ledge 32 on the opposite side of the slot is a second ledge 36 having a groove 38 in the top edge thereof.

At the opposite end of the device from ledge 32 and on the same side of lacing slot 24 as the ledge, a projection 40 is provided. Projection 40 is higher than ledge 32 and is partially aligned with the groove 34 longitudinally of the lacing slot. Projection 40 extends transversely of the lacing slot and terminates with the end closest to the lacing slot removed from the lacing slot. Aligned with projection 40 is a second projection 42. Projection 42 is on the opposite side of the lacing slot from projection 40 and one end of projection 42 is in immediate proximity to the lacing slot.

Secured to the bottom of yarn treating device 10 is a plate 44 which has an upturned end portion 46 provided with a yarn guiding notch 48. In use, the yarn treating device is mounted by means not shown so that the yarn treating passageway 20 is coaxial with a line extending through the bottom of guide notch 48 and tangential with a yarn delivering godet 50, such arrangement being best shown in FIG. 2.

As previously alluded to, in the manufacture of artificial filament yarn, the newly extruded bundle of filaments usually wind around a godet before being taken up on a bobbin or like collecting device. It is this godet which is indicated at 50 and the bobbin is mounted for rotation with a spindle 52 which moves up and down within a cap and ring assembly indicated in FIG. 1 at 54 whereby the yarn is traversed up and down the bobbin during collection. The bobbin rests on a collar 56 secured to the spindle and a lacing thong or the like 58 is secured to the underside of the collar. As mentioned, during changing of the bobbin the yarn winds up on the godet. When it is desired to start the yarn winding onto a fresh bobbin, the operator, either with a finger or a notched stick or the like 60, captures a loop of yarn from the godet and leads the loop to the lacing thong 58 whereby the yarn running away from the godet begins to wind onto the bobbin and the yarn running back to the godet becomes broken due to the fact that the bobbin is pulling it in one direction and the godet in the other. This operation is rather difficult to describe in detail to the uninitiated but is fully understood by those working in the art to which the present invention pertains. In leading the captured yarn loop toward the lacing thong, the operator manipulates the loop so that that portion of the loop which is running away from the godet runs on top of projection 40, through the groove 34 and guide notch 48. That portion of the loop running back to the godet is caused to run through guide notch 48, groove 38 and

4

over the projection 42. Thus, one portion of the yarn loop is on one side of lacing slot 24 and the other portion is on the other side of the lacing slot. As soon as the yarn is connected to the bobbin, the tension imposed on that portion of the loop running back to the godet causes a break in that portion of the yarn. At this time, the yarn running from the godet and toward the bobbin is riding, as best shown in dotted line in FIG. 2, over the projection 40 and through the groove 34. The ballooning action of the yarn as it winds onto the bobbin causes it to slip off of projection 40 and onto the flat upper face 31 of the yarn treating device adjacent said projection. As the yarn moves across the upper face of the treating device, it cannot cross the lacing slot 24 because in attempting to do so it contacts the end of projection 42. When the yarn moves to a position of alignment with lacing slot 24, the tension on the yarn causes it to be drawn down through the lacing slot and this action also dislodges the yarn from groove 34 and pulls that portion of the yarn into the lacing slot. From the lacing slot the yarn moves into the treating passageway 20, the sideways movement into passageway 20 being caused by the position of guide notch 48 in coaxial alignment with the passageway.

Thus, the above described arrangement provides means for temporarily guiding the yarn in proximity to a yarn treating device during the start-up of a new bobbin but unlike previously known arrangements it is not necessary for the operator to take any action to lace the yarn through the treating device after connecting the yarn to the bobbin.

When the treatment imparted to the yarn involves an air jet, it sometimes may happen that the yarn is blown out of the passageway 20 and through the lacing slot 24 but with the present guide arrangement the yarn returns immediately to its proper position without the attention of an operator. As previously mentioned, the running yarn is often hard to see and thus it will be appreciated that it is highly desirable to have an arrangement which assures that the yarn is properly laced through the treating device.

The guide groove 38 for guiding the yarn running back toward the godet prevents that portion of the yarn from accidentally entering the lacing slot during connection of the yarn to a fresh bobbin. During the start-up of a fresh bobbin, if both portions of the yarn loop get into the lacing slot or the treating passageway 20, it most often happens that both portions of the yarn will break thereby requiring the operator to go through the starting up operation again.

Having thus described a preferred embodiment of the invention, what is claimed is:

1. Yarn treating apparatus comprising a main body having a yarn treating passageway extending therethrough, said main body having a substantially flat face, a lacing slot opening through said flat face and communicating with said yarn treating passageway, and a pair of lacing guides on said flat face at opposite ends of said lacing slot.

2. The apparatus set forth in claim 1 wherein one of said lacing guides comprises a groove provided in a ledge extending outwardly from the flat face of said main body, and the other of said guides comprises a projection extending from said flat face and spaced from said lacing slot.

3. The apparatus set forth in claim 2 wherein said projection is aligned with said groove and is higher than said ledge.

4. The apparatus set forth in claim 1 wherein one of said lacing guides comprises a groove provided in a ledge extending outwardly from said flat face transversely of said lacing slot and terminating immediately adjacent said lacing slot, and the other of said lacing guides comprising a projection extending outwardly from said flat face transversely of said lacing slot and terminating with the end closest to said lacing slot removed from said lacing slot.

5

5. The apparatus set forth in claim 4 comprising a second projection aligned with said first mentioned projection, said second projection being in immediated proximity to said lacing slot and on the opposite side of said lacing slot from said first mentioned projection.

6. In a yarn treating system comprising a godet for delivering yarn to a windup apparatus, a guide in the path of the yarn between the godet and the windup apparatus for changing the direction of movement of the yarn, and a yarn treating device between the godet and the guide; the improvement comprising said yarn treating device having a yarn accommodating passageway extending therethrough, said passageway being coaxial with a line extending through said guide and tangential to said godet whereby the yarn may travel through said passageway in a substantially straight line between the godet and the guide, an upwardly directed lacing slot extending through said yarn treating device and communicating with said pas-

6

sageway, said yarn treating device having a substantially flat upper face, lacing guides on said upper face at opposite ends of said lacing slot for guiding the yarn during lacing-up operations, said lacing guides causing the yarn to be displaced from the aforementioned straight line, and said lacing guides being constructed and arranged to permit the yarn to be pulled into said lacing slot by the windup apparatus when the windup apparatus places tension on the yarn at the end of a lacing-up operation.

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