

E. J. GRISET, JR
PRODUCTION OF CURLY YARN

4 Sheets-Sheet 1

Fig. 1.

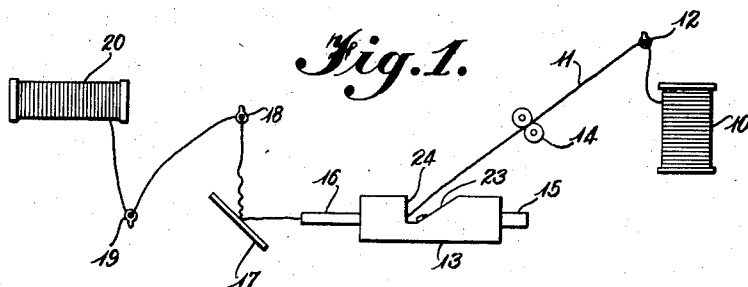


Fig. 2.

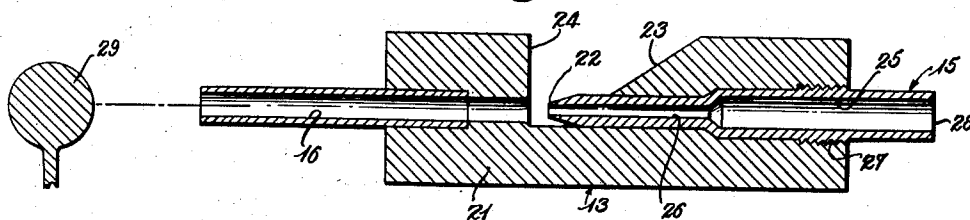


Fig. 3.

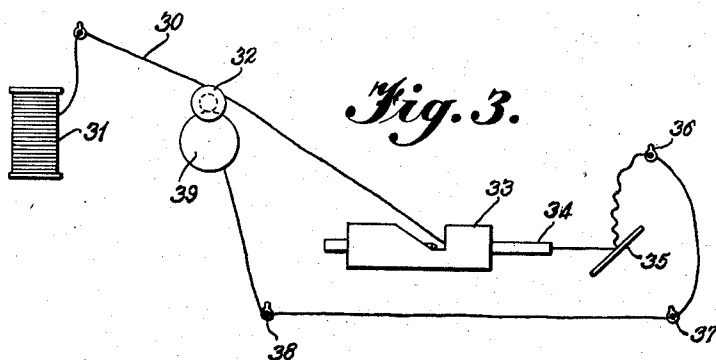


Fig. 4.

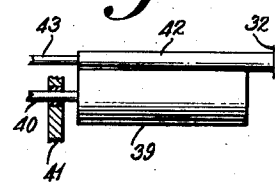
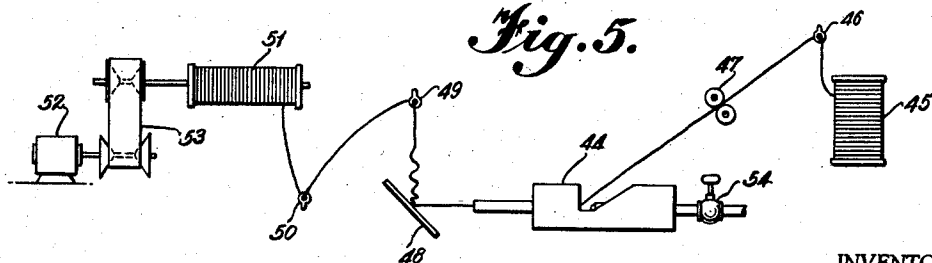


Fig. 5.



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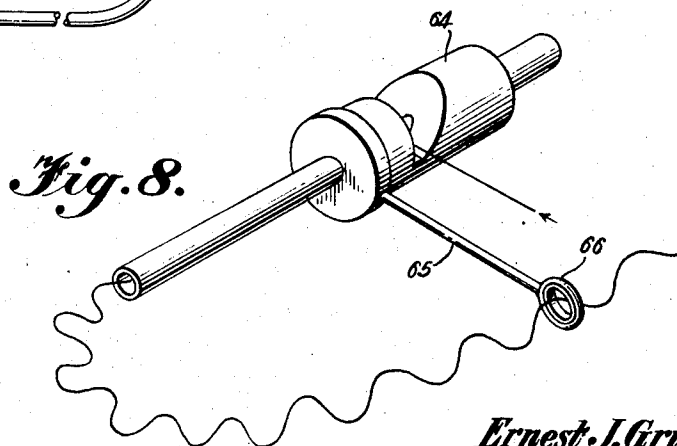
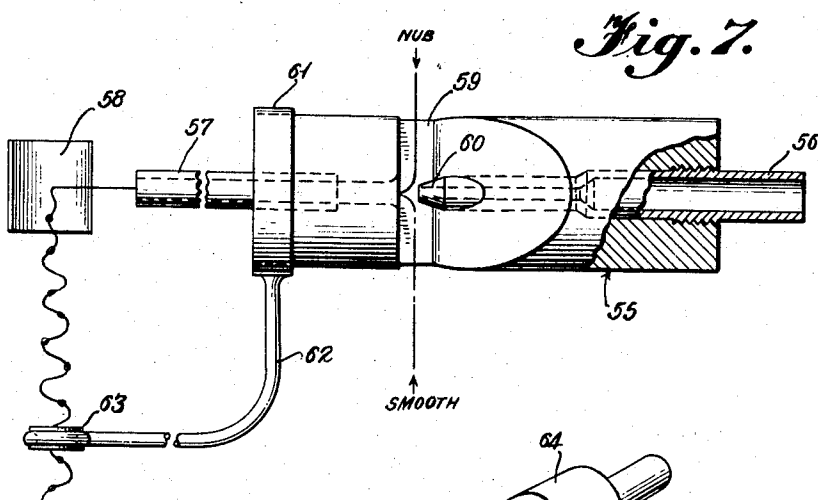
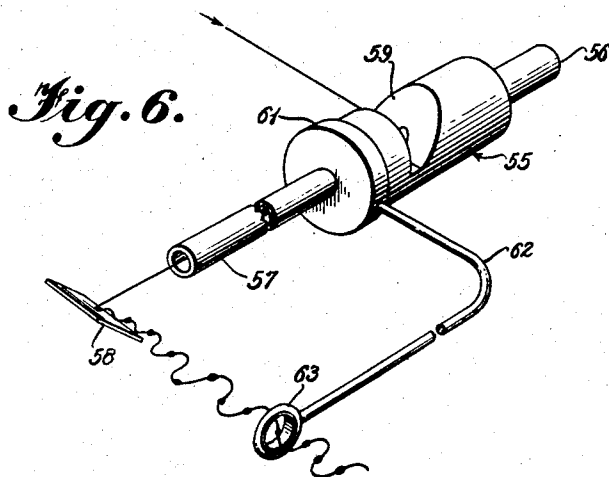
Feb. 24, 1959

E. J. GRISET, JR
PRODUCTION OF CURLY YARN

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4 Sheets-Sheet 2



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2,874,444

Filed Feb. 17, 1954

4 Sheets-Sheet 3

Fig. 9.

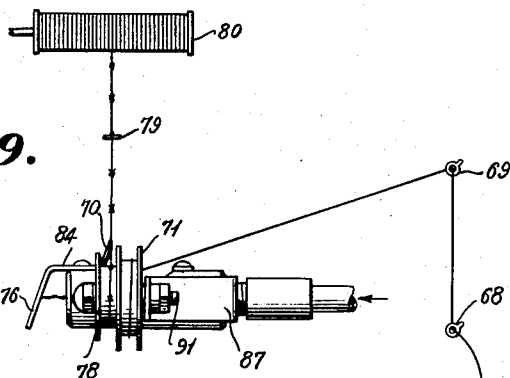


Fig. 10.

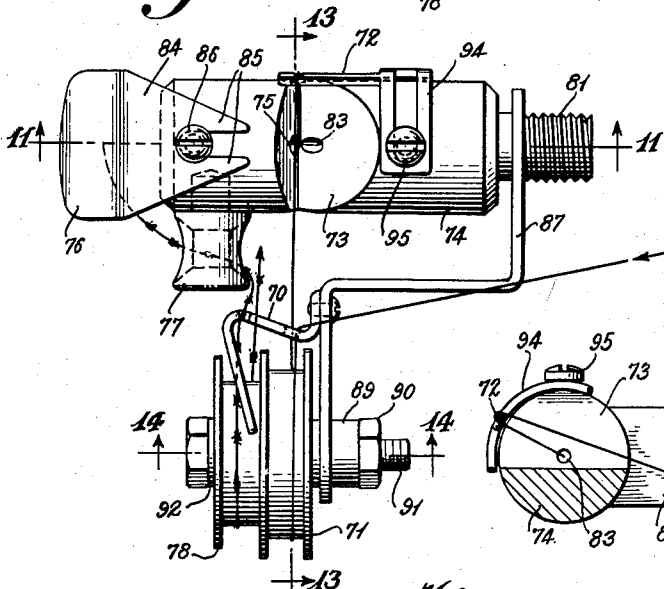


Fig. 13.

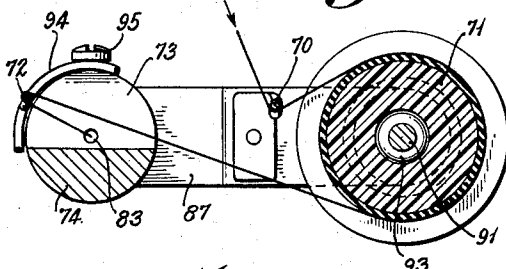


Fig. 11.

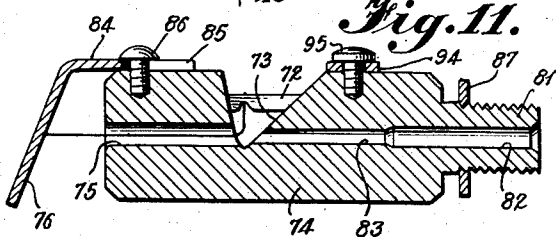


Fig. 14.

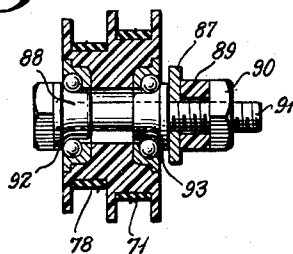
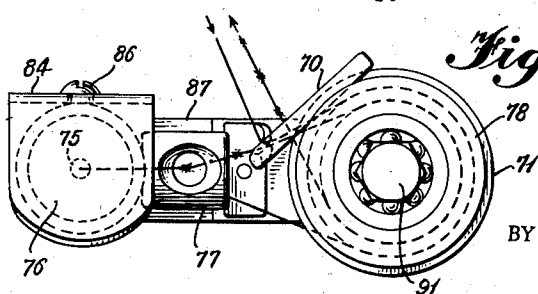


Fig. 12.



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E. J. GRISET, JR
PRODUCTION OF CURLY YARN

2,874,444

Filed Feb. 17, 1954

4 Sheets-Sheet 4

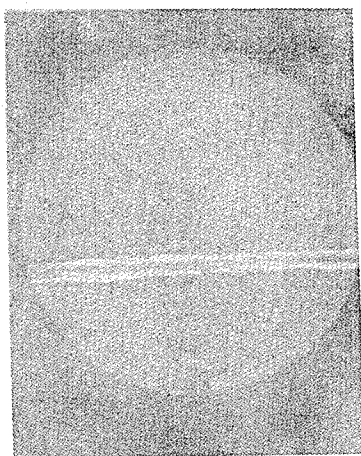


Fig. 15

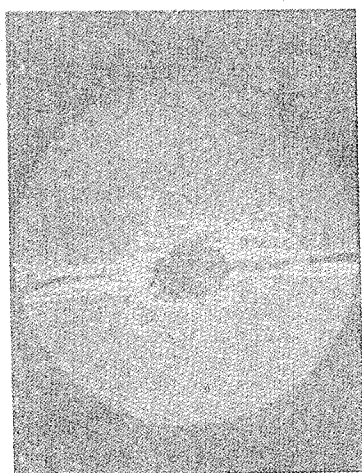


Fig. 17

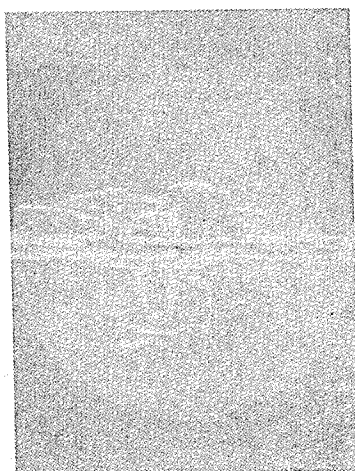


Fig. 16

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1

2,874,444

PRODUCTION OF CURLY YARN

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Application February 17, 1954, Serial No. 410,918

10 Claims. (Cl. 28—1)

This invention relates to the production of continuous filament yarn characterized by curls and fluffiness and, if desired, by the presence of random distributed nubs or localized areas of increased denier. This application is a continuation-in-part of commonly owned application Serial Number 354,503, filed May 12, 1953, and Serial Number 395,918, filed December 3, 1953.

In U. S. Patent No. 2,661,588 to Ernest J. Griset, Jr., and Ridgeway T. Lynch, there is disclosed an improved suction type thread collection device. It has been found that the appearance of multifilament yarn passed through this device is changed in various ways depending upon various factors which are, to a considerable degree, capable of control.

It is therefore an object of this invention to provide a multifilament yarn characterized by fluffs and curls and, optionally, by nubs or localized areas of increased thickness, and a method and apparatus for producing the same.

Other objects and advantages of the present invention can be understood upon reference to the following description of several embodiments thereof in conjunction with the annexed drawings wherein:

Figure 1 is a schematic view in side elevation of apparatus for the production of yarn according to the present invention;

Figure 2 is a view in section of a suction device similar to the one shown in elevation in Figure 1 but in association with a modified yarn target;

Figure 3 is a view in elevation similar to Figure 1 but showing means for feeding yarn to the suction device at a rate proportional to the rate of yarn withdrawal from the suction device;

Figure 4 is a detailed fragment of the yarn feeding device of Figure 3;

Figure 5 is a view in elevation of apparatus like that of Figure 1 but incorporating a change speed mechanism in the take up bobbin drive whereby nubs may be produced;

Figure 6 is a perspective view of another type of apparatus for the production of nubs in the curly yarn;

Figure 7 is a view in plan of the device of Figure 6;

Figure 8 is a perspective view of a form of device for producing curly or fluffy yarn without the use of a target or baffle for the yarn issuing from the suction device;

Figure 9 is a view in side elevation of a commercial form of apparatus according to the present invention, characterized by the grouping and supporting of the components of the apparatus on and about the body of the suction device;

Figure 10 is a top plan view of the major subassembly of Figure 9 to an enlarged scale;

Figure 11 is a view in section taken on the line 11—11 of Figure 10;

Figure 12 is an end view of the subassembly of Figure 10;

Figure 13 is a view in section taken on the line 13—13 of Figure 10;

2

Figure 14 is a view in section taken on the line 14—14 of Figure 10;

Figure 15 is a photomicrograph of an ordinary multifilament rayon yarn;

Figure 16 is a photomicrograph of a yarn of the same composition and size as that of Figure 15 after treatment according to the invention to produce curls and fluffiness but not nubs; and

Figure 17 is a photomicrograph of a yarn of the same composition and size as that of Figure 15 after treatment according to this invention to produce both nubs and fluffiness.

In general, the desired properties are introduced into the yarn in the present invention by passing the continuously running yarn into and through the suction device and by changing the direction of travel of the yarn after it emerges from the nozzle of the suction device and while it is still under the influence of the stream of air passing through the device. Preferably, the direction of travel is changed by disposing a baffle member as a yarn target opposite the nozzle of the suction device and causing the yarn to impinge thereon. The yarn is then collected in package form on any suitable take-up.

By controlling the respective rates at which the yarn is fed to and withdrawn from the suction device, for example, by feeding yarn into the suction device by a freely rotatable means operated solely by the running yarn withdrawn therefrom, a most unusual effect is obtained. The yarn treated according to the present invention is characterized by having a pronounced curliness and bulkiness throughout the continuous strand. It thus has properties in common with spun yarn and, in fact, a fabric woven with the present type yarn used as a filling has the same bulkiness and soft feel as a fabric woven from spun yarn.

Referring now to Figure 1, the numeral 10 designates a source of supply for a continuously running yarn 11. The yarn is passed through a guide 12 and introduced into the low pressure area of a suction type thread collecting device 13 by feed rollers 14. Further details of the device 13 will be clear from the discussion of Figure 2 below. Air or other gas from any suitable source is introduced into the device 13 through a jet tube 15. The yarn 11 is caught in the jet of gas and propelled through exhaust tube 16 of suction device 13.

A flat impervious baffle plate 17 mounted by means, not shown, is disposed a short distance away from the end of the tube 16. The baffle 17 is inclined at an angle with respect to a perpendicular to the tube 16. With this arrangement, the yarn is discharged from the end of the tube 16 and into contact with the baffle 17 where it continues to be subject to a turbulence due to the blast of air. The yarn 11 is then withdrawn through thread guides 18 and 19 to take-up 20. It is important that if a take-up such as 20 is used that it withdraw the yarn 11 from the vicinity of the baffle 17 at a slower speed than it is fed to the suction device 13 by the feed rollers 14. In other words, it is necessary that a certain amount of slack accumulate during the time that it is under the influence of the blast of air and, if a deflector is used, while the yarn is in the vicinity thereof.

The yarn collected on the take-up 20 has properties completely different from those possessed by the yarn supplied to the suction device 13. For example, a 450/80 viscose rayon filament yarn containing a twist of 3 T. P. I. after being subjected to the foregoing process is transformed from a smooth constant denier yarn into a yarn having the general appearance and feel of spun yarn. The described process does not actually sever individual filaments of yarn. Instead, the blast of air acts with varying severity on the various filaments with the result that numerous small curls are introduced throughout the

length of the yarn. Cloth woven using yarn so treated as filling was found to have a bulky appearance with a fuzzy or loopy surface.

Figure 2 shows the details of the thread suction device 13. The numeral 21 indicates generally a solid cylindrical support or housing in which the tube 15 terminates in a jet 22. The exhaust or discharge tube 16 is maintained in spaced axial registry with the jet 22 separated by a small gap. A notch cut in the housing 21 is defined by an inclined shoulder 23 and a perpendicular shoulder 24. The jet 22 projects through the shoulder 23 and an aligned aperture in the shoulder 24 leads to the tube 16.

The tube 15 is provided internally with two bores of different diameter. The larger bore 25 extends from the outer end about half way along the jet tube. The smaller bore 26 extends to the tip portion of the jet 22. The two-bore assembly is held in place in housing 21 by means of a threaded section 27 on the exterior of the jet tube 15 in a radial plane coinciding with a part of the length of large bore 25.

Air from any suitable source is connected at 28 to the large bore end of tube 15. The air emerges from the tip of jet 22 at a high velocity, enters discharge tube 16 and finally is emitted to the atmosphere. The cross-sectional area of tube 16 is about 3 times that of the jet 22. The high velocity stream of air creates a reduced pressure zone in the notch formed by the shoulders 23 and 24 with the result that any yarn placed in the wedge-shaped portion is immediately conveyed into the stream of high velocity air and propelled into the tube 16.

In Figure 2, a sphere 29, disposed opposite the exit end of tube 16, serves as the deflecting means for the air and yarn. As in the foregoing embodiments, it is necessary that the yarn be withdrawn from the vicinity of sphere 29 at a rate considerably less than that at which it is supplied to the suction device 13.

Figures 3 and 4 illustrate one means of controlling the rate at which the yarn is fed to the suction device and withdrawn therefrom. In this case, yarn 30 is withdrawn from a source 31 by means of feed roll 32 and supplied to suction device 33 at a rate depending on the speed of rotation of roll 32. Upon emerging from tube 34, the yarn 30 strikes deflector plate 35 where the path of travel is abruptly changed and it is then led by way of guides 36, 37 and 38 to a take-up 39. Shaft 40 of take-up 39, rotatably mounted in housing 41, is driven by any suitable means (not shown).

It will be seen from Figure 4 that freely rotatable roller 42 lies in contact with the rotating take-up 39 and is surface driven by the take-up 39 or the package of yarn carried thereon. By the use of this system, freely rotatable roller 42 derives a rotational energy from the driven take-up 39, which energy is utilized as the sole means for feeding yarn into the suction device at a rate which is continuously proportionate, and at a constant ratio, to the rate of withdrawal from said device. Feed roll 32 is about 25% larger in diameter than the diameter of roller 42 and is driven by roller 42 to which it is connected. Roller 42 is rotatably mounted on movable arm 43 for sliding movement up and down, depending on the size of the package carried on the take-up 39. In view of the size of feed roll 32, the yarn 30 will always be supplied to the collection device 33 at a rate about 25% faster than it is withdrawn by the take-up 39. As the package builds up on the take-up 39 and the peripheral speed of roller 42 increases, the speed of feed roll 32 increases at an identical rate.

It will be seen that the apparatus disclosed in Figures 3 and 4 not only controls the rate at which the yarn is supplied to the suction device and withdrawn therefrom but also automatically compensates for the change in the take-up speed as the take-up package increases in size. By the use of this apparatus a substantially uniform curl or bulkiness is given to the yarn throughout the entire package.

Best results are obtained in practicing the present invention if the yarn is supplied to the suction device between about 5% and 40% faster than it is withdrawn therefrom, depending on the size of the yarn being treated and the rate of feed. For example, a very satisfactory curl is obtained with 600/120 viscose rayon yarn if it is supplied to the suction device between about 8 and 34% faster than it is withdrawn therefrom. With 450/80 viscose rayon, a satisfactory range is between 7% to 30%. Good results are obtained by taking the yarn up at a rate of about 100 meters per minute. The present invention may be used to curl either twisted or untwisted yarn although a more satisfactory product is obtained if the yarn possesses at least a slight twist. Generally, the higher the denier the less twist required for optimum results. If desired, a quick drying soluble lacquer may be sprayed onto the yarn either before it enters the air stream, during the time it is in the air stream or after it leaves the air stream. This is by no means essential, but it is helpful as it tends to hold the curls in place during processing. After the yarn is woven, the lacquer may be removed by washing.

If the rate of yarn withdrawal from the suction device is varied in relation to the rate of yarn supply to the suction device, during a single winding-on period, nubs will be produced in the curly yarn.

In Figure 5, there is schematically shown a variation of the system of Figure 1 by which it is possible to produce nubs. In this case, the suction device bears numeral 44 and is structurally similar to the one shown in Figures 1-3 inclusive. The numeral 45 represents a supply package having thereon continuous filament yarn. Yarn is led from the package 45 through the thread guide 46 via a suitable feed roller assembly 47 to the notch of the suction device 44. After discharge from the suction device 44, it impinges against the plate 48 and is guided through guides 49 and 50 to a take-up device 51 driven by a motor 52 through a variable speed transmission 53 of the PIV type.

With the system of Figure 5, it is possible to produce nubs by operating the take-up device 51 at a constant peripheral speed while intermittently and at random interrupting the air flow by operation of a valve such as 54 in the air supply to the jet 44. Another way in which nubs can be produced is by varying, at random intervals, the take-up rate of the take-up device 51 by manipulation of the transmission 53. The yarn produced according to this embodiment of the invention is characterized by having nubs throughout the length of the yarn with the sections between the nubs relatively free from curls. Still another way of producing nubs is to operate the take-up 51 at an excessively low peripheral speed to permit an excessive amount of contractions of the yarn as it is being fluffed by the air jet. The amount of contraction required will vary, depending on the denier of the yarn being processed.

While reference has been made to random operation of valve 54 and random adjustment of drive 53, it is understood that the periodicity of such operations is really a matter of whether one wants the nubs to occur at random along the length of the yarn or at regular intervals. If the latter is desired, the valve 54 or the transmission 53 is operated at regular intervals. The magnitude of speed change of the transmission 53 and the magnitude of the variation in the pressure of the propelling air, of course, related to the size of the nubs sought to be produced.

Another and the preferred way of producing nubs according to the present invention is accomplished by manipulating the angularity of the yarn entry into and exit from the suction device. Suitable apparatus for this purpose is shown in Figures 6 and 7. In these figures a suction device similar to that shown in Figures 1 to 5, inclusive, is designated by numeral 55. The illustrated suction device 55 is comprised of a cylindrical body

having a central axial bore therethrough in which there are located an air or gas type supply tube 56 and a gas and yarn ejection tube 57. A flat impervious baffle plate 58 mounted by means, not shown, is disposed a short distance away from the end of tube 57. The central bore of the cylindrical body is intersected by a notch at 59 and the air supply tube 56 terminates in that notch in a nozzle 60 which is spaced from but on the same axis as the tube 57. When compressed air is supplied to the tube 56, a suction zone is created at the bottom of the notch 59 and yarn introduced into the notch is sucked into the tube 57 and discharged out of its end into contact with plate 58.

If continued reference to Figures 6 and 7 is made, it will be noted that the cylindrical body of the suction device 55 is surrounded, near its discharge end, by a ring 61 from which there extends a supporting arm 62, supporting at its free end a thread guide 63. The thread guide 63 has its eye or the thread path which it defines on an axis at right angles to the common axis of the tubes 56 and 57. If now yarn is introduced into the notch 59 from the side of the cylinder opposite to that from which the arm 62 extends, as indicated by the solid line in Figures 6 and 7, it will be found that nubs are produced. On the other hand, if the yarn is introduced into the notch on the same side of the suction device as the thread guide 63 and from the same general direction in which the yarn is withdrawn as indicated in broken lines in Figure 7, the yarn will be rendered more bulky, curly and fluffy but will not have nubs produced therein. Thus, if the yarn is introduced into the notch on the same side of the cylinder as the thread guide 63, the function will be the same as that described in application Serial Number 354,503, of which this application is a continuation-in-part. On the other hand, when the yarn is introduced from the opposite side of the cylinder from which it is withdrawn, not only is bulkiness and fluffiness imparted to the yarn but also the novelty effect of random distributed nubs.

It is not essential that the yarn enter exactly as shown in Figure 7 to produce the nubs. As a matter of fact, if one visualizes a vertical plane extending upwardly from Figure 7 and passing through the long axis of the tubes 56 and 57, then any entry of the yarn on the side of that plane opposite to the side in which the guide 63 lies will result in the production of numerous distinct nubs.

Entry of the yarn on the side of the plane in which guide 63 lies will likewise result in the production of satisfactory nubs. However, as the direction from which the yarn enters draws near to the direction in which the yarn is withdrawn from the jet, the tendency to produce nubs decreases. Stated differently, the radial angle formed between the yarn being fed to the jet and the yarn being withdrawn from the jet as viewed along the axis of the jet must be carefully controlled in the production of nubs. If this angle is between 90° and 180°, for example, the production of large distinct nubs is assured. Nubs are also obtained at angles less than 90° although the tendency to produce nubs decreases as the angle between the two threads decreases from 90° downward. Likewise, if one visualizes a horizontal plane extending along the axis of tubes 56 and 57, then any entry of yarn above that plane will result in the production of nubs if the yarn is withdrawn below the plane, as by a guide disposed underneath body of the suction device 55. If the yarn enters beneath the plane, the tendency to produce nubs decreases as the entry-withdrawal angle becomes smaller.

The reasons for the foregoing phenomenon are not fully understood. It appears, however, that the air stream intermittently grabs and releases the yarn when the yarn is introduced from one side of it and withdrawn from the other.

For the production of satisfactory nubs by this arrange-

ment, the yarn must impinge off a baffle plate or other deflecting member as it leaves the ejection tube. If it does not impinge off of a baffle, nubs will not be produced. On the other hand, if yarn is introduced into and withdrawn from the same side of a suction device, and no baffle is used, satisfactory fluffiness is produced. In Figure 8, a suction device 64, similar in structure and function to device 55 of Figure 7, is provided with a radial arm 65 constituting a supporting bracket for a yarn guide 66. If yarn is introduced into the device 64 from the same side as the radius of the arm 65, a good fluffy, nub free product is produced without the need for a baffle.

The following examples will illustrate the practice of the invention according to Figures 5, 6 and 7.

Example I

150/40 viscose rayon continuous filament yarn containing a twist of 5 turns per inch was fed by means of a feed roll assembly into the notch 59 of the suction device shown in Figures 6 and 7 at a rate of 130 meters per minute. The supply tube 56 on the suction device was $\frac{1}{8}$ inch in diameter and the nozzle 60 was $\frac{1}{16}$ inch in diameter. The length of the tube 57 was 3 inches and the diameter of this tube was $\frac{1}{8}$ inch. A $\frac{3}{4}$ inch square metallic deflector plate 58 was mounted $\frac{1}{4}$ inch away from the end of the tube 57. Plate 58 was tilted about a horizontal axis so as to produce an angle of about 45° with respect to a plane normal to the axis of tube 57. An air pressure of 40 pounds per square inch was applied to the tube 56 and the yarn impinging off plate 58 was withdrawn through thread guide 63 disposed on the side of the suction device opposite the side on which the yarn entered notch 59 and approximately $\frac{1}{2}$ inch away from tube 57. The yarn withdrawn through the guide 63 was taken up on a supply package at a rate of about 100 meters per minute. The collected yarn was characterized by having pronounced nubs or collections of curly segments such as the one shown in Figure 17 disposed at random throughout the length of the yarn. The portions of the yarn between the nubby sections were just slightly curled.

Example II

150/40 viscose rayon continuous filament yarn was fed into the suction device used in Example I above under the same conditions except that the yarn was fed into the suction device on the same side and from the same general direction in which it was withdrawn as indicated by dotted lines in Figure 7. The collected yarn was characterized by a uniform bulkiness due to a multiplicity of curls produced in the various filaments throughout the yarn. There was no evidence of nubs in the collected yarn.

Example III

150/40 viscose rayon continuous filament yarn was fed into a suction device similar to the one described in Example II above and provided with a quick operating valve such as valve 54 of Figure 5 in the air supply line to the suction device. While the yarn was being passed through the suction device under the conditions given in Example II, the air valve was rapidly opened and closed at random intervals and at an average rate of about 150 times per minute. The collected yarn was characterized by nubby sections disposed at random throughout the length of the yarn.

Example IV

150/40 viscose rayon continuous filament yarn was fed into the suction device described in Example II above by means of feed rolls at a rate of 130 meters per minute. The take-up device used was provided with a PIV drive similar to the one illustrated in Figure 5 and the take-up speed was varied at random between 90 and 130 meters per minute. The collected yarn was found to

have nubs disposed at random along its length. The sections in between the nubs were relatively free from curls.

In Figures 9 to 14, inclusive, there is shown a commercially desirable, simplified type of apparatus for producing fluffy, curly, novelty yarn either with or without nubs in accordance with the desires of the operator. In this device, multifilament yarn is led from a supply package 67 through guide 68 to a tension device 69, under a guide 70, around a roller 71, over a guide 72 into the notch 73 of a suction device 74, through the exit conduit 75 of the suction device 74, onto a baffle 76 and from thence through a guide 77, over guide 70, around roller 78 to a guide 79 and a constant speed driven collecting device 80. It will be noted that, in basic operation, the form of the invention shown in Figures 9 to 14, inclusive, is similar to the form shown in Figure 3. This is because the feeding of the yarn to the suction device is accomplished by a roller 71 which is driven by roller 78 which in turn is driven through the running yarn withdrawn from the collecting device 80. In other words, roller 78 derives a rotational energy from the running yarn withdrawn from the suction device by collecting device 80, which energy is utilized as the sole means for rotating roller 71 and thereby feeding yarn into the suction device at a rate which is continuously proportionate, and at a constant ratio, to the rate of withdrawal from said device. Despite these similarities between the devices of Figures 9 to 14, inclusive, and the device of Figure 3, it will be noted that many important structural features are present in the construction shown in Figures 9 to 14 whereby commercial operations and adjustments for different weights of yarn and applied treatments are greatly facilitated.

Upon reference to Figure 11, it will be noted that the suction device consists of a cylindrical body 74 machined out of metal and having an integral threaded boss 81 at one end. The air supply and withdrawal passage are not defined by pipes but are machined out of the body 74. The air is supplied through conduit 82 of enlarged cross section which leads to a coaxial conduit 83 of smaller cross section. This conduit discharges into the notch at 73, and the withdrawal conduit 75 which is larger in diameter than conduit 83 and lies in coaxial registry therewith on the other side of the notch. The baffle 76 is supported from an integral bracket 84 having tines 85 at its end which straddle a set screw 86 which adjustably holds the baffle 76 from the body 74.

A bracket 87 fastened to the boss 81 supports a ball bearing subassembly 88 on which the two rollers 71 and 78 are coaxially mounted for rotation together. The bearing subassembly 88 is locked in position by a compressible washer 89 compressed by a nut 90 on a bolt 91. The bolt 91 passes through the ball bearings and its head and the bracket 87 bear on the cones 92 and 93, respectively, of the bearing subassembly 88, see Figure 14.

The arm 87 has attached to it the generally Z-shaped guide 70, the structure and function of which is perhaps best appreciated by reference to Figure 10. The yarn guide 77 is mounted by a set screw to project from the side of the body 74 about 90° away from the bracket 84 which supports the baffle 76.

As has been described above, if yarn is led into the notch of a suction device from one side and withdrawn from that same side, fluffiness will result but there will not be any production of nubs. In the apparatus of Figures 9 to 14, inclusive, it is contemplated that nubs may or may not be produced depending upon adjustments made by the operator. With this in mind, there is a slotted arcuate member 94 which extends for about a little more than 90° about the cylindrical surface of the body 74 of the suction device. It may be locked in an angular position of adjustment by a set screw 95 threaded into the body 74. Projecting axially from the

slotted member 94 is the guide 72. In view of the adjustability of the member 94, guide 72 can cause the yarn itself to enter the notch 73 in various angular positions opposite to the withdrawal side, i. e., the side from which guide 77 projects. If the production of nubs is not desired, guide 72 need not be used.

Throughout this specification, reference has been made to curliness, fluffiness and nubs. These expressions are difficult to define with great accuracy and, for this reason, Figures 15, 16 and 17 of this case are photomicrographs depicting respectively an untreated control yarn of 150 denier, 40 filaments, the same yarn after being fluffed but without nubs and the same yarn with nubs. The pictures are taken at 42× magnification. It can be seen that the cross section of the yarn of Figure 16 is greater than that of Figure 15 by a substantial margin. Generally speaking, the denier of the yarn after being fluffed must be at least 2% greater than the untreated yarn in order to constitute a commercially satisfactory product. With respect to the nub yarn shown in Figure 17, the increase in denier of the treated yarn over the untreated yarn might well be less than 2%.

What is claimed is:

1. Apparatus for the treatment of multifilament yarn comprising a body having a passageway therethrough intersected by a notch, a baffle supported in spaced relation to the discharge end of said passageway, a yarn propelling wheel in the yarn path leading to the notch, a smaller yarn wheel in the yarn path leading from the baffle, means supporting said wheels for free rotation together and means to draw the yarn from said baffle around said smaller wheel whereby the yarn propelling wheel will be driven thereby to feed yarn to the notch faster than it is withdrawn from said baffle.

2. Apparatus for the treatment of multifilament yarn comprising a body having a passageway therethrough intersected by a notch, a baffle supported from said body in spaced relation to the discharge end of said passageway, adjustable means to guide the yarn into said notch in different angular positions about the axis of said passageway, a yarn propelling wheel in the yarn path leading to the notch, a smaller yarn wheel in the yarn path leading from the baffle, means supporting said wheels for free rotation together and means to draw the yarn from said baffle around said smaller wheel whereby the yarn propelling wheel will be driven thereby to feed yarn to the notch faster than it is withdrawn from said baffle.

3. Apparatus for the treatment of yarn comprising a suction device through which yarn is passed, a collection device for withdrawing yarn from said suction device, a first freely rotatable yarn driven wheel over which the withdrawn yarn is guided and a second wheel driven by said first wheel for feeding yarn to said suction device at a rate proportionate to the rate of collection.

4. Apparatus for the treatment of yarn comprising a suction device having a passageway through which yarn is passed, a baffle adjustably supported from said suction device in spaced relation to the discharge end of said passageway, a first yarn propelling wheel in the yarn path leading to said passageway, a second smaller yarn wheel in the yarn path leading from the baffle, means supporting said wheels for concurrent free rotation and means to draw the yarn from said baffle around said second wheel whereby the first wheel will be driven from said second wheel to feed yarn into the passageway faster than it is withdrawn from said baffle.

5. Apparatus for the treatment of yarn comprising a body having a passageway through which yarn is passed, a baffle supported in spaced relation to the discharge end of said passageway, a first yarn propelling wheel in the yarn path leading to the passageway, a second smaller yarn wheel in the yarn path leading from the baffle, means projecting from said body and supporting said wheels for concurrent free rotation and means to draw the yarn from said baffle around said second wheel whereby the

first wheel will be driven by the second wheel to feed yarn to the passageway faster than it is withdrawn from said baffle.

6. Apparatus for the treatment of yarn comprising a body having a passageway through which yarn is passed, a baffle adjustably supported from said body in spaced relation to the discharge end of said passageway, guide means adjustably supported from said body to guide the yarn into said passageway in different angular positions about the axis thereof, a first yarn propelling wheel in the yarn path leading to the passageway, a second smaller yarn wheel in the yarn path leading from the baffle, means projecting from said body and supporting said wheels for concurrent free rotation and means to draw the yarn from said baffle around said second wheel whereby the first wheel will be driven thereby to feed yarn to the passageway faster than it is withdrawn from said baffle.

7. Apparatus as set forth in claim 6 wherein said first wheel feeds yarn into said passageway at a rate of from 5 to 40% greater than that at which said second wheel withdraws yarn from said baffle.

8. The method of producing a bulky yarn having nubs therein that comprises introducing succeeding portions of continuous filament yarn into a high velocity gas stream from one side thereof, impinging said yarn and said stream against a baffle member and withdrawing said succeeding portions from the opposite side of said stream at a point downstream of the point of introduction.

9. Apparatus for the treatment of multifilament yarn

comprising a body having a passageway therethrough intersected by a notch, a baffle supported in spaced relation to the discharge end of said passageway, adjustable means to guide yarn into said notch in different angular positions about the axis of said passageway, and means including a fixed guide to withdraw yarn from said baffle.

10. Apparatus for the treatment of yarn comprising a suction device having a yarn receiving passageway therethrough, a baffle aligned with the discharge end of said passageway, a thread guide adjustably supported by said suction device for guiding yarn into said passageway in different angular positions about the axis thereof, and means for drawing yarn through said passageway.

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