United States Patent [19]

Gardella

[11] **3,815,350**

[45] **June 11, 1974**

[54] **PROCESS FOR THE PRODUCTION OF YARNS**

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[22] Filed: **Dec. 20, 1972**

[21] Appl. No.: **316,728**

[30] **Foreign Application Priority Data**

Jan. 22, 1972 Italy 12427/72

[52] **U.S. Cl.** ..... **57/167,** 28/DIG. 1, 57/34 CP, 57/157 S

[51] **Int. Cl.** **D01h 1/08,** D02j 1/22

[58] **Field of Search** ..... 57/34 R, 157 R, 157 S, 57/34 CP, 167, 76; 28/DIG. 1

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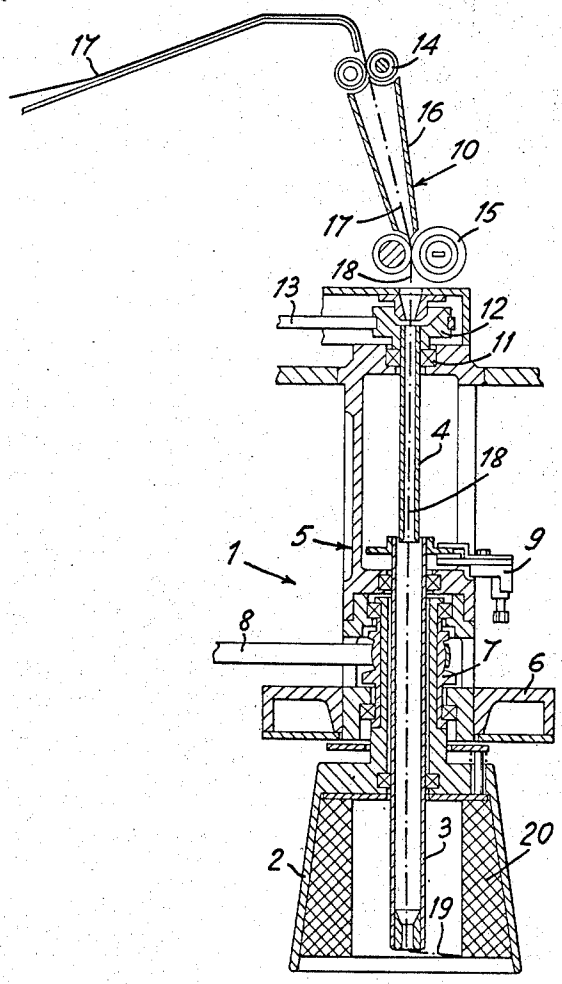
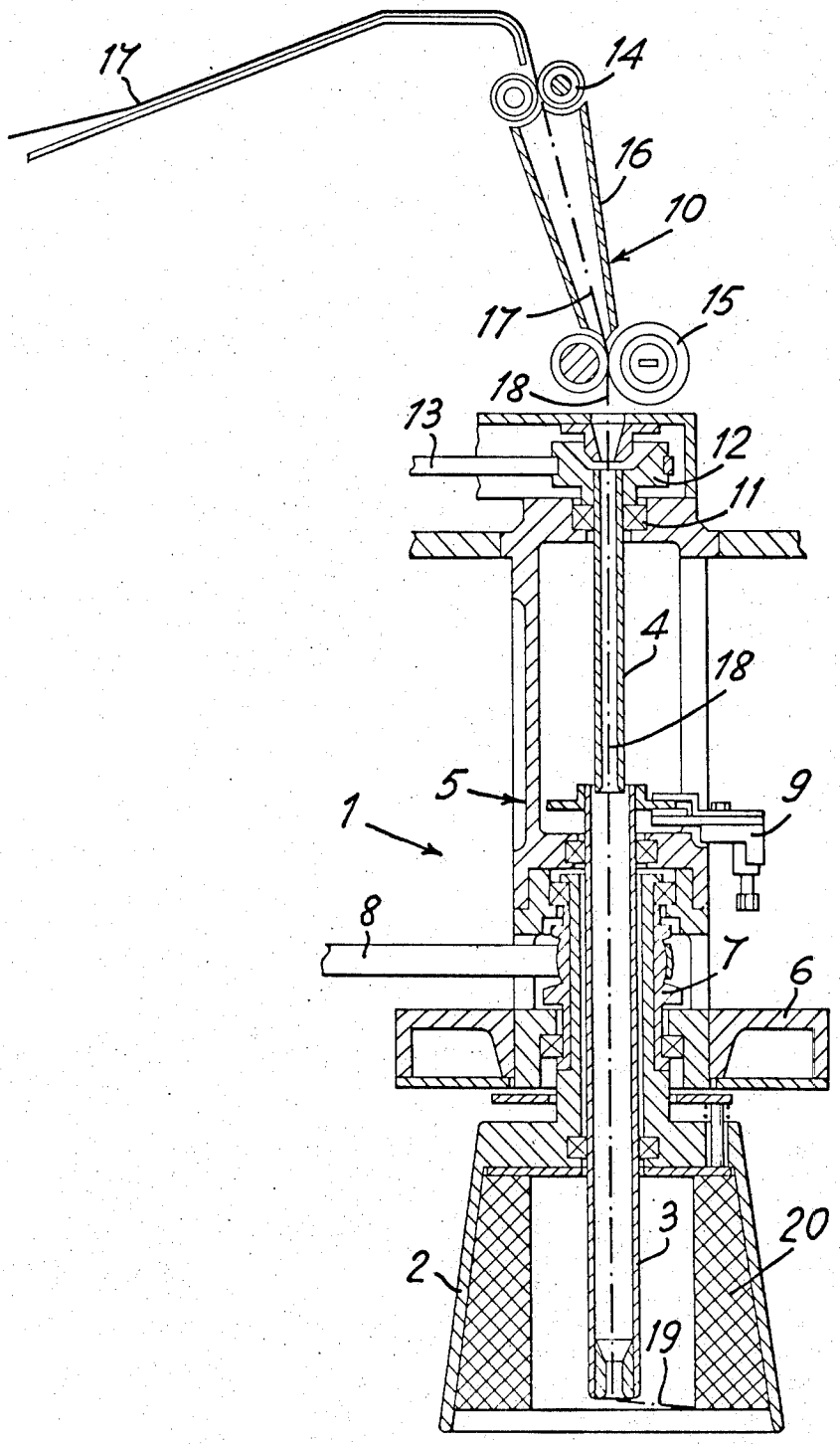
Attorney, Agent, or Firm—Larson, Taylor and Hinds

[57] **ABSTRACT**

A continuous sheet of synthetic resinous material oriented in a longitudinal direction and cut into a plurality of strands integrally joined together at regularly spaced intervals along the length thereof is continuously fed to the drafting unit of a can spinning spindle and transformed by drawing into a discontinuous fibrillated sliver, said sliver being continuously transformed into a yarn into the said spinning spindle by twisting it, and the so-formed yarn is deposited into a bobbin in the can of the can spinning spindle.

4 Claims, 1 Drawing Figure

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PROCESS FOR THE PRODUCTION OF YARNS

FIELD OF THE INVENTION

This invention relates to a process for the production of yarns from a continuous sheet of synthetic resinous material.

BACKGROUND OF THE INVENTION

It is known to produce multifilament materials by splitting, cutting or slitting a continuously moving strip, tube or sheet of synthetic resinous material orientated in a longitudinal direction into a plurality of strands, adjacent strands being integrally joined together at regularly spaced intervals along the length thereof.

The synthetic resinous material may be any such material which is capable of being formed into a continuous strip or sheet and which can be orientated. Examples of such material are polyalkenes (e.g. polyethylene, polypropylene etc.), polyamides (e.g. nylon), polyesters (e.g. polyterephthalic esters).

The said slitted continuous strip of synthetic resinous material may be thereafter subjected to a tensioning operation, by means of which it is transformed into a web-like or fibrillated sliver of multifilaments, which is collected into bobbins and which may be thereafter subjected to a spinning operation in suitable spinning frames, so as to transform said sliver into a yarn.

Whilst the slitted continuous strips of material may be easily collected into reels, and the said reels may be easily stored, handled and transferred from one place to another, the bobbins of slivers of multifilaments are bulky, and are not so easy to be handled for the subsequent twisting operation.

SUMMARY OF THE INVENTION

According to the present invention it was found that it is possible to avoid the above mentioned drawbacks of the known prior art processes, by feeding the previously slit continuous strip of synthetic plastic material directly to the drafting unit of a can spinning spindle on a spinning frame.

In this manner, the slit continuous strip is continuously transformed into a sliver in the drafting unit of the same spinning frame by which it is transformed into a yarn.

The so-produced yarn, is automatically collected into bobbins in the can of the can spinning spindle.

In this manner, the overall manufacturing process is very simplified, and it is also possible to feed directly the continuous strip from the slitting apparatus to the can spinning frame, thus eliminating also another intermediate processing step.

It is therefore the main object of the present invention a process for the production of yarns from continuous webs or strips of synthetic resinous material orientated in a longitudinal direction cut or slit into a plurality of adjacent strands, the adjacent strands being integrally joined together at spaced intervals along the length thereof, comprising the steps of continuously feeding said continuous slit web to the drafting unit of a can spinning spindle; continuously drawing said continuous slit web into said drafting unit so as to transform it into a discontinuous fibrillated sliver; continuously transforming the said fibrillated sliver into a yarn, by subjecting it to a twisting operation in said spinning spindle, and continuously depositing the thus formed twisted yarn of fibrillated synthetic resinous material into a bobbin in the can of the can spinning spindle.

Advantageously, the said continuous slit web is subjected in said drafting unit to a draw ratio comprised between 1:1,4 to 1:5, the said web being unsupported during the said drawing operation in the drafting unit.

BRIEF DESCRIPTION OF THE DRAWING

The present invention will now be further described with reference to the accompanying drawing, illustrating by way of example a longitudinal section through a centrifugal can spinning spindle and cooperating drafting unit, which may be used for performing the process according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

With reference to the drawing, numeral **1** generally denotes a centrifugal can spinning spindle, and for instance a spindle of the kind disclosed in my U.S. Pat. application Ser. No. 140,049 filed May 4, 1971, now U.S. Pat. No. 3,722,199, to which is made reference for a more complete description of the spindle end of its mode of operation.

The said can spinning spindle generally comprises a bell-shaped can **2**, a distributing tubular thread guide **3** and a pre-twisting tubular guide **4**. These three basic members of the spindle are mounted in one single upright supporting bushing, which is denoted as a whole by **5**, and is in its turn mounted in a pendulum like antivibrating manner onto the spindle rail **6** of the spinning machine.

The bell shaped can **2** is provided with a pulley **7**, fixedly secured at its neck, in which is engaged a belt **8** for rotationally driving the said bell-shaped can **2**.

The thread guide **3** is reciprocated in an upward and downward motion by means of a movable bench **9**, which is caused vertically to slide in the spinning machine frame by suitable guide means.

The pre-twisting thread guide **4**, which is arranged co-axially to the distributing thread guide **3**, between this latter and the overlying drafting unit **10**, is rotatably suspended by means of a ball bearing **11** from the upper end of the supporting bushing **5**, but is not allowed to slide axially. The lower end of the pre-twisting thread guide **4** is slidably telescoped in the distributing thread guide **3**. At the upper end of the pre-twisting thread guide and upon the supporting bushing **11** there is fitted a pulley **12** for rotatably driving the said thread guide **4**, through belt **13**.

The drafting unit **10** comprises a pair of feed roller **14**, and a pair of drawing rollers **15**, the drawing rollers **15** being driven at a peripheral speed which is greater than the peripheral speed of the feed rollers **14**.

16 is a funnel-shaped guide member, disposed in the path between the feed rollers **14** and the drawing rollers **15**.

OPERATION OF THE DESCRIBED APPARATUS FOR PERFORMING THE PROCESS ACCORDING TO THE INVENTION

The continuous slit strip **17** of orientated synthetic plastic material is fed to the spinning machine for instance from a suitable reel (not shown), or directly from the slitting machine (not shown). The said continuous strip **17** enters the drafting unit **10** of the spinning

spindle from between the feed roller pair **14**, and is subjected in the drafting unit **10** to a suitable tensioning by virtue of the different peripheral speed between the feed rollers **14** and the drawing rollers **15**. The draw ratio may for instance be of 1:1,4, although other ratios may be employed.

The strip **17** of slit orientated synthetic plastic material is transformed by effect of the tension applied to it in the drafting unit **10** into a discontinuous fibrillated multifilament sliver **18**, which is continuously fed to the pre-twisting tubular guide **4**, and then through the distributing thread guide **3** and penetrates into the underlying bell-shaped can **2**. Owing to the rotation of the bell-shaped can **2**, the sliver **18** is twisted and is thus made into a yarn **19**, which is deposited by centrifugal force onto the inner wall of said can **2**, and forms, owing to the upwardly and downwardly reciprocation motion of the distributing thread guide **3** a bobbin **20** in the inside of the bell-shaped can **2**.

By present presen process the disadvantages of the previous art are avoided, since the orientated slit strip **17** is transformed directly in the drafting units of a can spinning frame into a fibrillated sliver, which is soon thereafter continuously transformed into a yarn by the can spinning spindles of the spinning frame.

In this manner any intermediate handling of the sliver is eliminated.

It will be noted that the strip **17** in the drafting unit is not supported by the usual movable supporting means, and this in order to facilitate the conversion of said strip into a uniform fibrillated sliver.

To this end, the fixed funnel shaped guide **16** was provided around the sliver **18** in the drafting unit. The said guide may however be omitted, and the sliver may be guided by air jets or by the same air flow which is created by the rotating spinning spindle.

Having thus fully described my invention, what I claim is:

1. A process for the production of yarns from continuous webs or strips of synthetic resinous material orientated in a longitudinal direction cut or slit into a plurality of adjacent strands, the adjacent strands being integrally joined together at spaced intervals along the length thereof, comprising the steps of

a. continuously feeding said continuous slit web to the drafting unit of a can spinning frame;

b. continuously drawing said continuous slit web into said drafting unit so as to transform same into a discontinuous fibrillated sliver;

c. continuously transforming the fibrillated sliver from said drafting unit into a yarn, by subjecting it to a twisting operation in the spinning spindle of said can spinning frame;

d. and continuously depositing said twisted yarn of fibrillated synthetic resinous material into a bobbin in the can of said can spinning spindle.

2. The process according to claim **1**, in which the said continuous slit web is subjected into said drafting unit to a draw ratio comprised between 1:1,4 to 1:5.

3. The process according to claim **1**, in which the said continuous slit web is freely supported into said drafting unit.

4. The process according to claim **1**, in which the said web is subjected to the action of supporting air jets during its passage through said drafting unit.

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