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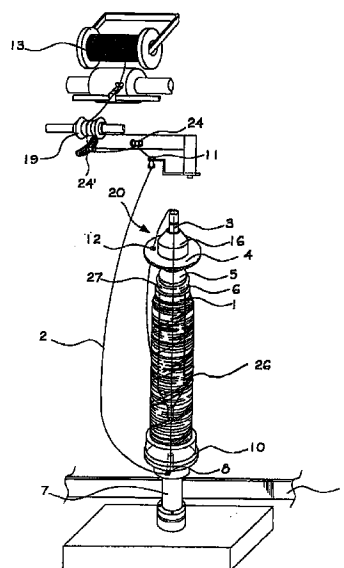
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(54) **A non-contact doubling and twisting apparatus in a double twister for a filament**

(57) In a double twister, wherein doubled yarn which gets unwound from a bobbin is input into a top guide (3), is twisted passing through a tenser (5) having a hollow and a yarn guiding pipe (26), passes through an eyelet (8) and is wound on a cylinder (13), a non-contact doubling and twisting apparatus characterized by further comprising a yarn guide (20) having a fly disc (4) which is located between a top guide (3) and a tenser (5), mounted to be rotated freely and has a disc hole (12) through which doubled yarn can pass, wherein doubled yarn which gets unwound from a bobbin, pass through the disc hole (12), is input into a top guide (3), is twisted passing through a tenser (5) having a hollow and a yarn guiding pipe (26), passes through an eyelet (8) and is wound on a cylinder (13).

FIG. 1



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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] This invention relates a non-contact doubling and twisting apparatus, with which both the twisted yarn and the filament yarn or the spun yarn can be doubled and twisted by using a fly disc of a two for one twister for a filament, and, more particularly, a non-contact doubling and twisting apparatus, wherein as yarn is input into a top guide by the disc hole of a fly disc since a yarn guide is newly mounted between a tenser and a top guide placed on the top of a spindle by converting the yarn guide of the two for one twister and it is designed to pass through a slot of a hollow, a yarn-twisting zone, at a non-contact state, a non-contact doubling and twisting apparatus can perform high speed doubling and twisting operations as well as it can take an advantage of a covering effect.

Discussion of Related Art

[0002] In a conventional double twister, doubled yarn which gets unwound from a bobbin is input into a top guide 3, is twisted passing through a tenser 5 having a hollow and a yarn guiding pipe 26, passes through an eyelet 8 and is wound on a cylinder 13,

[0003] In the case of a conventional two for one twister, since the yarn, which is wound on the bobbin, is input into the top guide 3 directly, at the time of unwinding operation, the yarn contacts with the top winding layer of the bobbin and contact resistance occurs since it contacts with an edge of the tenser disc 6 before it is input to the top guide 3. Also, at the time of high speed rotation, since the contact resistance is increased, the unwinding characteristics is decreased and, as is often the case, the supplied yarn is sometimes cut.

[0004] This invention is intended to increase the efficiency of doubling and twisting operation by guiding yarn into a yarn-twisting zone at a non-contact state as well as to improve unwinding characteristic at the time when the doubled yarn which is combined with more than two kinds of yarn gets unwound from a bobbin in the two for one twister for a filament.

[0005] Compared with the conventional method, this invention has much improved productivity and much simplified operation and can reduce production cost. Also, as this invention can result in a covering effect relatively easily by endowing doubled yarn made of more than two kinds of yarns with many twisting operations, it is intended to provide a covering yarn.

SUMMARY OF THE INVENTION

[0006] Accordingly, in order to overcome such drawbacks in the conventional art, it is therefore an object of

the present invention to provide a non-contact doubling and twisting apparatus which can result in very good efficiency for the doubling and twisting operation by guiding the yarn into a yarn-twisting zone at the non-contact state.

[0007] It is another object to provide a non-contact doubling and twisting apparatus which can result in a very good unwinding characteristic at the time when the doubled yarn which is combined with more than two kinds of yarn gets unwound from a bobbin in the two for one twister for a filament.

[0008] It is still another object to provide a non-contact doubling and twisting apparatus which can result in good productivity, comparing with the conventional and disclosed doubling and twisting method.

[0009] It is yet still another object to provide a non-contact doubling and twisting apparatus which can reduce the production cost because of more simplified process than the conventional method.

[0010] It is a further object to provide a covering yarn as it can get a covering effect relatively easily by endowing a doubled yarn made of more than two kinds of yarn with many twisting operations.

[0011] To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described, in a conventional double twister, wherein doubled yarn which gets unwound from a bobbin is input into a top guide 3, is twisted passing through a tenser 5 having a hollow and a yarn guiding pipe 26, wherein the tenser 5 is screwed to be combined to the yarn guiding pipe 26, passes through an eyelet 8 and is wound on a cylinder 13, a non-contact doubling and twisting apparatus is provided, which is characterized by further comprising a yarn guide 20 having a fly disc 4 which is located between a top guide 3 and a tenser 5, mounted to be rotated freely and has a disc hole 12 through which doubled yarn can pass. In the said non-contact doubling and twisting apparatus of the present invention, doubled yarn which gets unwound from a bobbin, passes through the disc hole 12, is input into a top guide 3, is twisted passing through a tenser 5 having a hollow and a yarn guiding pipe 26, wherein the tenser 5 is screwed to be combined to the yarn guiding pipe 26, passes through an eyelet 8 and is wound on a cylinder 13.

[0012] According to another aspect of the present invention, there is also provided a non-contact doubling and twisting apparatus in a double twister according to claim 1, wherein yarn guide 20 is integrally formed with a top guide holder 16 having a through hole, a cover 17 for fixing the top guide holder and a fly disc 4 having a disc hole 12, and wherein a ball bearing 15 is mounted in the inner circumferential surface of a cover 17, and a fly disc shaft 14 having a through hole which is connected with the through hole of the top guide holder 16, is inserted into the said ball bearing 15, so that the inner circumferential surface of the said ball bearing 15 gets in contact with the outer circumferential surface of a fly

disc shaft 14.

[0013] According to another aspect of the present invention, there is also provided a non-contact doubling and twisting apparatus in a double twister according to claim 1, wherein a disc hole 12 is rotated circumferentially having the same diameter as or longer diameter than the maximum diameter of a yarn winding layer wound on a bobbin 1 or the diameter of a tensor disc 6.

BRIEF DESCRIPTION OF THE ATTACHED DRAWINGS

[0014] A more complete appreciation of the invention, and many of the attendant advantages thereof, will be readily apparent as the same becomes better understood by reference to the following detailed description when considered in conjunction with the accompanying drawings in which like reference symbols represent the same or similar components, wherein:

FIG. 1 is a flow diagram showing the entire configuration of this invention.

FIG. 2 is a cross-sectional exemplified view of a fly disc, which is used in the doubling and twisting apparatus of this invention.

FIG. 3 is a disassembled perspective view indicating the state of using the fly disc of this invention.

FIG. 4 is a longitudinal section showing the state of using the fly disc of this invention.

FIG. 5 is a longitudinal section showing a conventional yarn-twisting apparatus of a double twister.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0015] The detailed description of this invention is as follows;

[0016] FIG. 1 is a flow diagram showing the entire configuration of a two for one twister for a filament of this invention. The doubled yarn 2, which is made of more than two kinds of yarn and wound on a bobbin 1, passes through a disc hole 12 of a fly disc 4, is input into a ceramic top guide 3, and is twisted passing through a tensor 5 having a hollow and the yarn guiding pipe 26.

[0017] The yarn guide 20 is connected to the top of a tensor 5 by a fly disc shaft 14 which can be inserted to be connected to the tensor 5 screwed on the top of a yarn guiding pipe 26. Also, there is a disc hole 12, through which the supplying yarn 2 can pass, on a round shaped fly disc 4, which can be freely rotated. The supplying yarn 2 which is to be unwound from the bobbin can be easily unwound by the rotating force of the fly disc 4 and the unwound yarn can pass through the rotating disc hole 12 and be input into the top guide 3.

[0018] While the input yarn is passing through the yarn guiding pipe and the tensor 5 having a hollow, yarn is twisted and comes out of an eyelet 8. After that, the

yarn passes touching the circumference of the fly disc 4 and is wound smoothly by passing a snail wire 11.

[0019] In the meantime, the spindle 7 is rotated by a flat belt 9 to which a driving force of a motor (not shown in the drawing) is delivered.

[0020] In the drawings, the marks 24, 24' are guide rollers for winding the doubled yarn, the number 25 is a tension adjustment and the number 18 is a tensor holder

[0021] FIG. 2 through FIG. 4 show a yarn guide 20 which is used for the non-contact doubling and twisting apparatus in a double twister of this invention, wherein yarn guide 20 is integrally formed with a top guide holder 16 having a through hole, a cover 17 for fixing the top guide holder and a round-shaped fly disc 4 having a disc hole 12 through which the yarn can pass, and wherein a ball bearing 15 is mounted in the inner circumferential surface of a cover 17, and a fly disc shaft 14 having a through hole which is connected with the through hole of the top guide holder 16, is inserted into the said ball bearing 15, so that the inner circumferential surface of the said ball bearing 15 gets in contact with the outer circumferential surface of a fly disc shaft 14. Also the ceramic top guide 3 is inserted into a through hole of the top guide holder 16.

[0022] The disc hole 12 placed on the fly disc 4 is rotated circumferentially having the same diameter as or longer diameter than the maximum diameter of the winding layer wound on the bobbin 1 or the diameter of a tensor disc 6.

[0023] The following is the working operation and the effect of this invention configured as the above.

[0024] The doubled yarn 2 which is wound on the bobbin 1 is input into the top guide 3 after passing through a disc hole 12. At this time, the fly disc 4 is rotated continuously by the tension of the yarn 2 which is input into the top guide 3. With the disc hole, which is placed on the fly disc, being rotated circumferentially while maintaining the distance having a constant length, the yarn 2, which gets unwound from the bobbin 1, is not contacted with a tensor disc 6 and the yarn which is wound on the bobbin is unwound smoothly. Also, the ballooning tension between the eyelet 8 and the snail wire 11 is maintained equally and the outer circumference of the fly disc 4 smoothes yarn-guiding operation between the snail wire 11 and the eyelet 8.

[0025] In this invention, since the yarn is guided by the disc hole 12 which is rotated circumferentially having the same diameter as or longer diameter than the maximum diameter of yarn winding layer wound on the bobbin 1 or the diameter of a tensor disc 6, the supplied yarn is unwound easily from the bobbin by the rotation of the fly disc 4. Also, the unwound yarn is not contacted with the yarn winding layer or the tensor disc 6 and is input into the top guide 3, so that it prevents the supplying yarn from being cut and it can also increase the efficiency of doubling yarns.

[0026] Also, the fly disc 4 is rotated continuously by

the tension of the yarn input into the top guide 3 from the bobbin 1. The yarn input into the top guide 3 by the rotation of the disc hole 12 is twisted evenly by the rotation of the rotary disc 10 while passing the yarn guiding pipe 26, without an additional adjustment of yarn tension. In this case, if the doubled yarn comprising both rubber yarn and spun yarn such as cotton yarn or filament yarn is twisted to have many tangles in the yarn-twisting zone, it is possible to get a covering yarn since the rubber yarn is located in the center and the spun yarn or the polyester filament yarn is formed on the surface and twisted evenly.

[0027] As the above, the doubled yarn which is twisted in the yarn guiding pipe 26, is twisted evenly by the rotation of the rotary disc 10, comes out of the yarn guiding pipe 26 through the eyelet 8, and is wound in the conventional cylinder through the snail wire 11.

[0028] Ballooning occurs between the eyelet 8 and snail wire 11 and the quality of the doubled yarn is controlled according to the size of the ballooning. However, as for the yarn-twisting zone and this part, the detailed description will be omitted since they are the same as the zone of the conventional two for one twister.

[0029] However, in this invention, the size of ballooning is designed to be controlled at a user's discretion by controlling the position of the snail wire 11 up and down.

[0030] Also, this invention has an advantage in that even twisted yarn can be made without using an additional tension adjustment apparatus for yarn since doubled yarn, both threads of which have the same yarn tension is guided into the yarn-twisting zone.

[0031] According to this invention, at a conventional two for one twister, by installing a fly disc 4 which is rotated on the top of the tensor 5 and inputting the supplying yarn 2 into the top guide 3 by the disc hole 12 which is rotated circumferentially having the same diameter as or larger diameter than that of a tensor disc 6 or the maximum diameter of winding layer wound on the bobbin, it is possible to improve the unwinding characteristics of yarn and to prevent the supplying yarn from being cut. Also, with only simple conversion said above, it is possible to achieve high speed doubling and twisting operations as well as to manufacture the covering yarn easily.

[0032] It will be apparent to those skilled in the art that various modifications can be made in A NON-CONTACT DOUBLING AND TWISTING APPARATUS IN A DOUBLE TWISTER FOR A FILAMENT of the present invention, without departing from the spirit of the invention. Thus, it is intended that the present invention covers such modifications as well as variations thereof, within the scope of the appended claims and their equivalents.

Claims

1. In a double twister, wherein doubled yarn which gets unwound from a bobbin is input into a top

guide 3, is twisted passing through a tensor 5 having a hollow and a yarn guiding pipe 26, passes through an eyelet 8 and is wound on a cylinder 13,

a non-contact doubling and twisting apparatus characterized by further comprising a yarn guide 20 having a fly disc 4 which is located between a top guide 3 and a tensor 5, mounted to be rotated freely and has a disc hole 12 through which doubled yarn can pass, wherein doubled yarn which gets unwound from a bobbin, pass through the disc hole 12, is input into a top guide 3, is twisted passing through a tensor 5 having a hollow and a yarn guiding pipe 26, passes through an eyelet 8 and is wound on a cylinder 13.

2. The non-contact doubling and twisting apparatus in a double twister according to claim 1, wherein yarn guide 20 is integrally formed with a top guide holder 16 having a through hole, a cover 17 for fixing the top guide holder and a fly disc 4 having a disc hole 12, and wherein a ball bearing 15 is mounted in the inner circumferential surface of a cover 17, and a fly disc shaft 14 having a through hole which is connected with the through hole of the top guide holder 16, is inserted into the said ball bearing 15, so that the inner circumferential surface of the said ball bearing 15 gets in contact with the outer circumferential surface of a fly disc shaft 14.
3. The non-contact doubling and twisting apparatus in a double twister according to claim 1, wherein a disc hole 12 is rotated circumferentially having the same diameter as or longer diameter than the maximum diameter of yarn-winding layer wound on the bobbin 1 or the diameter of a tensor disc 6.

FIG. 1

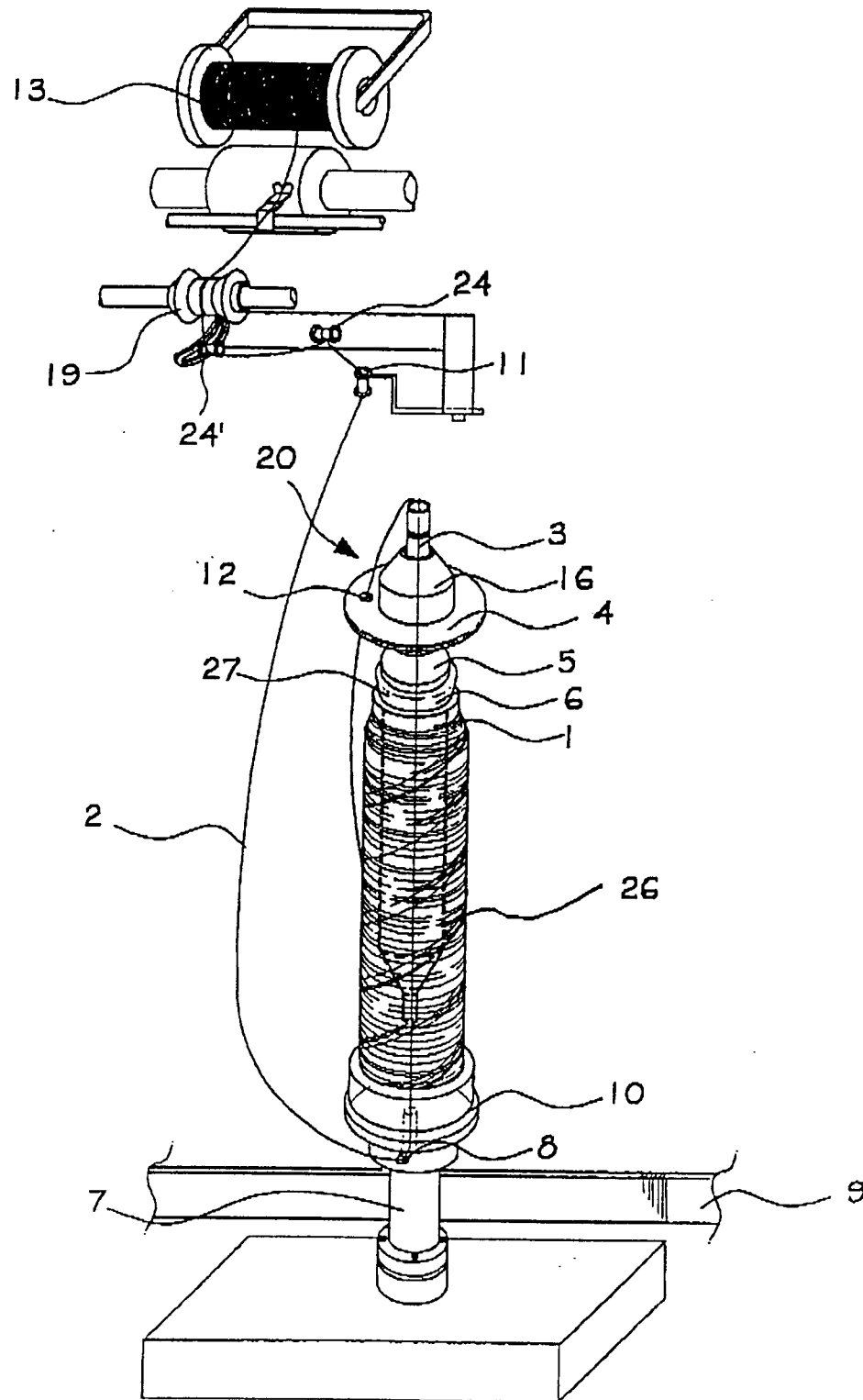


FIG. 2

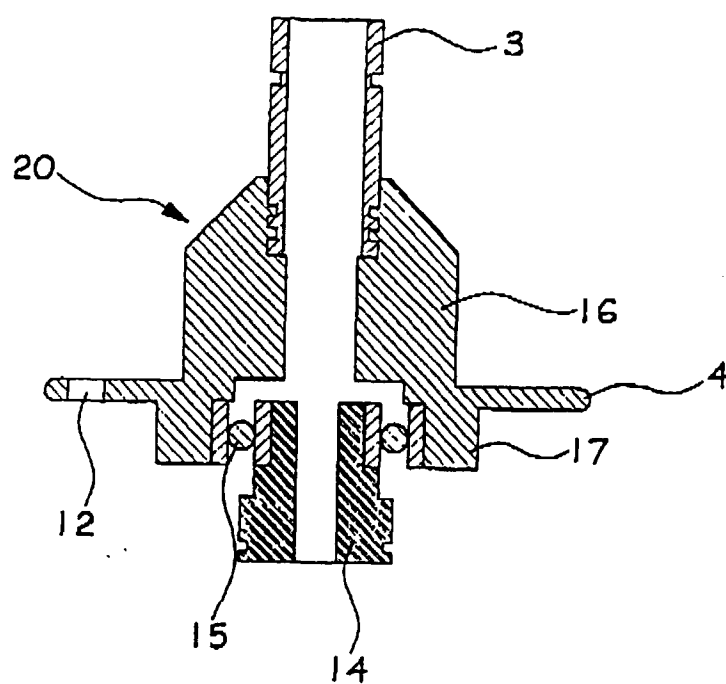


FIG. 3

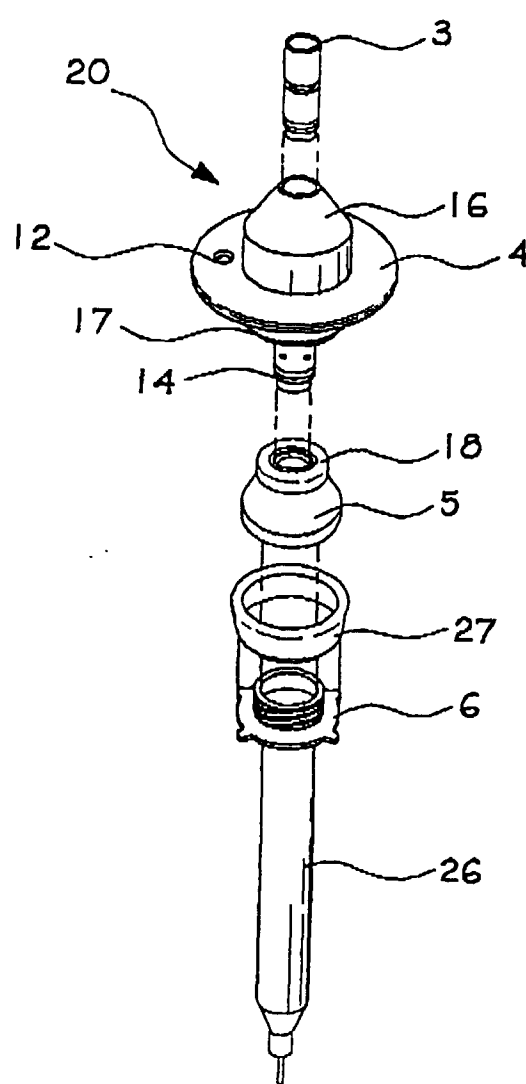


FIG. 4

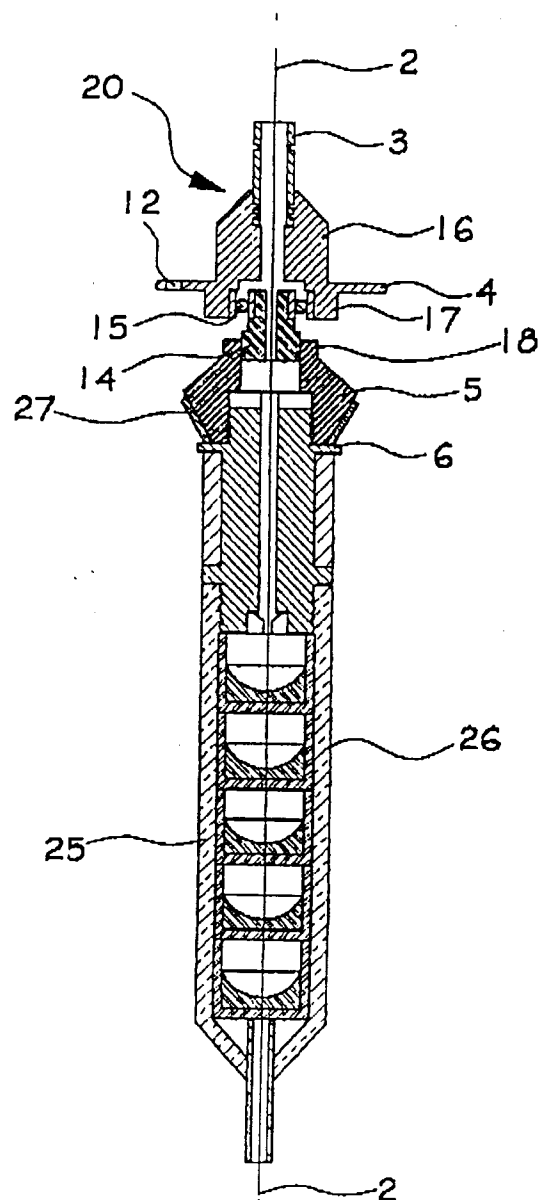


FIG. 5

