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(54) Process for making fancy thread using double-twist spindles

(57) In a process for making "fancy" threads (15) in a throwing machine by combining tie thread (3') that is twisted from double-twist and/or cabling spindle (12) having reserve (19), with one or more core (2') or finishing (1') threads paired in a situation of dummy twist, wherein using suitable feeders (22, 20) or other means, said core (2') or finishing (1') threads are introduced axially from below into this rotating spindle (12) and are then caused to exit from this spindle (12) in a direction perpendicular to their axis (K-K) and pulled parallel to this tie thread (3'), and the tie thread (3'), core (2'), and finishing (1') threads then are wound, pulling separately on the reserve (19), are twisted together, and are bound to form the fancy thread (15) after they detach from the surface of this reserve (19) to create the body of revolution around this axis (K-K), this "balloon", which is formed by enveloping the positions that are assumed by all these threads (1', 2', 3') when the travel--by rotating around this axis (K-K)--between the reserve (19) and the collecting nozzle (22) of the throwing machine.

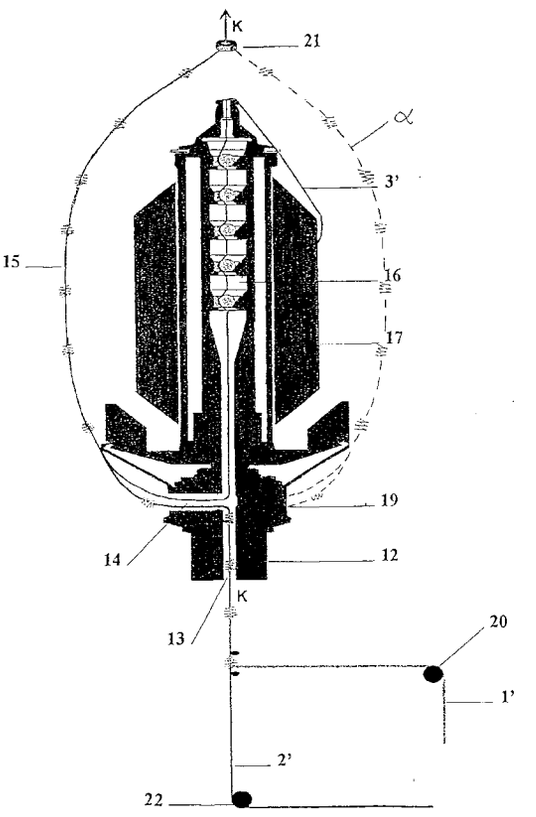

FIGURE 2

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Description

This invention relates to the field of the textile industry, in particular the sector relating to production of yarn using throwing machines.

A throwing machine, as is known to those skilled in the art, is a device which has a number of single-twist, double-twist and/or cabling spindles, each of which is usually connected coaxially to a bobbin on which a thread is wrapped that may or may not be paired, in the course of production, with other threads in order to create the desired finished product, of the "fancy" type or another type, which is then picked up by traction via a collecting nozzle.

In order to produce "fancy" thread--which is done by combining a number of different threads called core or finishing threads, that are introduced with different predetermined tensions, into a situation of dummy twist and combined into a thread called a tie thread--a spindle called a drilled spindle, that is, one having a hollow shaft, is used.

The inventor of this invention has conceived a process capable of making it possible to manufacture "fancy" thread using normal double-twist and/or cabling spindles in order to make a throwing machine more versatile and flexible, thus avoiding the need to replace spindles when switching from production of fancy yarns to yarns of another type and vice versa.

The object of the invention is a process for making "fancy" threads in a throwing machine by combining a tie thread that is effectively twisted from a rotating double-twist spindle having a reserve of one or more core or finishing threads paired in a situation of dummy twist, wherein using suitable feeders or other means, said core or finishing threads are introduced axially from below into this rotating spindle and are then caused to exit from this spindle in a direction perpendicular to their axis and are drawn parallel to said tie thread; the tie thread, core and finishing threads slide for a certain winding arc on the reserve, are twisted together, and are bound to form the fancy thread after they detach from the surface of this reserve to create the body of revolution around this axis, this "balloon", which is formed by enveloping the positions that are assumed by all these threads when they travel--by rotating around this axis--between the reserve and the collecting nozzle of the throwing machine.

The inventor also claims the use of traditional double-twist and/or cabling spindles for the production of "fancy" thread.

A more detailed description of the process that is the object of the invention will follow, with reference to the attached diagrams, where:

In Figure 1 shows a spindle with hollow shaft of known type being used to produce a yarn of the "fancy" type.

In Figure 2 shows a double-twist and/or cabling spindle used to make a "fancy" yarn as per the process according to the invention.

Figure 1 shows a fancy yarn being produced via spindle 6 with hollow shaft 10 that is inserted coaxially into a bobbin 7, from which tie thread 3 is pulled out; to said tie thread a twist is applied by the rotation of bobbin 7 with spindle 6. Via proper dummy twist equipment 11 that is integral with hollow shaft 10 of spindle 6, said tie thread 3 first leaves equipment 11 not twisted and parallel to one or more core threads 2 and/or finishing threads 1 (two in the figure) which are combined by this so-called dummy twist using methods known to those skilled in the art and is turned around threads 1 and 2 when it leaves equipment 11 in such a way as to block and bind the geometric configuration assumed by the threads following this dummy twist, yielding a yarn having the desired aesthetic quality and appearing to be an interlacement of a number of threads, all effectively twisted.

The numbers 18, 9 and 8 refer, respectively, to the feeder or other tensioner of core thread 2, the aperture for the introduction of finishing thread 1, and the feeder of said finishing thread 1.

By varying, for example, the feed rate of device 8 with respect to that of device 18, there results a superimposition of threads having different longitudinal shapes, but the same trajectory, thereby producing the desired aesthetic and/or chromatic effect of the finished product.

As mentioned above, unfortunately this type of spindle 6 is suitable for producing yarns only by the methods described above, but is obsolete for the production of other types of yarn, which are actually made using double twist and/or cabling spindles of known type, one of which 12 is shown in Fig. 2.

Spindle 12, which is equipped with device 19, which in technical jargbn is called the "reserve", is also applied coaxially to a bobbin 17.

Thread 3' that is unwound from bobbin 17, which does not turn with spindle 12, travels through an axial cavity 16 of the spindle, in which a first twist is imparted to it, and then leaves the spindle in a direction perpendicular to it via aperture 14, being wound and sliding along a winding arc around this reserve 19 before being pulled, while being kept rotating by spindle 12, properly shaped, towards the collecting nozzle 21 of the throwing machine (not shown). While travelling from reserve 19 to nozzle 21, another twist is applied to the thread, and this describes (while enveloping its successive positions) a body of revolution a that is also called a "balloon, " whose axis is axis K-K of spindle 12.

The inventor realized that with this type of spindle 12 it would be also possible to obtain a fancy yarn 15 if, by using thread 3' as a tie thread, one or more threads used as core threads 2' and/or finishing threads 1' were inserted axially into spindle 12, from the bottom to the top via cavity 13; the thread feed would be controlled as in the preceding case via appropriate feeders 20, 22 or other means (there could be an unlimited number of said

threads, ≥ 1). Then, while applying a succession of two effective twists to tie thread 3', one inside the spindle and one along the balloon, a dummy twist would be applied to finishing threads 2' and/or core threads 1', as described in the preceding case, causing them the exit from aperture 14 from which tie thread 3' can also exit; said tie thread will then be placed side by side with them (thread 3' can also exit from a different opening on reserve 19). After passing, being pulled separately, through part of reserve 19 under the action of the tension applied via collection nozzle 21, they separate for a brief stretch, beginning to bind to tie thread 3', and are then blocked and bound in their geometric position of dummy twist by tie thread 3' which, by describing with them said "balloon", is twisted onto them, just blocking them, owing to the action of the twists which thread 3' (which is already twisted once separately) assumes in a second twist.

It should be mentioned that the winding arc on reserve 19, in both cases described above, is not shown in the figures in order to avoid confusion; it can, however, obviously be imagined or deduced by one skilled in the art of design and interpretation executed up to this point.

The end result is thus, as the inventor wished, a fancy type yarn 15, which is similar in its characteristics to that which can be obtained with a spindle with a hollow shaft by using a common double twist and/or cabling spindle 12, which is also suitable for other types of working.

The embodiment described and depicted obviously does not exhaust all the possible variations that can be obtained by one skilled in the art by varying the shape, dimensions, and positioning of the individual components; there is also the possibility that the fancy threads could exit from 14 and the tie thread could exit from another hole on this spindle reserve. These other possible embodiments remain within the scope of the protection granted by this patent if they correspond to the content of the attached claims.

Claims

1. Process for making "fancy" threads (15) in a throwing machine by combining tie thread (3') that is effectively twisted from rotating double-twist spindle (12) having reserve (19) of one or more core (2') or finishing (1') threads that are paired in a situation of dummy twist, wherein using suitable feeders (22, 20) or other means, said core (2') or finishing (1') threads are introduced axially from below into this rotating spindle (12) and are then caused to exit from this spindle (12) in a direction perpendicular to their axis (K-K) and pulled parallel to this tie thread (3'), and the tie thread (3'), core (2') and finishing (1') threads then are wound, pulling separately on the reserve (19), are twisted together, and are bound to form the fancy thread (15) after they detach from the surface of this reserve (19) to create the body of revolution around this axis (K-K), this "balloon", formed by enveloping the positions that are assumed by all these threads (1', 2', 3') when they travel--by rotating around this axis (K-K)--between the reserve (19) and the collecting nozzle (2') [sic] of the throwing machine.

2. Use of a traditional double-twist and/or cabling spindle (12) having reserve (19) for the production of "fancy" thread (15) by combining a tie thread (3') that is effectively twisted and one or more threads that serve as core (2') or finishing (1') threads paired in a situation of dummy twist.

PRIOR ART

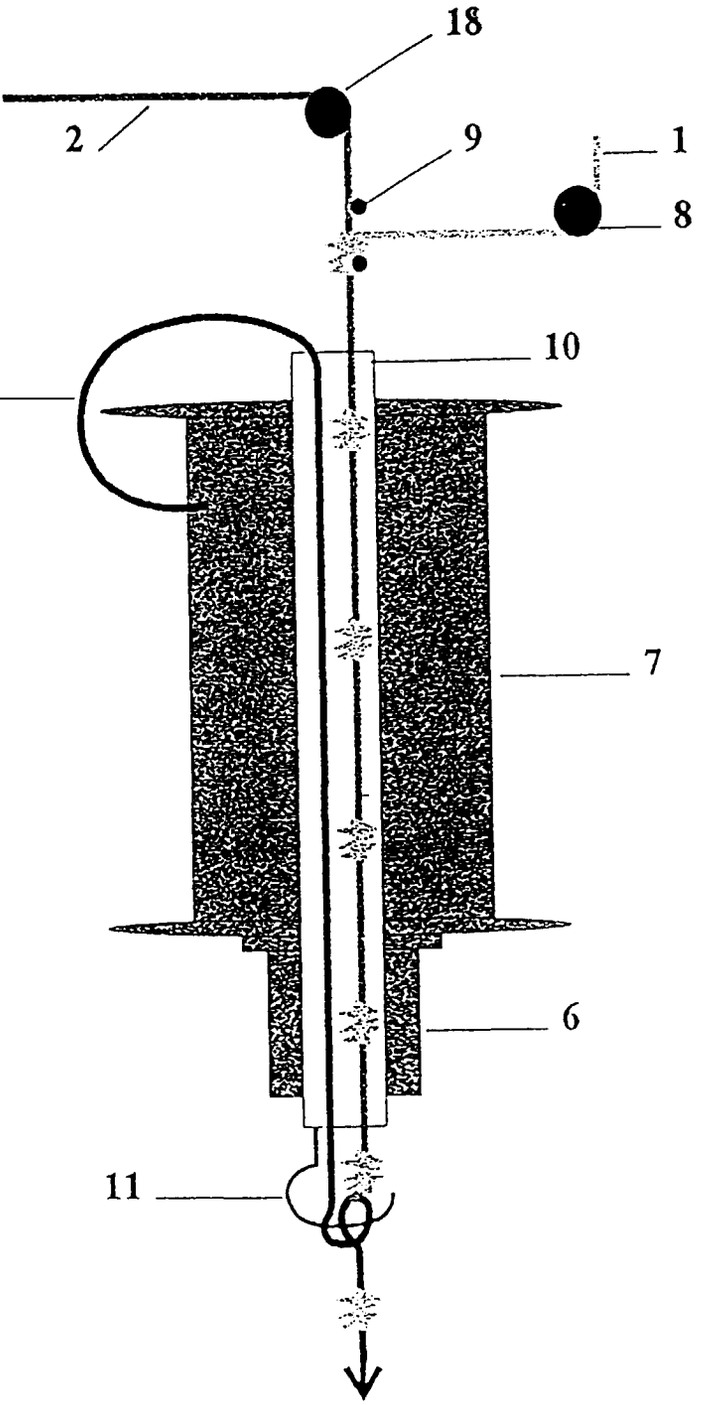

FIGURE 1

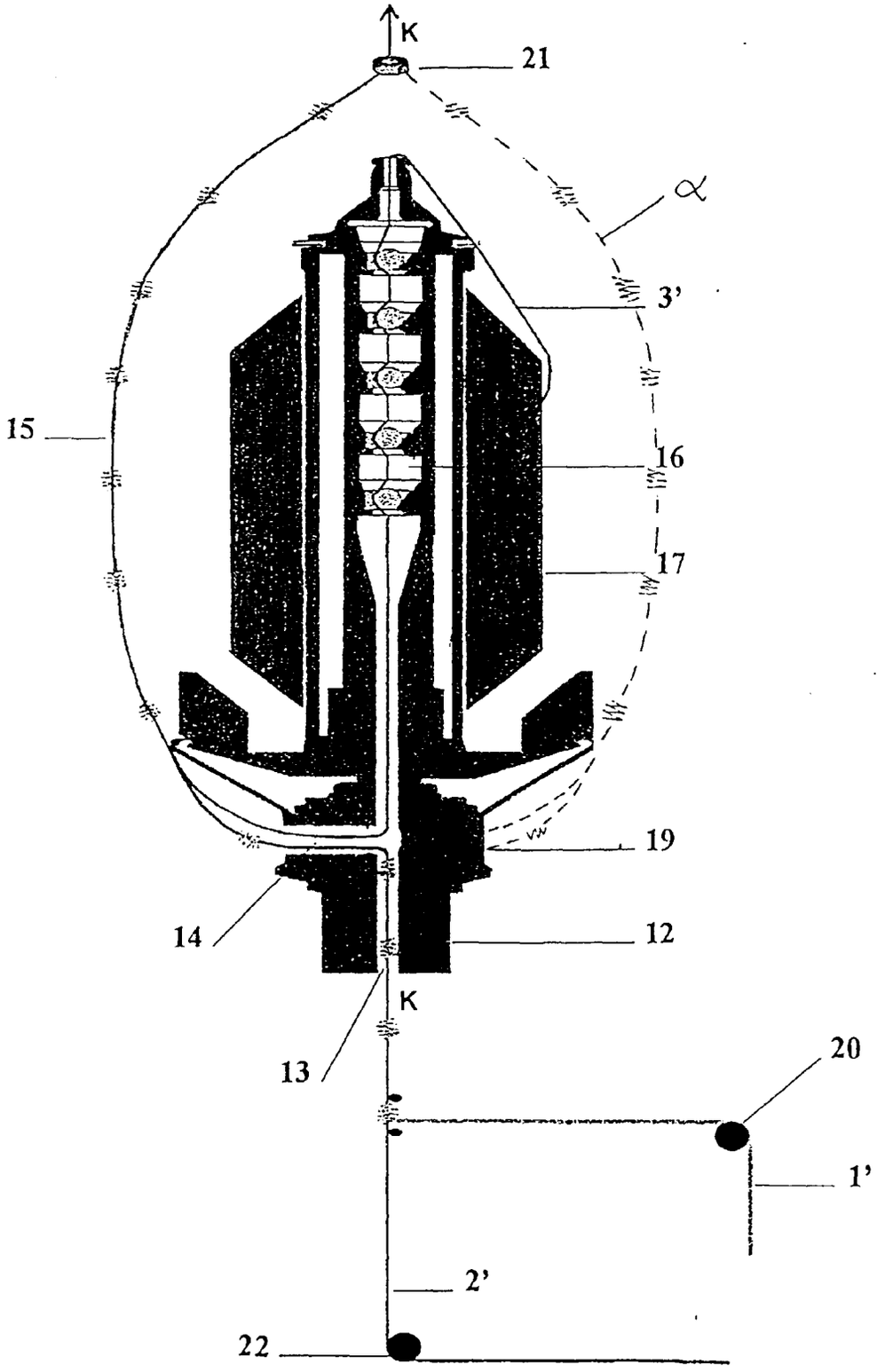

FIGURE 2

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EUROPEAN SEARCH REPORT

Application Number
EP 96 81 0577

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A X	US-A-4 157 645 (SOSTEGNI) * figure 1 * ---	1 2	D02G3/34
A	BE-A-760 543 (MOULINAGE ET RETORDERIE DE CHAVANOZ) * figure 1 * ---	1-5	
A	EP-A-0 008 918 (TEXTURED YARN CO. INC.) * figures * -----	1-5	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

D02G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	8 January 1997	Tamme, H-M

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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