



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 681 377 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
19.07.2006 Bulletin 2006/29

(51) Int Cl.:
D01H 1/241 (1974.07)

(21) Application number: **04791374.4**

(86) International application number:
PCT/ES2004/000455

(22) Date of filing: **20.10.2004**

(87) International publication number:
WO 2005/038101 (28.04.2005 Gazette 2005/17)

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PL PT RO SE SI SK TR**

(72) Inventor: **GALAN I LLONGUERAS, Jordi**
E-08228 Terrassa (ES)

(30) Priority: **20.10.2003 ES 200302441**

(74) Representative: **Urizar Anasagasti, José Antonio**
et al
Avenida de Europa 42, local bajo A
28224 Pozuelo de Alarcon (Madrid) (ES)

(71) Applicant: **Twisttechnology, S.L.**
08228 Terrassa (ES)

(54) **ONE-STEP JOINING, TWISTING AND WINDING MACHINE WITH EXTERNAL CONTROL OF TENSION AND WINDING MOVEMENT**

(57) The invention relates to a machine which performs yarn collecting-twisting and winding functions together, in order to obtain a marketable spool. The inventive machine is essentially characterised in that the ten-

sion and winding speed are controlled externally as a function of the volume defined by the twist balloon. All of the above is achieved using machines produced in accordance with the annexed claims.

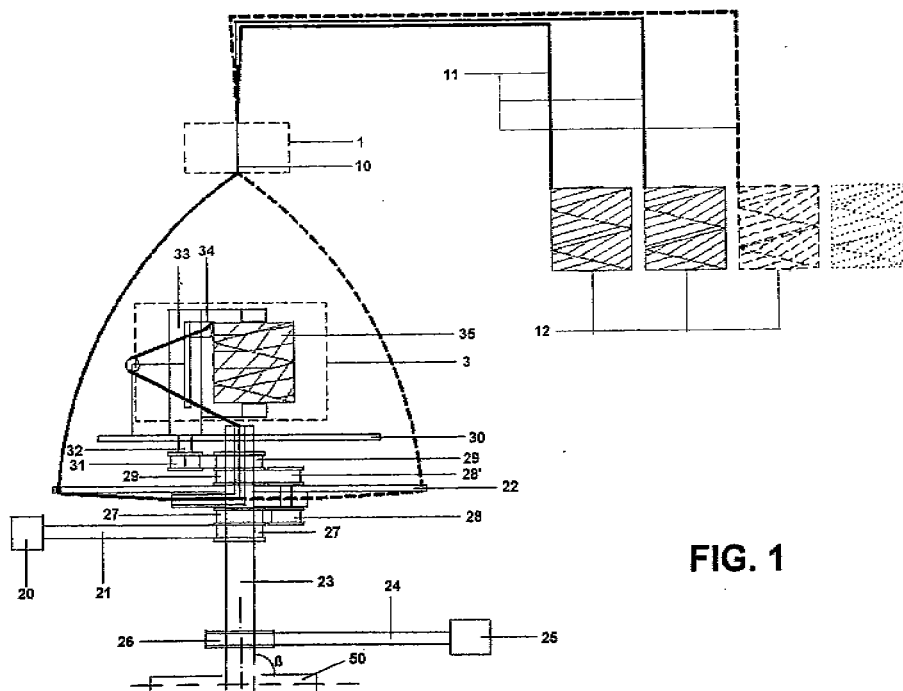


FIG. 1

EP 1 681 377 A1

Description

OBJECT OF THE INVENTION

[0001] The actual invention refers to a machine that can jointly effect the functions of binding, twisting and winding of yarns to obtain a marketable spool, with the basic characteristic of controlling the tension and winding movement speed from the outside to the volume delimited by the twisting spool ball. This is obtained through machines in accordance to the annexed claims.

BACKGROUND OF THE INVENTION

[0002] In the textile sector, the traditional machine that gives torsion to one or more yarns is the ring spooler. This is the most universal twisting machine that allows to join or collect one or several yarns and twist them. In other words, it effects the first steps in just one action, but it has one drawback in that subsequently, in most cases, the yarns have to be winded to obtain the commercial package.

[0003] Later, the double twisting frame (2x1) came out in the textile sector. This machine could double its speed when twisting, but with the inconvenience of having to join the yarns previously in other words, in having to obtain the yarns (with two or more ends) one had to join them together first and then place them inside the double twisting frame from then on producing at the same time the torsion stress (at double speed) and the winding.

[0004] Subsequently, double cordage-twisting frames that combined collecting, twisting and winding in a single process came out, but with two important drawbacks, the first being its high price and the second, since the control of the stress and the winding-speed is executed in the interior of the volume or mass that makes up the twisting ball, the joining-twisting-winding process had to be stopped if a parameter in the characteristics of the winding had to be changed. In these machines, the spooler is held up by two supports.

DESCRIPTION OF THE INVENTION

[0005] With the objective to eliminate the inconveniences exposed earlier, the collecting, twisting and winding machine of one or more yarns was developed, which includes: a first group of joint yarns carried out by means of a yarn guide, and any stress system of the same; a second group of twisting, composed of a wing or flank and a hollow spindle and a driving device (a perforated strap and motor e.g.) and a third winding section, the operation of which is the object of the actual invention and is based on the following: the yarn or yarn passes through the hollow spindle mentioned earlier entering the winding area, which is inside the specified mass or volume of the twisting spool. The winding area is controlled by an external motor device which transfers its movement inwards through a planetary system, be it pulleys/straps,

gears etc., and once the movement is obtained in the interior of the area of the yarn-twisting spool, the speed, the pairing and the stress of the winding can be controlled from the outside by means of the control of the said motor/driving device externally, and in conjunction with a diameter reading of the wind or reading of the linear speed of the wind. Finally, the wind or spool of any possible yarn or yarn can be managed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The characteristics, objectives, and advantages of the actual invention will be more evident starting from the detailed description that is displayed later on when it is taken in conjunction with the drawings wherein the reference characters correspond to the same parts in all of them and where:

Fig.1 schematically shows the essential parts and the working of the first preferred execution

Fig.2 is a perspective of the planetary system used in the machine of the actual invention

Fig.3 schematically shows the essential components and the working or function of the second preferred embodiment

PREFERRED EMBODIMENT OF THE INVENTION

[0007] In a first preferred embodiment, and referring to Fig.1, we can distinguish in the machine three different functional groups: included in the first group 1 are the mechanisms of collection or piling and stress or stretching; in the second group are the mechanisms of twisting of the yarns or yarns and also the mechanism that make the outside control of winding possible which is executed in the third group 3.

[0008] The first group 1 includes a yarn guide 10 that joins one or more ends 11 coming from the winders/spools 12, not included in the machine, and the yarn stress system which is not described in detail since it is well recognized in this art, like for example through photo-electric cells that detect the strain/stress of the yarn and modifies the speed of the winder/spool or, the twisting section with the objective of managing the stress of the spool and wind, or by a mechanical plate clutch or electromechanic that slides by with an excessive stress or tension of the yarn, or by any other recognized means in the market (plate/dish tensor or pulley).

[0009] The second group has the torsion mechanism that include the twisting wing 22 which through its supporting spin with the hallow spindle 23 provides the twist of the ends 11 gathered/collected earlier. The spin or turning of the hallow spindle 23 is produced by motor 25 together with the perforated strap 24 and the supportive pulley with axle 26. Once the ends are twisted, they pass through the interior of the hallow spindle 23 to the third group 3 of the winding.

[0010] The problem is posed in how to get the control-

led movement of the winding devices situated in the third group 3 from the exterior of the limited volume or mass of the yarn guide 10, the spool/ball that shapes the yarn as a result of its twisting and the plane on which the twisting wing 22 is turned. In the solution that is given to this problem lies the essence of the actual invention. Fig.2 we can observe with greater detail the planetary system that obtains this objective. The movement of a motor 20 is transmitted through a strap or gears 21 to the external pulleys 27 not supported with the spindle by means of turning or spooling which are supported between themselves. The movement of the external pulleys 27 is transmitted to the satellite or secondary pulley 28 and therefore, to the secondary pulley 28' supported jointly by a common secondary axle. The movement of the secondary pulley 28' produces the movement of the internal pulleys 29 not supported with the spindle by means of spooling which are supported between themselves, and so we have a controlled turning movement from the outside through the control of motor 20 of the conventional group of winding situated in the interior of the earlier mentioned volume.

[0011] The third group 3 produces the final part of the process which consists in the winding of the ends that were already twisted and that have been entered through the hollow spindle 23 and that has the turning of the internal pulley 29 as a motor driving device. This third group 3 is fundamentally made up of the swinging device 30 which is static with a certain angle of freedom and supports all the weight of the wound up group statically, a pulley 31 of the main axle 32 that gets the movement of the internal pulley 29 through a strap, a winding box or compartment 33, a winding needle 34 and wind/spool 35, which we will avoid to explain in detail since its functions are sufficiently known in the art.

[0012] As can be observed in fig.1 for the first preferred embodiment, the swing 30 only has one supportive point in the spindle 23 and the weight of the winder is sustained over the hollow spindle 23. Angle p that forms the axle of the hollow spindle and the firm base can vary depending on the type, weight and size of the wind to integrate inside the ball/spool area.

[0013] In the necessary cases, like when angle p is 0° or for big winds or spools, a double support can be available to give greater lift or support for the wound-up group as you can see in a second preferred execution.

[0014] In a second preferred execution, illustrated in Fig.3, described in the following, what is common in the first preferred execution is not explained in detail, neither are the numbers of corresponding reference included, focusing this description in the differences.

[0015] In the second preferred execution of Fig.3, the swing-board 30, which in this case has a U shape is supported at two points located in the hollow spindles 23 and 23', the yarn once collected and tightened goes through a hollow spindle 23' and undergoes a first twisting through the spade 22' and continues its path to undergo a second twisting and winding identical to the one developed in the

first preferred execution. Its important to note that the movement of the torsion or twisting of the flanks 22' jointly takes place with the twisted wing 22 through the mechanism formed by motor 25 that acts on pulley 43 which is joined with axle 40 and at the same time moves pulleys 41 and 42 which also turn pulleys 26 and 26' by means of straps 24 and 24' therefore to spindles 23 and 23' which in turn wings 22 and 22' are joined supportively to.

[0016] The previous description of the preferred executions is given to allow any expert in the art do or use the actual invention. Several modifications on these executions could be easily done by one who is an expert in the art, and the generic principles defined here are applicable to other executions not having to worry about the actual inventions non-ability to perform them, as determined in the following claims.

[0017] Similarly, and for equivalent principles, the detailed transmissions in the preferred executions could also be produced substituting the pulleys and straps with gears or chain transmission, or a combination of these, hence, are included in the object of the invention.

Claims

1. A One Step Collecting Twisting and Winding Machine with outside control of resistance and winding movement, of the type that incorporates a first collecting group(1), a second group of torsion mechanisms which includes a twisting wing (22) or two twisting wings (22, 22'), and of a winding group (3), **characterized by** the control of stress and speed of the winding is obtained from the outside of the volume limited by the yarn guide (11), the spool, and the twisting wing (22) or the two twisting wings (22, 22').
2. A One Step Collecting Twisting and Winding Machine with external control of stress and winding movement in accordance with claim 1, **characterized by** the necessary movement for the control of the winding is obtained from a motor (20) which transmits the movement to said third group (3) of winding through gears, chain transmission or combination of gears and chain transmission, or through a planetary system, which is composed of external pulleys (27) driven by a strap (21) that moves the said motor (20), said pulleys (27) not being shared in common movement with a hollow spindle (23) but being mutually shared in common movement, and said pulleys (27) transferring the movement to a satellite pulley (28) and therefore, to a satellite pulley (28'), because said satellite pulleys (28, 28') are shared in common movement with a common satellite axle, the movement of the satellite pulley (28) being transferred to internal pulleys (29) not shared in common movement with said hollow spindle (23) but being mutually

shared in common movement, thereby obtaining a rotary movement controlled from the outside by the motor control (20) inside of said volume limited by the yarn guides (11), the spool, and the twisting wing (22) or the twisting wing (22, 22'), in which volume said third group (3) of conventional winding is found.

10

15

20

25

30

35

40

45

50

55

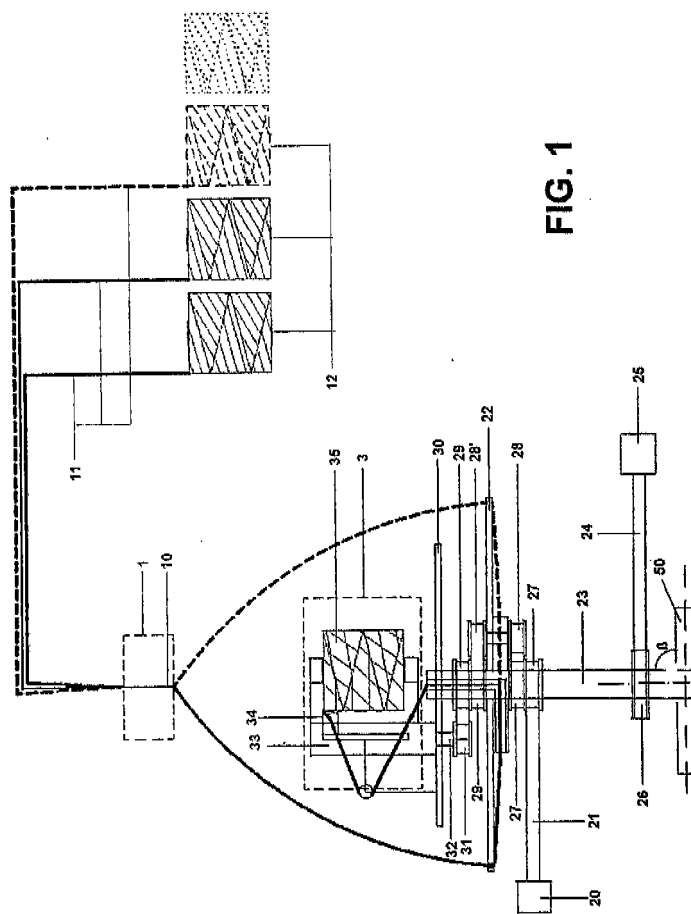


FIG. 1

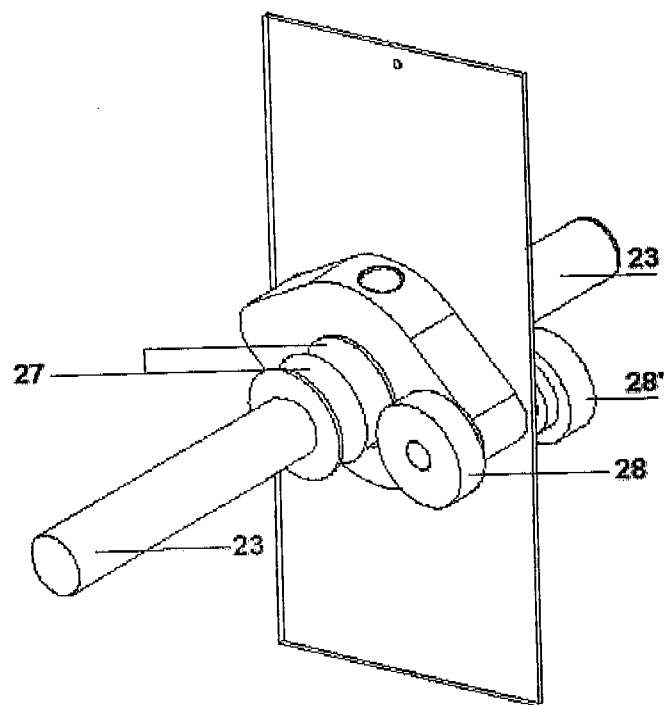


FIG. 2

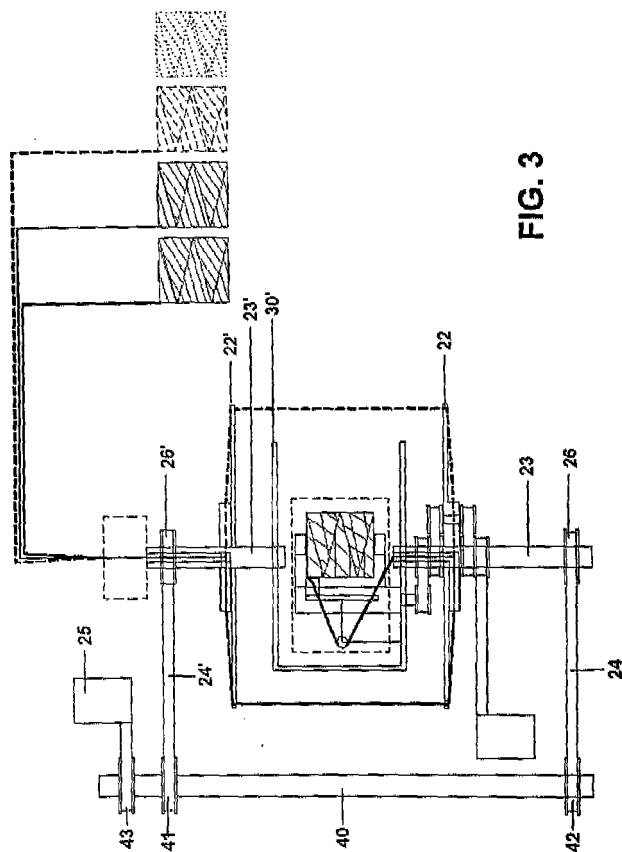


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2004/000455

A. CLASSIFICATION OF SUBJECT MATTER		
IPC 7 D01H 1/241		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC 7 D01H+, D07B+, B65H+		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
CIBEPAT, EPODOC, WPI, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 948845 A (JAMES MACKIE & SONS LIMITED) 05.02.1964, page 1, lines 37-39, page 2, lines 83-106, page 3, lines 6-32, figure 1	1, 2
A	FR 2461058 A1 (GODDERIDGE JEAN) 30.01.1981, page 1, lines 23-26: figure 1	1, 2
A	GB 1229551 A (FELTEN & GUILLEAUME CARLSWERK AKTIENGESELLSCHAFT) 28.04.1971, page 2, lines 99-118; figure 1	1, 2
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
25 JAN 2005 (25.01.05)		31 JAN 2005 (31.01.05)
Name and mailing address of the ISA/ S.P.T.O.		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/ ES 2004/000455

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 948845 A	05.02.1964	FR 1327510 A GB 948847 A	17.05.1963 05.02.1964
FR2461058 A 1	30.01.1981	NINGUNO	-----
GB 1229551 A	28.04.1971	DE 1983081 U FR 1595896 A	11.04.1968 15.06.1970

Form PCT/ISA/210 (patent family annex) (July 1992)