(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 216 948 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
26.06.2002 Bulletin 2002/26

(51) Int Cl.[7]: **B65H 54/00**, D01G 15/62, B65H 54/02

(21) Application number: **00830833.0**

(22) Date of filing: **19.12.2000**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(71) Applicants:
- **Bartoletti, Carlo**
  59013 Montemurlo (PO) (IT)
- **Bartoletti, Matteo**
  59013 Montemurlo (PO) (IT)
- **Benedetti, Daniele**
  59100 Prato (PO) (IT)
- **Capocchi, Claudio**
  59013 Montemurlo (PO) (IT)

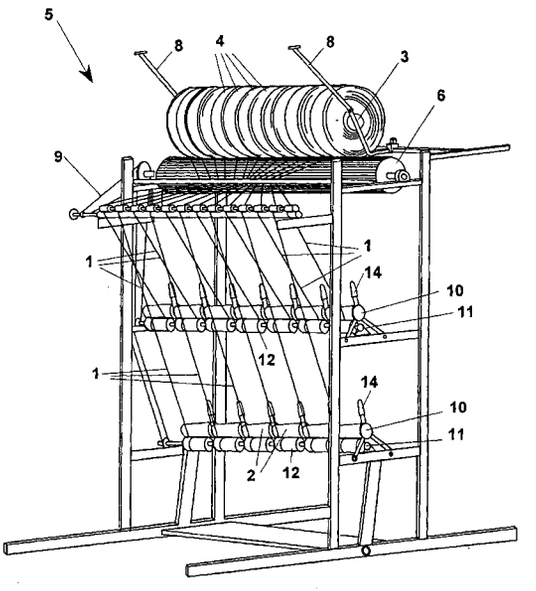
(72) Inventors:
- **Bartoletti, Carlo**
  59013 Montemurlo PO (IT)
- **Benedetti, Daniele**
  59100 Prato PO (IT)

(74) Representative: **Celestino, Marco**
ABM, Agenzia Brevetti & Marchi,
Viale Giovanni Pisano, 31
56123 Pisa (IT)

(54) Method and apparatus for preparing a roving for further textile working

(57) The method for preparing a rove (1) with untwisted fiber for further textile working, in particular knitting or weaving, provides winding the rove (1) with untwisted fiber directly on a cone (2). The steps are provided of: arranging a beam (3) having a plurality of hanks (4) of rove (1) on a tangentially dragging roller (6) that rotates at a predetermined speed; arranging a plurality of cones (2), in a same number as the hanks (4), on idle supports (10) and arranging an end of rove (1) on each cone (2); tangentially dragging (11,12) the cones (2) on the idle supports (10), for cross winding the rove (1) on them, at a speed substantially the same as the dragging speed of the beam (3), whereby each rove (1) proceeds from the beam (3) to the respective cone (2) without being stretched. The rove (2) can be easily drawn directly form a cone (2) for further textile working, for example knitting or weaving, treating, sewing, etc.

Fig. 3



EP 1 216 948 A1

Description

Field of the invention

[0001] The present invention relates to the field of textiles and more precisely it relates to a method for preparing a rove with untwisted fiber for further textile working, in particular knitting or weaving.

[0002] Furthermore the invention relates to an apparatus that carries out this method.

Background of the invention

[0003] Many types of yarns are known used in textile applications. Such yarns are featured by a certain resistance to stretching actions, since the fibres are tied to one another by twisting as a direct step of the spinning process.

[0004] Yarns are often supplied wound on cones, that are prepared on spooling machines pr directly on spinning, for example of the type "Ring Frame" or "Self Acting". For certain types of yarn, in such spinning machines the yarn is supplied from beam on which are wound parallel annular coils or hanks of carded rove, obtained from carding.

[0005] The cones have the function to allow an easy supply of yarn to the thread guides of textile machines, in particular knitting machines.

[0006] For some types of knitting or weaving instead of a yarn a rove is used directly as comes out from carding. More precisely, the hanks are extracted one at a time from the beams and from each of them the rove is gently pulled.

[0007] However, this step is subject to break of the rove, since the fibers of the latter are not twisted, and that stops knitting or weaving. In fact, the hanks coming from the beam do not have a conical shape, for an ease supply of the rove pulling it from the above, and are only suitable for being unwound with a contemporaneous rotation about their own axis. Furthermore unwinding has to be very slow, since the rove does not allow stretching, unless in a controlled way.

[0008] The machines for handling an already spinned yarn, furthermore, are not are suitable to handle directly a rove since they all work with a certain stretching action on the yarn, which the rove cannot support.

[0009] Such a rove can be made by carding a desired-textile fiber, for example natural fibers such as wool, cotton, as well as sinthetic fiber such as viscose, etc.

Summary of the invention

[0010] It is therefore an object of the present invention to provide a method for preparing a rove with untwisted fiber for further textile working, so that it can be drawn directly during a further textile working, for example knitting or weaving, treating, sewing, etc.

[0011] It is another object of the present invention to provide an apparatus that carries out this method.

[0012] According to a first aspect of the present invention a method for preparing a rove with untwisted fiber for a further textile working provides the step of winding the rove with untwisted fiber directly on a cone.

[0013] Advantageously, the cone has conical shape in order to allow drawing the rove with untwisted fiber from the above.

[0014] The step of winding the rove with untwisted fiber on cones according to the invention, comprises, preferably, the steps of:

- arranging on a tangential dragging roller a beam having on it a plurality of hanks of rove, the dragging roller rotating at a predetermined dragging speed ;
- arranging a plurality of cones, in a number corresponding to the hanks, on idle supports and arranging an end of rove on each cone;
- tangentially dragging said cones on said idle supports for winding said rove thereon, the speed of tangentially dragging the cones being substantially the same as the dragging speed of the roller on the beam, whereby each rove proceeds from said beam to the respective cone substantially without being stretched.

[0015] Alternatively, always according to the invention, at the carding exit where a plurality of roves are fed at a predetermined speed, the steps are provided of:

- arranging a plurality of cones on idle supports, in a same number as the roves, and arranging an end of rove on each cone (2);
- tangentially dragging said cones for cross winding said rove on it, the speed of tangentially dragging the cones being substantially the same as the speed of the roves, whereby each rove proceeds from said carding exit to the respective cone substantially without being stretched.

[0016] According to a further aspect of the invention, an apparatus for preparing a rove with untwisted fiber for further textile working comprises:

- a support for at least a beam having a plurality of hanks of rove;
- means for rotation of the beam at a predetermined dragging speed ;
- a plurality of cones, in a same number as the hanks, mounted on at least an idle support;
- at least a shaft having cylinders for tangentially dragging said cones;
- means for controlling the speed of said at least a tangential dragging shaft , whereby the speed of tangentially dragging the cones is substantially the same as the dragging speed of the roller on the beam.

[0017] Alternatively, the cones with the relative dragging shaft can be arranged directly at the exit of carding, in a same number as the roves that are coming therefrom, the means for controlling the speed causing the rotation of said cones at a tangential speed substantially the same as the speed of said roves that are coming from carding .

[0018] Upstream of the cones, means can be provided for unwinding the roves, comprising guides, deflectors and counter rotating dragging rollers.

[0019] According to the characteristics of the rove with untwisted fiber that is being wound on the cones, the means for unwinding can comprise also means for giving to the rove a light stretch or a light twist or false twist. This does not change the final open or untwisted structure of the rove on the respective cones.

Brief description of the drawings

[0020] Further characteristics and the advantages of the method for preparing a rove with untwisted fiber for further textile working and of the relative apparatus will be made clearer with the following description of an embodiment thereof, exemplifying but not limitative, with reference to the attached drawings, wherein:

- figure 1 shows a elevational side view of an apparatus according to the invention for preparing a rove with untwisted fiber for further textile working;
- figure 1A shows a conical cone on which a rove with untwisted fiber has been wound, according to the invention,;
- figure 2 shows an elevational front view of the apparatus of figure 1;
- figure 3 shows a perspective view of the apparatus of figure 1.

Description of a preferred embodiment

[0021] With reference to figure 1, an apparatus for preparing a rove 1 with untwisted fiber for further textile working, for example knitting or weaving, yarn treatments, sewing, etc., provides the step of winding the rove on a plurality of cones 2.

[0022] The step of winding the rove on cones 2 provides the step of arranging on a spooling machine 5 according to the invention a beam 3 having a plurality of hanks 4 of rove.

[0023] The beam 3 rests on a tangentially dragging roller 6 which has a friction surface , for example splined, and rotates at a predetermined dragging speed by means of a drive 7. Furthermore the beam 3 is held by support arms 8, which can be lowered for its loading/sloading.

[0024] The cones 2, in a number at least the same as hanks 4, are mounted on idle supports 10. On each cone 2 an end of a rove 1 is arranged. The idle supports can be opened quickly by means of handles 14.

[0025] Then, the cones are dragged tangentially by means of a shaft 11, having a plurality of dragging cylinders 12. Shaft 11 is brought into rotation by the same drive 7 of roller 6, by means of chain or belt transmission 9. The tangentially dragging speed of shaft 11 on cones 2 is substantially the same as the dragging speed of roller 6 on the beam 3. This way, each rove 1 proceeds from the relative hank 4 of beam 3 to the respective cone 2 without being stretched.

[0026] Rocking arms 13 are provided operated by not shown means, known in the spooling machines, for carrying out a cross winding of the rove on cones 2 and for guiding it during winding.

[0027] Alternatively to what described above, in a way not shown, the roves 1 can be wound on cones 2 directly at the exit of a carding plant. In this case, the supports 10 and the shafts (or the shaft) 11 are arranged directly at the exit of carding.

[0028] Always alternatively to what above described, the unwinding hanks 4, instead of the tangentially dragging rollers 6, can be operated directly by the beam 3 axis with a suitable speed control responsive to the feeding speed.

[0029] The foregoing description of a specific embodiment will so fully reveal the invention according to the conceptual point of view, so that others, by applying current knowledge, will be able to modify and/or adapt for various applications such an embodiment without further research and without parting from the invention, and it is therefore to be understood that such adaptations and modifications will have to be considered as equivalent to the specific embodiment. The means and the materials to realise the different functions described herein could have a different nature without, for this reason, departing from the field of the invention. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Claims

1. A method for preparing a rove (1) with untwisted fiber for further textile working, in particular knitting or weaving, **characterised in that** it provides the step of winding the rove (1) with untwisted fiber directly on a cone (2).

2. Method according to claim 1, wherein said cone (2) has conical shape in order to allow drawing the wound rove (1) from the above.

3. Method according to claim 1, wherein for winding the rove (1) on cones (2) the steps are provided of:

   - arranging a beam (3) having a plurality of hanks (4) of rove (1) on a tangentially dragging roller (6), the dragging roller (6) rotating at a prede-

termined dragging speed ;

- arranging a plurality of cones (2), in a same number as the hanks (4), on idle supports (10) and arranging an end of rove (1) on each cone (2);
- tangentially dragging (11,12) said cones (2) on said idle supports (10) for cross winding said rove (1) on them, the tangentially dragging speed of the cones (2) being substantially the same as the dragging speed of the roller on the beam (3), whereby each rove (1) proceeds from said beam (3) to the respective cone (2) without being stretched.

4. Method according to claim 3, wherein for cross winding the rove (1) on said cones (2) every rove (1) is brought into crossing oscillation immediately upstream of said tangential dragging (11,12) on said cones (2).

5. Method according to claim 1, wherein for winding the rove (1) on cones (2) directly at the carding exit from which a plurality roves (1) come at a predetermined speed, the steps are provided of:

- arranging a plurality of cones (2), in a same number as the roves, on at least a support shaft and arranging an end of rove (1) on each cone (2);
- tangentially dragging (11,12) said cones (2) for winding said rove (1), the speed of tangentially dragging the cones (2) being substantially the same as the speed of the roves, whereby each rove (1) proceeds from said carding exit to the respective cone (2) without being stretched.

6. An apparatus for preparing a rove (1) with untwisted fiber for further textile working comprising:

- a support (8) for at least a beam (3) having a plurality of hanks (4) of rove (1);
- means for rotation (6,7) of the beam (3) at a predetermined dragging speed ;
- a plurality of cones (2), in a same number as the hanks (4), mounted on idle supports (10);
- at least a shaft (11) having cylinders (12) for tangentially dragging said cones (2);
- means for controlling the speed (7) of said at least one shaft (11), whereby the speed for tangentially dragging said cones (2) is substantially the same as the dragging speed of the roller (6) of the beam (3).

7. Apparatus according to claim 5, wherein the cones (2) with the relative dragging shaft (11) are arranged directly at the exit of carding, in a same number as the roves (1) that are coming, the means for controlling the speed (7) causing the rotation of said cones (2) at a tangential speed that is substantially the same as the speed of said roves (1) that are coming from carding .

8. Apparatus according to claim 6 or 7, wherein for cross winding the rove (1) on said cones (2) rocking arms (13) are provided that guide every rove (1) and bring it into crossing oscillation immediately upstream of said tangential dragging (11,12) on said cones (2).

9. Apparatus according to claim 6, wherein said roves (1) are wound on the cones (2) directly at the exit of carding, said idle supports (10) and said shafts (11) being arranged directly at the exit of said carding.

10. Apparatus according to claim 6, wherein the unwinding of said hanks (4) is carried out driving directly said beam (3) with a suitable speed control responsive to the feeding speed of the rove (1).

Fig. 1

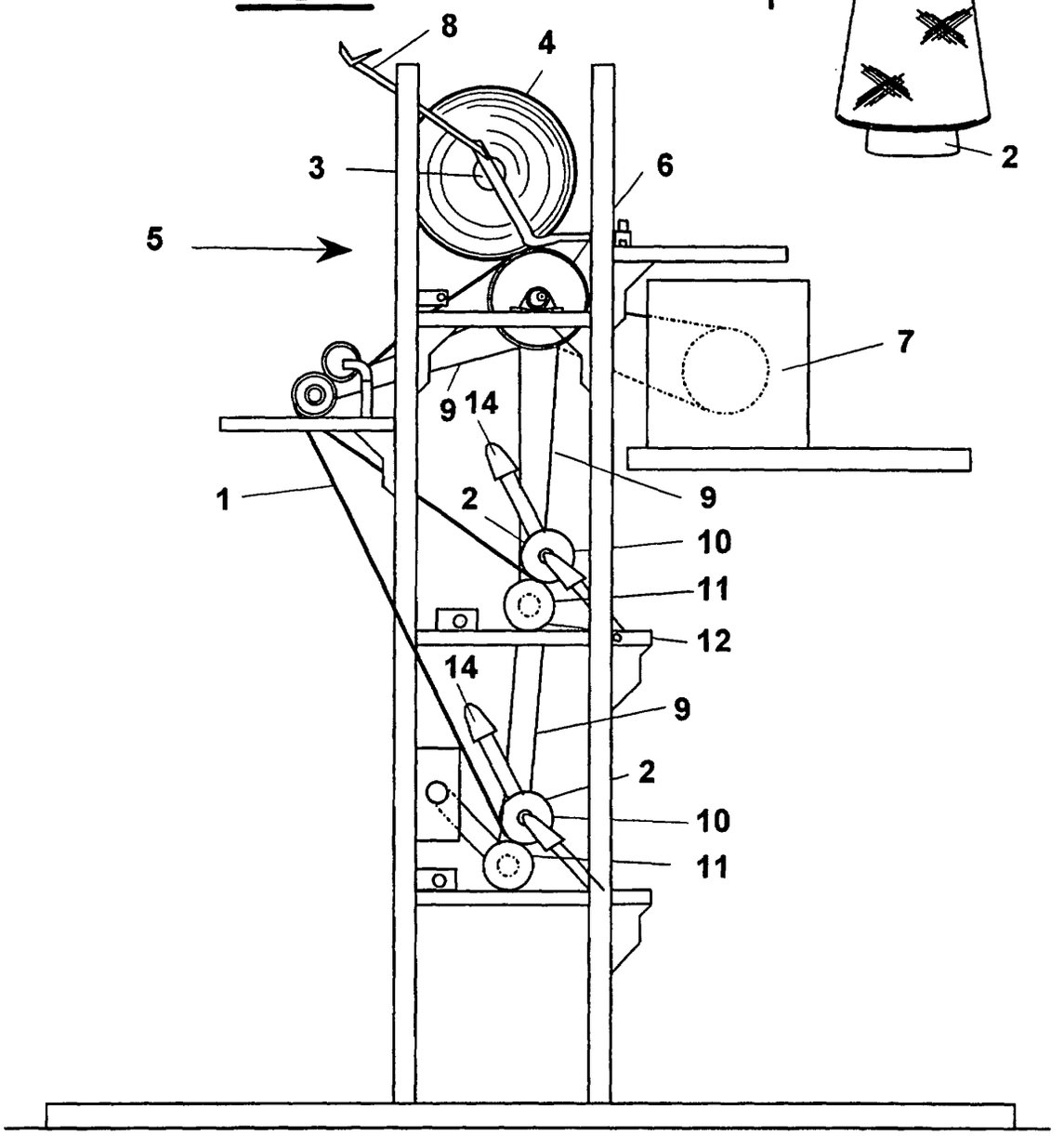


Fig. 1A

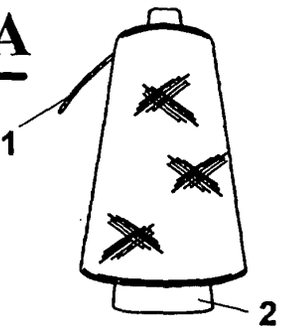


Fig. 2

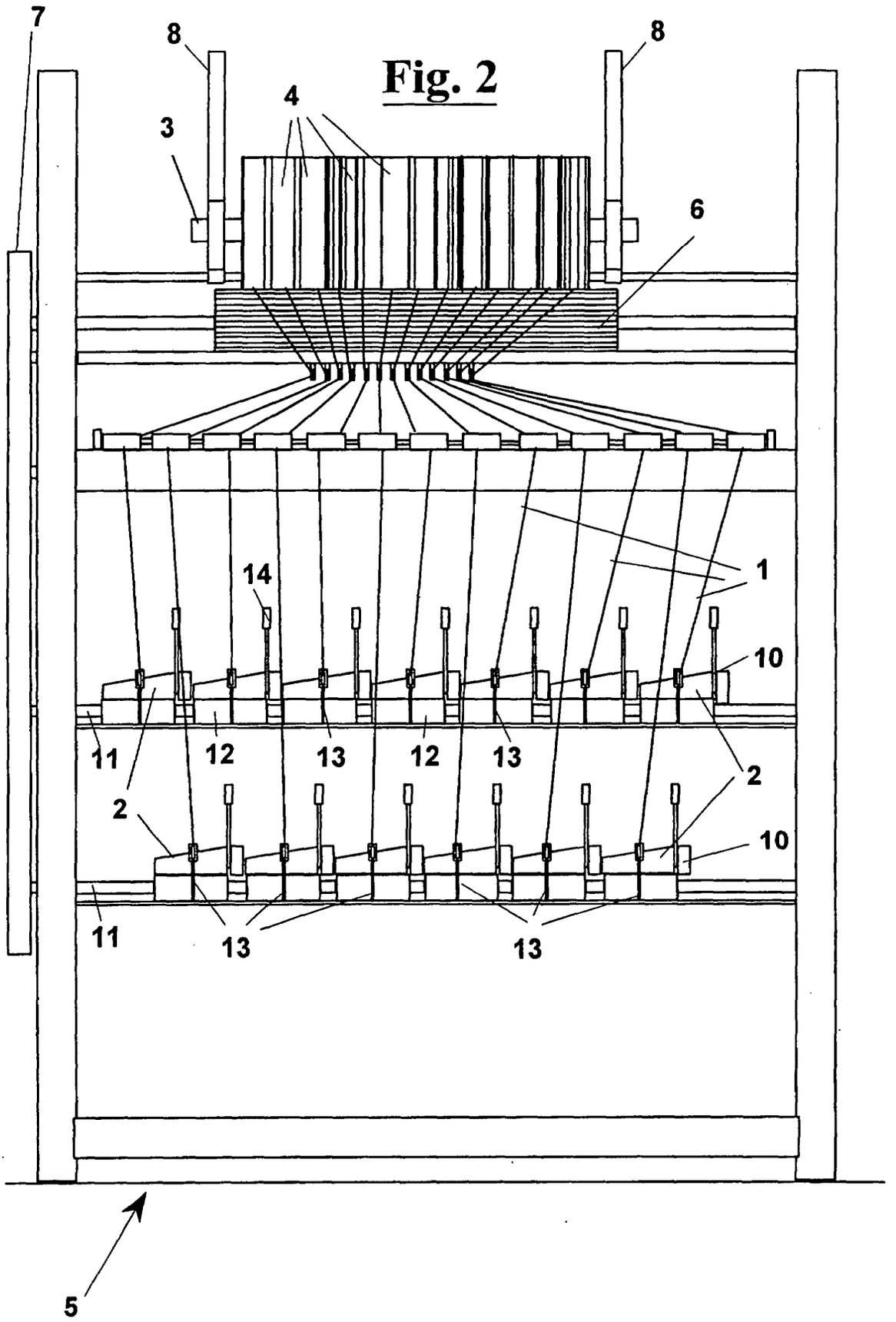
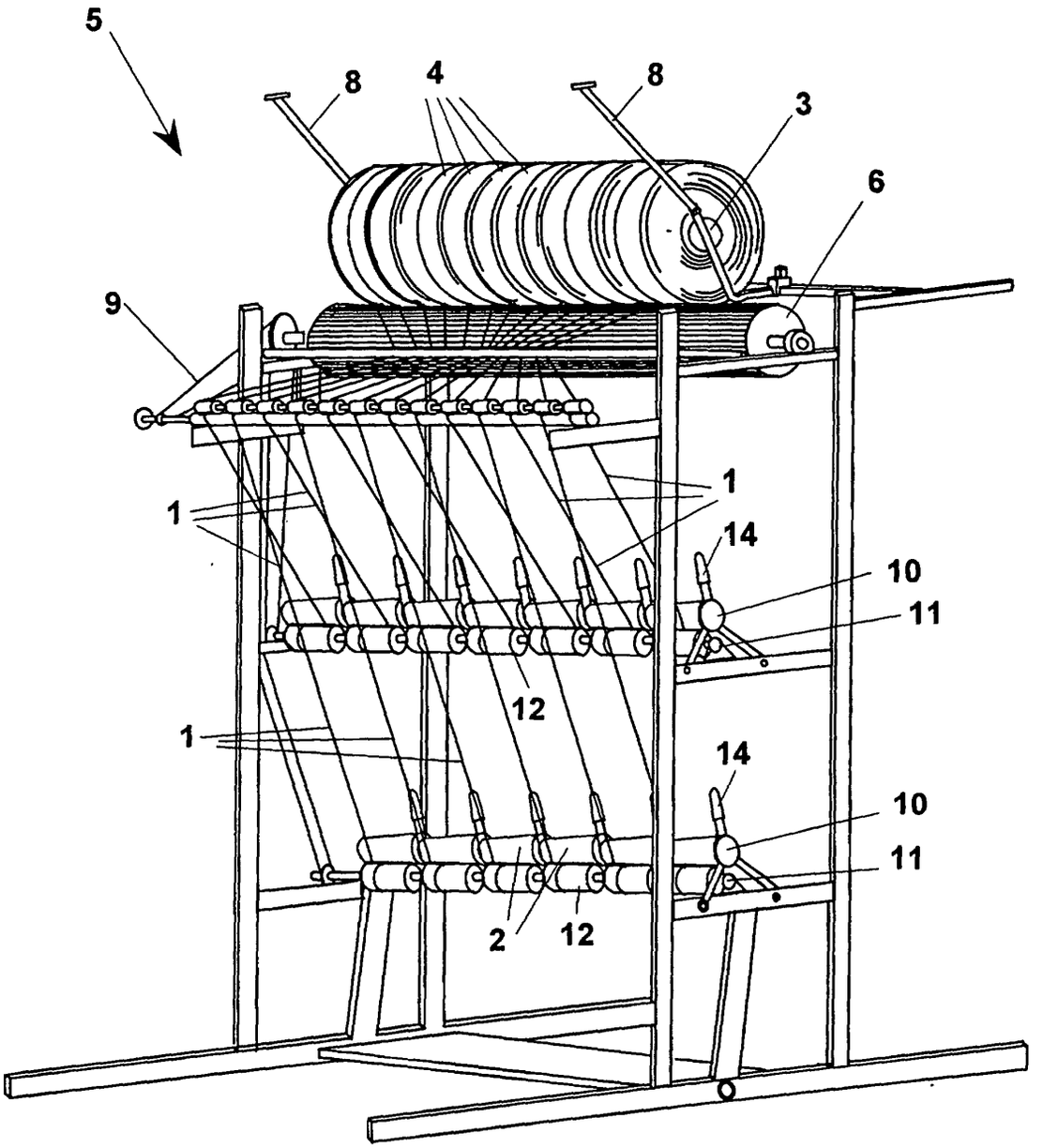


Fig. 3



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 83 0833

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.7)
X Y	GB 2 140 834 A (M. QUINNEN; E.S. LEVITEN) 5 December 1984 (1984-12-05) * page 1, line 41 - page 2, line 40 * * page 3, line 4 - line 24 * * page 4, line 11 - line 35 * * page 4, line 71 - page 5, line 7 * * page 5, line 80 - line 89; claims 7,25-29 *	1,2 3,4,6,8, 10	B65H54/00 D01G15/62 B65H54/02
Y	US 1 685 390 A (E.J. ABBOTT) 25 September 1928 (1928-09-25) * page 2, line 10 - line 107 * * page 1, line 22 - line 67 *	3,4,6,8, 10	
X	DE 198 01 259 A (HACOBA-TEXTILMASCHINEN GMBH CO. KG) 22 July 1999 (1999-07-22) * column 1, line 9 - column 2, line 53; claims 1,13 *	1-10	
X A	EP 0 427 032 A (CERIT SPA) 15 May 1991 (1991-05-15) * column 1, line 1 - line 53 * * column 4, line 27 - line 33 *	1,2 3,4,6,8, 10	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65H D01G
A	GB 428 465 A (BRITISH CELANESE LIMITED) 13 May 1935 (1935-05-13) * claim 7 *	1	
A	US 2 563 642 A (E. COLOMBU ET AL.) 7 August 1951 (1951-08-07) * column 2, line 38 - column 3, line 29 *	1,5,7	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22 June 2001	D'Hulster, E

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 83 0833

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.7)
X	DE 29 52 400 A (BARMAG BARMER MASCHINENFABRIK AG) 2 July 1981 (1981-07-02) * page 6, line 13 - page 7, line 16; figures *	1,5,7,8	
A	DE 29 37 600 A (BARMAG BARMER MASCHINENFABRIK AG) 2 April 1981 (1981-04-02) * page 10, last paragraph *	1,5,7,8	
X	GB 442 650 A (A. SOLDEVILA) 12 February 1936 (1936-02-12) * claims; figures *	1	
A	EP 0 607 945 A (E. FAGIO) 27 July 1994 (1994-07-27) * column 8, line 31 - line 48 *	1,5,7	
A	US 3 348 783 A (J.K.P. MACKIE) 24 October 1967 (1967-10-24)		TECHNICAL FIELDS SEARCHED (Int.Cl.7)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22 June 2001	D'Hulster, E

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 83 0833

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-06-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2140834 A	05-12-1984	US 4613336 A	23-09-1986
		HK 44888 A	17-06-1988
		JP 60017156 A	29-01-1985
US 1685390 A	25-09-1928	BE 334091 A	
DE 19801259 A	22-07-1999	NONE	
EP 427032 A	15-05-1991	IT 1236308 B	09-02-1993
GB 428465 A	13-05-1935	NONE	
US 2563642 A	07-08-1951	BE 494800 A	
		DE 862207 C	
		FR 60812 E	31-01-1955
		NL 78988 C	
DE 2952400 A	02-07-1981	NONE	
DE 2937600 A	02-04-1981	JP 56052362 A	11-05-1981
GB 442650 A	12-02-1936	NONE	
EP 607945 A	27-07-1994	IT 1263777 B	29-08-1996
		IT 1272350 B	18-06-1997
US 3348783 A	24-10-1967	GB 1111129 A	24-04-1968
		BE 666646 A	10-01-1966
		DE 1510353 A	05-02-1970

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82