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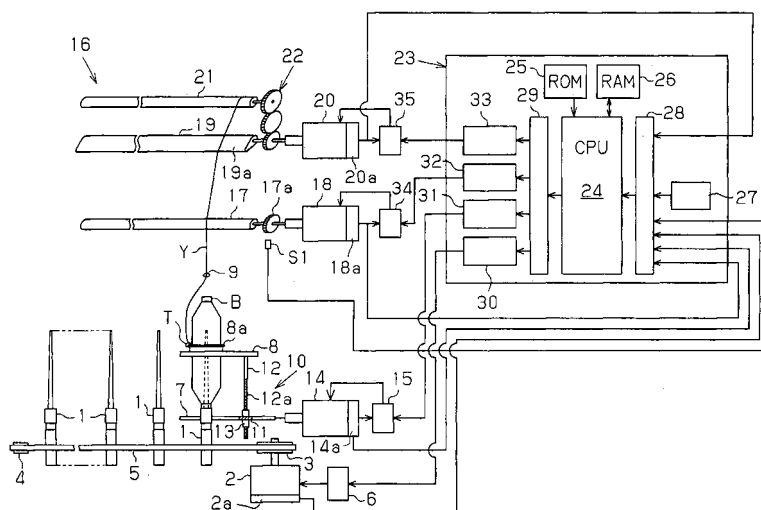
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(54) **Method and apparatus for manufacturing special yarn**

(57) A motor (18), which drives a pair of front rollers (17) of a draft part (16), is controlled such that the rotation speed of the pair of front rollers is decreased from a reference speed (N0) to a decelerated speed (N1) and thereafter increased to the reference speed based on a designed thickness profile (DP) including a slub length (L). The yarn length (La) spun while the rotation speed of the pair of front rollers is increased from the decelerated speed to the reference speed is computed in advance. When the rotation speed of the pair of front rollers

is decreased from the reference speed to the decelerated speed, the motor is controlled such that the rotation speed of the pair of front rollers is increased at a point in time at which the yarn length spun from when the rotation speed of the pair of front rollers is started to be decreased reaches a value obtained by subtracting the yarn length computed in advance from the slub length of the designed thickness profile. Therefore, a special yarn that accurately conforms to the designed thickness profile is manufactured.

Fig.2



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EUROPEAN SEARCH REPORT

Application Number
EP 05 01 1036

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	PATENT ABSTRACTS OF JAPAN vol. 012, no. 005 (C-467), 8 January 1988 (1988-01-08) & JP 62 162031 A (TOYODA AUTOM LOOM WORKS LTD), 17 July 1987 (1987-07-17) * abstract *	1-3,6	INV. D01H5/36
A	----- DE 40 41 301 A1 (AMSLER-IRO AG, ZUERICH, CH) 25 June 1992 (1992-06-25) * column 6, line 1 - column 7, line 21; figures 1-5 *	1-3,6	
A	----- US 4 569 192 A (YAMADA ET AL) 11 February 1986 (1986-02-11) * column 8, line 54 - column 10, line 57; figure 8 *	1-3,6	
A	* column 11, line 10 - line 50 *	4,5,7,8	
A	----- PATENT ABSTRACTS OF JAPAN vol. 1997, no. 04, 30 April 1997 (1997-04-30) & JP 08 325860 A (NIPPON BOSEKI YOHIN KENKYUSHO:KK), 10 December 1996 (1996-12-10) * abstract *	4,5,7,8	
			TECHNICAL FIELDS SEARCHED (IPC)
			D01H D02G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 May 2006	Examiner Henningsen, O
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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EPO FORM 1503 03.82 (P04C01)

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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LACK OF UNITY OF INVENTION
SHEET B

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3,6

Method for manufacturing a special yarn in which the yarn lengths spun while either the front rollers or back rollers are accelerated or decelerated are used to control the thickness profil.

2. claims: 4,5,7,8

Method and apparatus for manufacturing a special yarn in which the thickness profil is controlled by controlling starting and stopping of the back rollers in relation to the starting and stopping of the front rollers based on the distance (lm) between ends of aprons surrounding middle rollers and the nip of the front rollers.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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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
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08-05-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 62162031	A	17-07-1987	NONE
DE 4041301	A1	25-06-1992	NONE
US 4569192	A	11-02-1986	DE 3476430 D1 02-03-1989
		EP 0146296 A1 26-06-1985	
		HK 77489 A 06-10-1989	
		JP 1642150 C 28-02-1992	
		JP 3006255 B 29-01-1991	
		JP 60119228 A 26-06-1985	
		KR 8600678 B1 29-05-1986	
JP 08325860	A	10-12-1996	NONE