Title: PROCESS AND RELATED APPARATUS FOR THE ON-LINE REALIZATION OF THE DRAWING AND WARPING STEPS OF POLYAMIDE MONOFILAMENTS

Abstract: A process and apparatus for the on-line realization of the drawing and warping steps of mono-filament threads (10) from polyamide comprising a first pre-tensioning step (4-4a; 6-6a-6b) of the mono-filament threads unwinding from cheeces positioned on a creel, by passage through a tension compensator for said threads, and a drawing step on a plurality of rolls (11-13, etc.) arranged by groups, each group being spaced with respect to the other one. Each group of rolls is contained in a separator-container (7-9) and, at the outlet of the threads from each group, they are positioned on a thread-guide-reed (18-18a-18b) and an ionizing bar (19) for the elimination of the electrostatic charges accumulated by the threads on their translation on said rolls. The plurality of simultaneously treated threads provides for a number of about 1200 threads kept spaced from one another by a value of between 1.4-1.6 mm.
**INTERNATIONAL SEARCH REPORT**

*A. CLASSIFICATION OF SUBJECT MATTER*

| IPC 7 | D02H5/02 | D02H13/24 | D02J1/22 | D04B21/00 |

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 | D02H | D02J |

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database consulted during the international search (name of database and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tbody>
<tr>
<td>X</td>
<td>EP 0 349 724 A (MCCOY-ELLISON) 10 January 1990 (1990-01-10)</td>
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<td>A</td>
<td>column 4, line 52 -column 5, line 15; figure 1</td>
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<td>A</td>
<td>DE 30 18 373 A (MAYER) 19 November 1981 (1981-11-19) page 7, line 4 -page 8, line 23; figures 1,3</td>
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<td>US 5 333 364 A (ENFIELD) 2 August 1994 (1994-08-02)</td>
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Date of the actual completion of the international search

19 February 2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 MV Rijswijk
Tel: (+31-70) 340-2040, Tx: 31 651 epo nl
Fax: (+31-70) 340-3016

Date of mailing of the international search report

14.05.01

Authorized officer

BOUTELEGIER, C
### Box I  Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
   because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
   because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
   because they are decedent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box II  Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
   
   1 - 10

#### Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (1)) (July 1998)
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-10
   Process and apparatus for on-line drawing and warping of threads

2. Claims: 11-17
   Warp-knitted fabric and its application
<table>
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<th>Patent document cited in search report</th>
<th>Publication date</th>
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