

24 MAR 2004

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

162162

(43) International Publication Date
24 April 2003 (24.04.2003)

PCT

(10) International Publication Number
WO 03/033241 A1(51) International Patent Classification⁷: B29C 47/90,
47/94, 47/06, 55/28, 47/88

(21) International Application Number: PCT/EP02/12193

(22) International Filing Date: 14 October 2002 (14.10.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
90125310 12 October 2001 (12.10.2001) TW
PCT/EP01/12430 15 October 2001 (15.10.2001) EP
0214427.7 21 June 2002 (21.06.2002) GBCZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG,
SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
VC, VN, YU, ZA, ZM, ZW.(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK,
TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

(71) Applicant and

(72) Inventor: RASMUSSEN, Ole-Bendt [DK/CH]; Sagen-
strasse 12, CH-6318 Walchwil (CH).(74) Agent: GILL JENNINGS & EVERY; Broadgate House,
7 Eldon Street, London EC2M 7LH (GB).(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

Declaration under Rule 4.17:

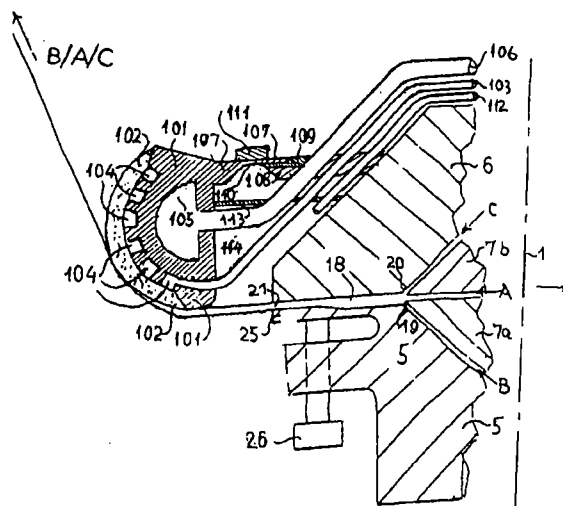
— as to the applicant's entitlement to claim the priority of the
earlier application (Rule 4.17(iii)) for all designations

Published:

— with international search report
— before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

[Continued on next page]

(54) Title: LONGITUDINAL ORIENTATION OF A TUBULAR THERMOPLASTIC FILM



(57) Abstract: The improved method and apparatus for longitudinal orientation of a tubular thermoplastic film as it leaves an annular extrusion die aims at a better control of this orientation. On its travel between the exit orifice (21) and the draw-down means, the at least partly molten film passes an annular frictional device (101), and the frictional force set-up hereby is variable in controlled manner. This device is cooled from its interior (105) in controlled manner by means of a fluid cooling medium. The friction may be controlled by airlubrication with air pressed through holes (123) in the frictional device or through microporous metal, (102) or alternatively by sucking the film against the frictional device. In a preferred embodiment the extrusion out of the die is peripheral extrusion, and in another preferred embodiment the film contains a blend of at least two compatible or compatibilized polymers, and the main proportion of the orientation takes place while one is predominantly in a crystalline state and the other predominantly in a molten state.

WO 03/033241 A1



ACTION

WO 03/033241 A1

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.