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*B29C 47/58* (2006.01)    *B29C 47/08* (2006.01)  
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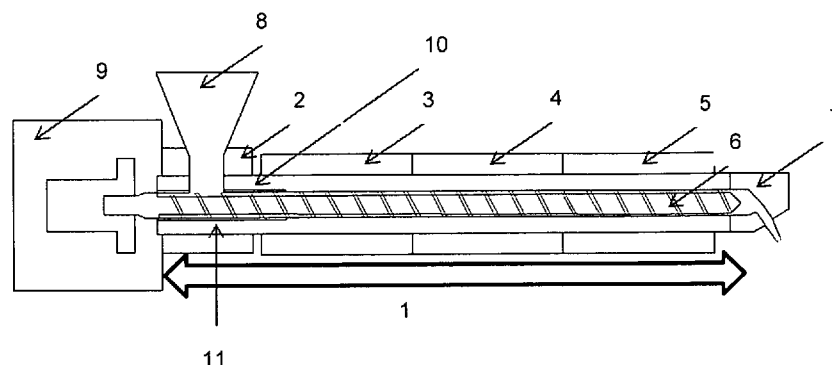
- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

15 November 2012

(54) Title: EXTRUSION METHOD AND APPARATUS

FIGURE 1



(57) Abstract: Improvements in the extrusion of thermohardenable materials are achieved by cooling the material in the initial zone (2) of the extruder (1) and reducing residence time by use of a prescribed length to diameter ratio and screw speed, particularly useful for intermittent application during robotically controlled mass production.

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/EP2012/000437

A. CLASSIFICATION OF SUBJECT MATTER					
INV.	B29C47/00	B29C47/58	B29K105/04	B29K101/10	B29K105/00
	B29K105/24	B29C47/66	B29C47/08	B29C47/82	B29C35/02
	B29C44/34				

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)  
B29C

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)  
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 27 54 877 B1 (FELTEN & GUILLEAUME CARLSWERK) 22 February 1979 (1979-02-22)	1,4,12
Y	column 2, line 24 - line 29 column 3, line 54 - line 66 column 5, line 16 - line 32 column 6, line 31 - line 35 column 6, line 56 - line 63; figures 1, 2	5
Y	DE 102 24 707 A1 (UPONOR INNOVATION AB [SE]) 12 December 2002 (2002-12-12) claims 1, 11; figure 1	5
A	EP 1 471 105 A2 (3M INNOVATIVE PROPERTIES CO [US]) 27 October 2004 (2004-10-27) paragraphs [0059], [0062] - [0064]; figure 7	5
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Further documents are listed in the continuation of Box C.  See patent family annex.

\* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p>
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Date of the actual completion of the international search <b>26 June 2012</b>	Date of mailing of the international search report <b>02/10/2012</b>
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer <b>Ingelgård, Tomas</b>
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2012/000437

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 112 290 A2 (MAILLEFER SA [CH]) 27 June 1984 (1984-06-27) page 1, line 22 - line 31 page 2, line 32 - line 36 page 3, line 19 - line 32 page 4, line 13 - line 16 page 5, line 1 - line 8; figure 1 -----	1

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP2012/000437

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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 dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 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 fees, this Authority did not invite payment of additional fees.
  
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, 2, 4, 5, 12

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1, 2, 4, 5, 12

Method of efficient cooling of thermally activatable materials in an extruder.

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2. claims: 3, 13-18, 20, 21

Method of coating discontinuous objects.

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3. claims: 6, 7

Adaption of a method for bulk stored materials.

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4. claims: 8-11, 19

Adaption of a method for avoiding excessive shear work on the material.

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5. claim: 22

Adaption of a method for improving the adhesion between a substrate and a coating.

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6. claims: 23-34

Extruder adapted for increased flow rate.

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2012/000437

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