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(54) Title: EXTRUSION ASSISTED ROTATIONAL FOAM MOLDING PROCESS

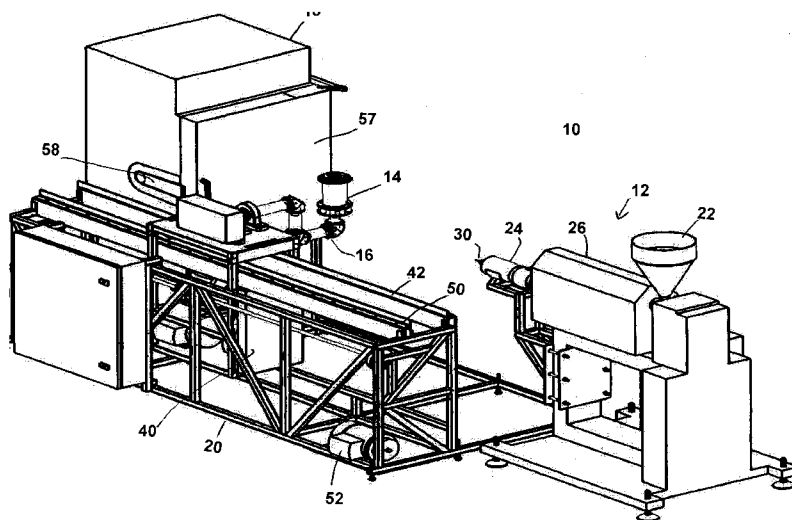


Figure 2

(57) Abstract: An extrusion assisted rotational foam molding process includes the steps of precharging a mold with a plastic; rotating and heating the mold until the plastic melts and coats the inside of the mold thereby producing a solid skin; removing the mold from the oven; injecting foamable extrudate including a heat activated blowing agent into the mold and rotating the mold; reinserting the mold into the oven in order to induce decomposition of the heat activated blowing agent contained in the extrudate and produce a foamed layer inside of the solid skin; and cooling the mold to produce a foamed product with an outer skin. A molding apparatus includes a mold, an arm, an extruder and an oven. The mold has an interface device. The arm is adapted to rotate the mold. The extruder is operably connected to the interface device. The oven is adapted to heat the mold.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC: B29C 44/06 (2006.01) , B29C 44/18 (2006.01) , B29C 44/34 (2006.01) , B29C 44/36 (2006.01) , B29C 44/44 (2006.01) , B29C 44/58 (2006.01) 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: B29C 44/* (2006.01)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used) Delphion, Derwent, CPD with key words, such as: rotational/rotation molding/moulding, rotomolding, rotomoulding, rotamolding, rotamoulding, foam, foamed, foamable, injector, extruder, valve, metal and slit(s).		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4457729 (PEERLKAMP, E. R.) 3 July 1984 (03-07-1984) *col. 3, lines 16-23; claim 1*	1-9
X	CA 2568731 A1 (ACOSTA, P. et al.) 9 February 2006 (09-02-2006) *figs. 2D and 11*	16-17
A	US 4952350 (DUFFY, K.) 28 August 1990 (28-08-1990) *whole document*	1-15
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents :	"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	
"A" document defining the general state of the art which is not considered to be of particular relevance	"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	
"E" earlier application or patent but published on or after the international filing date	"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	
"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)	"&" document member of the same patent family	
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 2 September 2008 (02-09-2008)	Date of mailing of the international search report 16 October 2008 (16-10-2008)	
Name and mailing address of the ISA/CA Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001-819-953-2476	Authorized officer Pengfei Zhang 819- 953-0654	

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of the 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. Claim Nos. :
because they relate to subject matter not required to be searched by this Authority, namely :

2. Claim 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. Claim Nos. :
because they are dependant 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 :

The claims are directed to a plurality of inventive concepts as follows:

- Group A - Claims 1-15 are directed to a method and a molding apparatus for making a multilayered article by using a rotational molding process.
- Group B - Claims 16-17 are directed to a valve made from resiliently deformable metal.

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 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 claim 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 claim Nos. :

- 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.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
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