

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**
(PCT Rule 43*bis*.1)

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2018/020379

International filing date (day/month/year)
01.03.2018

Priority date (day/month/year)
02.03.2017

International Patent Classification (IPC) or both national classification and IPC
INV. C08G71/04 C08J9/00 C08J9/08 C08J9/30

Applicant
CRYOVAC, INC.

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:



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Date of completion of this opinion

see form
PCT/ISA/210

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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - the international application in the language in which it was filed.
 - a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. forming part of the international application as filed:
 - in the form of an Annex C/ST.25 text file.
 - on paper or in the form of an image file.
 - b. furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. furnished subsequent to the international filing date for the purposes of international search only:
 - in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-22</u>
	No: Claims	<u>23</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-23</u>
Industrial applicability (IA)	Yes: Claims	<u>1-23</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V.

Reference is made to the following documents:

- D1 EP 2 735 585 A1 (SEALED AIR CORP [US]) 28 May 2014 (2014-05-28)
- D2 WO 2013/077865 A1 (CRYOVAC INC [US]; SPEER DREW [US]; MAHON WILLIAM J [US]; MAO LORNA LU) 30 May 2013 (2013-05-30)
- D3 US 2013/203878 A1 (IGUALADA JUAN-ANTONIO [ES] ET AL) 8 August 2013 (2013-08-08)

- 1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent claim 23 is not novel in the sense of Article 33(2) PCT.

Document D1, claim 1, discloses a method of making a foam, the method comprising a radical initiator, e.g. peroxides (D1, §0055) a polymerizable resin, e.g. trimethylol propane triacrylate (D1, §0036) carbon dioxide and promoters such as tertiary amines, such as aromatic amines (D1, §0060) and surfactants (D1, §0063) and curing the froth.

The resulting foams are low density foams between 0.25 and 7 pcf.

The resulting foams fall within the definition of independent claim 23 (cf. Item VIII).

Therefore, the subject-matter of present independent claim 23 is not novel over D1.

D2, claim 1, discloses a method of making a foam, the method comprising: providing a formulation comprising:

creating a mixture comprising

- (i) a first reactant having acrylate functionality
- (ii) a second reactant having diacrylate functionality and
- (iii) a blowing agent

and a surfactant and

curing the froth by free radical polymerization to produce a foam.

The resulting foams fall within the definition of independent claim 23 (cf. Item VIII).

Therefore, the subject-matter of present independent claim 23 is not novel over D2.

The subject-matter of present independent claims 1 and 22 differs from D2 in that specifically the formulation is defined as

a first part comprising 15% to 45% of at least one bicarbonate dispersed in 40% to 70% of at least one acrylate, and 1 % to 5% peroxide;

a second part comprising 15% to 40% of at least one acid, 1 % to 5% of an aromatic amine, optionally water and optionally at least one water reducible acrylate

and in that the first and second part is combined to create the blowing agent.

Therefore, the subject-matter of present independent claims 1 and 22 is novel over D2.

- 2 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent claims 1 and 22 is not inventive in the sense of Article 33(3) PCT.

D2 is considered as closest prior art since it discloses structurally similar polymer foams.

It would be obvious for a skilled person to create the already present carbon dioxide used in the process of D2 via a chemical reaction.

It is known to the skilled person that carbon dioxide can be produced chemically in situ. D3 discloses the chemical concept of citric acid and sodium bicarbonate as source for carbon dioxide (cf. D3, §0060-0062).

Therefore, the subject-matter of present independent claims 1 and 22 is not inventive over a combination of D2 with D3.

- 3 Dependent claims 2-21 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being as follows:

D2 discloses, as already discussed low density foams between 0.25 and 7 pounds per cubic foot.

D3 discloses sodium bicarbonate (cf. D3, §0062).

D2 discloses the specific acrylates (D2, p.2, l.21-31).

Re Item VII.

In order to fulfill the requirements of Rule 5.1(a) PCT, the applicant is requested to mention in the description as relevant background art the documents D1-D3 cited above.

Re Item VIII.

Independent claim 23 defines a foam comprising carbon dioxide. The application is not limited to closed cell foams. In the contrary the application, page 16 discloses cushioning as application, which implicitly discloses for the skilled person that gases are eliminated by compression. It is therefore unclear how the created foam could comprise carbon dioxide.

It is further unclear how the formed foam could comprise acrylate, since the acrylate was polymerised to polyacrylate.

It is further unclear how the formed foam could comprise acid, since the acid was reacted with the bicarbonate to form the carbon dioxide.

Hence the subject-matter of present independent claim 23 is unclear.

The units "cubic foot", "psig" and "square inch" employed in the description and the claims are not additionally expressed in using SI-units stipulated by Rule 10.1 (a) PCT.

Hence the subject-matter of the description and claims 2 and 3 is unclear.