PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

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.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2015/027867	28.04.2015	20.05.2014

International Patent Classification (IPC) or both national classification and IPC
INV. A61K9/48 B29C41/14

Applicant
DOW GLOBAL TECHNOLOGIES LLC

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 notifed 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:

European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0
Fax: +49 89 2399 - 4465

Date of completion of this opinion
see form PCT/ISA/210

Authorized Officer
Giménez Miralles, J
Telephone No. +49 89 2399-0

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 43*bis*.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 13*ter*.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 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.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 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-15
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-15
Industrial applicability (IA)	Yes:	Claims	1-15
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V

1. The relevant prior art documents are referred to as D1 to D4 as in the order of appearance in the International Search Report (ISR). Unless otherwise indicated, reference is made to the passages of said documents cited in the ISR.

2. Citations and explanations supporting the statement with regard to novelty (N), inventive step (IS) and industrial applicability (IA) (Rule 43*bis*.1(a)(i) and (b) PCT):

(N) The subject-matter of independent claims 1, 2, 8 and 9 is considered to be novel (Article 33(2) PCT).

The prior art does not anticipate an aqueous composition comprising a dispersion of one esterified cellulose ether (such as HPMCAS or HPMCP) at least partially neutralized with an ammonium salt of carbonic acid, formic acid or acetic acid, optionally comprising a plasticizer, wherein the weight of said esterified cellulose ether is at leat 80% of the total polymer in the aqueous composition, nor a polymeric capsule shell made of said aqueous composition.

(IS) The subject-matter of claims independent claims 1, 2, 8 and 9 is not considered to involve an inventive step (Article 33(3) PCT) for the following reasons.

D1 or D2 can be seen as the closest prior art. D1 discloses an aqueous dispersion comprising 15-25 wt.% partially neutralized HPMCAS wherein partial neutralization is carried out by adding aqueous ammonium hydroxide; the aqueous dispersion is used as coating film for pharmaceutical dosage forms, and particularly for making enteric hard capsule shells by dip-moulding. In D1, it is explicitly disclosed that partial neutralization of HPMCAS renders an aqueous dispersion of colloidal size range having appropriate solid content, viscosity, and rheological properties for use in manufacturing capsule shells (paragraphs 10, 14 and 24). D2 discloses an aqueous dispersion comprising partially neutralized HPMCAS or HPMCP, wherein partial neutralization is carried out by adding aqueous ammonium hydroxide and emulsification; the aqueous dispersion is used for coating films and in manufacturing of enteric hard capsule shells by dip-moulding.

Starting from D1 or D2, present claims 1 and 2 thus differ only in that the partial neutralization is carried out with an ammonium salt of carbonic acid, formic acid, or acetic acid. However, this modification does not imply any unexpected advantage or

benefit. In D2, it is disclosed that the compositions of examples 6-7 result in films which are less milky or hazy. Furthermore, use of an ammonium salt of carbonic acid, formic acid, or acetic acid instead of ammonium hydroxide for neutralization of acidic polymers such as HMPCAS or HPMCP would have been obvious in the light of D3. D3 discloses an aqueous dispersion of an acidic polymer such as HPMCAS or HPMCP partially neutralized with ammonium bicarbonate. The ammonium salt of the polymer enhances polymer solubility for the preparation of film coating for nanoparticles. In view of D3, it would have been obvious for the skilled person to use ammonium bicarbonate instead of ammonium hydroxide for partial neutralization of aqueous dispersions of HPMCAS or HPMCP according to D1 or D2.

Independent claims 8 (pharmaceutical or nutritional capsule comprising the capsule shell) and 9 (process for manufacturing the polymeric capsule shell by dip-moulding) are also lacking an inventive step for analogous reasons.

(IA) The subject-matter of claims 1-15 is considered to be industrially applicable (Article 33(4) PCT). The possibility of industrial application is beyond any doubt.