

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.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.
PCT/EP2019/061725

International filing date (day/month/year)
07.05.2019

Priority date (day/month/year)
09.05.2018

International Patent Classification (IPC) or both national classification and IPC
INV. C07D405/14 A61K31/47 C07D215/54 C07D215/56 C07D405/12 A61P33/10

Applicant
BAYER ANIMAL HEALTH GMBH

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 43bis.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 66.1bis(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

Authorized Officer

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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>1-18</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-18</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-18</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43bis.1 and 70.10)

and / or

2. Non-written disclosures (Rules 43bis.1 and 70.9)

see form 210

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

- D1 WO 2018/087036 A1 (BAYER ANIMAL HEALTH GMBH [DE]) 17 May 2018 cited in the application
- D2 EP 0 263 209 A2 (UPJOHN CO [US]) 13 April 1988
- D3 WO 2015/078800 A1 (BAYER CROPSCIENCE AG [DE]) 4 June 2015

1.1 D1 published on 17.05.2018 claims the priority date of 11 November 2016. This earlier application refers to the compound disclaimed in claim 1 (example 655) and similar compounds wherein R2 and Q have different definitions. Thus, this document has not been taken into consideration for the evaluation of novelty and inventive step, because the claimed priority has been checked and found valid.

2 Method for treatment of the human or animal body by therapy

Claims 16 to 18 relate to subject-matter considered by this Authority to be covered by the provisions of Rule 39.1(iv)/67.1(iv) PCT.

The patentability can also dependent upon the formulation of the claims. The EPO, for example, does not recognise as patentable claims to the use of a compound in medical treatment, but may allow claims to a product, in particular substances or compositions for in a first or further medical treatment. Before the entry into the European phase, claims 16 and 17 should be deleted in accordance with the decision G2/08; the Enlarged Board of Appeal held that the use of Swiss-type claims is permissible in applications having a priority date earlier than 29 January 2011, Art. 54(5) EPC (see G2/08, paragraph 7.1.4 of the reasons for the decision).

3 Novelty

The present application meets the criteria of Article 33(1) PCT, because the subject-matter of claims 1 to 18 is considered to be new over the prior art D2 and D3 in the sense of Article 33(2) PCT for the following reasons:

D2 refers also to structurally different quinolinyl derivatives useful for treating helminth infections. The structural distinguishing features of the compounds of D2 should be seen in the acylhydrazonyl moiety as well as present variables C(O)NH-A, Q and R2.

D3 discloses compounds useful for the control of nematodes and helminths. The compounds of D3 do not have a quinolinyl structure.

It is noted that intermediate compounds of formula (II) are not disclosed in D1 to D3.

4 Inventive step

The present application addresses the problem of providing quinolinyl derivatives useful for the control, treatment and/or prevention of infections with helminths.

D2 is considered to represent the closest prior art, since it refers also to quinolinyl derivatives useful for treating helminth infections.

The structural distinguishing features of the compounds of present claim 1 should be seen mainly in present variables C(O)NH-A, Q and R2.

There is no comparative data in the present application showing that these distinguishing features are responsible for an unexpected effect, thus the objective technical problem solved by the subject-matter of claim 1 should be seen in the provision of a further quinolinyl derivatives useful for the control, treatment and/or prevention of infections with helminths.

In view of the examples and the experimental section of pages 109 to 115 it is credible that the distinguishing features solve the above-mentioned problem.

There is no technical link in D3 which would have incited the skilled worker to replace the acylhydrazonyl group of the compounds of D2 with present variables C(O)NH-A, Q and R2 if he was looking for alternative anthelmintic quinolinyl derivatives.

The claimed subject-matter involves therefore an inventive step.

Re Item VI

Certain documents cited

Application No	Publication date	Filing date	Priority date (<i>valid claim</i>)
Patent No	(<i>day/month/year</i>)	(<i>day/month/year</i>)	(<i>day/month/year</i>)

wo2018/087036	17.05.2018	06.11.2017	11.11.2016

This earlier application refers to the compound disclaimed in present claim 1 (example 655) and structurally different compounds (distinguishing features R2 and Q, combinations thereof).