

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 <i>bis</i> .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/EP2019/067824	International filing date (day/month/year) 03.07.2019	Priority date (day/month/year) 05.07.2018	
International Patent Classification (IPC) or both national classification and IPC INV. C07D333/38 A01N43/10 A01N43/28 C07D413/04 A01P1/00 C07D333/40			
Applicant BAYER AKTIENGESELLSCHAFT			

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:  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 Marzi, Elena Telephone No. +49 89 2399-0	
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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>1-15</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-15</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-15</u>
	No: Claims	

2. Citations and explanations

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

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 EP 0 450 355, 9 October 1991

D2 WO 2004/024692, 25 March 2004

2. Novelty

The present compounds of formula (I) are novel over the compounds disclosed in D1 on account of the present substituent R3.

There is overlap between present formula (I) and formula (I) of D2. However as D2 does not disclose any preferred subgroups or any specific compounds which have the same substitution pattern of the present compounds, the present formula (I) can be considered to be a novel selection from D2.

None of the documents cited discloses the intermediates of claims 12-15.

Novelty is acknowledged (Art. 33(2) PCT).

3. Inventive step

The present application relates to thiophene carboxamide derivatives with antibacterial activity.

D2 can be considered to represent the closest prior art as it discloses thiophene carboxamide derivatives with the same activity.

Present compounds are a selection from formula (I) of D2, the selection being characterised by the particular choice of the substituent R3.

This selection results, as stated by the applicant on page 4, lines 1-3 of the description, in compounds controlling efficiently diseases caused Xanthomonas bacteria.

Therefore the problem to be solved is seen in the provision of thiophene derivatives with improved efficacy against Xanthomonas bacteria.

The application contains some comparative data wherein the activity of the present compounds I.02, I.04, I.79 and I.90 has been compared to the activity of compounds CMP4-CMP6 of D2. The present compounds (differing only in that R³ is a methyl group instead of the bromine or hydrogen of D2) have a much better efficacy. Therefore it is considered that the problem stated above has been solved. It is also considered that the solution proposed by the applicant involves an inventive step as there was no hint in any of the documents cited that the selection of the present compounds would result in such improved properties.

The intermediates of claims 12-15 are also inventive. New intermediates which take part in analogy processes for producing new and inventive products, must, in order to qualify as inventive intermediates, provide a structural contribution to the subsequent products. The structural contribution provided by the intermediate must display at least one of those features which differentiate the product from the closest prior art. In the present case the structural contribution over the prior art is the present R³ group. As the compounds of formula (I) are considered inventive, an inventive step can therefore be acknowledged for the corresponding intermediates of claims 12-15 which contain this feature or are clear precursors thereof.

Re Item VIII

Certain observations on the international application

In claim 14, p. 77, l. 12 U⁵ should be replaced by U^{5a}.