

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.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/EP2019/057318

International filing date (day/month/year)
22.03.2019

Priority date (day/month/year)

International Patent Classification (IPC) or both national classification and IPC
INV. G05D1/02 G06Q10/06

Applicant
VOLVO TRUCK CORPORATION

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:



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

Gundlach, Harald

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 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>1-19</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-19</u>
Industrial applicability (IA)	Yes: Claims	<u>1-19</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

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

1 Reference is made to the following document:

D1 US 2014/297182 A1 (CASSON WILLIAM [US] ET AL) 2 October 2014 (2014-10-02)

- 1.1 D1 discloses (Article 33(3) PCT) a method of controlling a ~~plurality~~ of vehicles, performing the same mission cycle, the method being characterized by
- mapping a first set of planned degrees of progress to the cycle (see 206 in D1, fig. 2),
 - controlling the vehicles to start the cycle at respective ~~different~~ points in time (implied by 210 in D1, fig. 2),
 - determining deviations of the vehicles from a respective planned degree of progress of the first set of planned degrees of progress (see 214 in D1, fig. 2),
 - mapping, based on the determined deviations, a second set of planned degrees of progress to the cycle (see "new speed profile" in D1, par. 80), and
 - controlling the vehicles so as to minimize deviations of the vehicles from a respective planned degree of progress of the second set of planned degrees of progress (see 210 in D1, fig. 2).
- 1.2 Claim 1 differs thus from the disclosure of D1 in that claim 1 defines that the method is applied to a plurality of vehicles, whereas D1 only discloses the method for one vehicle.
- 1.3 The problem to be solved can thus be construed as how to increase efficiency of a fleet of vehicles.
- 1.4 However, the skilled person would be aware that the method according to D1 is can be used to optimize fuel consumption (see D1, par. 40) and thus to increase efficiency of a single vehicle. The skilled person would further be aware that the application of the method according to D1 to a plurality of vehicles would result into an increase efficiency of a fleet of vehicles.

Accordingly, the skilled person would apply the method of D1 to a fleet of vehicles, whereby the subject-matter of claim 1 is rendered obvious (Article 33(3) PCT).

- 1.5 Because claims 2 - 15 lack the essential features of claim 16 (see below, point 4.1.3), the features of claims 2 - 15 cannot causally contribute to an effect of the invention and represent merely a disadvantageous modification of the subject-matter claimed in claim 1 - which does not justify acknowledgment of inventive step (Article 33(3) PCT).
- 1.6 As the essential feature of claim 16 cannot be carried out (see below, point 4.2.2), also claims 16 - 19 cannot achieve the effect of the invention and thus do not define features contributing causally to the effect of the invention (Article 33(3) PCT).

Re Item VII

Certain defects in the international application

- 2 Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art D1 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
- 3 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1 is not mentioned in the description, nor are these documents identified therein.

Re Item VIII

Certain observations on the international application

- 4 The application does not meet the requirements of Article 6 PCT, because of the following reasons.
- 4.1 The invention intends to achieve to increase productivity achieved by vehicle fleets (see page 1, last paragraph).
- 4.1.1 If the second set of planned degrees of progress (i.e. the future plan) does not represent a faster progress but a slower progress, then this effect is not achieved.
- As claim 1 is not limited to the features of **claim 2**, present claim 1 lacks essential features. Thus claim 1 does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

4.1.2 If the mapping to the second set of planned degrees is performed, when the determined deviations do not represent faster progress (i.e. the present situation), then also the effect of the invention is not achieved: in contrast unnecessary slowing down of vehicles is generated (see page 3, lines 26 - 27). As claim 1 is not limited to the features of claim 16, present claim 1 lacks essential features (see also page 12, lines 1 - 7).

Thus claim 1 does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

4.1.3 The relative term "a faster progress" used in claim 2 has no well-recognized meaning and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT:

In the context of a single vehicle, a faster progress is clear.

However, in the context of a plurality of vehicles, the progress of the plurality of vehicles might be defined, e.g.

- by the progress of the fastest vehicle,
- by the progress of the slowest vehicle, or
- by the average progress of all vehicles.

However, if the vehicles on average are behind, but only the fastest vehicle is faster than schedule, advancing the group schedule results into unnecessary slowing down of the vehicles.

Therefore, **claim 16** defines an essential feature, relating to the average progress of the vehicles.

As claim 1 is not limited to the features of claim 16, present claim 1 lacks essential features (see also page 12, lines 1 - 7).

Thus claim 1 does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

4.1.4 In this context, it is noted that **claim 16 depends on claims 10, 9, 8, 7, and 6.**

4.2 The invention claimed **in all claims** does not clearly define the vehicles (Article 6 PCT): do they have drivers or not ?

4.2.1 **If the invention claimed refers to vehicles with drivers (see page 2, lines 25 - 27), then the invention would only amount to a method for performing mental acts, which as such would not be patentable - and for which no search is required (Rule 39 PCT).**

4.2.2 **If on the other hand, the invention claimed refers to vehicles without drivers (see page 2, lines 23 - 24), then the question arises, how the autonomous vehicles can be faster than their schedule, according to which they are controlled ?
However, if the autonomous vehicles are not faster than their schedule but stick to their first set of planned degrees of progress, then the effect of the invention (see point 4.1) would never be achieved (see point 4.1.1), as the second set of planned degrees of progress would not be faster than the first set.**

In that case, the essential feature of the invention could not be carried out (Article 5 PCT).

4.3 Claim 8 defines "the actual progress degree parameter value", which has an antecedent only in claim 7:

Thus, claim 8 lacks antecedent if claim 8 does not depend on claim 7.