

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/US2024/043377

International filing date (day/month/year)
22.08.2024

Priority date (day/month/year)
10.10.2023

International Patent Classification (IPC) or both national classification and IPC
INV. G06Q10/10 G06F40/284 G06F40/289 G06F40/30

Applicant
GENESYS CLOUD SERVICES, 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 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

Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

Härdeman, David

Telephone No. -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.
 - b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13*ter*.1(a)),
 - ☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.
4. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.
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	<u>1-20</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-20</u>
Industrial applicability (IA)	Yes: Claims	<u>1-20</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 VIII

Certain observations on the international application

- 1 Claim 1 includes the feature of:

extracting, from the textual representation of the passage, at least one hierarchical set of nested sequences of words, wherein each sequence of a hierarchical set forms a subset of words of a subsequent sequence in the hierarchical set
- 2 A "hierarchy" is commonly understood as meaning "an arrangement or classification of things according to relative importance or inclusiveness". Here, it is in no way clear how the hierarchy is determined or what the relevance of the hierarchy is. It is also not clear what a "subsequent" sequence would be in a hierarchy (something which is higher/lower in the hierarchy might be understandable, but what is "subsequent", i.e. after?).
- 3 Furthermore, it is not clear if and why each sequence of a hierarchical set would necessarily form a subset of words of a subsequent sequence.
- 4 In summary, claim 1 is not clear, contrary to Article 6 PCT. The same objection is equally applicable to any other claim using the same or similar terminology.
- 5 Claim 3 defines the feature of "selecting a plurality of kernel sequences", which is a definition in terms of a result to be achieved, and leaves the reader in doubt as to how this selection is made or what the effect/relevance of the selection is.

Furthermore, the same claim also defines the feature of producing hierarchical sets of nested sequences comprising "subsequent, monotonically increasing...sequences of words". It is not clear how a sequence of words (as opposed to e.g. a counter or index value) can be "monotonically increasing".

Claim 3 is therefore also unclear, contrary to Article 6 PCT.

Re Item V

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

- 6 Reference is made to the following document:
- 7 Document D1, which can be regarded as being the closest prior art, discloses the following features of claim 1:

A method of identifying occurrence of a semantic variation of a phrase

A search term such as "cancel account", see the reference to paragraph [0055] below

in a passage

E.g. in previous call centre log(s) or transcripts

by at least one processor, the method comprising:

[0055] In operation 480, the document embedding for a particular document may be used in a practical manner...Embodiments may find use in semantic search of text or calls by phrase, where input phrases are used semantically (e.g. searching for 'cancel account' to return calls or call-snippets containing 'terminate service', 'suspend subscription' etc.), which could also be used in real-time to assist agents searching for similar problems.

based on a textual representation of the phrase, calculating a phrase embedding vector, representing a semantic meaning of the phrase;

[0003] An embedding may represent a word, phrase, multi-word phrase, sentence, string, document or some other unit of text as vectors, embedded in a vector space. Natural language processing (NLP) may represent or map these units of text as embeddings, often represented as vectors (e.g. ordered lists of values or continuous numbers) or distributed vectors. Such a vector may be a semantic measure, or a measure the linguistic context, of the word(s) associated with the vector...

obtaining a textual representation of the passage, comprising a plurality of words;

See, in particular, step 400 in figure 3, and the corresponding part of the description:

[0040] In operation 400, a corpus of documents may be created—e.g. call or interaction transcripts may be collected or created by converting audio recordings to text via. ASR.

extracting, from the textual representation of the passage, at least one hierarchical set of nested sequences of words, ~~wherein each sequence of a hierarchical set forms a subset of words of a subsequent sequence in the hierarchical set;~~
for each sequence, calculating a corresponding sequence embedding vector, representing a semantic meaning of the sequence;

As seen in steps 410 and 430 of figure 3, embeddings (i.e. vectors) are created both for phrases in documents and for the whole of the document as well (cf. [0041] and [0045])

for one or more sequence embedding vectors, calculating a corresponding vector similarity value,

[0003] ...The similarity, e.g. cosine similarity, or distance, e.g. Euclidian distance, between two vectors may measure the amount of semantic or meaning similarity between the words or groups of words associated with each vector. Cosine similarity may be a measure of the similarity between two vectors, and by extension of the entities (e.g. words, phrases) which are represented by those vectors...

representing similarity with the phrase embedding vector;

See the above references

identifying a sequence corresponding to a maximal vector similarity value of the one or more vector similarity values: and

determining the identified sequence as a semantic variation of the phrase, based on the maximal vector similarity value.

This essentially describes semantic search based on the hierarchical vectors created for documents, see steps 460 through 480 in fig. 3, as described in paragraphs [0050] through [0055].

- 8 The only identifiable difference between the subject-matter of claim 1 and the known method of document D1 is therefore the feature that "wherein each sequence of a hierarchical set forms a subset of words of a subsequent sequence in the hierarchical set".
- 9 As explained above, this feature is not clear, and at the level of abstraction employed in the present claim formulation, no clear technical effect can be derived from said feature.
- 10 Consequently, the subject-matter of claim 1 does not meet the requirements of Article 33(3) PCT.
- 11 The subject-matter of dependent claims 2–11 can also not be considered inventive, in the sense of Article 33(3) PCT, as the additional features of the respective claims are:
- claim 2: implicit in claim 1 and already known from D1 (see the passages cited against claim 1)
 - claims 3–6: unclear, as explained above with reference to claim 3, but insofar the claim features can be understood, they would appear to read onto the hierarchical decomposition of multi-party conversations in the corpus of documents (see paragraph [0079]) as well as the document topic embeddings (vectors) created in step 440 in figure 3 (see paragraph [0046])
 - claims 7–10: obvious in light of the embedding module 52, including embedding model 54, which is implemented a machine learning algorithm (see paragraphs [0031], [0064] and [0104])
 - claim 11: not defines in a manner which allows a clear technical effect to be identified
- 12 Independent claim 12, together with its dependent claims 13–19, merely recast the (computer-implemented) method of claims 1–12 in terms of a system (computer) for carrying out the same method. Independent method claim 20 essentially defines the same method as claim 1, albeit on a more generic level. The above objections against claims 1–12 are therefore equally applicable to the subject-matter of claims 12–20, which also lacks an inventive step in the sense of Article 33(3) PCT.