

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 016900-000047		FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US24/10958	International filing date (day/month/year) 09 January 2024 (09.01.2024)	(Earliest) Priority Date (day/month/year) 09 January 2023 (09.01.2023)	
Applicant Sicking Safety Systems LLC			

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out 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)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☒ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

☐ as suggested by the applicant.

☒ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
-***-Please See Supplemental Page-***-

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-11

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. E01F 15/02; E01F 15/14 (2023.01)

ADD. E01F 15/00 (2023.01)

CPC - INV. E01F 15/0423; E01F 15/043

ADD. E01F 15/025

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History document

Electronic database consulted during the international search (name of database and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2020/0190754 A1 (SICKING, D et al.) 18 June 2020; entire document	1-11
A	US 2002/0066896 A1 (BLIGH, R et al.) 06 June 2002; entire document	1-11
A	US 2021/0198855 A1 (THE UAB RESEARCH FOUNDATION) 01 July 2021; entire document	1-11
A	US 10,851,503 B2 (THE TEXAS A&M UNIVERSITY SYSTEM) 01 December 2020; entire document	1-11

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"D" document cited by the applicant in the international application

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

30 April 2024 (30.04.2024)

Date of mailing of the international search report

JUL 03 2024

Name and mailing address of the ISA/

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents

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Continued From Box No. III: Observations where unity of invention is lacking

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fee must be paid.

Group I: Claims 1-11 are directed towards a guardrail terminal with a corrugated shaped guardrail.

Group II: Claims 12-18 are directed towards a guardrail terminal, comprising a top and bottom wall.

Group III: Claims 19-20 are directed towards a guardrail terminal, comprising: walls configured to enclose a guardrail.

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The special technical features of Group I include at least an opening configured to accept a corrugated shaped guardrail; an impact face positioned at the second end, the impact face including a front surface facing away from the first end, a back surface facing toward the first end, and a bottom surface; a top plate extending from the first end to the impact face; a bottom plate extending from the first end toward the impact face; an opening formed between the bottom plate and the back surface of the impact face; a pair of side plates extending from the top plate to the bottom plate on opposite sides of the top plate and the bottom plate; and a deflector attached to the top plate and to a lower location on the back surface of the impact face, extending at an angle of at least 15 degrees downwardly from the top plate toward the back surface of the impact face, which are not present in Groups II-III.

The special technical features of Group II include at least a plurality of walls extending between the first end and the second end, including a top wall and a bottom wall; a passage having a vertical width formed by the plurality of walls extending from the opening to the second end; and a deflector attached to the top wall and extending across the vertical width of the passage, which are not present in Groups I and III.

The special technical features of Group III include at least a plurality of walls configured to peripherally enclose a guardrail, the plurality of walls extending in a longitudinal direction; a plate extending in a direction transverse to the longitudinal direction and connected to the plurality of walls; at least one side wall connected to the plate and extending in a first direction away from the plurality of walls; and a plurality of engagement pins supported by at least one of the plate and the at least one side wall, the plurality of engagement pins extending away from the plate in the first direction, which are not present in Groups I-II.

The common technical features shared by Groups I-III are a guardrail terminal, comprising: a first end, the first end including an opening; a second end; a deflector extending at an angle; a plurality of walls; a plate.

However, these common features are previously disclosed by WO 2020/118309 A2 to Sicking Safety Systems LLC. (hereinafter "Sicking"). Sicking discloses a guardrail terminal (guardrail terminal; abstract; paragraph [00101]), comprising: a first end, the first end including an opening (the guardrail terminal has a first and second end, where the terminal head has an opening through which the guardrail exits and passes under the vehicle; paragraph [00131]; figure 42); a second end (a second end; figure 42); a deflector extending at an angle (a deflector plate was designed to guide the folded guardrail down a steeper angle; paragraph [00130]; figure 44); a plurality of walls (plurality of walls; figure 42); a plate (guardrail beam; paragraph [00131]).

Since the common technical features are previously disclosed by the Sicking reference, these common features are not special and so Groups I-III lack unity.