

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: Lonnie E. Holder
Studebaker & Brackett, PC
8255 Greensboro Drive, Suite 300
Tysons, VA 22102
United States Of America

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year)

JUL 03 2024

Applicant's or agent's file reference
016900-000047

FOR FURTHER ACTION

See paragraph 2 below

International application No. PCT/US24/10958	International filing date (day/month/year) 09 January 2024 (09.01.2024)	Priority date (day/month/year) 09 January 2023 (09.01.2023)
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International Patent Classification (IPC) or both national classification and IPC

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

Applicant Sicking Safety Systems LLC

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 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/
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-8300

Date of completion of this opinion

30 April 2024 (30.04.2024)

Authorized officer

Shane Thomas
PCT Help Desk
Telephone No. 571-272-4300

WRITTEN OPINION OF THE
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Box No. I Basis of this 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(b)).
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 13ter.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:

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Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:
- ☐ paid additional fees.
- ☐ paid additional fees under protest and, where applicable, the protest fee.
- ☐ paid additional fees under protest but the applicable protest fee was not paid.
- ☒ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

☐ complied with.

☒ not complied with for the following reasons:

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.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

☐ all parts.

☒ the parts relating to claims Nos. 1-11

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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

1. Statement

Novelty (N)	Claims	1-11	YES
	Claims	None	NO
Inventive step (IS)	Claims	1-11	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1-11	YES
	Claims	None	NO

2. Citations and explanations:

Claim 1 meets the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a guardrail terminal, comprising: a deflector attached to the top plate and to a lower location on the back surface of the impact face, the deflector extending at an angle of at least 15 degrees downwardly from the top plate toward the back surface of the impact face.

In the closest prior art, US 2020/0190754 A1 to Sicking, D et al. (hereinafter "Sicking") discloses a guardrail terminal (a guardrail terminal 270; paragraph [0150]; FIG. 56), comprising: a first end, the first end including an opening configured to accept a corrugated shaped guardrail (guardrail beam 22 is positioned within feeder chute 330. It should be apparent that guardrail beam 22 is folded from a "W" shape; paragraph [0158]; FIG. 75 & FIG. 76); a second end (impact head 332; paragraph [0157]; FIG. 75); an impact face positioned at the second end (impact head 332 includes an impact face 336; paragraph [0157]; FIG. 75), 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 (The impact face is shown to include a front surface facing away from the first end, a back surface facing toward the first end, and a bottom surface; FIG. 42); a top plate extending from the first end to the impact face (a top plate extending from the first end to the impact face is shown; FIG. 42); a bottom plate extending from the first end toward the impact face (a bottom plate extending from the first end toward the impact face is shown; FIG. 44); an opening formed between the bottom plate and the back surface of the impact face (a top opening 214 is shown to be formed between the bottom plate and the back surface of the impact face; FIG. 42); 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 (a pair of side plates extending from the top plate to the bottom plate on opposite sides of the top plate and bottom plate is shown, FIG. 42); and a deflector attached to the top plate (guardrail terminals include an upper deflector 288 and a lower deflector 290. The upper deflector 288 is shown to be attached to the top plate; FIG. 56). Sicking fails to specifically disclose the deflector attached to the top plate and to a lower location on the back surface of the impact face, the deflector extending at an angle of at least 15 degrees downwardly from the top plate toward the back surface of the impact face.

In the second closest prior art, US 2002/0066896 A1 to Bligh, R et al. (hereinafter "Bligh") a guardrail terminal, comprising: a first end, the first end including an opening configured to accept a corrugated shaped guardrail (the edge portions 80 is shown to accept the rail member 12; paragraph [0029]; FIG. 1); a second end (the upstream end of the head assembly 10; paragraph [0018]; FIG. 1); an impact face positioned at the second end (The impact portion 14 of the head assembly 10 has, at its upstream end, an impact plate 28; paragraph [0018]; FIG. 1), the impact face including a front surface facing away from the first end, a back surface facing toward the first end (The impact portion 14 is shown to include a front surface facing away from the upstream end and a back surface facing toward the upstream end; FIG. 1); a top plate extending from the first end to the impact face (The head assembly 10 includes an elongated rail feeder chute 16 having an upper, U-shaped channel member 18; paragraph [0017]; FIG. 1); a bottom plate extending from the first end toward the impact face (The head assembly 10 includes an elongated rail feeder chute 16 having a lower, U-shaped channel member 20; paragraph [0017]; FIG. 1); 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 (the upper channel member 18 and the lower channel member 20 are secured in a spaced relation from one another by strap plates 22; paragraph [0017]; FIG. 1); and a deflector attached to the top plate (the head assembly includes a curved deflector plate. The left side member 40 consists of a curved plate 44. The curved plate 44 is shown to be attached to the upper channel member 18; paragraph [0006, 0019]; FIG. 1). Bligh does not disclose the impact face including a bottom surface, an opening formed between the bottom plate and the back surface of the impact face; a deflector attached to the top plate and to a lower location on the back surface of the impact face, the deflector extending at an angle of at least 15 degrees downwardly from the top plate toward the back surface of the impact face.

In additional prior art, US 2021/0198855 A1 to The UAB Research Foundation (hereinafter "UAB") discloses a guardrail terminal (a guardrail system 100; paragraph [0021]; FIG. 1), comprising: a first end, the first end including an opening configured to accept a corrugated shaped guardrail (the chute 115 can include a cage or similar structure having a channel or a hollow interior that is configured to receive at least a portion of a guardrail beam 103. The guardrail beams 103 can include W-beam guardrails although; paragraph [0021, 0023]; FIG. 2); a second end (front face of the terminal head; paragraph 0036; FIG. 10); an impact face positioned at the second end (The terminal head 112 can include projecting plates 155 on a front or a face of the terminal head 112; paragraph [0036]; FIG. 10), the impact face including a bottom surface (the projecting plates 155 can include flat portions that project from the canister 148. A flat bottom surface of the projecting plates 155 is shown; paragraph [0036]; FIG. 10); a top plate extending from the first end to the impact face (a top of the chute 115; paragraph [0037]; FIG. 10); a bottom plate extending from the first end toward the impact face (a bottom of the chute 115; paragraph [0037]; FIG. 10); 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 (The chute 115 can include one or more vertical members 117 a . . . 117 n (collectively "vertical members 117") that connect

---Continued in Supplemental Box---

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

-Continued From Box V. 2: Citations and Explanations--

a top of the chute 115 with a bottom of the chute 115; paragraph [0037]; FIG. 10). UAB does not disclose the impact face including a front surface facing away from the first end, a back surface facing toward the first end, an opening formed between the bottom plate and the back surface of the impact face; and a deflector attached to the top plate and to a lower location on the back surface of the impact face, the deflector extending at an angle of at least 15 degrees downwardly from the top plate toward the back surface of the impact face.

Sicking, Bligh, UAB, and the references of record do not disclose a deflector attached to the top plate and to a lower location on the back surface of the impact face, the deflector extending at an angle of at least 15 degrees downwardly from the top plate toward the back surface of the impact face. Sicking shows the deflector attached to the top plate but, fails to show the deflector attached to the top plate and to a lower location on the back surface of the impact face. Bligh shows an impact face including a front surface and a bottom surface but, does not show the impact face having a bottom surface. Although Bligh shows the curved deflector plate 44 extending toward a lower location on the back surface of the impact face, the curved deflector is not attached to the impact face. Therefore, it would not have been obvious to one of ordinary skill in the art, by the relevant date, to have employed this system, because the references taken solely, or in combination, fail to provide the required limitations, and modification of any complementary combination of the references of record would be impermissible and not provide any advantages over their present application.

Claims 2-11 meet the criteria set out in PCT Article 33(2)-(3), because of their dependency on claim 1.

Claims 1-11 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.