(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
31 August 2006 (31.08.2006)

PCT

(10) International Publication Number
WO 2006/089347 A1

(51) International Patent Classification:
B60P 7/04 (2006.01)

(21) International Application Number:
PCT/AU2006/000066

(22) International Filing Date: 19 January 2006 (19.01.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2005900279 24 January 2005 (24.01.2005) AU

(71) Applicant *(for all designated States except US)*: **TRANSKING CORPORATION PTY LIMITED** [AU/AU]; 43-47 Newton Road, Wetherill Park, NSW 2164 (AU).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: **KING, Lindsay, Alexander** [AU/AU]; 168 North Rocks Road, North Rocks, NSW 2151 (AU).

(74) Agent: **SPRUSON & FERGUSON**; GPO 3898, Sydney, NSW 2001 (AU).

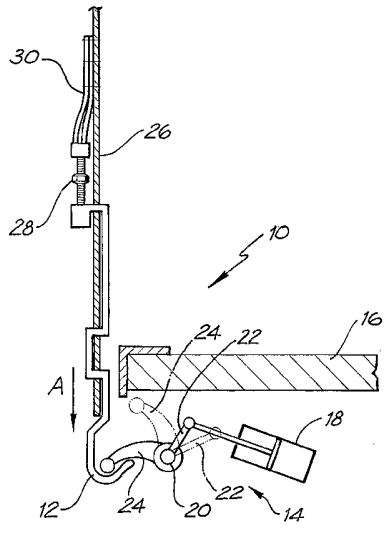
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CURTAIN LOCKING SYSTEM



(57) **Abstract:** The curtain locking mechanism (10) includes a hook (12) and latch assembly (14). The mechanism (10) is adapted for installation below the base (16) of a truck or trailer. The latch assembly (14) comprises a drive means (18) in the form of a pneumatic ram, adapted to pivot a shaft (20). The ram (18) is pivotally connected to a lever arm (22) of the shaft (20). The latch assembly (14) further comprises a crank (24) on the shaft (20) adjacent the hook (12). The hook (12) is attached to the curtain (26) by means of a length adjustment device (28) and a curtain strap (30). The curtain strap (30) is attached at one end to the curtain (26), such as by welding or stitching, and attached to the hook (12) at the other end via the adjustment device (28). In use, the latch assembly (14) can be moved between a locked configuration and an unlocked configuration. In the locked configuration, the latch assembly (14) engages the hook (12). In the unlocked configuration, the latch assembly (14) is disengaged from the hook (12).

WO 2006/089347 A1

CURTAIN LOCKING SYSTEM

Field of the Invention

The present invention relates to a curtain locking system and in particular to a curtain locking mechanism for locking the curtains of curtain-sided trucks and trailers.

Deficiencies of the Prior Art

It is known, in curtain-sided trucks and trailers, to lock curtains tight by means of a number of individual strap and buckle arrangements. The straps are spaced apart along the length of the curtain and are adjustable in length by means of a buckle. To lock the curtain tight, each one of the straps is attached to the trailer combing by, for example, a hook at the end of the strap and the strap is then tightened by closing the buckle. This system requires the user to individually attach and lock each of the straps to the trailer combing, which is a time-consuming and strenuous process.

Object of the Invention

It is the object of the present invention to substantially overcome or ameliorate one or more of the disadvantages of the prior art, or to at least provide a useful alternative.

Summary of the Invention

Accordingly, in a first aspect, the present invention provides a curtain locking mechanism for locking the curtain of curtain-sided trucks or trailers, the locking mechanism including:

a curtain hook adapted for attachment to the curtain;

a latch assembly adapted for actuation between an unlocked configuration and a locked configuration;

wherein, in the unlocked configuration, the hook is disengagable from the latch assembly and, in the locked configuration, the latch assembly engages and moves the hook to a position applying tension to the curtain.

In a second aspect, the present invention provides a curtain-sided truck or trailer including:

a curtain having a plurality of straps attached at intervals along the length of the curtain;

a plurality of hooks respectively attached to each of the plurality of straps;

a latch assembly adapted for actuation between an unlocked configuration and a locked configuration;

wherein, in the unlocked configuration, the hooks are disengagable from the latch assembly and, in the locked configuration, the latch assembly engages and moves the hooks to positions applying tension to the curtain.

In a preferred embodiment, the latch assembly includes a shaft driven to pivot between the locked configuration and the unlocked configuration, the shaft having a crank adapted to engage the hook in the locked configuration.

In an alternative embodiment, the latch assembly includes a latch bar or plate adapted for linear movement between the unlocked and locked configurations, the bar or plate adapted to engage the hook in the locked configuration.

Preferably, the mechanism includes a plurality of hooks spaced at intervals along the curtain and the latch assembly is adapted to simultaneously engage and move each of the hooks when actuated to the locked configuration. Further preferably, the latch assembly includes a shaft having a plurality of cranks, each crank corresponding to and adapted to engage one of the hooks.

In a preferred embodiment, the curtain includes one or more slots and the hook is shaped to weave through the one or more slots. Preferably, the hook is attached to a curtain strap, the curtain strap being stitched or welded to the curtain. Further preferably, the hook is attached to the curtain strap by means of an adjustment device.

In a preferred embodiment, the adjustment device includes a top portion attached to the curtain strap, a bottom portion attached to the hook and a threaded shaft received at either end of the top and bottom portions, wherein rotation of the threaded shaft in one direction contracts the top and bottom portions together and in the other direction expands the top and bottom portions apart.

In a preferred embodiment, the latch assembly includes drive means to actuate the latch assembly between the locked and unlocked configurations. Preferably, the drive means is a ram. In one embodiment the ram is a pneumatic ram. In another embodiment, the ram is an hydraulic cylinder. Preferably, the latch assembly further includes a lever arm extending from the shaft, the ram being attached to the lever arm. Further preferably, the latch assembly includes a plurality of rams adapted to simultaneously drive actuation of the latch assembly.

Brief Description of the Drawings

A preferred embodiment of the invention will now be described with reference to the accompanying drawings, wherein:

Figure 1 is a cross sectional schematic drawing of a curtain-sided truck or trailer incorporating an embodiment of a curtain locking mechanism according to the present invention;

Figure 2 is a cross sectional view similar to that of Fig. 1, showing a first embodiment of a latch assembly for the curtain locking mechanism;

Figure 3 is a partial side view of the curtain-sided truck or trailer shown in Fig. 1; and

Figure 4 is a cross sectional view similar to Fig. 2, showing a second embodiment of a latch assembly for the curtain locking mechanism.

Detailed Description of the Preferred Embodiment

Referring to the drawings, Fig. 1 is a schematic drawing of an embodiment of a curtain locking mechanism 10 according to the present invention. The mechanism 10 includes a hook 12 and latch assembly 14. The mechanism 10 is adapted for installation below the base 16 of the truck or trailer.

As shown in Fig. 2, the latch assembly 14 comprises a drive means 18, in the form of a pneumatic ram, adapted to pivot a shaft 20. The ram 18 is pivotally connected to a lever arm 22 of the shaft 20. The latch assembly 14 further comprises a crank 24 on the shaft 20 adjacent the hook 12. The hook 12 is attached to the curtain 26 by means of a length adjustment device 28 and a curtain strap 30. The curtain strap 30 is attached at one end to the curtain 26, such as by welding or stitching, and attached to the hook 12 at the other end via the adjustment device 28.

Alternatively, as shown in Fig. 4, the latch assembly comprises a drive means 18, in the form of a pneumatic ram, adapted to extend and retract a locking bar 25. A locking plate (not shown) may be employed as an alternative to the locking bar.

In use, the latch assembly 14 can be moved between a locked configuration and an unlocked configuration. In the locked configuration shown in Figs. 2 and 4, the latch assembly 14 engages the hook 12. In the unlocked configuration, shown in phantom in Figs. 2 and 4, the latch assembly 14 is disengaged from the hook 12.

In one embodiment shown in Fig. 2, when the latch assembly 14 is actuated from the unlocked to locked configuration, the ram 18 drives the lever arm 22, which rotates the shaft 20 such that the crank 24 engages and moves the hook 12 into a position applying tension to the hook 12 (in the direction of arrow A).

In an alternative embodiment shown in Fig. 4, when the latch assembly 14 is actuated from the unlocked to the locked configuration, the ram 18 drives the locking bar

25 to engage and move the hook 12 into a position applying tension to the hook 12 (in the direction of arrow A).

This tension is transferred from the hook 12 to the curtain 26 via the curtain strap 30, pulling the curtain 26 tight. This process is reversed for actuation from the locked configuration to the unlocked configuration, which releases the tension in the curtain and also allows the hook 12 to be disengaged from the latch assembly 14.

Referring now to Fig. 3, there is shown an embodiment of the truck or trailer incorporating a curtain locking mechanism 10 including a plurality of hooks 12. The shaft 20 has a corresponding plurality of cranks 24 adjacent each of the hooks 12. Each crank 24 is adapted to simultaneously engage the corresponding hook 12, when the shaft 20 is pivoted by actuation of the latch assembly 14 to the locked configuration.

The curtain 26 is provided with a plurality of slots 32 corresponding to each hook 12. The hooks 12 are received and located through the respective slots 32. The profile of each hook 12, as depicted in Fig. 2, is undulated corresponding to the respective slot 32, to assist in securing the hook 12 relative to the curtain 26. This helps maintain each of the hooks 12 in a consistent position whenever the latch assembly 14 is in the unlocked configuration. In turn, this assists in obtaining correct engagement of the hooks 12 by the cranks 24, when the latch assembly 14 is actuated to the locked configuration.

The adjustment devices 28 comprise a top portion 34 attached to the curtain strap 30, a bottom portion 36 attached to the hook 12 and a threaded shaft 38 received at either end by the top 34 and bottom 36 portions. Rotation of the threaded shaft 38 in one direction contracts the top 34 and bottom 36 portions together and in the other direction, expands the top 34 and bottom 36 portions apart. The adjustment devices 28 are provided to allow the user to adjust the effective length of the hook 12/curtain strap 30 arrangement. This allows initial alignment of the hooks 12 with the cranks 24 for the desired curtain tension, as well as readjustment of the hooks 12 should any become loose or overly tight.

The curtain locking mechanism 10 allows the user to lock down all of the curtain straps 30 by operation of, for example, a single switch. This greatly reduces the time and effort involved in manually locking down each strap individually.

In another form (not shown), the truck or trailer may comprise a number of isolated mechanisms, such that individual mechanisms, or individual groups of mechanisms, can be operated selectively and separately to the other mechanisms. Accordingly, single hooks or groups of hooks can be selectively engaged or disengaged in isolation to others.

Although the invention has been described with reference to a specific example, it will be appreciated by those skilled in the art that the invention may be embodied in other forms.

CLAIMS:

1. A curtain locking mechanism for locking the curtain of curtain-sided trucks or trailers, the locking mechanism having:

a curtain hook adapted for attachment to the curtain; and

a latch assembly adapted for actuation between an unlocked configuration and a locked configuration;

wherein, in the unlocked configuration, the hook is disengagable from the latch assembly and, in the locked configuration, the latch assembly engages and moves the hook to a position applying tension to the curtain.

2. The curtain locking mechanism as defined in claim 1, wherein the latch assembly includes a shaft driven to pivot between the locked configuration and the unlocked configuration, the shaft having a crank adapted to engage the hook in the locked configuration.

3. The curtain locking mechanism as defined in claim 1, wherein the latch assembly includes a latch bar or plate adapted for linear movement between the unlocked and locked configurations, the bar or plate being adapted to engage the hook in the locked configuration.

4. The curtain locking mechanism as defined in claim 1, the locking mechanism having a plurality of said hooks spaced at intervals along the curtain, wherein the latch assembly is adapted to simultaneously engage and move each of the hooks when actuated to the locked configuration.

5. The curtain locking mechanism as defined in claim 4, wherein the latch assembly includes a shaft driven to pivot between the locked configuration and the unlocked configuration, the shaft having a plurality of cranks, each crank corresponding to and adapted to engage one of the hooks in the locked configurations.

6. The curtain locking mechanism as defined in claim 1, wherein the curtain includes one or more slots and the hook is shaped to weave through the one or more slots.

7. The curtain locking mechanism as defined in claim 1, wherein the hook is attached to a curtain strap, the curtain strap being stitched or welded to the curtain.

8. The curtain locking mechanism as defined in claim 7, wherein the hook is attached to the curtain strap by means of an adjustment device.

9. The curtain locking mechanism as defined in claim 8, wherein the adjustment device includes a top portion attached to the curtain strap, a bottom portion attached to the hook and a threaded shaft received at either end of the top and bottom portions, wherein rotation of the threaded shaft in one direction contracts the top and bottom portions together and in the other direction expands the top and bottom portions apart.

10. The curtain locking mechanism as defined in claim 1, wherein the latch assembly includes drive means to actuate the latch assembly between the locked and unlocked configurations.

11. The curtain locking mechanism as defined in claim 10, wherein the drive means is a ram.

12. The curtain locking mechanism as defined in claim 11, wherein the ram is a pneumatic ram.

13. The curtain locking mechanism as defined in claim 11, wherein the ram is an hydraulic cylinder.

14. The curtain locking mechanism as defined in claim 11, wherein the latch assembly further includes a lever arm extending from the shaft, the ram being attached to the lever arm.

15. The curtain locking mechanism as defined in claim 10, wherein the latch assembly includes a plurality of rams adapted to simultaneously drive actuation of the latch assembly.

16. A curtain-sided truck or trailer including:

a curtain having a plurality of straps attached at intervals along the length of the curtain;

a plurality of hooks respectively attached to each of the plurality of straps;

a latch assembly adapted for actuation between an unlocked configuration and a locked configuration;

wherein, in the unlocked configuration, the hooks are disengagable from the latch assembly and, in the locked configuration, the latch assembly engages and moves the hooks to positions applying tension to the curtain.

17. The truck or trailer as defined in claim 16, wherein the latch assembly includes a shaft driven to pivot between the locked configuration and the unlocked configuration, the shaft having a plurality of cranks, each crank adapted to engage a respective one of the hooks in the locked configuration.

18. The truck or trailer as defined in claim 16, wherein the latch assembly includes a latch bar or plate adapted for linear movement between the unlocked and locked configurations, the bar or plate being adapted to engage the hooks in the locked configuration.

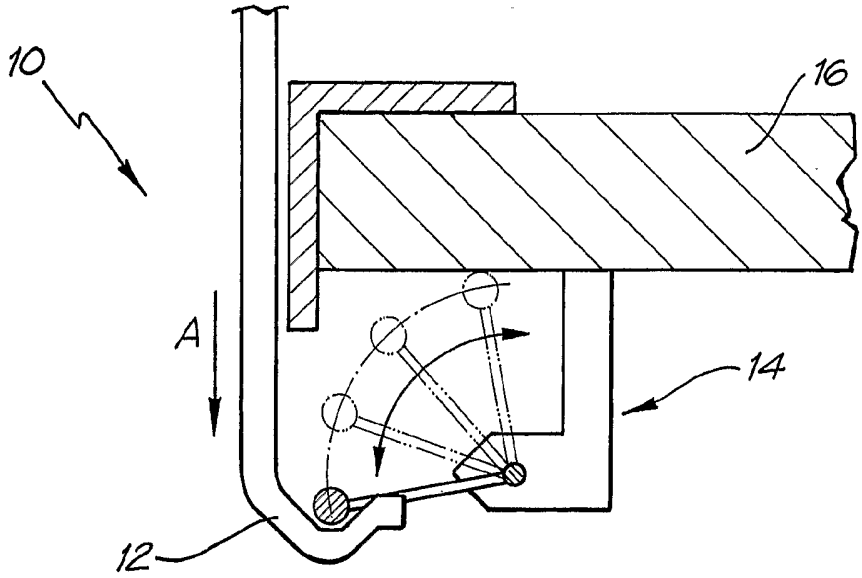


FIG. 1

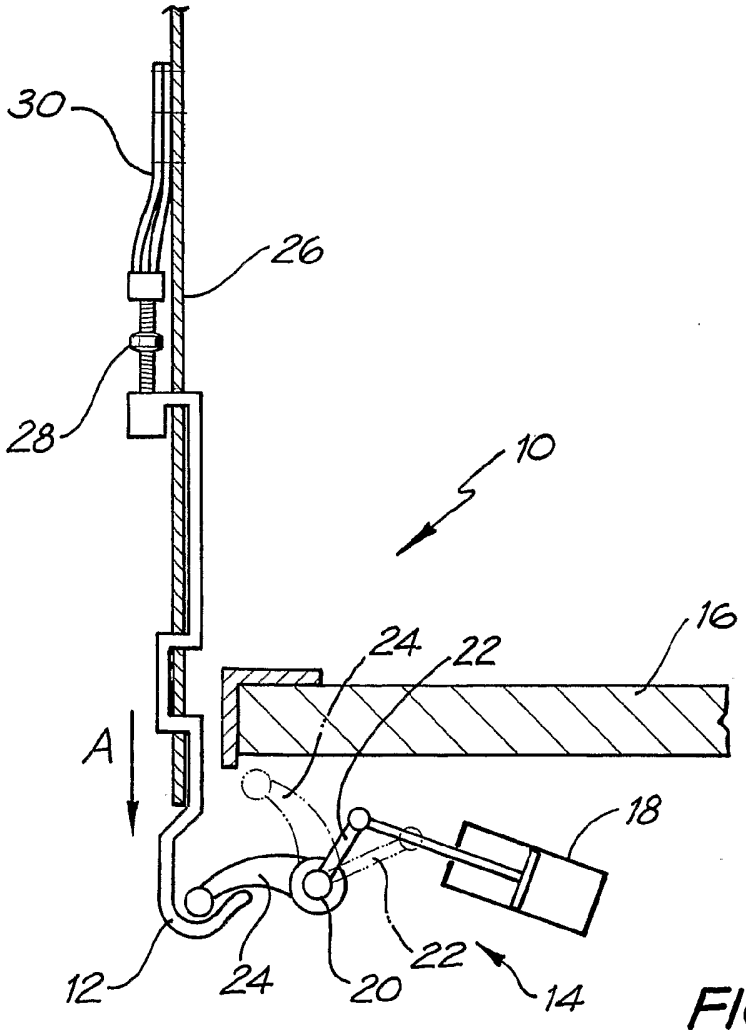


FIG. 2

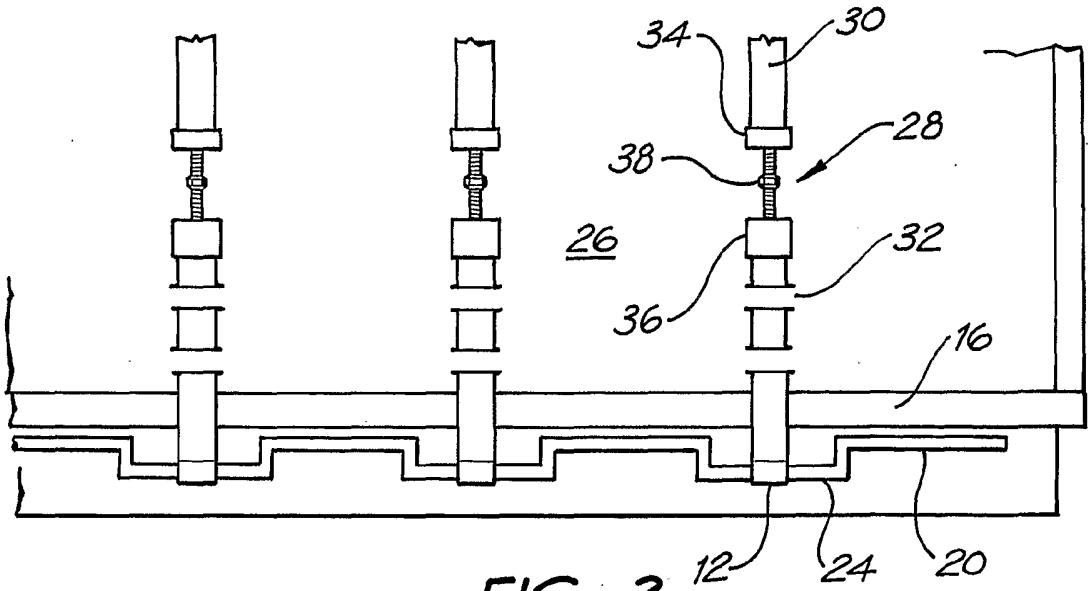


FIG. 3

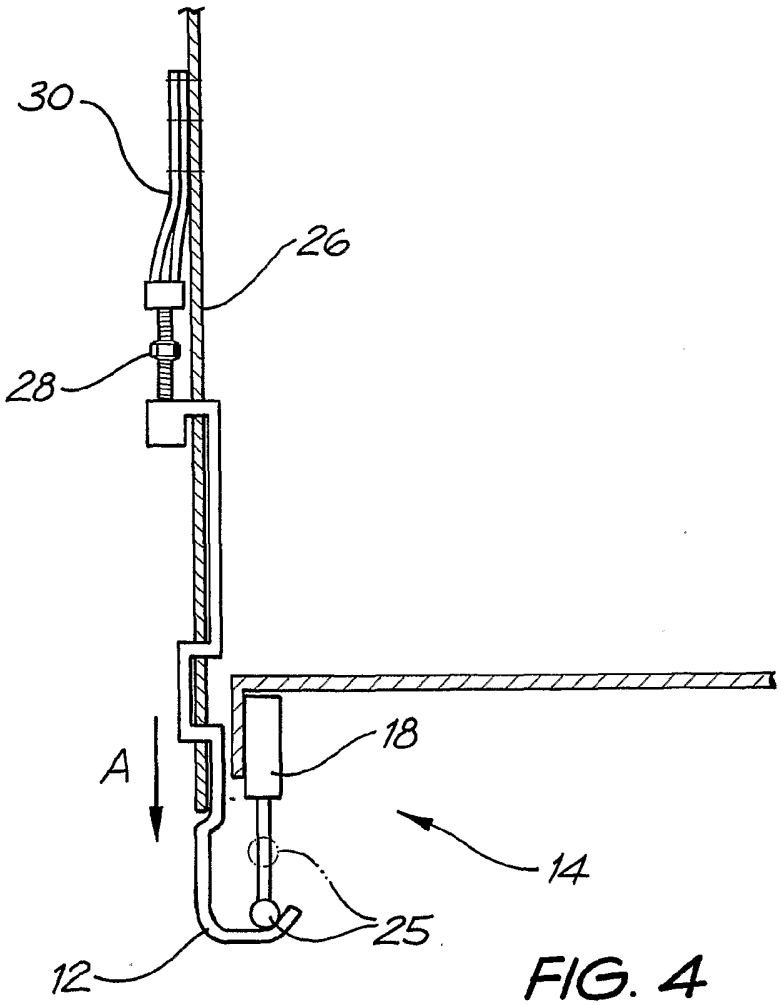


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2006/000066

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. ***B60P 7/04*** (2006.01)

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)

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DWPI and keywords TRAILER, TRUCK, CURTAIN, COVER, TARP, HOOK, CATCH, LOCK, SECUR and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1254801 A2 (MIRO BRAVO) 6 November 2002 Whole document	1-2, 4, 7, 10, 16
X	FR 2268669 A (MORINO) 21 November 1975 Whole document	1-2, 4-5, 7, 10, 16-17
X	GB 2361732 A (MOFFITT) 31 October 2001 Whole document	1-2, 4-5, 7-12, 16-17

[X] Further documents are listed in the continuation of Box C [X] 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

"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	Date of mailing of the international search report
15 February 2006	21 FEB 2006
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer **L. DESECAR** Telephone No : (02) 6283

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2006/000066

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1145902 A2 (MIRO BRAVO) 17 October 2001 Whole document	1, 3-4, 7, 10, 16, 18
A	US 5607200 A (SMIDLER) 4 March 1997 Whole document	1, 10-12

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/AU2006/000066**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member	
EP	1254801		
FR	2268669		
GB	2361732		
EP	1145902		
US	5607200	EP	0738621

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX