Quick Prior Art Search

Title : Vehicle Power Unit System & Body Unit System

5/12/2011
Client : [redacted]
Innomantra Consulting Private Limited

Search Report for: [redacted]	
Search Report by: Innomantra Consulting Private Limited	**Project No**: Trial 001
Title: Vehicle Power Unit System & Body Unit System	

A. What features were searched for?

A method of increasing volume in a truck tractor trailer to maximize freight loads. The following features were searched for:

F1. A truck tractor and removable body unit configured as a fixed body or an articulated truck-trailer combination.

F2. The truck tractor of F1 having a frame and having a fifth wheel mounted on the frame.

F3. The body unit of F1 having a body mounted on a frame, the frame supported by an axle and having a king pin for releasable engaging a fifth wheel.

F4. A coupling mechanism for releasable coupling the truck tractor frame and the body unit frame while allowing relative vertical pivoting movement between the truck tractor and body unit about the king pin and fifth wheel.

F5. An adjustable spring mounted to one of the truck tractor and body unit to act between the truck tractor frame and the body unit frame to adjust a loading between the truck tractor frame and body unit

F6. In general, about truck trailer combination.

B. References Uncovered

Relevant			**Background**		
Patent			**Patent**		
Patent/Pub No	**Pub.Date**	**Classification**	**Patent/Pub No**	**Pub.Date**	**Classification**
A. US4050707	Sep-27-1977	B62D 21/18	E. US5693985	Dec-02-1997	B60D 1/62
			F. US5397924	Mar-14-1995	B60D 1/62
			G. US3198548	Aug-03-1965	B62D 53/08
			H. US20080035814A1	Feb-14-2008	F16B 1/00

Non-Patent	**Non-Patent**
B. Switch-N-Go Detachable Truck Body System, http://www.switchngonc.com/	
C. TRUCK, TRACTOR and TRAILER - QUICK REFERENCE GUIDE, http://www.vvsi.com/training/TrainingGuide.pdf	
D. Len Rogers - Len Rogers European Truck Collection, http://www.hankstruckpictures.com/len_rogers14.htm	

We have used the following color codes to indicate the various features for easy understanding for our clients

F1 – Red, F2 – Blue, F3 – Green, F4 – Orange, F5 - Purple

C. What do the relevant references teach?

Reference A appears to teach feature F1, F2, F3 and F4 atleast in parts. **References B** through **D** appears to teach feature F1. However, the portions of the references are listed below:

Reference A

A truck trailer having a fixed bed and a liftable bed superposed above said liftable bed wherein the lifting means comprises an hydraulic actuator and the like for lifting rearward portions of the liftable bed and wherein the lifting means for the forward portion of the liftable bed comprises a variable height hitching mechanism adapted to be connected to the ***"fifth wheel" hitching plate carried by a truck tractor***. *(Abstract)*

Reference is now made to the hitching mechanism 13 and more particularly to FIGS. 2, 9 and 10. Foot 48 is adapted to fit and be locked into the ***"fifth wheel" mounted upon the truck tractor, which permits relative pivotal movements between trailer and tractor bodies***. One function of the adjustable height feature to be described is to permit mechanism 13 to accommodate variations in height of the ***"fifth wheel" which generally will be at 46 to 54 inches from ground***. Therefore, the bottom surface of mechanism 13 will be set at about 56 inches usually (without extension of the variable-height mechanism) and initial actuation of the mechanism will cause plate 13a to sit down upon the "fifth wheel". Mechanism 13 comprises an outer oblong shell 49 rigidly attached to and mounted between the jogged portions 14a and 16a of beams 14 and 16, and an inner telescoping shell 50. A vertical ram or hydraulic actuator 51 is rigidly secured to outer shell 49 through the agency of steel plates 52, 53 and mounting block 54, all parts being securely bolted, riveted or welded together. Actuator 51 is connected at its lower end through rod 51a to steel plate 56 which is welded internally to the inner shell 50. Accordingly, energization of actuator 51 will raise shell 49 and will lift the forward end of trailer 10 relative to the "fifth wheel" connection. When in the raised position, pins 57 and 58 may be moved into a set of aligned apertures 59 and 60 (sets of different heights being provided) in inner and outer shells 49 and 50 to lock these members in various extended positions for transport. ***Pins 57 and 58 are each connected to cranks 61 and 62 which can be rotated about pivots 61a, 62a by actuators 63, 64 to extend or withdraw pins 57 and 58. When extended, the amount of extension dimensionally of shell 50 from outer shell 49 will be approximately the height of beams 33 and 34, plus the vertical height variation necessary to adjust for different heights of the "fifth wheel***". ***(Description of a Particular Embodiment, Col 3, Lines 34 – 67 and Col 4, Lines 1 – 2)***

In accordance with the present invention therefor, a unique, simplified and highly effective arrangement has been disclosed for raising and securing in raised position, ***load bearing sections of a trailer body for transport beneath removable load bearing units such as a pallet 65***. By utilizing the variable-height hitching mechanism 13, only the very rearward portions of

the load bearing bed 11 need be raised above the fixed bed 21, and the latter need only be constructed to be coextensive generally with the rearward portions of the beams of the trailer body. Consequently, the mechanism for lifting is greatly simplified and the stresses created by large loads upon a raised platform are greatly minimized. Furthermore, since loads may be generally distributed somewhat closer to the trailer wheels than to the forward hitching mechanism, such loads may be more readily handled by varying the size and number of the actuators needed to raise the rearward portion of the bed 11 with respect to the fixed bed 21, although extremely heavy loads may require doubling-up of actuator capacity in the variable-height actuation mechanism. Also, less stress and strain results from the combination of well-distributed, upward force laterally under the rearward portion of bed 11 and the unitary or point force with respect to the hitching mechanism. ***(Description of a Particular Embodiment, Col 4, Lines 37 – 61)***

Reference B

Switch-N-Go detachable truck body system allows you to interchange truck beds and bodies in minutes.

One Switch-N-Go detachable truck body system can set a loaded truck body on the ground, pick up a loaded body, dump like a dump truck, and more - all in one system!

Switch-N-Go systems are designed for 11,000 - 26,000 GVW commercial truck needs. With this system you have a built in hoist which allows you to use several truck beds with one truck - ***quickly change your truck bed into a trailer***, a stake truck, a dump truck, or a flatbed.

Reference C

Frame Type Dump Trailers have a full length frame support, are constructed of steel or aluminum and range in length up to 48'. These trailers are more stable when dumping on uneven surfaces or with uneven loads than frameless types. **(Page 50)**

Reference D

Fiat 170. ***This truck has a rear steer tag axle and removable body***. Both hydraulic jacks can be clearly seen on the body. The truck was seen near Montese, Northern Italy in 2006.

D. What do the background references teach?

References E through **H** in general appears to teach about F6. However, the relevant portions of the references are listed below:

Reference E

A trailer electrical monitor function is implemented into a microprocessor based truck tractor and trailer electrical communication system where a programmable memory unit connected to a trailer electronic control unit is used by the trailer electronic control unit to store a trailer identification code, the result of which is connected through an interface circuit to the trailer electronic control unit where the result is then transmitted to a tractor electronic control unit and/or to an external programming unit The tractor and trailer electronic control units control the state of a plurality of switching devices to establish the appropriate electrical connection into and out of a standard seven pin tractor/trailer electrical connector where high speed data communication links are used for control diagnostics. *(Abstract)*

Reference F

A truck tractor and trailer electrical communication system having one electronic control unit located in tractor and another electronic control unit located in at least one trailer both respectively controlling the state of a plurality of switching devices to establish the appropriate electrical connection into and out of a standard seven pin tractor/trailer electrical connector where high speed data communication links are used for control and diagnostics. *(Abstract)*

Reference G

The present invention relates to truck tractor-trailer couplings and more particularly to a new and improved structure for adjusting the relative positions of the tractor and trailer.

In order to adjust the load-per-axle to meet the strictly enforced load limits on present day highways, it has been proposed to provide means for adjusting the position of the trailer relative to the tractor. For example, by moving the trailer forward, a larger portion of the trailer load can be supported upon the tractor axle. The adjusting structure for this purpose must be inherently strong to withstand the heavy wear to which tractor-trailer couplings are subjected. The prior art structures have utilized bolts inserted through registering openings; however, among other problems, the openings enlarge with use and it is no longer possible to lock the trailer securely in position thereby creating a dangerous driving condition. Furthermore, the prior art structures are cumbersome and unreliable. It is necessary to use several tools and expend substantial time and effort in removing bolts especially when they rust.

Accordingly, it is an object of the present invention to provide a truck tractor-trailer coupling having simply operable means for selectably adjusting the relative position of the trailer to the truck tractor. Along these lines, it is an object to provide a reliable adjusting structure which can withstand the rugged use to which tractor trailer couplings are subjected while still maintaining

the tractor-trailer coupling tightly locked. Also, it is an object to provide means to assure that the adjusting structure does not accidentally unlock.

It is a more specific object of the present invention to provide a tractor-trailer coupling with a large number of positions from which a selection can be made of the particularly desirable coupled position of the tractor and trailer. It is an object to provide an adjusting structure which is easily adjusted even after rusting with use. (Col 1, Lines 7 – 43)

Reference H

A main beam of a container semi-trailer provided with the joint, and the connecting method thereof. The joint is used to connect a main beam and has a first connecting plate connected to the main beam; a second and a third connecting plate secured to the same side of the first connecting plate and spaced apart to each other; and a fourth connecting plate slantingly connected between the second and third connecting plates. *(Abstract)*

E. Which features were not found? F1 – F5 in its entirety

F. Comments, if any?

Reference A was the closest document uncovered. Though the reference does not use the same terminology, the functioning and the diagrams as illustrated in **Reference A** appears to be similar (atleast in parts) to the given disclosure (US2010/0301584).

Date: 11-05-2011 Innomantra Consulting Private Limited