Dump Truck

Field of the Invention

[0001] The present invention relates to tipper lorry, generally known as dump truck. In particular, the present invention relates to dump truck with two ways of tipping.

Background

[0002] In the front portion and rear portion of the chassis frame of a dump truck unit, a drivers' cab and a tipper are mounted respectively. The tipper is an open-box bed used for containing materials, such as sand, ore, slurry and any other loose materials.

[0003] To unload the materials, the tipper is tipped at the rear, whereby during tipping, the front part of the tipper is lifted up by a certain height to reach the necessary tipping angle, thus allowing the materials to be discharged from the tipper. With the rear tipping, problems arise when the load is too heavy or the necessary tipping angle is too large, that during tipping, the truck might tip over. To avoid these problems, the tipper is designed sufficiently short and is operationally tipped at a small angle. These improved designs improve the safety during tipping, yet the loading capacity of the tipper is limited. Further, at a small tipping angle, the materials contained in the tipper may not be able to be fully discharged.

[0004] Another known method to unload the materials from the tipper is by tilting the tipper onto the right or left side of the truck. This method allows rapid unloading and avoids truck tipping over. However when tipped onto the side, the side-dumped load

will pile and the pile of the side-dumped load may cover the wheels of the truck. As a result, the wheels become stuck and difficult to turn.

[0005] US 1,066,527 discloses a side dump car having a car body with open sides. To the open sides, gates are pivoted thereon, thereby closing the open sides. During the operation, the car body can be tilted to one side thereby allowing the gates to swing to its open position and the load materials are simultaneously discharged.

Summary

[0006] One aspect of the present invention provides <<to be completed upon approval of claims>>

[0007] .

Brief Description of the Drawings

[0008] This invention will be described by way of non-limiting embodiments of the present invention, with reference to the accompanying drawings, in which:

[0009] Fig. 1 illustrates a side view of the dump truck according to one embodiment of the present invention; and

[0010] Fig. 2 shows the actuated position of the front tipper and the rear tipper of the dump truck of the present invention.

Detailed Description

[0011] The following descriptions of a number of specific and alternative embodiments are provided to understand the inventive features of the present

invention. It shall be apparent to one skilled in the art, however that this invention may be practiced without such specific details. Some of the details may not be described in length so as to not obscure the invention. For ease of reference, common reference numerals will be used throughout the figures when referring to same or similar features common to the figures.

[0012] The present invention provides a dump truck having improved dumping operation characteristics. The dump truck of the present invention has advantages over prior arts. Moreover, the dump truck of the present invention also satisfies road and safety law requirements.

[0013] Fig. 1 is a side view of the dump truck 100 according to one embodiment of the present invention.. The dump truck 100 comprises a truck chassis frame 101, a truck tipper 102 mounted to the truck chassis frame 101, and a driver's cab 103.

[0014] The truck tipper 102 is used to contain load materials. The truck tipper 102 is partitioned into two parts; a front tipper 102A and a rear tipper 102B. A protector 104 separates the front tipper 102A from the rear tipper 102B.

[0015] In one embodiment, the total length of the truck tipper is 40 feet, with a capacity of 440 tonnes. The ratio of the length of the front tipper and the rear tipper can be 3:2, 1:1, or 11:9. <<*Why must the length of the front tipper and the rear tipper be in this ratio?*>>

[0016] The front tipper 102A is containment base having a horizontal bottom 110A and four vertical enclosing sides 110B. One of the enclosing sides, preferably the left 110C or the right 110D side, is adapted for a first dumping gate for releasing the load

materials from the front tipper 102A. To secure the first dumping gate in a closed position, a plurality of latching locks may be used. *<<Please confirm that this is correct>>*

[0017] The rear tipper 102B is containment base having a horizontal bottom 120A and four vertical enclosing sides 120B. One of the enclosing sides, preferably the rear side, is adapted for a second dumping gate for releasing the load materials from the rear tipper 102B. To secure the second dumping gates in a closed position, a plurality of latching locks may be used. *<<Please confirm that this is correct>>*

[0018] Still referring to Fig. 1, the front tipper 102A and the rear tipper 102B are secured to the truck chassis frame 101 by a first hinge member 121 and a second hinge member 131, respectively. The first hinge member 121 is designed to allow the front tipper 102A to tip to the side of the truck 100, dumping the load contained in the front tipper 102A onto the ground at the side of the truck 100. Meanwhile, the second hinge member 131 is designed to allow the rear tipper 102B to tip to the rear of the truck 100, dumping the load onto the ground at the rear of the truck 100. The first hinge member 121 and the second hinge member 131 are arranged such that the weight of the front tipper 102A and the rear tipper 102B are fully supported by the truck chassis frame 101 during tipping/dumping operation.

[0019] It is further preferable that hoists are adapted to provide further connection between the truck tipper 102 and the truck chassis frame 101. In one embodiment, a first telescopic hoist hydraulic 122 provides connection between the front tipper 102A and the truck chassis frame 101, and a second telescopic hoist hydraulic 132 provides connection between the rear tipper 102B and the truck chassis frame 101. The first

telescopic hoist hydraulic 122 is disposed underneath the front tipper 102A and the second telescopic hoist hydraulic 132 is disposed underneath the rear tipper 102B.

[0020] The dumping operation of the dump truck is controlled by an operator from the driver's cab 103. The operation mechanism of the dump truck 100 is described as follows.

[0021] The load is contained in the front tipper 102A and rear tipper 102B of the dump truck 100. At the site of delivery, the load is to be discharged from the front tipper 102A and rear tipper 102B by actuating the hoists 122, 132. As the hoist 122, 132 is actuated, it lifts the tipper 102A, 102B connected to the hoist 122, 132. The lifted position of the front tipper 102A and the rear tipper 102B is shown in Fig. 2.

[0022] In response to the actuation of the first hoist 122, the front tipper 102A is *<<what is the tipping angle?>>* tipped towards the side of the truck 100. Simultaneously, the first dumping gate is opened and the load from the front tipper 102A is rapidly discharged on the ground at the side of the truck 100. The first hinge member 121 ensures that the weight of the front tipper 102A is fully supported by the truck chassis frame 101 during tipping. It is important to note that since the length of the front tipper 102A is not as long as the length of tipper of conventional side-dump truck, the side tipping of the dump truck of the present invention will not cause the wheels of the truck to be blocked.

[0023] In response to the actuation of the second hoist, 132 the rear tipper 102B is raised *<<What is the tipping angle? Is it considered a low tipping angle?>>*and tipped towards the rear of the truck 100. The second dumping gate 120E is opened and simultaneously, the load from the rear tipper 102B is rapidly discharged on the

ground at the rear of the truck 100. The first hinge member 131 ensures that the weight of the rear tipper 102B is fully supported by the truck chassis frame 101 during tipping.

[0024] It is preferable that during the actuation of the second hoist 132 (rear tipping is effected), the first hoist 122 is not actuated that the front tipper 102A is in its rest position. In this manner, the weight of the front tipper 102A will compensate the forces applied to the truck chassis frame 101 by the upward movement of the rear tipper 102B during rear tipping. Consequently, the dump truck 100 is fully balanced during dumping operations. These characteristics give stability to the dump truck 100 such that the loads are safely discharged while preventing the dump truck 100 from tipping over.

[0025] As outlined above, the dump truck of the present invention is advantageous over prior arts. The dump truck of the present invention provides two ways of tipping, side tipping and rear tipping, simultaneously. While giving the stability to the truck during rear tipping, the design of the tipper of the present invention also prevents the dumped load from blocking the wheels during side tipping. The design of the dump truck of the present invention ensures the safety during dumping operation, as well as the comprehensiveness and cleanliness during the operation. The dump truck of the present invention is also advantageous when the user wishes to transport two different types of materials in one trip. The front tipper is fully separated from the rear tipper that it allows the truck to transport two different materials.

[0026] The above description illustrates various embodiments of the present invention along with examples of how aspects of the present invention may be implemented. While specific embodiments have been described and illustrated it is understood that many charges, modifications, variations and combinations thereof could be made to the present invention without departing from the scope of the present invention. The above examples, embodiments, instructions semantics, and drawings should not be deemed to be the only embodiments, and are presented to illustrate the flexibility and advantages of the present invention as defined by the following claims:

Claims

1. A dump truck, comprising:

a truck chassis frame;

a driver's cab secured to the front of the truck chassis frame;

a truck tipper secured to the truck chassis frame behind the driver's cab, the truck tipper comprising a front tipper and a rear tipper, the front tipper and the rear tipper each comprising a containment base having a horizontal bottom and four vertical enclosing sides, wherein the front tipper and the rear tipper is separated by a protector;

a first telescopic hoist hydraulic disposed underneath the front tipper for providing connection between the front tipper and the truck chassis frame; and

a second telescopic hoist hydraulic disposed underneath the rear tipper for providing connection between the rear tipper and the truck chassis frame.

wherein during dumping operation, the front tipper is tipped towards the side of the dump truck by actuation of the first telescopic hoist hydraulic and the rear tipper is tipped towards the rear of the dump truck by actuation of the second telescopic hoist hydraulic.

2. The dump truck of claim 1, wherein the first telescopic hoist hydraulic is actuated when the second telescopic hoist hydraulic is not actuated.

3. The dump truck of claim 1, wherein the front tipper and the rear tipper are secured to the truck chassis frame by a first and second hinge members, respectively.

4. The dump truck of claim 1, wherein the right or left enclosing sides of the front tipper is adapted for a first dumping gate.

5. The dump truck of claim 1, wherein the rear enclosing sides of the rear tipper is adapted for a second dumping gate.

6. The dump truck of claim 1, wherein the length of the truck tipper is 40 feet.

7. The dump truck of claim 1, wherein the ratio of the length of the front tipper and the rear tipper is 11:9.

8. The dump truck of claim 1, wherein the ratio of the length of the front tipper and the rear tipper is 3:2.

9. The dump truck of claim 1, wherein the ratio of the length of the front tipper and the rear tipper is 1:1.