

[54] **AGGREGATE HANDLING METHOD
AND SYSTEM**

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[22] Filed: **April 6, 1970**

[21] Appl. No.: **25,681**

[52] U.S. Cl. **214/43, 94/44, 214/152**

[51] Int. Cl. **B65g 67/02**

[58] Field of Search **214/38 R, 38 B, 38 BA, 38 BB,
214/152, 44, 43; 94/44, 46**

[56] **References Cited**

UNITED STATES PATENTS

3,439,593 4/1969 Torman 94/44

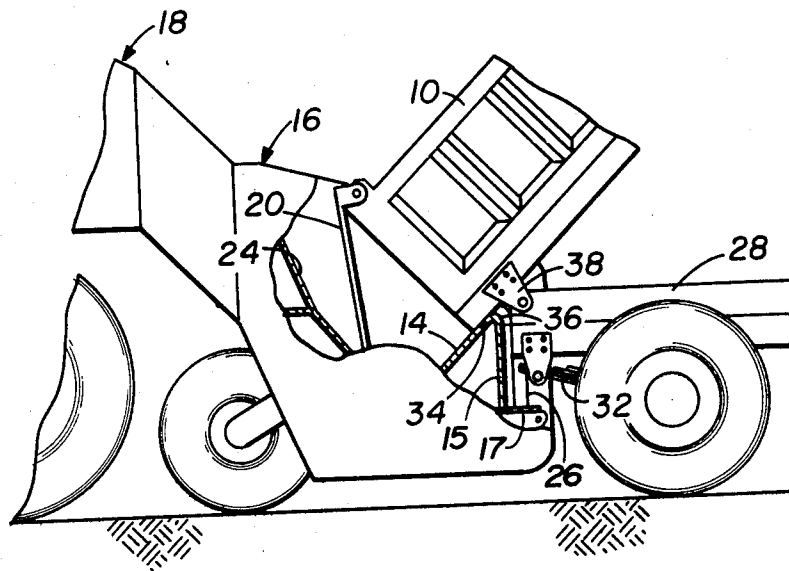
3,447,700 6/1969 Nickel 214/38 BA
3,016,809 1/1962 McNeill 94/44 X

Primary Examiner—Robert G. Sheridan
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[57] **ABSTRACT**

A method for transferring crushed rock from a dump truck to the hopper of a paving machine without danger of spillage by interlocking the rear end of the dump bed with the upper portion of the hopper when the dump bed is raised into position to dump into the hopper. The hopper is provided with an upwardly extending centrally located bumper which is adapted to engage and push the rear end of the truck frame during the time the dump bed is raised to transfer aggregate from the dump bed into the hopper while permitting the truck to pivot relative to the hopper.

4 Claims, 4 Drawing Figures



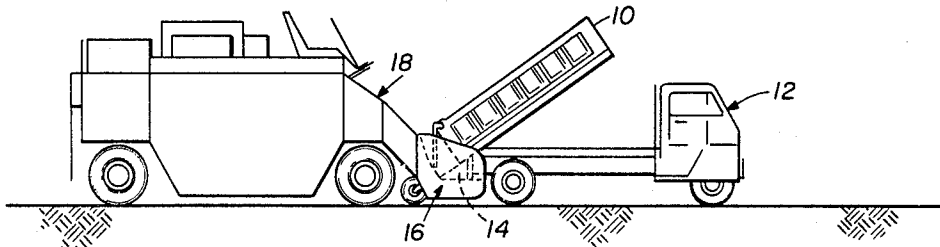


FIG. 1

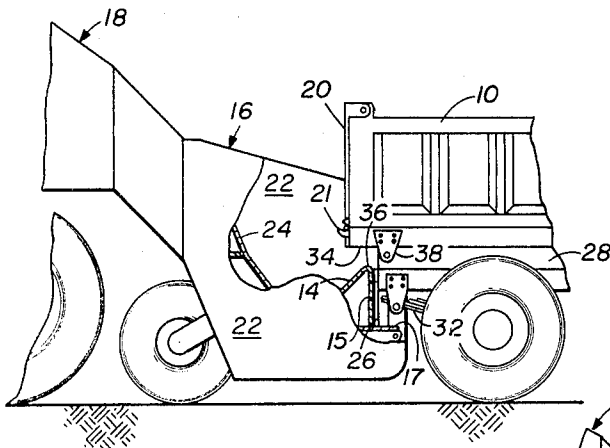


FIG. 3

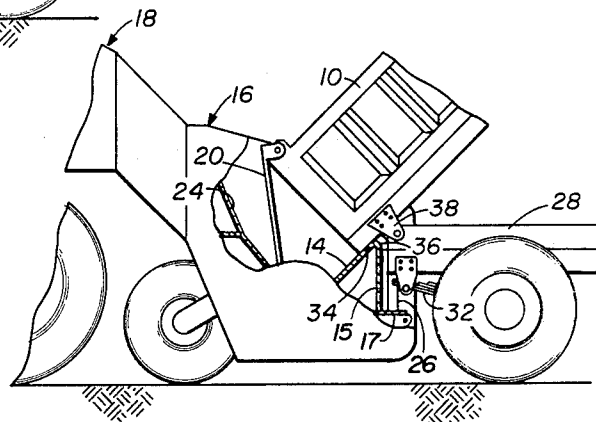


FIG. 4

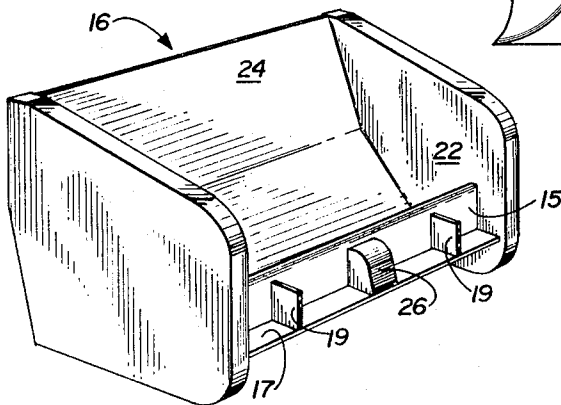


FIG. 2

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AGGREGATE HANDLING METHOD AND SYSTEM

This invention relates to the handling of particulate material, such as road paving aggregate, sand and the like. In another aspect, this invention relates to a new method of transferring particulate material from a dump truck to a hopper mounted on a movable chassis. In still another aspect, this invention relates to an improved hopper mounted on a paving machine which is adapted to retain a dump truck while the dump bed of said dump truck is raised and delivering particulate material into said hopper.

In the paving or resurfacing of roadways, such as streets, runways, driveways, parking areas, and the like, with various bituminous paving methods, one or more layers of particulate material are generally deposited on the prepared roadway surface in a controlled manner. It is generally necessary that each layer of particulate material be delivered in a manner to yield a substantially uniform thickness, and various machines have been developed for this purpose. These machines usually have a hopper or bin for receiving aggregate from a dump truck. In some machines the receiving hopper also serves as a spreading hopper, while in other machines a separate spreading hopper located at the other end of the vehicle is employed. In the paving machine disclosed in U.S. Pat. No. 3,270,633, issued to John H. Holland on Sept. 6, 1966, the receiving and spreading hopper is mounted at the front end of the machine behind a spraybar for applying a uniform layer of liquid asphalt binder on the roadway surface.

In that paving machine, as well as most other paving machines, the volumetric capacity of the receiving and spreading hopper is less than the volumetric capacity of the dump trucks. Therefore, in order to maintain an efficient and continuous paving operation, the dump truck is pushed by the motorized paving machine while aggregate is being delivered to the receiving hopper. During this delivery operation, it is very important that no aggregate be spilled in front of the paving machine because it would be coated first with asphalt, then a layer of aggregate, and result in a bump which can be removed only by tearing up the paving. Therefore, various hookup devices have been used to couple the dump truck with the paving machine during these delivery operations to eliminate the danger that the two will separate. These coupling mechanisms are expensive, require the time and attention of the operator, and require good coordination between the operator and truck driver.

Accordingly, one object of this invention is to provide a new and improved method of coupling a dump truck with a hopper while transferring particulate material from said dump truck to said hopper.

Another object of this invention is to provide an improved hopper having an end wall adapted to coact and interlock with an adjacently positioned dump truck having its bed pivoted upwardly while transferring particulate material to said hopper.

According to one embodiment of this invention, a new method is provided for coupling a dump truck with a hopper which is mounted on one end of a moving chassis and adapted to receive particulate material from said dump truck wherein the hopper and dump truck are moved together, and the dump bed of the truck is pivotally positioned so that the delivery end of the dump bed is positioned over the hopper opening so that the upper portion of the hopper end wall is retained between the lower end of the dump bed and the rear end of the dump truck frame.

According to another embodiment of this invention, an improved hopper for a paving machine is provided which includes a bottom section enclosed by opposed side and opposed end walls and wherein the upper portion of the outer end wall extends upwardly to a point such that when the rear end of the dump bed of a dump truck is pivoted downwardly as the bed is raised, the upper portion of the wall is retained between the lower end of the dump bed and the rear end of the dump truck frame so that the dump truck cannot separate from the hopper while a load of particulate material is being transferred from the dump truck into the hopper.

This invention can be more easily understood by reference to the drawings in which:

FIG. 1 is a schematic view illustrating the relative positioning of a dump truck and a paving machine when operating according to a preferred embodiment of this invention;

FIG. 2 is a perspective view of the hopper of the paving machine of FIG. 1 which is constructed in accordance with this invention which may be used to carry out the method of this invention;

FIG. 3 is a schematic view, partly in section, illustrating the improved hopper of this invention and the position of the rear end of a dump truck when aligned with and engaged by the outer portion of the hopper end wall; and,

FIG. 4 is a schematic view, partly in section, of the hopper and dump truck of FIG. 2 wherein the dump truck and hopper are fully engaged and retained according to this invention.

Now referring to the drawings, particularly to FIG. 1, there is illustrated a preferred embodiment of this invention wherein a dump truck 12 is coupled to a moving paving machine 18. Dump bed 10, which is pivotally mounted on the end of the frame of truck 12, is illustrated in the raised position to dump aggregate into hopper 16 which is mounted on the front end of paving machine 18.

Paving machine 18 can be any suitable paving apparatus known in the art which has a hopper for receiving particulate material disposed at one end. A particularly suitable paving apparatus having a hopper disposed at one end thereof is disclosed in U.S. Pat. No. 3,270,633, issued on Sept. 6, 1966. Other paving machines having different aggregate supply systems can be used in the practice of this invention. Some of this equipment has means for pushing a dump truck in advance of the machine, an aggregate receiving hopper for receiving the aggregate dumped from the truck, a rear distribution hopper, and a suitable conveyor belt mechanism for moving the aggregate from the front receiving hopper to the rear spreading hopper. This invention can also be utilized with the type of machine that pulls a dump truck backwards over the aggregate course laid by the machine as the load of aggregate is dumped into a receiving hopper disposed at the rear of the machine. Such a machine is typically provided with suitable apparatus for transporting the aggregate from the rear of the machine to a distribution hopper located at the front of the machine. Also, hopper 16 can utilize the aggregate metering and spreading system disclosed and described in my copending application, Ser. No. 685,645, filed Nov. 24, 1967, which application is herein incorporated by reference.

Referring now to FIGS. 2-4, the hopper 16 has a front wall 14, a rear wall 24 and two side walls 22. A front fairing 15 extends downwardly from the lip of front wall 14 to a base member 17. A push pad 26 is disposed in the center of the hopper and extends forwardly of the fairing 15 and may extend above the lip of front wall 14. A pair of stops 19 extend from wall 14 on each side of the push pad 26 to limit transverse movement of the truck with respect to the hopper.

In order to establish the engaging and retaining hookup as illustrated in FIG. 1, dump truck 12 and paving machine 18 must initially be aligned in a manner as illustrated in FIG. 3. As the paving machine approaches the truck, the push pad 26 engages the rear end of the frame of the truck to push the truck. The latching means 21 which holds the lower portion of tail gate 20 closed is released and bed 10 is raised about pivot axis 38 to the position illustrated in FIG. 4 causing particulate material to be transferred from bed 10 into hopper 16. The rear end 34 of the bed will contact the upper inside face of front wall 14 thereby leaving the forward lip 36 of wall 14 retained between the rear end of truck frame 28 and the end 34 of bed 10. Thus, the dump truck will be retained by hopper 16 of paving machine 18 so that if the paving machine and truck are moving down an incline, the freewheeling dump truck will not disengage and roll away from paving machine 18, thus spilling aggregate immediately in front of the rapidly moving paving machine. The position of the push pad forward of the fairing 15 permits some longitudinal misalignment of the truck with respect to the hopper.

Since the relative depression of bed 10, i.e., the height of bed 10 as illustrated in FIG. 4, is a function both of the resilience of springs 32 and the weight of the particulate material within bed 10, the upward extension of hopper wall 14 can vary somewhat according to the particular situation. However, generally, the same hopper can be utilized in accordance with this invention for receiving most known aggregates, such as gravel, crushed shell, crushed rocks, and the like from a standard dump truck. Also, if desired, especially when using hoppers with small volumetric capacities, short extensions or rock lips can be fastened to the two side walls of dump bed 10 which extend into the hopper opening during the dumping operation to prevent material from overflowing from the hopper as the full dump bed is lifted to the position as illustrated in FIG. 4.

Although this invention has been described with respect to its preferred embodiments, it should be understood that many variations and modifications will now be obvious to those skilled in the art, and the above described preferred embodiments are in no way intended to limit the scope of this invention.

I claim:

1. The method for transferring a volume of particulate material from a moving dump truck having a dump bed with a rear delivery end pivotally mounted adjacent the rear end of a spring supported truck frame into a moving hopper carried at one end of a vehicle and having a bottom section enclosed by opposite side walls, an inner end wall and a reinforced outer end wall to form an opening for receiving said material, comprising:

- a. positioning said moving hopper and said moving dump truck so that said opening is aligned below the delivery end of said dump bed,
- b. moving said hopper and said dump bed together and

thereby engaging the front of said outer end wall with said truck at a point below said dump bed,

- c. pivoting said dump bed to a position so that said delivery end moves downwardly toward said opening and the upper portion of said outer end wall of said hopper is retained between the lower end of the dump bed and the rear end of the truck by engagement of the dump bed with the upper portion of said outer end wall of said hopper, and

- d. transferring said volume of particulate material from said dump bed into said hopper.

2. A vehicular machine having a hopper disposed at one end for receiving aggregate from a dump truck, means carried by the machine at the front of the hopper for engaging a dump truck and positioning the dump truck such that aggregate will be dumped into the hopper as the dump bed is pivotally raised, and a reinforced member carried by the machine at the front of the hopper which extends upwardly to a point between the rear end of the dump bed and the frame of the truck when the dump bed is partially loaded and pivotally raised for engagement with the underside of the pivotally raised dump bed to prevent separation of the machine and dump truck at least until the bed is emptied.

3. The vehicular machine defined in claim 2 wherein the reinforced member includes a plate disposed at approximately the same angle as the angle of the dump bed when pivotally raised, the plate forming a portion of an interior wall of the hopper.

4. The vehicular machine defined in claim 3 wherein the first means has a vertically disposed surface projecting forwardly from the hopper and positioned to engage the truck frame.

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