May 21, 1963 C. J. KORANDA ET AL 3,090,519

HOPPER OUTLET CONSTRUCTION

Filed Feb. 29, 1960

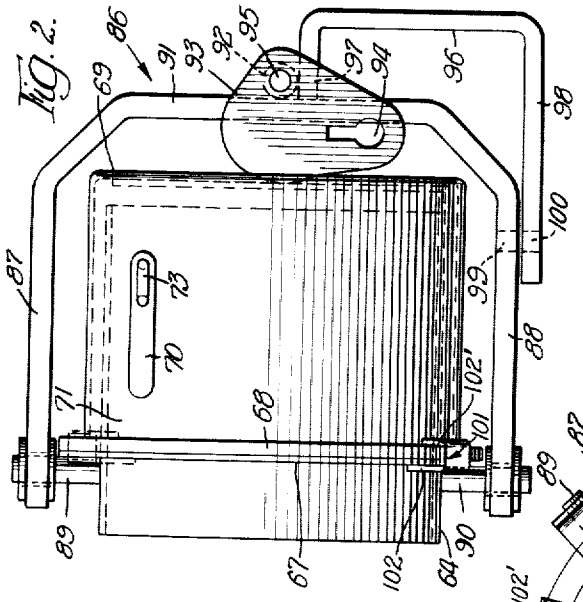


Fig. 2.

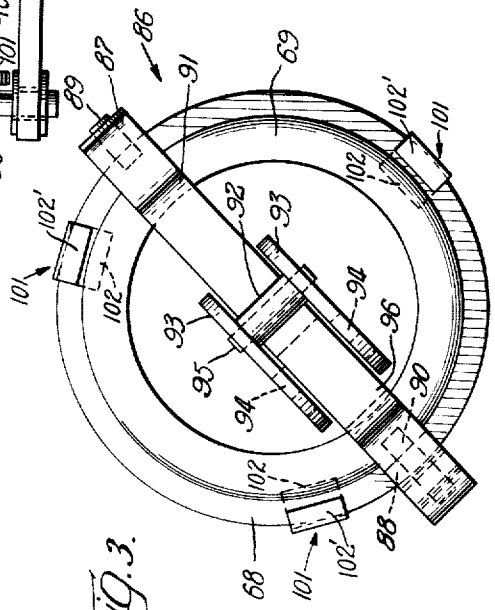


Fig. 3.

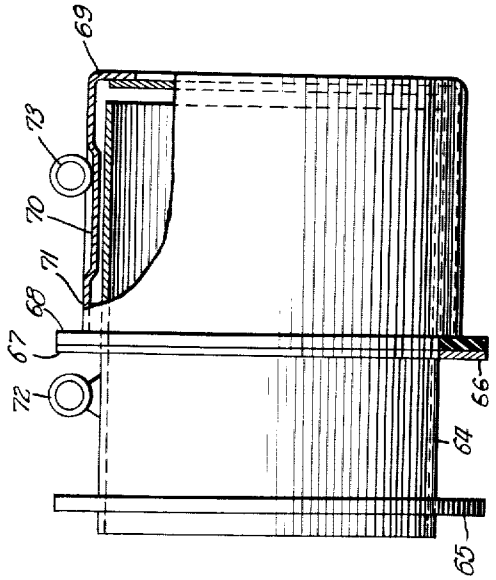


Fig. 1.

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United States Patent Office 3,090,519
Patented May 21, 1963

3,090,519

HOPPER OUTLET CONSTRUCTION

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Filed Feb. 29, 1960, Ser. No. 11,648
3 Claims. (Cl. 220—46)

This invention relates, generally, to conveying apparatus and it has particular relation to such apparatus for use with vehicles, such as trucks and railway cars, provided with one or more hoppers at the bottom from which finely divided lading is to be removed by pneumatic means. This application discloses an invention which is an improvement over the invention disclosed in application Serial No. 723,329, filed March 24, 1958, and assigned to the assignee of this application, now Patent No. 2,950,-143, issued August 23, 1960.

Among the objects of this invention are: To provide improved means including a vacuum chamber for pneumatically removing finely divided lading from a hopper or like receptacle filled therewith; to provide improved means for closing the outer end of an outlet conduit connected to the vacuum chamber; to provide a bail and cam arrangement for holding the cap that closes the outlet conduit in closed position; and to mount the bail for rotation about an axis inclined to the horizontal to correspondingly limit the extent that the bail can swing downwardly in unlocked position.

Other objects of this invention will, in part, be obvious and in part appear hereinafter.

This invention is disclosed in the embodiment thereof shown in the accompanying drawings and it comprises the features of construction, combination of elements and arrangement of parts that will be exemplified in the construction hereinafter disclosed and the scope of the application of which will be indicated in the appended claims.

For a more complete understanding of the nature and scope of this invention reference can be had to the following detailed description, taken together with the accompanying drawings, in which:

FIGURE 1 is a view, partly in side elevation and partly in section, showing the details of construction of an outlet conduit from a vacuum chamber and a closure cap therefor;

FIGURE 2 is an elevational view of the construction shown in FIGURE 1 and in addition showing how a bail and latch construction is applied for detachably holding the closure in the closed position on the outlet conduit; and

FIGURE 3 is a view, in end elevation, of the construction shown in FIGURE 2.

The drawings show an outlet conduit **64** that extends from a closure sheet forming a part of a hopper construction and open into a vacuum chamber therein from which lading is withdrawn by application of suction to the outer end of the conduit **64**. Surrounding the left end of the outlet conduit **64** and spaced slightly from the extreme left end is an annular flange **65** which may be welded to the outlet conduit and also to the closure sheet. Where the outlet conduit is initially assembled with the closure sheet, the annular flange **65** can be omitted and the outlet conduit welded directly to the closure sheet.

The right end of the outlet conduit **64** forms a cylindrical nozzle portion **66** for receiving a flexible hose (not shown) which forms a part of a pneumatic exhaust system. The nozzle portion **66** is preferably completely enclosed in order to avoid contamination by extraneous material. Accordingly, a radial flange **67** is provided intermediate the ends of the outlet conduit **64** and well

spaced from the right end of the nozzle portion **66**. On the right side of the radial flange **67** there is a resilient gasket **68**, preferably of gum rubber, against which an outlet closure cap **69** can bear in sealed relation. In order to engage the resilient gasket **68** intermediate its outer and inner surfaces spaced elongated indentations **70** are formed in the closure cap **69**. For example, three such indentations **70** can be formed. The open annular end portion **71** of the closure cap **69** then is so positioned that it engages the gum rubber gasket **68** as shown in FIGURE 2 and as described.

In order to prevent loss of the outlet closure cap **69** an eye **72** is secured to the outlet conduit **64** and another eye **73** is secured to the closure cap **69**. Then a chain (not shown) interconnects the eyes **72** and **73** which is long enough to permit removal of the closure cap **69**.

Any suitable means can be employed for holding the closure cap **69** in place on the outlet conduit **64**. Preferably the clamp mechanism shown in FIGURES 2 and 3 is employed.

The construction shown in FIGURES 3 and 4 of the drawings is generally the same as that shown in FIGURES 1 and 2 of the drawings and described hereinbefore. Accordingly, the same reference characters have been applied where essentially the same parts are used. As pointed out hereinbefore, FIGURES 3 and 4 show the hood **36** to be of inverted V-shape for the purpose of minimizing the amount of lading left on the upper surface. At the ends of the hood **36**, as shown in FIGURE 4, generally L-shaped gaskets **79** of gum rubber are provided for the purpose set forth hereinbefore with respect to the gasket **48**.

In FIGURE 4 the inlet conduit **80** has the same diameter as the outlet conduit **64**. Otherwise the construction of the means for introducing air other fluid into the vacuum chamber **35** is essentially the same as described for FIGURES 1 and 2. The arm **60** is located on the upper side of the inlet conduit **80** for receiving the sealing band.

In order to hold the closure cap **69** securely in place againct the gum rubber gasket **68** a bail, shown generally at **86**, is used. It includes parallel arms **87** and **88** which extend along the sides of the outlet conduit **64**. They are pivoted on radially extending pins **89** and **90**. As shown in FIGURE 3, the pins **89** and **90** are located in such manner as to permit the bail **86** to swing downwardly only a limited extent. Accordingly, the pins **89** and **90** are located along a line which may be inclined at an angle of about 45° away from the horizontal. The arms **87** and **88** are interconnected by a connecting portion **91** which carries a transversely extending sleeve **92** at the ends of which a pair of cams **93—93** are mounted. They are provided with registering key shaped openings **94** to receive a sealing pin (not shown). A pin **95** extends through the sleeve **92** and through the cams **93—93** to pivotally mount them on the connecting portion **91** of the bail **86**. It will be observed that the cams **93—93** are so shaped that, when they are rotated about the axis of the pin **95** with the bail **86** in the position shown in FIGURE 3, the closure cap **69** is engaged thereby and is forced to the left into sealing engagement with the gum rubber gasket **68**.

The rotation of the cams **93—93** to and from the operative position is accomplished by a handle **96**. One end **97** of the handle **96** is interposed between the cams **93—93** and is secured thereto. The other end **98** of the handle **96** extends along the arm **88**. In order to provide additional means for preventing unauthorized use of the handle **96** registering openings **99** and **100** are provided

in the arm **88** and in the end **98** for receiving a bolt or lock as may be desired.

Since certain further changes can be made in the foregoing construction and different embodiments of the invention can be made without departing from the spirit and scope thereof, it is intended that all matter shown in the accompanying drawings and described hereinbefore shall be interpreted as illustrative and not in a limiting sense.

What is claimed as new is:

1. In combination, closure means for the opening of a hopper having a vacuum chamber for handling finely divided lading comprising:

(*a*) a cylindrical elongated nozzle section at one end of the vacuum chamber for receiving endwise thereof a suction hose,

(*b*) a cylindrical closure cap telescoped over said hose receiving nozzle section to close off the same and protect the surface thereof to be overlaid by the suction hose from contamination,

(*c*) a radial flange on said nozzle section adjacent the open end of said closure cap,

(*d*) a resilient gasket between said radial flange and the juxtaposed end of said closure cap,

(*e*) pivot pins secured to and extending outwardly from diametrically outer sides of said nozzle section on the side of said radial flange away from said closure cap,

(*f*) a bail in the form of a one piece yoke including parallel arms rotatably mounted at one end on said pivot pins and extending along said nozzle section and joined at the other end by a rigid uninterrupted connecting portion spaced from the closed end of said closure cap in its closed position, and

(*g*) a pair of cams rotatably mounted on opposite sides of said connecting portion of said bail on the side thereof away from said closure cap to swing on an axle normal to a plane containing the axis of swinging movement of said bail for engaging said closed end of said closure cap and retaining it in closed position and in tightly fitting relation to said resilient gasket.

2. The invention, as set forth in claim 1, wherein the cams are apertured for receiving a sealing pin on the side of the connection portion of the bail facing the closure cap to prevent rotation of said cams away from operative engagement with the closed end of said closure cap.

3. The invention, as set forth in claim 1, wherein a handle is secured at one end to the cams therebetween and extends therefrom in spaced relation to the connection portion of the bail and thence in overlying relation to one of the arms thereof.

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CERTIFICATE OF CORRECTION

Patent No. 3,090,519 May 21, 1963

Clarence J. Koranda et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 22, begining with "The construction shown" strike out all to and including "the sealing band." in line 40, same column 2.

Signed and sealed this 3rd day of December 1963.

(SEAL)
Attest:
ERNEST W. SWIDER

Attesting Officer

EDWIN L. REYNOLDS

Acting Commissioner of Patents