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ADJUSTABLE AND REMOVABLE ROLLER ASSEMBLY

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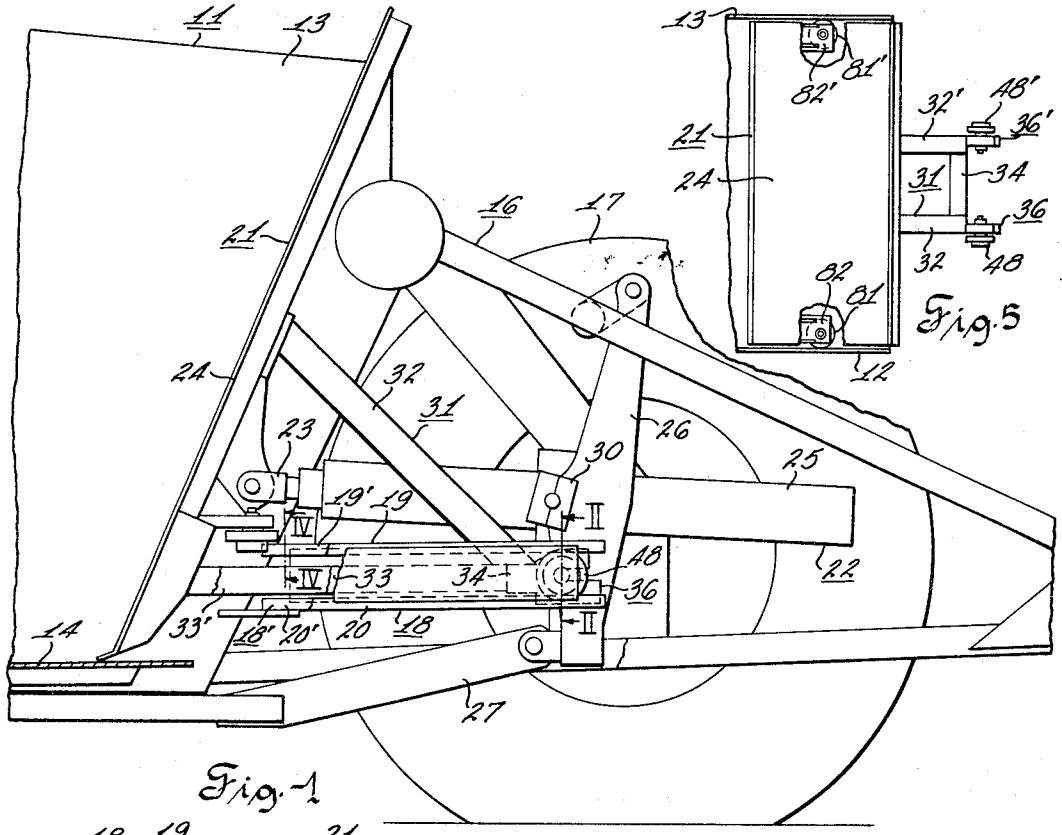


Fig. 1

Fig. 5

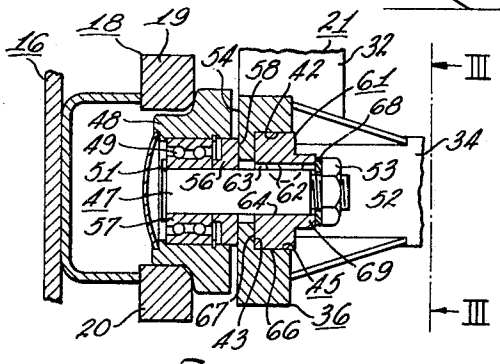


Fig. 2

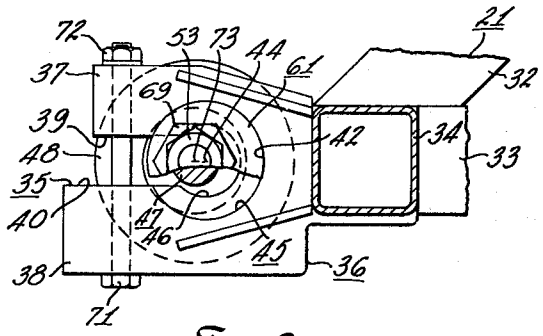


Fig. 3

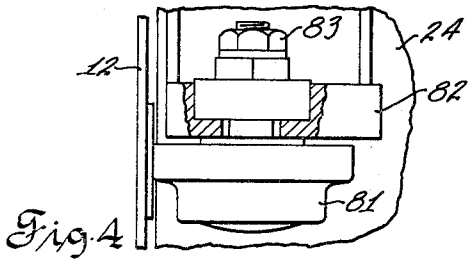


Fig. 4

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ADJUSTABLE AND REMOVABLE ROLLER ASSEMBLY

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ABSTRACT OF THE DISCLOSURE

A roller mounting in an ejector of an earthmover permitting radial adjustment of the roller and through a releasably secured eccentric. The roller shaft carries an eccentric which upon rotation adjusts the position of the roller and the eccentric is axially removable from the shaft so that the roller shaft may pass through an elongated slot in its support. The eccentric is held against rotation by frictional engagement with the support. An elongated slot divides the shaft support into leg portions which when drawn together cause radial gripping action between a cylindrical surface of the support and the cylindrical portion of the eccentric.

This invention relates to a roller assembly for an ejector wherein the roller shaft is mounted in an eccentric which on rotation adjusts the roller radially.

It has been common practice in earth movers to provide rollers for guiding the ejector as it moves in a reciprocable fashion fore and aft in the scraper bowl. In the manufacture of large scraper bowls, it is difficult to hold close tolerances between the structural parts because the bowl is fabricated by welding. Accordingly, it is desirable to provide some means for adjusting the rollers in relation to the mating roller surfaces on the scraper bowl and frame.

It is an object of this invention to provide an ejector roller mounting which permits a roller to be adjusted in a plane at right angles to its axis of rotation.

It is a further object of this invention to provide a radially adjustable and removable roller assembly for an ejector of an earth mover.

It is a further object of this invention to provide a radially adjustable and removable roller wherein it may be removed in a direction at right angles to its axis.

These and other objects and advantages of this invention will be apparent to those familiar with the art when the following description is read with the drawings in which:

FIG. 1 is a side view of a scraper with parts removed to show an ejector in which the present invention is incorporated.

FIG. 2 is an enlarged section view taken along the line II—II in FIG. 1.

FIG. 3 is an enlarged view taken along the line III—III in FIG. 2.

FIG. 4 is an enlarged view taken along the line IV—IV in FIG. 1, and

FIG. 5 is a reduced top view of the ejector mechanism shown in FIG. 1.

Referring to the drawings, the earth mover or scraper **11** includes a scraper bowl having side walls **12, 13** rigidly secured to one another as by a bottom wall **14** and rear frame **16** welded thereto. A pair of wheels **17**, only one of which is shown, support the rear of the earth mover **11** in a conventional manner. A pair of parallel and transversely spaced guide means **18, 18'** are provided on the rear frame **16** for receiving the ejector guide rollers **48, 48'**. The guide means include upper and lower tracks **19, 19'** and **20, 20'**. The ejector **21** is provided to push excavated material from the scraper bowl upon expansion of an ejector jack **22**. The jack **22** has its rod **23** pivotally connected to the rear of the ejector push plate **24** and its cylinder **25** is pivotally connected by a trunnion **30** to an upstanding lever **26**. The top of the lever **26** is pivotally connected to the frame **16** and the lower end of the lever **26** is pivotally connected to the rear end of a reciprocable link **27**, the forward end of which is connected to a reciprocable bottom door, not shown. The ejector **21** includes a rear guide roller frame **31** which as shown in FIGS. 1 and 5 is made up of braces **32, 32', 33, 33'** and **34** which are welded together, the forward ends of braces **32, 32'** and **33, 33'** being welded to the rear of ejector plate **24**. A pair of transversely spaced guide roller supports **36, 36'** are secured as by welding to the rear of the ejector frame **31**. The roller supports **36, 36'** extend vertically and rearwardly at the inner side of guide means **18, 18'**.

As shown in FIGS. 2 and 3, support **36** is split by a horizontal slot **35** to present a C-shaped bracket having upper and lower legs **37, 38**. An inward facing cylindrical surface **42** and a flat surface **43** perpendicular to the axis **44** of the cylindrical surface **42** define a pocket **45** for receiving an eccentric **61**. The axis **44** of cylindrical surface **42** coincides with the axis of a cylindrical part **46** of the slot **35** whose diameter is greater than the distance between horizontal surfaces **39, 40** of the straight part of slot **35**. The slot **35** is greater in width than the diameter of the shaft **47** on which guide roller **48** is rotatably mounted by an anti-friction bearing **49**. The shaft **47** includes a head **51** on one end and threads **52** on its opposite ends for receiving axial thrust transmitting means in the form of a washer **68** and nut **53**. The support **36** also includes a flat face **54** on the side thereof opposite to flat surface **43** which is parallel to the latter. A shoulder part **56** is supported on the shaft **47** intermediate the inner raceway **57** of bearing **49** and the support **36**. The shoulder part **56** has a thrust face **58** in complementary thrust transmitting engagement with flat face **54**. The eccentric **61** has a bore **64** in close fitting radially fixed engagement with shaft **47**. Key **62** on shaft **47** cooperates with a keyway **63** in eccentric **61** to permit axial shifting movement and prevent rotary movement of eccentric **61** relative to the shaft **47**. The eccentric **61** includes a radially outward facing cylindrical face **66** which is complementary to and in thrust transmitting engagement with inward facing cylindrical surface **42** of support **36**. The eccentric **61** also includes a thrust surface **67** on its innermost side which is complementary to and in thrust transmitting engagement with the flat surface **43**. Wrench receiving means in the form of a nut-like portion **69** is provided on the side of the eccentric remote from its thrust surface **67**. This nut-like portion **69** permits a wrench to be applied to hold the eccentric **61** and shaft **47** in the desired position when the nut **53** is tightened to bring faces **54, 58** and surfaces **43, 67** into thrust transmitting engagement with sufficient force to prevent rotation of the eccentric **61** relative to the support **36**. An adjustable and releasable tension means in the form of bolt **71** is provided to draw legs **37, 38** toward one another thereby causing cylindrical surface **42** to grippingly engage cylindrical face **66** thus providing additional resistance to rotation of eccentric **61** relative to support **36**. The tightening and release of the tension element is achieved by screwing nut **72** on and off the threaded end of bolt **71**. The axis **73** of shaft **47** is in eccentric, parallel relation to axis **44** of eccentric **61**.

The roller assembly may be removed from support **36** by removing bolt **71**, removing nut **53** and washer **68**

from shaft 47, then removing eccentric 61 axially from pocket 45 in a direction away from roller 48, and then sliding the shaft 47 horizontally at right angles to its axis 73 rearwardly through slot 35. This roller mounting permits the roller 48 and its mounting parts to be removed from the support without requiring removal of ejector 21 from the scraper bowl 11 or from its operating jack 22.

The ejector 21 is also provided with a pair of side rollers 81, 81' which are mounted in supports 82, 82' extending rearwardly from push plate 24 of ejector 21. The mounting of these rollers 81, 81' is the same as that for rollers 48, 48' except a slot is not provided for removal in a direction at right angles to the roller axis inasmuch as the rollers 81, 81' can be removed downwardly after nut 83, as shown in FIG. 4, is removed.

From the foregoing description it is apparent that an extremely useful and novel roller mounting has been provided which permits radial adjustment of the roller relative to its support and replacement of the roller assembly without removal of the ejector from the scraper or disassembly of the ejector from its operating means.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. In an ejector of an earthmover, a guide roller mounting comprising:

a support on said ejector including

annular pocket in one side of said support, said annular pocket having a radially inward facing cylindrical surface and a flat surface at the bottom thereof perpendicular to the axis of said cylindrical surface,

a flat face on the other side of said support parallel to said flat surface, and

an opening in said support extending between said flat surface and flat face

an ejector guide roller,

a shaft rotatably supporting said roller

an annular shoulder part on said shaft with a thrust face complementary to and in thrust transmitting relation to said flat face,

an eccentric connected in radially fixed and axially shaftable relation to said shaft having

a radially outward facing cylindrical face in thrust transmitting relation to said cylindrical surface of said support and

a thrust surface on one of its axially opposite sides

complementary to and in thrust transmitting engagement with said flat surface, and

releasable axial thrust transmitting means engaging said shaft and eccentric urging said flat surface into engagement with said thrust surface with sufficient force to prevent rotation of said eccentric relative to said support.

2. The invention of claim 1 wherein said eccentric includes wrench receiving means on its side opposite to said one side thereof.

3. The invention of claim 2 wherein said releasable axial thrust transmitting means includes a nut.

4. The invention of claim 1 wherein said opening is an open ended slot dividing leg portions of said support and further comprising adjustable and releasable tension means interconnecting said leg portions and operable to draw said portions toward one another causing said inward facing cylindrical surface of said support to grippingly engage said outward facing cylindrical face of said eccentric.

5. The invention of claim 4 wherein the width of said slot is greater than the diameter of said shaft and less than the diameter of said inward facing cylindrical surface.

6. The invention of claim 5 wherein said eccentric is axially removable from said shaft in the direction away from said support when said releasable thrust transmitting means is disengaged from said shaft and said tension member is removed from said leg portions.

7. The invention of claim 1 wherein said eccentric is nonrotatably secured to said shaft.

8. The invention of claim 7 wherein said eccentric includes a bore in eccentric relation to said cylindrical face and in close fitting radial engagement with said shaft.

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