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3,072,025

PAVEMENT ROLLER ATTACHMENT FOR GRADING VEHICLE

Filed May 24, 1960

3 Sheets-Sheet 1

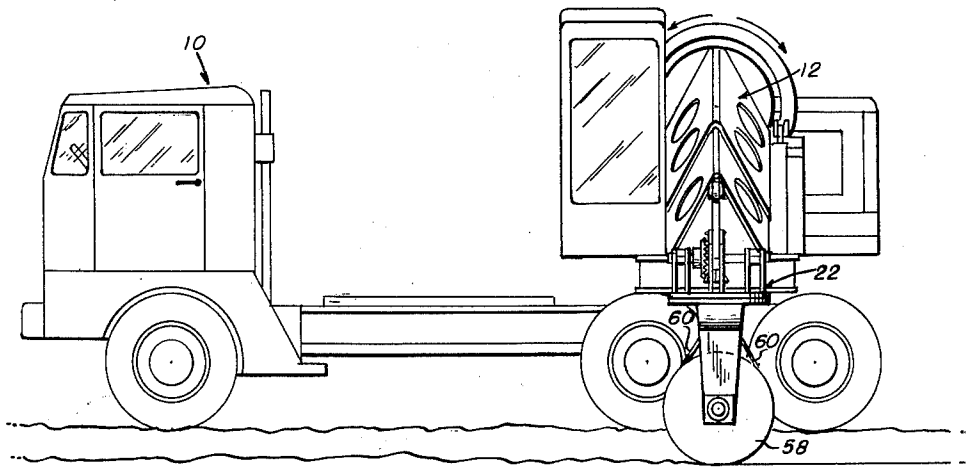


FIG. 1

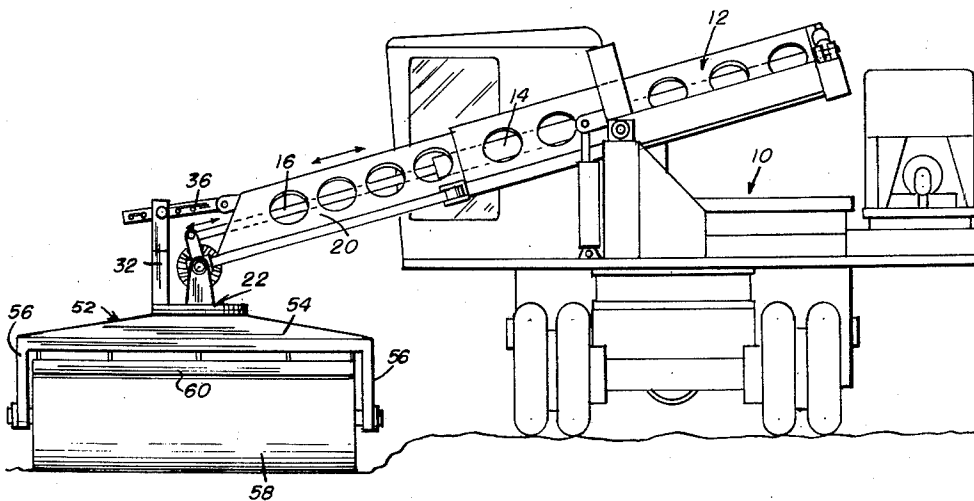


FIG. 2

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3 Sheets-Sheet 2

FIG. 3

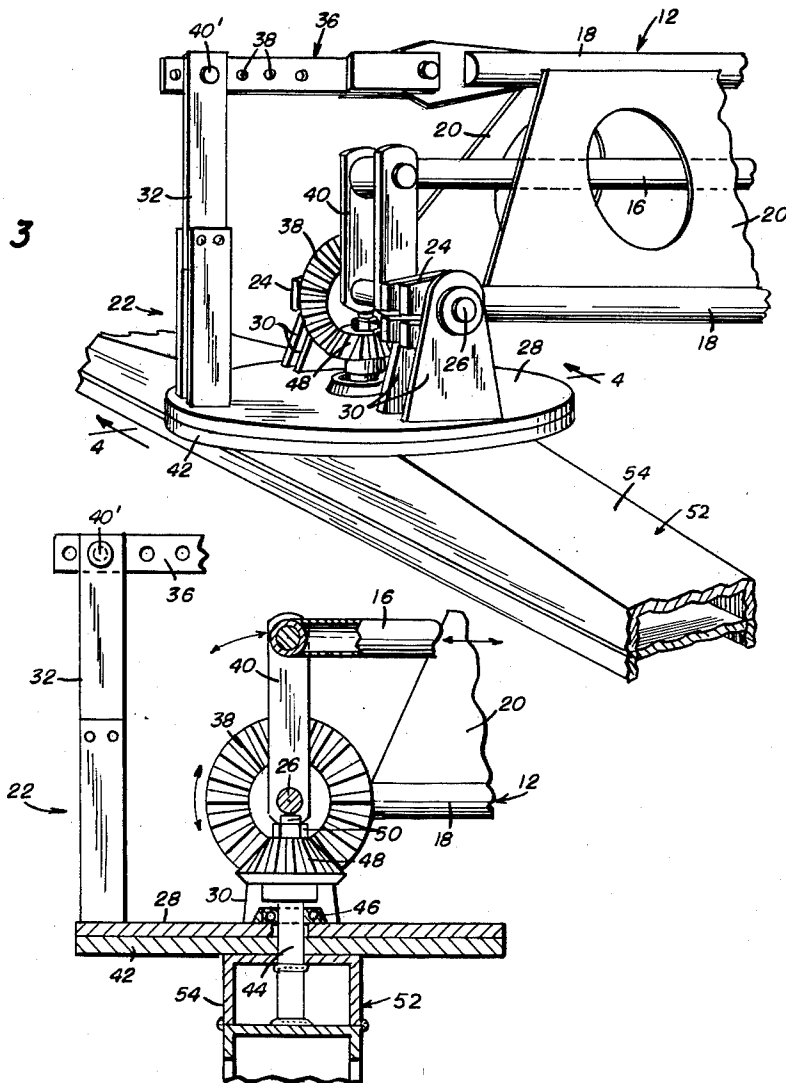


FIG. 4

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3 Sheets-Sheet 3

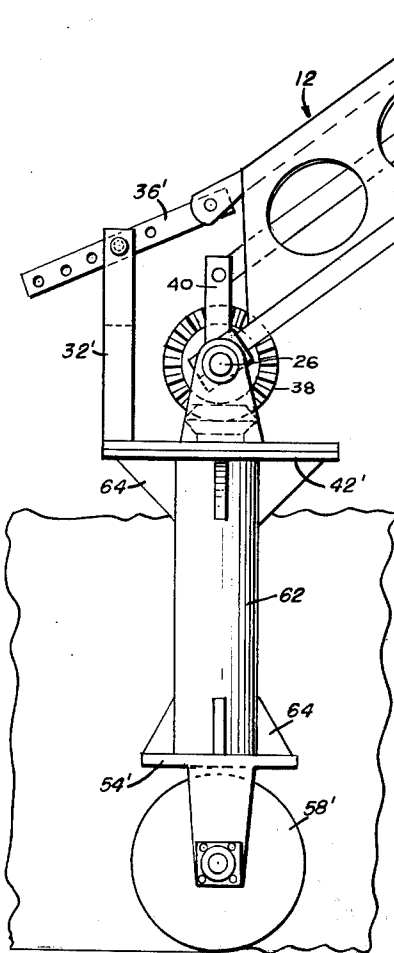


FIG. 5

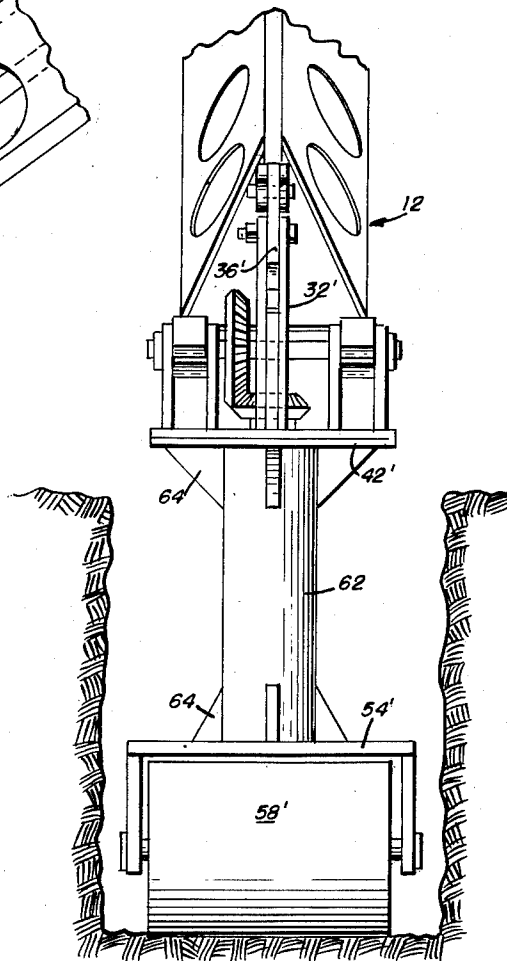


FIG. 6

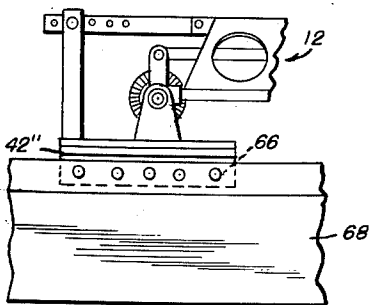


FIG. 7

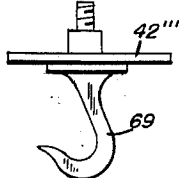


FIG. 8

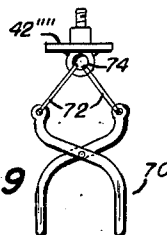


FIG. 9

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PAVEMENT ROLLER ATTACHMENT FOR GRADING VEHICLE

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5 Claims. (Cl. 94-50)

This invention relates to a pavement roller attachment for a grading vehicle having a swingable boom.

More specifically, this invention relates to a roller attachment for the swingable boom of a grading vehicle, said attachment affording new versatility to the vehicle and providing means whereby a paving strip spaced remote from the road and disposed on an incline may be easily rolled.

Heretofore, when it has been desired to compact a paved area spaced from a road, it has been customary to run a conventional roller back and forth over the area. This has made it necessary to make the remote area accessible to the roller itself, often at a great inconvenience. Problems have been compounded in the past when the remote area has been disposed at an incline—presenting a difficult and awkward work area. Because of these difficulties, work done in remote areas has often resulted in a rough pavement.

In a vehicle having an extensible boom mounted thereon, and a powered reciprocable rod mounted adjacent the boom, the present invention is the improvement of means mounting a paving roller at the distal end of the boom. Means are also provided connecting the reciprocable rod and the roller whereby reciprocation of the rod rotates the roller about a vertical axis. Through simple adjustment of the boom and the roller, the roller may be disposed at any angle to the vehicle and at a desired distance from it so that as the vehicle moves along, the remote area engaged by the roller is effortlessly compacted. Pressure exerted by the roller on the pavement may be regulated by the elevation of the boom. When the compacting is complete, the boom with the roller thereon is merely elevated above the pavement and the vehicle moves on to the next work site.

It is therefore an object of the present invention to provide for a vehicle having a swingable boom an attachment adapted to hold adjustably a paving roller remote from the vehicle whereby a remote paving strip disposed at any incline may be easily rolled.

It is a further object of this invention to provide means by which the pressure of a spaced roller as described above may be varied by simple adjustment of the vehicle boom.

It is a further object of the invention whereby the angle of the roller or other attachment may be changed by simple adjustment of power means within the boom.

This invention embodies other novel features, details of construction and arrangement of parts which are hereinafter set forth in the specification and claims, and illustrated in the accompanying drawings, wherein:

FIG. 1 is a side elevation showing an attachment embodying the invention secured to the boom of a grading vehicle;

FIG. 2 is a rear elevation of the apparatus shown in FIG. 1;

FIG. 3 is an enlarged perspective fragmentary view of an attachment embodying the invention;

FIG. 4 is a fragmentary sectional view taken on the line 4-4 of FIG. 3;

FIG. 5 is a fragmentary side elevation showing a modified attachment embodying the invention;

FIG. 6 is a rear elevation of the apparatus shown in FIG. 5;

FIG. 7 is a fragmentary side elevation of another modification of the invention;

2

FIG. 8 is a side elevation of a part of yet another modification of the invention; and

FIG. 9 is a side elevation of a part of still another modification of the invention.

Referring more in detail to the drawings, FIG. 1 shows a conventional grading vehicle 10 having a boom 12 swingably mounted thereon. One such vehicle is described in the U.S. Patent 2,541,045 which issued February 13, 1951 to Ferwerda et al. By conventional means, the boom is adapted to swivel about a vertical axis on the vehicle. It is also adapted to swing about a horizontal axis on the vehicle (see FIG. 2), and to rotate about its own longitudinal axis. As shown in FIG. 2, the boom may be extended in length by means of a telescoping action well known in the art. Mounted within the conventional boom structure is a hydraulic cylinder and piston 14 adapted to extend and retract a reciprocable rod 16 by pressure of hydraulic fluid within the cylinder.

As shown in FIG. 3, the boom 12 is a structure triangular in cross section and comprising three spaced columns 18 having reinforcing plates 20 extending therebetween. The attachment embodying the invention is mounted at the distal end of the boom and is generally designated 22. The preferred attachment comprises a pair of aligned spaced bearings 24 secured respectively to the lower columns 18 of the boom. Through the bearings 24 extends a cross shaft 26. A circular plate 28 is provided which has two spaced apart pairs of spaced upstanding bearings 30. These upstanding bearings 30 are arranged to straddle the bearings 24 respectively at the end of the boom and also receive the shaft 26. By this means the circular plate 28 is swivelly mounted at the distal end of the boom 12.

Adjustable means for stabilizing the plane of the circular plate 30 are provided and comprise an upstanding arm 32 rigidly secured to the forward portion of the plate and having an aperture in the upper end thereof. To the upper column 18 of the outer end of the boom is pivotally secured a link 36. As shown in FIG. 3, the link 36 is formed with a plurality of spaced apertures which may be selectively engaged by a pin 40' extending through the aperture at the top of the rigid arm 32. By selecting the appropriate aperture in the link 36 the disposition of the circular swivel plate may be fixed.

As is well shown in FIGS. 3, 5 and 6, the shaft 26 carries intermediate the bearings 24 a bevel gear 38. Also secured to the shaft are a pair of spaced, rigid, radially extending crank members 40. To the distal ends of the crank members 40 is pivotally connected the distal end of the reciprocable rod 16. As an alternative to the connection shown in FIG. 6, the crank members 40 may be rigidly bolted to the bevel gear 38 eliminating the need to mount rigidly both the crank and the bevel gear on the shaft.

By means of the arrangement shown, reciprocation by the cylinder and piston unit 14 oscillates the bevel gear 38.

A second circular plate 42, of substantially the same dimensions as the first, is disposed under the first plate 28 and adapted to rotate thereagainst. As best shown in FIG. 4, the second plate has a rigidly upstanding stud member 44 which extends through a central aperture in the first circular plate 28. This central aperture may be surrounded by an appropriate bearing 46 rotatably to journal the stud. The upper end of the stud member 44 is reduced and threaded and receives a bevel pinion 48 keyed appropriately and held on the stud by a nut 50. The bevel pinion 48 is disposed in meshing relation with the bevel gear 38, and a gear ratio of about 1:2 exists between the two gears. By means of this structure, rotation of the bevel gear 38 will result directly in twice as rapid rotation of the second plate 42. To facilitate this

rotation, appropriate lubricant may be used between the two plates 28 and 42. As shown in FIGS. 2, 3 and 4, a roller yoke 52 comprising a cross beam 54 is secured to the underside of the second plate 42. This securing may be effected by the weldments of the lower portion of the stud member 44 thereto. The beam 54 may be symmetrically tapered as shown in FIG. 2 and has at its opposite ends respectively a pair of depending arms 56. Suitably journaled between the ends of the depending arms is a pavement roller 58 by conventional shaft and bearing means. As shown in FIG. 2 the pavement roller may be provided with an appropriate scraper blade 60 or the like.

With my versatile device attached to the boom of the conventional grading vehicle as shown in FIGS. 1 and 2, there is literally no position which the pavement roller 58 cannot be made to assume. By the bevel gear means 38-48 of the adjustment in rotation of the second plate on the first, the angle of the roller with respect to the boom can be changed. Similarly, by changing the adjustment between arm 32 and link 36, the angle of the plane of the plate 28 may be altered. Thus it is possible to roll a pavement area remote from the road and inclined at any angle to the vehicle. FIGS. 1 and 2 illustrate the roller 58 engaging a level drain area adjacent the road. However, as can easily be visualized, the area could be inclined and the roller still could accommodate it.

FIGS. 5 and 6 show a modified attachment also embodying the invention. The modification is especially suitable for rolling pavement at the bottom of ditches, trenches, etc. Under this embodiment, suitable spacer means 62 such as a conventional 8 or 10-inch pipe are rigidly secured to the underside of the second plate 42' and to the top of the beam member 54'. The pipe may be of any desired length suitable for work with ditches of given depth. As shown, reinforcing fins or fillets 64 may be used to secure the pipe in position.

Further modifications of the invention are shown in FIGS. 7 through 9. In FIG. 7 a scraper attachment is shown. In this embodiment, rather than a pavement roller, an angle 66 is secured to the underside of the second plate 42''. To this angle is secured the upper end of a scraper member 68. As shown, the scraper member may be slightly concaved forwardly as is conventional.

The modification shown in FIG. 8 comprises a hook 69 rigidly attached or attached by link means (not shown) to the underside of the second plate 42'''. Because it can be rotated to any angle, this hook is especially useful with the additional attachment of my invention.

FIG. 9 shows a clamp attachment comprising a pair of pivoted plier-like members 70 having at their lower ends an openable jaw. To the upper ends of the plier-like members are secured respectively a pair of links 72 and the links are together supported by a single ring 74 in the bottom of a modified second plate 42''''.

Throughout the various embodiments mentioned above the reference numeral used in the showing of the preferred embodiment has been primed or multiple primed to distinguish from the preferred embodiment, but to maintain continuity throughout.

It will be understood by those skilled in the art that the attachment embodying my invention imparts new flexibility and usefulness to a conventional grading vehicle having a swingable boom. Through my invention, it is, among other things, now possible to roll a strip of pavement remote from the road and disposed at literally any angle.

While this invention has been shown in but one form it is obvious to those skilled in the art that it is not so limited but is susceptible of various changes and modifications without departing from the spirit and scope of the claimed invention.

I claim:

1. In a vehicle having a boom swingably mounted thereon, and a reciprocable rod mounted generally longitudinally along said boom and power means mounted adjacent said boom for moving said reciprocable rod, the improvement of a plate pivotally mounted at the distal end of said boom, means between said boom and said plate for holding said plate in adjusted position with respect to said boom, a second plate disposed under and adapted to rotate against said first plate, said second plate having spaced depending arms between which is journaled a pavement roller, and rotatable means operatively connecting said reciprocable rod and said second plate, whereby reciprocation of said rod rotates said second plate and roller as a unit.

2. In a vehicle having a boom swingably mounted thereon, and a reciprocable rod mounted on said boom and power means mounted adjacent said boom for moving said reciprocable rod, the improvement of a plate adjustably mounted at the distal end of said boom, means between said boom and said plate for holding said plate in adjusted position with respect to said boom, a second plate disposed under said first plate and adapted to rotate against said first plate, said second plate having spaced depending arms between which is journaled a pavement roller, and rotary means operatively connecting said reciprocable rod and said second plate, whereby reciprocation of said rod rotates said second plate to change the angle of said roller and said arms mounting the same with respect to said vehicle.

3. In a vehicle having a boom swingably mounted thereon, and a reciprocable rod mounted on said boom with power means mounted adjacent said boom for moving said reciprocable rod, the improvement of a pair of spaced aligned bearings secured to the distal end of said boom, a shaft extending through the bearings, a plate having a second pair of bearings extending upward therefrom and receiving said shaft, whereby said boom and said plate are swivelly related, means attached to said boom and said plate to fix adjustably the swivel of said plate, a bevel gear secured to said shaft, a crank arm carried by said shaft and in fixed relation to said bevel gear, said crank arm having its distal end secured to said reciprocable rod, a second plate disposed under said first plate and adapted to rotate thereagainst, said second plate having a rigidly mounted upstanding stud extending through a central aperture in said first plate and carrying on its upper end a second bevel gear disposed in meshing relation with said first bevel gear, whereby reciprocation of said rod rotates said second plate, said second plate having secured thereunder a cross beam having spaced depending arms between which is journaled a pavement roller.

4. In a vehicle having a boom swingably mounted thereon, and a reciprocable rod mounted on said boom with power means mounted adjacent said boom for moving said reciprocable rod, the improvement of a pair of spaced aligned bearings secured to the distal end of said boom, a shaft extending through the bearings, a plate having a second pair of bearings extending upward therefrom and receiving said shaft, whereby said boom and said plate are swivelly related, adjusting means to fix adjustably the swivel of said plate, said adjusting means comprising an arm rigidly secured to said plate and having a pin on the outer end thereof and a link connected to said boom and having a plurality of spaced holes therein, said pin selectively engaging in one of said holes, a bevel gear secured to said shaft, a crank arm carried by said shaft and in fixed relation to said bevel gear, said crank arm having its distal end secured to said reciprocable rod, a second plate disposed under said first plate and adapted to rotate thereagainst, said second plate having a rigidly mounted upstanding stud extending through a central aperture in said first plate and carrying on its upper end a second bevel gear disposed in meshing rela-

5

tion with said first bevel gear, said second plate having secured thereunder a cross beam having spaced depending arms between which is journaled a pavement roller whereby reciprocation of said rod rotates said roller about a vertical axis to change the angle of said roller with respect to said vehicle.

5. In a vehicle having a boom swingably mounted thereon, and a reciprocable rod mounted within said boom to extend longitudinally therewith and power means mounted adjacent said boom for moving said reciprocable rod, the improvement of a pair of spaced aligned bearings secured to the distal end of said boom, a shaft extending through the bearings, a plate having a second pair of bearings extending upward therefrom and receiving said shaft, whereby said boom and said plate are swivelly related, adjusting means connected between said boom and said plate to fix the swivel of said plate,

6

a bevel gear secured to said plate and having a crank arm fixed thereto, said crank arm having its distal end secured to said rod, a second plate disposed under said first plate and adapted to rotate thereagainst, said second plate having a rigidly mounted upstanding stud extending through a central aperture in said first plate and carrying on its upper end a second bevel gear disposed in meshing relation with said first bevel gear, whereby reciprocation of said rod rotates said second plate, said second plate being adapted to carry a tool.

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2,386,025	Wills -----	Oct. 2, 1945
2,962,950	Martin -----	Dec. 6, 1960