

Aug. 29, 1967

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3,338,315

SOIL PACKER AND PULVERIZER

Filed March 22, 1965

2 Sheets-Sheet 1

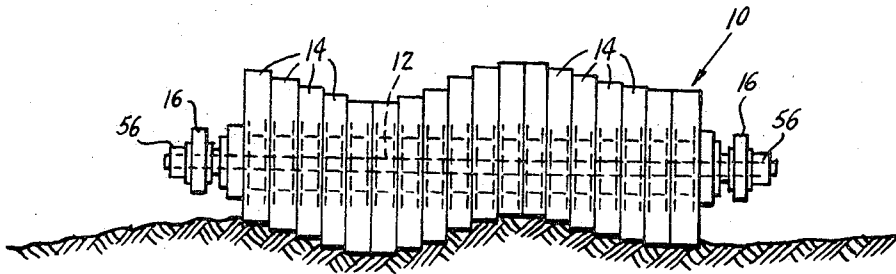


FIG. 1

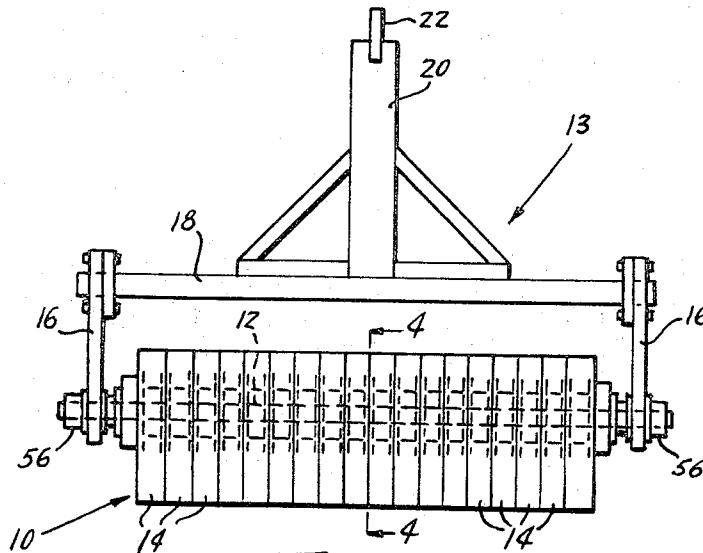


FIG. 2

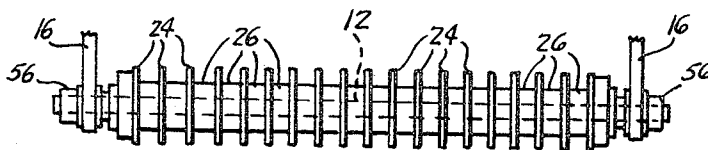


FIG. 3

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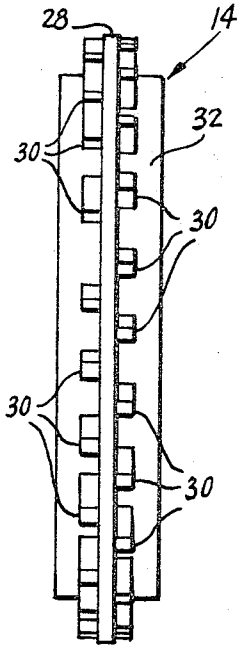


FIG. 6

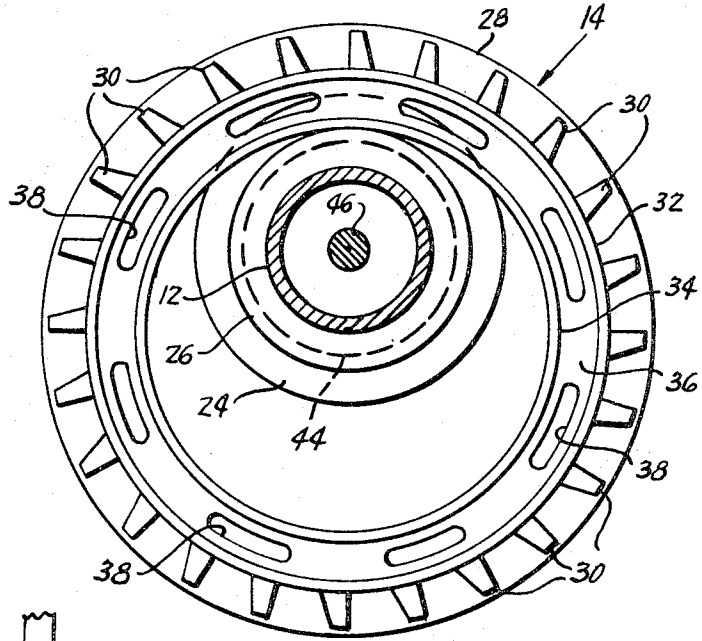


FIG. 4

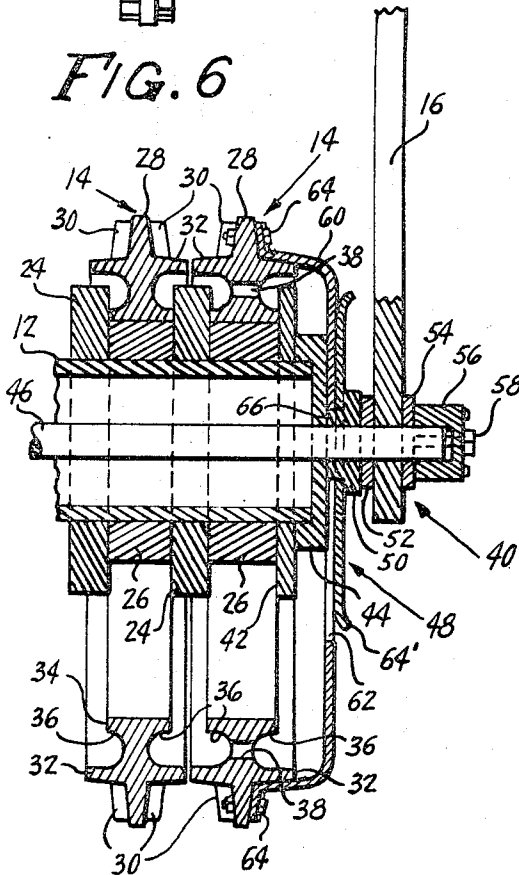


FIG. 5

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SOIL PACKER AND PULVERIZER

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ABSTRACT OF THE DISCLOSURE

A soil packer and pulverizer including a frame carrying a transverse axle, a plurality of rings loosely mounted on the axle in close lateral juxtaposition, each ring having an inner and an outer flange forming an I beam cross section, and spacer rings and resilient inserts on the axle mounting the rings for vertical movement so that the outer flange closely follows the earth's contour.

This invention relates to an improved earth working roller unit for pulverizing and packing soil.

While various types of earth working pulverizers have been known in the prior art, it has been found that rapid wear occurs on the inside of the device because of the metal-to-metal contact of the interior working parts as well as the accumulation of abrasive substances, such as dirt or sand.

The primary object of this invention is to provide an earth pulverizing device capable of sustaining long periods of extensive use without undue abrasive wear.

Another object of this invention is to provide an earth pulverizing device so arranged as to minimize the accumulation of abrasive substances in the interior of the device.

It is a more specific object of the invention to provide resilient bearing surface in the interior of the device to minimize destructive metal-to-metal wear.

Still another specific object of this invention is to provide an earth pulverizing device equipped with resilient bearing means therein and arranged to minimize the accumulation of abrasive substances therein.

A further object of this invention is to provide an earth pulverizing device having independently vertically moveable pulverizing rings which are horizontally stable.

Further advantages and objects reside in the combinations of elements, arrangements of parts, and features of construction and operation, all as will be more fully pointed out hereafter and disclosed in the accompanying drawings wherein there is shown a preferred embodiment of this inventive concept.

In the drawing:

FIGURE 1 is a rear view of this invention showing its operation over an undulating surface;

FIGURE 2 is a plan view of the device of FIGURE 1;

FIGURE 3 is a view similar to that of FIGURE 2 but with certain parts broken away for clarity;

FIGURE 4 is an enlarged sectional view taken along line 4-4 of FIGURE 2;

FIGURE 5 is an enlarged sectional view showing details of the mounted pulverizer rings and details of the connection of the main shaft with a draft means; and

FIGURE 6 is an end view of one of the pulverizer rings showing the configuration of the ground contacting teeth.

Referring now to FIGURES 1 and 2 the earth pulverizing device, shown generally at 10, comprises a transverse shaft 12 on which are loosely mounted a plurality of ground engaging pulverizer rings 14. Shaft 12 is journaled in a hitch means shown generally at 13 which comprises a pair of side or draft members 16 which are rigidly attached to a transverse member 18 on which is rigidly mounted a tow bar 20 and clevis 22. As more fully described hereafter pulverizer rings 14 are arranged to allow independent vertical movement to provide a device capa-

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ble of engaging an undulating surface throughout its width.

FIGURE 3 shows a portion of the device of FIGURE 2 with pulverizer rings 14 removed. Mounted alternately along the lateral extent of main shaft 12 are a series of spacing rings 24 and resilient bearing inserts 26. As more fully described hereafter the spacing rings 24 provide horizontal stability to the pulverizing rings 14 assuming that the working surface of the ring 14 is in its proper location and preventing side sway of the device.

Referring now to FIGURES 4-6 the pulverizer ring 14 is cast to include a central upstanding ring 28 on both sides of which are laterally mounted a series of staggered teeth 30 which abut an outer flange 32 and are formed integrally therewith. An inner flange 34 of lesser width than outer flange 32 is connected to the outer flange 32 by a control connecting web 36 in which are formed a series of slots 38. One feature of this arrangement is that the series of staggered teeth provides an improved clod breaking capability over prior art devices.

It is inevitable in an earth working device of this type that some dirt and dust will find its way into the interior. The I-beam type cross section of the pulverizer wheel acts to provide an area for such dirt to collect thus minimizing abrasion between the raceway of flange 34 and the bearing surface of resilient bearing 26. Slots 38 allow a large accumulation in one area to be expelled into an adjacent area which tends to minimize abrasion in any one spot, thus tending to promote the useful life of all pulverizer rings 14.

As shown in FIGURES 4 and 5 the diameter of inner flange 34 is much larger than that of main shaft 12 which allows the rings 14 to move independently vertically assuring that the outer edge of ring 14 closely follows ground contours. Resilient bearings 26, which may be of any resilient material but are preferably made of a silicon rubber, engage the raceway of flange 34 to provide a more efficient rolling action than provided by prior art devices. Although inserts 26 may be fixedly secured to main shaft 12, it has been found desirable to provide a sliding fit. This insures bearing action between the outer surface of bearing 26 and flange 34 and bearing action between the inner surface of bearing 26 and shaft 12. A slidable fit will also insure a slow rotation of the bearing member which tends to distribute wear along its entire circumference rather than at a few small points.

Spacing rings 24 which preferably have a close sliding fit on shaft 12 but which may be fixed thereto have an annular width sufficient to extend past flange 34 but short of flange 32 when bearing 26 engages the raceway of flange 34. Such an arrangement provides horizontal stability for the loosely mounted ring 14 since any potential sway by the ring creates a binding action between ring 24 and shaft 12, thereby ensuring that the working elements 30 of ring 14 are efficiently oriented with respect to the working surface.

Slidably mounted spacing rings 24 and bearings 26 are confined to an appropriate width and shaft 12 is journaled in side members 16 by the bearing and hub arrangement shown generally at 40. A lateral end plate 42 is slidably mounted on shaft 12 remote from the end thereof and abuts the outermost bearing 26. In turn an end cap closes the end of hollow shaft 12 and provides a central aperture 44 through which bearing shaft 46 extends. As will be more fully explained hereafter a dirt shield generally shown at 48 is mounted upon bearing shaft 46. A spacer 50 and bearing 52 are provided between draft member 16 and dirt shield 48. A bearing 54, hub cap 56 and bolt 58 act rotatably to secure bearing shaft 46 to draft member 16. Thus it is seen that the draft arm 16 may be moved in a horizontal direction allowing the pul-

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verizer ring 14 to rotate freely and move in a vertical direction.

Dirt shield 48 comprises an annular member 60 having a large aperture 62 therein affixed to the outermost pulverizing ring 14 by bolts 64 or the like. A closing plate 64 is situated inside the bearing 50 and is provided with an enlarged control plug 66 fixedly secured thereto which is tightly slidably or fixedly mounted on shaft 46. Thus it is seen that the outer ends of the device 10 are equipped with a dirt shield that substantially prevents the entry of dirt thereinto. The vertical movement of the outermost pulverizing ring 14 is always such that the aperture 62 is continually closed by closing plate 64.

From the foregoing it will be seen that there is provided an improved earth pulverizer, which accomplishes all the objects of the invention and others, including many advantages of practical utility and commercial importance.

As many embodiments may be made within this inventive concept, and as many modifications may be made in the embodiment hereintofore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative, and not in a limiting sense.

I claim:

1. An earth working pulverizer for pulverizing and compacting soil comprising a main transverse member having two ends, resilient bearing means on said transverse member presenting a substantially cylindrical surface having a diameter and a plurality of pulverizing rings

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having central apertures substantially larger than the diameter of said bearing means, and means for confining said pulverizing rings between the ends of said transverse member, each said pulverizing ring comprising an outer circumferential flange having earth working means mounted thereon, an inner circumferential flange spaced inwardly from said outer flange and a central upstanding web connecting said flanges, and said bearing means comprising a plurality of spaced apart resilient bearings positioned adjacent said inner flange and spacing ring means positioned in the spaces between said bearings for intermittently engaging an edge of said inner flange.

2. The device of claim 1 wherein said outer flange is of greater width than said inner flange.

3. The device of claim 1 wherein said earth working means include an outwardly extending control rib having a plurality of staggered teeth mounted laterally thereof.

4. The device of claim 3 wherein said central upstanding web is formed with a plurality of slots.

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