ABSTRACT OF THE DISCLOSURE

This disclosure provides a vibratory road roller including a roller drum having transversely disposed walls located adjacent the ends thereof. Housing sections rotatably mounted in a double bearing arrangement have relatively large diameters and therefore effectively reduce the surface stress caused by forces generated by the rotating eccentric weights mounted thereon.

BACKGROUND OF THE INVENTION

Prior art road rollers include shafts or axles rotatably mounted in a transverse wall of a roller drum. These prior art shafts are continuous one piece structures and carry the weight of the eccentric weights. In addition, these shafts directly bear the vibratory forces thereon through end bearings located at either end of the shafts. This prior art structure requires end bearings having relatively large dimensions where there are relatively large vibratory forces being established in the roller road. That is, with only two bearings located at each end of the continuous shaft, structural limitations necessarily imposed restrictions on the amount of vibration force which might be used.

PURPOSE OF THE INVENTION

The primary object of this invention is to provide a vibratory road roller structure including eccentric weights which generate forces which may be relatively large and are more evenly distributed over the roller drum of the apparatus than in known road rollers.

Another object of this invention is to provide a vibratory road roller having a vibration generating shaft which may revolve at a higher rate of speed with standard load values thereby achieving a considerable increase in efficiency with respect to the vibratory effect of the roller drum.

A still further object of this invention is to provide a road roller drum which carries independent shaft end sections on a double bearing arrangement. Each of these independent shaft end sections is connected by way of a stub shaft section to effect the turning of the eccentric weights within a housing structure.

SUMMARY OF THE INVENTION

The vibratory road roller of this invention includes a roller drum having transverse walls located adjacent each end thereof. The vibration generating shaft assembly of this road roller includes independent shaft end sections rotatably mounted in a double bearing arrangement within an opening provided in the transverse walls. Each of the shaft end sections carries an eccentric weight and is connected to the other by a stub shaft section. The independent shaft end sections of the vibration generating shaft assembly have relatively large diameters and therefore effectively reduce the surface stress caused by forces generated by the rotating eccentric weights mounted thereon.

BRIEF DESCRIPTION OF DRAWINGS

Other objects of this invention appear in the following description and appended claims, reference being made to the accompanying drawing which forms a part of this specification.

The sole figure in this application is a cross-sectional view of a road roller made in accordance with this invention.

DESCRIPTION OF SPECIFIC EMBODIMENT

The trailer roller generally designated 1 is a specific embodiment of a road roller made in accordance with this invention. This roller 1 includes a drum 2 having transverse walls 3 and 4. The transverse walls 3 and 4 are adjacent the ends of the drum 2 and have bearing housings 5 fixedly attached thereto. A bearing 6 is mounted at the outer side of eccentric weight 11 within each housing 5. The bearing 6 in this specific embodiment is a cylindrical roller bearing but it is obvious that other types of bearings might be used in the construction of a road roller made in accordance with this invention. Another bearing member 8 is mounted in a cover 7 which is attached to the inner side of each housing 5.

A vibration generating shaft assembly, generally designated 9, includes independent shaft sections 10 and 10b which rotate in the bearings 6 and 8. The eccentric weights 11 are fixedly mounted on shaft sections 10 and 10b and are located between the bearings 6 and 8. Each of the shaft sections 10 and 10b is thereby rotatably mounted in bearings 6 and 8 on each side of the eccentric weights 11. The independent shaft sections 10 and 10b which are mounted in the housings 5 are connected by a stub shaft 12. As shown, the shaft sections 10 and 10b have relatively large diameters to effectively reduce the surface stress caused by the forces generated by the rotating eccentric weights 11. The shaft and sections 10 and 10b have a substantially larger diameter than the stub shaft 12. In this specific embodiment, the stub shaft 12 passes through a bore located in the shaft section 10b. One end of the stub shaft 12 engages a wedge-shaped engagement projection 13. A boss 14 is fixedly mounted on the other end of the shaft 12. A screw pin 15 fixedly attaches the boss 14 to the shaft section 10b. The stub shaft section 12 rotates with the shaft sections 10 and 10b which turn within the bearings 6 and 8. The shaft section 10 includes a journal pin 10a which projects outwardly from the frame section 17. A drive pulley 16 is fixedly mounted to the journal pin 10a. This drive pulley 16 may be a toothed disk. Retaining rings 18 are fixedly mounted on the frame section 17. Each of the housings 5 are rotatably mounted in the retaining rings 18 by way of the bearings 19. Each retaining ring 18 is sealed off from its associated housing 5 by packing rings 20 and 21.

As is apparent from the drawings, each of the shaft sections 10 and 10b carries one of the eccentric weights 11 and bearings 6 and 8 and has a substantially larger diameter that is approximately double the diameter of the connecting stub shaft section 12. As shown, the sub-
stantially larger diameter of each shaft section 10 and 10b extends beyond both sides of the bearings 6 and 8 for each of the eccentric weights 11. It is through this structure that the bearings 6 and 8 will be made large enough for the eccentric weights 11. Because of the size differential between the end sections 10 and 10b and the connecting shaft 12, it is possible for the eccentric weights 11 to be much larger and heavier and operate within essentially lower specific surface loads than has been achieved in the prior art. It is further a result of such a relationship that the eccentric weights 11 may be rotated at a much higher speed while the wear associated with the operation of the various parts is effectively avoided. It is further apparent in the drawings that this specific embodiment shows the shaft end sections 10 and 10b to have substantially the same diameters as well as having the size relationship existing between the shaft end sections 10 and 10b and the connecting stub shaft section 12.

In another embodiment of this invention, additional bearings may be provided between the ends of the drum 2 to generate larger forces with the vibration generating shaft 9. This embodiment contemplates the use of another transverse wall 22 located within the drum 2. A bearing housing 23 is secured to the transverse wall and contains two bearings 24 and 25 to provide additional support to the independent stub shaft section 12. This additional support clearly enables larger forces to be generated by the shaft assembly.

The specific embodiments as described hereinabove contemplate the use of a stub shaft section 12 that is easily removable from one end of the drum 2. The removal of this shaft 12 is easily effected by detaching the boss 14 from the shaft section 10b by disengaging the screws 15.

Another embodiment of this invention contemplates the use of a shaft that extends between splined sockets located on the inner ends of the shaft sections 10 and 10b. In other words, both shaft sections 10 and 10b may have a structure which includes a projection such as the boss 13 as illustrated in the drawing.

While the vibratory road roller has been shown and described in detail, it is obvious that this invention is not to be considered as being limited to the exact form disclosed, and that changes in detail and construction may be made therein without the scope of the invention, without departing from the spirit of the invention.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. In a road roller in which vibratory forces are generated, the combination comprising:
   (a) a vibration generating shaft assembly having a rotatable shaft means coaxially mounted within a roller drum,
   (b) said shaft assembly including at least one eccentric weight rotatably mounted in each end of the roller drum and a bearing means located on each side of each eccentric weight,
   (c) a separate housing located at each end of the roller drum to enclose said eccentric weights and said bearing means,
   (d) said rotatable shaft means including separate shaft end sections and a connecting stub shaft section which interconnects the shaft end sections,
   (e) each said shaft end section carrying one of the eccentric weights and having a substantially larger diameter than the stub shaft section,
   (f) at least one of the shaft end sections including a bore through which the stub shaft section penetrates,
   (g) said stub shaft section being fixedly attached to each shaft end section.

2. In a road roller in which vibratory forces are generated, the combination comprising:
   (a) a vibration generating shaft assembly having a rotatable shaft means coaxially mounted within a roller drum,
   (b) said shaft assembly including at least one eccentric weight rotatably mounted in each end of the roller drum and a bearing means located on each side of each eccentric weight,
(c) a separate housing located at each end of the roller drum to enclose said eccentric weights and said bearing means,
(d) said rotatable shaft means including separate shaft end sections and a connecting stub shaft section which interconnects the shaft end sections,
(e) each said shaft end section carrying one of the eccentric weights and the bearing means and having a substantially larger diameter than the connecting stub shaft section,
(f) said shaft end sections having substantially the same diameters,
(g) said substantially larger diameter extending both sides of the bearing means for each eccentric weight.

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