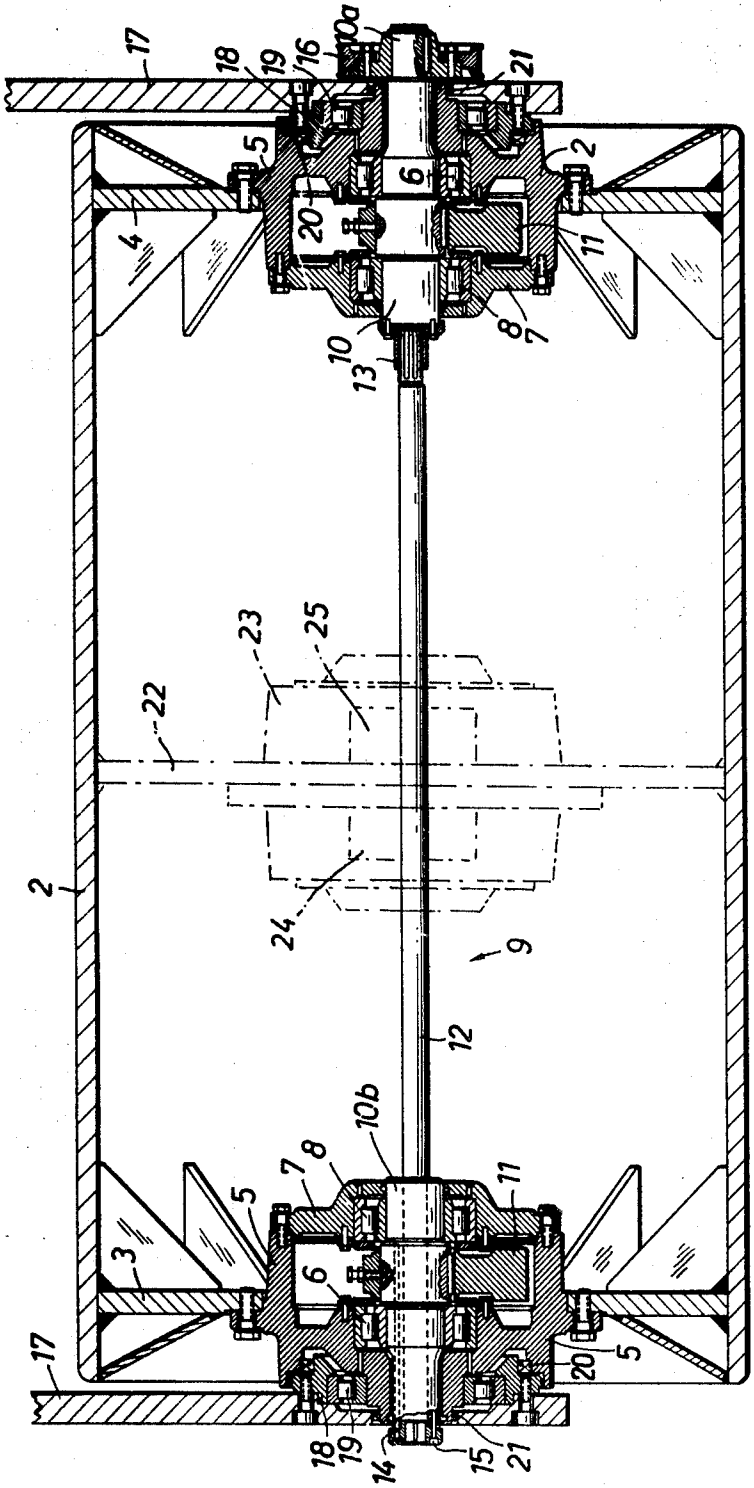
Sept. 20, 1971 B. KALTENEGGER 3,605,584

VIBRATORY ROAD ROLLER

Filed March 19, 1969



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United States Patent Office 3,605,584 Patented Sept. 20, 1971

3,605,584

VIBRATORY ROAD ROLLER

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Filed Mar. 19, 1969, Ser. No. 808,497
Claims priority, application Germany, Mar. 22, 1968, K 60,719
Int. Cl. E01c 19/28
U.S. Cl. 94—50R 6 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure provides a vibratory road roller including a roller drum having transversely disposed walls located adjacent the ends thereof. Housings are fixedly mounted within centrally located openings of the transversely disposed walls. A short shaft extends coaxially through each of the housings and are rotatably mounted therein. An eccentric weight is mounted on each of the coaxially located shafts within the housings. Bearing members located on each side of the eccentric weights rotatably support the short shaft sections. A stub shaft section interconnects the short shaft sections with each other to effect movement in response to the means for driving the said road roller.

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 road roller. 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 then interconnected 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 thereby 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 **10*b*** which rotate in the bearings **6** and **8**. The eccentric weights **11** are fixedly mounted on shaft sections **10** and **10*b*** and are located between the bearings **6** and **8**. Each of the shaft sections **10** and **10*b*** is thereby rotatably mounted in bearings **6** and **8** on each side of the eccentric weights **11**. The independent shaft sections **10** and **10*b*** which are mounted in the housings **5** are connected by a stub shaft **12**. As shown, the shaft sections **10** and **10*b*** 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 **10*b*** 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 **10*b***. 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 **10*b***. The stub shaft section **12** rotates with the shaft sections **10** and **10*b*** which turn within the bearings **6** and **8**. The shaft section **10** includes a journal pin **10*a*** which projects outwardly from the frame section **17**. A drive pulley **16** is fixedly mounted to the journal pin **10*a***. 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 **10*b*** 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 **10***b* 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 **10***b* 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 **10***b* to have substantially the same diameters as well as having the size relationship existing between the shaft end sections **10** and **10***b* 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 **9**.

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 **10***b* 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 **10***b*. In other words, both shaft sections **10** and **10***b* 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 within the scope of the invention, without departing from the spirit thereof.

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, and

(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) one of the shaft end sections including a journal portion projecting to one side of the road roller,

(g) said road roller having a drive means including a drive wheel means located on the journal portion.

3. 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, and

(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, and

(f) frame sections are disposed adjacent each end of the roller drum and are rotatably mounted on respective housings.

4. 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, and

(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 that is approximately double the diameter of the connecting stub shaft section,

(f) said substantially larger diameter extending beyond both sides of the bearing means for each eccentric weight.

5. In a road roller as defined in claim **4** wherein said shaft assembly includes support means located intermediate the ends of the rotatable shaft means between the separate housings to provide additional support for generating relatively large vibration forces with the eccentric weights.

6. 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, and

(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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U.S. Cl. X.R.

94—50V