

PATENT SPECIFICATION

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(54) IMPROVEMENTS RELATING TO VIBRATING ROLLERS

(71) We, FLEXIBLE DRIVES (GILMANS) LIMITED, a British Company of Skataskalo Works, Millers Road, Warwick, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described, in and by the following statement:—

This invention relates to vibrating rollers.

For compacting soil and more especially road construction material it has been found that a roller which is vibrated as it rolls is more effective than a roller which depends solely on weight.

In known vibrating rollers an out-of-balance shaft extending axially through the roll is driven independently of the roll which is supported from the frame by flexible mountings to eliminate or reduce the transmission of vibrations to the frame.

According to our invention a vibrating roller comprises a roll, a frame, a motor mounted on the frame, and a disc which is rotatably mounted in the frame, is driven by the motor and is coupled by flexible means to the adjacent end of the roll, the flexible means suspending the driven end of the roll from the frame.

The said flexible means serve both to transmit the drive from the disc to the roll and to isolate the frame from the vibrations imparted to the roll.

Preferably the frame comprises a cross-piece and two side members each extending adjacent one end of the roll, the non-driven end of the roll being mounted in a bearing suspended by flexible means from the adjacent side member of the frame.

The flexible means at either end of the roll may comprise rubber or like pads angularly spaced around the end of the roll or a continuous ring of flexible material.

The roll may be driven by a hydraulic motor which drives a pinion meshing with an internal ring gear on the disc.

The vibrations are preferably imparted to the roll by an out-of-balance shaft extending axially through the roll in which it is mounted

in anti-friction bearings, the shaft being driven by a belt or by any other convenient means.

One embodiment of our invention is described by way of example and illustrated in the accompanying drawings, in which:—

Figure 1 is diagrammatic front view of a vibrating roller according to our invention; and

Figure 2 is an enlarged section through the roll and frame of the roller only.

Figure 1 shows diagrammatically an internal combustion engine 10 which is mounted on the cross-piece of the frame 11 of a roller and which drives an hydraulic pump 12 and also drives a countershaft 13 through a clutch 14. A belt 15 transmits drive from a pulley 16 on the free end of the countershaft 13 to a vertically aligned pulley 17 (see Figure 2) on the extended end of an out-of-balance shaft 18 which is mounted in bearings 19 axially located in the end members 20, 21 of the roll 22, the extended end of the shaft 18 projecting through the adjacent side member of the frame 11. The clutch 14 allows the drive to the shaft 18 to be interrupted so that the roller can be used with or without vibration. The cross-piece of the frame 11 is of substantial depth and incorporates two tanks 23, 24, one for hydraulic fluid and the other for water for spraying on the roll 22.

The hydraulic pump 12 supplies fluid under pressure to a hydrostatic motor 25 mounted on the side member of the frame 11 through which the shaft 18 projects. The motor 25 drives a pinion 26 which meshes with an internal ring gear 27 on a disc 28 which is rotatably mounted on the side member of the frame 11 and which is coupled by angularly spaced rubber or like pads 29 to the adjacent end member 20 of the roll 22. The other end member 21 of the roll 22 is mounted in a bearing 31 supported by angularly spaced flexible mountings 32 secured to the adjacent side member of the frame 11. A cover plate 33 is fixed over the hydrostatic motor 25.

The disc 28 has a hub 34 projecting outwardly towards the side member of the frame 11 and surround-

ing the extended end of the shaft 18. A roller bearing 35 works between the outside of the hub 34 and a bearing housing 36 projecting inwardly from the side member of the frame 11. A resilient ring 37 is inserted between the end of the housing 36 and the disc 28.

The rubber pads 29 are shown as rubber in shear bonded between two discs 38 which have outwardly projecting spigot portions 39 which co-operate with complementary openings in the driving disc 28 and in the end member 20 of the roll 22, i.e. the rubber pads 29 are simply trapped between the driving disc 28 and the roll 22. The rubber pads may be retained in position by any other convenient means or alternatively the pads may be replaced by a continuous ring of flexible material. Similarly the angularly spaced flexible mountings 32 on the non-drive side of the roll may be replaced by a flexible ring mounting.

It will be noted that the end members 20, 21 of the roll 22 are set in from the actual ends of the roll 22 so that the flexible mountings between the frame and the roll can be contained inside the roll. On the non-drive end of the roll 22 the side member of the frame 11 is joggled inwardly so that the lower portion of this side of the roll is completely clear thus allowing the roll to be used close up to an obstruction such as a kerb.

WHAT WE CLAIM IS:—

1. A vibrating roller comprising a roll, a frame, a motor mounted on the frame, and a disc which is rotatably mounted in the frame, is driven by the motor and is coupled by flexible means to the adjacent end of the roll, the flexible means suspending the driven end of the roll from the frame.

2. A vibrating roller as claimed in claim 1 in which the frame comprises a cross-piece and two side members each extending adjacent

one end of the roll, the non-driven end of the roll being mounted in a bearing suspended by flexible means from the adjacent side member of the frame.

3. A vibrating roller as claimed in claim 1 or claim 2 in which the flexible means for coupling the driving disc to the roll comprises rubber or like pads angularly spaced around the disc.

4. A vibrating roller as claimed in claim 1 or claim 2 in which the flexible means for coupling the driving disc to the roll comprises a continuous ring of flexible material.

5. A vibrating roller as claimed in any of the claims 1 to 4 in which the motor drives a pinion meshing with an internal ring gear on the disc.

6. A vibrating roller as claimed in any of the claims 1 to 5 in which the roll is vibrated by an out-of-balance shaft extending axially through the roll and mounted in bearings in the ends of the roll.

7. A vibrating roller as claimed in claim 6 in which the drive to the vibrating shaft and the roll drive are both located on the same end of the roller so that the non-driven end of the roll is clear.

8. A vibrating roller as claimed in any of the claims 1 to 7 in which the frame is provided with tanks for hydraulic fluid and water.

9. A vibrating roller as claimed in any of the claims 1 to 8 in which the motor is a fluid pressure motor.

10. A vibrating roller substantially as described with reference to the accompanying drawings.

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The rubber pads 29 are shown as rubber in shear bonded between two discs 38 which have outwardly projecting spigot portions 39 which co-operate with complementary openings in the driving disc 28 and in the end member 20 of the roll 22, i.e. the rubber pads 29 are simply trapped between the driving disc 28 and the roll 22. The rubber pads may be retained in position by any other convenient means or alternatively the pads may be replaced by a continuous ring of flexible material. Similarly the angularly spaced flexible mountings 32 on the non-drive side of the roll may be replaced by a flexible ring mounting.

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WHAT WE CLAIM IS:—

1. A vibrating roller comprising a roll, a frame, a motor mounted on the frame, and a disc which is rotatably mounted in the frame, is driven by the motor and is coupled by flexible means to the adjacent end of the roll, the flexible means suspending the driven end of the roll from the frame.

2. A vibrating roller as claimed in claim 1 in which the frame comprises a cross-piece and two side members each extending adjacent

one end of the roll, the non-driven end of the roll being mounted in a bearing suspended by flexible means from the adjacent side member of the frame.

3. A vibrating roller as claimed in claim 1 or claim 2 in which the flexible means for coupling the driving disc to the roll comprises rubber or like pads angularly spaced around the disc.

4. A vibrating roller as claimed in claim 1 or claim 2 in which the flexible means for coupling the driving disc to the roll comprises a continuous ring of flexible material.

5. A vibrating roller as claimed in any of the claims 1 to 4 in which the motor drives a pinion meshing with an internal ring gear on the disc.

6. A vibrating roller as claimed in any of the claims 1 to 5 in which the roll is vibrated by an out-of-balance shaft extending axially through the roll and mounted in bearings in the ends of the roll.

7. A vibrating roller as claimed in claim 6 in which the drive to the vibrating shaft and the roll drive are both located on the same end of the roller so that the non-driven end of the roll is clear.

8. A vibrating roller as claimed in any of the claims 1 to 7 in which the frame is provided with tanks for hydraulic fluid and water.

9. A vibrating roller as claimed in any of the claims 1 to 8 in which the motor is a fluid pressure motor.

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