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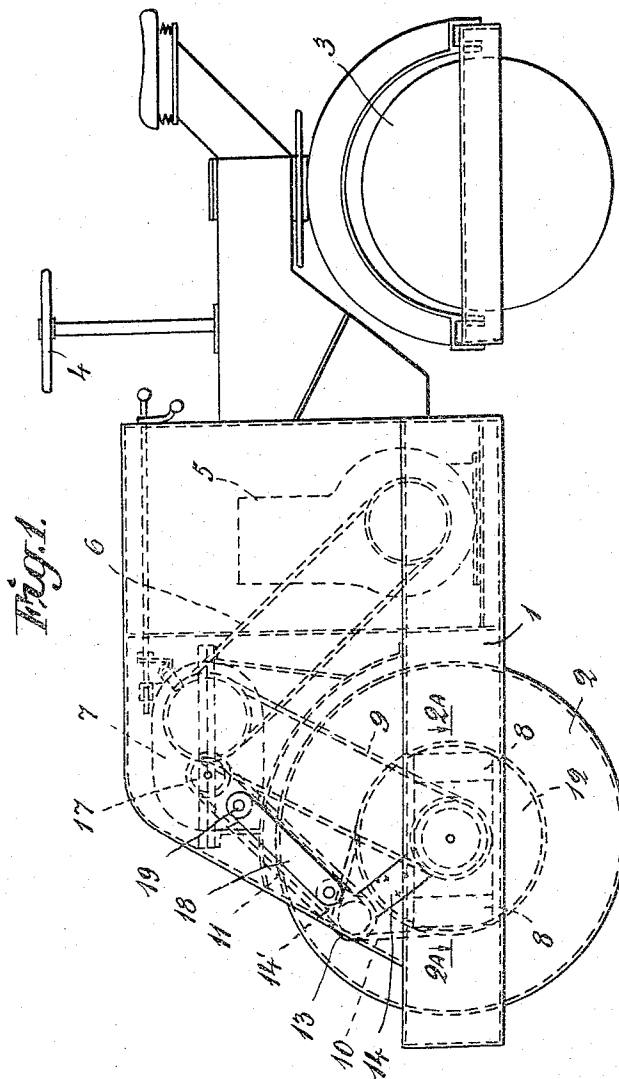
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2,873,656

CHAIN DRIVE FOR VIBRATING PLANING ROLLERS

Filed Nov. 22, 1954

2 Sheets-Sheet 1



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Fig. 2A.

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CHAIN DRIVE FOR VIBRATING PLANING ROLLERS

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4 Claims. (Cl. 94—50)

This invention concerns vibrating planing rollers, i. e. rollers or compressing machines of the type having a vibrating roller drum, that is rolled along on the ground to be compressed.

Obviously vibrating planing rollers may be designed in many different ways. By way of example it is well known to construct them in the form of a trailed vehicle, which is dragged along the ground in question by a separate tractive vehicle. It is also known to mount a vibrating roller drum on a wheeled vehicle in such a way that the roller drum is elastically suspended in the vehicle frame and capable of simultaneously pressing against the ground. In this case the carrying wheels of the vehicle may be driven, for instance by a motor mounted on the vehicle, and drive the vehicle in their turn. In smaller planing rollers it is also known to let the roller drum itself carry a frame supporting a driving motor, which delivers the power required for producing the vibrations in the roller drum and also imparts to the latter through an elastic transmission, usually consisting of a V-belt, a rotary motion advancing the machine over the ground.

It is quite obvious that such utilization of the vibrating roller drum as a driving wheel considerably simplifies the construction of a self-moving vibrating planing roller. However, so far it has not been possible to drive the vibrating roller drum of larger vibrating rollers in a similar way, as the rotary moment required to propel the roller has been too large to be transferred by means of elastic transmission means in the form of V-belts.

An object of the present invention is to provide a chain drive device serving the purpose of imparting to the vibrating roller drum of vibrating planing rollers a rotary motion for propelling the machine, and this by means of a driving motor mounted on a roller frame which is elastically carried by the vibrating roller drum. It is therefore possible to drive the whole machine along by means of the vibrating roller drum and a driving engine therefor, which engine is carried by the roller chassis and which is simultaneously utilized to drive the vibrating elements imparting the vibratory motion to the roller drum, and this even if the vibrating planing roller machine is very large and thus requires a large driving moment. However, such a chain drive can be used only if the chains can be kept well stretched despite of the vibrating movements of the roller drum, a condition which is satisfied by the structure to the invention.

According to the present invention, in a vibrating planing roller, comprising a vibrating roller drum and a driving engine mounted on a roller frame structure which is resiliently carried by the vibrating roller drum, there is provided a chain drive serving to transmit, from the engine to the vibrating roller drum, a rotary motion for propelling the roller, characterized in that an arm is journaled to be swingable about the centre axis of the roller drum and has its free end connected, through a connecting bar extending substantially in a plane parallel

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to the swinging plane of the arm and angularly with the latter, with a point located in the proximity of a chain wheel driven by the engine. The free end of the arm also carries a shaft having at least two interconnected rotatable wheels, one of which may be a sprocket wheel connected through an endless chain to the chain wheel driven by the engine and the other of which may comprise a driving member coupled to a driven member secured to the vibrating roller drum.

The invention will be described further by way of example with reference to the accompanying drawings, in which:

Fig. 1 is a diagrammatic side view of a compressing machine or vibrating planing roller in accordance with the invention,

Fig. 2 is a partial axial section through one end of the roller drum, and

Fig. 2A is a fragmentary section of the machine of Fig. 1 taken along the line 2A—2A looking in the direction of the arrows.

The vibrating planing roller or compressing machine illustrated consists of a frame structure 1, the front end of which is elastically carried by a vibrating roller drum 2, while its rear end is carried by a steering roller 3 which is turnable about a vertical axis and which can be operated by means of a steering wheel 4. The frame structure 1 carries a driving engine 5, which is connected through an arbitrary transmission means, for instance a chain 6, with a gear box 7 likewise supported by the frame structure 1.

The shaft of the roller drum 2 is connected to the frame structure 1 in a conventional manner by means of spring elements such as rubber pads 8 fore and aft of a bearing support 22, as shown in Fig. 2A. At each position the rubber pad 8 adjacent to the frame 1 is secured thereto by a plate 8a. An L-shaped plate 8b fastened to the frame 1 supports the other pad 8. A yoke 8c secured between the pads 8 extends to the bearing support 22. This arrangement permits the drum to perform vibrating movements without these being transmitted to the frame 1.

A shaft 20 provided with suitable eccentric weights 21 extends centrally through the roller drum 2 and is independently rotated by suitable manipulation of the gear box 7 in known manner by an elastic transmission in the form of one or more V-belts 9 in order to impart a vibrating motion to the roller drum 2 while the latter is rolled along the ground. The moment which must be transmitted to the vibrator shaft through the transmission 9 is normally so small that it can very well be transferred by means of V-belts even in large rollers.

However, a considerable moment is required to impart to the roller drum 2 a rotary motion propelling the compressing machine, not least because the advancing speed of the machine should be kept low. The propelling power is thus transmitted from the gear box 7 to the roller drum 2 through a chain drive comprising two endless chains 10 and 11. One of these endless chains, 10, is passed around a chain wheel 12, which is rigidly secured to one end of the roller drum 2 concentric with the axis of rotation or centre axis of said drum, and around a sprocket 13 mounted at the outer end 14a of an arm 14, which is journaled to be freely swingable about the centre axis of the roller drum 2 (Fig. 2). The outer end 14a carries elongated openings through which bolts 14b adjustably secure it to an inner portion 14c of the arm 14. The sprocket 13 is rigidly mounted on a short shaft 15 also carrying a fixed second sprocket 16, around which is placed the other endless chain 11, the latter engaging with a chain wheel 17 on the output shaft of the gear box 7.

The outer end of the arm 14 is provided with a lug

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14', which is connected, through an adjustable connecting link bar 18 formed by upper and lower sections 18a and 18b adjustably secured together by bolts 18c in elongated slots, with a point 19 located close to the chain wheel 17 on the output shaft of the gear box. The arm 14 and the connecting bar 18 are both adjustable in length so that each of the endless chains 10 and 11 respectively can be kept appropriately tightened, and the arm 14 and the connecting bar 18 are substantially at right angles to one another. The connecting bar 18 extends substantially in a plane parallel to the swinging plane of the arm 14.

It is obvious that the chain drive described above is capable of transmitting even very large moments from the gear box 7 to the roller drum 2, since the endless chains 10 and 11 can always be kept tightened despite the vibrating movements of the roller drum relative to the frame structure and the gear box 7 carried thereon. The linkage formed by the arm 14 and connecting bar 18 does not transmit the vibratory movements from the roller drum 2 to the gear box 7 or the frame structure 1 of the roller. If necessary, the closed chains 10 and 11 may be doubled and, if desired, the angle between the arm 14 and the connecting bar 18 may differ from that shown in the figure, only the two parts must not be on a line with one another. It will also be obvious that the chain drive here disclosed can be used in vibrating rollers of other types than the one chosen in this example. The endless chain 10 may also be replaced with a gear wheel transmission between the shaft 15 and the roller drum 2.

What I claim is:

1. Vibrating roller mechanism comprising a frame, a roller drum rotatably mounted on a shaft, means resiliently fastening the drum shaft to the frame, a weight in the roller drum rotated by the drum shaft to generate vibrations, power means carried by the frame coupled to the drum shaft to provide rotation thereof, an arm carrying a rotatable shaft in one of its ends, means journaling the other end of the arm concentrically with the drum shaft for swinging movement relative thereto, a drive pulley coupled to the power means, a bar angularly related to the shaft carrying end of said arm, said bar being pivotally connected at one of its ends to said

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arm and at its other end to a pivot adjacent to the drive pulley, a pair of pulleys secured to the rotatable arm shaft, an endless and elongated substantially inelastic flexible element connecting the drive pulley and one of the shaft pulleys, a pulley on said roller drum, and means coupling said drum pulley to the other of said shaft pulleys for rotating the drum.

2. Vibrating roller mechanism comprising a frame, a roller drum rotatably mounted on a shaft, means resiliently fastening the drum shaft to the frame, a weight in the roller drum rotated by the drum shaft to generate vibrations, power means carried by the frame coupled to the drum shaft to provide rotation thereof, an arm carrying a rotatable shaft in one of its ends, means journaling the other end of the arm concentrically with the drum shaft for swinging movement relative thereto, a drive sprocket wheel coupled to the power means, a bar angularly related to the shaft carrying end of said arm, said bar being pivotally connected at one of its ends to said arm and at its other end to a pivot adjacent to the drive sprocket wheel, a pair of sprocket wheels secured to the rotatable arm shaft, an endless chain connecting the drive sprocket wheel and one of the shaft sprocket wheels, a sprocket wheel on said roller drum, and means coupling said drum sprocket wheel to the other of said shaft sprocket wheels for rotating the drum.

3. Apparatus as defined in claim 2, wherein the arm and the bar are adjustable in length.

4. Apparatus as defined in claim 2, wherein the longitudinal axes of the arm and the bar intersect to form a variable angle approximating 90°.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,873,656

February 17, 1959

Karl Olov Börje Andersson

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the heading to the printed specification, between lines 7 and 8, insert -- Claims priority, application Sweden November 30, 1953 --; column 2, line 67, for "carring" read -- carrying --.

Signed and sealed this 2nd day of June 1959.

(SEAL)

Attest:

KARL H. AXLINE

Attesting Officer

ROBERT C. WATSON
Commissioner of Patents