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(54) Tandem vibratory roller

(57) The tandem vibratory roller consisting of the front (11) and rear drum (12), control vibration exciters (13 and 14), and at least two acceleration sensors (16 and 17) interconnected with the control unit (15) through individual inputs for operating the vibration mode, namely

the input for the selection of vibrating drum (20), the input for turning off vibration (19), and the input for spinning the eccentric weights of vibration exciters (18), when the front drum (11) is equipped with a separate control vibration exciter (13) and the rear drum (12) is equipped with a separate control vibration exciter (14).

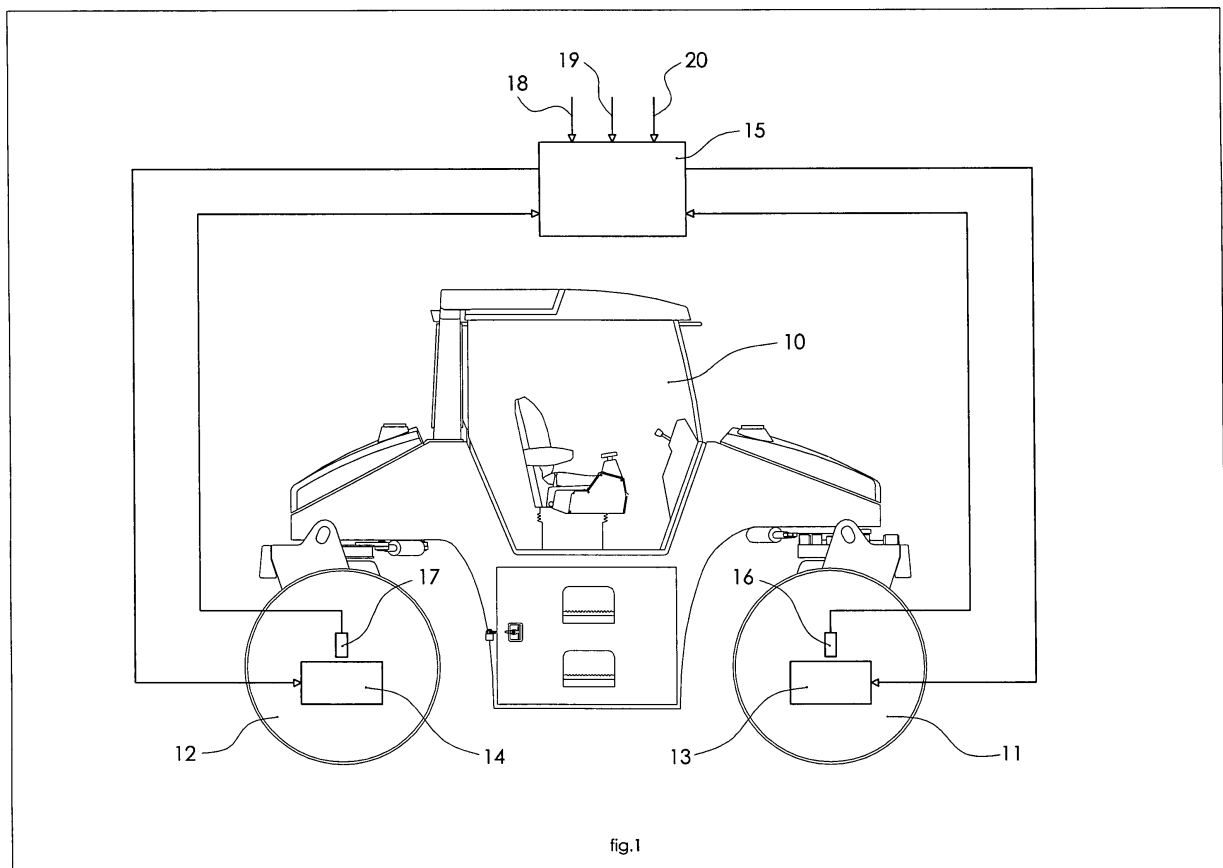


fig.1

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Description

Field of Technology

[0001] The invention concerns the arrangement of the tandem vibratory roller equipped with the vibration exciter with continuous control.

Present Level of Technology

[0002] The currently produced tandem vibratory rollers of higher weight categories, weighing seven to twelve tonnes, are usually equipped with a two-stage, or exceptionally multi-stage, control of the parameters of vibration. The parameters are controlled manually by the machine operator. The considerable disadvantage of the mentioned known solutions is the impossibility to adjust the parameters of vibration, i.e. amplitude and frequency, so that the manually set value is always as optimal as possible for a wide range of various types of compacted materials including a various thickness of laid layers to be compacted.

[0003] Another known solution of the optimisation of the setting of the vibration parameters are the versions of the tandem vibratory rollers equipped with the device for the automatic evaluation of the degree of compaction including the device enabling the automatic setting of required parameters.

[0004] The above described and in practice required trend of the optimisation of the setting of the vibration parameters of the tandem vibratory rollers facilitates several known solutions. Two known systems are below described for the purpose of the presentation of the state of technology in this field. One system is known under the trade name VARIOCONTROL and the other is offered under the name ACE.

[0005] The VARIOCONTROL system includes the vibration exciter with the directed vector of exciting force. The disadvantage of the VARIOCONTROL system is a considerably high weight of used vibrator and its design complexity, which limits the use of the system only on one of the drums of a tandem roller.

[0006] The ACE system uses the principles of the control of the eccentric moment of the vibrator with circular vibration by means of a differential gearbox changing the mutual position of two coaxial eccentrics. The disadvantage of this solution is that the gearbox is expensive and that the control vibrator is used only on one of the drums of a tandem roller.

[0007] With respect to the above-mentioned reasons, the controlled vibrators of the tandem vibratory rollers are used only on one of the drums, when the other drum is equipped with a two-amplitude vibrator. However, this compromise solution does not enable the maximum use of the compaction capacity of the tandem vibratory roller.

Principle of the Invention

[0008] The above-mentioned disadvantages will be removed by a new solution of the tandem vibratory roller consisting of the front and rear drum and two separate regulation vibration exciters, as well as including at least two acceleration sensors interconnected with the control unit by means of individual inputs, namely the input for the selection of vibrating drums, the input for the selection of the mode of vibrating drums, the input for turning off the vibration exciter, and the input for spinning the eccentric weights of vibration exciters. The principle of the new solution is that the front drum and the rear drum contain a separate control vibration exciter. Further, the front drum as well as the rear drum is equipped with separate acceleration sensors, when the control unit sets the vibration parameters according to the data from the accelerator sensor that is always the second one in the direction of the tandem roller travel. And further, the mentioned control unit turns on and off the function of control vibration exciters in the front or rear drum by means of the input for spinning the eccentric weights of vibration exciters and the input for turning off vibration without stopping the rotation of the mentioned eccentric weights by zero setting the eccentric moment of both control vibration exciters.

Layout of Illustrations

[0009] The invention shall be further more closely explained with reference to the enclosed drawing, where Fig. 1 shows schematically one of a number of versions of the tandem vibratory roller equipped with the vibration exciter with continuous control.

Examples of the Implementation of the Invention

[0010] The tandem vibratory roller 10 contains the front drum 11 and rear drum 12, when each drum is equipped with a separate control vibration exciter 13 and 14 with the continuous control of circular vibration. Both mentioned regulation vibration exciters 13 and 14 are controlled by one control unit 15.

[0011] The front drum 11 of the tandem vibratory roller 10 is also equipped with the accelerator sensor 16, when the rear drum 12 contains the accelerator sensor 17. The mentioned control unit 15 sets the vibration parameters according to one of the mentioned accelerator sensors 16 and 17 that is at a given moment the second one in the direction of the tandem roller travel 10. The automatic selection of any of the acceleration sensors 16 and 17 prevents the damaging of the compacted layer by the second drum that follows the first drum in the already compacted track created by the first drum.

[0012] By means of three individual inputs 18, 19, and 20 of the control unit 15, namely the input for the selection of vibrating drum 20, the input for turning off the vibration exciter 19, and the input for spinning the eccentric

weights of vibration exciters 18, the operator of the tandem vibratory roller 10 can set the required vibration function in the control unit 15. Using the input of the selection of vibrating drum 18, the operator can determine which of the control vibration exciters 13 or 14 will vibrate, whether the front drum 11 or the rear drum 12 or both drums at the same time.

[0013] Before the technological operation of compaction, the operator of the tandem vibratory roller 10 using the spinning input 18 puts into rotation both vibration exciters 13 and 14 that are at that moment set up to the zero eccentric moment, when the vibration is started by the operator using the activation of the input for turning on vibration 20 in the control unit 15.

[0014] The advantage of the described arrangement of the tandem vibratory roller 10 is that it facilitates turning off vibration by zero setting the eccentric moment without the necessity to stop the rotation of eccentric weights of the control vibration exciters 13 and 14. This solution reduces the fuel consumption as it prevents the energetically demanding braking and subsequent spinning of the eccentric weights of control vibration exciters 13 and 14 in the reversing of the tandem vibratory roller 10.

Industrial Utilisation

[0015] The new arrangement of the tandem vibratory roller can beneficially be used for compacting hot asphalt mixtures, specially thin layers when the optimisation of the parameters of the vibration of the front and rear drums facilitates increasing the area capacity rating of tandem roller and the turning-off of vibration by zero setting the eccentric moment of vibrator without the necessity to stop its rotation reduces the specific fuel consumption.

Claims

1. The tandem vibratory roller (10) including the front (11) and rear drum (12), control vibration exciters (13 and 14), and at least two acceleration sensors (16 and 17) interconnected with the control unit (15) through individual inputs, namely the input for the selection of vibrating drum (20), the input for turning off vibration (19), and the input for spinning the eccentric weights of vibration exciters (18) **is characterised in that** the front drum (11) is equipped with a separate control vibration exciter (13) and the rear drum (12) is equipped with a separate control vibration exciter (14).
2. The tandem vibratory roller (10) according to paragraph 1 **is characterised in that** the front drum (11) is equipped with the acceleration sensor (16) and the rear drum (12) contains the acceleration sensor (17), when the control unit (15) sets the vibration parameters according to the data from the accelerator sensor that is always the second one in the di-

rection of the tandem roller travel (10).

3. The tandem vibratory roller (10) according to paragraphs 1 to 2 **is characterised in that** the control unit (15) turns on and off the function of control vibration exciters in the front (11) or rear drum (12) by means of the input for spinning the eccentric weights of vibration exciters (18) and the input for turning off vibration (19) without stopping the rotation of the mentioned eccentric weights by zero setting the eccentric moment of both control vibration exciters (13 and 14).

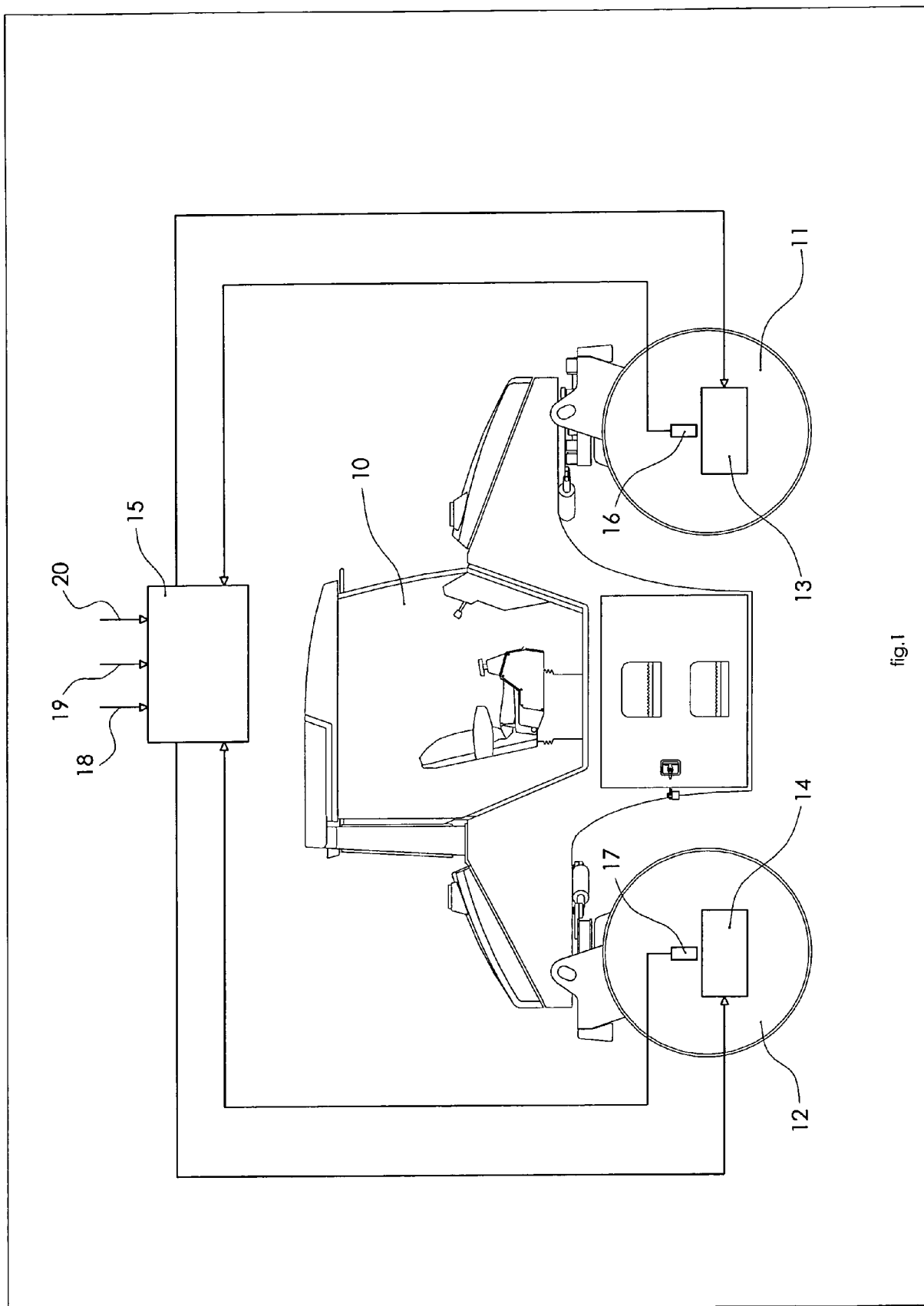


fig. 1



EUROPEAN SEARCH REPORT

Application Number
EP 08 46 6016

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Y	* paragraphs [0015] - [0024] * * paragraphs [0026] - [0047] *	2	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search Munich		Date of completion of the search 19 December 2008	Examiner Kerouach, May
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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