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(54) **Vibratory compactor controller**

(57) An apparatus (10) for actuating a vibratory mechanism in a vehicle comprising a sensor (14) configured to produce an operational value signal indicative of an operational characteristic of the vehicle; a computing device (11) operable to receive the operational value signal and determine actuation values based at least in part on the operational value signal and to produce a corresponding control signal for selectively actuating the vibratory mechanism; and an input device (13) configured to modify the actuation values during operation of the vehicle. A method for controlling a vibratory mechanism in a vehicle comprising the steps of producing an operational value signal indicative of an operational characteristic of the vehicle; determining actuation values from the operational value signal; modifying actuation values during operation of the vehicle; and signaling the vibratory mechanism to actuate in response to actuation values.

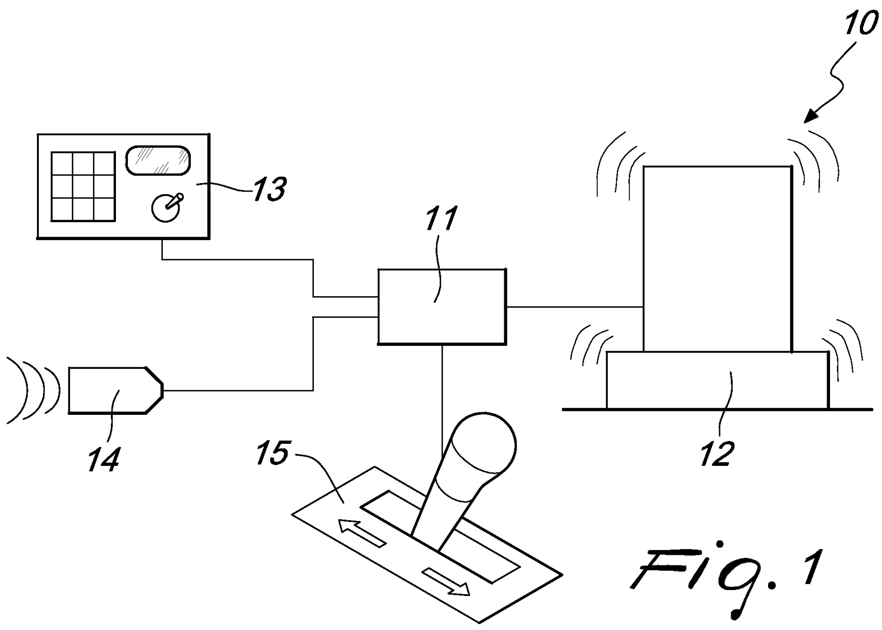

Fig. 1

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Description

Technical Field

[0001] This disclosure generally relates to the field of vibratory machines, specifically vibratory machines comprising for example a vibratory compactor. Particularly, the disclosure relates to an apparatus and a method for actuating a vibratory compactor.

Background

[0002] Vibratory compactors may be generally used in road construction for compacting freshly-laid asphalt, soils and other materials. A compactor may generally comprise a drum mounted in a frame assembly. An eccentric mounting shaft arrangement may be located within the frame assembly, and may rotate relative to the drum. Such shaft arrangement may selectively vibrate the drum to provide the desired compaction of the material being worked.

[0003] Present vibratory compactors may be actuated by vibratory control systems, which are production released systems. Such control systems may use preset software parameters to activate or deactivate the vibratory compactors. An example of a software parameter may be the travel speed of the machine comprising the vibratory compactor.

[0004] To actuate the vibratory compactor, the control system may be first initiated and the vibratory mode may be selected. Thereafter, the control system may activate or deactivate the vibratory compactor upon reaching respective preset travel speeds. Generally, the activation speed may be higher than the deactivation speed.

[0005] In operation, travel speeds may change due to specific conditions at the construction site, for example to suit the type of materials used. A test strip may be constructed for working the vibratory compactor in order to choose an optimal travel speed for the machine which may comprise the vibratory compactor. The appropriate travel speed may be selected based on the impact spacing of the vibratory compactor. A suitable impact spacing is 10 - 14 impacts per foot, i.e. 10 - 14 impact per 0.3048m. Typically, a vibratory compactor may be operated at two frequencies, like a high frequency of 63Hz or a low frequency of 42 Hz. At a higher frequency the machine may travel at a higher speed and maintain the desired impact spacing.

[0006] However, the control systems may not be directly controlled by the operator or otherwise adjusted during operation. The preset software parameters may only be changed by software technicians.

[0007] With current controls systems, deactivation of the vibratory compactor may take too long as the machine would need to slow down to the preset travel speed in order for deactivation to occur. Hence, a time lag of approximately 2 - 3 seconds may exist between the deactivation of the vibratory compactor and cessation of vibration. A higher deactivation speed may be desired, for some construction sites, as it may reduce the overall time taken to stop the machine and hence may allow for a quick change in operating direction of the machine.

[0008] The present disclosure is directed, at least in part, to improving or overcoming one or more aspects of the prior art system.

Brief Summary of the Invention

[0009] In a first aspect, the present disclosure describes an apparatus for actuating a vibratory mechanism in a vehicle comprising a sensor configured to produce an operational value signal indicative of an operational characteristic of the vehicle; a computing device operable to receive the operational value signal and determine actuation values based at least in part on the operational value signal and to produce a corresponding control signal for selectively actuating the vibratory mechanism; and an input device configured to modify the actuation values during operation of the vehicle.

[0010] In a second aspect, the present disclosure a method for controlling a vibratory mechanism in a vehicle comprising the steps of producing an operational value signal indicative of an operational characteristic of the vehicle; determining actuation values from the operational value signal; modifying actuation values during operation of the vehicle; and signaling the vibratory mechanism to actuate in response to actuation values.

[0011] Other features and advantages of the present disclosure will be apparent from the following description of various embodiments, when read together with the accompanying drawings.

Brief Description of the Drawings

[0012]

Fig. 1 is a block diagram exemplifying a method and an apparatus for actuating a vibratory compactor according to the present disclosure;

Fig. 2 is a block diagram exemplifying a control system according to the method and apparatus for actuating a vibratory compactor of Fig. 1;

Fig. 3 is a flowchart exemplifying a method of actuating a vibratory compactor according to the present disclosure;

Fig. 4 is a flowchart exemplifying first and second embodiments for activating a vibratory compactor according to the present disclosure;

Fig. 5 is a flowchart exemplifying first and second embodiments for deactivating a vibratory compactor according to the present disclosure;

Fig. 6 is a run time value vs time graph plotting the run time value such as speed of a vehicle and actuation values based on first and second embodiments for activating a vibratory compactor and first and second embodiments for deactivating the vibratory compactor;

Fig. 7 is a flowchart exemplifying third and fourth embodiments for deactivating a vibratory compactor according to the present disclosure;

Fig. 8 is a run time value vs time graph plotting the run time value such as speed of a vehicle and actuation values based on third and fourth embodiments for deactivating the vibratory compactor, wherein the maximum run time value may be selected over a period of time; and

Fig. 9 is a run time value vs time graph plotting the run time value such as speed of a vehicle and actuation values based third and fourth embodiments for deactivating the vibratory compactor, wherein the deactivation value may be computed progressively.

Detailed Description

[0013] This disclosure generally relates to systems and methods for activating and deactivating a vibratory compactor comprised in a vibratory machine.

[0014] An exemplifying architecture of the actuating apparatus **10** according to the present disclosure is summarized in the block diagram of Fig.1. Actuating apparatus **10** may comprise a control system **11** which may be connected to a vibratory compactor **12.**

[0015] The function of the control system **11** may be to determine that an activation or deactivation value is attained or surpassed and to thereafter activate or deactivate the vibratory compactor **12.** In this disclosure, activation value and deactivation value may be hereinafter referred to collectively as actuation values. The control system **11** may operate on the basis of prevailing programmed software parameters and values which may be programmed prior to operation of a vehicle at an operation site, such as a road construction area, or parameters and operational characteristics of the vehicle, for instance the operational values which may be supplied during operation of a machine at the operation site.

[0016] The actuating apparatus **10** may further comprise an operator input device **13,** a sensor device **14** and an override device **15.** The devices may be connected independently and directly to the control system **11.**

[0017] The operator input device **13** may serve as an interface for parameters and operational values to be supplied, during operation of a machine, to the control system **11.** The operational values of a parameter, which may be the desired activation or deactivation values, may be entered by the operator into the operator input device. The control system **11** may use the entered values, instead of programmed software actuating values, as the appropriate actuating values to actuate the vibratory compactor.

[0018] The entered operational values may also include delta values (ΔV) which may be used by the control system **11** to compute the actuation values to actuate the vibratory compactor. Delta values may also be programmed software value. The delta value may be a specific value or a function such as a fraction or a percentage.

[0019] The operator may enter a single value selected from activation value, deactivation value or delta value or the operator may enter a combination of said values as required by the program of the control system **11.**

[0020] The operator input device **13** may be a potentiometer or a speed control input, such as a keyboard and associated screen display. The skilled person would realize that the operator input device **13** may be any suitable device which may serve as an interface for entering values to the actuating apparatus **10.**

[0021] The control system **11** may be connected to the sensor device **14** to receive operational values therefrom through an operational value signal. Actuation of the vibratory compactor **12** may be based on the operational values. The control system **11** may determine whether programmed or entered actuation values may be attained or surpassed by comparing the actuating values to the operational values derived from the sensor device **14.** Suitable sensor devices **14** according to the disclosure may be for instance a tachometer, coils of the propel pump, a propel handle, or combinations thereof.

[0022] Suitable parameters according to the disclosure may be the travel speed or the propel handle position which controls the travel speed of a machine. Travel speed may be measured directly or measured from coils of a propel pump wherein the current flow provides a proportional representation of the travel speed. Travel speed may also be obtained from motor control signals. Operational values received by the control system **11** may be the travel speed or the propel handle position. Travel speed, propel handle position or other operational values that may serve to evaluate the current speed of the vehicle may be collectively referred to as run time values in the text of this disclosure.

[0023] In one embodiment, the activation value may be entered through a dial potentiometer. The activation value may be entered as a percentage of a predetermined maximum speed setting of the vehicle. Within 0% to a threshold value, for instance 20%, of the dial setting, the actuating apparatus **10** may activated or deactivated manually. As the dial is actuated to setting greater than the threshold value, for instance greater than 20%, the actuating apparatus may be activated or deactivated automatically by the control system **11.** Particularly, as the dial setting is set to greater percentages, the activation speed may increase. At the maximum dial setting the actuating apparatus **10** may be activated when the vehicle reaches the maximum set speed.

[0024] The control system **11** may compare programmed or entered actuation values to the run time values of travel speed or propel handle position, which are derived from the respective sensor devices. The control system **11** may activate the vibratory compactor **12** at a run time value equal to or greater than said activation value and the control system **11** may deactivate the vibratory compactor **12** at a run time value equal to or lesser than said deactivation value.

[0025] Override device **15** may function to nullify the signals of the control system **11.** For instance, the run time values may be reduced to below the programmed or entered deactivation value without the control system **11** deactivating the vibratory compactor **12** by engaging the override device **15.** The vibratory compactor may be activated only at run time values higher than the activation value by engaging the override device **15.** The override device may be any suitable input device such as a switch.

[0026] In an alternative embodiments, the vibratory compactor may be deactivated at a neutral propel handle position thorough the override device **15.**

[0027] With reference to Fig. 2, the control system **11** may comprise a computing device **16,** for instance, a processor or a CPU and a control mechanism or controller **17.** The computing device **16** may be connected to the control mechanism **17.** The computing device **16** may process the actuation values and run time values to compute the actuation status of the vibratory compactor **12** and thereafter send control signals for the activation or deactivation of the vibratory compactor **12,** for instance through the control mechanism **17.** The control mechanism **17** may be connected to the vibratory compactor **12** and may thereby activate or deactivate the vibratory compactor **12** upon receipt of the specific control signal from the computing device **16.**

[0028] The control system **11** may further comprise memory device **20** connected to the computing device **16.** Memory device **20** may store variables entered by the operator through the operator input device **13** and may comprise a plurality of memory cells **21, 22, 23,** for storing the values of activation value, the deactivation value and the delta value respectively. The values may be entered by the operator, read by the computing device **16** from programmed values or be computed by the computing device **16.**

[0029] Memory device **20** may further comprise memory cells for storing variables derived from the sensor device **14.** The memory cells **24, 25** may store run time values as derived from sensor device **14** and peak run time values reached during operation, respectively. Peak run time value may be constantly and instantaneously updated in memory cell **25** as new peak run time values are attained. In an embodiment, peak run time values may be tracked from the activation of the vibratory compactor **12.**

[0030] Memory device **20** may further comprise memory cell **26** for storing a maximum run time value which may be selected from the peak run time values. In an embodiment, a maximum run time value is attained over a preset variable. In an embodiment, the variable is time. The skilled person would realize that other variables may be used such as distance.

[0031] The variable for tracking peak run time values and recording the maximum run time value may be programmed or entered by the operator. The variable value may be stored in a further memory cell **27.**

[0032] The general operation of the actuating apparatus **10** will now be described with reference to the flow chart of Fig. 3.

[0033] At step **31** the operator may optionally select a desired parameter used to actuate the vibrator. The parameter may be the travel speed or the propel handle position. If this step is omitted, the desired parameter may be selected by the operating software by default.

[0034] In step **32** the operator may select or may deselect manual input. Manual input may permit the operator to enter the required data.

[0035] If manual input is selected the operator may enter the activation value in step **33,** for instance the travel speed or the propel handle position at which the vibrator may be started.

[0036] If manual input is not selected or deselected, the default activation value may be read by the computing device **16** in step **34.**

[0037] In above steps **33, 34,** the activation value may be an absolute or may be a relative activation value, for example a function such as a fraction or a percentage.

[0038] In step 35, the computing device **16** may register the activation value as entered by the operator, as read from memory or may compute the activation value from the maximum speed control setting on the basis of the entered or read relative activation value. The maximum speed control setting is a control setting which may limit the maximum speed of the machine.

[0039] In step **36,** the operator may select or deselect an adaptability attribute for deactivation.

[0040] If the adaptability feature is not selected or deselected, the operator may select or may deselect manual input in step **37.**

[0041] If manual input is selected the operator may enter the appropriate variable for the deactivation value or the delta value in step **38.**

[0042] If manual input is not selected or deselected, the default variable for the deactivation value or the delta value may be read by the computing device **16** in step **39.**

[0043] In step **40,** the computing device **16** may register the deactivation value entered by the operator or read by the computing device **16.** If the delta value was entered by the operator or read by the computing device **16,** the deactivation value may be computed on the basis of the delta value by the computing device **16.**

[0044] If the adaptability feature is selected , the operator may select or deselect manual input in step **41.**

[0045] With the adaptability attribute selected, the computing device **16** may compute the deactivation value on the basis of the peak run time values, in an embodiment, or the selected maximum run time value, in another embodiment.

[0046] If manual input is selected, the operator may enter the appropriate variables for the delta value and the time period for tracking peak run time values, if maximum run time value is to be selected from peak run time values, in step **42.**

[0047] If manual input is not selected or deselected, the default variables for the delta value and the time period for tracking peak run time values, if maximum run time value is to be selected from peak run time values, may be read by the computing device **16** in step **43.**

[0048] In step **44,** the computing device **16** may compute the deactivation value on the basis of the delta value and the highest peak run time value or on the basis of the delta value and the maximum run time value selected from peak run time values.

[0049] In step **45,** the computing device **16** may signal the vibratory compactor **12** to activate or deactivate , for instance through the control mechanism **17.**

[0050] In step **46,** the activation or deactivation signal may be overridden by the operator for instance by actuation of a switch. In an alternative embodiment, the vibratory compactor may be deactivated by positioning the propel handle to neutral.

[0051] A first embodiment and a second embodiment of the specific operation for activating the vibratory compactor will be described in more detail with reference to the flow chart of Fig. 4.

[0052] In the first embodiment, the operator may enter an absolute activation value or a relative activation value in step **51.**

[0053] In the second embodiment, the computing device **16** may read an absolute activation value or a relative activation value in step **52.**

[0054] The following steps of the first and second embodiments are identical and will be described as a single set of steps.

[0055] In step **53,** the computing device may register the entered or read activation value variable or may compute the activation value from the maximum speed control setting on the basis of the entered or read the relative activation value, for instance, where the relative activation value is a function, by applying the function to the value of the maximum control setting.

[0056] The computing device **16** may read the run time value in step **54.**

[0057] The computing device **16** may compare the run time value with the activation value in step 55.

[0058] The computing device **16** may then check if a run time value is equal or is greater than the activation value in step **56.**

[0059] If a run time value may be equal or is greater than the activation value the computing device **16** may signal the vibratory compactor **12** to activate, for instance through the control mechanism **17,** in step **57.**

[0060] The computing device **16** may then go to the deactivation program in step **58.**

[0061] If a run time value remains less than the activation value, the computing device **16** may return to step **54** and may proceed through the sequential steps of the flowchart as described above.

[0062] A first embodiment and a second embodiment of the specific operation for deactivating the vibratory compactor will be described with reference to the flow chart of Fig. 5.

[0063] In the first embodiment, the operator may enter the deactivation value or the delta value in step **61.**

[0064] In the second embodiment, the computing device **16** may read the default deactivation value or the default delta value in step **62.**

[0065] The following steps of the first and second embodiments are identical and will be described as a single set of steps.

[0066] In step **63,** the computing device may register the entered or read deactivation value or may compute the deactivation value from the entered, read or computed activation value on the basis of the entered or read delta value. For instance, the delta value may be subtracted from activation value or the delta value may be a function that is applied to activation value.

[0067] The computing device **16** may read the run time value in step **64.**

[0068] The computing device **16** may compare the run time value with the deactivation value in step **65.**

[0069] The computing device **16** may check if a run time value is equal or is less than the deactivation value in step **66.**

[0070] If a run time value is equal or is less than the deactivation value the computing device **16** may signal the vibratory compactor **12** to deactivate, for instance through the control mechanism **17,** in step **67.** The skilled person would realize that the vibratory compactor may be activated at any juncture prior to step **66.**

[0071] The computing device **16** may go to the activation program in step **68.**

[0072] If a run time value remains greater than the deactivation value, the computing device **16** may return to step **64** and may proceed through the sequential steps of the flowchart as described above.

[0073] Fig. 6 may illustrate the actuation of the vibratory compactor **12** based on the first and second embodiments for activation and the first and second embodiments for deactivation. Actuation values may not fluctuate as a function of time and may be hence denoted accordingly as straight horizontal lines. The curve may represent a run time value such as speed over time.

[0074] At the start of operation, run time values may increase with time and a run time value may equal or surpass the activation value t_1, at which point the control system **11** may activate the vibratory compactor **12.** The vibratory compactor **12** may continue vibrating until a run time value is equal or is below the deactivation value, at such point t_2 the control system **11** may deactivate the vibratory compactor **12.**

[0075] A third embodiment and a fourth embodiment of the operation for deactivating the vibratory compactor will be described with reference to the flow chart of Fig. 7.

[0076] In the third embodiment, the operator may enter the delta value in step **71.** A variable such as a time period for tracking peak run time values may be entered in addition to the delta value in step **71,** if the deactivation value is to be computed from the maximum run time value selected from peak run time values. Alternatively, the distance travelled may be entered instead of the time period.

[0077] In the fourth embodiment, the computing device **16** may read the default delta value in step **72.** A variable such as a default time period for tracking peak run time values may be read in addition to the default value in step **72,** if the deactivation value is to be computed from the maximum run time value selected from peak run time values. Alternatively, the distance travelled may be read instead of the time period.

[0078] The following steps of the third and fourth embodiments are substantially identical and will be described as a single set of steps.

[0079] The computing device **16** may read the run time value in step **73.**

[0080] The computing device **16** may track the peak run time values in step **74.** The peak run time values may be tracked over the entered or read time period, if the deactivation value is to be computed from the maximum run time value selected from peak run time values. Alternatively, the peak run time values may be tracked over the entered or read distance travelled.

[0081] Step **75** is an optional step wherein the computing device **16** may select the maximum run time value from the peak run time values if the deactivation value is to be computed from the maximum run time value. In an embodiment, the maximum run time value may be selected at the end of the entered or read time period; alternatively, the maximum run time value may be selected at the end of the entered or read distance travelled.

[0082] The computing device **16** may compute a deactivation value on the basis of a peak run time value and the delta value or a selected maximum run time value and the delta value in step **76.** In an embodiment, the deactivation value may be computed by subtracting the delta value from a peak run time value or from a selected maximum run time value.

[0083] The computing device **16** may compare a run time value with the deactivation value and may check if a run time value is equal or is less than the deactivation value in step **78.**

[0084] If a run time value is equal or is less than the deactivation value the computing device **16** may signal the vibratory compactor **12** to deactivate, for instance through the control mechanism **17,** in step **79.**

[0085] The computing device **16** may go to the activation program in step **80.**

[0086] If a run time value remains greater than the deactivation value the computing device **16** may go to step **77,** wherein the computing device **16** may compare a run time value with the deactivation value, or alternatively to step **73,** and may proceed through the sequential steps of the flowchart as described above.

[0087] Fig. 8 may illustrate the actuation of the vibratory compactor **12** based on the first and second embodiments for activation and the third and fourth embodiments for deactivation wherein the maximum run time value is selected over a period of time. Activation value may be constant and may be denoted by the horizontal line. The curve may represent a run time value such as speed over time.

[0088] At the start of operation, run time values may increase with time and upon equalling or surpassing the activation value, the control system **11** may activate the vibratory compactor **12** and initiate tracking of peak run time values, at time T_1. Peak run time values (P_1, P_2 and P_3) are tracked over the duration of the entered or read time period (T_1 - T_2). At the end of the time period (T_2) the maximum run time value is selected (P_3) from the peak run time values and used to compute the deactivation value (P_3 - delta value). The vibratory compactor **12** may continue vibrating until the run time value may equal or decrease below the computed deactivation value, at such point the control system **11** may deactivate the vibratory compactor **12.**

[0089] Fig. 9 may illustrate the actuation of the vibratory compactor **12** based on the first and second embodiments for activation and the third and fourth embodiments for deactivation wherein the deactivation value is computed progressively. Activation value may be constant and may be denoted by a horizontal line. The curve may represent a run time value such as speed over time.

[0090] At the start of operation, run time values may increase with time and upon equalling or surpassing the activation value, the control system **11** may activate the vibratory compactor **12** and initiate tracking of peak run time values. Peak run time values (P_1, P_2 and P_3) are tracked. For each successive peak run time value the control system **11** computes the corresponding deactivation value (DV_1, DV_2 and DV_3). The vibratory compactor **12** may continue vibrating until the run time value equals or decreases below the computed deactivation value having the highest value (DV_3), at such point the control system **11** may deactivate the vibratory compactor **12.**

[0091] The skilled person would realize that the components of the actuating apparatus **10** may be placed in any suitable positions on the machine and that the various components may be suitably and/or appropriately connected.

[0092] The skilled person would also realize that the steps of the above flow chart may be modified or changed to obtain the same outcome and that actuation of the vibratory compactor **11** may be achieved by any of the combinations of the above described embodiments.

Industrial Applicability

[0093] This disclosure describes a device and method for actuating of a vibratory compactor **12.** The device and method may permit the operator of a machine comprising the vibratory compactor **12** to modify, change actuation values or settings, or to input said values and settings during operation. Delta values may also be entered. The device and method, hence, permits the operator to control the activation and deactivation of the vibratory compactor **12** during operation to suit the conditions at, for instance, a road construction site.

[0094] Particularly, the deactivation of a vibratory compactor may be coupled to a changing variable. This adaptability attribute permits the deactivation point to be based on the maximum recorded variable.

[0095] It is noted that the term "operation" hereby indicates use of the machine by an operator, including times before or after the vehicle has been started or stopped.

[0096] The industrial applicability of the actuating apparatus and control systems as described herein will have been readily appreciated from the foregoing discussion.

[0097] Accordingly, this disclosure includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the disclosure unless otherwise indicated herein.

[0098] Where technical features mentioned in any claim are followed by references signs, the reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, neither the reference signs nor their absence have any limiting effect on the technical features as described above or on the scope of any claim elements.

[0099] One skilled in the art will realize the disclosure may be embodied in other specific forms without departing from the disclosure or essential characteristics thereof. The foregoing embodiments are therefore to be considered in all respects illustrative rather than limiting of the disclosure described herein. Scope of the invention is thus indicated by the appended claims, rather than the foregoing description, and all changes that come within the meaning and range of equivalence of the claims are therefore intended to be embraced therein.

Claims

1. An apparatus (10) for actuating a vibratory mechanism in a vehicle comprising:

    - a sensor (14) configured to produce an operational value signal indicative of an operational characteristic of the vehicle;
    - a computing device (16) operable to receive the operational value signal and determine actuation value based at least in part on the operational value signal and to produce a corresponding control signal for selectively actuating the vibratory mechanism; and
    - an input device (13) configured to modify the actuation value during operation of the vehicle.

2. The apparatus (10) according to claim 1 wherein the computing device (16) is operable to track peak operational characteristics.

3. The apparatus (10) according to claim 2 wherein the computing device (16) is operable to produce a deactivation value based at least in part on the peak operational characteristics.

4. The apparatus (10) according to claim 2, wherein the computing device (16) is operable to track peak operational characteristics over a time period or distance traveled and to determine a maximum operational characteristic from said peak operational characteristics.

5. The apparatus (10) according to claim 4 wherein the computing device (16) is operable to produce a deactivation value based at least in part on the selected maximum operational characteristic.

6. The apparatus (10) according to any one of the preceding claims wherein the operational characteristic is derived from the speed of the vehicle.

7. A method for controlling a vibratory mechanism in a vehicle comprising the steps of:

    - producing an operational value signal indicative of an operational characteristic of the vehicle;
    - determining an actuation value from the operational value signal;
    - modifying the actuation value during operation of the vehicle; and
    - signaling the vibratory mechanism to actuate in response to the actuation value.

8. The method according to claim 7, wherein the step of producing the operational value signal comprises tracking peak operational characteristics from activation of the vibratory mechanism.

9. The method according to claim 8, wherein the step of determining an actuation value comprises producing a deactivation value based at least in part on the peak operational characteristics.

10. The method according to claim 8, wherein the tracking of the peak operational characteristic is over a time period or distance traveled and a maximum operational characteristic is selected from said peak operational characteristics.

11. The method according to claim 10 wherein the step of determining actuation values comprises producing a deactivation value based at least in part on the maximum selected operational characteristic.

12. The method according to any one of claims 7 - 11

wherein the parameter is the speed of the vehicle.

13. A vibratory compactor comprising the apparatus according to any one of claims 1 -6.

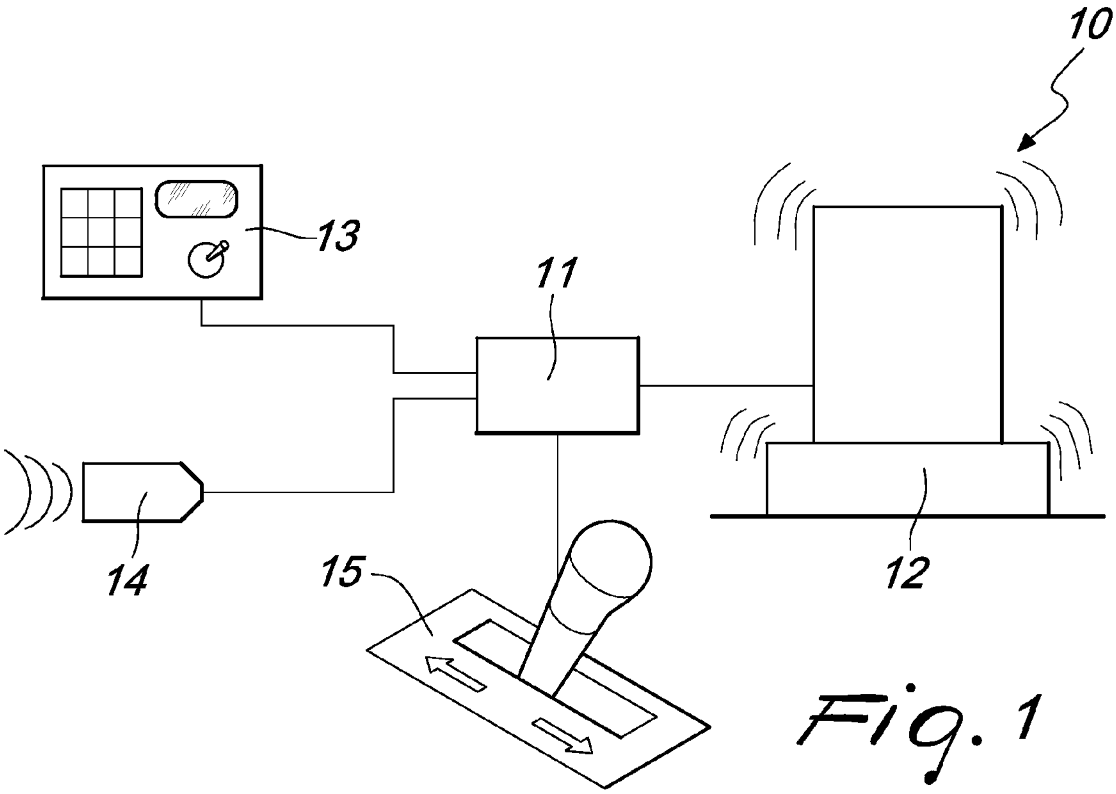

Fig. 1

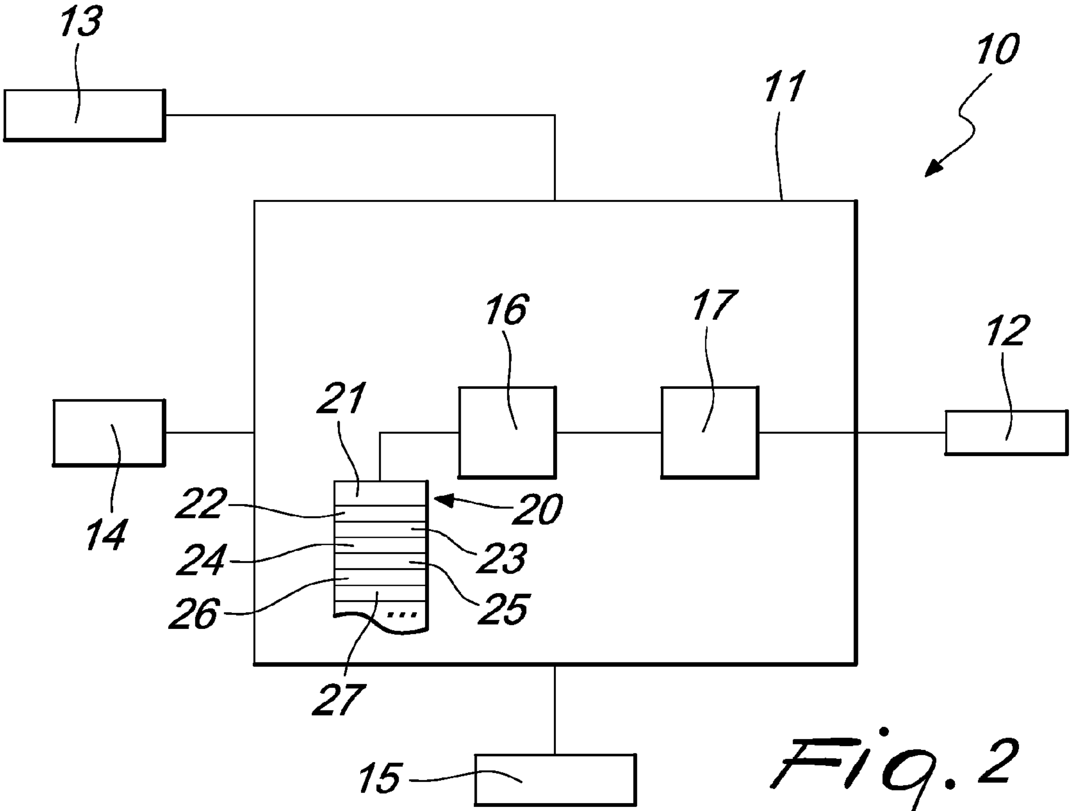

Fig. 2

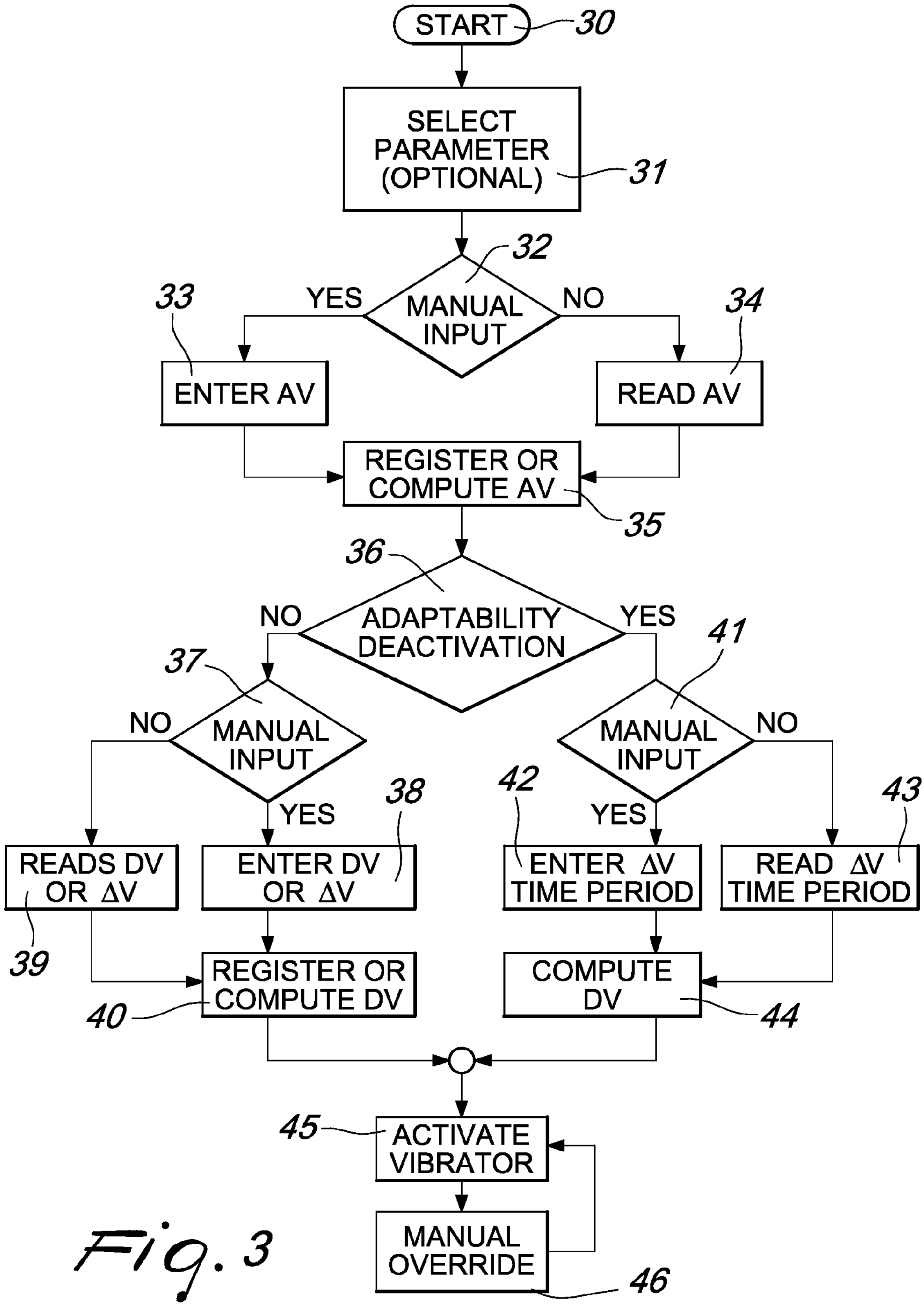
START
30
SELECT PARAMETER (OPTIONAL)
31
32
MANUAL INPUT
YES
NO
33
34
ENTER AV
READ AV
REGISTER OR COMPUTE AV
35
36
ADAPTABILITY DEACTIVATION
NO
YES
37
41
MANUAL INPUT
NO
YES
MANUAL INPUT
NO
YES
38
42
43
READS DV OR ΔV
ENTER DV OR ΔV
ENTER ΔV TIME PERIOD
READ ΔV TIME PERIOD
39
REGISTER OR COMPUTE DV
COMPUTE DV
40
44
45
ACTIVATE VIBRATOR
MANUAL OVERRIDE
46

Fig. 3

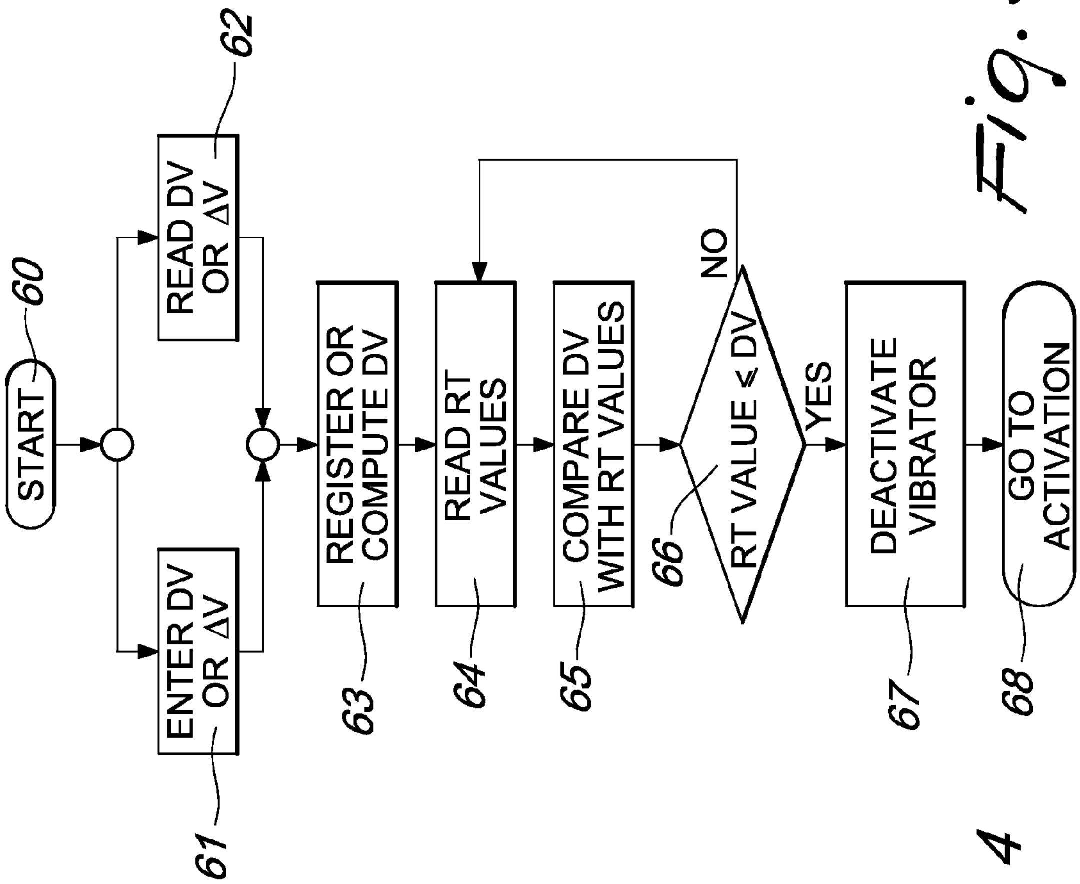
START
60
ENTER DV OR ΔV
61
READ DV OR ΔV
62
REGISTER OR COMPUTE DV
63
READ RT VALUES
64
COMPARE DV WITH RT VALUES
65
RT VALUE ≤ DV
66
NO
YES
DEACTIVATE VIBRATOR
67
GO TO ACTIVATION
68

Fig. 5

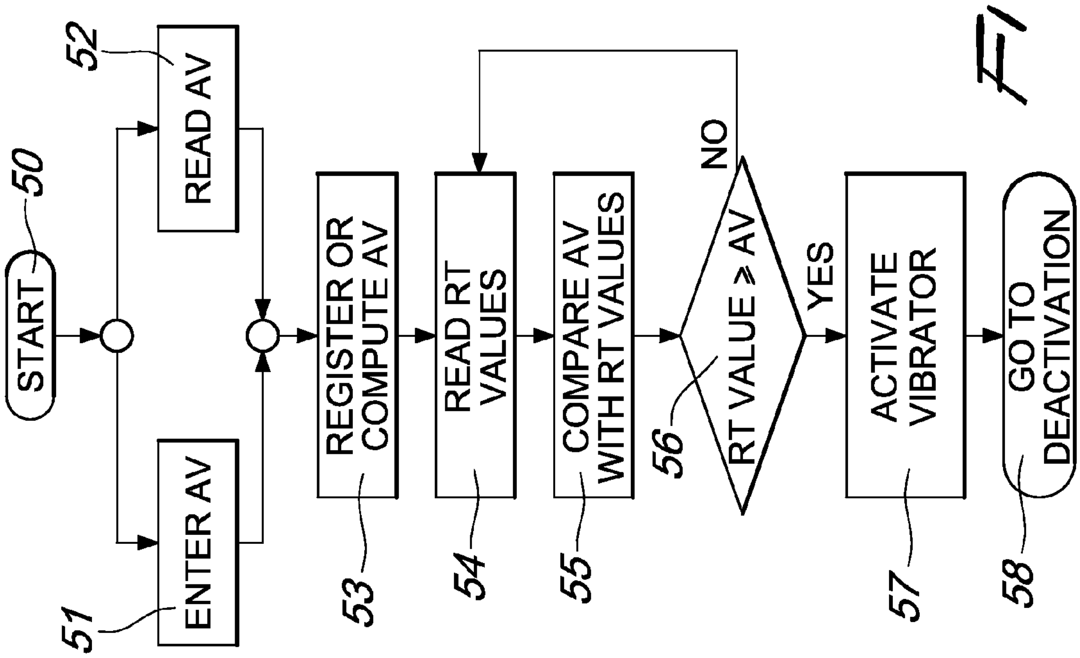
START
50
ENTER AV
51
READ AV
52
REGISTER OR COMPUTE AV
53
READ RT VALUES
54
COMPARE AV WITH RT VALUES
55
RT VALUE ≥ AV
56
NO
YES
ACTIVATE VIBRATOR
57
GO TO DEACTIVATION
58

Fig. 4

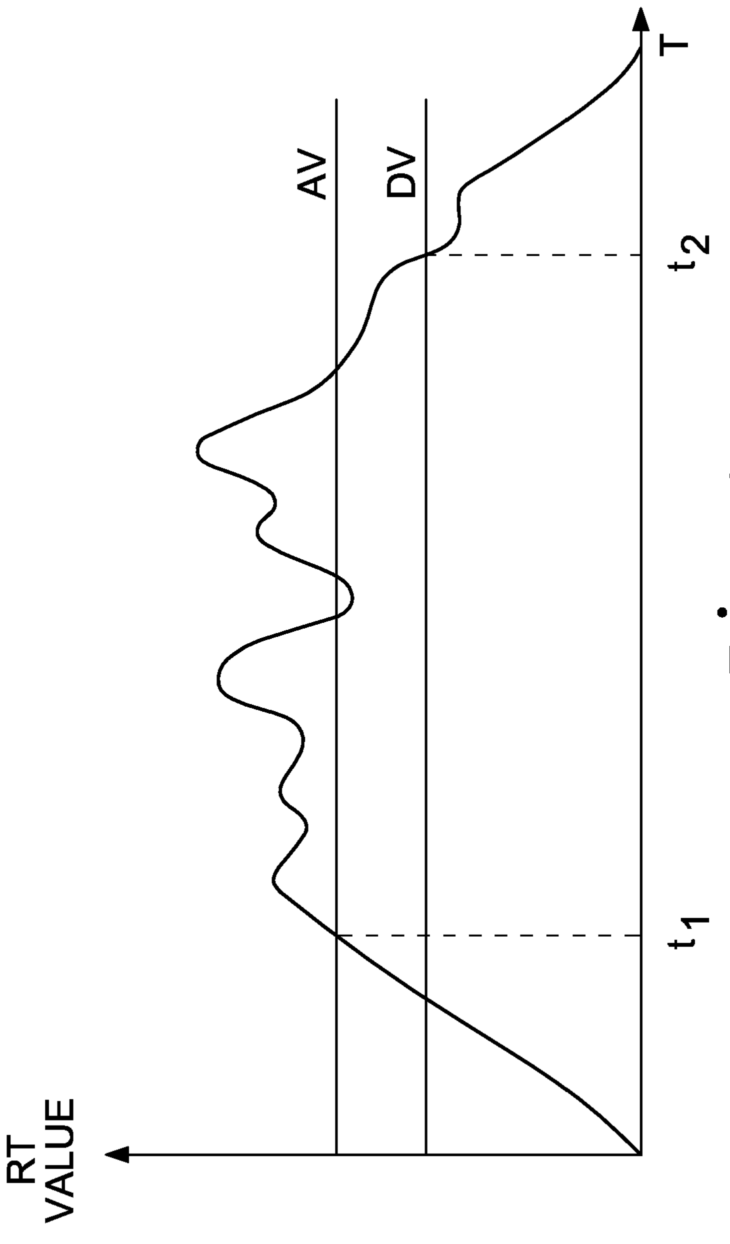

Fig. 6

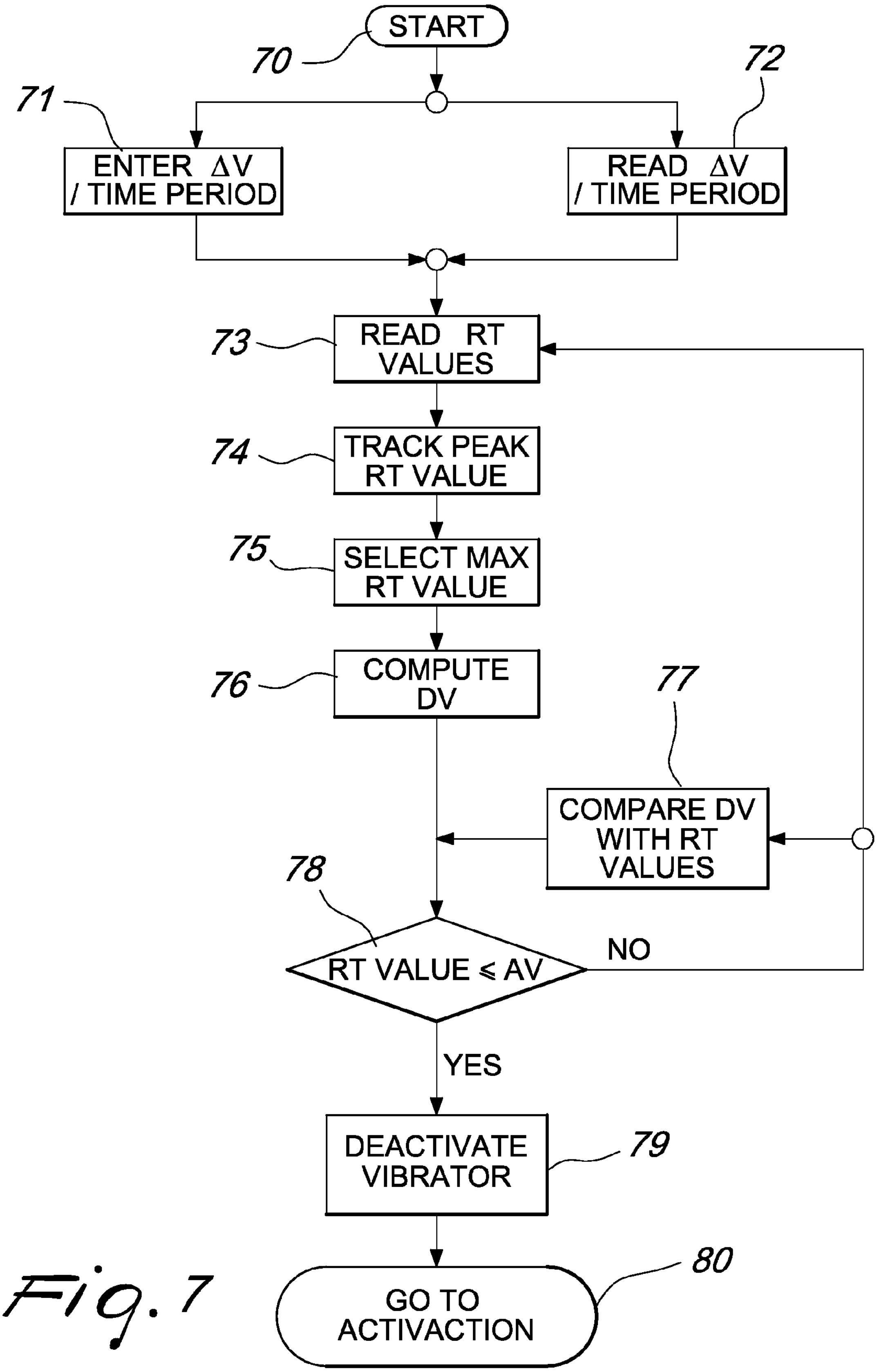
START
70
71
72
ENTER ΔV / TIME PERIOD
READ ΔV / TIME PERIOD
73
READ RT VALUES
74
TRACK PEAK RT VALUE
75
SELECT MAX RT VALUE
76
COMPUTE DV
77
COMPARE DV WITH RT VALUES
78
RT VALUE ≤ AV
NO
YES
DEACTIVATE VIBRATOR
79
80
GO TO ACTIVACTION

Fig. 7

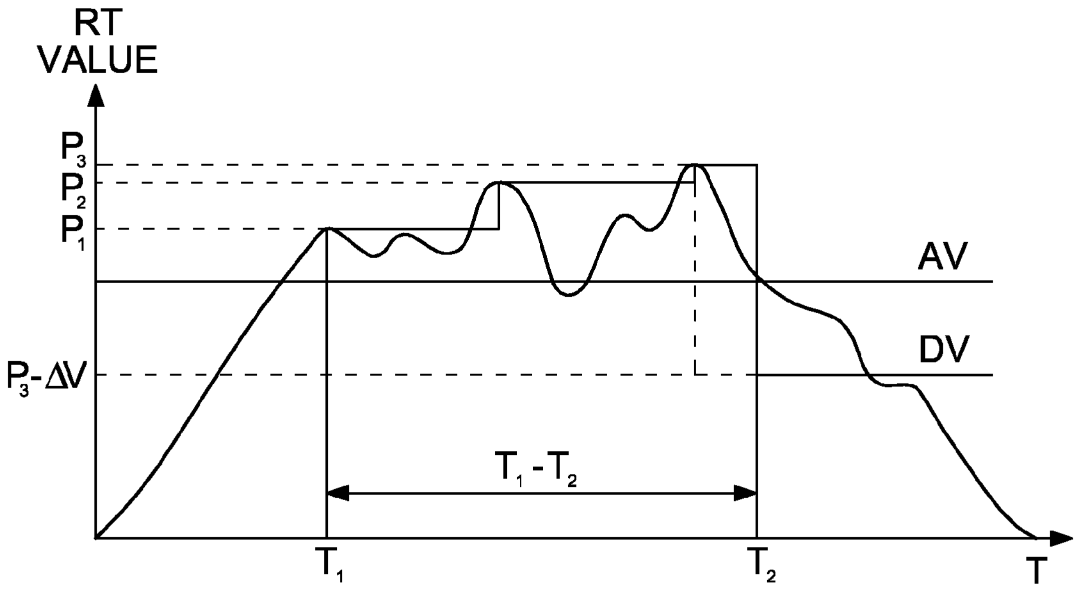
RT
VALUE
P_3
P_2
P_1
AV
DV
P_3-ΔV
T_1 - T_2
T_1
T_2
T

Fig. 8

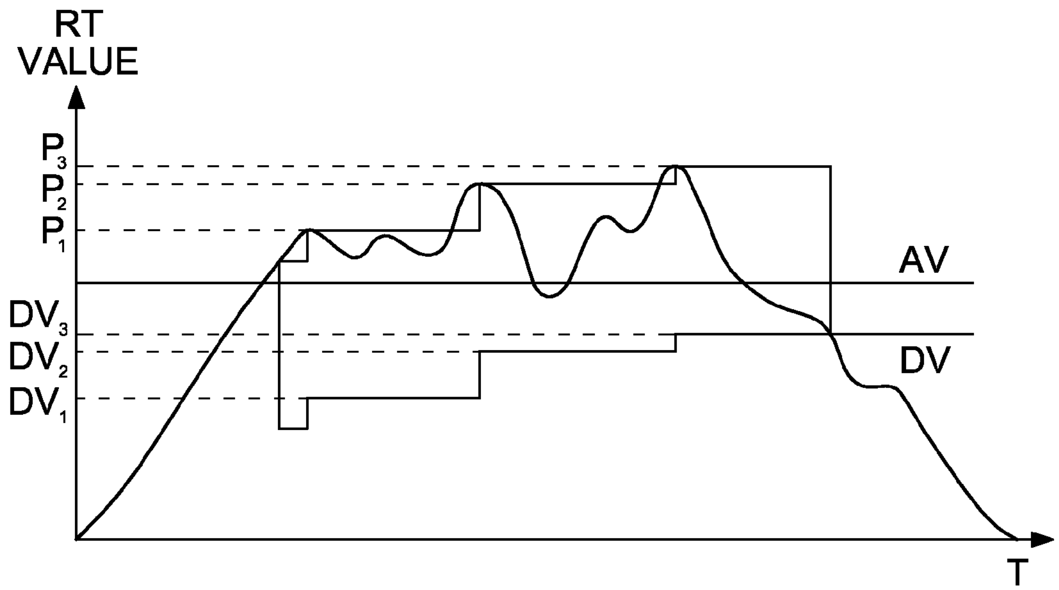
RT
VALUE
P_3
P_2
P_1
AV
DV_3
DV_2
DV_1
DV
T

Fig. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 08 16 8108

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 775 019 A (KONIG F ET AL) 27 November 1973 (1973-11-27) * column 5, line 20 - column 7, line 14; figures 1,2,4 *	1-5, 7-11,13	INV. E01C19/28
X	EP 0 777 016 A (INGERSOLL RAND CO [US]) 4 June 1997 (1997-06-04) * page 2, line 45 - page 3, line 19 * * page 5, line 39 - page 6, line 11; figures 1-8 *	1,6,7, 12,13	
X	WO 95/10664 A (THURNER GEODYNAMIK AB [SE]; SANDSTROEM AAKE [SE]) 20 April 1995 (1995-04-20) * page 19, line 10 - page 20, line 31; figures 1,2,12 *	1,6,7, 12,13	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	9 April 2009	Flores Hokkanen, P

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