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(54) **Vibrating device alarm clock**

(57) An alarm clock comprising a driving assembly and a vibrating device (1) placed in a remote position, the driving assembly comprising a clock and a transmitter of a driving signal timed by the clock. The vibrating device (1) comprises a receiving element (3) responsive to the signal, vibrating elements (4) electrically connected to the receiving element (3) and operated by it in

response to the signal, and electric feed means (10) electrically connected to the vibrating elements and to the receiving element (3). The vibrating device (1) is placeable in a portion of the bed which comes into contact with a person asleep on the bed itself to wake him up by means of its vibration.

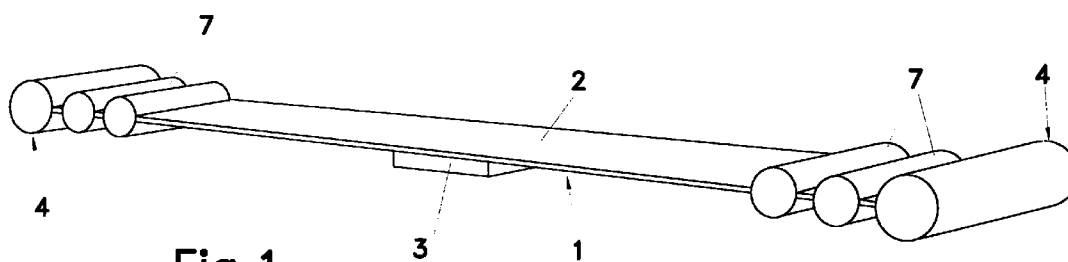


Fig. 1

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Description

The present invention relates to an alarm clock and a time warning device associated thereto.

A large number of different kinds of alarm clocks is on the market, all having the common feature of using a sound-signal emission for waking up the user from sleep. Unfortunately, and with all the negative consequences one can easily guess, it frequently can happen that the sound doesn't succeed in waking up the user, owing to the fact that he has got accustomed to the sound emitted by the alarm clock, or that the clock is not positioned in close proximity to the bed and so the sound reaches the user's ear with softened intensity.

Furthermore, it has to be pointed out that the problem often occurs of two or more people asleep in the same room, having to wake up at different times in the morning. In this case the sound of the alarm programmed by the user which has to wake up earlier disturbs the other person's (or persons') sleep, sometimes to the point that a both sudden and undesired awakening can not be avoided.

It is an object of the present invention to solve the above mentioned problems, providing an alarm clock which reduces a lot the risk of not effectively and reliably accomplishing to his function with respect to known alarm clocks, and succeeds in carrying out said function towards only one user in a personalised manner, without disturbing other people asleep in the same room.

This object has been achieved with the vibrating device alarm clock according to the present invention, which comprises a driving assembly and a remote vibrating device. The, driving assembly comprises a clock and a driving signal transmitter timed by the clock. The vibrating device, placeable in a portion of the bed to wake up a sleeping person by means of its vibration, comprises a receiving element responsive to the driving signal, at least one vibrating element electrically connected to the receiving element and operated thereby in response to the driving signal, and electric feed means, preferably of a battery type, electrically connected to the at least one vibrating element and to the receiving element.

Other features and advantages of the vibrating device alarm clock according to the present invention will be apparent from the following description of a preferred embodiment, made purely as an example and implying no limitation, with reference to the accompanying drawings, in which:

- Figure 1 shows a perspective view of the vibrating device of the alarm clock according to the present invention;
- Figure 2 shows an exploded perspective view of a vibrating element of the device of figure 1;
- Figure 3 shows an exploded perspective view of a battery-housing case of the vibrating element of figure 1.

With reference to the above figures, the alarm clock according to the present invention comprises a driving assembly, not shown, with a conventional clock which, when a sharp time is struck, programmed by the user with a programming procedure that is fully conventional as well, operates a radio signal transmitter for driving a vibrating device 1, placed in a remote position.

The vibrating device, to be placed through a slot suitably formed in the lining inside a pillow on which the user lays his head while resting, comprises a laminate bar 2, a little shorter with respect to the length of the pillow. A receiving element 3, schematically shown in figure 1, responsive to the signal emitted by the driving assembly, is connected to bar 2 in a central position. Element 3 is provided with a wire antenna, not shown, placed along bar 2 according to an annular path.

A vibrating element 4, electrically connected with receiving element 3 by means of wires, not shown, is fixed to each end of bar 2 and is operated by element 3 in response to the driving signal.

With reference in particular to figure 2, in the depicted embodiment each vibrating element 4 comprises a cylindrical container 5, connected along a directrix with the respective end of bar 2. Inside container 5 a motor 9 is placed, operating a rotor 6, pivotally supported coaxially to container 5, having a substantially cylindrical shape but with an incomplete development due to the provision of a plane longitudinal milling 6a. Rotor 6 is unbalanced owing to milling 6a, so that it generates, when operated, a vibration which is transmitted via case 5 along laminate bar 2 to device 1 on its whole.

Battery-housing cases 7, shown in particular in figure 3, are placed near each vibrating element 4 and house batteries 10 electrically connected to receiving element 3 and to vibrating elements 4 for their feed. In the depicted embodiment two cases 7 for each bar end are provided, and they have a cylindrical shape too, being closed by a respective screw plug 8. Batteries 10 are typically 1.5 Volt ones and advantageously can be of a rechargeable kind.

As above said, when the programmed time is struck the driving assembly emits the signal which is picked up by receiving element 3 and transmitted by it to vibrating elements 4, triggering off the vibration of device 1. In this way the user, sleeping with his head on the pillow and so directly contacting the device, wakes up as a consequence of the vibration.

The above described embodiment of vibrating device 1, with vibrating element 4 symmetrically placed at the ends of bar 2, allows an optimal involvement of the pillow, providing a vibration which is strong enough to wake up the user, whichever part of the pillow he may be laying his head upon.

The two elements 4 can be operated simultaneously or alternatively. The second choice is particularly advantageous to reduce the electric consumption of the device.

The vibration strength is adjusted by the user acting on the driving assembly, as a function of his needs and characteristics. In fact, the possibility of increasing or reducing the rotation speed of rotor 6 is provided, modifying with a simple adjustment operation the features of the signal emitted by the driving assembly, thus producing a vibration respectively stronger or weaker.

The vibration of device 1 can be produced by means of other equivalent systems, as for example using cam strikers, vibrating plates and so on. Even if according to what above described the signal emitted by the driving assembly is advantageously a radio signal, a wire connection can be provided between the driving assembly and the vibrating device for the direct transmission of an electric signal.

The material which laminate bar 2 is made of must have both a certain stiffness and a suitable capability of transmitting vibrations. A material which is particularly suitable to the purpose is PVC, namely in its form known under the FOREXTM trade mark.

Though the most advantageous placing of the vibrating device is, as above said, inside the pillow, it is possible to provide, if preferred by the user, different placings, e.g. in internal pockets suitably formed in the mattress.

It will be apparent from the above that the alarm clock according to the present invention accomplishes his function in a certain and reliable manner. Furthermore, its function is addressed only to the person who actually has to be woken up, without disturbing other people asleep in the same room or even in the same bed.

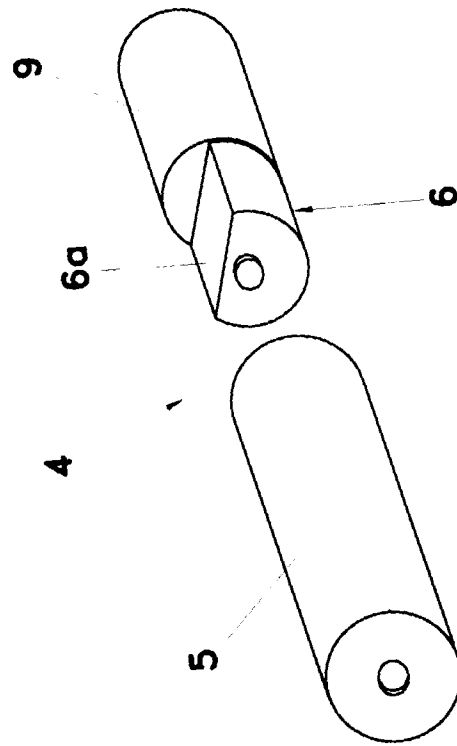
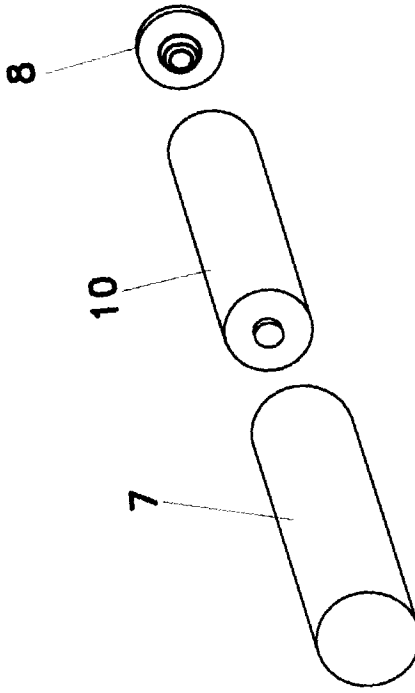
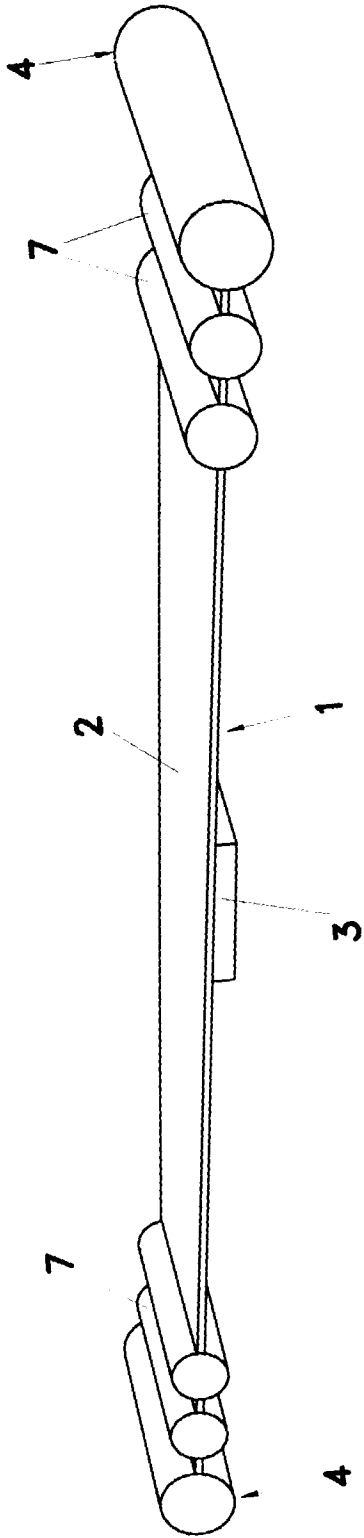
Variations and/or modifications can be brought to the vibrating device alarm clock according to the present invention, without departing from the scope of the invention itself as defined by the appended claims.

Claims

1. An alarm clock characterised in that it comprises a driving assembly and a vibrating device (1) placed in a remote position, said driving assembly comprising a clock and a transmitter of a driving signal timed by said clock, said vibrating device (1) comprising a receiving element (3) responsive to said signal, at least one vibrating element (4) electrically connected to said receiving element (3) and operated by it in response to said signal, and electric feed means electrically connected to said at least one vibrating element and to said receiving element (3), said vibrating device (1) being placeable in a portion of the bed which comes into contact with a person asleep on the bed itself to wake him up by means of its vibration.
2. The alarm clock according to claim 1, wherein said vibrating device (1) comprises a substantially laminate bar (2), about as long as said pillow, said at

least one vibrating element (3) being connected to a respective end of said bar.

3. The alarm clock according to the previous claims, wherein said receiving element (3) is connected to said bar in a substantially central position.
4. The alarm clock according to the previous claims, wherein said electric feed means comprise at least one battery (10).
5. The alarm clock according to the previous claims, wherein said at least one battery (10) is housed inside a respective battery-housing case (7) placed on said bar (2) near said at least one said vibrating element (4).
6. The alarm clock according to the previous claims, wherein said at least one vibrating element (4) and said at least one battery (10) are placed on said bar (2) in a substantially symmetrical position with respect to a median transversal axis thereof.
7. The alarm clock according to the previous claims, wherein said at least one vibrating element (4) comprises a cylindrical container (5) inside which an electric motor (9) and an unbalanced rotor (9) operated by said motor are placed, said rotor (6) being pivotally supported within said container.
8. The alarm clock according to claim 7, wherein said unbalanced rotor (6) has a substantially cylindrical shape, on which a longitudinal plane milling (6a) is formed.





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EUROPEAN SEARCH REPORT

Application Number
EP 98 83 0361

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 4 093 944 A (MUNCHERYAN HRAND M) 6 June 1978	1	G04G13/02
Y	* column 1, line 47 - column 3, line 37 * ---	2-8	
Y	US 5 144 600 A (CHENG PETER S C) 1 September 1992 * column 1, line 45 - column 2, line 44 * ---	2-8	
Y	PATENT ABSTRACTS OF JAPAN vol. 016, no. 522 (P-1445), 27 October 1992 & JP 04 194997 A (NGK SPARK PLUG CO LTD), 14 July 1992 * abstract * ---	2-8	
Y	PATENT ABSTRACTS OF JAPAN vol. 018, no. 109 (E-1513), 22 February 1994 & JP 05 304743 A (SAYAMA SEIMITSU KOGYO KK), 16 November 1993 * abstract * -----	2-8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			G04G
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 5 October 1998	Examiner Exelmans, U
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