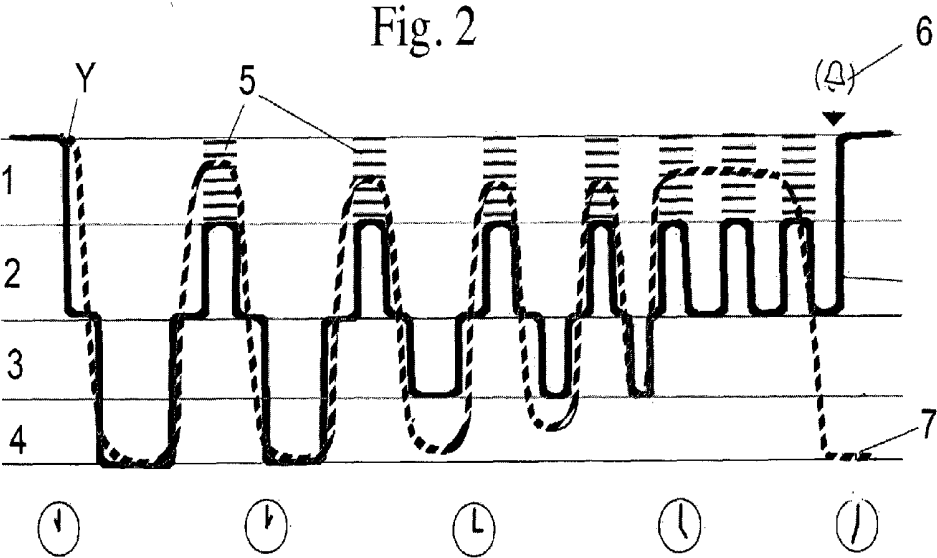
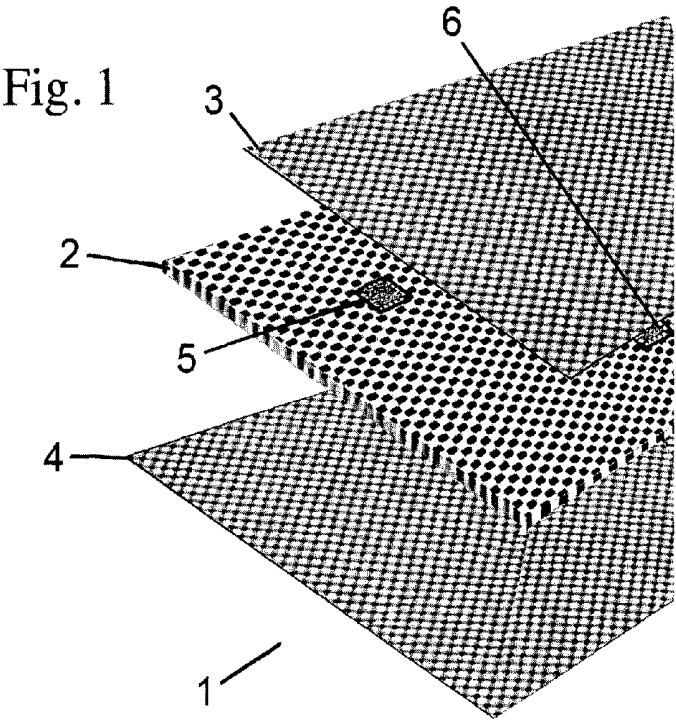




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ELECTRICALLY HEATED BLANKET WITH SLEEP DEPTH -DEPENDENT CONTROL- FOR WEIGHT LOSS

FIELD OF THE INVENTION

[0001] The invention relates to a bed cover, more particularly to an electric blanket, which, however barely isolates, but only temporarily produces electrical warming.

BACKGROUND OF THE INVENTION

Problem to be Solved

[0002] The known physiological effect that light clothing and some shivering increase calorie consumption and thus helps in weight loss, has already led to many proposed concepts in diet, light clothing and to strive for more physical action.

[0003] However, the physiological effects causing chills with small, involuntary contractions of subcutaneous muscles is discomforting to most obese persons and is therefore avoided.

[0004] Additionally, there is the old superstition that colds were caused by temporal hypothermia—even though catching a cold is known to be caused by infections.

[0005] Therefore, such recipes have rarely been complied with.

Prior Art

[0006] A technological solution to this problem is suggested in patent applications of Li Jun in CN2870640 (Y) Deshui Li with CN201888580 (U), as well as Hanschke in DE 10 2010 033 971 A1, which propose a blanket with circulating coolant, while several other innovations suggest the injection of cooling (or, for other purposes warming) air or transfer agents into bed covers, as proposed in DE 692 12 211 T2.

[0007] It is important to note however, that blankets with circulation of coolants inevitably must be rather stiff and uncomfortable and would be severely impaired in their function by inevitable kinks.

[0008] Moreover, the system requires high technical complexity for waterproofing or airtightness and maintaining circulation.

[0009] In addition, application is bound to high self-discipline, since the blankets already spread chill before falling asleep.

Object of the Invention

[0010] It is therefore an object of the present invention, to develop a system for high user compliance.

[0011] This is achieved with only chilling the body within deep sleep phases and with a design, that is inexpensive and less intricate to use.

Inventive Step

[0012] The inventive step therefore is to control the heating with an analysis of the state of sleep, which is expediently done by inserting sensors into the blanket and to refrain from any active cooling, but to design the blanket so that it isolates the body heat as little as possible in its passive state and rises temperature only through the electric heating function which can easily be controlled.

Techno-Medical Basis

[0013] The sleep cycle comprises a change from deep sleep to light sleep with brief almost-awake moments. In this phase, possible cooling is perceived and would lead to awakening.

[0014] The average adult has about 4-5 full sleep cycles within 8 hours. Each cycle lasts between 90 and 110 minutes, and has 5 different phases, which vary individually and on external influences.

[0015] Phase 1 marks falling asleep, in phases 2 to 4 of the sleep grows deeper for the so-called delta sleep status, during which cooling causes no reduction in the depth of sleep or would provoke waking up.

[0016] The 5th Phase is called REM phase. This is the dream phase of accelerated respiration, increased brain activity and rapid eye movements under the eyelid (hence REM is the acronym for Rapid Eye Movement).

[0017] At this stage cooling would result in impairment of the sleep quality and therefore has to be avoided.

[0018] With the aid of an acceleration sensors, the short light-sleep phases (particularly the critical REM-phases) can be determined and largely predicted by the sequence analysis, so that the blanket can be heated up again before such a critical moment occurs.

DESCRIPTION OF THE INVENTION

[0019] The blanket consists of a heating fabric as in conventional electric blankets, only that it is covered on both sides with lattice or heat-permeable fabric.

[0020] A few three-dimensional position sensors, in a one-chip design are integrated and report to an analytic electronic device.

[0021] The occurrence of position changes, which are registered this way, build the parameters for the identification of sleep phases, which may be assigned as to common model and on this basis be continuously predicted, however improved with increasing self-learning of the system on basis of evolution of registered data.

[0022] In deep sleep phases, normally characterized in a lack of movement—but fine tuned by appropriately corrected analysis—the heating of the blanket is reduced or turned off. This results in a cooling effect even at ambient temperatures up to 25° C., which otherwise—though in half-sleep—would cause a user to re-arrange his blanket.

[0023] If the user wakes up due to discomfort, he or she can press the sleep button on a small control unit, so that the blanket warms again.

[0024] With feeding back equivalent parameters into the control system, switching points and -times can be automatically be fine tuned.

[0025] Furthermore, an increased movement of the blanket is sufficient as an indicator that the deep sleep phase is over and the temperature needs to be raised again.

DESCRIPTION OF THE DRAWINGS

[0026] FIG. 1 shows the structure of the blanket 1 with the heating fabric 2, the covering lattice 3 and 4 and the incorporated sensors 5 and 6.

[0027] FIG. 2 is a typical diagram that demonstrates the depth of sleep (Y) on the the perpendicular axis in phases from sleep-in and half-sleep 1 up to 4, the deep “delta-phase” on 8 hours sleep time (see clock faces below), until wake-up time 6.

[0028] The broken line 7 indicates the heating intensity which needs to be adapted to the sleep phases and can be used for waking up the user by switching off the heating at reveille time.

What is claimed is:

1. Electrically heated blanket with sleep depth-dependent control for weight loss, wherein the blanket has no significant thermal insulation effect.

2. Electrically heated blanket as to claim 1, wherein the heating is controlled in response to sleep phases.

3. Electrically heated blanket as to claim 1, wherein the the sleep phases are determined by motion sensors in the blanket, connected to an recording logic.

4. Electrically heated blanket as to claim 3 wherein coming sleep phases are predicted by evaluation of registered prior devolutions.

5. Electrically heated blanket as to claim 1, wherein renewed pressure on the start button prior to passage of an ordinary sweep is registered as incident due to possible temperature undercut.

6. Electrically heated blanket as to one or more of the preceding claims, wherein the switch-off of the heating is also used for or at least supporting waking up of the user at reveille time.

* * * * *

专利名称(译)	带有睡眠深度控制的电加热毯 - 用于减轻体重		
公开(公告)号	US20160250065A1	公开(公告)日	2016-09-01
申请号	US15/029631	申请日	2014-01-27
[标]申请(专利权)人(译)	FUHS曼弗雷德		
申请(专利权)人(译)	FUHS, 曼弗雷德		
当前申请(专利权)人(译)	FUHS, 曼弗雷德		
[标]发明人	FUHS MANFRED		
发明人	FUHS, MANFRED		
IPC分类号	A61F7/00 H05B1/02 H05B3/56 A61B5/00 H05B3/34		
CPC分类号	A61F7/007 A61F7/0097 A61B5/4812 H05B3/342 A61B2562/0219 H05B1/0272 H05B1/0202 A61F2007/029 A61F2007/0086 H05B3/56		
优先权	202013009227 2013-10-18 DE		
外部链接	Espacenet USPTO		

摘要(译)

控制电热毯使其最初在低环境温度下提供舒适的温暖，但是在达到深度睡眠阶段时，温度降低，同时消耗尽可能多的卡路里，因为它不会扰乱睡眠。

