comfortaire bed manual

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Because we are a small company only five fulltime employees, we cannot absorb all those costs. For these reasons, we do not allow returns or exchanges on our large, bulky items. Once an item has shipped, your order cannot be canceled or returned or exchanged. Please do not refuse an item when you receive the package to try to return the item. We will NOT accept it back and we will not issue a refund. It is really important to measure your bed. This is especially important for California king and regular king size. You may think you have the biggest bed in the world, but California King is not bigger than the regular king; its only longer. See all the bed sizes. Unfortunately, we cannot promise that one of our products will work for or with with your specific headboard, bed, etc. There are too many different types of beds for us to make that kind of guarantee. However, if youve read ALL the information weve provided, used our hook templates, etc., you can feel absolutely sure that our bed frames and bed rails will work with your bed. Well promptly send replacement parts or a whole new item if necessary at no cost to you. If youve received a damaged or defective item, please call us as soon as possible at 18009056252 during our normal business hours. 930am 530pm EST, Monday through Saturday. We are happy to talk them over with you. Just call us at 18009056252 during normal business hours 930am 530pm EST, Monday through Saturday. You may get our voice mail. We will call you back. Suite 2610, Charlotte, NC, 28280, US More specifically,Recently, the air mattress has begun to replace the traditional residential mattress which uses coils and springs. Much popularity has arisen in the home mattress market for a residential mattress having an air chamber for supporting the sleeper. The typical air mattress includes at least one air chamber and an inflation and deflation means.http://www.santilariocasa.it/userfiles/carel-controller-manual-ir32.xml

Such means for inflation and deflation range from hand pumps and blowers to computerized air control systems. The utilization of an air chamber provides a sleeping surface which can have varying levels of firmness to suit the preferences or needs of the sleeper with the use of two air chambers. The left and right sides of a bed can be set to maintain two different sleeping surface conditions to accommodate the specific preferences of each sleeper. For example, one sleeper may prefer a sleeping surface which is firm while the other may prefer a surface that is soft. Dual chambers allow for the accommodation of both sleepers. Air chambers are available in many sizes, for example, a double mattress, a queen, and a king. In each mattress, whether single or double chambers, the volume of fluid per chamber is significantly different. As such, the amount of time required to inflate the mattress would vary as the number of attempts an air system takes to hit a desired fullness would vary. Development of an air system to consistently reproduce a sleep surface condition regardless of air chamber size is a matter to which significant attention needs to be directed. Additionally, an air chamber which inflates at a given interval with a consistent inflation time, regardless of air chamber size, is needed. Although attempts have been made to produce consistent sleep surfaces with fixed inflation times, none have considered the variation in air mattresses sizes. These previous methods of controlling a pump or blower all contain significant disadvantages. Those employing a static lookup table to associate settings with pressure do not adjust for various mattress sizes. For example, these systems may require five minutes to fill a double mattress from empty to full, but, pressured the same, the difference for a king sizes mattress may be ten minutes.

While several air systems exist, none are selfcalibrating, selflearning air systems that can accurately repeat a sleeping surface regardless of the air chamber. Also, none are able to inflate to the same fullness for a fixed time interval regardless of air chamber size. An example of an air mattresses which is not selfcalibrating is illustrated in U.S. Pat. No. 5,652,484. This patent discloses an automatic control system for controlling the pressure of an air mattress. A base processor controls the speed and time the blower runs for inflation. However, the processor calculates the time for running the blower each and every time the blower needs to run. This calculation does not consider air chamber size nor contains “learning” from inaccurate calculations. The invention of U.S. Pat. No. 4,897,890 discloses an air control system for an air bed which utilizes an air pump having a diaphragm. The pump is directly controlled through buttons depressed by a user of the control system. No selfcalibrations are made concerning the length of time nor the speed in which to run the pump. Other examples of air control systems which do not contain means for selfcalibration include U.S. Pat. Nos. 4,394,784; 5,020,176; and 5,794,288. Accordingly, an object of the present invention is to provide for an air mattress and air mattress control system for dynamically calculating the blower speed to provide fixed inflation times regardless of the mattress size. Another object of the present invention is to provide an air system able to accurately replicate a prescribed sleep surface within a preselected period of time regardless of mattress size.

SUMMARY OF THE INVENTION The foregoing and other objects are achieved by our invention which, in one aspect, is a system for controlling the inflation and deflation of an air chamber of an air mattress which comprises a system processor with a computer readable medium, an air blower whose speed is controlled by the processor, a supply port carried by the blower through which air is delivered to the chamber, a remote control for generating a command signal to the processor representing a desired degree of fullness of said air chamber; and a set of processing instructions within said readable medium responsive to a command signal so that responsive to said command signal, the processor executes instructions for retrieving a blower speed from an array of speeds, and retrieves a first adjustment value to the blower speed, adjusts the blower speed based on said adjustment value, and operating said blower at the adjusted blower speed. By controlling the degree or level of inflation or fullness of the mattress chamber the sleeping surface can be automatically adjusted to provide maximum comfort to the sleeper or user.

In another aspect, the present invention is an air mattress control system for controlling the inflation and deflation of an air chamber of an air mattress to provide a desired air chamber fullness having a system processor with a computer readable medium, an air blower operably connected to said computer readable medium which is operably connected to the system processor, and a supply line in fluid communication with the air chamber for inflating and deflating said air chamber comprising a remote control having a computer readable medium including a memory area, a numeric value stored in said memory area representing the desired fullness of the air chamber selected by a user, a plurality of control buttons carried by said remote control operably connected to said computer readable medium of said remote control, a set of remote control instructions contained within said computer readable medium of said remote control for, responsive to the depression of at least one of said control buttons, incrementing said numeric value to said system processor, a motor speed array indexed by desired fullness values, and, a set of processing instructions contained in said computer readable medium of said system processor for, in response to receiving said numeric value from said system processor, selecting a motor speed from said motor speed array, adjusting said selected motor speed, calculating a motor speed run time, and operating said motor speed at said adjusted motor speed for said calculated time.

In yet another aspect, the invention, is an improved method for controlling the fullness of an air mattress having at least one inflatable chamber and a means for generating a pressurized flow of air to the chamber through a supply port, the supply port including a value for admitting and removing air from said chamber, the chamber including a pressure sensor for measuring chamber fullness and the improvement comprises the steps of providing a multispeed air blower as the means for generating pressurized air flow, the operating speed of said blower being selected from an array of discrete, incremented blower speeds, said speeds in said array being a predetermined function of chamber size and time to reach a designated percentage of fullness; a target value being a percentage of fullness; comparing the target value with the current level of chamber fullness measured by said sensor and determining the differential percentage, selecting a blower speed from an array corresponding to said differential percentage operating the blower at said selected speed, opening said valve to introduce pressurized air into said chamber through said valve, again determining the percentage of fullness measure by said sensor, and determining a new differential percentage; selecting a new blower speed based on the new differential, and operating the blower at the new speed to introduce air into the chamber, repeating the previous four steps until said target value is substantially reached whereupon said value is closed. The pumps, valves, connectors, controllers, chambers, and other equipment mentioned herein is readily obtainable by those skilled in the art who, using this specification as a guide, can purchase and assemble the same. DESCRIPTION OF A PREFERRED EMBODIMENT Reviewing FIG.

1, the air system designated generally as A can be seen placed underneath the air mattresses, designated generally as B, with a set of remote units, designated generally as C, all connected to the air system. Fluid is transported between air system A and air mattresses B through supply tube 10. It should be noted that multiple supply tubes to multiple air chambers are possible given the various size of mattresses. For example, a twin bed may only require a single air chamber while a king bed may require two or more chambers. FIG. 1 illustrates a mattress with two chambers. Referring now to FIG. 2, the air system A will be explained in more detail. Air supply 10 is connected to a port 12 of valve assembly D. In this particular embodiment, dual valve assemblies are shown to support a dual chamber mattress. For inflation, blower engine 14 is connected to fan 16 which provides air flow in a direction designated as 18 for delivery to the air chamber. The air delivered to the air chamber is provided by an intake 20 contained within the air system A. It should be noted that while air is the fluid of the preferred embodiment, other fluids may certainly be used. Also contained within air system A is a processor 22 which is supplied power through power cord 24. Blower engine 14 is connected to processor 22 through connection 26 so that processor 22 can control the speed and duration for which the blower engine operates. Fullness sensors 28 a and 28 b are also located on processor board 22 and are connected to valve assembly D through tubes 30 a and 30 b. This allows the fullness sensors to be able to read fullness from the air chambers. The valve assemblies are also connected to processor port 22 through connections 32 a and 32 b. This connection allows processor 22 to control the opening and closing of the valves contained within the valve assembly D. Remote units designated generally as C FIG.

1 are connected to air system A through twistedpair cabling utilizing RJ11 jacks 34 a and 34 b. These jacks provide a connection to processor board 22 through remote unit connection 36. This connection allows the remote units to communicate with the air system and specifically with processor 22. Contained within processor 22 is controller 38 containing a computer readable medium for storing computer readable code for the operation of processor 22 and air system A. The computer executable code residing on controller 38 will be described later in more detail. Referring to FIG. 3, air system A is described in further detail. Remote controllers C are connected to processor 22 for transmitting user command signals to processor 22 and subsequently to controller 38. Processor 22 controls valves 40 a and 40 b of valve assembly D to allow fluid to flow from the blower through valves 40 a and 40 b, through supply tubes 10 a and 10 b to inflate air mattresses 42 a and 42 b. Additionally, fluid from the air mattress flows through the supply tube, through valves 40 a and 40 b and exits through vent 20 FIG. 2 . Valve assembly D is further illustrated in FIG. 4 which shows a valve assembly for the dual chamber embodiment. During the inflation process the air blower produces air flow in direction 18. Valve assembly D contains valve seat 44 for receiving valve head 46 so that when Oring 48 carried by valve head 46 contacts valve seat 44 air flow is prevented. Spring 50 applies pressure in direction 52 to force valve head 46 and Oring 48 to valve seat 44. Additionally, an advantage of this design is to provide for fluid pressure of the air mattress to exert the pressure in direction 54 through delivery tube 10 to force valve stem 56 in direction 52 to create a tighter seal between the valve head, Oring, and valve seat. Simply put, the pressure keeping the valve closed is related to the amount of pressure in the air chamber.

The left valve assembly D illustrates the valve in the closed position. When the valve is open, valve ports 58 allow for air flow in direction 60 to flow around Oring 48, through valve stem 56, through port 12, and through supply hose 10 into the air chamber. In the preferred embodiment, solenoid 62 is connected to processor 22 through connections 32 a and 32 b FIG. 2 . When energized, solenoid 62 applies a magnetic force to valve stem 56 to pull valve head and Oring away from valve seat in direction 64 thereby allowing air flow in direction 18 when the blower is on, and allowing for air flow to escape the air mattress in the direction 54 when the blower is off. The pressure contained in the air mattress is transmitted through pressure tubes 30 a and 30 b respectively to pressure sensor 28 a and 28 b FIG. 2 from port 12. It is advantageous to close the valve when checking pressure in order to avoid any potential discrepancies caused by fluid movement in the direction 18 through the blower. Function of the Air System Referring now to FIG. 5A, the software embedded in a computer readable medium of processor 22 will be described in further detail. Step 70 depicts the calculation of the initial motor speed in which to run the motor. This calculation is based upon the target fullness. In calculating the initial motor speed, a mathematical relationship exists between the target fullness and the proper motor speed. This relationship is represented by the graph shown in FIG. 8. As illustrated in the graph of FIG. 8, the Xaxis represents a mutual index between the Target Fullness and Initial Blower Speed and the Y axis represent the target fullness as a percentage. As illustrated, the Target Fullness is a logarithm progression when compared to the linear progression of the Initial Speed. By relating the motor speed to the Target Fullness in this logarithmic manner, the opposite initial motor speed is calculated.

It should be noted that the speed represented in the graph is representative of motor speed and the actual data transmitted to the blower is inverse. Therefore, the higher a number transmitted to the blower, the slower the motor speed. FIG. 6 illustrates the motor speed in more detail. Step 72 of FIG. 6 represents receiving the target fullness F t from the remote C. The target fullness is used to index an estimated target array in step 74. In the present embodiment 44 values are used to relate the estimated target with the initial speed. If the target value exceeds the estimated values of the array, as checked in step 76, the motor speed is returned as the last and fastest speed in the array in step 78. Otherwise, if the estimated target value is greater than the target fullness, as checked in step 80, the array index number is reduced by one in step 82. Otherwise, the next set of values are checked in step 84. The end result of this function is to provide for an initial blower speed having a relationship with the target pressure so as to provide a blower speed sufficient to inflate the mattress based upon the target speed and ultimately the desired sleeping surface. Once the initial motor speed is selected through the target motor speed function, the delay is set between ramping up the motor and opening the valve in step 86 FIG. 5 A. The higher the target pressure, the higher the interval between ramp up speed and opening the valve since the higher the target pressure requires the higher motor speed which requires a longer ramp up time. In step 88, the initial motor speed is adjusted based upon fuzzy logic employed to either increment or decrement the speed in which to run the motor. Fuzzy logic is the logic used so that the motor speed used to inflate the mattress based upon the target fullness and pressure deferential between the present fullness and target fullness is adjusted per mattress size and environment.

For example, to go from a fullness of 50 to 75 is a target pressure of 75 with a pressure differential of 25. Given a constant motor speed, a twin mattress would take less time to inflate than a queen. Therefore, the fuzzy logic allows the air controller to “learn” the correct blower speed so that either mattress would inflate at a consistent period of time. The twin would take five seconds since the air controller uses different speeds relative to the different size mattresses. Additionally, the fuzzy logic is responsive to varying environmental conditions for the mattress. Based upon the well known physics principal, a change in temperature causes a change in a pressure of a gas given a constant volume. Since the air system of the present invention consistently adjusts motor speed through its fuzzy logic, the air system can selfcalibrate for changes in temperature of the air mattress and maintain a consistent fullness and sleep surface irrespective of environmental conditions. To accomplish its goals, the Fuzzy logic functions use the history of previous inflation speeds and number of tries to determine whether the speed was sufficient to fill the mattress on the first try. Therefore, the fuzzy logic has been able to learn the proper motor speed in order to inflate the mattress within a specified time regardless of the size of the air mattress. The ultimate goal is to eliminate the fullness differential between the starting fullness with the target fullness. Once this motor speed is adjusted, it is transmitted to the motor controller of processor 22 in step 90. Next, the determination is made on whether this is the first attempt to inflate the mattress in step 92 and, if it is, the next step is to check whether the valve is already open in step 94. If the valve is not open, the current fullness is read in step 96 and a determination is made on whether the motor is already running in step 98.

If the motor is already running, then the delay is set for opening the valve in step 100. If the motor is not on the motor is turned on in step 102 and the value delay between the motor ramping up and the valve opening is set in step 104. The motor start clock is set in step 106 so that the motor will not run indefinitely but rather will time out if the target fullness is not reached within a specified period of time. In step 108, the difference between the target fullness and the actual pressure is calculated and, based upon this spacing, the time is set in which to next check the fullness differential in step 110. Continuing on to FIG. 5B, the check is then made as to whether the time has expired in which to check the fullness in step 112. If the time has expired, the current fullness is read. This represents the first try. Next, the determination on whether the fullness differential is greater than a certain tolerance in step 116. For example, if the difference in the target fullness and the actual pressure is less than 3%, this may be an acceptable differential so that the air chamber is considered having reached the target fullness. Therefore, a mathematical equivalent between the target pressure and the actual fullness is not necessary but rather only that the actual pressure is within an allowable range for target fullness. Then the counter representing the number of attempts to reach the target fullness is incremented in step 118 the valves are closed in step 120 and the actual fullness is read in step 122. The fullness differential is calculated in step 124 and the determination is made on whether the actual fullness is within the specified range of the target fullness or the number of tries has exceeded a predetermined number in step 126. If neither condition is true, the motor is kept on and in step 128, the fuzzy logic increments the motor speed by one speed setting since the motor speed was insufficient to reach the target pressure within the first try.

The process then begins again at step 70. Were the actual fullness to have exceeded the target fullness, the motor speed would have been decremented. Returning to step 116, if the actual fullness is within the tolerable range of the target fullness then the current fullness is read in step 132 and if the time to try at this particular speed has expired, as checked in step 134, the motor speed is adjusted based on the fuzzy logic in step 136 and the process is repeated back to step 70. FIG. 7 represents the remote unit attached to the air controller for transmitting the target fullness or manually operating the air blower and valve. Remote unit C contains display 140 for representing the actual fullness or target fullness based upon the mode in which the remote unit is operating. Input button 142 performs several features based upon the mode in which the handheld is operating. In automatic mode, the input button increments and decrements the target fullness as displayed on display 140. In manual mode, the plus runs the blower and inflates the mattress while the minus opens the valve to deflate the mattress. A “100” button 144 allows for the single operation of filling the mattress to 100%. Mode button 146 determines in which mode the handheld is operating. Modes which are possible are automatic mode, manual mode, and dual chamber mode. Automatic mode is where the remote control unit transmits a target fullness to the air system for inflation or deflation of the air chamber to the desired fullness. Manual mode is for opening the valve or running the blower responsive to the plus and minus button. Dual chamber mode inflates or deflates multiple air chambers with a remote unit. Additionally, memory button 148 can be used to reach a particular target at a touch of a button other than the 100% setting of button 144. To perform these operations, remote unit C also contains a processor computer readable medium and computer executable code for the application.

While a preferred embodiment of the invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the following claims. Unlock The Coupons Comfortaire Slumber Search is supported by readers. Some links on Slumber Search are referral links. If you use one of these and buy something, Slumber Search may make a small amount of money. More info. Comfortaire made the original adjustable airsupported bed before a former employee went off to found Select Comfort, the makers of Sleep Number, which later acquired Comfortaire in 2013. Today, Comfortaire mattresses are sold throughout the US in select comfort Sleep Number store fronts and online. The difference between Sleep Number and Comfortaire is one of overall selection and technology. It is not doubt that the Sleep Number is Select Comforts flagship brand, but Comfortaire offer a wider selection of options in their memory foam and latex and are low in VOCs from using Certipur materials. That said, it is sometimes difficult to stay focused with all of the reviews from countless brands. Customers report feeling both positively and negatively about these mattresses. Some are ecstatic about their new mattress, but others are less pleased. Comfortaires Supportiveness Mattress support is important for keeping your spine well aligned and sleeping well. Overall, these mattresses are above average in terms of supporting sleepers. This is important if you have back problems or need something that will keep the spine aligned properly. Most customers describe these mattresses as providing a good level of support initially. Edge Support Edge support is the amount of resistance there is for sleepers along the sides versus the amount of support in the middle.

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