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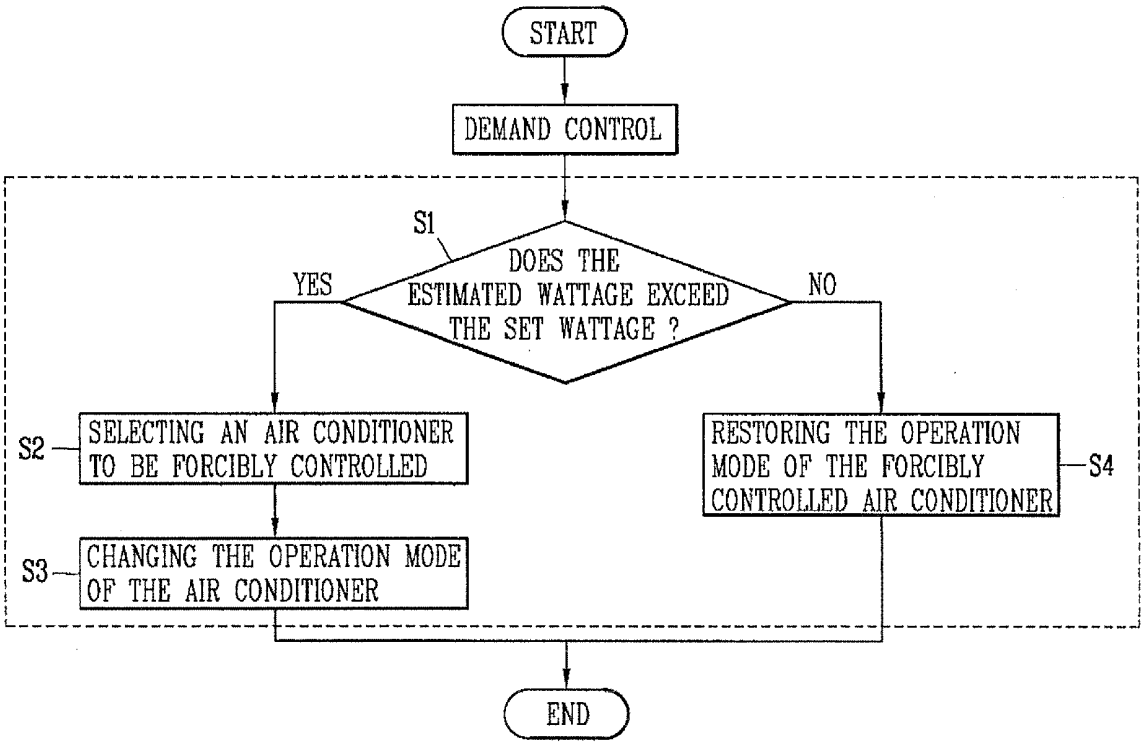
(54) **Demand control system and method for multi-type air conditioner**

(57) A demand control system for the multi-type air conditioner includes a demand control unit for controlling the operational efficiency of the air conditioners by changing the operation mode of the air conditioners when the estimated wattage exceeds a set wattage while enabling the user to feel more comfortable.

FIG. 2



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Description

[0001] The present invention relates to a demand control system and method for a multi-type air conditioner.

[0002] In general, a demand control regime for a multi-type air conditioner is a technique for controlling the consumption of electrical power by switching on/off an air conditioner randomly selected or selected among a plurality of air conditioners according to a pre-set cycle so as to control the operational efficiency of a multi-type air conditioner within the range of a permissible wattage (i.e., the amount of electrical power).

[0003] The demand control regime emphasizes electrical power control rather than a user's convenience, and operates to restrict the power consumption by sequentially switching off consumption loads of the electrical power.

[0004] However, the related art demand control system for a multi-type air conditioner has the following problem. That is, because the air conditioner to be provided or deprived of electrical power supply is selected without regard to the user's convenience, the user in an area where the air conditioner is forcibly controlled is located may feel substantially less comfortable.

[0005] Therefore, the present invention is directed to provide a demand control system and a demand control method for a multi-type air conditioner which is capable of enhancing a user's comfort as well as of stably maintaining an electrical power, resulting from reducing a wattage consumption by controlling an air conditioner with changing an operation mode of the air conditioner when an estimated wattage exceeds a set wattage.

[0006] To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described herein, there is provided a demand control system for a multi-type air conditioner, comprising: a wattage consumption sensing unit for calculating an estimated consumed wattage of a plurality of air conditioners of a building; and a demand control unit for changing an operation mode of at least one air conditioner among the plurality of air conditioners when the estimated wattage calculated by the wattage consumption sensing unit exceeds a set wattage value.

[0007] In another aspect of the present invention, there is provided a demand control method for a multi-type air conditioner, comprising: calculating an estimated wattage consumed by a plurality of air conditioners of a building; and changing an operation mode of at least one air conditioner among the plurality of air conditioners when the calculated wattage exceeds a set wattage value.

[0008] The foregoing and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

Figure 1 is a schematic block diagram showing a demand control system for a multi-type air conditioner in accordance with the present invention; and

Figure 2 is a flowchart showing a control method of the demand control system of Figure 1.

[0009] Description will now be given in detail of the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

[0010] As shown in Figure 1, the demand control system for a multi-type air conditioner in accordance with the present invention may include a wattage consumption sensing unit 10 for calculating an estimated wattage consumed by a plurality of air conditioners 50 of a building; and a demand control unit 20 for controlling an operational efficiency of the air conditioners 50 by changing an operation mode of at least one air conditioner 50 of the plurality of air conditioners 50 when the wattage consumption sensing unit notifies the demand control unit that the estimated wattage consumption exceeds the set wattage value.

[0011] The plurality of air conditioners 50 may each include an outdoor unit 51 and at least one indoor unit 52 connected to the outdoor unit 51.

[0012] The wattage consumption sensing unit 10 may receive data with respect to the wattage measured from a watt-hour meter 71 by being connected with the watt-hour meter 71 connected with the plurality of air conditioners 50 so as to estimate the consumed wattage after a certain time duration. And then, the wattage consumption sensing unit 10 may sense whether the estimated wattage exceeds a pre-set demand wattage value so that the sensed information may be transferred to the demand control unit 20.

[0013] The demand control unit 20 may be connected with the wattage consumption wattage sensing unit 10 and to each outdoor unit 51 and indoor unit 52 of the air conditioners 50 so that, when the estimated wattage exceeds the set wattage value, the operation mode of the air conditioners 50 may be sequentially changed so as to reduce the wattage consumption of the plurality of air conditioners 50.

[0014] That is, the demand control unit 20 may switch off the outdoor units 51 of the air conditioners so that the operation mode of the indoor unit 52 in a corresponding area may be changed into a blowing (fan only) mode for reducing the wattage consumption of the air conditioners 50.

[0015] Meanwhile, when changing the operation mode of the air conditioners 50, the demand control unit 20 may change the operation mode of the indoor units 52 into the blowing (fan only) mode by switching off the outdoor unit 51, and also into another operation mode that can reduce the power consumption by changing into a dehumidifying mode, changing a blowing amount, controlling a circulation speed of a refrigerant, or the like.

[0016] As such, changing the operation mode of the air conditioners 50 for reducing the wattage consumption can prevent the temperature in each area from suddenly

being changed, comparing with abruptly shutting off the electrical power supply for the air conditioners 50, and accordingly a user in the area where the forcibly controlled air conditioner 50 is located may feel comfortable for a longer time. Also, the time taken until the air conditioner 50 is restored from the forcibly controlled temperature to the prior temperature is shortened, thereby preventing unnecessary energy consumption.

[0017] Hereafter, a method for an air conditioner in accordance with the present invention will be described with reference to Figure 2.

[0018] First, while performing a cooling or a warming operation with respect to a certain area of a building by the plurality of air conditioners 50 disposed in the building, the wattage consumption sensing unit 10 may sense whether the estimated wattage exceeds the pre-set wattage value by calculating the estimated wattage based on the information regarding the consumed wattage measured by the watt-hour meter 71, and then transfer the thusly sensed information to the demand control unit 20 (S1).

[0019] Here, if the information that the estimated wattage exceeds the set wattage value is transferred to the demand control unit 20 from the wattage consumption sensing unit 10, the demand control unit 2 may select at least one outdoor unit 51 (S2). Here, the forcibly controlled outdoor unit 51 may be excluded. In other words, when the estimated wattage consumption exceeds the set wattage value, the demand control unit 2 changes an operation mode of at least one air conditioner of the plurality of air conditioners. For example, the demand control unit 2 switches the at least one air conditioner into a blowing mode, switches the at least one air conditioner into a dehumidifying mode, changes a blowing amount of the at least one air conditioner, or changes a circulation speed of a refrigerant of the at least one air conditioner

[0020] And, the selected outdoor unit 51 may be switched off so that the operation mode of the indoor unit (s) 52 connected with the outdoor unit 51 may be changed into the blowing (fan only) mode (S3). As such, the overall wattage consumption of the air conditioners may be reduced resulting from the switching off of the outdoor unit 51.

[0021] Meanwhile, upon reducing the wattage consumption of the air conditioners 50, the wattage consumption sensing unit 10 may sense the information that the estimated wattage falls short of the set wattage value, and then transfer such sensed information to the demand control unit 20. Then, the demand control unit 20 may change the operation mode of the air conditioners controlled in the previous step into a cooling mode or a warming mode from the blowing mode, so that the operation mode of the air conditioners may be restored to their previous original state (S4).

[0022] As aforementioned, the demand control system and the demand control method for a multi-type air conditioner in accordance with the present invention operates to control the operational efficiency of the air conditioners by changing the operation mode of the air conditioners so as to reduce the wattage consumption of the air conditioners when the estimated wattage consumption exceeds a set wattage value, thereby enabling a user in the area where the controlled air conditioner is located to feel comfortable pleasant for a longer time.

[0023] Further, the time taken until the air conditioner is restored from the forcibly controlled temperature to the prior desired temperature is shortened, thereby preventing unnecessary energy consumption.

Claims

1. A demand control system for a multi-type air conditioner, comprising:

   a wattage consumption sensing unit that calculates an estimated wattage consumption of a plurality of air conditioners of a building and compares the estimated wattage consumption with a set wattage value; and
   a demand control unit that changes an operation mode of at least one air conditioner of the plurality of air conditioners when the wattage consumption sensing unit notifies the demand control unit that the estimated wattage consumption exceeds the set wattage value.

2. The system of claim 1, wherein the demand control unit switches the at least one air conditioner into a blowing mode when the wattage consumption sensing unit notifies the demand control unit that the estimated wattage consumption exceeds the set wattage value.

3. The system of claim 1, wherein the demand control unit switches the at least one air conditioner into a dehumidifying mode when the wattage consumption sensing unit notifies the demand control unit that the estimated wattage consumption exceeds the set wattage value.

4. The system of claim 1, wherein the demand control unit changes a blowing amount of the at least one air conditioner when the wattage consumption sensing unit notifies the demand control unit that the estimated wattage consumption exceeds the set wattage value.

5. The system of claim 1, wherein the demand control unit changes a circulation speed of a refrigerant of the at least one air conditioner when the wattage consumption sensing unit notifies the demand control unit that the estimated wattage consumption exceeds the set wattage value.

6. The system of claim 1, wherein the demand control

unit restores the operation mode of the at least one air conditioner when the wattage consumption sensing unit notifies the demand control unit that the estimated wattage consumption is less than the set wattage value.

7. The system of any of claims 1 to 6, wherein the wattage consumption sensing unit calculates the estimated wattage consumption from a wattage consumption value measured by a watt-hour meter connected with the plurality of air conditioners.

8. A method for controlling an air conditioner, comprising:

calculating an estimated wattage consumption of a plurality of air conditioners of a building;
comparing the estimated wattage consumption with a set wattage value; and
changing an operation mode of at least one air conditioner of the plurality of air conditioners when the estimated wattage consumption exceeds the set wattage value.

9. The method of claim 8, wherein changing the operation mode comprises switching the at least one air conditioner into a blowing mode.

10. The method of claim 8, wherein changing the operation mode comprises switching the at least one air conditioner into a dehumidifying mode.

11. The method of claim 8, wherein changing the operation mode comprises changing a blowing amount of the at least one air conditioner.

12. The method of claim 8, wherein changing the operation mode comprises changing a circulation speed of a refrigerant of the at least one air conditioner.

13. The method of claim 8, further comprising restoring the operation mode of the at least one air conditioner when the estimated wattage consumption is less than the set wattage value.

FIG. 1

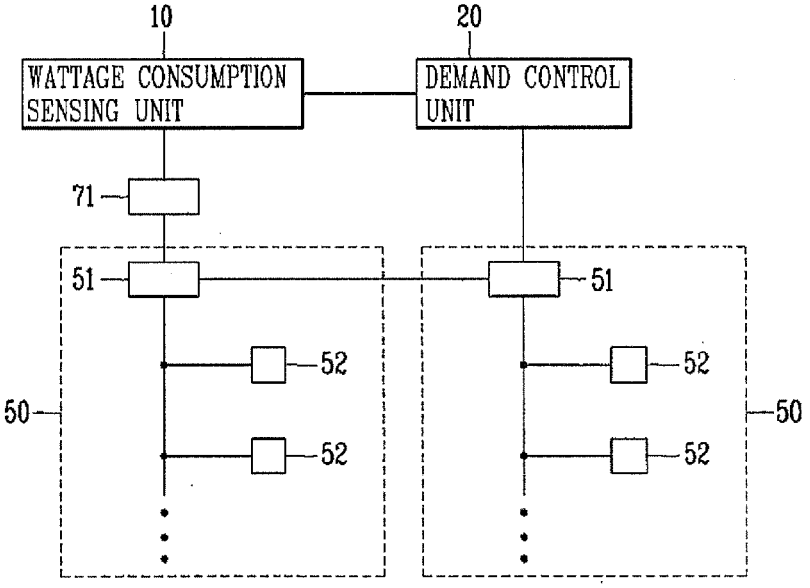
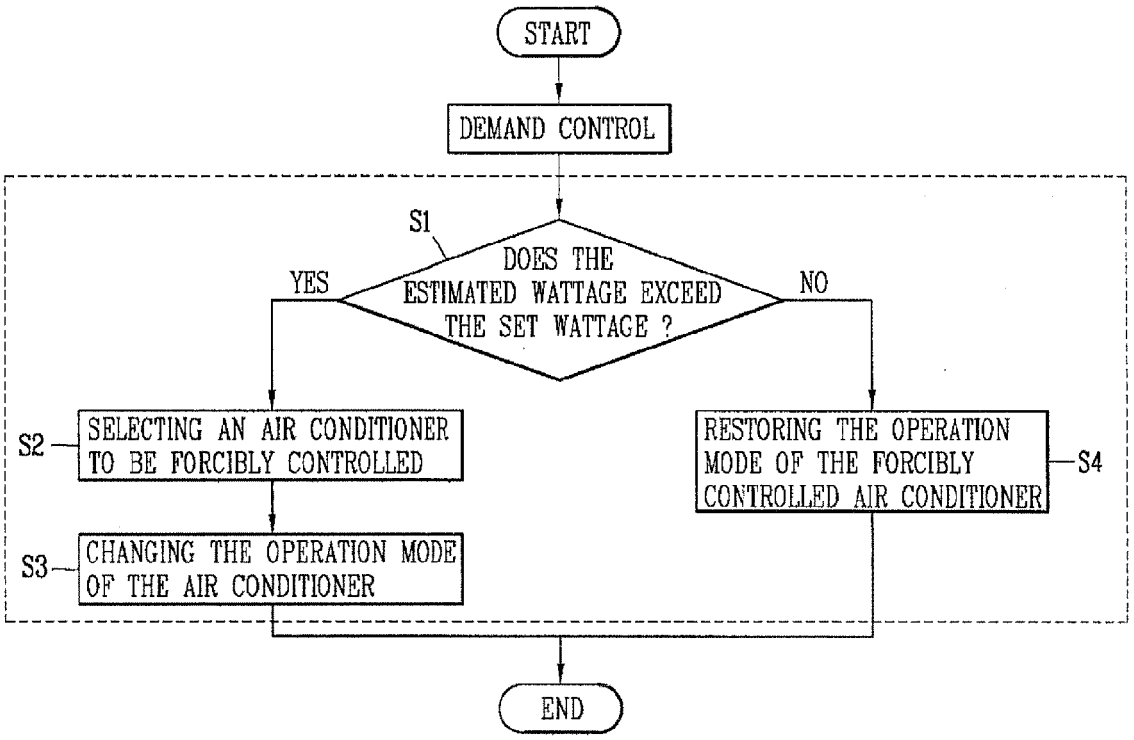

10
20
WATTAGE CONSUMPTION SENSING UNIT
DEMAND CONTROL UNIT
71
51
51
52
52
52
52
50
50

FIG. 2


START
DEMAND CONTROL
S1
DOES THE ESTIMATED WATTAGE EXCEED THE SET WATTAGE ?
YES
NO
S2
SELECTING AN AIR CONDITIONER TO BE FORCIBLY CONTROLLED
S3
CHANGING THE OPERATION MODE OF THE AIR CONDITIONER
RESTORING THE OPERATION MODE OF THE FORCIBLY CONTROLLED AIR CONDITIONER
S4
END

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EUROPEAN SEARCH REPORT

Application Number
EP 08 15 0528

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			TECHNICAL FIELDS SEARCHED (IPC) F24F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	2 June 2008	Decking, Oliver

CATEGORY OF CITED DOCUMENTS

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02-06-2008

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