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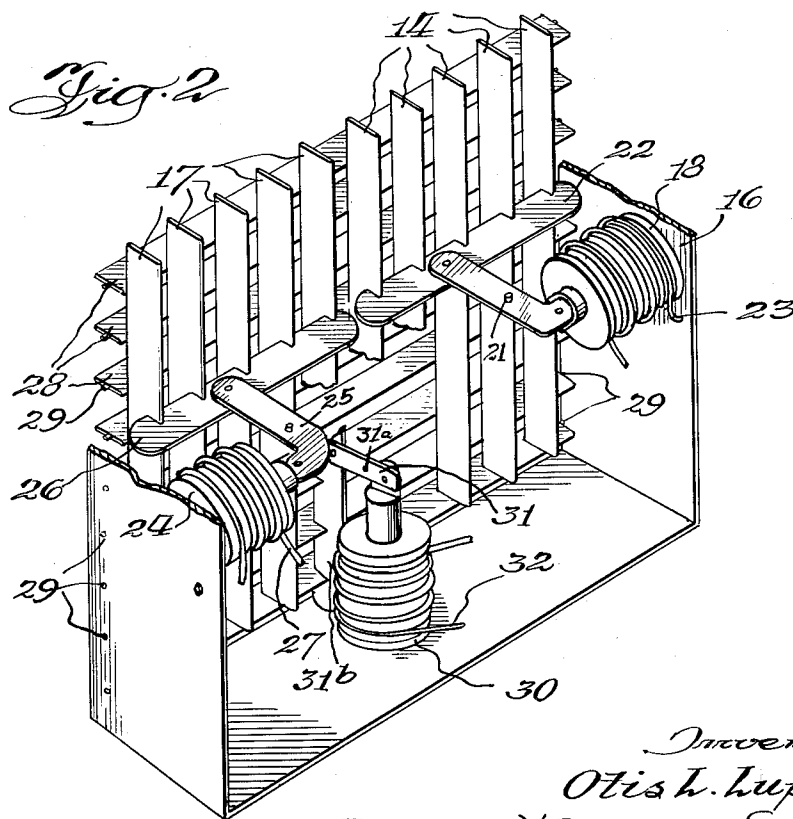
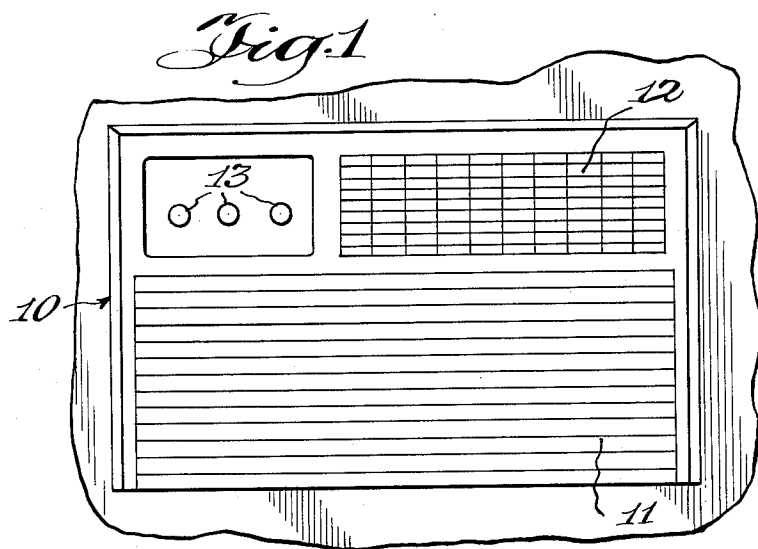
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AIR CONDITIONER LOUVER MECHANISM

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2 Sheets-Sheet 1



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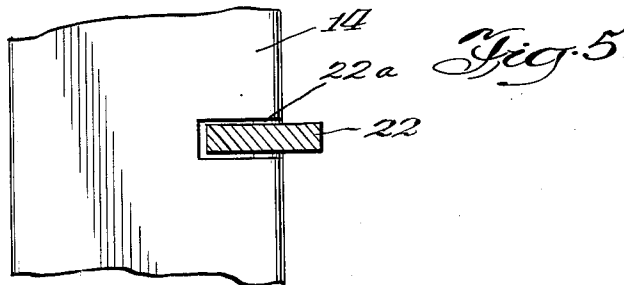
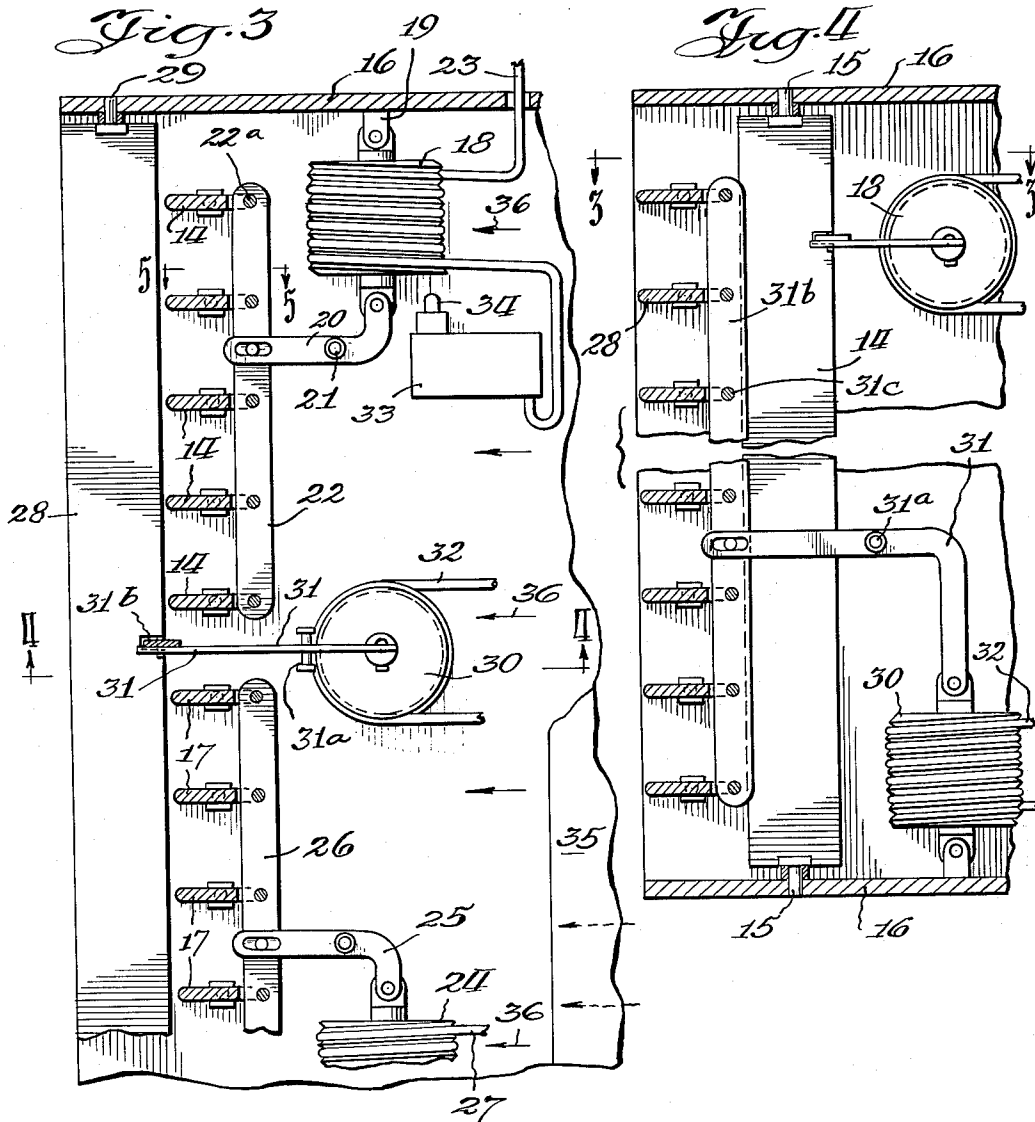
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AIR CONDITIONER LOUVER MECHANISM

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3 Claims. (Cl. 98-40)

This invention relates to an air conditioner and particularly to means for directing the conditioned air in the space being conditioned.

An ordinary air conditioner, particularly of the individual room type, customarily directs air in one direction which usually can be changed but then remains fixed in direction until changed again. The apparatus of this invention permits substantially continually changing the direction of conditioned air flow so as to sweep a large area of the space being conditioned.

One of the features of this invention is to provide an improved apparatus for use with air conditioner having means for supplying chilled air to the space being conditioned with the direction of the chilled air being substantially constantly and automatically changed in order to sweep large areas of the space.

Other features and advantages of the invention will be apparent from the following description of one embodiment thereof as shown in the accompanying drawings. Of the drawings:

FIGURE 1 is a front elevation of a room air conditioner embodying the invention.

FIGURE 2 is a fragmentary perspective view partially broken away of a portion of the apparatus of the air conditioner of FIGURE 1 with portions omitted for clarity of illustration.

FIGURE 3 is a fragmentary plan view in section of a portion of the apparatus.

FIGURE 4 is a fragmentary sectional elevational view taken substantially along line 4-4 of FIGURE 3.

FIGURE 5 is a fragmentary sectional view taken substantially along line 5-5 of FIGURE 3.

As shown in FIGURE 1 the air directing apparatus of this invention may be embodied in a conventional room air conditioner as illustrated at 10. This air conditioner has the customary air inlet section 11 for drawing air from the room and the customary exhaust section 12 for exhausting chilled air to the room. There is also provided the customary operating controls 13. The air directing apparatus of this invention forms a part of the air exhaust system 12 in order to control the direction of the chilled air exhausted therethrough.

The air directing apparatus of this invention comprises air directing means movable through a cycle such as from side to side and/or up and down for directing the conditioned air in a stream of changing direction. In the preferred embodiment, as illustrated hereinafter, there will be a plurality of these air directing means each directing air in a separate stream of changing direction in order to sweep a relatively large area of the space being conditioned. Thus, one set of air directing means and the control therefor may sweep the room or other space from left to right and back again. Another similar portion of the apparatus may sweep the room up and down in a vertical direction.

The apparatus also includes energizable moving means for moving each air directing means through the above mentioned cycle together with means operated by heat exchange with the chilled air for energizing the moving means through one portion of the cycle and auxiliary means for subsequently energizing the moving means through another portion of the cycle. In certain embodiments this other portion of the cycle returns the directing means toward its initial position. In a still more preferred embodiment the air directing means is oscillatable

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in two directions which make up the cycle with the one portion being one of the two directions and the other portion being the other of the two directions.

In the embodiment illustrated the chilled air is projected into the space being conditioned by a plurality of sets of air directing means. Certain sets oscillate the stream from side to side generally horizontally while other sets oscillate the stream up and down or generally vertically.

In one set of oscillating members there is provided a plurality of parallel louvers 14 each arranged for oscillation about a central axis defined by opposite hinge pins illustrated at 15 in FIGURE 4. These hinge pins 15 are mounted in the supporting frame 16 for the apparatus. Aligned with the first set of louvers 14 is a second set of louvers 17 similarly mounted for oscillation.

In order to oscillate the first set of louvers 14 there is provided an expansible member, here shown as a bellows 18, containing an expansible fluid such as an ordinary refrigerant Freon. The bellows 18 has one end mounted on a fixed bracket 19 that is attached to the supporting frame 16 and has the other end free to move and hingedly connected to a pivoted link 20. This link is movable about a fixed pin 21 and has its other end pivotally mounted on a reciprocable bracket 22 which is movably attached to the inner sides of the louvers 14 by pins 22a. Extending around the bellows 18 in heat transfer relationship therewith is an electrical resistance heater wire 23.

The other set of louvers 17 is provided with a similar bellows 24, pivoted link 25, bracket 26 and heater wire 27.

In front of the two sets of louvers 14 and 17 there is provided a horizontal set of louvers 28 that are similarly mounted for oscillation each about an aligned pair of end pins 29 similar to the pins 15. This set of louvers 28 is also provided with a bellows 30 similar to the bellows 18 and 24 and with a corresponding oscillatable hinged link 31 and heater wire 32. Link 31 is movable about a fixed pin 31a. Link 31 is pivotally mounted on a reciprocable bracket 31b which is movably attached to the inner sides of louvers 28 by pins 31c.

In order to energize the various heater wires there is provided a microswitch 33 provided with a contact portion 34 which can be retracted on expansion of the bellows 18. In order to avoid complicating the description the switch 33 is shown in FIGURE 3 but not in FIGURES 2 and 4.

During operation of the apparatus all three bellows 18, 24 and 30 are exposed to the conditioned air that is chilled by the evaporator 35 illustrated diagrammatically in FIGURE 3. This chilled air from a conventional evaporator 35 flows in cooling contact with the bellows as illustrated by the direction arrows 36 of FIGURE 3. Cooling of the bellows causes contraction because of the heat expansible and contractable fluid on the interior of the bellows. This contraction causes the louvers 14 to be oscillated to the right, as viewed in FIGURE 3, and the louvers 17 to be oscillated to the left, as viewed in FIGURE 3. The contraction of the bellows 30 causes the horizontal louvers 28 to be oscillated upwardly.

At a certain point in the contraction of the bellows 18 it is withdrawn from contact with the switch button 34 permitting the switch 33 to close and energize not only heater wire 23 but also all the other heater wires. This provides electric current to these heater wires and causes the bellows 18, 24 and 30 to again expand. This expansion of the bellows oscillates the louvers in the opposite direction until the expanding bellows 18 again depresses the switch button 34 to de-energize the electric heater wires. When this occurs, the conditioned air from the evaporator 35 again cools the bellows and the fluid therein so that the bellows contract to oscillate each set of louvers in the direction as first above given.

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As can be seen from the description of the invention, the apparatus here provides automatic means for sweeping the space being conditioned, preferably with a plurality of streams of conditioned air. This is achieved automatically with the energy for oscillating the streams in one direction being provided by the conditioned air itself and the energy for oscillating in the opposite direction being provided by electric heater means whose operation is controlled by the same means that provides the oscillation.

Having described my invention as related to the embodiment shown in the accompanying drawings, it is my intention that the invention be not limited by any of the details of description, unless otherwise specified, but rather be construed broadly within its spirit and scope as set out in the accompanying claims.

The embodiment of the invention in which an exclusive property or privilege is claimed is defined as follows:

1. In an air conditioner having means for supplying chilled air through a discharge opening to a space being conditioned, apparatus comprising: oscillatable air directing means in said discharge opening for directing said chilled air in back and forth movements constituting repeating cycles, said air directing means comprising a set of a plurality of hingedly mounted substantially parallel louvers; an expansible bellows means containing a fluid that expands on heating and contracts on cooling for oscillating said air directing means louvers; means for securing one end of said bellows means for movement of said bellows means at its opposite end; means for locating said bellows means in said chilled air supply means to be chilled thereby to contract said bellows means and move said louvers in one direction in said cycle; means for heating said bellows means to expand said bellows means and move said louvers in the opposite direction in said cycle; and means operated by said contracting and expanding of said bellows means for activating said heating means on said contracting and deactivating said heating means on said expanding.

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2. In an air conditioner having means for supplying chilled air through a discharge opening to a space being conditioned, apparatus comprising: oscillatable air directing means in said discharge opening for directing said chilled air in back and forth movements constituting repeating cycles, said air directing means comprising a set of a plurality of hingedly mounted substantially parallel louvers; an expansible bellows means containing a fluid that expands on heating and contracts on cooling for oscillating said air directing means louvers; means for securing one end of said bellows means for movement of said bellows means at its opposite end; means for locating said bellows means in said chilled air supply means to be chilled thereby to contract said bellows means and move said louvers in one direction in said cycle; an electric resistance heater in heat exchange relationship with said bellows means to expand said bellows means and move said louvers in the opposite direction in said cycle; switch means closable for energizing said heater; and means operated by said contracting and expanding of said bellows means for closing said switch on said contracting and for opening said switch on said expanding.

3. The apparatus of claim 2 wherein said air conditioner includes a plurality of said sets of louvers with each set having its own said bellows and said resistance heater.

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