

Aug. 5, 1952

J. E. LONG
AIR CONDITIONER

2,606,009

Filed Oct. 10, 1949

2 SHEETS—SHEET 1

Fig. 1

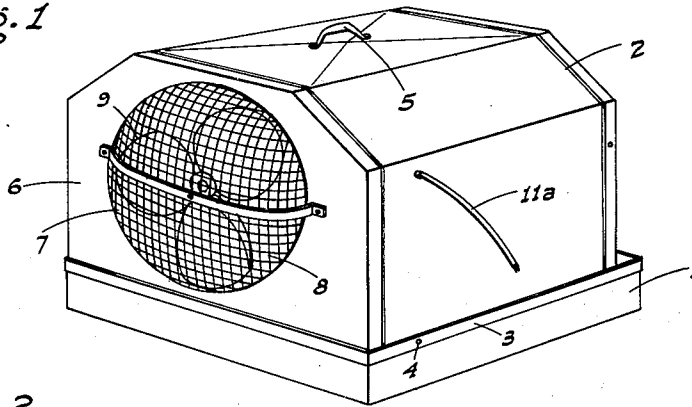


Fig. 2

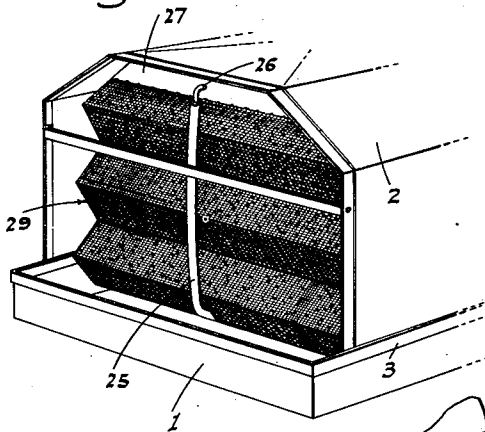


Fig. 4

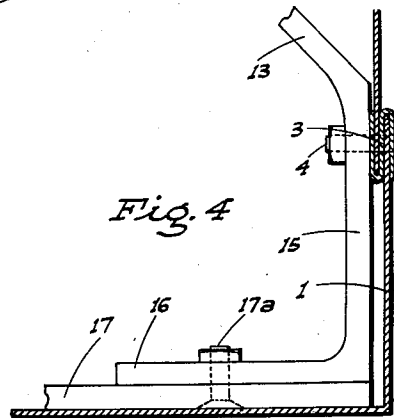


Fig. 5

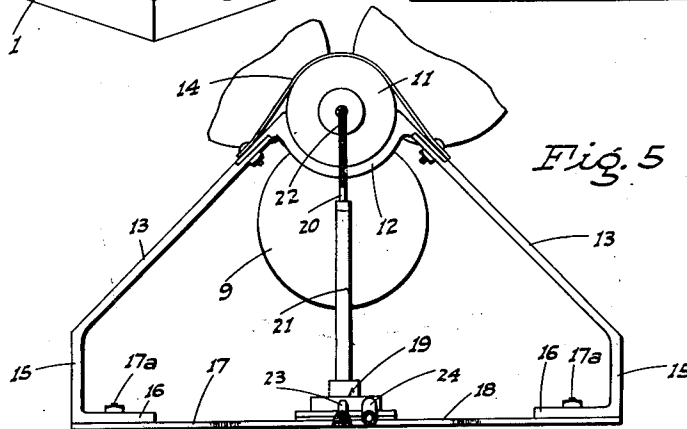
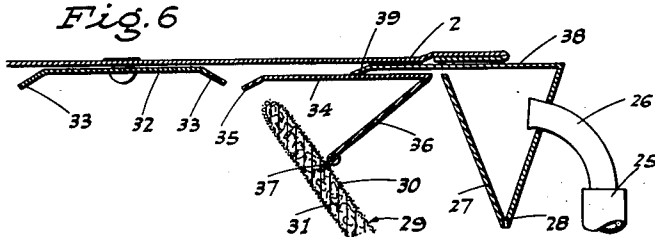


Fig. 6



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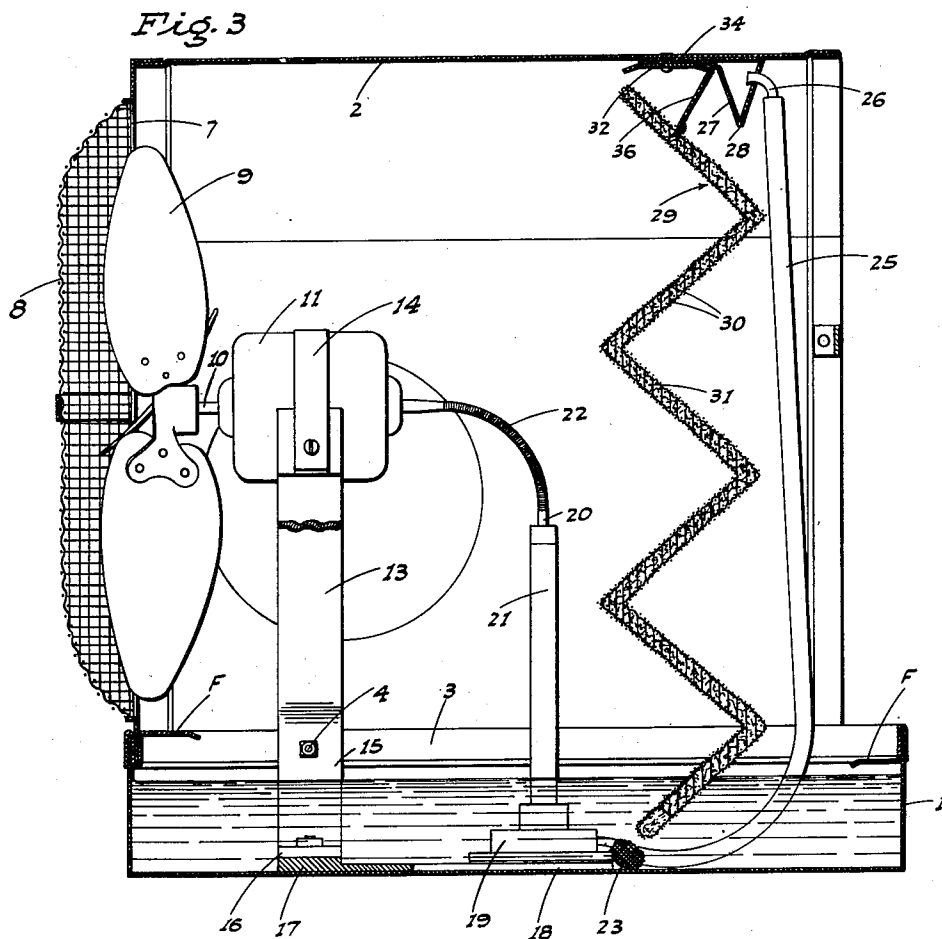
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2 SHEETS—SHEET 2



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2,606,009

AIR CONDITIONER

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6 Claims. (Cl. 261-29)

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This invention is directed to, and it is an object to provide, a novel air conditioner of motor driven, water evaporative type.

Another object of the invention is to provide an air conditioner which embodies an air filter pad of novel construction; such pad, together with the drip trough which feeds water thereto, being detachably mounted in the housing in a unique manner.

A further object of the invention is to provide an air conditioner embodying a novel drive arrangement between the fan motor and water pump of the apparatus.

An additional object of the invention is to provide an air conditioner with a sturdy and rigid mount for the fan motor; such mount also serving for attachment of the housing to the base pan, and support of the motor driven water pump.

A still further object of the invention is to provide an air conditioner which is relatively light weight, compact, and readily manually portable from place to place.

It is also an object of the invention to provide an air conditioner designed for ease and economy of manufacture.

A separate object of the invention is to provide a novel heater attachment for the device whereby the same may be used to heat the air passing therethrough.

Still another object of the invention is to provide a practical and reliable air conditioner, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is a perspective view, taken from the front, of the air conditioner.

Fig. 2 is a fragmentary perspective view, taken from the rear, of the air conditioner.

Fig. 3 is an enlarged sectional elevation of the air conditioner.

Fig. 4 is an enlarged fragmentary cross section of the fan mounting frame showing particularly the manner in which the base pan and housing are coupled thereto.

Fig. 5 is a rear elevation, detached, of the motor and pump unit, together with the mounting frame.

Fig. 6 is an enlarged fragmentary longitudinal section showing the parts employed to detachably secure the filter pad and the drip trough

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in the housing; such parts being partially separated.

Referring now more particularly to the characters of reference on the drawings, and at present to Figs. 1-6, inclusive, the air conditioner comprises an initially open top, rectangular base pan, indicated at 1. A hood or housing 2 is mounted on the base pan 1, and said housing is open bottom and rear. The housing 2 is engaged about its lower edges with the upper edges of the base pan 1 by means of longitudinal S-fittings 3; the cooperating parts being coupled together by bolts 4 which also secure the fan mounting frame, as will hereinafter appear. A handle 5 is fixed to the top of the housing 2, whereby the device may be readily carried by hand from place to place.

At the front 6 thereof the housing 2 is formed with a relatively large, centrally disposed, air outlet opening or port 7, and said port is covered by a semi-dome like mesh shield 8.

An air propelling fan 9, of multiple blade type, runs in the housing 2 substantially within the port 7, and such fan is hub-mounted on the forwardly projecting shaft 10 of an electric motor 11 disposed to the rear of such fan. The electric motor 11 is adapted to be energized by means of an electric supply cord 11a which leads from one side of the housing 2.

The electric motor 11 rests in a saddle 12 on the upper end of an upstanding triangular frame 13 disposed transversely in the housing. The motor 11 is prevented from escape from the saddle 12 by a hold-down strap 14.

The upstanding triangular frame 13, which forms the mount for the motor 11, as above, includes vertical legs 15 on opposite sides thereof adjacent the bottom, and such legs include in-turned feet 16. The feet 16 rest on a cross bar 17 and are secured thereto by bolts 17a. Additionally, the bolts 4 pass through the legs 15, whereby the frame 13 is effectively maintained in rigid relation in the base pan 1.

The cross bar 17 firmly seats on the bottom of the base pan 1, and any possible teetering is prevented by a rearward extension 18 on said cross bar, which extension serves as a base mount for a water pump 19 which is secured thereto.

The water pump 19 includes an upstanding drive spindle 20 which runs through a tubular guide 21 to a point of projection thereabove. At its upper end the spindle 20 is disposed to the rear end some distance below the axis of the electric motor 11, but is aligned with said axis centrally between the sides of the housing 2.

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The shaft 10 of the motor 11 is double-ended, the rear end portion being coupled by a flexible shaft 22 to the free end of the spindle 20 in driving relation to the latter. The flexible shaft 22 thus imparts a right-angle drive between the motor 11 and said spindle 20.

The gear pump 19 includes an intake fitting 23 and a discharge fitting 24; the latter being coupled to a hose 25 which leads upwardly in the housing 2 and discharges by means of a nozzle 26 into a horizontal, transversely extending drip trough 27 at the top of said housing.

The drip trough 27 has a plurality of drip openings 28 in the bottom thereof, and said trough is disposed directly above a vertically zig-zag air filter and heat exchange pad 29 disposed in the housing 2 adjacent its rear end. The pad 29 extends from side to side of said housing and is of a height which leads from within the base pan 1 upwardly to a point closely adjacent, but short of, the top of said housing; such pad being faced on opposite sides by wire mesh 30, between which is a filler of excelsior 31 or the like.

The drip trough 27 and the filter pad 29 are removably suspended from the top of the housing 2 in the manner shown particularly in Fig. 6, and wherein:

A horizontal, transverse supporting plate 32 is secured close to but spaced from the under side of the top of the housing 2 at a point generally above the normal position of the filter pad 29; said supporting plate 32 having downturned front and rear lips 33.

The filter pad 29 has a horizontal, transversely extending attachment plate 34 thereabove in spaced relation; the forward edge of such attachment plate including a downturned lip 35, while the rear edge of said plate is secured by a suspension flange 36 to the upper portion of the pad, as at 37.

By sliding the attachment plate 34 over the supporting plate 32; i. e. between said latter plate and the top of the housing 2 (see Fig. 3), the filter pad 29 is effectively suspended in place; lip 35 then overlapping the corresponding lip 33 so as to aid in holding flange 34 in place.

Similarly, the drip trough 27 includes, at the top, a horizontal, transverse attachment plate 38 which projects forwardly of said trough and includes a downturned front edge lip 39.

The attachment plate 38 slides over attachment plate 34, between the latter and the top of the housing, for the effective but removable suspension of the drip trough 27 in its proper position of use directly above the uppermost course of the filter pad 29.

The supporting plate 32 has sufficient spring to permit the attachment plates 34 and 38 to engage between the top of the housing 2 and said supporting plate. Such spring also tends to hold the attachment plates 34 and 38 in their engaged positions of use.

Water is prevented from slopping from either end of the base pan 1 by means of anti-splash flanges F which project inwardly from adjacent the upper edges of said pan above the quantity of water normally disposed in the latter.

When the above described air conditioner is in use, the motor driven fan 9 causes a forceful stream of air to flow through the housing 2, such stream passing through the filter pad 29 in said housing.

During operation of the device the pump 19 is constantly driven by the flexible shaft 22,

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pumping water from within the base pan 1 upwardly into the drip trough 27, whence said water drips onto the vertically zig-zag filter pad 29, maintaining the same wet. Additionally, the lower end of said filter pad depends into the water in the base pan 1 whereby the pad is additionally moistureized by capillary attraction.

As the air stream flows through the filter pad 29 an effective heat exchange occurs, cooling the air before it is discharged, and further all dust etc. is filtered out of the air as it passes through the pad.

The invention thus provides a very practical, effective, and reliable device for air cleaning and cooling; the device being readily portable from place to place, as conditions may require.

As the pump 19 is mounted on the rearward extension 18 of cross bar 17, and as the motor supporting frame 13 is secured to said cross bar, the working parts of the device are mainly in unitary relation, which permits of ready initial assembly, as well as the subsequent maintenance of said parts in their proper relative positions.

From the foregoing description it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. An air conditioner comprising a base pan adapted to hold a quantity of water, a housing mounted on the pan open at its ends for the passage of air therethrough, an air filter and heat exchange pad within the housing and disposed with its face of greatest area normal to the path of air flowing through the housing, a frame upstanding from the base pan intermediate the ends of the housing inside the same and in front of and spaced from the pad, an electric motor mounted on the frame with the motor axis extending longitudinally of the housing, the motor including a double-ended shaft, a fan on the front end of the shaft, a pump mounted between the motor and pad and including an upstanding drive spindle, a flexible shaft connected between the rear end of the motor shaft and spindle, the pump including an intake in the base pan and an outlet, and passage means between said outlet and the top portion of the pad; the frame including a cross bar seated in the base pan, a rearward extension on said cross bar likewise seated in the pan, and the pump being mounted on said extension whereby the motor and pump are secured in rigid unitary relation by the frame.

2. An air conditioner comprising a base pan adapted to hold a quantity of water, a housing mounted on the base pan having end openings for passage of an air stream therethrough, an air filter and heat exchange pad within the housing and disposed with its face of greatest area normal to the path of air flowing through the housing, a rigid transverse frame upstanding in the housing from the base pan in front of and spaced from the pad, a saddle at the upper end of the frame, a double-ended shaft motor secured in the saddle with the shaft

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lengthwise of the housing, a fan on the front end of the shaft, a rearward extension on the lower end of the frame, a pump mounted on said extension including an upstanding drive spindle, a flexible drive shaft between the rear end of the motor shaft and said spindle, the pump including an intake in the base pan and an outlet, and a conduit leading from the outlet to a discharge point above the pad.

3. An air conditioner comprising a base pan adapted to hold a quantity of water, a housing mounted on the base pan having end openings for passage of an air stream therethrough, an air filter and heat exchange pad within the housing and disposed with its face of greatest area normal to the path of air flowing through the housing, a rigid transverse frame upstanding in the housing from the base pan in front of and spaced from the pad, a saddle at the upper end of the frame, a double-ended shaft motor secured in the saddle with the shaft lengthwise of the housing, a fan on the front end of the shaft, a rearward extension on the lower end of the frame, a pump mounted on said extension including an upstanding drive spindle, a flexible drive shaft between the rear end of the motor shaft and said spindle, the pump including an intake in the base pan and an outlet, and a conduit leading from the outlet to a discharge point above the pad; the frame seating in the base pan and including side legs, and means securing corresponding sides of the base pan and housing to said side legs.

4. In an air conditioner which includes a housing having a top, an air filter and heat exchange pad upstanding in the housing below the top, and a horizontal, transverse drip trough in the housing below said top above an upper portion of the pad; a pad and trough suspension assembly comprising horizontal, transverse, forwardly projecting attachment plates on both the upper end of the pad and trough, and a horizontal, transverse supporting plate mounted under and closely spaced from the top of the housing; the attachment plates removably fitting one upon

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the other between said supporting plate and top.

5. An air conditioner, as in claim 4, in which the cooperating edges of the attachment plates and supporting plates have downturned lips thereon.

6. An air conditioner comprising a base water pan, an open-ended housing upstanding from the pan, an electric motor and fan unit in the housing to create an air stream therethrough, a water saturated pad hung in the path of the stream, a motor driven submerged pump to supply water to the pad, means removably mounting the motor and pump as a unit in the conditioner, said means comprising an upstanding frame in the pan having a central saddle in which the motor is supported and a bottom member on which the pump is mounted; and means removably mounting the frame in connection with the pan and housing, the side walls of the pan and housing overlapping, said last named means including upstanding legs on the frame at said side walls, and bolts removably passing through the frame legs and the overlapping side wall portions.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,436,483	Cox	Nov. 21, 1922
1,815,864	Patrick	July 21, 1931
1,866,840	Carmean	July 12, 1932
2,075,862	Myers	Apr. 6, 1937
2,105,887	Langford	Jan. 18, 1938
2,156,888	Wester	May 2, 1939
2,165,979	Nicholson	July 11, 1939
2,201,647	Feinberg	May 21, 1940
2,319,565	Stratton	May 18, 1943
2,333,374	Guthrie	Nov. 2, 1943
2,387,473	Spitzka	Oct. 23, 1945
2,404,479	Essick	July 23, 1946
2,456,781	Hardey	Dec. 21, 1948