

Oct. 18, 1966

I. JEPSON

3,280,302

HAIR DRYER AIR BLOWER

Filed May 24, 1963

3 Sheets-Sheet 1

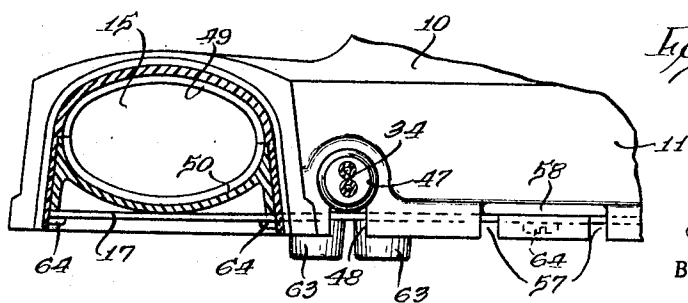
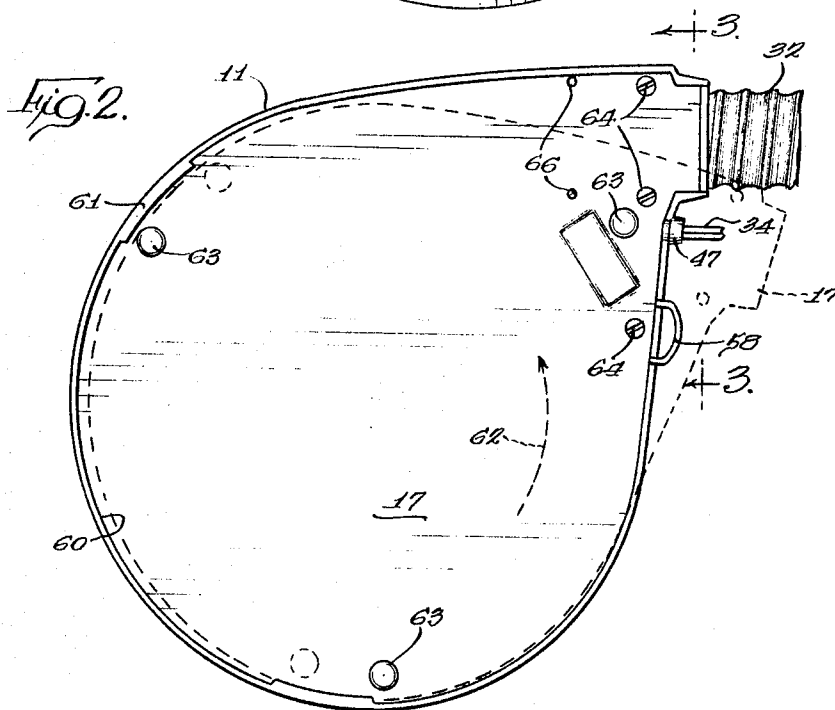
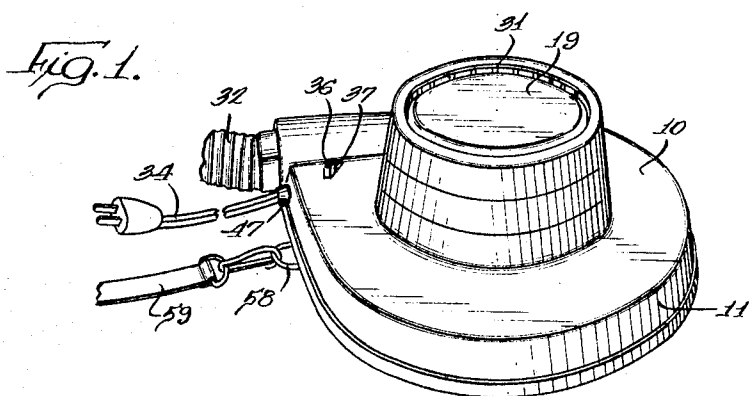


Fig. 3.

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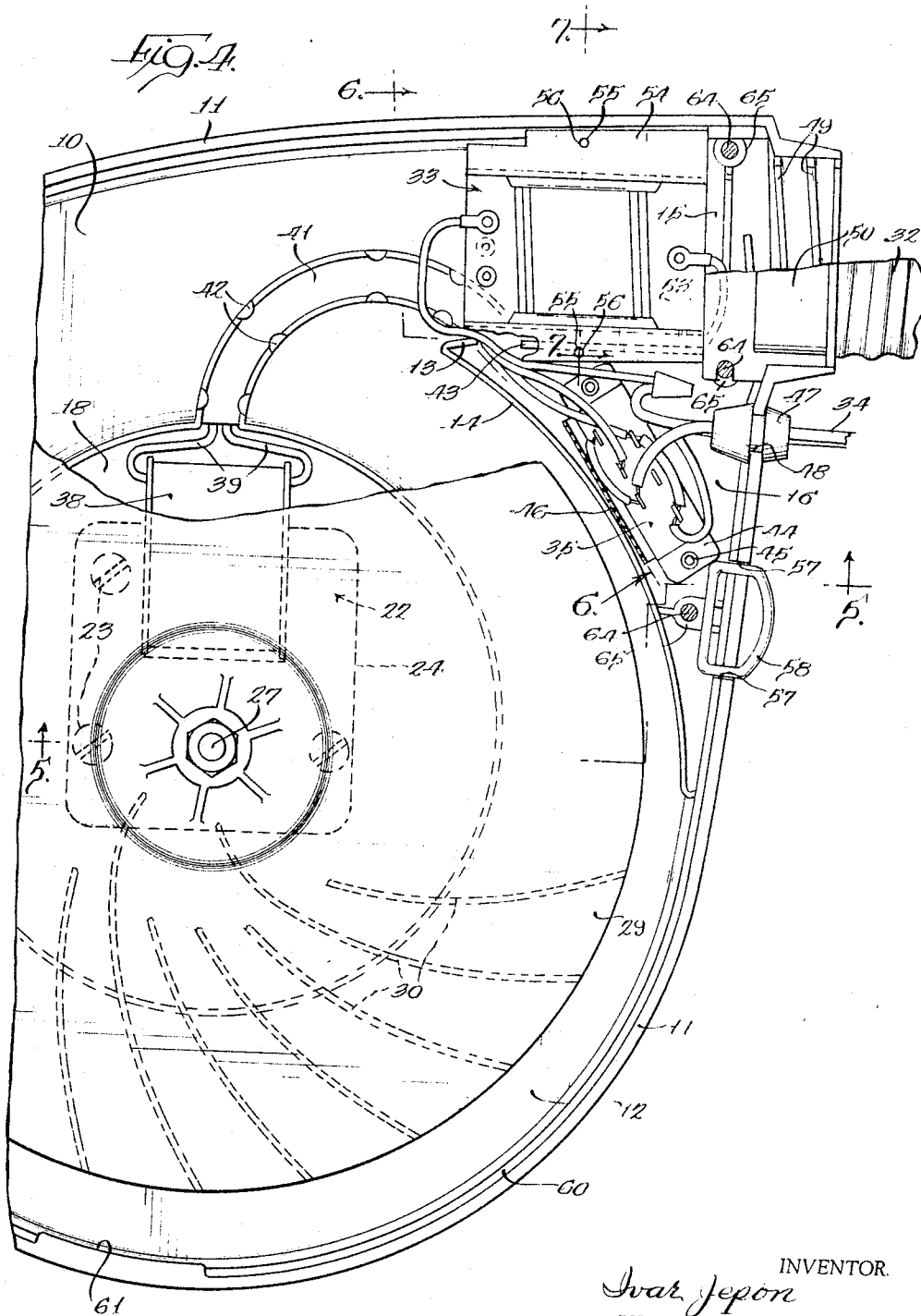
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3 Sheets-Sheet 2



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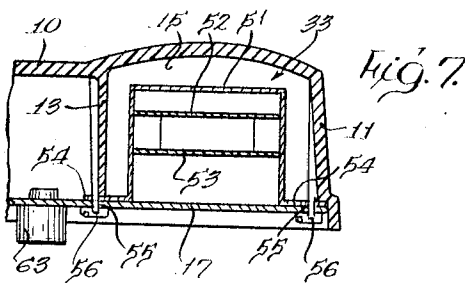
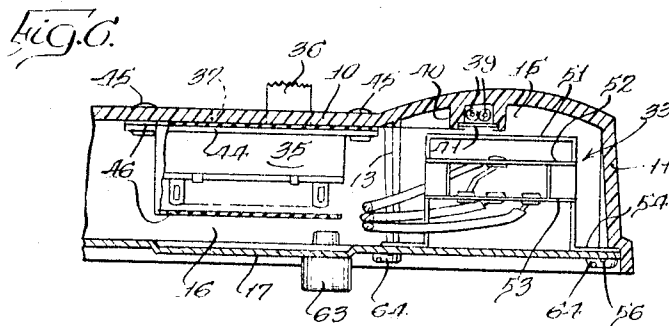
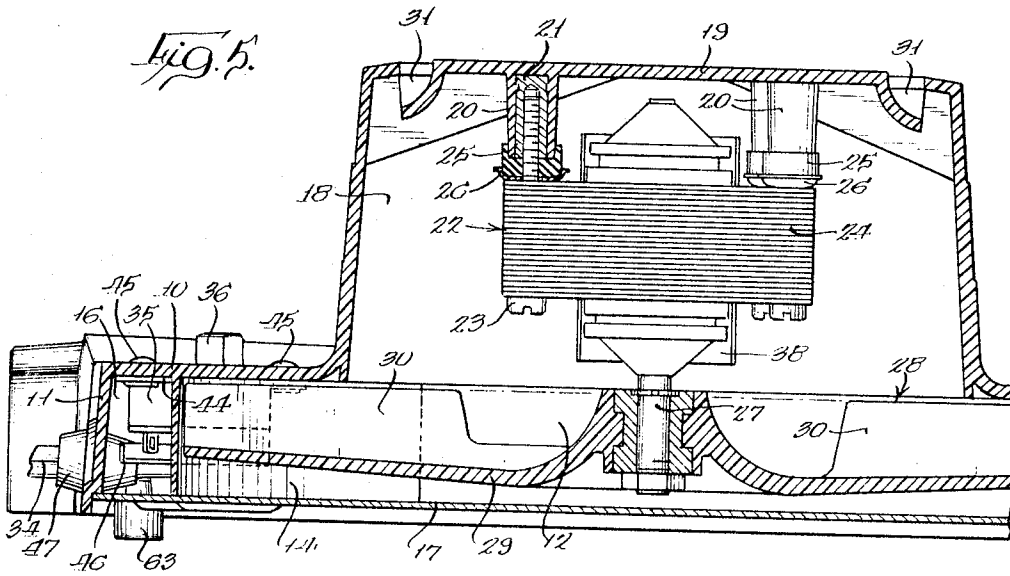
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3 Sheets-Sheet 3



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1

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HAIR DRYER AIR BLOWER

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3 Claims. (Cl. 219—370)

This invention relates to a hair dryer air blower, and more particularly, to an improved motor driven air blower unit for nonprofessional type hair dryers.

By the term nonprofessional type hair dryer is meant a small or compact and hand portable motor driven air blower unit having heating means, a lightweight hair drying cap, and a hose interconnecting the blower unit and cap. This type of hair dryer has become very popular in the past several years since it enables women to groom their hair in their homes at their own convenience and at minimum cost.

Some of the existing home hair dryers are relatively expensive since they are not low cost from a structural and manufacturing point of view. Others provide features which have little to do with improving the main function of the device, namely, that of drying the hair. The potential market for home hair dryers can be significantly increased by making low cost hair dryers available to the public. For example, a low cost hair dryer would be a suitable gift item for teen-agers and attractive to those adults not interested in an expensive hair dryer.

Accordingly, it is an object of this invention to provide improvements in motor driven air blower units for low cost hair dryers.

In the preferred form of the invention, the improved motor driven air blower unit comprises a housing having integral portions thereof defining a motor chamber, a blower chamber with a tangential exhaust passageway and a switch chamber. The housing comprises a single piece molded plastic cover member having integral depending flanges to define the blower and switch chambers and exhaust passageway. The switch chamber is located immediately between the tangential exhaust passageway and blower chamber. The motor chamber is positioned above the blower chamber and is provided with integral support means for mounting the motor in the motor chamber. This support means dispenses with a divider plate between the blower and motor chambers for supporting the motor as is common in the prior art. The electrical leads connected to the motor are disposed in a channel integrally formed in the underside of the blower chamber cover member. The disposition of the leads in the channel keeps them out of the way of the rotary air blower in the blower chamber. Location of the switch chamber immediately between the tangential exhaust passageway and the blower chamber makes use of space which might otherwise be unused. The bottom of the blower and switch chambers and the bottom of the exhaust passageway are closed by a single piece closure member. This closure member also serves to retain a heater assembly in the exhaust passageway.

The features of the invention which are believed to be novel are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings.

In the drawings:

FIG. 1 is a perspective view of a motor driven air blower unit for home type hair dryers;

FIG. 2 is an enlarged bottom view of the device;

FIG. 3 is an enlarged sectional view taken along the section line 3—3 of FIG. 2;

2

FIG. 4 is an enlarged view similar to that of FIG. 2 and partly broken away with the bottom cover plate removed;

FIG. 5 is an enlarged sectional view taken along the section line 5—5 of FIG. 4;

FIG. 6 is an enlarged sectional view taken along the section line 6—6 of FIG. 4; and

FIG. 7 is an enlarged sectional view taken along the section line 7—7 of FIG. 4.

Referring now particularly to FIGS. 1 and 4 of the drawings, the motor driven blower unit is enclosed in a single piece molded plastic housing having a cover member 10. The cover member 10 is generally teardrop shaped in plan view, and a peripherally extending downwardly depending flange 11 is integrally formed on cover member 10. The flange 11 defines a blower chamber 12 beneath the cover member 10. Also integrally formed on the underside of cover member 10 are depending flanges 13 and 14. The flanges 11 and 13 define a generally channel-shaped downwardly facing exhaust passageway 15 which is tangentially disposed with respect to the blower chamber 12. Also, the flanges 11, 13 and 14 define a downwardly facing and generally triangular-shaped switch chamber 16. The switch chamber 16 is disposed immediately between the tangential exhaust 15 and the blower chamber 12. That is to say, the flange 13 is shared in common with the exhaust passageway 15 and the switch chamber 16, and the flange 14 is shared in common with the blower chamber 12 and the switch chamber 16. The downwardly facing chambers 12 and 16 and the passageway 15 are closed by a single piece closure member 17, see FIG. 2. The closure member 17 is also generally teardrop shaped in plan view and is aligned with respect to the cover member 10 in spaced relationship with the flanges 11, 13 and 14 extending therebetween.

Integrally formed on the cover member 10 above the blower chamber 12 is a motor chamber 18, see FIG. 5. The motor chamber 18 is provided with an integral cover member 19. Integrally formed on the underside of motor chamber cover member 19 are a plurality of motor supporting projections 20. Projections 20 are in the form of hollow bosses having metallic threaded inserts 21 therein. The motor indicated generally by reference numeral 22 is suspended off the motor chamber cover member 19 by a plurality of studs 23 which extend through the stator 24 of the motor into the threaded inserts 21. Rubber dampers 25 which are capped by metallic cup-shaped members 26 are interposed between the stator and bosses 20 for sound damping purposes.

The motor 22 has a rotary armature shaft 27 which depends from the motor chamber 18 into the blower chamber 12. An air blower member indicated generally by reference numeral 28 is suspended in the blower chamber 12 off the lower end of shaft 27. The air blower member 28 comprises a circular disc 29 having a plurality of air moving blades 30 integrally formed on the upper surface thereof.

A plurality of air inlet openings 31 are formed in the motor chamber cover member 19. When the motor 22 is energized air entering through the inlets 31 first passes over the motor 22 to cool the same. Then the air enters the blower chamber 12 and is moved from the blower chamber through the exhaust passageway 15. An air hose 32 is connected to the exhaust passageway 15 and a (not shown) hair dryer cap is connected to the outer end of hose 32 for delivering air to the hair dryer user's head.

An air heater indicated generally by reference numeral 33 is disposed in the exhaust passageway 15 for heating the air which is delivered to the hair dryer user's head. An electrical extension cord 34 is connected to the device for plugging it into an electrical wall outlet or the like. The device is controlled by an electrical switch 35 posi-

tioned inside the switch chamber 16. The electrical switch 35 is provided with an operating knob 36 which protrudes through an opening 37 formed in the blower chamber cover member 10. The motor and electrical heater assembly are controlled by the switch 35. The switch knob 36 has three positions comprising an off position, a low heat position and a high heat position.

The electric motor 22 is positioned in the motor chamber 19 so as to locate its electrical winding coil 38 near the switch chamber 16. A pair of electrical leads 39 are connected to the coil 38 for energizing the same. A downwardly facing channel 40 is integrally formed in the underside of the blower chamber cover member 10. The leads 39 are disposed in the channel 40. The leads 39 are retained in the channel 40 by a closure member 41 so as to keep the leads out of the way of the air blower 28. The channel 40 extends in an arc from the electrical coil 38 to the switch chamber 16. The closure member 41 comprises a strip of insulating paper or board in the shape of an arc. It is retained in closed position by crimping over integral portions 42 of channel 40 by the application of some heat and pressure to the plastic portion thereof. The flange 13 has a slot 43 formed therein so that the leads 39 can be brought into the switch chamber 16 for connection to the switch 35. The switch 35 has a mounting bracket 44 which is connected to the cover member 10 by rivets or the like 45. A strip of insulating paper 46 or the like, see FIG. 6, extends from between the bracket 44 and cover member 10 to over the switch 35 so as to cover the electrical terminal connections thereto.

The electrical extension cord 34 also extends into the switch chamber 16. Cord 34 is provided with a strain relief 47 which is positioned in a slot 48 formed in the flange 11. The strain relief 47 is retained in the slot 48 by the bottom closure member 17.

The hose 32 comprises a flexible plastic tube which is reinforced by a helically coiled internal reinforcing wire so as to provide the hose with non-kinkable side walls. This type of hose is conventional in the hair dryer art. The outermost end of the exhaust channel 15 has some half threads 49 integrally formed thereon. Opposed to this outermost portion of the exhaust channel is a complementary insert 50, see FIG. 3, to provide a generally oval-shaped connector fitting for the hose 32. The insert 50 is retained in position by the closure member 17.

The electrical heater 33 comprises a generally channel-shaped downwardly facing frame member 51, see also FIG. 7, and a pair of heater wound electrical insulating cards 52 and 53 mounted in the frame member. The sides of channel member 51 are provided with integral tabs or the like 54. Apertures 55 are formed in the tabs 54. A plurality of integral projections 56 are formed on the flanges 11 and 13. These projections 56 are receivable in the apertures 55 to properly locate the heater 33 in the channel exhaust passageway 15. The tab 54 disposed along the flange 13 also closes the slot 43 so as to retain therein the leads which extend through the slot. The electrical leads from the heater 33 extend into the switch chamber 16 through the slot 43. All the necessary electrical connections between the motor 22, heater 33, extension cord 34 and switch 35 are made inside the switch chamber 16.

A pair of slots 57 are formed in the depending flange 11 along the switch chamber 16. A ring 58 is inserted into these slots 57 and is retained therein by the bottom closure plate 17. The ring 58 is for the purpose of connecting a carrying strap 59 or the like to the motorized blower unit. If so desired, the strap 59 can be designed to enable the hair dryer user to sling the motorized blower unit off the user's shoulder or waist.

The bottom closure member or plate 17 is connected in position by forming a shoulder 60 along the lower edge of the depending flange 11. Also formed on the depending flange 11 are a plurality of overhanging portions 61. The closure member 17 is received between the shoulder

60 and overhanging portions 61 and moved into final position by a slight rotational movement of closure member 17 in the direction indicated by arrow 62 of FIG. 2. The plate 17 has a plurality of rubber or the like sound damping pads or lugs 63 connected thereto. This is for the purpose of preventing the motorized blower unit from vibrating or chattering when rested on a support surface such as a table top. The blower chamber 12 is shallow and relatively broad with respect to the motor chamber 18 which is positioned centrally on the cover member 10. The hose 32 is connected to the blower chamber 12 at the tangential exhaust 15 so as to have a horizontal take-off from with respect to the motorized air blower. This and the relatively broad transverse dimension for the blower chamber 12 impart stability to the device. That is to say, if a pull is exerted on the hose 32 while the motorized blower unit is resting on a table top or the like it will not be tipped over and the rubber feet 63 prevent the device from accidentally sliding off the table top.

After the closure plate 17 is rotated into final position from the broken line position indicated in FIG. 2 to the full line position, the plate 17 is secured by a plurality of screws or the like 64 located along the exhaust channel 15 and switch chamber 16. These screws 64 can be of the self-tapping type and are received in hollow depending bosses 65 integrally formed on the underside of cover member 10. Two such bosses are located adjacent the outermost end of exhaust channel 15 along opposite sides thereof, and an additional one is located in the switch chamber 16 adjacent the ring 58.

In the prior art it is common to provide a divider plate between the blower chamber 12 and the motor chamber 18 for the purpose of supporting the motor 22. Sometimes this divider plate was secured in position by bosses disposed within the blower chamber 12 about the periphery of the blower disc 29. Similar bosses might also be used for connecting a bottom closure member to the unit. These bosses interfered with proper operation of the air blower inasmuch as they constituted barriers or restrictions to proper air flow along the periphery of the air blower. In the invention, this is avoided by supporting the motor directly off integral portions of the motor chamber 18, and by supporting the plate 17 between the shoulder 60 and overhanging portions 61.

The closure plate 17 has a pair of apertures 66 formed therein adjacent the tip portion of its generally teardrop shape which are adapted to receive the projections 56 which cooperate with the heater assembly 33. The closure plate 17 bottoms against the tabs 54 of the heater frame 51 and also against the complementary end fitting 50 at the outermost end of the channel exhaust 15 to hold these parts in assembled position.

It will now be seen that the invention provides an improved low cost hair dryer inasmuch as a minimum number of parts are utilized and the device is easy to assemble. For example, the plastic housing which defines the blower chamber 12, the motor chamber 18, the tangential exhaust 15 and the switch chamber 16 is a single piece member which can be readily fabricated by a plastic molding operation. No divider plate is required between the blower chamber 12 and the motor chamber 18. Instead, the motor is supported or suspended off the integral cover 19 of the motor chamber. The prior art divider plate would provide means for retaining the motor leads 39 away from the air blower 28. However, in the instant invention, this is conveniently accomplished by providing an integrally formed motor lead channel 40 in the underside of the cover member 10. The depending flanges which define the tangential exhaust, the blower chamber and the switch chamber are integrally formed with the plastic housing member. The same is true for other parts such as the motor lead channel 40, the bosses 65, and the shoulder 60 and its overhanging portions 61. The necessary parts such as the motor 22 and the air blower 28 are readily assembled in the plastic housing member, and the

5

same is true of the switch 35, the heater assembly 33 and the end fitting insert 50 and hose 32. After all the parts are assembled into position, the motorized blower unit is closed by the bottom closure member 17 which is provided with a generally teardrop shape similar to that of the cover member 10 so as to simultaneously close the tangential exhaust 15 and the switch chamber 16 and retain the parts such as the heater assembly 33, the insert 50 and the hose 32 in final assembled position.

While there has been shown and described a particular embodiment of the invention, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention, and that it is intended by the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A motor driven air blower unit, said unit comprising a housing, said housing having air inlet and outlet openings formed thereon, said housing comprising a cover member having an integral peripherally extending depending flange formed thereon, a closure member positioned against said flange to define a closed air blower chamber between said cover and closure members, a rotary air blower positioned in said blower chamber, a motor chamber integrally formed on said cover member above said blower chamber, a motor positioned in said motor chamber, said motor being suspended in said motor chamber off integral portions thereof, said motor having a rotary shaft depending into said blower chamber for driving said rotary air blower, and said air blower being suspended in said blower chamber off the lower end of said shaft, and a downwardly facing channel formed on the underside of said blower chamber cover member, a pair of electrical leads connected to said motor for energizing the same, said leads being positioned in said channel, and said leads being retained in said channel away from said rotary air blower by a closure member for said channel.

2. A motor driven air blower unit, said unit comprising a housing, said housing having air inlet and outlet openings formed thereon, said housing comprising a cover member having an integral peripherally extending depending flange formed thereon, a closure member positioned against said flange to define a closed air blower chamber between said cover and closure members, a rotary air blower positioned in said blower chamber, a motor chamber integrally formed on said cover member above said blower chamber, a motor positioned in said motor chamber, said motor being suspended in said motor chamber off integral portions thereof, said motor having a rotary shaft depending into said blower chamber for driving said rotary air blower, and said air blower being suspended in

6

said blower chamber off the lower end of said shaft, and a downwardly facing air exhaust channel integrally formed on the underside of said blower chamber cover member, said exhaust channel being tangentially disposed with respect to said blower chamber, and a downwardly facing switch chamber integrally formed on the underside of said blower chamber cover member between said exhaust channel and blower chamber, an electrical heater positioned in said exhaust channel, an electrical switch positioned in said switch chamber for controlling said heater and motor, and said exhaust channel and switch chamber being closed by said blower chamber closure member and said blower chamber cover and closure members being generally teardrop shaped in plan view and their tips being aligned in spaced relationship on opposite sides of said depending flange, said exhaust channel and switch chamber being positioned in side-by-side relationship between said aligned tips and depending flange, and said depending flange having a continuous shoulder and spaced overhanging portions integrally formed thereon for receiving said blower chamber closure member therebetween by slight rotational movement of said blower chamber closure member into aligned position.

3. In motor driven air blower unit having air heating means, a housing for said unit, said housing having air inlet and outlet openings formed thereon, said housing comprising a cover member having integrally formed depending flanges thereon for defining a downwardly facing blower chamber and a downwardly facing tangentially disposed air exhaust channel, a heater assembly in said exhaust channel, said heater assembly comprising a downwardly facing channel-shaped frame member, tabs formed on the sides of said frame member, apertures formed in said tabs, integral projections formed on the depending flanges which define said exhaust channel, said projections being received in said apertures for positioning said heater assembly in said exhaust channel, and a closure member positioned against said depending flanges for closing said blower chamber and exhaust channel and retaining said heater assembly in said exhaust channel.

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