June 10, 1958 E. S. HEWITT ET AL 2,837,835

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Fig. 1.

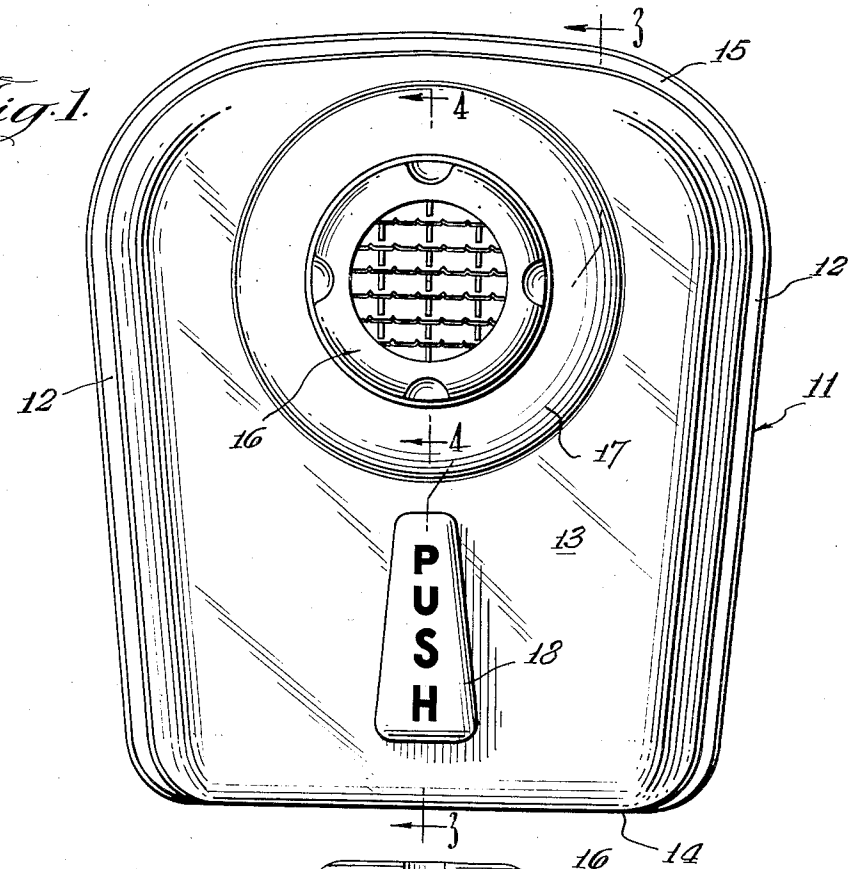
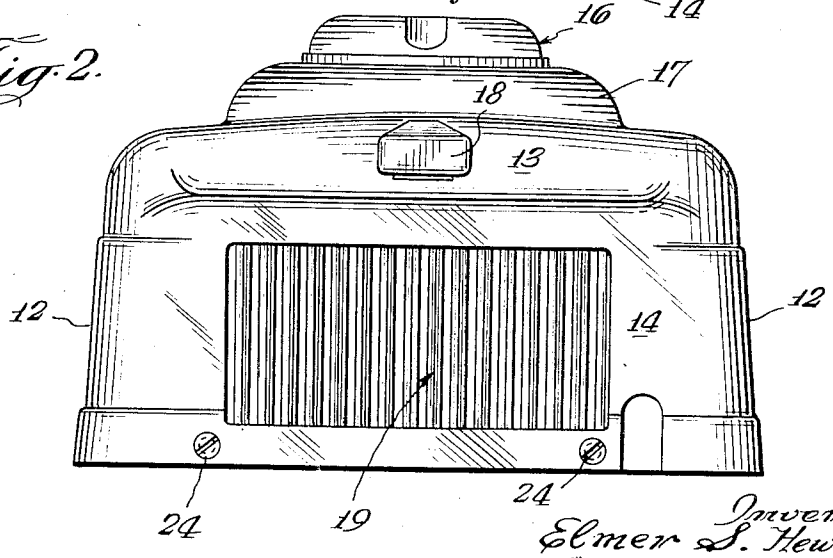


Fig. 2.



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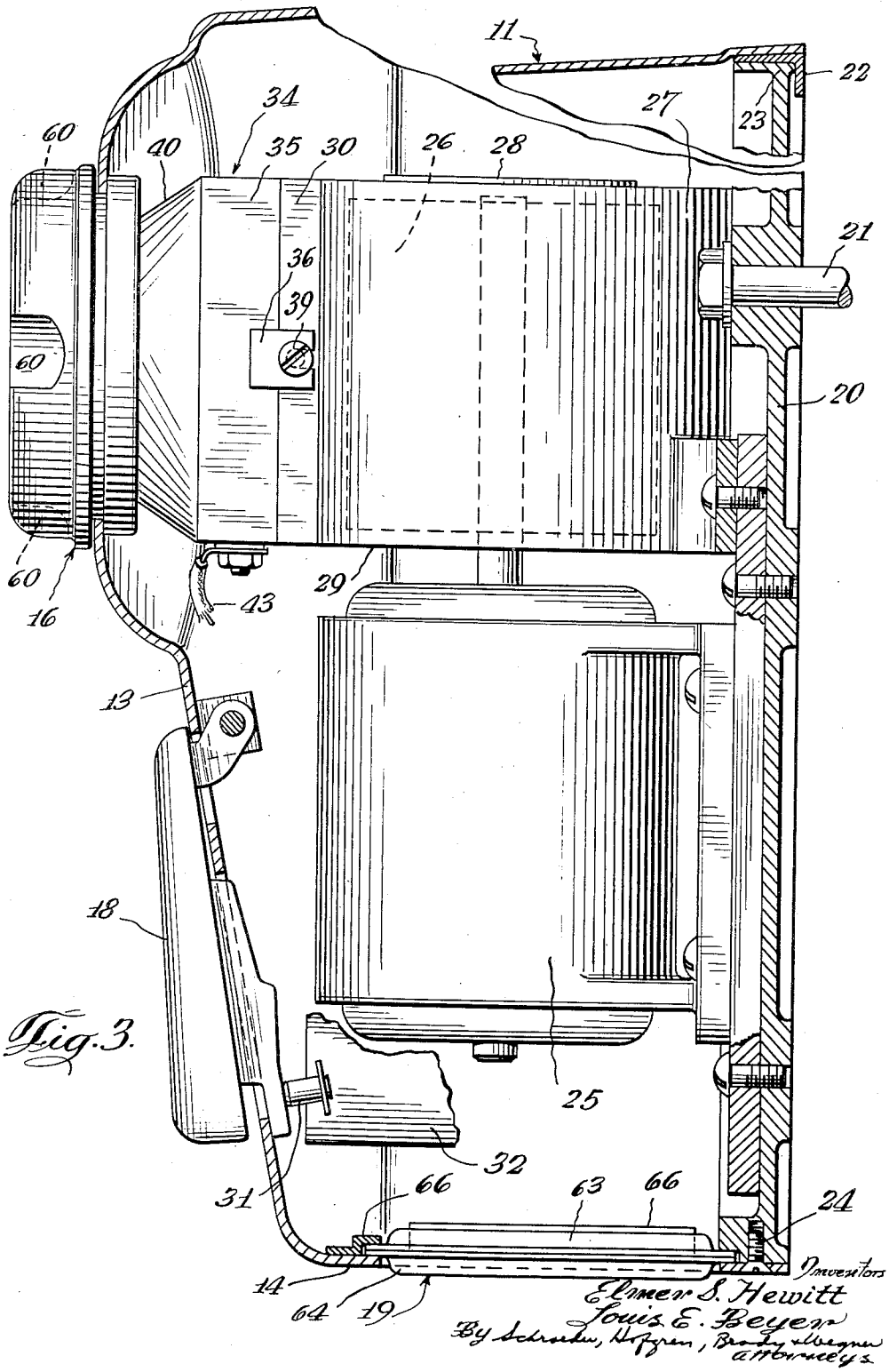


Fig. 3.

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Fig. 4.

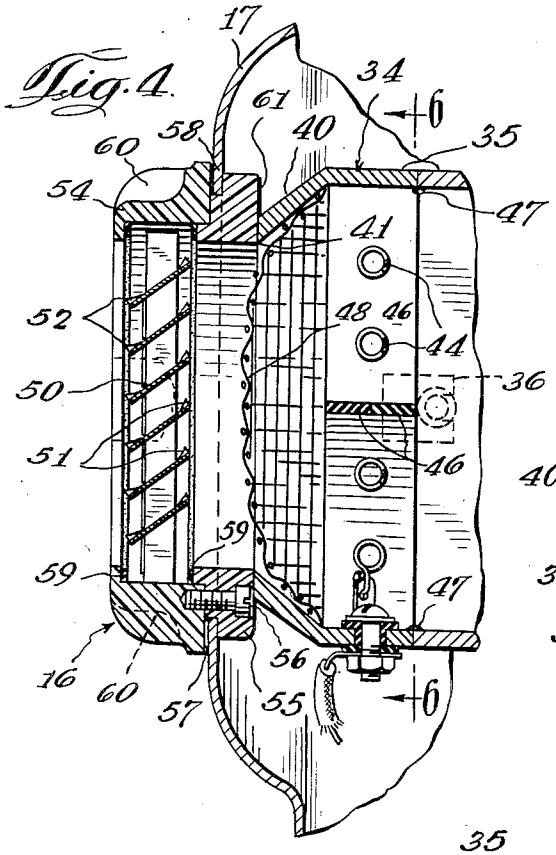
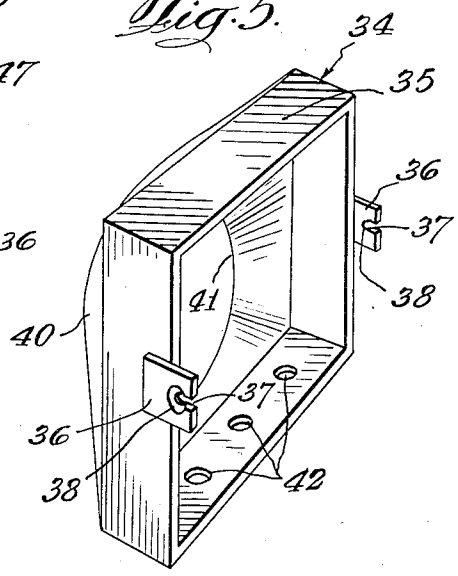


Fig. 5.



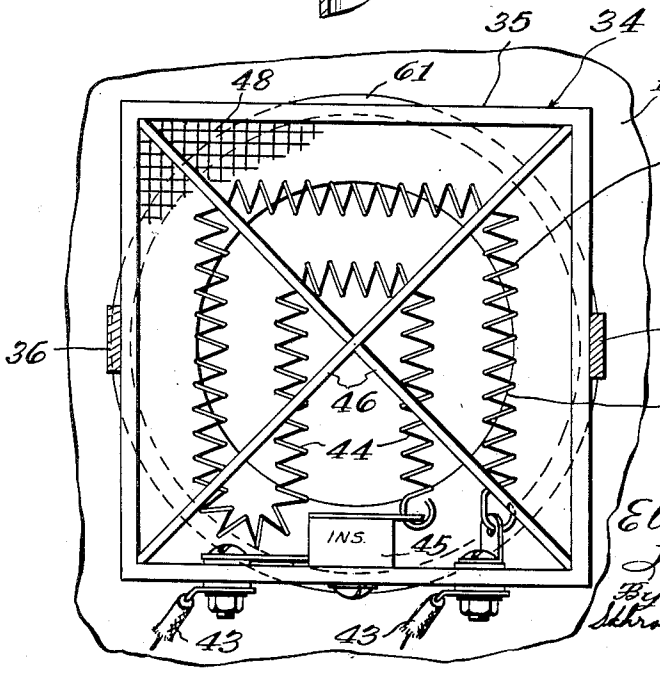


Fig. 6.

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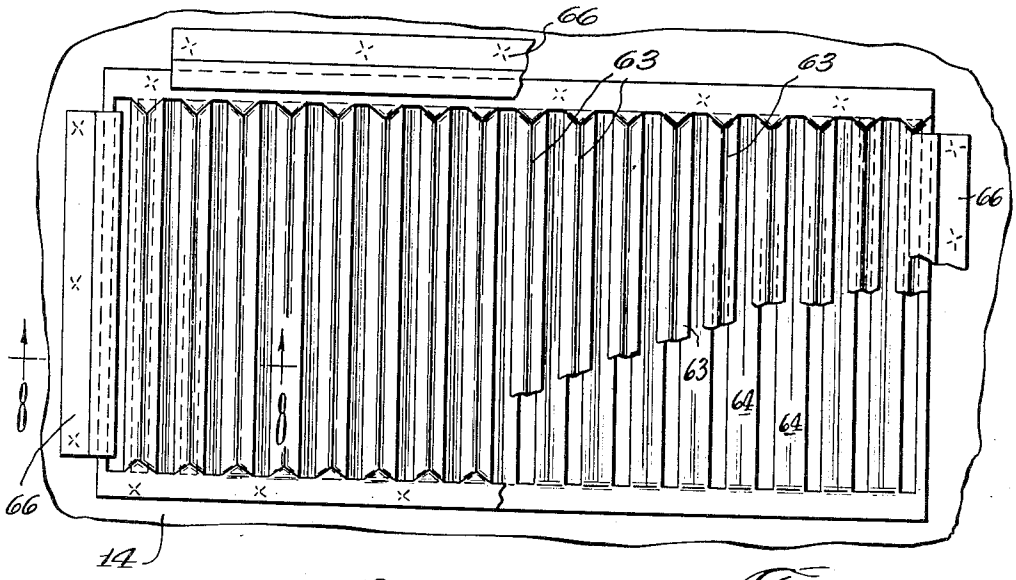


Fig. 7.

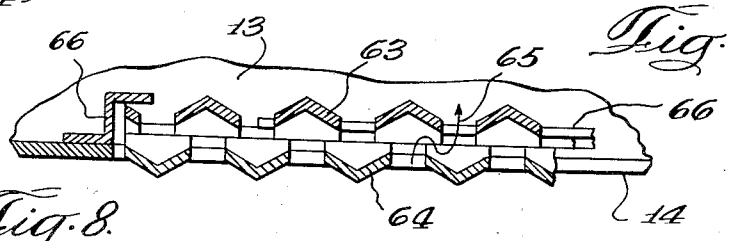


Fig. 8.

Fig. 9.

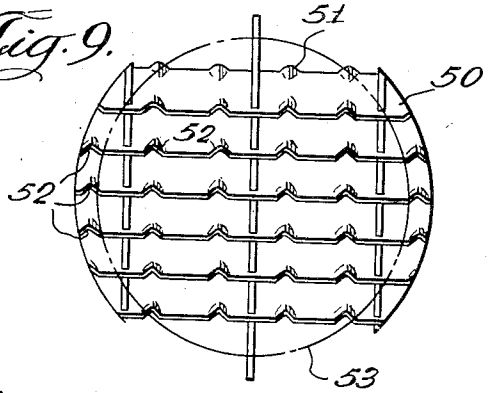
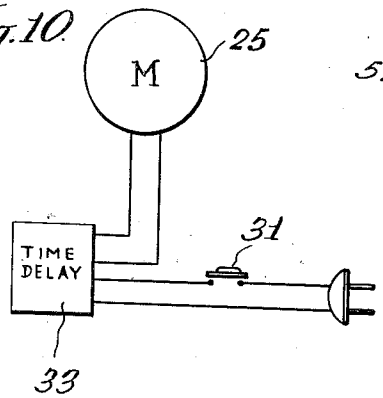


Fig. 10.



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Application March 4, 1954, Serial No. 414,148

2 Claims. (Cl. 34—243)

This invention relates to an air dryer and more particularly to a forced air dryer for discharging heated air used to dry a person's hands and face.

In recent years, the use of towels in public and plant washrooms has been replaced in part by drying units which blow heated air through a nozzle for drying purposes. Wet hands may be dried by rubbing them together in the discharged stream of heated air. The units are usually equipped with a time delay switch which will turn them on for a brief period during which a person may hold his hands in the air stream to effect the drying.

Several problems have arisen with the use of air dryers in the past, one such problem being concerned with malicious tampering with the device. The nozzle provided on the unit may be turned through 360° to direct the air upwardly to the face or downwardly to the hands. These nozzles have been filled with various liquids from water to ink by pranksters whereupon the next person to use the unit may be drenched by the liquid placed in the nozzle. Efforts to combat this problem by fixing the nozzle with only a downward direction have removed the problem but also limited the use of the machine for drying only hands. The present apparatus solves the problem in a novel manner and provides an improved air directing means not subject to the tampering mentioned.

Servicing of the units has in the past also presented a difficult problem. Ordinarily, the units are mounted on a wall with the apparatus and machinery of the unit mounted in a box-like casing. In the present unit, the operating mechanism is mounted on a base plate which is secured to the wall and is covered by a casing which is removable from the base plate very easily. The casing carries the air directing means in such a novel manner that it may be sealed to the blowing apparatus without permitting leakage of air out of the stream.

The new air dryer includes another feature in its structure comprising an improved means for heating the air permitting the use of a lower amperage heating element.

A further feature includes an improved permanent type filter in the unit to prevent lint and other solid matter being drawn into the blower housing.

Other features, advantages and objects of the present invention will be apparent from the following description taken in conjunction with the showing of a preferred embodiment in the accompanying drawings in which:

Figure 1 is a front elevational view of the dryer unit of this invention;

Figure 2 is a bottom plan view of the unit illustrated in Figure 1;

Figure 3 is a vertical sectional view through the unit taken substantially along line 3—3 in Figure 1 partially broken away and partially fragmentary to show the operating mechanism;

Figure 4 is a fragmentary vertical sectional view through the air directing means and heating element taken substantially along line 4—4 in Figure 1;

Figure 5 is a perspective view of the heating element housing removed from the apparatus;

Figure 6 is a fragmentary vertical sectional view taken substantially along line 6—6 in Figure 4 showing the heating element on its supports in the housing;

Figure 7 is a fragmentary top plan view of the filter element partially broken away to show the structure thereof;

Figure 8 is a fragmentary vertical sectional view through a portion of the filter taken substantially along line 8—8 in Figure 7;

Figure 9 is a front elevational view of the louvers removed from the air directing means; and

Figure 10 is a line diagram of the motor and its support.

The drying unit is usually mounted on the wall at approximately chest height so that heated air from the unit may be conveniently directed to the hands or face of a person using the unit for drying purposes. The appearance of the unit to a person is substantially that of Figure 1. The casing **11** of the present unit is larger at the top than at the bottom with the side walls **12** sloping outwardly from the front of the unit toward the base. A front wall **13** slopes from a relatively narrow bottom **14** to a larger top portion **15**. The air baffle unit **16** is mounted in an outwardly projecting portion **17** of the casing and immediately below the air baffle is a switch bar **18** with appropriate lettering thereon such as "Push" thus informing the user to depress the bar to operate the mechanism.

The bottom view of the apparatus illustrates the shape of the casing side walls **12** as well as the upwardly and outwardly sloping front face **13**. Substantially centrally located in the bottom **14** is a filter unit **19** spanning an opening in the casing to admit air to the blower mechanism of the apparatus.

A more detailed illustration of the apparatus is found in Figure 3 wherein it will be noted that the base plate **20** may be secured as by lag screw **21** to the wall of a washroom. The casing **11** has a lip **22** on its upper edge which may fit over the upper edge **23** of the base plate **20**. This hook effectively holds the casing in position around the base plate so that when the casing is on the base plate, the base plate is not visible. A pair of screws **24** underneath the unit securely fastens the unit casing to the base plate.

Air is admitted through the filter **19** and is pulled into the casing by motor **25** mounted on the base plate and driving a fan **26**. This fan is mounted in a scroll **27** also mounted on the base plate and has an opening **28** at the top and an opening **29** at the bottom for conducting air into the scroll and to the fan **26**. The scroll is in the form usually found in small fans and has a square delivery or outlet **30** directed substantially horizontally to the front of the unit.

In operation of the dryer, the push bar **18** may operate a switch **31** mounted on a support **32**, shown fragmentarily, which is connected to the base plate of the unit. This switch operates through a time delay **33**, shown diagrammatically in Figure 10, to operate the motor and also to operate a heating coil to heat the air discharged from the scroll. The motor and heating coil are thus actuated for the same length of time.

In the present apparatus, the heating element housing is so formed that it directs air toward a smaller passage, thus increasing the velocity of the air and raising the temperature thereof under ordinary circumstances. Since the temperature of the delivered air need only be at a certain level, it has been found that the heating element used may be one which will draw less amperes and thus, in effect, cut the cost of operating the unit. The housing **34** for the heating element has a square rear portion **35** matching in size and configuration the outlet **30** on the scroll. A pair of lugs **36** on opposite

sides of the housing are provided with a slot 37 and a depressed opening 38 at the upper end of the slot for receiving a screw 39 for securing the housing to the scroll. The outer portion 40 of the housing is a transition section narrowing to a round opening 41. Appropriate openings 42 are provided in one side of the housing for receiving electrical leads 43 to the heating element 44. A circuit breaker 45 is also incorporated inside the blower housing responsive to the temperature of the heating element to protect the heating coil from burning out.

The manner of mounting the heating coil 44 within the housing is one contributing to its very easy replacement. The element is wound upon a pair of crossed supports 46 of a length to fit easily but firmly within the confines of the square portion 35 of the housing. A small amount of material is upset to form corner projections 47 in each corner of the square outlet 30 of the scroll. The support members 46 have a width which is equal to the depth of the square portion 35 of the housing so that when they are placed in the housing, they may bear outwardly against the transition portion 40 of the housing and inwardly against the upset corner portions 47 in the scroll mouth. This abutment on either side of the supports 46 maintains the heating element in position and also serves to hold a screen 48 in place to prevent the introduction of foreign articles into the heating element from outside the casing. The air baffle 16 is in a substantially upright plane and includes a plurality of louvers 50 set at an angle to the general direction of air discharge. These louvers are generally flat with a plurality of upset portions 51 on the rear edges and similar upset portions 52 on the front edges, which strengthens the louvers. The louver unit is shown in Figure 9 and it should be noticed from the dotted line 53 that only a portion of the louvers are effective for directing the air. The outer portions are secured in an outer ring 54 of the air baffle and a joined inner ring 55 secured together by a plurality of screws 56. These rings provide a groove 57 about their periphery for engaging the edge portion 58 of the casing to maintain the air baffle therein and yet permit rotary movement of the baffle. A gasket 59 is placed on either side of the louver unit to hold it in place in the rings.

The only operative structures supported in the casing are the switch bar and the air baffle. This baffle unit has finger grip areas 60 which direct the user's attention to the fact that the baffle can be turned so that the louvers may direct the air in any direction from the horizontal direction of discharge. Upon removal of the casing, the air baffle is removed from the front of the heating element housing 34. The parts are rigidly held in position on the base plate and casing so that when the casing is properly fitted on the base plate, the inner surface 61 of the inner ring will abut the outer end of the transition portion 40 and form a good seal therewith. This prevents practically all leakage of air between the housing and air baffle. At the same time, it permits the unit to be very easily serviced and provides a very simple means of producing some friction on the air baffle to hold it in any position to which it is turned.

The air filter 19 is also supported in the casing. Its structure is such that it may be easily cleaned with a stiff brush. As illustrated in Figures 7 and 8, the filter includes a plurality of inverted V-shaped bars 63 and similar bars 64 in staggered relation so that the open portions face each other. The air thus has to follow a tortuous path such as indicated by the arrow 65 in entering the casing. Metal clips 66 are provided in the casing for holding the filter in place.

It will be noted from the foregoing description that the present invention provides an air dryer which is not subject to the problems or disadvantages mentioned above. The air is discharged substantially horizontally and then deflected from that path by the air baffle which is mounted in the casing wall. Should vandals attempt to pour liquid into the louvers, no particular harm can be done as the liquid can immediately drain to the air filter 19 and out of the casing without being held in the air stream passage so as to be blown on the next user of the device. Service of the unit is simplified considerably by the structure and effective economies in operation are achieved by the structure of the heating unit.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims.

We claim:

1. In a forced air dryer, a casing enclosing a fan scroll arranged to discharge air substantially horizontally, a heating coil housing on the fan scroll forming an air directing member and having a narrowing discharge portion terminating in an upright discharge mouth, a heating coil in said housing adapted to heat air forced through the scroll, and an air baffle rotatably supported in the front face of said casing opposite said discharge mouth, the inner end of said baffle being in slidable contact with the mouth defining end of the heating coil housing to seal against leakage of air between the baffle and housing, said baffle having a discharge opening in an upright plane and inclined louvers extending across the opening, a plurality of substantially parallel louvers in said air baffle each inclined to the direction of air discharge from said fan scroll, and an outer ring on said baffle having finger depressions about its periphery to permit manual rotation of the baffle and louvers to direct the discharged air in desired directions.

2. In a forced air dryer, a casing enclosing a fan scroll, means for forcing air through the scroll, a heating element housing having a base portion mating with the scroll to receive air delivered from the scroll and walls forming a transition section narrowing the housing to a delivery opening smaller than said base portion, intersecting support members clamped in said housing base portion between said transition section and the scroll, a heating coil threaded upon said support members, an air baffle having a plurality of louvers for receiving and directing discharged air, said baffle having an inner ring and a mating outer ring removably secured together with an annular groove therebetween rotatably mounting the baffle in the front wall of the casing, the outer portion of said heating element housing being in contact with the inner ring of said air baffle to prevent leakage of air between the housing and baffle.

References Cited in the file of this patent

UNITED STATES PATENTS

1,548,839	Henshall	Aug. 11, 1925
2,129,059	Herbster et al.	Sept. 6, 1938
2,420,732	Bichsel et al.	May 20, 1947
2,479,571	Hewitt	Aug. 23, 1949
2,646,629	Clemens	July 28, 1953
2,677,041	Oliver et al.	Apr. 27, 1954

FOREIGN PATENTS

166,677	Great Britain	July 18, 1921