

Aug. 23, 1966

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3,267,701

FABRIC CONDITIONER FOR CLOTHES DRYER

Filed Feb. 12, 1964

5 Sheets-Sheet 1

FIG. 1

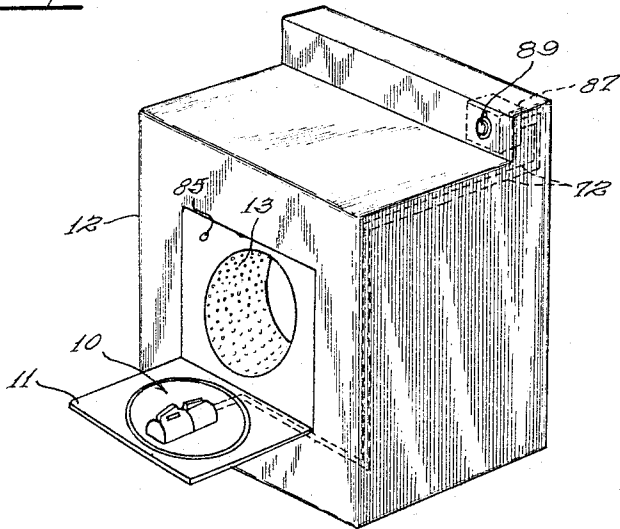
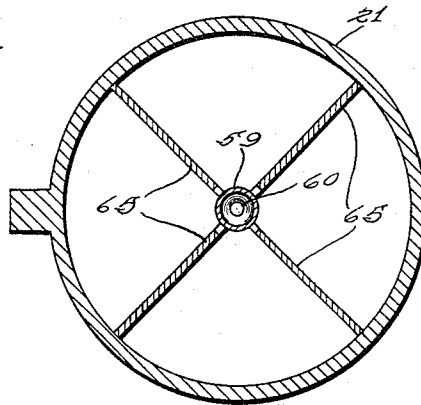
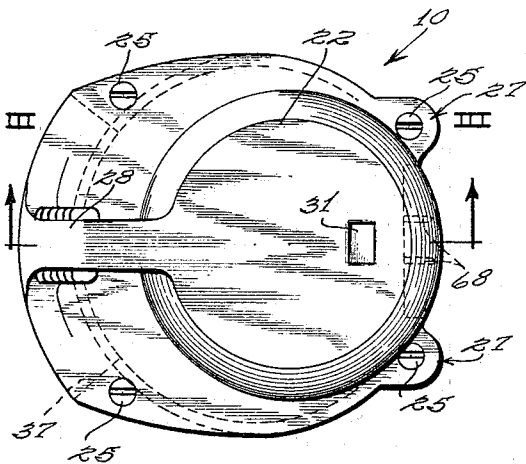


FIG. 2

FIG. 4



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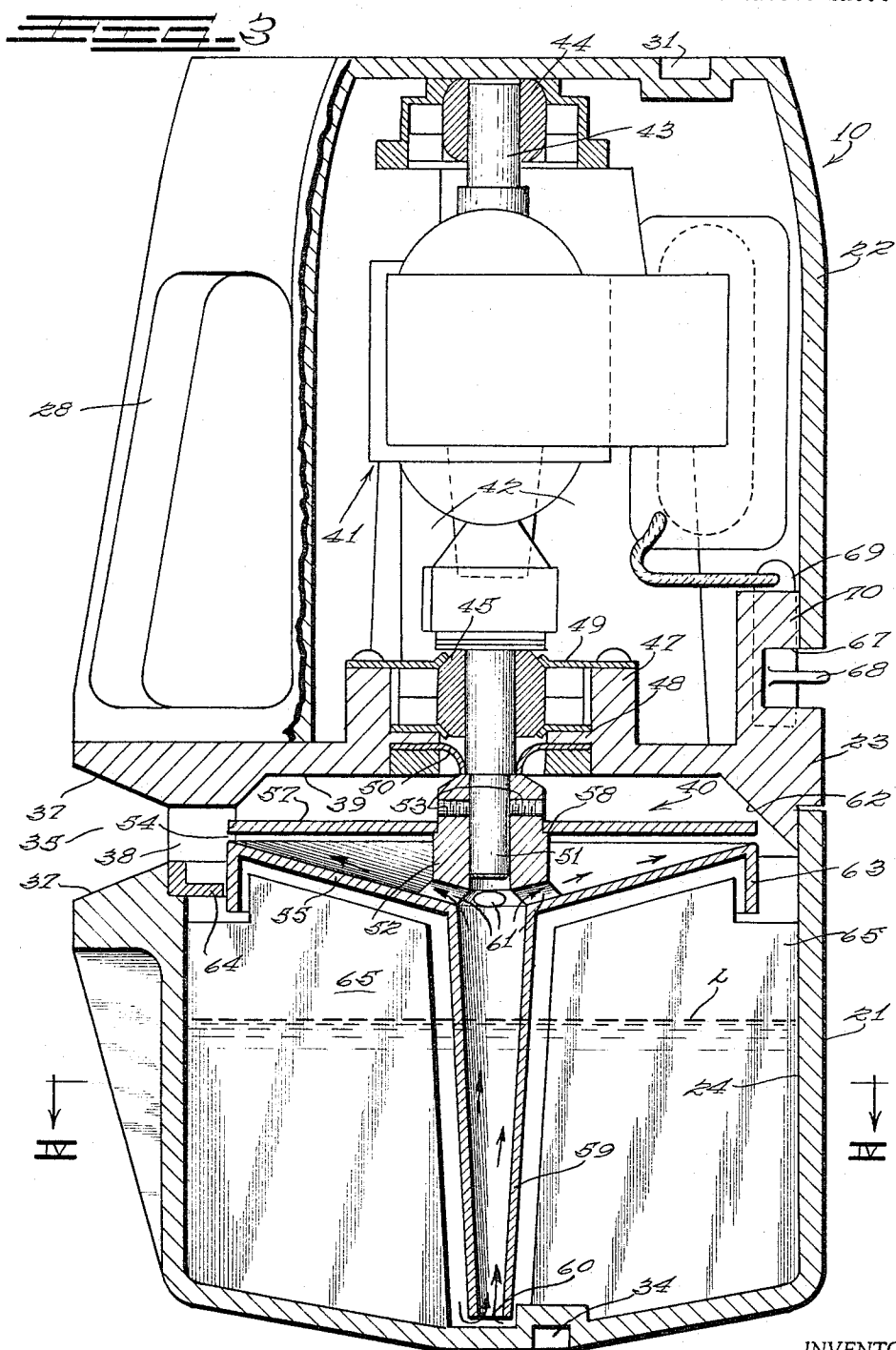
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FABRIC CONDITIONER FOR CLOTHES DRYER

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5 Sheets-Sheet 2



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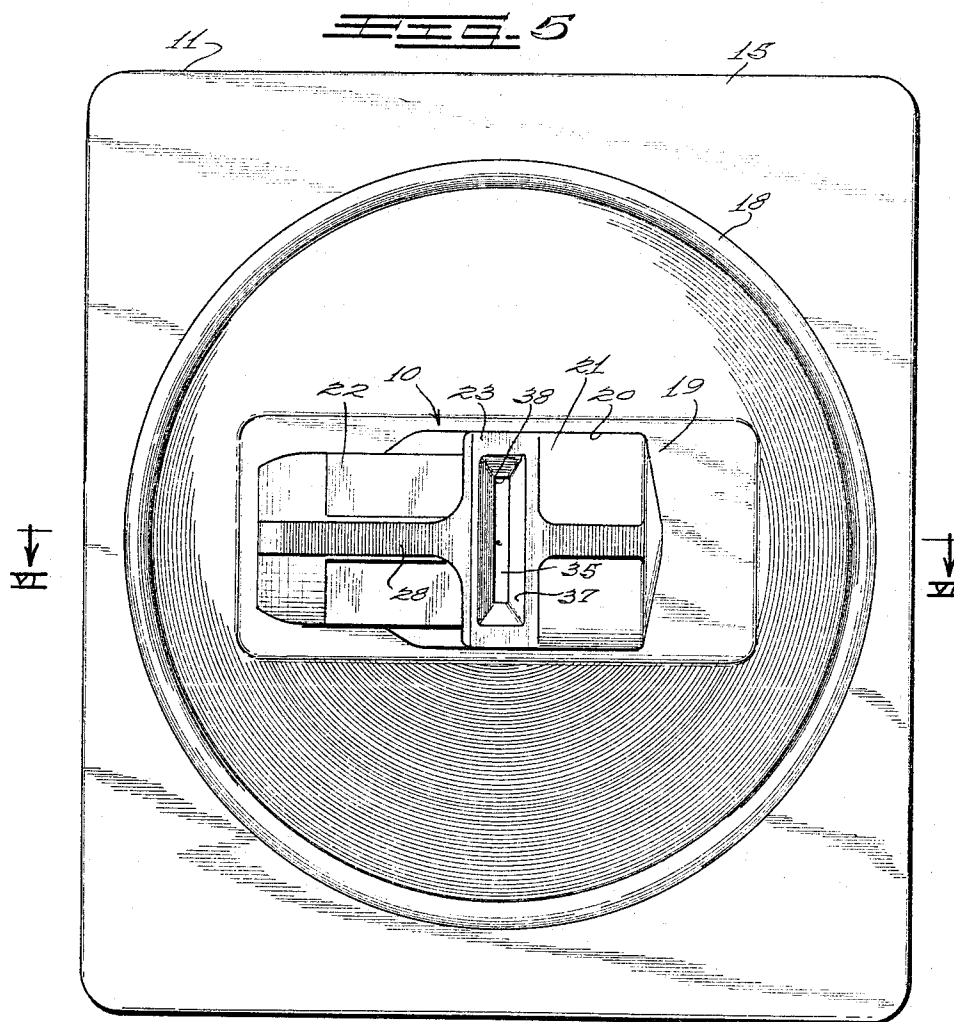
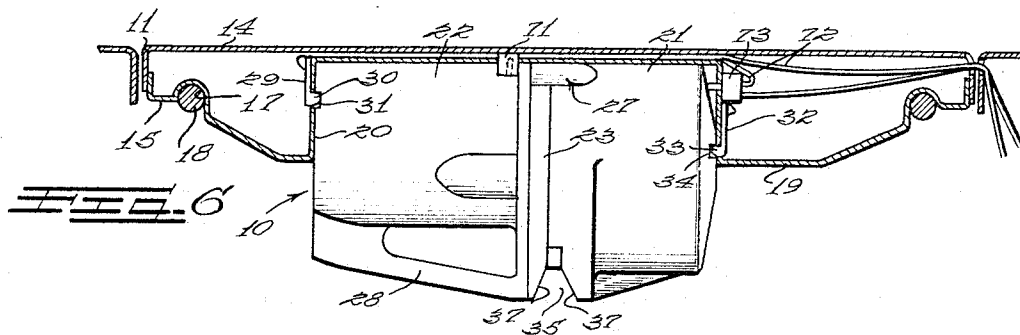
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FABRIC CONDITIONER FOR CLOTHES DRYER

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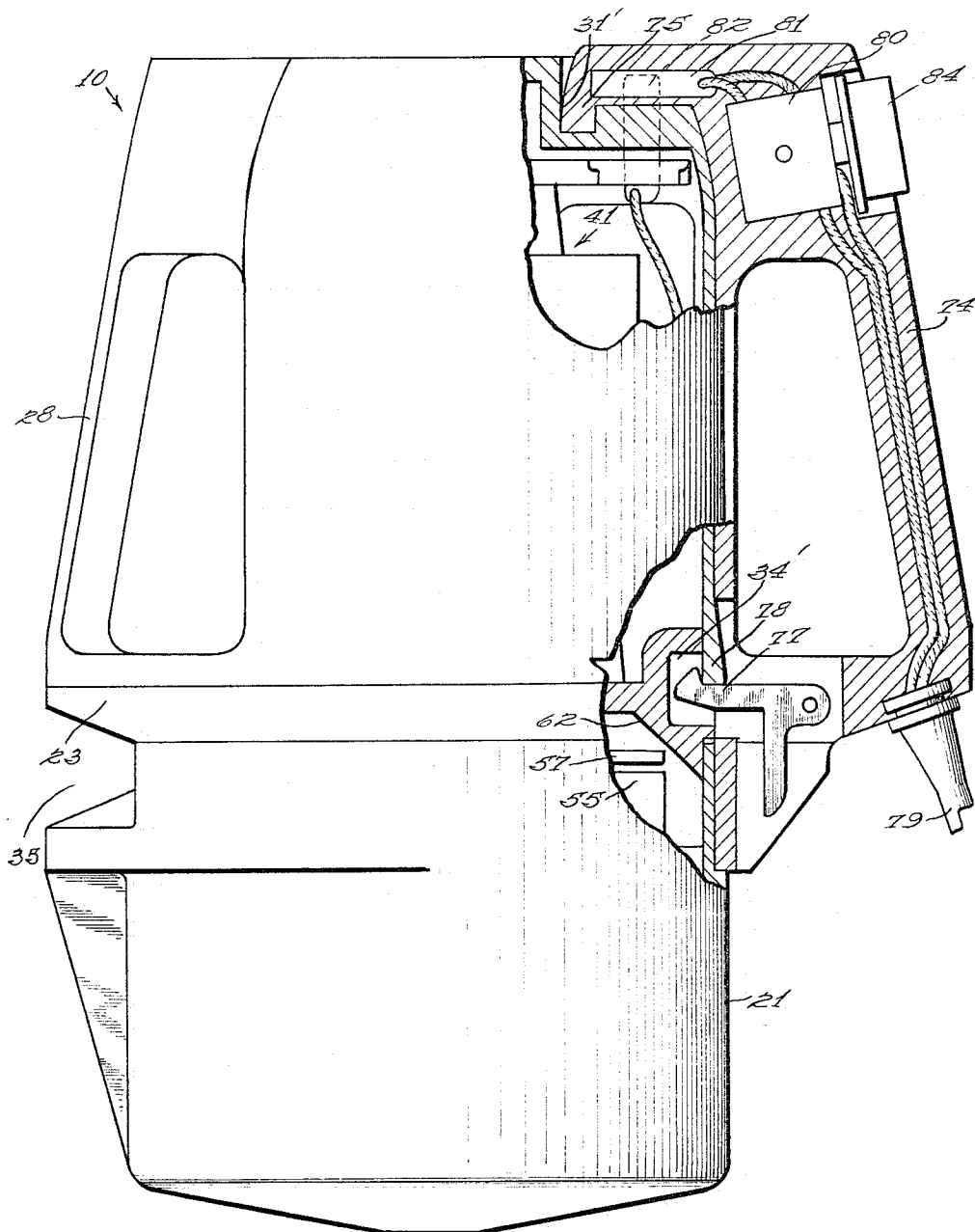
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FABRIC CONDITIONER FOR CLOTHES DRYER

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FIG. 7



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FABRIC CONDITIONER FOR CLOTHES DRYER

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FIG. 8

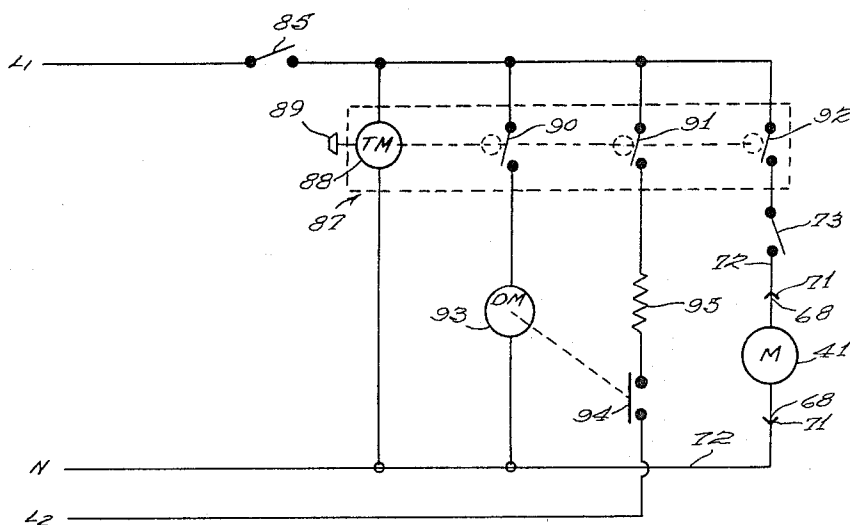
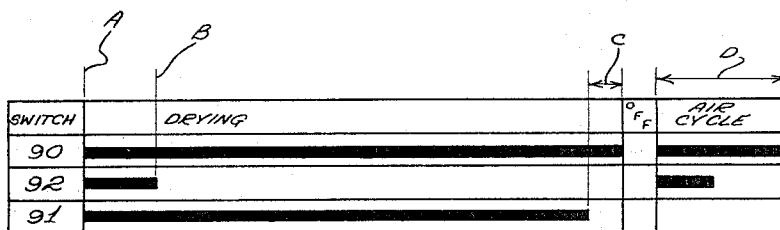


FIG. 9



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FABRIC CONDITIONER FOR CLOTHES DRYER
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22 Claims. (Cl. 68—12)

The present invention relates to improvements in home appliances and is more particularly concerned with a novel clothes drier and fabric conditioner wherein a dual purpose nebulizer is removably mounted in the access door of the drier for use as a combined part of the machine and can be separated and used as a separate article of utility apart from the drier.

In clothes driers it is desirable to add different types of liquid additives such as bleach, clothes fresheners, waterproofing materials, mildew preventative, mothproofing, fireproofing, fabric softeners, etc. during the drying cycle. In a horizontal drum type of domestic clothes drier, a desirable location for the additive dispenser is on the access door, generally located at the front of the machine. As heretofore proposed, such additive dispensers have been single utility, permanently built-in devices which have presented various servicing problems, awkward and bulky structures, and have required undue space thus limiting design efficiency and compactness. Furthermore, prior devices have not been adapted for use apart from the drier.

Accordingly, it is an important object of the present invention to provide a new and improved clothes drier or similar fabric conditioning apparatus and nebulizer wherein the nebulizer is useable separate and apart from the conditioner, thus substantially extending the utility of the nebulizer.

Another object of the invention is to provide a novel additive dispenser for clothing conditioner access doors.

A further object of the invention is to provide a novel removable door mounted additive dispenser nebulizer for clothes driers and the like.

Still another object of the invention is to provide a new and improved nebulizer construction.

A yet further object of the invention is to provide a novel self-contained nebulizer unit that can be produced and sold at low cost, which is easy to handle, has multiple utility, is simple in structure and easy to clean and service and which can be readily made from relatively unbreakable materials.

Yet another object of the invention is to provide a nebulizer construction which is highly efficient and economical in operation.

Other objects, features and advantages of the present invention will be readily apparent from the following detailed description of certain preferred embodiments thereof, taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a perspective view of a clothes drier embodying features of the invention;

FIGURE 2 is a top plan view of a nebulizer according to the present invention;

FIGURE 3 is an enlarged vertical sectional detail view taken substantially on the line III—III of FIGURE 2;

FIGURE 4 is a reduced scale horizontal sectional detail view taken substantially on the line IV—IV of FIGURE 3;

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FIGURE 5 is a plan view of the inside of the drier door showing the nebulizer in place;

FIGURE 6 is a sectional elevational detail view taken substantially on the line VI—VI of FIGURE 5;

FIGURE 7 is a side elevational view of a modified construction of the nebulizer adapted for attachment of a removable handle;

FIGURE 8 is a schematic electro-mechanical operating diagram for the clothes drier; and

FIGURE 9 is an operating sequence diagram.

In a representative construction, a nebulizer 10 (FIG. 1) is constructed and arranged to be removably mounted operatively on the inner side of an access door 11 which is hingedly mounted on the front of the cabinet of a clothes drier 12. Within the cabinet is a rotary tumbling drying drum 13 defining a treatment chamber compartment having a forward access opening and mounted in any usual or preferred manner to be driven rotatably by suitable power means such as an electric motor and suitable electrical control circuitry such as will be described more fully hereinafter. When the door 11 is closed, the nebulizer 10 is positioned with respect to the forward access opening into the rotatable drum 13 to discharge a spray of any suitable and preferred liquid material in substantially nebulized condition into the interior of the rotatable drum 13 for conditioning clothing or other fabric material in the load to be treated in the drum.

In the exemplary embodiment of the invention, rotation of the drum 13 is in a counterclockwise direction. The load of material to be treated is carried on the inner surface of the drum 13 until it reaches approximately the 1 o'clock position and then falls away from such surface in a generally dispersed manner, landing in substantially the lower left quadrant of the drum chamber. In order to obtain most effective treating contact of the nebulized material with the load, the nebulizer 10 is oriented to project the spray therefrom slightly to the left of center of the opening generally toward said lower left quadrant for contacting the dispersed load material.

As best seen in FIGURES 5 and 6, the door 11 comprises a generally pan-shaped outer panel 14 and a complementary opposed inner panel 15 with the marginal edges of the panels telescopically secured in known manner. Within the circular groove 17 inset in the inner panel 15 is a sealing ring gasket 18 which engages against the front panel of the drier cabinet in the closed position of the door. In the area outlined by the gasket seating groove 17 is provided an inwardly offset projecting area portion 19 on the panel 15 provided with a generally central, flanged receptacle cavity socket 20 preferably generally complementary in outline to the nebulizer unit 10 and supportingly receptive of the unit for proper operating orientation. This inwardly projecting, nebulizer supporting area portion 19 of the inner door panel is adapted to project into the access opening in the front wall of the drier casing and toward the inside of the drier drum 13 and efficiently positions the nebulizer 10 for dispensing of nebulized treating material into the chamber of the drum 13.

Referring now to FIGURES 2 and 3, the nebulizer 10 comprises a casing or housing including a generally cup-shaped base shell 21, a complementary inverted cup-shaped hood or cover top shell 22 and an intermediate mounting and partition disk 23. All three of these ele-

ments are adapted to be made from any suitable castable or moldable material and in a practical form are made of molded parts from suitable lightweight synthetic plastic material. At least the base portion or element 21 may be translucent or transparent since it is provided with a sump chamber 24 of substantial volumetric capacity for a supply of treating liquid L which can thus be checked visually as to quantity through the wall of the sump bowl. Means for securing the casing elements in separably assembled alignment, with the intermediate member 23 clamped between the opposing ends of the elements 21 and 22, herein comprise screws 25 which at the rear of the housing are accommodated in suitable, aligned ear flange and boss assemblies 27 which are provided in symmetrical circumferentially spaced relation to serve as stabilizing supports when the assembly is backed into the bottom of the mounting socket 20. For convenience in manipulating the nebulizer unit into and out of the socket 20, the front portion of the cap 22 is provided with an integral handle 28.

For releasably retaining the nebulizer unit 10 within the supporting socket 20, a spring latch 29 is mounted on the socket-defining flange of the door panel 15 (FIG. 6) to engage a rounded detent head 30 in pressure-yieldable releasable relation in a keeper socket 31 in the top end wall of the cover 22. Similarly, a spring arm latch 32 is mounted on the socket flange to engage a rounded pressure-releasable detent head 33 in a complementary keeper socket 34 provided in the base wall of the sump cup bowl 21. Through this arrangement, as the nebulizer unit 10 is manipulated into the socket 20, light inward camming pressure of the housing against the latch heads 30 and 33 overcomes the resilient bias of the spring latches and the latch heads then snap into the respective keeper sockets 31 and 34 to retain the nebulizer unit in place within the socket 20. When it is desired to remove the unit from the socket 20, this is readily accomplished by grasping the handle 28 and pulling outwardly thereon relative to the socket which results in camming the latch heads out of their keeper sockets and thereby releasing the unit.

Powered means are provided within the nebulizer housing for nebulizing the liquid L and driving it through a fixed nebulizer nozzle 35 (FIGS. 3, 5 and 6) which is circumferentially elongated at the front of the housing. This nozzle is defined by opposed flaring lip surfaces 37 provided on the bowl 21 and the intermediate member 23 and leading from a circumferentially elongated relatively narrow aperture or orifice 38 opening from the interior of the housing and more particularly the upper end of the sump chamber 24 and a roof chamber 39 defined by the lower side of the intermediate partition and mounting member 23. In addition to serving as a nebulizer discharge orifice and nozzle, the nozzle 35 and the orifice 38 serve as a filling inlet through which a supply of the liquid L is adapted to be poured into the sump bowl. The flaring lip surfaces 37 provide a funnel-like lead-in into the sump chamber 24 to facilitate easy filling with additives.

Within the sump chamber 24, and operatively aligned with the discharge and filling aperture 38 is a nebulizer rotor 40 which is directly coupled coaxially with an electrical driving motor 41 housed within the chamber of the cover 22. Support for the motor is provided by the partition and mounting disk member 23 which has suitable upwardly extending motor supporting pylons 42 to which the motor frame is attached with a motor shaft 43 having an upwardly projecting portion journaled in a bearing assembly 44 and a downwardly projecting portion journaled in a bearing assembly 45 mounted in an upwardly projecting annular flange 47 on the partition member 23 between an integral annular horizontal flange 48 and a removable retainer disk 49. Below the flange 48 a sealing ring disk 50 engages about the motor shaft and prevents liquid from migrating to the bearing 45.

On its lower end portions, the motor shaft 43 is provided with a reduced diameter portion 51 to which a hub 52 of the rotor assembly 40 is corotatively attached as by means of set screws 53 whereby the rotor is supported for free spinning operation within the sump chamber 24 and the roof chamber 39. Through this arrangement, an annular nebulizing orifice 54 defined between the perimeters of concentric, substantially equal diameter spinning disks 55 and 57 carried by the hub 52 is aligned with the orifices 38. Desirably the disk 55 is integral in one piece with the lower end of the hub 52 and slopes upwardly generally dish shape, while the disk 57 is flat and is fixed to the hub 52 on a peripheral upwardly facing rabbet shoulder 58 on the hub whereby the outer margin of the upper disk is maintained in predetermined narrow spaced relation to the underlying convergently related spinner orifice margin of the dished disk 55.

On the hub 52 concentric with the spinner disks is a downwardly projecting integral centrifugal suction pump tube 59 of at least internally frusto-conical shape progressively enlarging from a relatively small diameter lower end suction orifice 60 located adjacent the bottom of the sump 24 to a larger diameter head and from which a plurality of equidistantly spaced passage bores 61 lead to the dished spinner surface of the disk 55. As the spinning disk rotor 40 is spun at high speed, such as 15,000 r.p.m. by operation of the motor 41, the treating liquid is centrifugally pumped up the flaring inside wall of the pump tube 59 and is driven at high centrifugal acceleration toward the spinner orifice 54, causing efficient nebulization and ejection of the nebulized liquid through the nebulizer nozzle 35. Except at the discharge orifice 38, liquid leaving the spinner orifice is deflected by a sloping surface 62, defining the perimeter of the roof chamber 39, back into the sump 24.

Means are provided to avoid centrifugal displacement of liquid out of the sump 24 except through the nebulizing spinner orifice 54. To this end, the dished spinner disk 55 has a downwardly projecting outer marginal deflector skirt 63 which diverts back into the sump 24 any liquid that may migrate up the outer surface of the pump tube 59 and the undersurface of the dished spinner disk 55. As a precaution against escape of liquid from the sump under the spinner disks through the exit orifice 38, a horizontal deflector flange 64 is provided along the lower edge of the exit orifice. Any tendency towards development of a vortex in the liquid L within the sump 24 is counteracted by a series of circumferentially spaced vertical baffles 65 in the sump 24, fixedly supported by the bowl 21.

Power for driving the electrical motor 41 and control of the motor in operation of the associated drier 12 is effected by connecting the motor into the operating electrical circuit of the machine when the nebulizer 10 is mounted on the door 11. In a desirable arrangement, the back of the housing adjacent juncture of the cover 22 with the mounting partition 23 defines a socket 67 within which connecting prongs 68 of an electrical connector 69 supported by a boss 70 on the partition 23 are adapted to mate with a complementary separable door-mounted electrical connector 71 (FIGS. 6 and 8) to which are attached electrical leads 72 connected into the electrical control circuit of the machine. A cutout switch 73 such as a normally open micro-switch is suitably mounted on the door, such as adjacent to the base end of the unit receiving cavity socket 20, to be engaged by the base end of the nebulizer unit housing, and closed only when the nebulizer is in fully operating position within the socket 20. For safety purposes, this assures that the electrical contacts of the connector 71 will be deenergized or dead in the absence of the nebulizer 10.

By virtue of the electrical connector 69 carried by the nebulizer unit, the unit can be used apart from the clothes drier by attaching an electrical cord thereto to energize the motor 41 for nebulizing any desirable treating liquid

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to be sprayed either as an article treatment, as an insect spray, as a room vaporizer, etc.

In order to facilitate use of the atomizer unit 10 as an atomizer or sprayer separate from the clothes drier, the arrangement disclosed in FIGURE 7 including a separable manipulating handle 74 may be employed. Whereas the handle may be constructed and arranged to connect supportingly with the upper and lower ends of the nebulizer housing in the sockets 31 and 34 and effect electrical connection with the connector 69, the slightly simpler arrangement of the handle 74 and its connection to the nebulizer may be utilized. In this modified arrangement, a latch socket 31' in the top of the cover 22 received a rigid interlock lug 75 on the upper portion of the handle, while an interlock socket 34' in the rear of the nebulizer housing receives a releasable dog latch 77 engageable with a keeper 78 extending partially across this socket to retain the handle in place for manipulating the nebulizer. The handle carries an electrical cord 79 connected to a digitally operable switch 80 conveniently located in the upper portion of the handle and electrically connected to an electrical connector 81 mounted adjacent to the interlock lug 75 for effecting a coupling with an electrical connector 82 mounted adjacent to the keeper socket 31' and effecting a connection with the motor 41. Through this arrangement, selective energization of the motor 41 is readily effected through closing of the normally opening switch 80 by depressing a switch button 84.

The nebulizer dispenser unit 10 of FIGURE 7 is structurally and functionally substantially identical to the unit as described in connection with FIGURES 1-6 except for relocation of the keeper sockets 31' and 34' and of the electrical motor connector 82. Use of the modified unit in a clothes drier, therefore, requires only relocation of the retaining latch mechanism on the door and the door-carried electrical connector to accommodate the relocation of the complementary structures on the modified unit.

In a typical drying and treating cycle, wherein, for example, bleaching and drying of a batch or load of white materials such as clothing and household linens, and the like, is to be accomplished, the wet washed materials are placed into the treating chamber or compartment within the rotary drying drum 13. The nebulizer 10 with the sump chamber 24 thereof substantially filled with a suitable amount of a liquid bleach such as hydrogen peroxide is mounted in the cavity socket 20 of the drier door. This closes the safety switch 73 (FIGS. 6 and 8).

Upon closing the drier 11, a normally open switch 85 (FIGS. 1 and 8) in the drier control circuit and mounted on the cabinet 12 is closed by the door, and the drier is ready to begin a drying, treating cycle. Then, a sequential controller 87 has a timer motor 88 thereof adjusted by means of a knob 89 to the "Start" position of the drying operation, indicated at A in FIGURE 9. This closes timer switches 90, 91 and 92. Closing of the switch 90 completes the circuit through a drive motor 93 for driving the rotary drum 13 to tumble the materials therein and also drives an air blower (not shown) for moving heated drying air through the tumbling material to be treated and dried. When the motor 93 reaches a predetermined speed, it closes a centrifugal switch 94 to complete a circuit for energizing an air heater 95. This heater circuit is also controlled by the timer switch 91. Closing of the switch 92 complete the energizing circuit for the nebulizer motor 41 and the nebulizer will spray the bleach onto the dispersed tumbling materials in a fine mist, thereby evenly distributing the bleach throughout the wet material.

At the end of the spraying period, shown at B in FIGURE 9, at least all of the liquid required from the sump 24 of the nebulizer 10 will have been dispensed, and the timer switch 92 is opened to deenergize the motor 41. However, the drier continues on to the end of a typical drying sequence, including a cooling down period shown at C in FIGURE 9.

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It will be understood that in the case of a drying-bleaching operation, it is necessary to subject the fabrics to fairly elevated temperatures, such as on the order of 140° F. to liberate the oxygen from the bleach to accomplish the bleaching.

However, in the use of some other additives, such as water repellants, fabric softeners, water for dampening, etc., it is often recommended that they be applied to the wet or dry materials without the addition of heat. In the use of such non-heat additives, an "Air Cycle" setting of the sequential controller 87, as shown at D in FIGURE 9, effects dispensing of the additives to the materials in the rotary drum 13 without subjecting the materials to heat during addition of the additive. After addition of the additive in the "Air Cycle" setting, the user of the drier may remove the nebulizer 10 from the door of the drier to use the nebulizer as a portable hand sprayer, and reset the control knob 89 to the beginning of the "Drying" cycle portion of the controller 87 to remove moisture from the materials, if so desired.

Although minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such modification as reasonably and properly come within the scope of my contribution to the art.

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

1. A fabric conditioning apparatus including a cabinet having therein a rotary drum and an access door confronting the interior of the drum and adapted to be opened for access into the drum,

said door having an inner face providing a socket recess, a nebulizer unit engageable in said socket recess and

having nozzle means directed to discharge into the drum when the door is closed,

liquid nebulizing means within said nebulizer unit including an electrical motor,

and electrical connection means carried by the nebulizer and by said door for providing electrical connection therebetween,

and means for energizing said electrical motor when the door is closed,

said electrical connection means on the door and on the nebulizer being separable when the nebulizer is removed from said socket recess and including a normally open safety switch which is closed by the nebulizer when in the socket recess but which is open when the nebulizer is removed from the socket recess.

2. A clothing conditioner including a cabinet having therein means defining a treating chamber and having an access door including an inner side exposed to said chamber,

a nebulizer including a housing having a discharge opening therefrom and mounting therein electrically operated nebulizing means,

an electrical connector externally on said housing and connected with said electrically operated means,

a mating electrical connector carried by the inner side of said door,

coactive latch means on said inner side of said door and on said housing releasably retentive of said housing on said inside of said door with said electrical connectors mated and said discharge opening positioned for discharging into said chamber in response to operation of said electrically operated nebulizing means,

and a detachable handle including latch means coactive with the latch means on the housing for releasably attaching the handle and also including an electrical connector mating with the electrical connector on the housing,

whereby the nebulizer is adapted to be used apart from the door.

3. A clothing conditioner including a cabinet having therein means defining a treating chamber and having an access door including an inner side exposed to said chamber,

a nebulizer including a housing having a discharge opening therefrom and mounting therein electrically operated nebulizing means,

an electrical connector externally on said housing and connected with said electrically operated means,

a mating electrical connector carried by the inner side of said door,

coactive latch means on said inner side of said door and on said housing releasably retentive of said housing on said inside of said door with said electrical connectors mated and said discharge opening positioned for discharging into said chamber in response to operation of said electrically operated nebulizing means,

a detachable handle including latch means coactive with the latch means on the housing for releasably attaching the handle and also including an electrical connector mating with the electrical connector on the housing,

and a permanent handle on said housing positioned to facilitate manipulation of the nebulizer into and out of mounted position on the door.

4. For use in a fabric conditioner of the type including a cabinet having therein a conditioning compartment and an access door,

a nebulizer constructed and arranged to be mounted on the inner side of said door for discharging conditioning material into said compartment and including:

a housing comprising a pair of opposed generally cup-shaped housing shells and a partition between the adjacent ends of the shells,

means detachably securing the ends of the shells,

a nebulizing rotor in one of said shells,

driving means in the other of said shells,

means extending through the partition for connecting the driving means and the rotor,

said one shell and said partition defining a controlled discharge opening from the housing aligned with said rotor,

said one shell defining a conditioning material sump and said rotor including a nebulizing disk structure and a coaxial generally frusto-conical hollow tube centrifugal pump extending into the sump and operable in the spinning of the rotor by said driving means to draw material by centrifugal action from the sump and discharge it onto the disk structure,

and baffle means in said sump preventing development of a vortex of the material in the sump.

5. A fabric conditioner including a cabinet,

a rotatable drum positioned within said cabinet for tumbling fabrics placed within said drum,

electrically actuated means for rotatably driving said drum,

an access opening into said drum,

an access door in said cabinet aligned with said access opening to provide in the open position of the door access to the inside of said drum and having an inner panel facing the interior of said drum in the closed position of the door,

an electrically operated nebulizer releasably mounted on said inner panel for dispensing selected additives into the interior of said drum,

electrical means for supplying heat to the interior of said drum for heating fabrics placed therein,

sequential electrical control means controlling the operation of said driving means and said nebulizer and said heating means for dispensing additives into said drum while simultaneously rotating said drum and supplying heat to its interior,

and an electrical circuit for connecting said nebulizer with said control means and including a normally open safety switch on said door closed by the nebulizer when it is mounted on said inner panel and separable electrical contact means on the nebulizer and on the door.

6. A fabric conditioning apparatus including a cabinet having a front wall, a drum rotatably mounted on a generally horizontal axis within said cabinet and having an access opening adjacent said front wall,

said front wall having an access opening aligned with said access opening of said drum,

a door hingedly mounted on said front wall at the lower side of said access opening in said front wall and swingable between a closed generally vertical position and an open generally horizontal upwardly facing position,

an inner panel structure on said door,

said panel structure having a receptacle cavity socket which opens toward the interior of the cabinet in the closed position of said door,

a nebulizer unit having a housing complementary to and received in said socket and thus vertically oriented in the closed position of said door,

means on said housing and on said door providing a releasable latch for retaining said housing in said socket,

a partition dividing said housing into upper and lower chambers,

an electrical motor supported in said upper chamber,

a drive shaft extending from said motor through said partition into said lower chamber,

a nebulizing rotor in said lower chamber mounted corotatively with said shaft to be spun in the operation of the motor,

said lower chamber providing a conditioning liquid sump,

said rotor including pump means and nebulizing means operative to draw fluid from the sump and nebulize said fluid,

said housing having a discharge opening leading from said lower chamber adjacent to said partition and aligned with said nebulizing means and directed away from said door for discharge of nebulized fluid into said drum in the closed position of said door,

and means for controlling operation of said motor including electrical connecting means on said housing and on said door.

7. A fabric conditioning apparatus including a cabinet having means providing a conditioning chamber therein and an access door disposed vertically in the closed position thereof and having an inner side,

and a nebulizer mounted on said inner side of the door, and including:

a vertically oriented housing having an upper chamber and a lower chamber,

a partition dividing said housing chambers,

an electrical motor supported above said partition in said upper chamber,

a drive shaft extending from said motor through said partition,

a nebulizing rotor in said lower chamber mounted corotatively with said shaft to be spun in the operation of the motor,

said lower chamber providing a conditioning liquid sump,

said rotor including pump means and nebulizing means operative to draw fluid from the sump and nebulize the same,

and means for directing nebulized fluid from said nebulizing means into the cabinet chamber including a discharge opening from said nebulizer housing leading from said lower chamber adjacent to said partition,

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said door being pivotally mounted to swing into open position with said inner side facing upwardly and said discharge opening being directed upwardly in the open position of the door and being formed by a flaring lip structure facilitating filling of the sump with fluid there-through while the discharge opening is directed upwardly.

8. A clothing conditioner including a cabinet having therein means forming a treatment chamber and having an access door including an inner side exposed to said chamber,

a nebulizer including a housing having a discharge opening therefrom and mounting therein electrically operated nebulizing means,

a socket recess in said door conformably shaped to said nebulizer housing to receive the nebulizer in nested relation,

an electrical connector externally on said housing and connected with said electrically operated means, and a mating electrical connector carried by the inner side of said door in said socket recess,

said discharge opening positioned for discharging into said chamber in response to operation of said electrically operated nebulizing means.

9. A clothing conditioner as defined in claim 8 and further characterized by

coactive latch means on said inner side of said door and on said housing releasably retentive of said housing on said inside of said door with said electrical connectors mated.

10. A clothing conditioner as defined in claim 8 and further characterized by said access door being disposed vertically in the closed position thereon and said nebulizer housing being vertically oriented and formed with an internal partition dividing the interior of said nebulizer housing into an upper chamber and a lower chamber,

said electrically operated nebulizing means including an electrical motor supported above said partition in said upper chamber,

a drive shaft extending from said motor through said partition and

a nebulizing rotor in said lower chamber mounted corotatively with said shaft to be spun in the operation of the motor,

said lower chamber providing a conditioning liquid sump,

said rotor including pump means and operable together with said nebulizing means to draw fluid from the sump,

whereby the nebulized fluid will be directed out of the discharge opening.

11. A clothing conditioner as defined in claim 8 and further characterized by said nebulizer housing having a sump formed therein for receiving a supply of conditioning liquid,

said discharge opening in said nebulizer housing being formed by a flaring lip structure forming a filling inlet through which a supply of conditioning liquid may be charged into said sump.

12. A clothing conditioner as defined in claim 8 and further characterized by said nebulizer housing having aligned chambers and a dividing partition,

said electrically operated nebulizing means including a driving motor in one of said chambers,

a rotary nebulizer in the other of said chambers and means connecting said motor to said nebulizer through said partition.

13. A clothing conditioner as defined in claim 8 and further characterized by handle means formed on said nebulizer housing to facilitate manipulation of the nebulizer to facilitate manipulation thereof.

14. A clothing conditioner as defined in claim 8 and further characterized by said nebulizer housing comprising a pair of opposed generally cup-shaped housing

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shells and a partition between the adjacent ends of the shells,

means detachably securing the ends of the shell, said electrically operated nebulizing means including

a nebulizing rotor in one of said shells,

driving means in the other of said shells,

means extending through the partition for connecting the driving means and the rotor,

said one shell and said partition together forming said discharge opening in said housing in alignment with said rotor.

15. A clothing conditioner as defined in claim 14 and further characterized by said one shell having formed therein a conditioning material sump and said rotor including a centrifugal pump and a nebulizing disk onto which the centrifugal pump discharges conditioning material pumped from the sump.

16. A clothing conditioner as defined in claim 15 and further characterized by a coaxial generally frusto-conical hollow tube centrifugal pump extending into the sump and operable in the spinning of the rotor by said driving means to draw material by centrifugal action from the sump and discharge it onto the disk.

17. A clothing conditioner as defined in claim 8 and further characterized by keeper means on said housing, and latch means on said door engageable with said keeper means for retaining said nebulizer in nested assembly on said door.

18. In combination,

a dryer having a cabinet formed with an access door, a rotatable drum in said cabinet having an open end adjacent said door and through which a supply of materials to be dried may be inserted for a tumbling action,

said access door having an inner side formed with a shaped socket recess,

a nebulizer including a housing having a discharge opening therefrom and mounting therein electrically operated nebulizing means,

said housing being shaped complementary to said socket recess and being received therein in nested relation,

an electrical connector externally on said housing and connected with said electrically operated means, and a mating electrical connector carried by the inner side of said door in said socket recess,

whereby operation of said electrically operated nebulizing means will direct conditioning fluid through said discharge opening into said drum.

19. The invention of claim 18 and further characterized by said discharge opening in said housing constituting an orifice arranged to directionalize the discharge conditioning fluid towards a selected quadrant within the interior of the drum for optimum engagement with the material tumbling in the drum.

20. The invention of claim 18 and further characterized by releasable latch means on the door and on the nebulizer housing releasably interengageable to retain the nebulizer in said socket recess.

21. A fabric conditioner including a cabinet, a rotatable drum positioned within said cabinet for tumbling fabrics placed within said drum, means for rotatably driving said drum, an access opening into said drum,

an access door in said cabinet aligned with said access opening to provide in the open position of the door access to the inside of said drum and having an inner panel facing the interior of said drum in the closed position of the door,

a nebulizer including a housing having a discharge opening therefrom and mounting therein electrically operated nebulizing means,

a socket recess in said door conformably shaped relative to said nebulizer housing to receive the nebulizer in nested relation,

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an electrical connector externally on said housing and connected with said electrically operated means, a mating electrical connector carried by the inner side of said door in said socket recess, means for supplying heat to the interior of said drum 5 for heating fabrics placed therein, and sequential control means controlling the operation of said driving means and said nebulizer means and said heating means for dispensing additives into said drum while simultaneously rotating said drum and 10 supplying heat to its interior.

22. A fabric conditioner as defined in claim 21 and further characterized by said heating means comprising electrical heating elements for supplying heat to the interior of said drum.

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