United States Patent

Geisler et al.

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[54] HUMIDIFIER ASSEMBLY

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[52] **U.S. Cl.** **126/113**, 261/92

[51] **Int. Cl.** **F24f 3/14**

[58] **Field of Search** 126/113; 261/92

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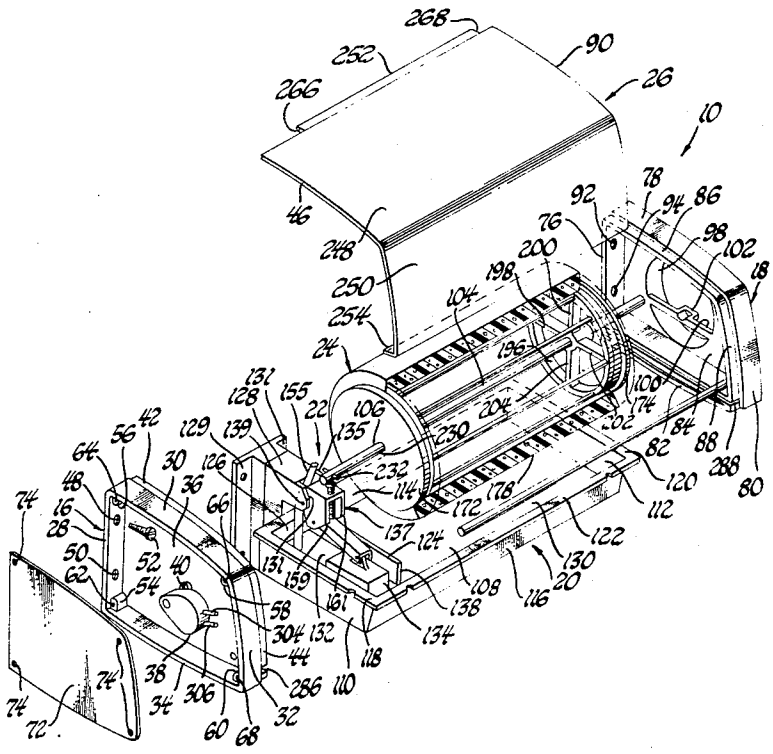
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[57] **ABSTRACT**

A humidifier assembly for use with a related hot air heating system has separate end support members individually mountable, in spaced relation, to a portion of the heating system; the end supports in turn support a separate lower water pan, a water carrying rotatable drum assembly which is also removable as a subassembly and a detachable cover assembly for enclosing the operating components of the humidifier including a water inlet assembly which, in one form of the invention is separately secured to the related heating system and in another form of the invention is detachably secured to the separate lower water pan.

11 Claims, 12 Drawing Figures



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3 Sheets-Sheet 1

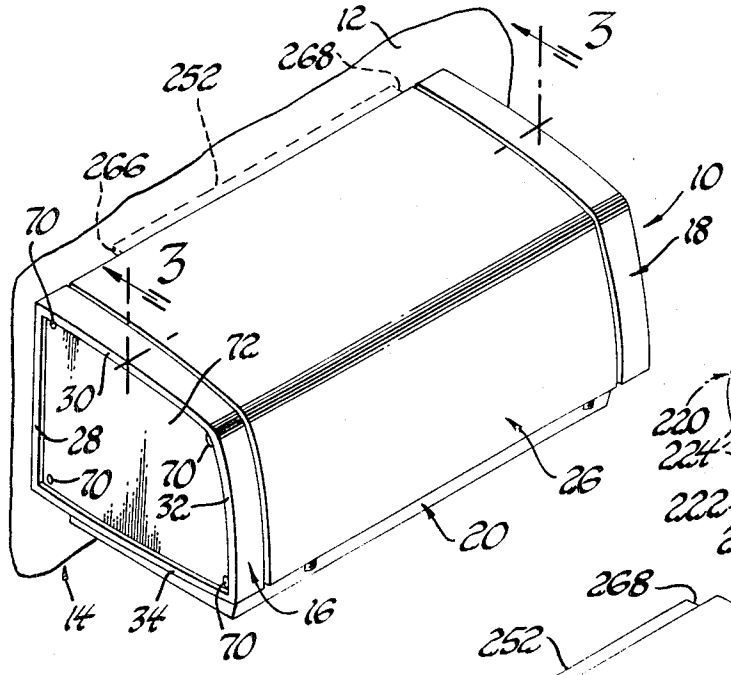


Fig. 1

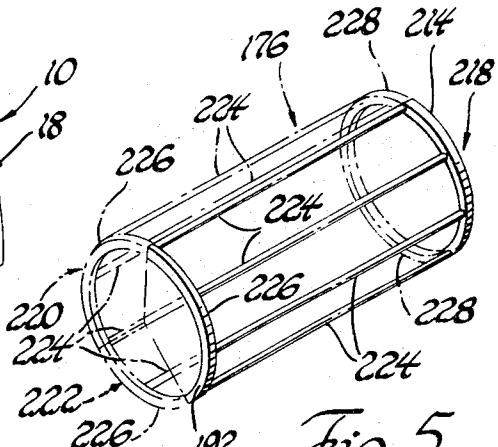


Fig. 5

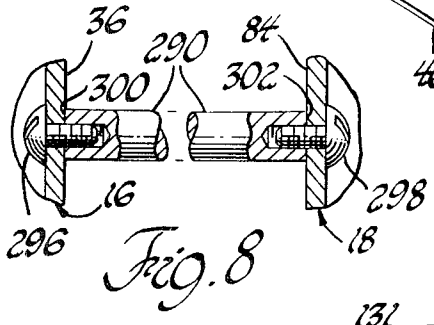


Fig. 8

Fig. 2

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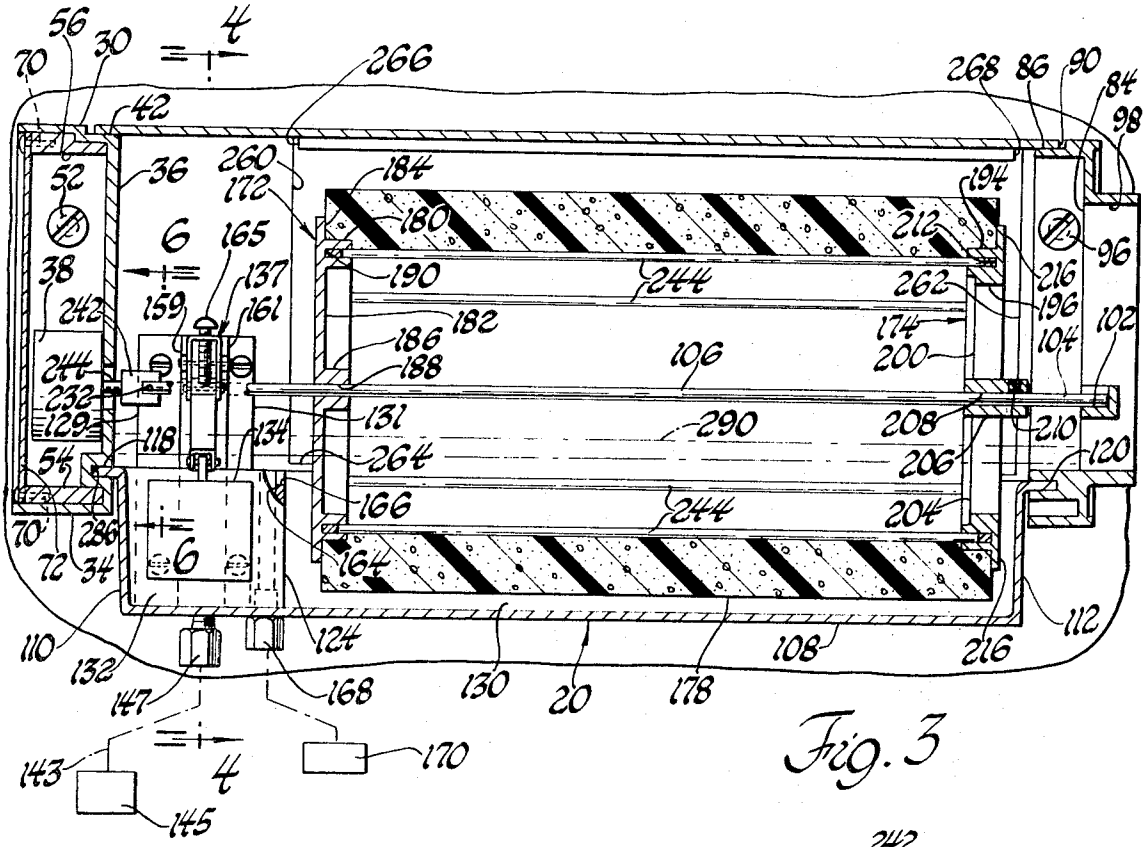


Fig. 3

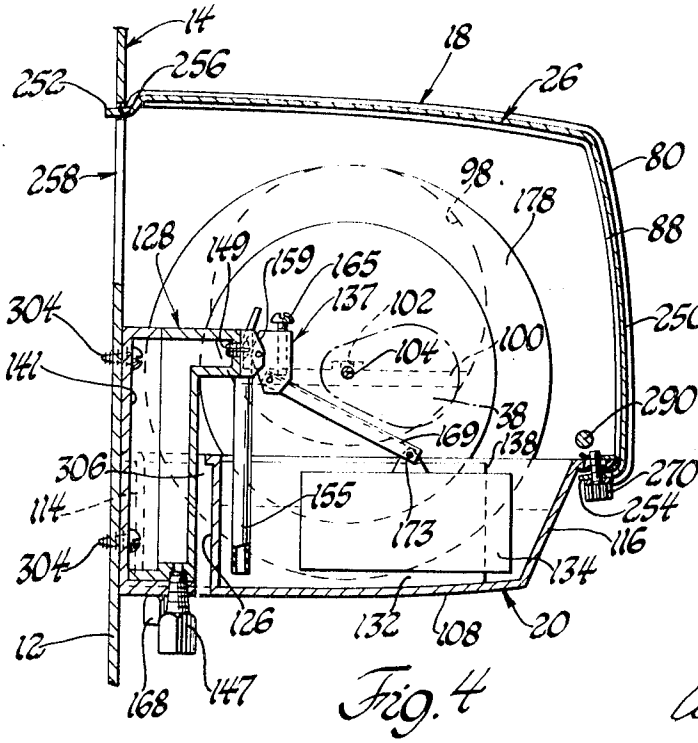


Fig. 4

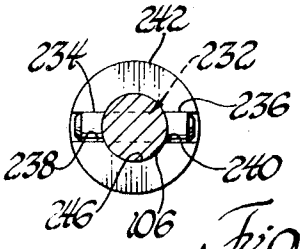


Fig. 6

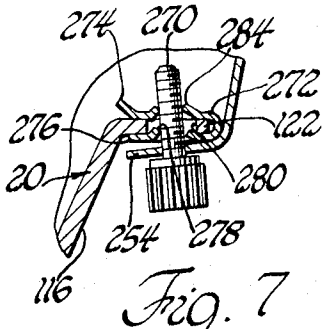


Fig. 7

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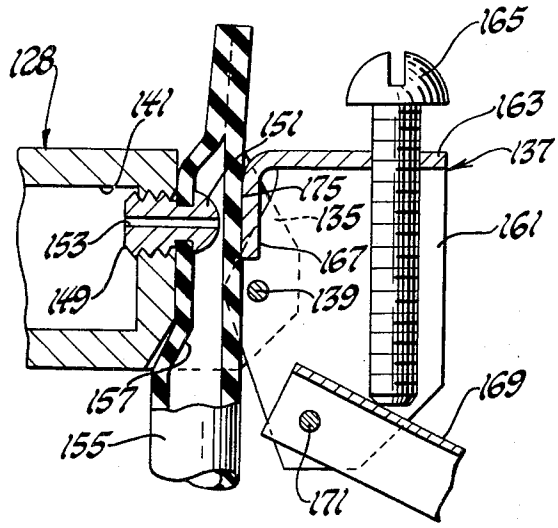


Fig. 9

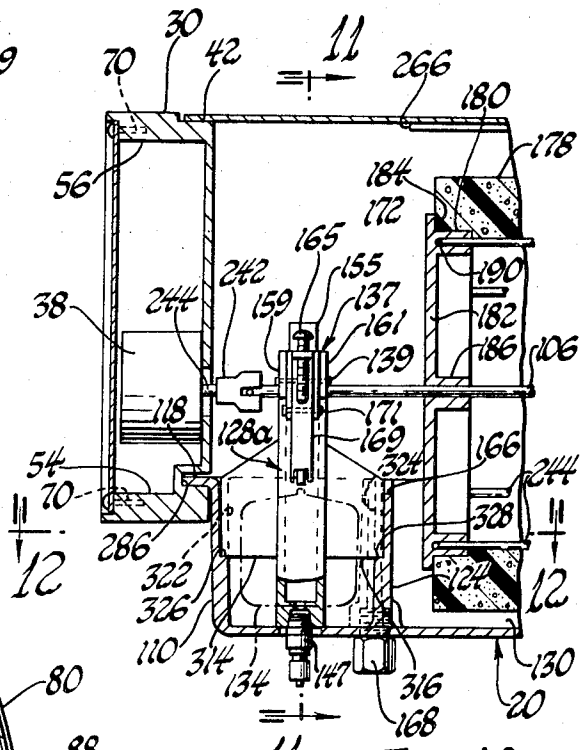


Fig. 10

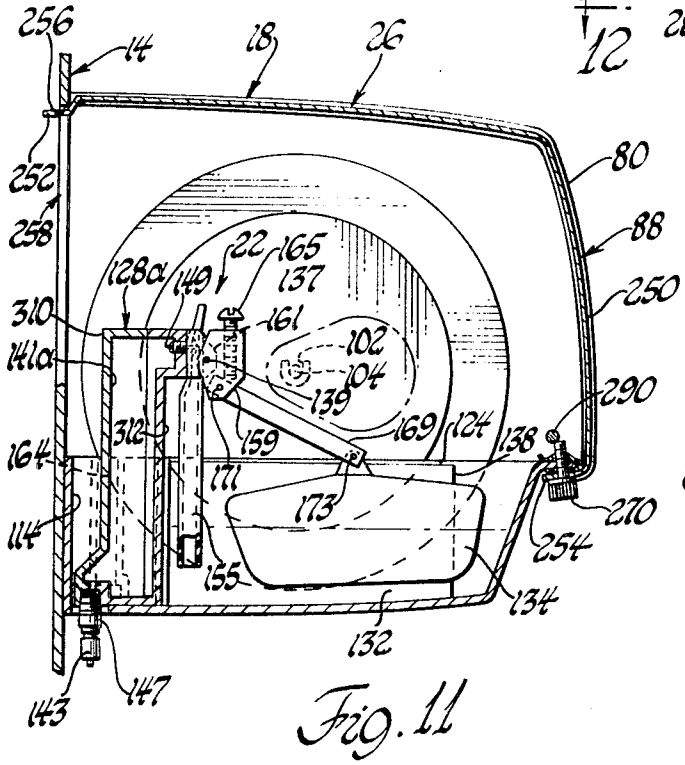


Fig. 11

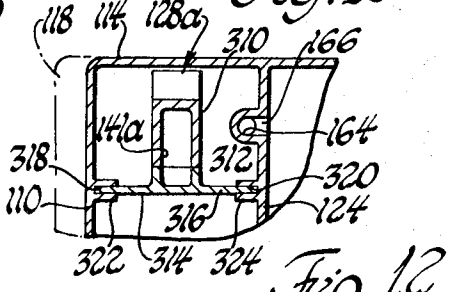


Fig. 12

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HUMIDIFIER ASSEMBLY

BACKGROUND OF THE INVENTION

Various humidifier assemblies have been proposed by the prior art. However, such prior art devices have not been found to be entirely satisfactory. For example, many of such prior art humidifying devices are so constructed as to require the tedious complete disassembly of the entire humidifier from the related hot air heating system in order to either inspect, adjust, repair or replace the operating components. Further, many of the prior art structures are so constructed as to be of a generally unitized character which does not permit of separation into individual easily packaged components. That is, they are by nature comparatively very bulky requiring maximum space for shipping and storage as between, for example, the manufacturer and distributor or retailer. Such increased space requirements, of course, add substantially to the overall cost of the humidifier to the ultimate consumer.

Accordingly, the invention as herein disclosed and described is concerned with the solution of the above as well as other related problems.

SUMMARY OF THE INVENTION

According to the invention, a humidifier assembly comprises a housing assembly adapted to be secured to a portion of an associated hot air heating system, said housing assembly comprising spaced support means, water reservoir means, and water inlet valving means separate from said housing assembly said support means and said water reservoir means for at times supplying water to said water reservoir means in order to replenish water depleted therefrom.

A general object of this invention is to provide a humidifier assembly of novel construction permitting the compact packaging of the component elements as well as the ready access to the operating elements of the humidifier when such humidifier is assembled onto an associated hot air heating system.

Another object of the invention is to provide, in a humidifier assembly, a separate or easily separable water inlet valving assembly which can be easily removed therefrom without the necessity of having to disassemble any major components of the humidifier assembly.

Other more specific objects and advantages of the invention will become apparent when reference is made to the following detailed description considered in conjunction with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

In the drawings, wherein for purposes of clarity certain elements may be omitted from one or more views:

FIG. 1 is an elevational perspective view of a humidifier assembly, embodying the teachings of the invention, illustrated as mounted onto a portion of a related heating system;

FIG. 2 is a generally exploded perspective view of the elements comprising the humidifier assembly of FIG. 1;

FIG. 3 is an enlarged cross-sectional view taken generally on the plane of line 3—3 of FIG. 1 and looking in the direction of the arrows;

FIG. 4 is a cross-sectional view taken generally on the plane of line 4—4 of FIG. 3 looking in the direction of the arrows;

FIG. 5, is a perspective view, with portions thereof in phantom line, illustrating one of the subassemblies shown, for example, in FIGS. 2 and 3;

FIG. 6 is an enlarged cross-sectional view taken generally on the plane of line 6—6 of FIG. 3 and looking in the direction of the arrows;

FIG. 7 is an enlarged fragmentary portion of the structure shown in FIG. 4;

FIG. 8 is an enlarged fragmentary view, partly in cross section, of one of the elements shown, for example, in FIG. 2;

FIG. 9 is an enlarged fragmentary portion of the structure shown in FIG. 4;

FIG. 10 is a fragmentary cross-sectional similar to FIG. 3 but illustrating a second embodiment of the invention;

FIG. 11 is a cross-sectional view taken generally on the plane of line 11—11 of FIG. 10 and looking in the direction of the arrows; and

FIG. 12 is a fragmentary cross-sectional view taken generally on the plane of line 12—12 of FIG. 10 and looking in the direction of the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now in greater detail to the drawings, FIG. 1 illustrates a humidifier assembly 10, constructed in accordance with the teachings of the invention, mounted onto, for example, a wall 12 of the heat plenum assembly 14 of a related heating system.

FIG. 2, a generally exploded perspective view, illustrates the humidifier assembly 10 as comprising end support members 16, 18, a lower disposed water tray or pan 20, a float regulated water inlet valve assembly 22, a rotatable drum or wheel assembly 24 and a cover 26.

As is shown by both FIGS. 2 and 3, end support 16 is formed of rear wall section 28, upper wall section 30, forward wall section 32 and lower wall section 34 generally peripherally situated as to form a continuous surface. Such peripheral wall sections are, in turn, joined as by a vertically extending integrally formed wall 36 which, among other things, serves to support an electric motor assembly 38 suitably secured thereto as by mounting screws, one of which is shown at 40.

Upper and forward wall sections 30 and 32 are respectively formed with stepped surfaces 42 and 44 which are preferably formed as to define a continuous mounting surface for the reception thereagainst of end 46 of the main housing cover 26. Rear wall section 28 has clearance apertures 48 and 50 formed therethrough adapted for the reception of suitable attaching means such as screws, one of which is shown at 52, in order to securely mount the end support 16 onto the wall 12 of plenum assembly 14. In addition to mounting apertures 48 and 50, end support 16 is provided with bosses 54, 56, 58 and 60, generally at the juncture of the respective peripheral wall sections, which are respectively provided with, preferably, apertures 62, 64, 66 and 68 as for the threadable engagement with suitable self-tapping screws 70 for holding the end cover plate 72 assembled against the end support 16 (as best seen in FIG. 3). Of course, apertures 74, formed through cover plate 72, accommodate the passage therethrough of screws 70.

As also shown in both FIGS. 2 and 3, it can be seen that end support 18 is somewhat similar to end support 16. That is, end support 18 includes a rear wall section 76, upper wall section 78, forward wall section 80 and lower wall section 82 formed to be generally peripherally situated and continuous about an integrally formed vertically extending end wall 84. Upper and forward wall sections are respectively formed with stepped surfaces 86 and 88 which are preferably formed to define a continuous mounting surface for the reception thereagainst of end 90 of the main housing cover 26. Rear wall section 76 has clearance apertures 92 and 94 formed therethrough adapted for the reception of suitable attaching means, such as screws typically illustrated at 96 of FIG. 3, in order to securely mount the end support 18 onto the wall 12 of plenum assembly 14.

Vertical wall section 84 has an aperture formed therein which, actually, is one end of an integrally formed outlet conduit 98. A generally horizontally disposed supporting strut 100 is provided with an integrally formed trunnion portion 102 which is adapted to receive and support end 104 of the main drum or wheel shaft 106.

As illustrated in FIGS. 2, 3 and 4, the water tray or pan 20 is comprised of a lower floor or bottom 108 with vertically upwardly extending side walls 110 and 112, a vertically upwardly extending rear wall 114 and a forward or front wall 116 upwardly directed but somewhat inclined from the vertical. As will be seen, the end wall 110 is preferably made shorter than opposite end wall 112 in order to provide an offset-like clearance to accommodate the support arrangement for the water inlet mechanism 22. Side walls 110 and 112 have, respectively, generally laterally extending flanges 118 and 120

for use in slidably supporting the tray **20** in end supports **16** and **18** while the forward wall **116** has a laterally extending flange **122** employable for locking or latching the cover **26** thereto.

Internally of the pan **20**, an integrally formed vertically extending wall portion **124** is provided defining, generally, a first major chamber **130** which contains the greatest portion of the water and in which the drum assembly **24** rotates and a second chamber **132** defined generally by walls **124**, **110** and a short rear wall **126** containing a float **134** therein. Wall **124** is preferably provided with a cut-out portion **138** in order to permit the ready flow of water from chamber **132** to main chamber **130**.

The water inlet valve assembly **22** is illustrated as being comprised of a main mounting body **128**, including flange portions **129** and **131**, which has laterally spaced yoke-like arms **133** and **135** between which is received a float arm supporting member **137** pivotally connected to the arms **133** and **135** as by a transversely extending pivot pin **139**. (Also see FIG. **9**.) As can be seen in both FIGS. **4** and **9**, the body **128**, which may be formed by the joining of separate sections, is made generally hollow in order to thereby define an internal passageway or conduit means **141** which, at its lower end, communicates with water supply conduit means **143** connected as to a suitable source of water **145**. The conduit means **143** may be secured to the body **128** as by a threaded connection **147**. The other end of body **128** has an outlet fitting **149**, threadably secured therewith , which also includes a head portion **151** and a discharge passage **153** formed therethrough. A relatively flexible and resilient tube member **155**, closed at its upper end, is secured to the body **128** by outlet fitting **149** so as to have the head or discharge end **151** thereof disposed within the passageway **157** formed internally of the tube **155**. The lower end of tube member **155** is open and disposed generally within chamber **132** as shown in FIG. **4**.

The member **137** is of a generally U-shaped configuration having legs **159** and **161** disposed on either side of and integrally formed with a bridging bight portion **163** which threadably receives a screw **165** therethrough. The bight portion **163** may also include a downwardly depending tab-like portion **167** and the tube **155** is so situated as to be between the upper end of body **128** and tab **167**. A float arm **169**, pivoted at its upper end to legs **159** and **161** as by a pin **171**, is pivotally connected at its lower end to float **134** as by a pivot pin **173**.

The operation of the inlet valve assembly **22**, can be briefly described as follows. Water, supplied by source **145**, flows upwardly through conduit means **141** of body **128** and through passage **153** into conduit means **157**, of tube **155**, thereby flowing downwardly therethrough and into chamber **132** of pan **20**. As the water level within the pan **20** rises, float **134** will be lifted upwardly and in so doing cause float arm **169** to generally pivot or tend to pivot about pin **171**. This would continue until the float arm **169** abuts against the lower end of screw **165**. When this happens, further lifting of the float **134** causes bracket-like member **137** to pivot counter-clockwise about pivot **139** thereby causing tab **167** to force the forwardly disposed wall portion **175** of the tube **155** against the end **151** of fitting **149** sealing the outlet or discharge passage **153**. As the water level in chambers **130** and **132** drops, the float **134** moves downwardly allowing tab **167** and wall portion **175** of tube **155** to move away from and again open discharge passage **153**. The desired height of the normal water level can be selected by either threadably raising or lowering the screw **165** relative to bight portion **163**.

Preferably, second conduit **164** is formed integrally with wall section **124** so as to be generally vertically disposed. As is best seen in FIG. **3**, wall **124** has a notch **166** formed therethrough so as to provide a passageway communicating generally between the upper end of conduit **164** and the main chamber **130**. The lower end of conduit **164** may extend beneath the bottom **108** of tray **20** and, in a manner known in the art, be provided with a coupling nut **168** for connection to a suitable related conduitry leading to a sump or drain **170**. If for some reason the float controlled inlet should fail to shut-off the flow of incoming water, notch or passageway **166**, being at a level below the height of walls of pan **20**, will cause the water to flow therethrough and into the conduit **164** from where it can be returned to a suitable drain **170** thereby preventing the water from overflowing the pan **20**.

The water drum or wheel assembly **24** is illustrated as being comprised of a main shaft **106** on which are mounted spaced end wheels **172** and **174** which cooperatively carry a drum-like cage assembly **176** which, in turn, supports a sleeve-like or tubular member **178** consisting of suitable material possibly exhibiting some qualities of capillary attraction for water.

As shown in both FIGS. **2** and **3**, end wheel **172** is formed to have a circular sleeve-engaging surface **180** and a closed disc-like wall **182** which is preferably extended beyond surface **180** in order to thereby define a radially extending continuous flange portion **184**. The central portion of wall **182** may be reinforced as by a boss **186** through which a passageway **188** is formed for the reception therethrough of the main shaft **106**. Additionally, wheel **172** is provided with a continuous annular groove **190**, of some axial depth, which is adapted to receive therein end **192** of cage assembly **176**.

In comparison, end wheel **174**, formed to have a circular sleeve-engaging surface **194**, has an open passageway **196** formed therethrough in which are situated wheel supporting spoke members **198**, **200**, **202** and **204** which, generally at their juncture, contain or form a bearing-like portion **206** provided with a passageway **208** for the reception therethrough of the main shaft **106**. Preferably, bearing portion **206** is provided with an internally threaded aperture for threadably engaging a set screw **210** which can be tightened against the shaft **106** in order to transmit rotary motion from shaft **106** to wheel **174** and, through cage **176**, to wheel **172**. Additionally, wheel **174** is provided with a continuous annular groove **212**, of some axial depth, which is adapted to receive therein end **214** of cage assembly **176**. As with wheel **172**, end wheel **174** also has a continuous radially extending flange **216** formed thereabout.

Preferably, the cage assembly **176**, as illustrated in FIG. **5**, is comprised of a plurality of sections **218**, **220** and **222** each of which is similarly formed. That is, as typically shown by section **218**, each may be comprised of a plurality of longitudinally extending rods or bars **224** which are spaced from each other and joined at their respective opposite ends to end members **226** and **228**. Even though such cage sections may be formed of any suitable material it is contemplated that they would be preferably formed of non-rusting material such as stainless steel or aluminum. Further, even though the sections **218**, **220** and **222** are illustrated as being formed to have their respective end members **226** and **228** formed to be of arcuate configuration it is contemplated that such cage sections could be initially formed to be flat, that is, have their end members **226** and **228** straight. This would greatly minimize the required space for packaging and shipment of the apparatus during, for example, shipment from the manufacturer to the distributor and/or retailer. If this were done, then the end members **226** and **228** would be bent to conform to slots or recesses **190** and **212** in wheels **172** and **174** at time of installation of the humidifier assembly **10**. Once the cage assembly **176** is assembled into wheels **172** and **174**, the rods or bars **224**, as shown in FIGS. **2** and **3**, serve to support the medial portion of the water carrier sleeve **178**.

As shown in FIGS. **2** and **3** and in enlarged scale in FIG. **6**, the end **230** of shaft **106** is provided with a cross pin **232** extending therethrough so as to have its projecting ends **234** and **236** respectively received within slots **238** and **240** formed within a socket-like coupling member **242** drivingly connected to the output shaft **244** of motor assembly **38**. The coupling member **242** is also provided with an aperture **246** for the reception therein of the end of shaft **106**.

The cover assembly **26**, as illustrated in FIGS. **1**, **2** and **4** is formed in a generally L-shaped configuration having an upper portion **248** and a forward wall-like portion **250**, preferably integrally formed with each other. As best seen in FIGS. **2** and **4** the free end of upper portion **248** may be provided with a laterally extending flange portion **252** which, preferably, is formed in a stepped relationship with respect to the upper cover portion **248**. Similarly, the free end of forward wall portion **250** is illustrated as being provided with a laterally extending and generally horizontally projecting flange **254** which is also preferably integrally formed with cover wall portion **250**. As shown in FIGS. **1**, **3** and **4**, the purpose of flange **252** is to lock under the upper edge **256** of the aperture **258**, formed in wall **12** of heat plenum **14**, whenever the cover **26** is assembled onto the end supports **16** and **18**. The aperture **258**, in addition to upper edge **256**, may be formed with side edges **260**, **262** and a lower edge **264**. As shown in FIGS. **2** and **3**, the ends of flange **252** are cut back as at **266** and **268** so as to be accommodated within the width of aperture **258** as defined by side walls **260** and **262**. As can best be seen in FIG. **3**, the aperture **258** is formed in wall **12** so as to be preferably juxtaposed to the drum assembly **24** while providing a degree of shielding against the direct flow of hot air against the water inlet valve assembly **22** and related structure.

Flange **254**, as shown in FIGS. **1**, **4** and **7**, is illustrated as carrying a plurality of securing means such as screws **270** which are adapted to be detachably connected to respective U-shaped clips **272** carried by the flange **122** formed on the upper end of forward wall **116** of water pan **20**. As typically illustrated in FIG. **7**, the U-clips **272** may be formed with legs **274** and **276** frictionally engaging opposite sides of flange **122** with a concave depression in leg **276**, containing a clearance aperture **278**, being situated with the larger aperture **280** formed through flange **122**. Leg **274** is provided with an aperture therethrough defined generally by opposed edges **282** and **284** disposed with respect to each other as to threadably engage the screw **270**. The provision of such clips **272** enables the screws to be axially pushed through aperture **278** and upwardly between edges **282** and **284** thereby enabling a quick locking action of cover flange **254** to pan flange **254**.

As shown in FIGS. **2** and **3**, wall **36** of end support **16** is formed to provide a generally horizontally disposed recess or slot **286** for the slidable reception therein of flange **118** of water tray **20** and, similarly, end support **18** is also formed to provide a horizontally disposed slot **288** for the slidable reception therein of the opposite flange **120** of pan **20**.

In order to enhance the rigidity and dimensional stability of the humidifier assembly, especially of the end support members **16** and **18**, when assembled onto the related heating system ductwork, a spacer type tie bar or rod **290** is preferably provided so as to extend between and engage respective wall sections **36** and **84** of end supports **16** and **18**. FIG. **8**, in enlarged scale, fragmentarily illustrates the manner in which the rod **290** is secured to walls **36** and **84** of end supports **16** and **18**. Apertures **292** and **294** formed through walls **36** and **84**, respectively, receive screws **296** and **298** therethrough for threadable engagement with internally threaded portions formed in the ends **300** and **302** of the tie rod **290**. The overall length of rod **290**, that is, the distance from end **200** to end **302** is such as to maintain the desired spacing between end supports **16** and **18** when assembled in the manner shown.

OPERATION OF INVENTION

The operation of the invention is briefly as follows. Once the humidifier assembly **10** as shown in FIGS. **1**, **3** and **4** is assembled onto the heat plenum wall **12** (or such other suitable portion of the heating system as is available) the electrical terminals **304** and **306** of the electric motor **38** are connected to suitable switching mechanism such as that often associated with the heating system blower assembly.

The inlet to the humidifier **10** is, of course, provided by the aperture **258** in wall **12**; however, the outlet from humidifier **10** is formed by conduit **98**, formed in end support **18**, which is connected by suitable ductwork or conduitry (not shown) to, for example, the plenum chamber **14** at a point downstream of the inlet aperture **258**.

Accordingly, in an arrangement as above, whenever the heating system blower assembly is energized causing a flow of heated air, a portion of such air is admitted into the humidifier assembly **10** through the inlet aperture **258**. The electric motor **38**, being simultaneously energized with the blower assembly, causes shaft **106** to rotate and in so doing rotate with it the end wheels **172**, **174** and water carrier **178**. The carrier **178**, which may be made of fibrous or other suitable material (many of which are well known in the art), is generally in the path of flow of the incoming heated air; therefore, as the carrier **178** rotates through the water supply within the tray or pan **20** some of the water is picked-up by the carrier **178** and then evaporated into the heated incoming air. The outlet conduit **98**, being connected to an area of lower pressure within the heating system, enables such moistened heated air within the humidifier **10** to flow through the outlet conduit **98** back to the heated air supply portion of the heating system. Even though not shown, it should be apparent that a second electrical switching means, responsive to sensed relative humidity, may be situated serially with the terminal **304** or **306** of motor **38**. In such an arrangement, motor **38** would become de-energized whenever such humidity sensitive switch sensed the attainment of a preselected value of relative humidity, within a particular heated zone, even though the blower assembly may continue to be energized.

Of course, depending upon the material comprising the sleeve-like carrier **178**, some flow of incoming heated air might pass through the carrier **178** and enter the interior thereof. Accordingly, the aperture or passageway **196** formed through the end wheel **174** is provided for enabling such moistened air within the interior of the drum assembly **24** to flow axially through aperture **196** and ultimately back to the associated heating system via conduit **98**.

In view of the preceding disclosure it should be apparent that the invention provides a humidifier assembly of novel and unique characteristics and features. For example, one of the outstanding features is the employment of separate components such as the end supports **16**, **18**, the pan **20**, the end wheels **172**, **174** and the cage sections **218**, **220** and **222** as well as the cover or hood **26**. The major benefit derived from the above is the great reduction in costs of shipping and storage of such humidifiers as might occur between the manufacturer and distributor or retailer.

That is, since the drum assembly **24** is comprised of separable components each of them can be laid flat or stacked (as in the case of the cage sections **218**, **220** and **222**) thereby requiring a minimal packaging space. The remaining components, such as the end supports **16** and **18** as well as the cover **26** can also, because of their separability, be packaged in a manner minimizing space requirements. It is conceivable that where high volume production and shipping were required, the various elements such as the pan **20** and cover **26** would be produced so as to have appropriate tapered surfaces or configurations to permit the meeting of a quantity of the same component within one shipping container.

Further, the invention has the advantage of being able to accommodate the construction of humidifiers of increased or decreased capacity at minimal costs. For example, it would be possible to, in practicing the invention, construct two sizes (in terms of water evaporating capacity) of humidifiers by merely having two sizes of water pans, two sizes (in terms of increased length) of water carrier **178** and cage sections **218**, **220** and **222** two sizes of shafts **106** and two sizes of hoods or covers **26**. All of the other elements would be interchangeable.

Humidifiers constructed in accordance with the teachings of the invention also provide additional operational benefits. For example, whenever the need should arise to clean or replace the water carrier **178** it can be quickly and easily accomplished by unlocking and removing the cover **26** thereby

totally exposing the drum assembly **24** which may then be totally lifted out of the assembly without the need of any major disassembly as often required by the prior art.

The same holds true for such instances as when inspection or adjustment of the water inlet mechanism is required. That is, such mechanism is fully exposed merely by the quick and easy removal of the cover **26**.

It should also be pointed out that another major advantage is attained by the use of the water inlet assembly **22** and the mounting body **128** associated therewith. As shown, for example, in each of FIGS. **2**, **3** and **4**, the body **128** is mounted, as by screws **304**, to the wall **12** of the plenum chamber **14**. Further, in order to accommodate the space required by body **128**, wall **110** of the water tray **20** is made shorter than opposite wall **112** and is joined to a relatively short wall segment **126**, generally parallel to forward wall **116**, which, in turn, is joined to a second relatively short wall segment **306**, generally parallel to end walls **110** and **112** and which may be in line with the internally disposed wall **124**. As is evident, walls **126** and **306** combine to define a notch-like clearance accommodating the body **128**. The benefit of this arrangement is that the pan **20** can be removed without the necessity of having to in any way disassemble the water supply from the body **128** or the valving mechanism **22**. That is, all that is necessary is to lift the float **134** and arm **169** upwardly (so as to clear the height of wall **126**) and then merely pull the water tray **20** out of the grooves or slots **286** and **288**. As the tray is thusly withdrawn, the tube **155**, being flexible, will deflect so as to permit the passage thereunder of the rearwardly disposed wall portion **126**. As is conventional practice, suitable manually operable valve means in the conduit means **143** can be shut-off so as to permit the float **134** to hang freely, once the tray is completely removed and to prevent the flow of water through the fitting **149** during such time.

FIGS. **10**, **11** and **12** illustrate a second embodiment of the invention. All elements, shown therein, which are like or similar to those of the preceding Figures are identified with like reference numbers.

Referring in greater detail to FIGS. **10**, **11** and **12**, it can be seen that the water inlet valving assembly **22** is carried by a support **128*a*** somewhat similar to support or body **128** of the preceeding Figures. The support **128*a*** may be comprised of body sections **310** and **312** suitably held or joined together thereby defining an internal conduit or passageway **141*a*** like that at **141** of, for example, FIG. **4**.

As best seen in FIGS. **10** and **12**, the body or support **128*a*** has a pair of oppositely disposed wing-like key members **314** and **316** which are respectively received within slots or key passages **318** and **320**. The slots **318** and **320** are, formed within protruding wall portions **322** and **324** formed integrally with walls **110** and **124** of tray **20**, terminate in abutment-like surfaces **326** and **328**.

Accordingly, it can be seen that should the water inlet assembly **22** need servicing or replacement, the entire assembly, including body or support **128*a***, can be quickly removed merely by disengaging the connection **147** and lifting the body **128*a*** causing the keepers **314** and **316** to be withdrawn from the slots **318** and **320**.

Further, the various structural elements or components comprising the humidifier may be formed of any suitable material; however, it is contemplated that such elements could be easily manufactured from a suitable plastic, and even coated if desired, which would have a low affinity to the corrosive as well as other elements often contained and carried by water.

Although only selected preferred embodiments of the invention have been disclosed and described, it should be apparent that other embodiments and modifications of the invention are possible within the scope of the appended claims.

We claim:

1. A humidifier assembly, comprising a housing assembly adapted to be secured to a portion of an associated hot air heating system, said housing assembly comprising spaced support means, water reservoir means, comprising a separate pan-like structure detachably carried by said spaced support means and water inlet valving means separate from said housing assembly said support means and said water reservoir means for at times supplying water to said water reservoir means in order to replenish water depleted therefrom, said water inlet valving means comprising a body portion adapted for mounting to said associated hot air heating system within the confines of said housing assembly but separately from said housing assembly including said spaced support means and externally of said pan-like structure, said body portion carrying a water flow controlling valve assembly having a discharge end, and a resiliently deflectable conduit operatively secured to said valve assembly, said resiliently deflectable conduit having an inlet portion and a discharge portion with said inlet portion being in communication with said discharge end of said valve assembly, and a float mechanism operatively connected to said body portion and having a float member situated within the confines of said pan-like structure as generally defined by upstanding wall portions thereof, said float member being effective to terminate water flow through said valve assembly discharge end whenever the water level within said pan-like structure has attained a predetermined level, said discharge portion of said resiliently deflectable conduit being normally received within the confines of said upstanding wall portions of said pan-like structure and being further effective to resiliently deflect over the effective height of said upstanding wall portions whenever said pan-like structure is withdrawn from said spaced support means in a direction generally transverse to said resiliently deflectable conduit.

2. A humidifier assembly, comprising a housing assembly adapted to be secured to a portion of an associated hot air heating system, said housing assembly comprising spaced support means, water reservoir means, water inlet valving means separate from said housing assembly said support means and said water reservoir means for at times supplying water to said water reservoir means in order to replenish water depleted therefrom, said water reservoir means comprising a separate pan-like structure detachably carried by said spaced support means, said water inlet valving means comprising a body portion adapted for detachable mounting to said pan-like structure, said pan-like structure comprising slot-like retainer portions formed therein, and said body portion comprising oppositely disposed guide-like members slidably received within said slot-like retainer portions.

3. A humidifier assembly according to claim **2**, wherein said body portion comprises an upper end and a lower end with an internally formed conduit communicating between said ends, wherein said lower end is adapted to be juxtaposed to a floor portion of said pan-like structure upon said guide-like members being received within said slot-like retainer portions, and wherein said upper end is provided with a water discharge passage controllable by an associated variably positionable valve member.

4. A humidifier assembly according to claim **3**, wherein said variably positionable valve member is operatively connected to a float member disposed within said pan-like structure so as to be responsive to the existing level of the water within said pan-like structure.

5. A humidifier assembly according to claim **3**, wherein said body portion is formed of at least first and second body sections joined to each other along directions generally longitudinally of said body portion, and wherein said internally formed conduit is partly formed in each of said first and second body sections.

6. A humidifier assembly, comprising a housing assembly adapted to be secured to a portion of an associated hot air heating system, said housing assembly comprising spaced support means, water reservoir means, and water inlet valving means separate from said housing assembly said support means and said water reservoir means for at times supplying water to said water reservoir means in order to replenish water depleted therefrom said water reservoir means comprising a

separate pan-like structure detachably carried by said spaced support means, said water inlet valving means comprising a body portion adapted for mounting to said associated hot air heating system separate from said spaced support means and externally of said pan-like structure, said body portion comprising a lower water inlet end adapted for connection to a suitable source of water and an upper end adapted for at times discharging water into said pan-like structure, conduit means formed internally of said body portion communicating between said upper and lower ends, and a float member situated within said pan-like structure and adapted for controlling the flow of water from said upper end into said pan-like structure.

7. A humidifier assembly according to claim 6, wherein said spaced support means comprises first and second separate end wall-like members each adapted for separate attachment to said portion of said associated hot air heating system, wherein said pan-like structure is slidably supported at its opposite ends by said first and second wall-like members, including cover means adapted to operatively engage said end wall-like members so as to define an interior chamber which at least partially includes therein said upper end of said body portion of said water inlet valving means.

8. A humidifier assembly, comprising a housing assembly adapted to be secured to a portion of an associated hot air heating system, said housing assembly comprising oppositely disposed and spaced end support means, water reservoir means situated intermediate said spaced end support means, water inlet means for directing water from an associated water supply means to said water reservoir means, cover means adapted to operatively engage said end support means so as to define an interior chamber including therein said water inlet means, and a rotatable water carrier assembly situated within said chamber, said water carrier assembly being so positioned as to have a portion thereof contacting the water within said reservoir means, said water carrier assembly comprising a rotatable shaft carrying a plurality of axially spaced disc-like members for rotation therewith, said rotatable shaft having one end adapted for driving connection to associated motor means, said axially spaced disc-like members comprising a first wheel member carried by said shaft for rotation therewith, a second wheel member carried by said shaft for rotation therewith and in spaced relationship to said first wheel member said water carried by said shaft for rotation therewith and in spaced relationship to said first wheel member, said water carrier assembly further comprising cage-like means respectively carried at opposite ends thereof by said first and second wheel members, and generally tubular water lifting means carried generally about said cage-like means for lifting a part of the water from within said water reservoir means and presenting such lifted water to the flow of hot air of said heating system, and said water inlet valving means being separate from said water reservoir means and said housing assembly including said spaced support means.

9. A humidifier assembly, comprising a housing assembly adapted to be secured to a portion of an associated hot air heating system, said housing assembly comprising oppositely disposed and spaced end support means, water inlet means for directing water from an associated water supply means to said water reservoir means, cover means adapted to operatively engage said end support means so as to define an interior chamber including therein said water inlet means, and a rotatable water carrier assembly situated within said chamber, said water carrier assembly being so positioned as to have a portion thereof contacting the water within said water reservoir means, said water carrier assembly comprising a rotatable shaft carrying a plurality of axially spaced disc-like members for rotation therewith, said rotatable shaft having one end adapted for driving connection to associated motor means, said spaced end support means comprising first and second separate end wall-like members each adapted for separate attachment to said portion of said associated hot air heating system, said water reservoir means comprising a separate lower pan-like structure detachably carried by said first and second wall-like members, said pan-like structure including first and second laterally extending flange portions respectively formed at opposite ends of said pan-like structure, and said first and second wall-like members being respectively provided with first and second laterally extending support surfaces being adapted to respectively slideably receive thereon and vertically support said first and second laterally extending flange portions in order to thereby support said pan-like structure generally between said first and second wall-like members, said water inlet means comprising float controlled water inlet valve means, said water inlet means being operatively connected to said hot air heating system separate from said pan-like structure thereby enabling removal of said pan-like structure from said wall-like members without necessity of disconnecting said water inlet means from said associated water supply means.

10. A humidifier assembly according to claim 6, wherein said body portion is formed of at least first and second body sections joined to each other along directions generally longitudinally of said body portion, and wherein said internally formed conduit is partly formed in each of said first and second body sections.

11. A humidifier assembly, comprising a housing assembly adapted to be secured to a portion of an associated hot air heating system, said housing assembly comprising spaced support means, water reservoir means, and water inlet valving means separate from said housing assembly said support means and said water reservoir means for at times supplying water to said water reservoir means in order to replenish water depleted therefrom, said water reservoir means comprising a separate pan-like structure detachably carried by said spaced support means, said water inlet valving means comprising a body portion adapted for detachable mounting to said pan-like structure, said pan-like structure comprising at least one slot-like retainer portion carried thereby, and said body portion comprising at least one guide-like member detachably received within said at least one slot-like retainer portion.

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