Sept. 10, 1957 C. REMPEL 2,805,426

BATH TUB

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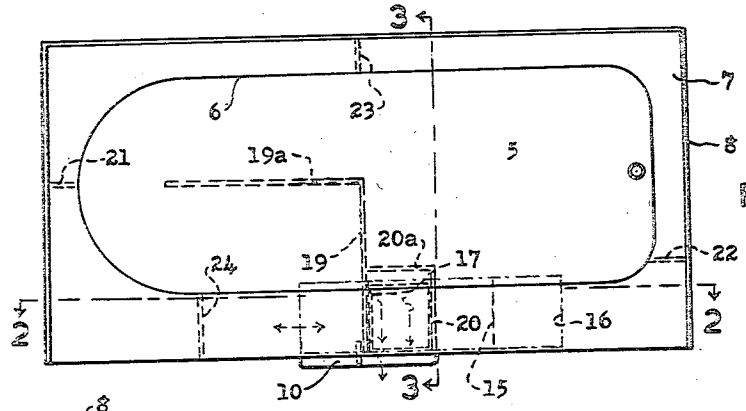


FIG. 1.

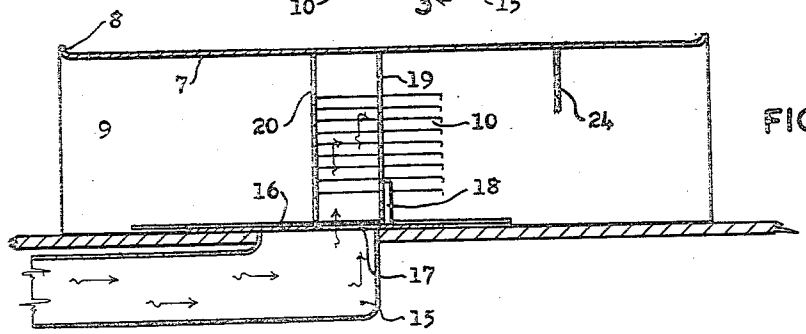


FIG. 2.

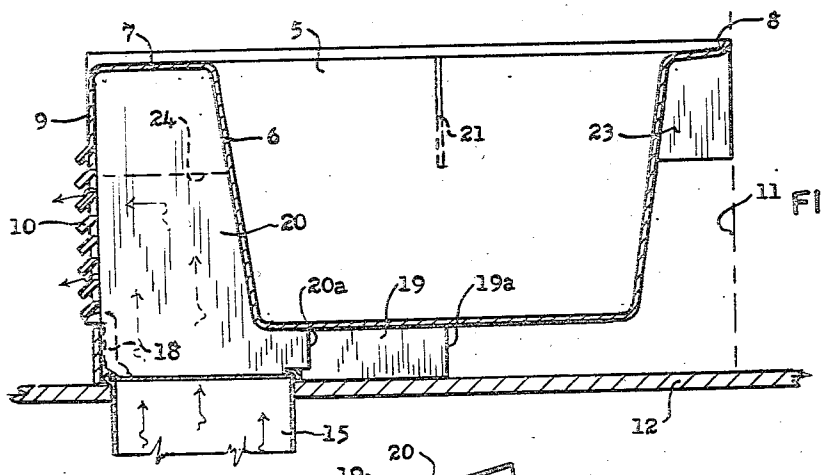


FIG. 3.

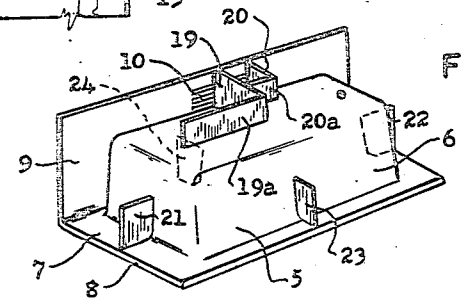


FIG. 4.

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BATH TUB

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14 Claims. (Cl. 4—179)

This invention relates to improvements in a bath tub and apertains particularly to one capable of being heated and designed to be incorporated in and become a part of the warm air heating system of the house.

A current complaint respecting the ordinary bath tub is that the user often suffers discomfort in coming in contact with its relatively cold surface because the initial temperature of the tub is not infrequently much lower than that of the water filling it and the person's body. Further, where there is a substantial difference in the temperatures of the tub and the hot water, the equalizing heat transfer operates to lower the water temperature unduly.

Accordingly, it is the principal object of the present invention to provide a bath tub that may be easily heated to render the same more pleasant and comfortable for the user and that will act less to cool the filling water.

A further object of the invention is to provide a bath tub that may be incorporated in and be heated by the warm air heating system of the building in which the tub is installed.

A further object of the invention is to provide a bath tub heated by the warm air of the heating system of the building and wherein the tub serves as a part of such heating system.

A further object of the invention is to provide a bath tub that may be incorporated in and be heated by the warm air heating system of the building and serve as the warm air outlet for the room.

A further object of the invention is to provide a bath tub that may be incorporated in and be heated by the warm air heating system of the building and serve as a heat exchanger in the bathroom.

A still further object of the invention is to provide a bath tub of the so-called cabinet or apron type, that may be incorporated in the distributing duct system of a warm air heating plant, having a warm air outlet register associated therewith, as for instance a warm air outlet register.

A still further object is the provision of a bath tub of the nature and for the purposes described that is characterized by structural simplicity, operative efficiency and reasonable costs of production and installation whereby the same is rendered commercially desirable.

To the accomplishment of these and related objects as shall become apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts as shall be hereinafter more fully described, illustrated in the drawings, and pointed out in the claims hereunto appended.

The invention will be best understood and can be more clearly described when reference is had to the drawings forming a part of this disclosure wherein like characters indicate like parts throughout the several views.

In the drawings:

Figure 1 is a plan view of a preferred embodiment of my novel bath tub for inclusion in a warm air heating system;

Figure 2 is a vertical longitudinal section, as taken on the line 2—2 of Figure 1, looking in the direction indicated by the arrows, and showing the inside of the louvered apron and the damper-controlled supply duct;

Figure 3 is an enlarged longitudinal transverse section as taken on line 3—3 of Figure 1, looking in the direction indicated by the arrows; and

Figure 4 is a smaller scale perspective view of the tub in inverted position, showing the arrangement of warm air deflecting baffles.

In current residential construction, bath tubs of the so-called cabinet type are in general use. These regularly have a flange running all the way around the top and in the most popular style have a depending apron at the front; they are designed to be set into an alcove of suitable dimensions. Somewhat less in demand are those tubs in which the apron continues around one end adapting the tub to be set in a corner of the bathroom. In either case, under and around the tub an open space occurs that is bounded by the outside of the tub depression, the apron, surrounding walls of the room, and the underlying portion of the floor. Sometimes this area is insulated. In this invention it is proposed to deliver the warm air heating duct for the bathroom into this space and to provide asuitably located damper-controlled outlet register that is preferably incorporated in the apron of the tub. Thus warm air may be caused to circulate under the tub to warm the same and/or find egress into the room as desired and according to the setting of the damper.

In the drawings, the popular style of front apron tub is shown. This tub **5** includes the usual depression **6**, encircling top flange **7** with upstanding rim **8** along the back and both ends, and a depending apron **9** at the front. A block of louvres **10** is shown as occurring centrally in the apron **9**.

This tub **5** is designed to be set in an accommodating alcove or recess of suitable size in a bathroom, the wall of which alcove is designated at **11** and to be supported on the bathroom floor designated at **12** (see Figure 3) in the usual way.

Instead of delivering directly into the bathroom as customary, I provide that the warm air distributing duct **15** from the building's regular warm air heating system feeds into the area or space under the tub; such area or space being bounded in the presently disclosed embodiment by the underside of the tub including the depression **6**, encircling flange **7**, and apron **9**, the three surrounding walls of the alcove **11** and the floor **12**. The warm air may be caused to pass directly out through the apron louvres **10** into the bathroom or to be trapped under or circulated around the underside of the tub as described.

It has been deemed advantageous to provide simple means to control and direct the warm air flow and while various devices and arrangements may be employed, I have chosen as most suitable the form shown wherein the mouth of the warm air duct **15** is disposed under the forward side of the tub, just inside the apron **9** and being nearer to one end of the tub reaches to substantially the center. A horizontal damper **16**, slidable longitudinally of the tub is employed having an overall length greater than twice the length of the duct's mouth and to one side of the center of which is an opening **17** approximately one half the size of the said duct's mouth. A handle **18** rises from the damper and projects into the bottom louvre for easy operation or adjustment of the slidable damper.

The tub has two main baffles **19** and **20** that may be formed integral with the tub in the case of a cast iron tub or be braised or welded to it in the case of a steel

tub. They both stand substantially vertically in the space between the depression **6** and apron **9** and are arranged transversely of the tub. The former occurs midway of the length of the tub, dividing the block of louvres **10** down the middle and at the bottom runs under the tub to the longitudinal median of the depression **6** then continues along the median more than half-way toward the lower end of the tub as a right angle wing **19***a*. The second main baffle **20** is spaced up-tub from the former and stands in line with the side of the block of louvres, its bottom runs under the tub depression **6** only about half as far as the former and then continues as a right angle wing **20***a* that terminates where it meets the inwardly extending bottom part of baffle **19**. Other lesser baffles **21**, **22** at opposite ends and **23**, **24** at opposite sides, employed to arrest the flow and trap the warm air, are shorter, depending less than half way from the flange **7**, and serve to force the circulation of warm air toward the bottom of the tub and under the depression thereof.

It will be observed, on reference particularly to Figures 1 and 2, that the size and location of the mouth of the duct **15** with respect to the baffles **19** and **20** and the louvres **10** that serve as the warm air outlet is such that about one half the mouth of the duct lies under the space between the two main baffles **19** and **20** and the other half lies up-tub from the baffle **20** and consequently cut off from direct access to the louvres. This is for the purpose of facilitating the selective control and use of the warm air input from the heating system.

In use, the damper **16**, by means of its handle **18** that is allowed to slide past the central baffle **19** at the edge thereof, can be adjusted as required. In the drawings, the damper is shown in middle position with its opening **17** underlying the space between the baffles **19** and **20** so that the full flow of warm air from the duct passes directly out through the up-tub half of the block of louvres **10**. By sliding the damper fully to the left in Figure 1 (right in Figure 2), the duct is closed completely: By sliding the damper fully to the right in Figure 1 (left in Figure 2) the full flow of warm air is delivered into the space under the tub on the up-tub side of baffle **20** and thus shut off from direct access to the louvres so that the warm air flow is caused to circle and envelop the tub depression and extend around the free end of the baffle wing **19***a* before finding its way to the half of the block of louvres on the down-tub side of baffle **19**. Obviously, intermediate adjustments of the damper between its mid position delivering warm air directly through the louvres to the room and either fully closed or full bath-encircling flow allows the user to obtain any desired flow or apportioning of warm air and the resultant heating of the room and/or bath tub.

While the desirability of heating the bath tub is readily apparent and the several advantages thereof will be recognized, this invention in connecting the tub with the warm air heating duct and utilizing the tub as a part of the warm air distributing system, including the incorporation of a damper-controlled outlet register in the tub apron, harmonizes with the current trend in residential building.

(1) It provides a tub with the special advantages of being preheated;

(2) A modern appearing tub with a neat register built into the apron;

(3) Delivers the warm air centrally into the bathroom;

(4) Reduces the necessary duct work and eliminates the need for the usual warm air register with the resultant saving in installation costs;

(5) Allows bath tub and warm air register being installed in one operation;

(6) Saves valuable wall space in small room by dispensing with separate register; and

(7) Does away with the need for insulating under and around the tub.

For these reasons this warm air unit commends itself alike to the builder and home owner and contributes to the attractiveness, comfort and value of a modern home.

From the foregoing description taken in connection with the accompanying drawings, it will be manifest that a bath tub, capable of being heated and designed to be incorporated in and become a part of the warm air heating system of the house, is provided that will fulfill all the necessary requirements of such a device, but as many changes could be made in the above description and many apparently widely different embodiments of the invention may be constructed within the scope of the appended claims, without departing from the spirit or scope thereof, it is intended that all matters contained in the said accompanying specification and drawings shall be interpreted as illustrative and not in a limitative or restrictive sense.

Having thus described the invention, what is claimed as new is:

1. In combination with the warm air heating system of a building, a bath tub connected with and providing a part of the terminal portion of a heat distributing duct of said system, an air outlet, and means intermediate said duct and said bath tub adapted to regulate the flow of warm air from said duct to discharge it directly through said outlet or cause such part of it as desired to circulate under and warm the bath tub.

2. A bath tub having the outer faces of the lateral, end and bottom walls of the tub enveloped by an enclosed air space, means for delivering hot air to the space, an air outlet communicating with the said space, an air distributing means co-acting with the said means to selectively deliver hot air directly to the outlet, or to cause hot air to circulate around the walls and under the bottom of the tub prior to delivery to the outlet.

3. A bath tub having the outer faces of the lateral, end, and bottom walls enveloped by an enclosed air space, means for delivering hot air to the space, an air outlet divided into two sections, one of the sections communicating with the air space, and air distributing means co-acting with the said means to selectively deliver hot air directly to one of the sections of the outlet, or cause the hot air to circulate around the walls and under the bottom of the tub prior to delivery of the air to the other section of the outlet.

4. A bath tub having the outer faces of its lateral, end, and bottom walls enveloped by an enclosed air space, means for delivering hot air to the air space, an outlet communicating with the space, means for downwardly deflecting hot air in the upper confines of the enclosed air space, and means co-acting with the first said means to selectively deliver hot air directly to the outlet or to cause the hot air to circulate around the walls and under the bottom of the tub prior to delivery to the outlet.

5. A bath tub having the lateral, end, and bottom walls enveloped by an enclosed air space, an apron forming one of the walls of the air space, means for delivering hot air to the air space, an air outlet in the apron, and an adjustable air distributing means co-acting with the said means and adapted in one position to deliver hot air directly to the outlet, and in another position to cause the hot air to circulate around the walls and under the bottom of the tub prior to delivery to the air outlet.

6. A bath tub having its lateral, end, and bottom walls enveloped by an enclosed air space, means for delivering hot air to the air space, an air outlet co-operating with the air space, and longitudinally adjustable air distributing mean co-acting with the said means and adapted in one position to deliver hot air directly to the air outlet, and when moved longitudinally to another position, to deliver hot air to the air space to circulate around the walls and under the bottom of the tub prior to delivery to the air outlet.

7. A bath tub having its lateral, end, and bottom walls enveloped by an enclosed air space, a hot air inlet duct located below the tub, an air outlet divided into two sec-

tions, one section extending partially across the air duct, the other section being located beyond the confines of the duct, and adjustable means controlling the distribution of air from the duct, and adapted in one position to deliver air directly to the adjacent section of the air outlet, and in another position to deliver hot air to the air space to circulate around the walls and under the bottom of the tub prior to delivery to the other section of the air outlet.

8. A bath tub having its lateral, end, and bottom walls surrounded by an enclosed air space, an air inlet duct to the air space, an apron on the tub forming one of the walls of the air space, an air outlet on the apron and divided into two sections, a passage communicating with one section of the outlet and having its inlet end relatively smaller than and located adjacent to the end of the duct, the other section of the air outlet lying outside the confines of the duct and communicating with the enclosed air space, and adjustable means co-acting with the air duct and adapted in one position to deliver hot air directly to the passage and its associated section of the air outlet, and in another position to deliver hot air to the air space to be circulated around the walls and under the bottom of the tub prior to delivering the air to the other section of the air outlet.

9. A bath tub having its lateral, end, and bottom walls surrounded by an enclosed air space, an air inlet to the air space, an apron forming one of the walls of the air space, a sectional air outlet on the apron, one section communicating with the enclosed air space, a second section communicating with the air inlet, and means co-acting with the air inlet and adapted to selectively deliver hot air directly to the second section of the outlet or to deliver hot air to the air space to circulate around the lateral, end and bottom walls of the tub prior to delivery to the first section of the outlet.

10. The bath tub claimed in claim 8 in which the adjustable means co-acting with the air duct is a slidably mounted damper provided with a port commensurate with the inlet to the passage connecting with one section of the air outlet.

11. A bath tub having its lateral, end, and bottom walls enveloped by an enclosed air space, a hot air inlet duct to the air space, an apron forming one wall of the air space, a sectional air outlet on the apron, one section communicating with the enclosed air space, a second section communicating through a passageway with the air inlet, a damper slidably mounted over the inlet duct and formed with a port designed in one position to deliver hot air to the second section of the air outlet, and in another position to deliver hot air to the air space, the damper in intermediate positions being designed to deliver hot air simultaneously to the second section of the air outlet, and through the enclosed air space to the first section of the air outlet in desired predetermined proportions.

12. A bath tub having its lateral, end, and bottom walls enveloped by an enclosed air space, an apron forming a wall of the said space, an air outlet on the apron, baffles dividing the air outlet into two sections, the first section communicating with the air space, and the second section separated from the air space, a hot air inlet duct, and adjustable air distributing means associated with the duct and designed in one position to deliver hot air directly to the second section of the outlet, and in another position to deliver hot air to the enclosed air space to positively circulate around the walls and under the bottom of the tub prior to delivery of the air to the first section of the air outlet.

13. The bath tub claimed in claim 12 in which downwardly depending baffles are provided in the upper portion of the enclosed air space.

14. In combination with the surrounding building structure such as the walls and floor of an accommodating alcove, a bath tub forming a space with said surrounding walls and floor of the building selectively as a part of the warm air heating system of the building, said tub having an apron extending between said walls and to said floor, a warm air outlet from said space; a warm air heating duct of said heating system feeding into the space under the tub and surrounded by the apron of the tub and the walls and floor of the alcove, and means disposed intermediate said duct and said bath tub for selectively directing warm air from said duct to pass immediately outwardly through the outlet or to circulate about under the tub in the aforementioned surrounded space and through the outlet.

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