

- [54] **WATER HEATED MIRROR FOR
CONDENSATION CONTROL**
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165/168, 248/467, 350/3, 350/310
[51] Int. Cl.**G02b**
[58] Field of Search 350/61, 3, 310; 165/47, 168,
165/171; 4/145, 146, 148; 248/467

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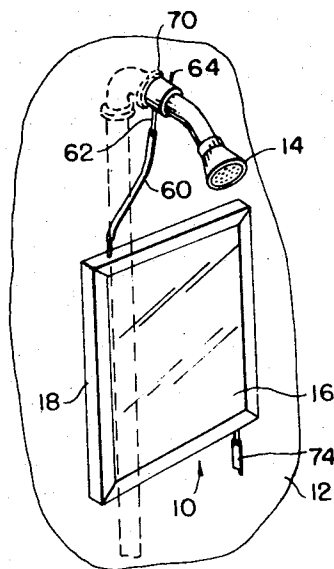
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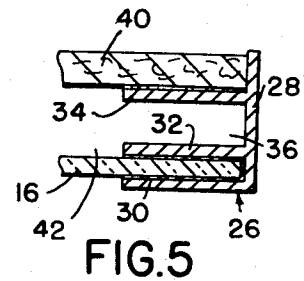
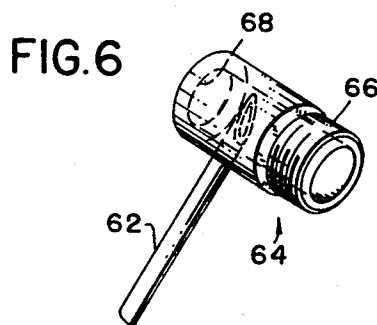
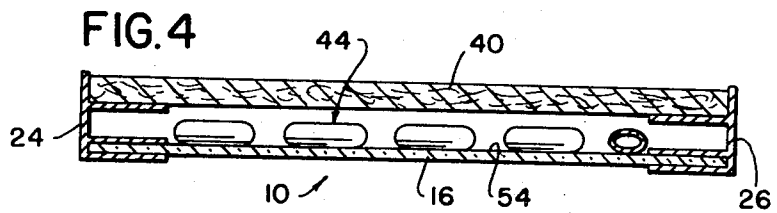
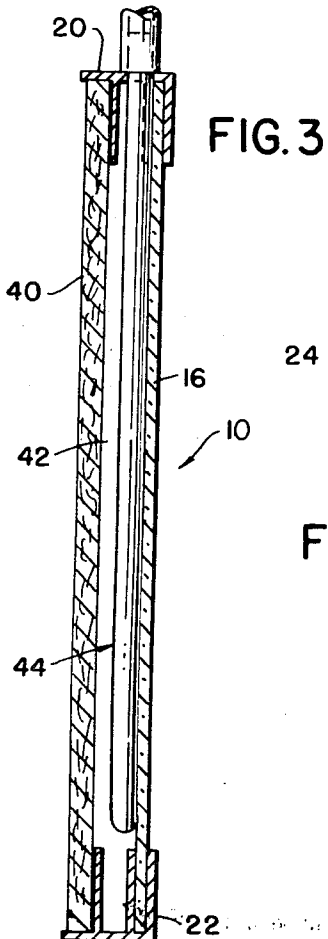
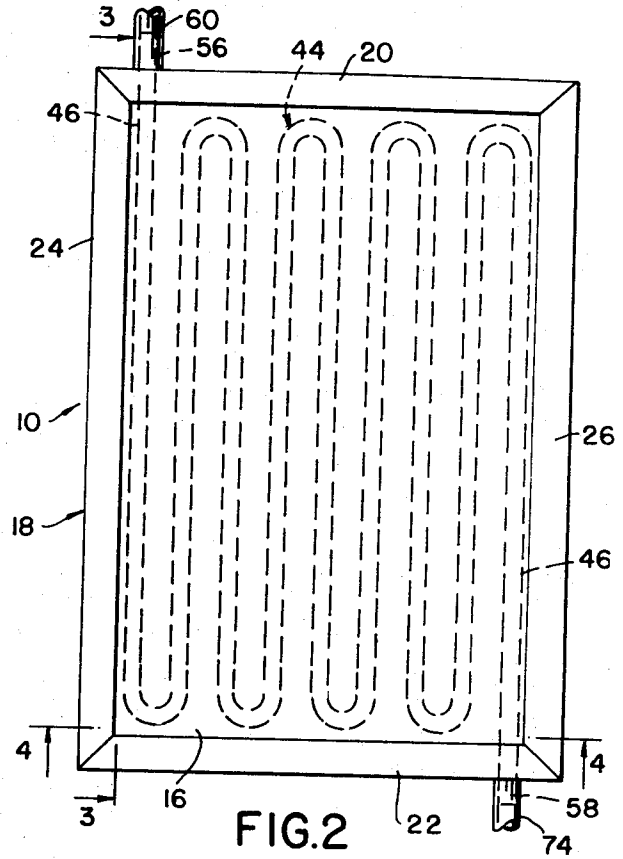
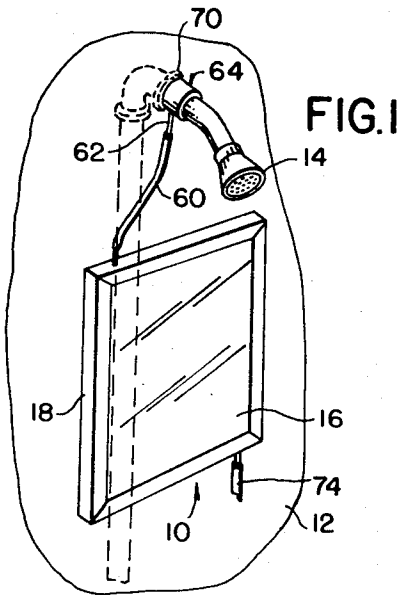
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[57] **ABSTRACT**

The water heated mirror includes a shell and a glass mirror panel which define a conduit type chamber in heat exchange relationship therewith through which hot water flows to elevate the temperature of the glass panel and prevent condensation of moisture on the reflecting surface thereof. The side and bottom end walls of the shell are provided with drain openings for the gravity drainage of spent water from the interior of the chamber.

6 Claims, 13 Drawing Figures





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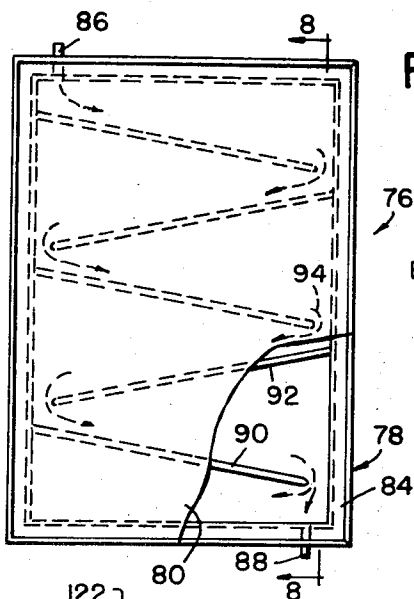


FIG. 7

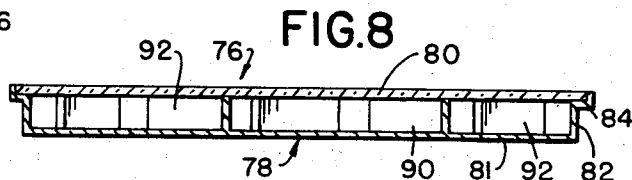


FIG. 8

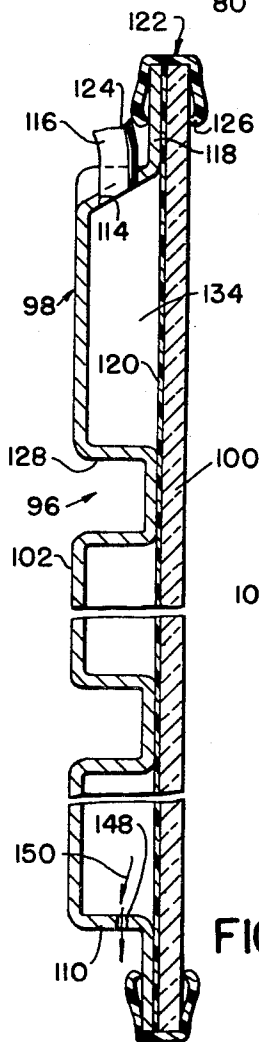


FIG. 11

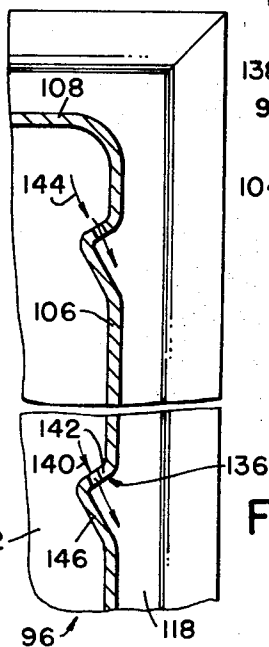


FIG. 10

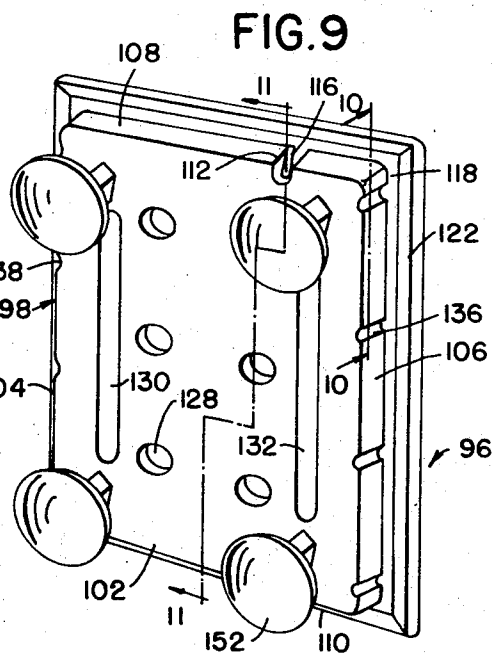


FIG. 9

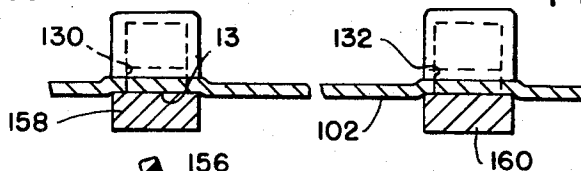


FIG. 13

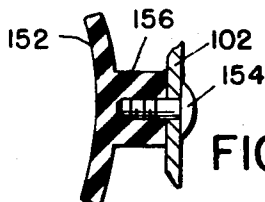


FIG. 12

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WATER HEATED MIRROR FOR CONDENSATION CONTROL

CROSS-REFERENCE TO RELATED APPLICATION

This application is a division of my copending U.S. application entitled "Water Heated Mirror," Ser. No. 812,155, filed on Apr. 1, 1969, now U.S. Pat. No. 3,594,063.

BACKGROUND OF THE INVENTION

Mirrors are frequently provided in bathrooms and shower areas for use in shaving, combing the hair, and the like. When a person takes a hot shower or a hot bath, steam generated from the hot water used for bathing or showering causes moisture to condense on the reflecting surface of the mirror, thus making the mirror unusable for its usual purpose.

The present invention provides a means for flowing hot water through conduit structure provided on the reverse side of the glass mirror panel in heat exchange relationship therewith. The flow of hot water causes the glass panel to become warm and thus prevents the condensation of moisture on the reflecting surface, it being appreciated that moisture will not condense on a surface which is at an elevated temperature. Several different structures are provided in accordance with the present invention for accomplishing the purpose. The mirror assembly thus provided may easily be integrated into the existing conduit means provided in bathrooms. A fitting is disclosed which permits ready installation of the water inlet of the mirror to existing shower heads. The mirror assembly is relatively inexpensive and does not require extensive modification of the bathroom plumbing for installation.

SUMMARY OF THE INVENTION

The water heated mirror comprises a shell having a back wall with upstanding side and end walls. A glass mirror panel is glazed on the outer marginal edges of the upstanding walls of the shell to define an interior conduit type chamber for the flow of hot water on the reverse surface of the glass mirror panel. Hot water inlet means are provided for said conduit chamber. Drain openings are provided in the side and bottom end walls of the shell for drainage of spent water from the chamber.

IN THE DRAWINGS

FIG. 1 is a view in perspective of one embodiment of the water heated mirror of the present invention illustratively mounted in a shower stall.

FIG. 2 is a front elevational view of the mirror of FIG. 1;

FIG. 3 is a view in section taken substantially along the line 3—3 of FIG. 2 looking in the direction of the arrows;

FIG. 4 is a sectional view of the mirror taken substantially along the line 4—4 of FIG. 2 looking in the direction of the arrows;

FIG. 5 is an enlarged view of the right hand portion of FIG. 4;

FIG. 6 is a view in perspective of the fitting utilized to connect the mirror to the water supply;

FIG. 7 is a front elevational view of another embodiment of a water heated mirror;

FIG. 8 is a sectional view taken substantially along the line 8—8 of FIG. 7 looking in the direction of the arrows and pivoted 90° in the clockwise direction;

FIG. 9 is a view in perspective of a further embodiment of the water heated mirror;

FIG. 10 is a sectional view taken substantially along the line 10—10 of FIG. 9 looking in the direction of the arrows;

FIG. 11 is a sectional view taken substantially along the line 11—11 of FIG. 9 looking in the direction of the arrows;

FIG. 12 is a sectional view of one of the suction cups of FIG. 9 illustrating the mode of attachment thereof to the mirror assembly; and

FIG. 13 is a sectional view illustrating magnet means for attaching the mirror to a support structure;

Referring first to the embodiment illustrated in FIGS. 1-6, it will be noted that the water heated mirror 10 is mounted on the wall 12 of a shower stall beneath the shower head 14. The mirror is of relatively large size to result in a full view of the upper portion of a person's body. The mirror is mounted at approximately eye level so that it may be used for shaving, combing of the hair, and the like.

The mirror assembly comprises a glass plate 16 having the usual silvering thereon for reflecting purposes. The plate 16 is mounted in a generally rectangular frame 18. The frame 18 comprises top and bottom elements 20, 22 and side elements 24, 26. The ends of these elements are mitred so that they will fit together in the desired rectangular shape.

The cross-sectional configuration of the frame elements is best illustrated in FIG. 5. As will be there noted, each frame element comprises a side wall 28 and a front wall 30 which extends at right angles thereto. A first flange 32 extends from the inner surface of the side wall 28 parallel to the front wall 30 and spaced rearwardly therefrom to define a channel for receiving an edge portion of the glass plate 16. The plate 16 is glazed into the channel by use of a suitable glazing material to firmly hold the glass in place and result in a fluid-tight joint.

A second flange 34 extends from the inner surface of the side wall 28 parallel to the first flange 32 and spaced rearwardly therefrom to define a central channel 36. The flange 34 and rear portion of the side wall 28 define an L-shaped recess. A rectangular panel 40 is received in this recess to form the back wall of the mirror unit. The panel 40 is illustratively fabricated of a water-proof fibrous material. However, other materials such as metal or plastic may be used to fabricate the panel 40. The panel 40 is secured in place by means of a suitable adhesive to result in the entire unit being fluid-tight.

The mirror assembly thus far described defines a central space 42 which is utilized to receive a sinuous tubular coil 44. The coil 44 is formed in a sinuous pattern having downwardly directed tubular portions 46 and upwardly directed portions 48 interconnected by two bends 50, 52. The coil 44 is of a size to substantially occupy the space 42 both vertically and horizontally to thereby substantially cover the glass plate 16. The coil 44 is placed in intimate, heat-exchange contact with the inner surface 54 of the glass plate 16. This may be accomplished by use of a suitable adhesive. The

coil 44 may be fabricated of a metal such as copper or it may be fabricated of a plastic material.

A portion 56 of the first downwardly extending coil section 46 extends upwardly through an opening in the top frame member 20 and forms the water inlet to the coil. A similar portion 58 of the last downwardly extending coil section 46 extends through an opening in the lower frame member 22 to form the water outlet. A flexible tube 60 connects the inlet 56 with a tubular extension 62 of a fitting 64. As best seen in FIG. 6, the fitting 64 comprises a section of pipe having one end 66 externally threaded with the other end 68 being internally threaded. The tubular extension 62 communicates with the interior of the fitting and bypasses part of the water which flows through the fitting. The externally threaded end 66 is threadingly received in the water outlet fitting 70. The internally threaded end 68 threadingly receives the shower head 14. The fitting 64 permits integration of the mirror 10 with a standard shower head arrangement without the need for extensive modification of the shower head. A flexible drain tube 74 extends downwardly from the outlet 58 for the passage of water from the unit onto the shower floor for flushing through the usual drain provided therein.

In operation of the water heated mirror 10, hot water is caused to flow through the coil 44 whenever the shower is turned on. The hot water flowing through the coil 44 causes the glass panel 16 to become heated, thus preventing condensation of moisture thereon. Consequently, the mirror will remain clear even though the shower area may become steamy.

FIGS. 7 and 8 illustrate another embodiment of a water heated mirror 76. The mirror 76 comprises a generally rectangular shell 78 in which is mounted a glass mirror panel 80. The shell 78 is illustratively fabricated of metal. However, the shell may be inexpensively formed of plastic by the vacuum molding process. The shell 78 comprises a back wall 81 having upstanding side walls 82. An L-shaped flange 84 is provided on the outer edges of the side walls 82 to define a recess to receive the glass mirror panel 80. The panel 80 is glazed into the shell by use of a suitable adhesive to make the juncture of the panel and shell fluid-tight. A tubular inlet 86 is provided in the upper wall of the shell for connection to the hot water as described in connection with FIG. 1. A tubular outlet 88 is provided in the lower wall of the shell for drainage of water from the unit as previously described.

A plurality of laterally and downwardly extending vanes 90, 92 are provided within the shell 78 to define a tortuous path for the flow of hot water through the unit. The vanes 90 extend from the left hand side of the unit as viewed in FIG. 7 downwardly towards the right-hand side. The vanes terminate short of the opposite side wall to provide an opening for the passage of water. The vanes 92 extend from right to left as viewed in FIG. 7 and also terminate short of the opposite side wall to provide for an opening for the passage of water. As illustrated by the dotted arrows 94, water flows from the inlet 86 to the right and then passes downwardly and then flows from right to left. The water is in direct contact with the glass panel 80 and thus heats this panel to prevent condensation of moisture thereon. The water finally drains through the outlet 88. The vanes 90, 92 in addition to guiding the water flow, also serve as struc-

tural reinforcements for the unit. The vanes extend between the glass mirror panel 80 and back wall 81 of the shell 78 to thus reinforce these walls. The side walls of the unit are similarly reinforced by the connection of the vanes thereto.

FIGS. 9-11 illustrate another embodiment of a water heated mirror 96. The mirror 96 comprises a shell 98 in which the glass mirror panel 100 is glazed. The shell 98 comprises a back wall 102 having upstanding side walls 104, 106, top wall 108 and bottom wall 110. A notch 112 is provided in the top wall 108. An opening 114 in the notch receives a tubular inlet member 116 which is connected to the source of hot water (not shown). A peripheral flange 118 extends entirely around the shell 98 outwardly from the outer edges of the walls 104, 106, 108, 110. The glass mirror 100 has a sheet 120 of plastic material adhered to the rear surface thereof. The sheet 120 in turn is adhered to the surface of the flange 118 in fluid-tight relationship to result in the interior of the assembly being fluid-tight. The sheet 120 serves to insulate the glass from direct contact with the hot water. Additionally, the sheet 120 may be selected for easy adherence to both glass and metal, the shell 98 being illustratively fabricated of metal.

A U-shaped molding strip 122 fabricated of plastic is provided around the marginal edge of the mirror assembly. The strip 122 has flexible side walls with in-turned lip portions 124, 126 to securely grip the flange 118 and the marginal edge of the glass mirror panel 100. The molding strip 122 is decorative and, additionally, tends to prevent the ingress of moisture which would have a deteriorating effect upon the glazed edge portion of the shell 98, glass mirror panel 100, and plastic sheet 120.

A plurality of cylindrical recesses 128 are provided in spaced-apart relationship in the center of the back wall 102 of the shell 98. The recesses 128 extend into contact with the sheet 120. The recesses 128 serve to space the back wall 102 from the sheet 120 and also to reinforce the structure. In addition, they serve to direct water flow uniformly throughout the shell. Elongated recesses 130, 132 are provided on each side of the cylindrical recesses 128. These recesses also engage the sheet 120 and serve the same purposes as the recesses 128.

Water is injected into the space 134 defined by the shell 98 and glass mirror panel 100. The water, which is at an elevated temperature, floods the space 134 and thus heats the glass mirror panel 100 to prevent the condensation of moisture on the exterior surface thereof.

Means are provided to constantly drain the spent water from the space 134. A plurality of spaced apart notches 136, 138 are provided in each of the side walls 104, 106. As will be noted in FIG. 10, the notches are substantially V-shaped. An opening 140 is provided in the upper wall portion 142 for the drainage of water as illustrated by the solid arrows 144. Water thus constantly drains from the sides of the mirror unit. The lower wall portion 146 of the notches is angled downwardly to assist in the gravity flow of the water. Additional spaced apart openings 148 are provided in the bottom wall 110 for the drainage of water as illustrated by the solid arrows 150 in FIG. 11. These drainage openings 140, 148 cause the water to flow uniformly within chamber 134.

Four spaced apart suction cups 152, illustrated in FIGS. 9 and 12, are provided for securement of the mirror unit 96 to a supporting wall surface. The suction cups 152 are held in place by means of screws 154 which extend through openings in the back wall 102 into threaded engagement with enlarged portions 156 of the suction cups. The mirror unit may thus be applied to virtually any wall surface by merely pressing the suction cups into engagement therewith.

FIG. 13 illustrates an alternate means for mounting of the mirror 96. As illustrated in FIG. 13, elongated permanent magnets 158, 160 are secured in the elongated recesses 130, 132 of the back wall 102. The magnets may be secured in place by means of a suitable adhesive. In mounting of the mirror unit, the unit is merely pressed against the supporting wall surface whereupon the magnets 158, 160 will hold the mirror in place. It is, of course, necessary to have a wall surface which is metallic in nature or which has a metallic portion thereon as, for example, the metallic trim frequently provided in modern bathroom designs.

What I claim as my invention is:

1. An indoor water heated mirror for use in steamy bath areas comprising a shell having a back wall with upstanding side walls and top and bottom end walls, a glass mirror panel glazed to the outer marginal edges of said side and end walls in fluid-tight engagement therewith to define an interior fluid-tight chamber, said mirror panel and said shell defining a water conduit means for the flow of hot water on the reverse surface of said panel in heat exchange relationship with the panel to heat the panel and prevent steam from condensing thereon, hot water inlet means in the top wall of said shell, said side and bottom end walls having drain openings therein for the gravity drainage of spent water from the interior of said chamber, said drain openings causing the water to flow uniformly within the chamber wherein structure is provided within said chamber defining a flow path for hot water to cause

flow of water within the chamber in paths to pass substantially uniformly over the reverse surface of said glass mirror in heat exchange relationship therewith.

2. The indoor water heated mirror as defined in claim 1 and further characterized in that the side walls of said shell are each provided with a plurality of spaced apart inwardly directed notches having a generally V-shape with upper and lower wall portions, the upper wall portions having said openings formed therein, said lower wall portions defining a downwardly inclined slope for the gravity flow of water from the mirror after the water drains through the openings.

3. The indoor water heated mirror as defined in claim 2 and further characterized in the provision of a plurality of spaced apart recesses in said back wall extending into contact with the reverse side of said glass mirror panel to structurally rigidify the mirror assembly and to define flow paths for water through said interior fluid-tight chamber.

4. The indoor water heated mirror as defined in claim 1 and further characterized in the provision of a sheet of plastic material secured to the reverse surface of said mirror panel to insulate said panel from the hot water flowing through said interior chamber, said sheet of plastic material extending between the glass mirror panel and the outer marginal edges of said side and end walls to thereby glaze the glass mirror panel to the outer marginal edges of the side and end walls in said fluid-tight engagement.

5. The indoor water heated mirror as defined in claim 1 wherein said structure within said chamber comprises a plurality of cylindrical recesses struck out of the back wall of said shell and extending towards and engaging said mirror panel.

6. The indoor water heated mirror as defined in claim 1 wherein said structure comprises a plurality of elongated recesses struck out of the back wall of said shell and extending towards and engaging said mirror panel.

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