

## US 6,231,115 B1

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216, as shown in FIGS. 2C and 4. In particular, the lower wall is positioned substantially in the second mounting plane of the chassis so as to longitudinally extend adjacent the inner longitudinal members 180 in a horizontal manner. Furthermore, the lower wall 216, mounted to the second mounting surface in a well known manner is preferably formed of structural insulating material such as 3" thick structural insulating material associated with the trademark FOME-CORE® which is manufactured by the Monsanto Corporation.

In the preferred embodiment, the at least one lower wall 216 comprises a first wall 216a that extends between the first main longitudinal member 106a and the first inner longitudinal member 180a, and a second wall 216b that extends between the first and second inner longitudinal members 180a, 180b. However, it will be appreciated that in another embodiment, the at least one lower wall 216 could be adapted so as to completely extend between the main longitudinal members 106.

Thus, as shown in FIGS. 2C and 4, the rear section 34 of the chassis 32 defines the plurality of longitudinally extending channels 40. In particular, the channels 40 are defined by the space between the rear section 38 of the floor assembly 36, the vertical walls 120 of the upper I-beams 116 of the main longitudinal members 106, and the central walls 182 of the inner longitudinal members 180. Consequently, as will be described in greater detail below, the channels 40 are able to allow elements of the trailer 30 to be longitudinally disposed therein.

In the preferred embodiment, the plurality of channels comprise three channels 40a-c as shown in FIG. 2C. In particular, the channels 40a, b are further defined by the lower horizontal walls 216a, b respectively so as to substantially enclose the channels 40a, b. Furthermore, the channel 40c is defined by the space between the second inner longitudinal member 180b, the second main longitudinal member, and the rear section 38 of the floor assembly 36. Moreover, since the chassis 32 is devoid of a planar wall that longitudinally extends along the second mounting plane directly underneath the channel 40c, the channel 40c is substantially exposed from underneath the chassis. However, it will be appreciated that, in another embodiment, the channel 40c could be enclosed in the manner of the channels 40a-b.

In one embodiment, the channels 40a, b form an air return conduit for the HVAC unit 138 positioned beneath the rear section 34 of the chassis 32. In particular, as shown in FIG. 4, an opening 218 is formed in each lower wall 246a, b adjacent the HVAC unit 138 so as to communicate the channels 216a, b with the HVAC unit. Furthermore, an elbow channel member 220 adapted to receive a vertical airflow into a vertical input port 222 and redirect the airflow through a horizontal output port 224 in a horizontal direction, is positioned at the rear end 62 of the chassis 32 adjacent the rear lateral member 200b. Furthermore, as shown in FIG. 2A, the elbow member 220 is positioned so that the output port 224 communicates with the channels 40a, b via the opening 214 in the lateral member 200b. Moreover, as shown in FIG. 1A, the elbow member 220 is positioned so that the input port 222 communicates with the interior living space 46 of the trailer via an opening 226 formed in the rear section 38 of the floor assembly 36. Thus, return air from the living space is able to travel through the elbow member 220 and the channels 40a, b so as to arrive at the HVAC unit.

In one embodiment, as shown in FIGS. 2C and 4, a heating/cooling duct 228 of the HVAC unit 138 is disposed

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in the channel 40c. In particular, the known HVAC air supply duct 228 defining a plurality of upper openings 230 and a lower opening 232 (shown in phantom) is positioned within the channel 40c so as to longitudinally extend above the rear section 34 of the chassis 32 in a substantially flush manner. Furthermore, the duct 228 is positioned so as to communicate an output port 234 of the HVAC unit 138 (FIG. 2B) with the HVAC duct 228 via the lower opening 232. Moreover, a plurality of registers 236 (FIG. 1B) are extended through openings 238 defined in the rear section 38 of the floor assembly 36 above the channel 40c and through the openings 230 of the HVAC duct 228 so as to communicate the output port 236 of the HVAC unit 138 with the interior living space 46 of the trailer 30.

In one embodiment, one of the channels 40 functions as cable tray for an electrical power distribution system of the trailer. In particular, as shown in FIG. 2C, at least one known insulated 110 Volt electrical cable 240 coupled to the electrical power distribution system of the trailer is disposed within the channel 40c, so as to longitudinally extend the cable above the inner cross members 140 of the rear section 34 of the chassis 32 in a substantially flush manner.

Thus, it will be appreciated that the plurality of channels 40 defined by the rear section 34 of the chassis 32 simplify the assembly of the trailer 30. In particular, the channels 40 are easily adaptable so as to form return air conduits for the HVAC unit 138. Furthermore, the channels enable the air supply duct 228 of the HVAC unit 138 to be easily disposed therein. Moreover, the channels 40 function as a raceway for electrical cables so as to simplify the assembly of the electrical power distribution system of the trailer.

Although the preferred embodiment of the present invention has shown, described and pointed out the fundamental novel features of the invention as applied to this embodiment, it will be understood that various omissions, substitutions and changes in the form of the detail of the device illustrated may be made by those skilled in the art without departing from the spirit of the present invention. Consequently, the scope of the invention should not be limited to the foregoing description, but should be defined by the appending claims.

What is claimed is:

1. A fifth wheel travel trailer comprising:

a chassis having a main section and at least one elevated section wherein the main section of the chassis comprises a first and a second longitudinally extending main longitudinal member each having an upper mounting surface, a plurality of longitudinally extending inner longitudinal members each having an upper and a lower mounting surface, and a plurality of laterally extending inner cross members each having an upper mounting surface, wherein the plurality of inner cross members are laterally disposed between the main longitudinal members so as to interconnect the main longitudinal members such that the upper mounting surfaces of the main longitudinal members align with a first mounting plane and such that the upper mounting surfaces of the inner cross members align with a second mounting plane positioned beneath the first mounting plane, wherein the plurality of inner longitudinal members are disposed between the main longitudinal members such that the lower mounting surfaces of the inner longitudinal members are positioned adjacent the upper mounting surfaces of the inner cross members and such that the upper mounting surfaces of the inner longitudinal members are substantially aligned with the first mounting plane;

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- a housing member comprising a plurality of walls so as to define an interior living space therein, wherein the housing member upwardly extends from the chassis so as to receive support therefrom;
- a carriage member comprising a plurality of rotatably mounted wheels so as to provide the trailer with mobility, wherein the carriage assembly downwardly extends from the main section of the chassis so as to support the chassis; and
- a floor assembly comprising a main section, wherein the main section of the floor assembly directly mounts to the main section of the chassis in the first mounting plane so as to further rigidify the main section of the chassis, wherein the space between the main section of the floor assembly, the main longitudinal members, the inner longitudinal members, and the inner cross members defines a plurality of longitudinally extending channels.
2. The trailer of claim 1, wherein the housing member further comprises a plurality of pop-out sections that extend from the housing member so as to enlarge the interior living space of the housing member.
3. The trailer of claim 1, wherein the chassis further comprises a plurality of outriggers that extend from the main longitudinal members in a lateral manner so as to extend the width of the main section of the chassis.
4. The trailer of claim 3, wherein the chassis further comprises a plurality of outer members that are disposed at the perimeter of the main section of the chassis.
5. The trailer of claim 1, wherein the first and second main longitudinal members each comprise a lower and upper I-beam positioned in a stacked formation.
6. The trailer of claim 5, wherein each of the lower and upper I-beams comprise a central wall and a lower and upper planar flange extending from the central wall in a substantially perpendicular manner.
7. The trailer of claim 6, wherein each of the lower and upper I-beams is formed of steel such that the central wall has an approximate height of 8 inches and an approximate thickness of  $\frac{3}{16}$  inch and such that the lower and upper flanges each have an approximate thickness of  $\frac{3}{32}$  inch and an approximate width of 3 inches.
8. The trailer of claim 6, wherein the central walls of the upper and lower I-beams are corrugated so as to increase the strength to weight ratio of the main longitudinal members.
9. The trailer of claim 6, wherein the carriage assembly having a plurality of mounting surface couples with the main longitudinal members such that the lower flanges of the lower I-beams overlay the plurality of mounting surfaces of the carriage assembly.
10. The trailer of claim 1, wherein each of the inner cross members comprises a central planar wall aligned in a vertical manner and an upper lip having an upper planar surface extending from the central wall in a substantially perpendicular manner, wherein the upper mounting surfaces of the inner cross members comprise the upper planar surfaces of the upper lips of the inner cross members.
11. The trailer of claim 1, wherein the chassis further comprises a first plurality of attachment members that are interposed between the main longitudinal members and the inner cross members in a flush manner.
12. The trailer of claim 1, wherein the plurality of inner cross members comprise seven spatially distributed inner cross members.

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13. The trailer of claim 1, further comprising a central heating/ventilation/air conditioning system which comprises a central heating/ventilation/cooling unit having an input port and an output port, an air return conduit extending from the input port, and an output air duct extending from the output port.
14. The trailer of claim 13, wherein the chassis further comprises a first partition wall horizontally disposed between the first and second main longitudinal members in the second mounting plane so as to define a first longitudinally extending enclosed channel, wherein the first enclosed channel forms a portion of the return air conduit of the central HVAC system.
15. The trailer of claim 14, wherein the trailer further comprises an airflow elbow member having a first and second port such that an airflow that enters the first port exits the second port in a perpendicular manner, wherein the elbow member is positioned at a rear end of the chassis so as to communicate the interior living space of the trailer with the first enclosed channel, wherein the partition wall defines an opening which communicates the input port of the HVAC unit with the first enclosed channel, thereby defining the return air conduit of the HVAC system.
16. The trailer of claim 13, wherein the output air duct is longitudinally disposed within the plurality of channels.
17. The trailer of claim 16, wherein the output air duct defines a lower opening adapted to communicate the output air duct with the output port of the HVAC unit, wherein the main section of the floor assembly defines a plurality of openings, and wherein the output air duct further defines a plurality of upper openings that align with the plurality of openings of the main section of the floor assembly so as to communicate the output port of the HVAC unit with the interior living space of the trailer.
18. The trailer of claim 16, further comprising an electrical distribution system having at least one electrical cable, wherein the at least one electrical cable longitudinally extends along the plurality of channels.
19. A travel trailer comprising:  
 a chassis having a main section and at least one elevated section wherein the main section of the chassis is comprised of a plurality of lateral cross-members and a plurality of longitudinal members that are interconnected at a plurality of interconnection points so that upper surfaces of the plurality of longitudinal members are substantially co-planer at a first height, wherein the plurality of lateral cross-members are attached to the plurality of longitudinal members such that the plurality of interconnection points are located beneath the first height;
- a carriage member comprising a plurality of rotatably mounted wheels so as to provide the trailer with mobility, wherein the carriage assembly downwardly extends from the main section of the chassis so as to support the chassis;
- a floor comprised of at least one panel directly attached to the upper surfaces of the plurality of longitudinal members so that at least one longitudinal channel is defined by the floor, the plurality of longitudinal members and the lateral cross-members; and
- a housing member defining an interior living space therein, wherein the housing member upwardly extends from the chassis so as to receive support therefrom.

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20. The trailer of claim 19, wherein the plurality of longitudinal members comprise a first and second main longitudinal member.

21. The trailer of claim 20, wherein the first and second main longitudinal members each comprise a lower and upper I-beam positioned in a stacked formation.

22. The trailer of claim 21, wherein each of the lateral cross members comprises a central planar wall aligned in a vertical manner and an upper lip having an upper planar surface extending from the central wall in a substantially perpendicular manner, wherein the plurality of interconnection points are positioned on the upper planar surface of the central planar wall of the lateral cross members.

23. The trailer of claim 22, wherein the lateral cross members extend from the longitudinal members in a perpendicular manner.

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24. The trailer of claim 23, wherein the main section of the chassis further comprises a plurality of outriggers that laterally extend from the first and second main longitudinal members so as to extend the width of the main section of the chassis.

25. The trailer of claim 24, wherein the main section of the chassis further comprises a plurality of longitudinal outer members disposed adjacent the plurality of outriggers so as to interconnect the plurality of outriggers.

26. The trailer of claim 25, wherein the main section of the chassis further comprises at least one lateral outer member disposed at a rear edge of the main section of the chassis so as to interconnect the main longitudinal members.

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# Tab II

## Imperial RV Center - Your Iowa RV and travel trailer dealer

### Imperial RV Center

#### Bay Hauler Trailer



Enjoy the comforts of home while taking the toys along. Aluminum-Framed Lightweight Construction.



#### Standard Features

- 1-1/2" tube ramp door with 5/8" plywood decking
- Spring assisted door
- 2 Exterior lights at loading door
- Fluorescent lighting in garage area
- Enclosed, insulated, heated fresh water tank
- Advantech 3/4" performmax 500 floor
- TPO - Gas and oil resistant rubber glued to ramp
- 2 Door refer
- EZ lube hubs
- TV antenna
- Solid doors

#### Popular Options

- Outside shower
- DSI water heater
- Generator
- Pump station w/fuel cell
- Rear screen door
- Ladder
- Solid door required with C.S.A. (241, 291)
- Oven