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TRANSPORT REFRIGERATION SYSTEM.

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Description

The invention relates in general to transport refrigeration systems, and more specifically to transport refrigeration systems for narrow post highway trailers. There are two types of refrigerated highway trailers, distinguished by the way the front wall of the trailer is supported. The two types are commonly referred to as "narrow post" and "wide post".

Narrow post trailers have the main trailer front wall support structure spaced about three feet (91 cm) apart, and the opening for accommodating a transport refrigeration system mounted on the front wall must fit between the supports of the support structure. This opening is usually twenty eight inches (71 cm) high and thirty seven inches (94 cm) wide. Transport refrigeration systems of the prior art for narrow post trailers conventionally include narrow box type evaporator sections which intrude into the interior trailer space by a dimension which is approximately three feet (91 cm) wide, two and one-half feet (76 cm) high, and three and one-third feet (101 cm) deep.

Wide post trailers have the main trailer front wall support structure spaced about sixty eight inches (173 cm) apart. Front wall openings are usually about forty six inches (117 cm) high and sixty inches (152 cm) wide. Transport refrigeration systems for wide post application are about one-third larger in exterior volume than systems for narrow post application, with the larger volume and large opening to the cargo space permitting innovative system designs which result in a much smaller intrusion of the refrigeration system into the cargo space. For example, systems such as shown in U.S. 4,182,134 and US-A-4,551,986, which are assigned to the same assignee as the present application, require only about a four inch (10 cm) intrusion into the cargo space. This intrusion is about the minimum, as it is occupied by ductwork which directs air from the lower part of the trailer into the evaporator section of the refrigeration system.

The minimal intrusion of the wide post transport refrigeration systems into the cargo space, commonly referred to as zero cube units, is a highly desired feature, as it enables substantially all of the cargo space to be used. Thus, it would be desirable to reduce the intrusion of the narrow post transport refrigeration systems into the cargo space, if this can be accomplished without excessively increasing the weight and size of the overall unit package. For example, any rearrangement of the components of the transport refrigeration system must not increase the depth dimension of the unit beyond about 22.3 inches (56.6 cm), i.e., the measurement from the front wall of the trailer towards the tractor.

Briefly, the present invention is a new and improved transport refrigeration system adapted for mounting on the front wall of a narrow post highway trailer which reduces the intrusion of the unit into the cargo space to four inches (10 cm), the same as the intrusion in wide post trailers, while simultaneously providing increased service accessibility not previously available with the presently used narrow post or wide post units.

The invention consists in a transport refrigeration system having a support frame which includes a rear portion adapted for mounting on the front wall of a trailer having an opening therein, and, with respect to said rear portion, a top portion, side portions, a front portion, and an intermediate support structure which extends outwardly from the rear portion towards the front portion, with at least said front, rear, and top portions each defining major openings in the support frame, and with the intermediate support structure having a vertically oriented support wall which defines a condenser plenum between said support wall and the front portion of the support frame, and an evaporator plenum between said support wall and the rear portion of the support frame; an evaporator coil supported by the support frame in the opening defined by the rear portion of the support frame; an evaporator blower; a condenser coil supported by the support frame, in the opening defined by the top portion of said support frame; and a condenser fan, characterized by:

- an air delivery assembly mounted on the intermediate support structure, with said condenser fan and evaporator blower being an integral part of the air delivery assembly, said air delivery assembly including a vertically oriented mounting flange having a first side which faces the front portion of the support frame and a second side which faces the rear portion, with the condenser fan and evaporator blower being mounted on said first and second sides, respectively, of the mounting flange,
- and wherein the support wall defines an opening dimensioned to receive the evaporator blower,
- said mounting flange being removable mounted on the support wall, closing the opening in the support wall while disposing the evaporator blower in a first air flow path via the opening in the support wall, and disposing the condenser fan in a second air flow path,
- said first air flow path including said evaporator coil, with said evaporator blower drawing air from the trailer through said evaporator coil and discharging air back into the trailer,
- said second air flow path including said condenser coil, with said condenser fan drawing air through the opening defined by the front portion of said support frame and forcing air through said condenser coil,
- said intermediate support structure further including a top portion which slopes upwardly from the vertically oriented support wall towards the rear...
portion of the support frame, with said top portion defining a common wall of said evaporator and condenser plenums,

with the opening defined by the front portion of the support frame being dimensioned to enable the air delivery assembly to be removed from the support frame as an integral unit, through the opening defined by the front portion of the support frame.

The invention will become more readily apparent by reading the following detailed description in conjunction with the drawings, which are shown by way of example only, wherein:

Figure 1 is an exploded perspective view of a transport refrigeration system constructed according to the teachings of the invention;

Figure 2 is a front elevational view of the transport refrigeration system shown in Figure 1; and

Figure 3 is a side elevational view of the transport refrigeration system shown in Figure 2, with some parts cut away in order to more clearly illustrate air flow paths through the system.

Referring now to the Figures, Figure 1 is an exploded perspective view of a transport refrigeration system 10 constructed according to the teachings of the invention. Figures 2 and 3 will also be referred to in the following description, with Figure 2 being an elevational view of the front of transport refrigeration system 10, with a grill removed, and Figure 3 a side elevational view. Parts are broken away in Figure 3 in order to more clearly illustrate air flow paths defined by the system.

More specifically, transport refrigeration system 10 includes a main structural support frame 12 which is secured to the front 14 of a highway trailer 15, which may be of narrow post construction. Trailer 15 includes a cargo space 17 to be conditioned by transport refrigeration system 10. Front 14 has an opening 16 therein, which is sealed when system 10 is mounted on front 14, for circulation of trailer air through refrigeration system 10. Frame 12 includes a base 18, a top 20, front and rear portions 22 and 24, respectively, and first and second side portions 26 and 28, respectively. The front 22, top 20, rear 24, and first and second sides 26 and 28 define openings 30, 32, 34, 36 and 38, respectively. Thus, frame 12 essentially consists of a rectangularly shaped base 18, a rectangularly shaped top 20, and four vertically extending corner legs 40, 42, 44 and 46 which extend between the corners of the base and top.

An intermediate support structure 48 is provided between the front and rear portions 22 and 24, with the intermediate support structure 48 including a vertically oriented wall 50 which defines an opening 52, a top 54 which angles or slopes upwardly from the upper edge of wall 50 to the back or rear portion 24, and side portions which extend from the lateral edges of wall 50 to the rear portion 24, such as side portion 56. Wall 50 is substantially parallel with the major planes of the front and rear portions 22 and 24, respectively, of support frame 12. A horizontally extending, intermediate cross piece 57 (Figure 3) also extends between legs 44 and 46, across the rear 24 of frame 12. Side portion 56 has a plurality of openings therein for access to various controls, as well as to provide clearance for a drive belt. It will be noted that the intermediate support structure 48 extends from the top portion 20 of frame 12 towards the bottom portion 18, terminating well short of the bottom portion 18 to provide a relatively large open space in the lower part of frame 12 for receiving a power pack 58.

As shown most clearly in Figure 2, power pack 58 includes an internal combustion engine 60, such as a Diesel engine, and a refrigeration compressor 62 which is driven by engine 60.

Transport refrigeration system 10 further includes an evaporator coil assembly 64, a condenser coil assembly 66, an air delivery unit 68, and a grill 70.

Evaporator coil assembly 64 includes an evaporator coil 72, an expansion valve 74, a heat exchanger 75, and other conventional items not shown, such as a valve control bulb, defrost termination switch, and defrost air pressure sensing probes. Evaporator coil 72 has planar, parallel, inlet and outlet surfaces 76 and 78, respectively. Evaporator coil assembly 64 is mounted in the upper rear portion of frame 12, through the opening 34 defined by rear 24, with its planar inlet and outlet surfaces 76 and 78 vertically oriented. As shown most clearly in Figure 3, when the transport refrigeration system 10 is mounted on front wall 14, the evaporator coil 72 extends into opening 16 until the planar inlet surface 76 is in substantially the same vertical plane as inner surface 80 of the front wall 14. A gasket 79 surrounds and seals opening 16. The planar outlet surface 78 is in spaced parallel relation with the intermediate support wall 50, and the expansion valve 74 is aligned with an opening in side wall 56, such as opening 82. Evaporator coil 72 includes a plurality of horizontally oriented tubes 84, with the tubes having vertically oriented fins. Sheet metal 86 is attached to the evaporator coil 72 and spaced from the inlet surface 76 to define an air duct 88 which directs trailer air from the bottom portion of the trailer cargo space into the planar inlet surface 76 of the evaporator coil, as indicated by arrows 89 in Figure 3.

The condenser assembly 66 includes a condenser coil 90 which is mounted in the top 20 of frame 12, via opening 32 defined by top 20. Condenser coil 90 includes a plurality of horizontally oriented tubes 92, with the associated fins being vertically oriented.

Internal combustion engine 60 includes a radiator 94 which is formed into a relatively thin but tall assembly such that it can be mounted adjacent to one of the sides of intermediate support structure 48, such as the side which is opposite to side 56. Radiator 94 includes a plurality of vertically oriented tubes 96 hav-
ing horizontally oriented fins.

Air delivery unit 68 includes an air delivery assembly 98 for delivering air for the condenser coil 90, evaporator coil 72, and engine radiator 94, with assembly 98 having a very narrow depth dimension. Air delivery assembly 98 includes a mounting flange 100, a first air mover 102 mounted on a first side of mounting flange 100, and a second air mover 104 mounted on the second or remaining side of mounting flange 100. The first air mover 102 is preferably in the form of a blower 106 having a large diameter but minimal axial depth, as a blower is highly effective in redirecting air 90 degrees from an inlet angle. Blower 106 is mounted on a shaft 108 which extends through mounting flange 100 via suitable support bearings. The second air mover 104 is preferably in the form of a fan 110 in order to limit the starting inertia of the air delivery unit 98 and enable the unit to be started by engine 60 without the necessity of providing a clutch. Fan 110 is also mounted on shaft 108, adjacent to a driven pulley 112. A pair of idler pulleys 114 and 116 are also mounted on flange 100, on the same side as fan 110, adjacent to a vertical edge of flange 100. Air delivery assembly 98 is completely adjustable as an integral unit before it is mounted in frame 12, including an air inlet structure or orifices 118 for blower 106. Air delivery assembly 98 can also be removed from the support frame 12 as a unit for servicing, without interfering with the cargo space 17 of the associated trailer 15.

Air delivery assembly 98 is mounted in frame 12 through opening 30 defined by front 22, with flange 100 being secured to vertical wall 50 of the intermediate support structure 48 to seal the opening 52 therein. The longitudinal axis of shaft 108 is oriented perpendicular to the planar inlet and outlet surfaces 76 and 78, respectively, of evaporator coil 72. Blower 106 extends into the relatively narrow space between wall 50 and the outlet surface 78 of the evaporator coil 72.

When air delivery assembly 98 is mounted in its operative position, flange 100 completes an air plenum or chamber 119 for the evaporator coil assembly 64, and it operatively disposes blower 106 in a first air flow path in which the blower 106 draws trailer air through the evaporator coil 72, indicated by arrows 89, and forces conditioned air, indicated by arrows 91, back into the trailer 15 via the evaporator plenum chamber 119 which is defined by an upper sloping front portion and top of the evaporator coil assembly 64, the top 54 of the intermediate support structure 48, wall 50, and one side of flange 100.

A chamber is formed about fan 110 via a shroud 120 and front plate 122, which members complete the air delivery unit 68. This fan chamber is part of a condenser plenum 123 in which air is directed in a second air flow path. In the second air flow path, external air enters the fan 110 axially via grill 70, indicated by arrows 93, and it is directed upwardly through condenser coil 90, indicated by arrows 95, and laterally through engine radiator 94, indicated by arrows 97. It will be noted that flange 100 forms a common wall between the evaporator and condenser plenums 119 and 123, as does wall 50 and the top 54 of the intermediate support structure 48.

Engine 60 includes a drive pulley 124 which links the driven pulley 112 and the idler pulleys 114 and 116 via a drive belt 126.

The disclosed transport refrigeration system 10 provides a compact assembly which fits into the limited space provided external to narrow post highway trailers, while intruding into the cargo space of the trailer only to the extent necessary to direct trailer air from the lower part of the trailer into the evaporator coil 72. The overhead mounting of the condenser 66, and the lateral mounting of the engine radiator 94, along with an air delivery assembly 98 which has a relatively short axial dimension, all combine to meet the requisite dimensional requirements, providing an external package which does not significantly exceed the dimensions or weight of prior art units for narrow post trailers.

In addition to providing a compact arrangement, the transport refrigeration system 10 of the invention is easier to service than prior art refrigeration systems for narrow post highway trailers, as the evaporator coil 72 and its controls are serviceable external to the trailer. The trailer cargo is not disturbed. For example, evaporator controls for the evaporator section 64, including expansion valve, valve control bulb, defrost termination switch, and defrost air pressure sensing probes, are accessible for servicing from the trailer exterior, on one side of the transport refrigeration unit 10. The remaining refrigeration controls, such as receiver, accumulator, pilot valve, three-way valve, and drier, are mounted so they are accessible on the other side of the unit. The power pack 58 is accessible from the front and both sides of frame 12, and the compressor is accessible from the front and one of the sides of frame 12, making transport refrigeration system 10 easy to service and maintain.

The new and improved air delivery assembly 98 may be manufactured and completely adjusted as an integral unit before mounting the unit in support frame 12, unlike the air delivery functions of prior art narrow post refrigeration systems. Air delivery assembly 98 may also be removed from support frame 12 as a complete unit, if necessary for service.

Claims

1. A transport refrigeration system (10) having a support frame (12) which includes a rear portion (24) adapted for mounting on the front wall (14) of a trailer (15) having an opening (16) therein, and, with respect
to said rear portion (24), a top portion (20), side portions (26,28), a front portion (22), and an intermediate support structure (48) which extends outwardly from the rear portion (24) towards the front portion (22), with at least said front, rear, and top portions (22,24,20) each defining major openings (30,34,42) in the support frame (12), and with the intermediate support structure (48) having a vertically oriented support wall (50) which defines a condenser plenum (123) between said support wall (50) and the front portion (22) of the support frame (12), and an evaporator plenum (119) between said support wall (50) and the rear portion (24) of the support frame (12); an evaporator coil (72) supported by the support frame (12) in the opening (34) defined by the rear portion (24) of the support frame (12); an evaporator blower (106); a condenser coil (90) supported by the support frame (12), in the opening (32) defined by the top portion (20) of said support frame (12); and a condenser fan (110), characterized by:

an air delivery assembly (98) mounted on the intermediate support structure (48), with said condenser fan (110) and evaporator blower (106) being an integral part of the air delivery assembly (98), said air delivery assembly (98) including a vertically oriented mounting flange (100) having a first side which faces the front portion (22) of the support frame (12) and a second side which faces the rear portion (24), with the condenser fan (110) and evaporator blower (106) being mounted on said first and second sides, respectively, of the mounting flange (100), and wherein the support wall (50) defines an opening (52) dimensioned to receive the evaporator blower (106), said mounting flange (100) being removable mounted on the support wall (50), closing the opening (52) in the support wall (50) while disposing the evaporator blower (106) in a first air flow path via the opening (52) in the support wall (50), and disposing the condenser fan (110) in a second air flow path, said first air flow path including said evaporator coil (72), with said evaporator blower (106) drawing air from the trailer (15) through said evaporator coil (72) and discharging air back into the trailer (15), said second air flow path including said condenser coil (90), with said condenser fan (110) drawing air through the opening (30) defined by the front portion (22) of said support frame (12) and forcing air through said condenser coil (90), said intermediate support structure (48) further including a top portion (54) which slopes upwardly from the vertically oriented support wall (50) towards the rear portion (24) of the support frame, with said top portion (54) defining a common wall of said evaporator and condenser plenums (119,123), with the opening (30) defined by the front portion (22) of the support frame (12) being dimensioned to enable the air delivery assembly (98) to be removed from the support frame (12) as an integral unit, through the opening (30) defined by the front portion (22) of the support frame (12),

2. The transport refrigeration system of claim 1 wherein at least one of the side portions (26) of the support frame (12) defines an opening (36), and including a power unit (58) on the support frame (12) comprising a compressor (62) coupled to an internal combustion engine (60) having a radiator (94), said radiator (94) being disposed in the opening (36) defined by the at least one side portion (26), with the condenser fan (104) forcing air through said radiator (94) as well as through the condenser coil (90),

3. The transport refrigeration system of claim 1 wherein the evaporator coil (72) has planar, parallel inlet and outlet surfaces (76, 78), with said planar inlet and outlet surfaces being vertically oriented,

4. The transport refrigeration system of claim 3 wherein the air delivery assembly (98) includes a single shaft (108) common to both the condenser fan (110) and evaporator blower (106), with said shaft (108) having a longitudinal axis which intersects the evaporator coil (72) perpendicular, to the vertically oriented, planar, parallel inlet and outlet surfaces (76,78).

Patentansprüche

1. Ein Transportkühlsystem (10) mit einem Tragrahmen (12) einschließlich eines hinteren Teils (24), der zum Aufmontieren auf die Vorderwand (14) eines Anhängers (15) mit einer Öffnung (16) in dieser Wand ausgelegt ist, und in diesem hinteren Teil (24) mit einem Oberteil (20), mit Seitenteilen (26, 28), mit einem Vorderteil (22) und mit einem Zwischengetriebe (48), das sich vom hinteren Teil (24) ausgehend zum vorderen Teil (22) zu erstreckt, wobei wenigstens die Vorder-, Hinter-, und Oberteile (22, 24, 20) jeweils größere Öffnungen (30, 34, 42) im Tragrahmen (12) definieren, und wobei dieses Zwischengetriebe (48) eine sich senkrecht erstreckende Tragwand (50), die eine Kondensationskammer (123) zwischen dieser Tragwand (50) und dem Vorderteil (22) des Tragrahmens (12) und eine Verdunstungskammer (119) zwischen dieser Tragwand (50) und dem hinteren Teil (24) dieses Tragrahmens (12) definiert, eine Verdunstungsschlaufe (72), die vom Tragrahmen (12) in der vom hinteren Teil (24) des Tragrahmens (12) definierten Öffnung (34) gehalten wird, einen Verdunstungsbläser (106), eine vom Tragrahmen (12) in der durch den Oberteil (20) dieses Tragrahmens (12) definierten Öffnung (32) gehaltene Kondensationskammerschlaufe (90), sowie einen Kondensationsventilator (110) aufweist, gekennzeichnet durch:
eine am Zwischentragengerüst (48) montierte Lufteinblasgruppe (98), wobei dieser Kondensationsventilator (110) und dieser Verdunstungsblasser (106) integrale Bestandteile dieser Lufteinblasgruppe (98) und diese Lufteinblasgruppe (98) einen senkrecht ausgerichteten Anbaufansch (100) aufweist, der eine dem Vorderteil (22) des Tragrahmens (12) gegenüberliegende erste Seite und eine dem hinteren Teil (24) gegenüberliegende zweite Seite aufweist, und wobei der Kondensationsventilator (110) und der Verdunstungsblasser (106) auf dieser ersten bzw. zweiten Seite des Anbaufansches (100) montiert sind, und bei dem die Tragwand (50) eine Öffnung (52) definiert, die so dimensioniert ist, daß sie den Verdunstungsblasser (106) aufnimmt, wobei dieser Anbaufansch (100) abnehmbar auf der Tragwand (50) montiert ist und dabei die Öffnung (52) in der Tragwand (50) verschließt während er den Verdunstungsblasser (106) in einem ersten Luftströmungspfad durch die Öffnung (52) in der Tragwand (50) und den Kondensationsventilator (110) in einem zweiten Luftströmungspfad anordnet, wobei dieser erste Luftströmungspfad diese Verdunstungsschlangen (72) beinhaltet und dieser Verdunstungsblasser (106) die Luft durch diese Verdunstungsschlangen (72) aus dem Anhänger (15) saugt und Luft wieder zurück in den Anhänger (15) läßt, wobei dieser zweite Luftströmungspfad diese Kondensationswasserleitungen (90) beinhaltet und der Kondensationsblasser (110) die Luft durch die vom Vorderteil (22) des Tragrahmens (12) definierte Öffnung (30) saugt und durch diese Kondensationswasserleitungen (90) drückt, wobei dieses Zwischentragengerüst (48) ferner einen Oberteil (54) aufweist, der sich von der senkrecht ausgerichteten Tragwand (50) schräg aufwärts zum hinteren Teil (24) des Tragrahmens zu erstreckt und dieses Oberteil (54) eine gemeinsame Wand dieser Verdunstungs- und Kondensationskammer (119, 123) definiert, wobei die vom Vorderteil (22) des Tragrahmens (12) definierte Öffnung (30) so bemessen ist, daß die Lufteinblasgruppe (98) als integrale Einheit durch die im Vorderteil (22) des Tragrahmens (12) definierte Öffnung (22) ausgebaut werden kann.

2. Das Transportkühlsystem gemäß Anspruch 1, bei dem wenigstens einer der Seitenflächen (26) des Tragrahmens (12) eine Öffnung (38) definiert, einschließlich einer Leistungseinheit (58) auf dem Tragrahmen (12), die einen an einen Verbrennungsmotor (60) gekoppelten Verdichter (62) mit einem Kühler (94) aufweist, wobei dieser Kühler (94) in der von wenigstens einem Seitenflächen (26) definierten Öffnung angeordnet ist und der Kondensationsventilator (104) Luft durch diesen Kühler (94) sowie durch die Kondensations-

Revendications

1. Un système de réfrigération pour transport (10) comportant un châssis porteur (12) qui comporte une partie arrière (24) adaptée pour être montée sur la paroi avant (14) d'une remorque (15) dans laquelle est prévue une ouverture (16) et, par rapport à la dite partie arrière (24), une partie supérieure (20), des parties latérales (26,28), une partie avant (22), et une structure porteuse intermédiaire (48) qui s'étend vers l'extérieur depuis la partie arrière (24) en direction de la partie avant (22), avec au moins lesdites parties avant, arrière et supérieure (22,24,20) définissant chacune des ouvertures principales (30,34,42) dans le châssis porteur (12), et avec la structure porteuse intermédiaire (48) qui comporte une paroi porteuse (50) orientée verticalement et définissant un volume pour condenseur (123) entre ladite paroi porteuse (50) et la partie avant (22) du châssis porteur (12), et un volume pour évaporateur (119) entre ladite paroi porteuse (50) et la partie arrière (24) du châssis porteur (12) ; un serpent en évaporateur (72) supporté par le châssis porteur (12) dans l'ouverture (34) définie par la partie arrière (24) du châssis porteur (12) ; un ventilateur d'évaporateur (106) ; un serpentin de condenseur (90) supporté par le châssis porteur (12), dans l'ouverture (32) définie par la partie supérieure (20) dudit châssis porteur (12) ; et un ventilateur de condenseur (110), caractérisé par :

- un ensemble de distribution d'air (98) monté sur la structure porteuse intermédiaire (48), avec ledit ventilateur de condenseur (110) et ledit ventilateur d'évaporateur (106) faisant partie intégrante de l'ensemble de distribution d'air (98), ledit ensemble de distribution d'air (98) comportant une bride de montage (100) orientée verticalement et pourvue d'un premier côté qui est dirigé vers la partie avant (22) du châssis porteur (12) et d'un second côté qui est dirigé vers la partie arrière (24), le ventilateur de condenseur (110) et le ventilateur d'évaporateur (106) étant respectivement montés sur lesdits premier, second côtés de la bride de montage (100),
et où la paroi porteuse (50) définit une ouverture (52) dimensionnée de façon à recevoir le ventilateur d’évaporateur (106).

Ladite bride de montage (100) étant installée de façon amovible sur la paroi porteuse (50), en fermant l’ouverture (52) prévue dans la paroi porteuse (50) tout en disposant le ventilateur d’évaporateur (106) dans un premier passage d’écoulement d’air par l’intermédiaire de l’ouverture (52) prévue dans la paroi porteuse (50), et en disposant le ventilateur de condenseur (110) dans le second passage d’écoulement d’air,

ledit premier passage d’écoulement d’air comprenant ledit serpentin d’évaporateur (72), ledit ventilateur d’évaporateur (106) aspirant de l’air à partir de la remorque (15) et à travers ledit serpentin d’évaporateur (72) pour le renvoyer ensuite dans la remorque (15).

Ledit second passage d’écoulement d’air comprenant ledit serpentin de condenseur (90), ledit ventilateur de condenseur (110) aspirant de l’air à travers l’ouverture (30) définie par la paroi avant (22) dudit châssis (12) et refoulant l’air à travers ledit serpentin de condenseur (90),

la structure porteuse intermédiaire (48) comprenant en outre une partie supérieure (54) qui est inclinée vers le haut à partir de la paroi porteuse (50) orientée verticalement en direction de la partie arrière (24) du châssis porteur, ladite paroi supérieure (54) définissant une paroi commune pour les dits volumes d’évaporateur et de condenseur (119,123),

l’ouverture (30) définie par la paroi avant (22) du châssis porteur (12) étant dimensionnée pour permettre d’enlever l’ensemble de distribution d’air (98) du châssis porteur (12) sous forme d’une unité complète, par l’intermédiaire de l’ouverture (30) définie par la paroi avant (22) du châssis porteur (12).

2. Le système de réfrigération pour transport selon la revendication 1, dans lequel au moins une des parties latérales (26) du châssis porteur (12) définit une ouverture (36), et il est prévu sur le châssis porteur (12) une unité motrice (58) comprenant un compresseur (62) accouplé à un moteur à combustion interne (60) comportant un radiateur (94), ledit radiateur (94) étant disposé dans l’ouverture (36) définie par au moins la paroi latérale précitée (26), le ventilateur de condenseur (104) refoulant de l’air à travers ledit radiateur (94) et également à travers le serpentin de condenseur (90).

3. Le système de réfrigération pour transport selon la revendication 1, dans lequel le serpentin d’évaporateur (72) comporte des surfaces d’entrée et de sortie (76,78) qui sont planes et parallèles, lesdites surfaces planes d’entrée et de sortie étant orientées verticalement.

4. Le système de réfrigération pour transport selon la revendication 3, dans lequel l’ensemble de