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Unger

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[54] GROUND MOUNTING BASE FOR CENTRAL AIR CONDITIONER HEAT EXCHANGER UNITS

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[52] **U.S. Cl.** **248/346,** 248/19, 248/361

[51] **Int. Cl.**.....**F16m 13/00**

[58] **Field of Search** ..248/346, 19, 361; 52/292, 295, 52/612, 102, 27, 294; 33/211, 207 C; 106/DIG. 3

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[57] **ABSTRACT**

A ground mounting base is disclosed for use with externally mounted heat exchanger units such as the outdoor condenser unit commonly used in residential central air conditioning systems. The base is light weight but strong and comprises a pad of concrete employing vermiculite as its primary aggregate, a wire screening reinforcement, and a top layer of sand aggregate concrete. A bubble level is affixed at the top surface to aid in leveling the base and upward projecting pre-set mounting bolts affixed therein for receiving and affixing the heat exchanger to the base. The base also preferably has inclined side walls inclining outward from the top to the bottom to aid in preventing horizontal movement after implacement.

4 Claims, 4 Drawing Figures

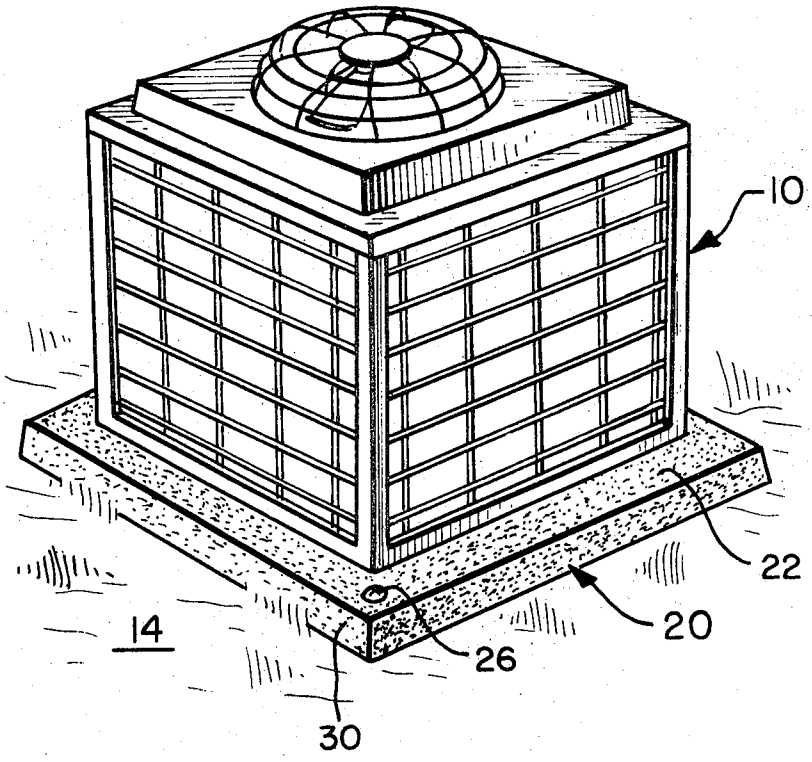


FIG. 1

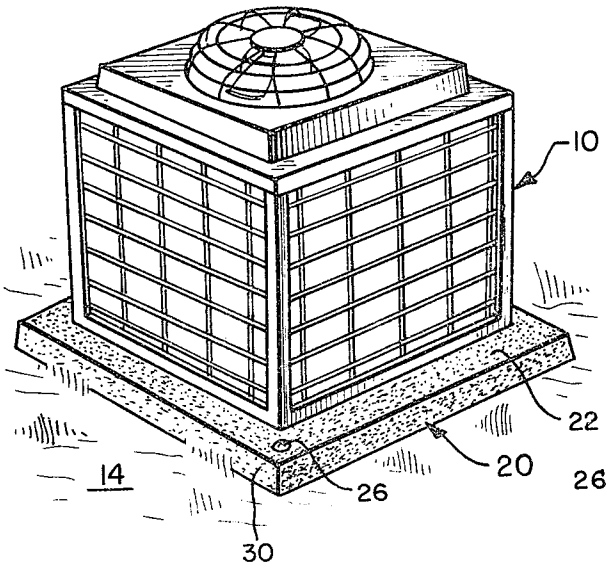


FIG. 2

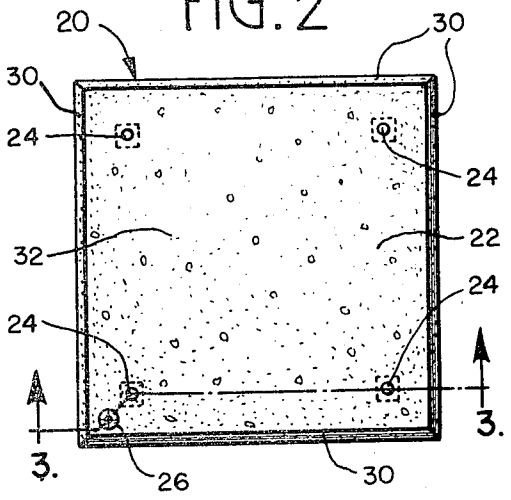
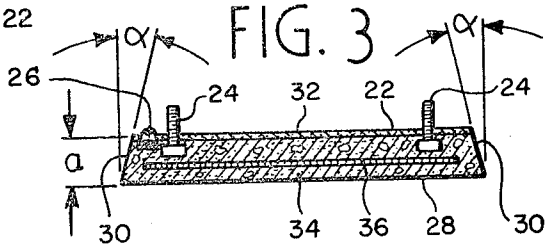


FIG. 3



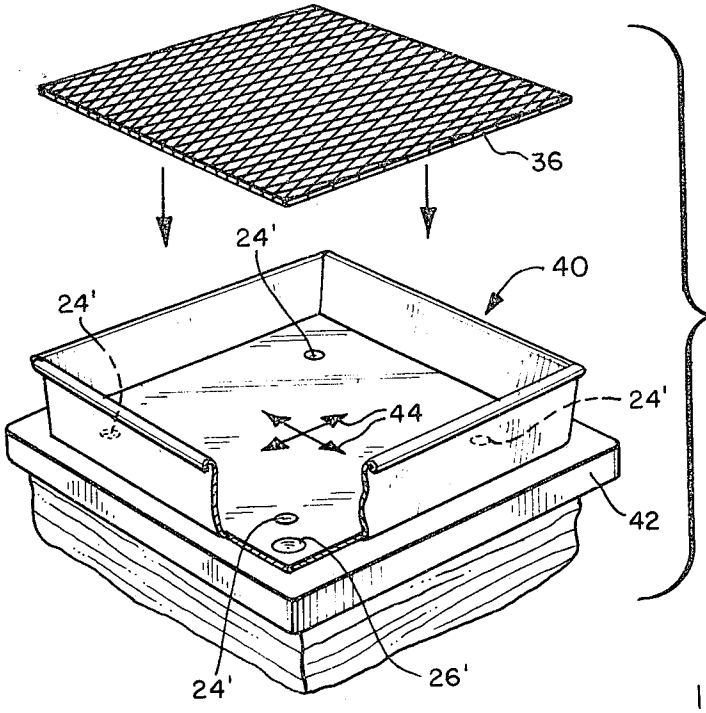


FIG. 4

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GROUND MOUNTING BASE FOR CENTRAL AIR CONDITIONER HEAT EXCHANGER UNITS

FIELD OF THE INVENTION

The present invention relates to mounting bases for heat exchanger units of the type mounted on soil such as the common residential central air conditioning condenser unit.

BACKGROUND OF THE INVENTION

At the present time most residential central air conditioning systems, as well as a few other systems, employ externally mounted heat exchanger unit. Such air conditioning units may comprise a condenser, often combined with a compressor, a blower and electric motor equipment. For our purposes, we will term all of this equipment that is packaged to form a single unit, as a heat exchanger unit. These units are most commonly mounted exposed to the elements but necessarily near the residence or building with which they are employed.

They are often rather noisy since blower, fans, compressors and similar equipment are often included. In most cases they are made to withstand exposure to the air and elements (perhaps with a cover during winter) but do require a firm and level base.

In the past this has been a concrete pad usually square with vertical sides formed of normal concrete made of crushed stone or gravel, cement and sand, and mixed with water. To save set-up time and visits, these pads are usually pre-cast and delivered to the site in a finished and hardened state. Although these pads generally serve their purpose well, they suffer from certain drawbacks that the present invention overcomes. These prior pads are extremely heavy and hard to handle. For example, a typical small unit pad, 3 by 4 feet by 2 inches, may weigh 125 pounds, normally requiring two or more men to carry and handle it. Conventional pre-cast concrete pads must be set in a properly preleveled and filled site or it may fracture. Such pads or bases are also subject to fracture through dropping (to which it is prone because of its weight). Proper leveling of the pad once on the ground is also difficult.

The rigid structure of the pre-cast conventional pad also does nothing to lessen the noise and vibration generated by the unit mounted thereon and can in certain circumstances serve as a sounding board to magnify that noise. If set too near the building or in certain soils, undesirable vibrations of the unit can be felt in the structure or the surrounding area.

It sometimes happens in the installation of the conventional rigid pre-cast pad that the soil is not properly prepared or later settles unevenly. When this occurs the weight of the pad and its units can be concentrated at spaced horizontal points subjecting the pad to shear and strain that can lead to cracking and/or fracturing of the pad.

SUMMARY OF THE INVENTION

In overcoming one or more of the aforementioned disadvantages of prior bases, the present invention provides a new and improved external heat exchanger unit ground base comprising at least a pad having a generally flat top surface and a generally flat bottom surface with joining edge side walls therebetween,

which pad is formed of concrete employing vermiculite as its primary aggregate, by volume, and including reinforcement therein.

In accordance with another feature of the invention the top surface layer is formed primarily of concrete employing sand as its primary aggregate, by volume, to provide a rigid top surface.

In accordance with other features of the present invention the pad includes a bubble level formed therein at its top surface so that it may be leveled quickly and easily in installation and its leveling easily checked during use. The side walls of the base are preferably slanted or inclined outward from the top to the bottom surfaces. Pre-positioned bolts may be cast in the base so as to project from the top surface to aid in attaching the heat exchanger unit to the base. Further, the entire base surface is preferably sealed by a silicone or wax sealer.

ADVANTAGES OF THE INVENTION

A soil-mounted base for a heat exchange unit made in accordance with the present invention has light weight as its primary advantage. For example a base of the same dimensions as the above mentioned prior art example weighs about 25 pounds rather than one hundred and 25 pounds.

In addition to all of the advantages that flow from this lighter weight: ease of handling (one man can carry it easily), inexpensive shipping costs, less probability of dropping and fracturing; the base of the invention provides for superior sound deadening and vibration dampening. Further the base's bottom surface can deform to accommodate small variations in the soil thus insuring better weight distribution and less danger of cracking or fracturing dung installation and use.

The inclusion of a permanent bubble level provides for greater ease of installation and maintenance while the inclined side walls both spread the weight better, resist horizontal movement of the base and unit and also aids in the manufacture of the base.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The invention, together with the further advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings, in the several figures of which like reference numerals identify like elements, and in which:

FIG. 1 is a perspective view of a base constructed in accordance with the principles of the present invention, together with an air conditioning heat exchanger unit mounted thereon;

FIG. 2 is a plane view of the base of FIG. 1;

FIG. 3 is a sectional view of the base of FIGS. 1 and 2 as seen along the line 3—3 of FIG. 2; and

FIG. 4 is a perspective view illustrating in part, the presently preferred method and apparatus for making the base of FIGS. 1–3.

DETAILED DESCRIPTION

Referring now to FIG. 1 there is depicted a heat exchanger unit 10 of a particular type used in re-

sidential air conditioning systems, which unit **10** is mounted atop pad or base which is generally designated **20** and is constructed in accordance with the present invention. The base **20**, as is the normal practice, is situated on the ground **14** and is exposed to the elements remote from the structure to be cooled.

As is better seen in FIG. **2**, this particular base **20** is generally square in overall shape. Although here shown for definiteness as square other shapes, such as round or rectangular, to conform to the shape of the unit **10**, may be employed without departing from the present invention. The base **20** is pre-manufactured by being pre-casted as will be explained below.

The base **20** has an upper or top surface **22** which is generally planar or flat for receiving the unit **10**. This surface preferably has mounting bolts **24** projecting from it to receive the unit **10** and affix it to the base **20**. The bolts **24**, as are better seen in FIG. **3**, are preferably set below the surface **22** and captivated within the body of the base **20**.

Also visible on the surface **22**, as can be seen in FIGS. **1–3**, is a bubble level **26** which is also preferably captivated in the body of the base **20**. This bubble level **26** is per se old and may be of the conventional type used, for example, in static wheel balancing machines, but should contain a liquid such as alcohol that will not easily freeze. This type of level has, as is best seen in the side view of FIG. **3**, a dome-shaped top. It may be positioned anywhere on the upper surface **22** but is preferably positioned, as shown, in a corner so as to be visible after the unit **10** is affixed to the base **20**.

As best seen in FIG. **3**, the base **20** includes a generally flat bottom surface **28** for sitting on the soil and side walls **30** between the top and bottom surfaces **22** and **28**. These walls **30** are slanted or inclined outward from the top surface **22** toward the bottom surface **28** to form an angle α with a vertical plane. This particular construction aids in the manufacture of the base **20**, as will be explained below in connection with FIG. **5**, as well as in the seating of the finished pad on the ground. The angle α is preferably about 22°.

As is also best shown in FIG. **3**, and in accordance with the primary features of the present invention, the body of the base **20** is vertically stradified and includes a thin upper layer **32** adjacent to and forming the surface **22**, of essentially conventional concrete-cured mixed sand aggregate, cement, and water. The remainder zone **34** of the body of the base, in accordance with the present invention, is formed of vermiculite aggregate concrete, and includes a generally planar and horizontally extending reinforcing metal wire screen **36** which is positioned in a plane generally parallel to and about half-way between, the top and bottom surfaces **22** and **28**.

The reinforcing screen **36** is preferably expanded metal screening with diamond shaped openings bounded by metal ribbon segments slanted or angled to the plane of the screen. One suitable type of such screening is the type used as lathing in the construction of plaster interior finished room walls.

The composition and manner of making the base **20** can be illustrated by means of example with the use of the illustration of FIG. **4**. In that Figure a pan shaped forming fixture **40** is shown mounted on a "shanking" table **42**. The form **40** includes depressions **24'** and **26'** for receiving the bolts **24** and the level **26**. These latter fixtures are preferably mounted in their respective depressions in the empty form **40** by means of a removable binder such as wax. Next pre-soaked vermiculite aggregate, cement and water are mixed and poured into the form which is shaking or vibrating form, as indicated by the arrows **44**. Coloring, e.g. green, if desired may be added at this point in the process. Sand is then added, which because of its higher specific gravity than the vermiculite, will gravitate to the bottom of the form to eventually form the top layer **32** of the finished base **20**. After this, the reinforcing screen **36** is impressed into the still fluid mixture to its desired position. The outer dimensions of the screen may be sized to have it fit against the sloping side walls of the form **40** at the proper depth.

The proportioning of the dry ingredients by weight is preferably about the following: two units of vermiculite to 10 units of cement to five units of sand. By volume the vermiculite provides the bulk of the base.

As a particular example, two pounds of vermiculite plus 10 pounds of cement and five pounds of said will yield a 2 inch thick square pad about three feet by three feet of a cured weight of about 20 pounds. A similar sized base of conventional construction would weigh from four or five or more times as much.

After the base has set, it is removed from the form **40** and, preferably after curing, is dipped in silicone or wax to seal it. The only additional preparation required is to remove the protective wax from the bolts and top of the bubble level. When this is done the base is ready for installation.

As should now be clear, a new and improved ground base for heat exchanger units has been described that is lighter in weight than previous bases, easier in handling, less expensive to ship, less likely to be dropped or broken and which provides for greater sound deadening and vibration dampening than prior pads.

The ability of the vermiculite concrete bottom to adapt to shifting and slightly irregular soils without fracturing, insures a better effective use-life for the installed base. The use of the permanent bubble level, while not necessarily for the practice of the broader aspects of the present invention, provides for easy installation and will give a warning to the user of shifting soils or uneven settling of the installed base and unit. The inclined side walls, while also not necessary for the practice of the invention in its broader aspects, has the further advantages of easing removal of the base from the form and of preventing or lessening horizontal shifting of the installed base and unit.

While particular embodiments of the invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. A pre-manufactured heat exchanger unit ground base comprising:

a unitary structure having a generally parallel and generally flat top and bottom surfaces;

said structure having metal internal reinforcements positioned between its top and bottom surfaces;

said structure being composed primarily of concrete employing vermiculite as its primary, by volume, aggregate, and having said vermiculite concrete form said bottom surface and, at least, the major part of said structure's thickness above said bottom surface;

said base formed with a thin layer of hard concrete at its top surface;

said base defining inclined side walls between the marginal segments of said top and bottom surfaces which walls are inclined outward from the marginal top surface to the bottom surface, and

said base having affixed therein bolts for affixing the heat exchanger unit to said base which bolts are head mounted into said base with stems that project outwardly from said top surface.

2. The heat exchanger unit ground base as defined in claim **1**, wherein:

said base has, affixed on its upper surface, a bubble level to aid in leveling during installation of the base and of any heat exchanger unit thereon.

3. A pre-manufactured heat exchanger unit ground base comprising:

a unitary structure having a generally parallel and generally flat top and bottom surfaces;

said structure having metal internal reinforcements positioned between its top and bottom surfaces;

said structure being composed primarily of concrete employing vermiculite as its primary, by volume, aggregate, and having said vermiculite concrete form said bottom surface and, at least, the major part of said structure's thickness above said bottom surface;

said base formed with a thin layer of hard concrete at its top surface;

said concrete being formed with dry weight portions of approximately two units of vermiculite to five units of sand to ten units of cement; and

said reinforcement is a generally planar metal screen affixed generally parallel to and approximately equidistant from said top and bottom surfaces and comprising an expanded cut-and-formed metal sheet which sheet defines a plurality of small openings bounded by metal ribbon segments whose planes are inclined to the plane of the screen.

4. The ground base for a heat exchanger unit as defined in claim **3**, wherein:

said base has, affixed on its upper surface, a bubble level (**26**) to aid in leveling during installation;

said base defines inclined side walls (**30**) between the marginal segments of said top and bottom surfaces which walls are inclined outward from the marginal top surface to the bottom surface;

said base has affixed therein means (**24**) for affixing the unit to said base which means project outwardly from said top surface;

said means for affixing are bolts, head mounted into said base with stems projecting out of the top surface; and

said base is dip-sealed in a concrete sealant.

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