ABSTRACT: An evaporator support bracket for attaching a plurality of water cooler evaporator tubes to the elongated L-shaped support which is utilized to mount the evaporator within the water cooler cabinet, the bracket consisting of two mating halves which are clamped together by means of a metal screw to form a generally U-shaped member, the ends of the legs of the U-shaped member being provided with attaching means which fit within slots suitably provided in the elongated leg of the L-shaped support and which are prevented from removal therefrom except by a rotation of approximately 90° of each half of the U-shaped member.
1 EVAPORATOR SUPPORT BRACKET FOR WATER COOLERS

BACKGROUND OF THE INVENTION

1. Field of The Invention

Our invention relates to fluid dispensing devices, and more particularly to an improvement in water coolers of the type wherein an evaporator comprising a plurality of coiled evaporator tubes is mounted within the water cooler cabinet.

2. Description of The Prior Art

Inherent in the use of an evaporator as part of the refrigeration unit of a water cooler is the need to provide some type of means to mount the evaporator within the enclosure which normally comprises the cabinet of the water cooler. In accordance with the teachings of the prior art this has been most often accomplished by utilizing a plurality of support members which are first securely fastened to the evaporator, and which thereafter are suitably attached to some portion of the framework of the water cooler cabinet.

The conventional manner of securing the coiled tubes of the evaporator to the aforesaid support members is by brazing each individual coil of the tubes thereto. This in and of itself is a difficult and time-consuming task. In addition however there is added thereto the further requirements that each of the support members be properly aligned at right angles to all of the tubes secured thereto, and that each of the support members be properly positioned relative to each other around the circumference of the evaporator such that the support members will subsequently be capable of being aligned with the cooperating means located on the framework of the water cooler cabinet to which the support members are intended to be attached. Not only is this brazing operation difficult and time consuming to perform but it is also relatively expensive.

Moreover the aforesaid difficulties are further compounded when utilizing a tube-on-tube evaporator, i.e., an evaporator wherein a tube for the refrigerant is coiled externally of the coils of the tube for the water in juxtaposed relation thereto.

In manufacturing such a tube-on-tube evaporator the conventional practice has been to braze the coils of the refrigerant tube to the coils of the water tube with the coils of the latter being fastened to the support members as previously set forth hereinabove.

Although some improvements have been made in the past in the manufacture and assembly of such prior art evaporators with support members securely fastened thereto, a need has nevertheless continued to exist for a cheaper, simpler, and easier way of fastening the coils of the evaporator tubes to each of a plurality of support members.

OBJECTS OF THE INVENTION

It is therefore an object of the present invention to provide a novel and improved evaporator mounting assembly for water coolers which is simpler and easier to manufacture and assemble than alleged prior art functional equivalents.

It is another object of the present invention to provide such an evaporator mounting assembly for water coolers wherein the need for brazing all of the coils of the evaporator tubes to support members is obviated.

A still further object of the present invention is to provide such an evaporator mounting assembly for water coolers which is capable of accommodating the differing sizes of evaporators employed in water coolers of varying capacities.

Yet another object of the present invention is to provide such an evaporator mounting assembly for water coolers which represents a better quality product as well as a substantial cost saving over alleged prior art functional equivalents.

SUMMARY OF THE INVENTION

In accordance with a preferred embodiment of the present invention there is provided an evaporator mounting assembly for use in fluid dispensing devices comprising a support bracket for attaching the coils of a plurality of evaporator tubes to an elongated L-shaped support. The latter is in turn used to mount the evaporator within the enclosure of the fluid dispensing device. The bracket consists of two mating, substantially identical halves which attach to form a generally U-shaped member, the legs of which are attached to an elongated leg of the L-shaped support. The ends of the legs of this U-shaped bracket are provided with attaching means which fit within slots in the elongated leg of the L-shaped support, and the U-shaped bracket is prevented from removal from the L-shaped support except by 90° rotation of each half of the U-shaped bracket. Horizontal flanges are located on the bight portion of the U, and they are clamped together by a sheet metal screw. The evaporator tubes are positioned and supported between the elongated leg portion of the L-shaped support and the bight portion of the U-shaped bracket.

The invention will be more fully understood from the following detailed description and its scope will be pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side elevational view of a water cooler having an evaporator and a plurality of evaporator mounting assemblies in accordance with the present invention, the evaporator and the evaporator mounting assemblies being illustrated in skeleton;

FIG. 2 is a top plan view of the evaporator and evaporator mounting assemblies for the water cooler of FIG. 1 illustrated as being removed therefrom;

FIG. 3 is a side elevational view of an evaporator mounting assembly in accordance with the present invention illustrating the manner in which the coils of the evaporator tubes are clamped thereby; and

FIG. 4 is a perspective view on a slightly enlarged scale of the major components of an evaporator mounting assembly in accordance with the present invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to FIG. 1 of the drawing, the invention is shown as incorporated in a water cooler of conventional design generally designated by reference numeral 10, and which comprises a housing 11 having a top wall 12 in which there is located a basin or sink 13. A dispensing outlet or bubbler 14, attached to the top wall 12 of the housing at one side of the basin 13, is supplied with chilled water in the normal fashion by suitable means (not shown) leading from the chiller or evaporator 15 illustrated in skeleton in FIG. 1. Conventional means (not shown) are provided in a manner well known in the art for the purpose of controlling the flow of chilled water from the evaporator 15, and the dispensing of water from the bubbler 14.

By way of a brief explanation of the flow of water through the water cooler 10 to the bubbler 14, it is to be understood that in accordance with conventional practice water is normally brought from a suitable source of supply to the site of installation of the water cooler 10 by means such as a pipe leading from the city water main. The latter pipe is in turn connected by suitable means to the water inlet pipe of the water cooler through which the water normally flows to a precooler unit (not shown) and thence to the water tube 16 of evaporator or chiller 15. After being chilled to the desired temperature by the evaporator 15, the water is conducted to bubbler 14 from whence it is dispensed in response to actuation of conventional valve means (not shown).

In a manner well known in the art, a suitable refrigerant is circulated through the coils of tube 17, which is externally wrapped around water tube 16 of evaporator 15, by means of a motor-compressor-condenser unit (not shown) suitably supported within the lower portion of housing 11 of water cooler 10. The aforesaid motor-compressor-condenser unit has not been illustrated in the drawing inasmuch as the construction and operation of such units are well known to those skilled in the art and inasmuch as a showing and more complete description thereof are not deemed essential to an understanding of the instant application.
Referring now to FIGS. 3 and 4 of the drawing, the evaporator mounting bracket 18 illustrated therein includes a generally U-shaped support bracket 19 which is utilized for the purpose of attaching the respective coils of water tube 16 and refrigerant tube 17 to an elongated L-shaped support 20.

In a manner to be more fully set forth hereinafter, the L-shaped support 20 functions as a means of mounting the evaporator 15 within the housing 11 of water cooler 10.

The support bracket 19 consists of two essentially Z-shaped mating portions 21 and 22 which are identical except for their length and which when attached to each other provide the support bracket 19 with its characteristic U-shape. The end of one of the legs 23 and 24, respectively, of each of the Z-shaped mating portions 21 and 22 is provided with a pair of notches 23a, 23b, and 24a, 24b, respectively. As best seen with reference to FIG. 4 of the drawing, the notched ends of legs 23 and 24 of Z-shaped mating portions 21 and 22, respectively, fit within a pair of spaced slots 25 and 26 suitably provided in, and support brackets 20.

In order to insert the notched ends of legs 23 and 24 into the aforesaid slots 25 and 26, the Z-shaped mating portions 21 and 22 are first turned 90° with respect to their position as illustrated in FIG. 4. Inasmuch as the thickness of the Z-shaped mating portions 21 and 22 is less than the width of slots 25 and 26, the notched end of legs 23 and 24 will freely pass through the aforesaid slots 25 and 26. Thereafter, the Z-shaped mating portions 21 and 22 are rotated 90° back to the position illustrated in FIG. 4 of the drawing. By virtue of the interlocking arrangement formed by the interengagement of notches 23a and 23b of leg 23 of Z-shaped mating portion 21 with the side edges of slot 25, and the similar relationship existing between notches 24a and 24b of the leg 24 of Z-shaped mating portion 22 with the side edges of slot 26, either and/or both of the Z-shaped mating portions 21 and 22 are prevented from being removed from the elongated leg portion 20a of U-shaped support 20 except by 90° rotation of the respective Z-shaped mating portion 21 or 22.

The horizontal flanges 27 and 28 which are located respectively at the other end of each of Z-shaped portions 21 and 22 mate to form the bight portion of the U of U-shaped support bracket 19. The horizontal flanges 27 and 28 are each provided with a suitable screw hold 27a and 28a respectively which receives a metal screw 29 preferably of the threaded cutting type whereby the two Z-shaped mating portions 21 and 22 are securely clamped together. As viewed with reference to FIG. 3 of the drawing, the respective coils of water tube 16 and refrigerant tube 17 are thus positioned and supported between the elongated leg portion 20a of the L-shaped support 20 and the bight portion formed by the Z-shaped mating portions 21 and 22 of the U-shaped support bracket 19.

For purposes of assembling the evaporator mounting assembly 18 to the evaporator 15, the leg portion 20a of support 20 is positioned within the hollow of the evaporator 15 adjacent the inner surface of the water tube 16. One of the Z-shaped mating portion 21 or 22 is then attached to the elongated leg portion 20a of L-shaped support 20 in the manner previously described hereinabove. Then the L-shaped support 20 with one Z-shaped mating portion 21 or 22 attached is properly positioned in juxtaposed alignment relation to the respective coils of water tube 16 and refrigerant tube 17 of evaporator 15. Thereafter, the other Z-shaped mating portion 21 or 22 is attached to the elongated leg portion 20a of L-shaped support 20 in the manner set forth previously, and the metal screw 29 is positioned in the screw openings 27a and 28a and is tightened whereby the respective coils of water tube 16 and refrigerant tube 17 are securely fastened to L-shaped support 20. In accordance with the preferred embodiment of the invention three such evaporator mounting assemblies are positioned in equally spaced apart relation around the circumference of the evaporator 15. It will be of course be understood that a greater or lesser number of evaporator mounting assemblies could be utilized without departing from the true spirit and scope of the instant invention.

Short leg 20b of the L-shaped support 20 is provided with an opening 20c for the purpose of receiving a suitable securing member such as a metal thread cutting screw (not shown) similar to the previously described screw 29. Such a securing member 1 is employed to secure the L-shaped support 20 and thereby the evaporator 15, to which the L-shaped support 20 is attached, to the framework or other suitable component of the housing 11 of water cooler 10. As a means of compensating for any minor misalignment between the screw-receiving opening 20c in the short leg 20b of L-shaped support 20 and a corresponding opening similarly provided in the framework of the water cooler 10, the notches 23a, 23b, and 24a, 24b of legs 23 and 24 respectively of the Z-shaped mating portions 21 and 22 are of greater width than the thickness of the stock from which L-shaped support 20 is made. The notches 23a, 23b, 24a, and 24b are thus preferably dimensioned so as to provide for a slight amount of lateral adjustment of the evaporator mounting assembly 18 relative to the coils of the evaporator 15 while at the same time providing a secure attachment of the aforesaid coils to the L-shaped support 20.

Thus, in accordance with the present invention there has been provided an evaporator mounting assembly for water cooler evaporator units including a U-shaped support bracket and an L-shaped support member. This assembly is simpler to manufacture and easier to assemble than prior art utilized for similar purposes. In addition the evaporator mounting assembly of the instant invention obviates the need for brazing all of the coils of the evaporator tubes to the L-shaped support member thereby reducing substantially the time and cost of utilizing the subject evaporator mounting assembly for its intended purposes. Further, the subject evaporator mounting assembly is capable of accommodating differing sizes of evaporators which are required for water coolers of varying capacities. Finally the evaporator mounting assembly disclosed herein has proven both in tests and under service conditions to be a better quality product than that which had previously been used by the prior art for similar purposes.

While only one embodiment of our invention has been shown, it will be appreciated that many modifications thereof may readily be made by those skilled in the art. For example if so desired, the water tube 16 may be tacked brazed to the elongated leg portion 20a of L-shaped support 20 at the start and finish of the winding of the tube and/or the refrigerant tube 17 at the start and finish of its winding may be tacked brazed to the water tube 16. We therefore intend by the appended claims to cover the above modifications as well as all other modifications.

We claim:
1. An evaporator mounting assembly for evaporators of fluid dispensing devices comprising:
a. support means for mounting an evaporator within a fluid dispensing device;
b. said support means comprising an L-shaped support member having an elongated leg portion and a short leg portion extending at substantially right angles to each other;
c. a support bracket for attaching said evaporator to said support means;
d. said support bracket comprising a pair of substantially identical mating portions, each of said substantially identical mating portions having attaching means at one end thereof and fastener receiving means at the other end thereof;
e. said elongated leg portion of said L-shaped support member having a pair of elongated spaced slots therein for receiving said attaching means of said substantially identical mating portions of said support bracket to secure said support bracket to said support means, said bracket and said support means when secured together defining a space therebetween in which is positioned a portion of said evaporator;
f. a fastener positioned in said fastener receiving means of said substantially identical mating portions to clamp said
substantially identical mating portions together and thereby securely fasten said evaporator to said support means; and

2. An evaporator mounting assembly for evaporators of fluid dispensing devices as set forth in claim 1 wherein said pair of substantially identical mating portions are each of a substantially Z-shaped configuration comprising a first generally planar portion adjacent one end, a second generally planar portion adjacent the other end, and a generally planar intermediate portion interconnecting said first and second planar portions.

3. An evaporator mounting assembly for evaporators of fluid dispensing devices as set forth in claim 2 wherein:
   a. each of said attaching means comprises a pair of notches located adjacent the end of said first planar portion; and
   b. each of said fastener receiving means of said substantially identical mating portions comprises a screw hole located adjacent the end of said second planar portion.

4. An evaporator mounting assembly for a hollow evaporator of a water cooler comprising:
   a. an L-shaped support member having an elongated leg portion and a short leg portion extending at substantially right angles to each other, said elongated leg portion having a pair of elongated slots therein and said short leg portion having fastener receiving means for receiving a fastener to mount said evaporator within said water cooler, said elongated leg extending axially through the hollow of the evaporator;
   b. a generally U-shaped support bracket comprising a pair of substantially identical mating portions of substantially Z-shaped configuration, each of said pair of substantially identical mating portion adjacent comprising a first generally planar portion adjacent one end, a second generally planar portion adjacent the other end, and a generally planar intermediate portion interconnecting said first and second planar portions;
   c. each of said pair of substantially identical mating portions having attaching means in said first generally planar portion and fastener receiving means in said second generally planar portion;
   d. said attaching means cooperating with said pair of elongated slots in said elongated leg portion of said L-shaped support member to secure said U-shaped support bracket to said L-shaped support member, said U-shaped bracket being external to said evaporator such that said U-shaped bracket and L-shaped support when secured together surround a portion of said evaporator; and
   e. a fastener positioned in said fastener receiving means of said pair of substantially identical mating portions to clamp said pair of substantially mating portions together and thereby securely fasten said evaporator to said L-shaped support member.

5. An evaporator mounting assembly for a hollow evaporator of a water cooler as set forth in claim 4 wherein:
   a. each of said attaching means comprises a pair of notches located adjacent the end of said first planar portion; and
   b. each of said fastener receiving means of said pair of substantially identical mating portions comprises a screw hole located adjacent the end of said second planar portion.
UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,544,049 Dated December 1, 1970

Inventor(s) Norman R. Brown, Mitchell J. Koziara and Franklin Ribble

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 65, the first occurrence of "is" should be canceled.
Column 3, line 71, the first occurrence of "be" should be canceled.
Column 4, lines 46 & 47, after the second occurrence of "modifications", -- which fall within the true spirit and scope of our invention -- should be inserted.

Column 6, line 3, "portion adjacent" should read --portions --.

SIGNED AND SEALED
MAR 16 1971

Mar 16, 1971

(SEAL)

Attest:
Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents