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AIR CONDITIONING APPARATUS

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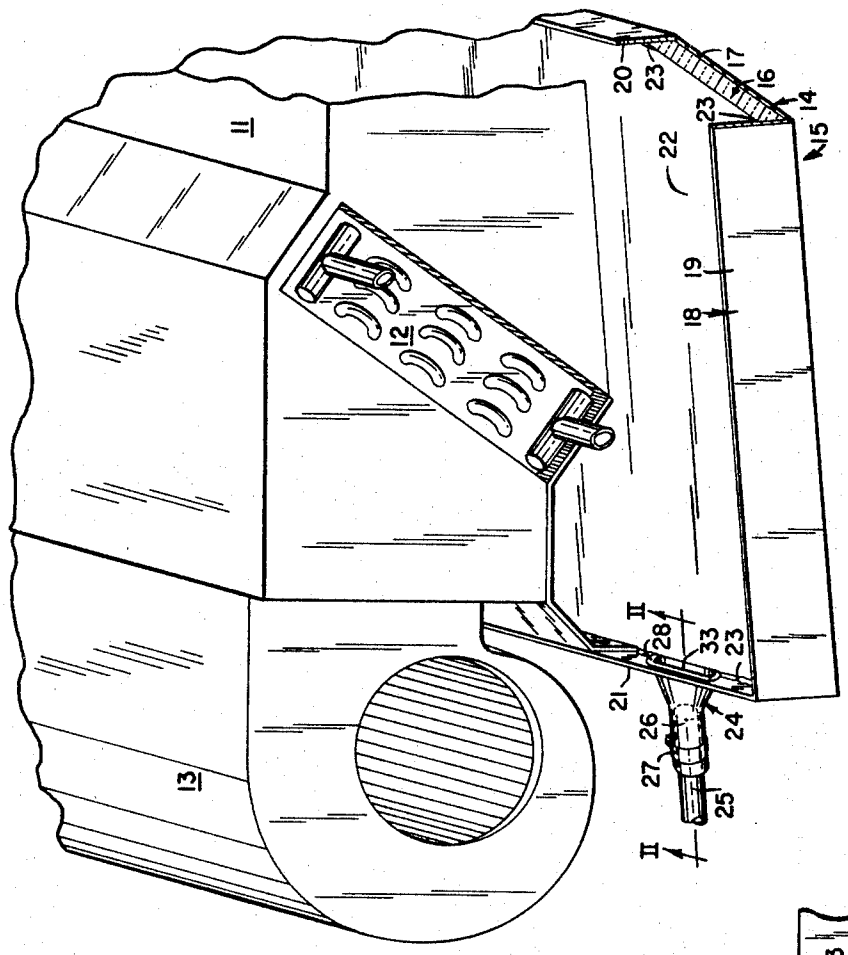

FIG. 1

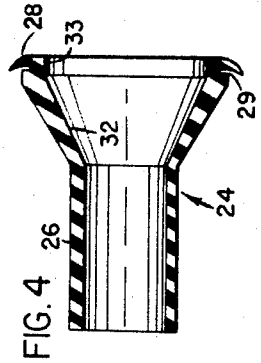

FIG. 4

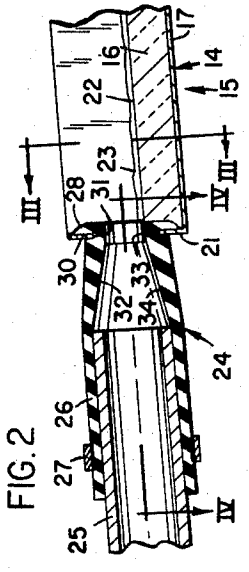

FIG. 2

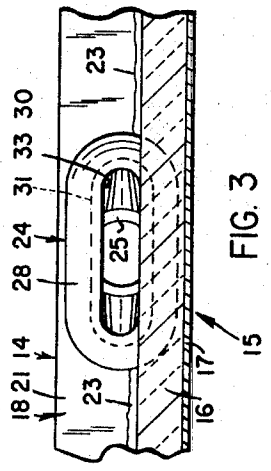

FIG. 3

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AIR CONDITIONING APPARATUS

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ABSTRACT OF THE DISCLOSURE

Drain assembly for use with an air conditioning unit including a container in which a bottom plate of lower thermal conductivity than the container is sealingly connected in the container for preventing moisture from contacting and chilling the bottom wall of the container and a drain fitting having a horizontally elongated port is attached to the container.

This invention relates to a drain assembly for use with an air conditioning unit and more particularly, to a drain assembly for disposing of moisture such as condensate dripping from the unit.

Dripping of moisture has been a common problem in various types of air conditioning installations. Drain pans for disposing of this moisture may be provided but since the moisture flowing from the pan through a drain pipe and connecting fitting is often below the dew point of ambient atmosphere, condensate often results at the juncture of the fitting and the pan and causes undesirable dripping. Another difficulty often encountered in installing air conditioning units is that of aligning the drain pipe with the drain assembly.

Summary of the invention

This invention relates to a drain assembly for use with an air conditioning unit, said assembly being adapted to dispose of moisture from a portion of the unit, comprising a container attached to an air conditioning unit to receive said moisture, said container including four side walls sealingly interconnected, said side walls having relatively high thermal conductivity, a drain fitting having thermal conductivity substantially lower than said walls and including an attaching portion at one end mounted on one of said walls and at an opposite end a generally tubular portion adapted to receive a drain pipe, said fitting having a drain passage extending through said tubular portion and said one wall and opening into said container thereby substantially preventing conduction of sufficient heat through said fitting for the formation of condensate on said fitting or said walls about said fitting when the temperature of said moisture is below the dew point of ambient air, said attaching portion having a horizontally elongated port opening into said container and said drain passage extending through said port thereby substantially preventing matter deposited in said port affecting water level in said container, said container including a bottom wall sealingly connected to said side walls and a bottom plate having relatively lower thermal conductivity than said side walls and fitting against and substantially over the entire surface of said bottom wall between said side walls and providing an inner bottom surface of the container, and sealing material having low thermal conductivity extending completely around the periphery of said bottom plate and sealingly engaging said bottom plate and said sidewalls for substantially preventing said moisture contacting and chilling said bottom wall.

It is a primary object of this invention to provide a new and improved drain assembly in an air conditioning unit. More specifically, it is an object of this invention to

provide such a drain assembly including a drain fitting to facilitate alignment and connection of the air conditioning unit to the building drain pipe system, and substantially prevent condensate on the unit drain assembly resulting from cold moisture passing through the fitting.

Another object of this invention is to provide a new and improved fitting which is flexible and of low heat conductivity to facilitate connection with a pipe and substantially prevent sufficient conduction of heat through the fitting to result in the formation of condensate when fluid passing through the fitting is below the dew point of ambient atmosphere.

These and other objects and advantages of the invention will be apparent from the following description and the accompanying drawing in which:

FIGURE 1 is a fragmentary perspective view of an air conditioning unit embodying features of the invention;

FIGURE 2 is an enlarged, fragmentary vertical sectional view taken generally along II—II in FIGURE 1;

FIGURE 3 is a fragmentary sectional view taken generally along the line III—III in FIGURE 2; and

FIGURE 4 is a sectional view of the fitting shown separately, but as if taken on the line IV—IV in FIGURE 2.

Referring to FIGURE 1 of the drawings, an air conditioning unit includes a casing **11** containing a fin-coil cooling unit **12** through which air is forced by blower means **13** to cool the air which then passes to a space having a cooling requirement.

During operation of the unit, condensate may form on portions of the unit such as the casing **11** and the cooling unit **12** and drip into a container **14** of a drain assembly **15** below the casing. The body of the container **14** is preferably galvanized iron or steel and therefore has a high thermal conductivity coefficient, for example 27.0. Insulating material, such as a half-inch rigid plate **16** of expanded polyurethane foam rests on a bottom wall **17** of the container **14** in tight engagement with a side wall **18**, including opposed end walls **19**, only one being shown, a front wall **20** and opposed thereto a rear wall **21**. The side wall **18** extends above an inner bottom surface **22** of the container **14** provided by the top face of the plate **16**. The insulating plate **16** prevents formation of condensate on the outside of the bottom wall **17** and lower part of the side wall **18**. A bead **23** of suitable flexible adhesive sealant or caulking material which may be a synthetic rubber sealer such as Permalastic Product Company, sealer XM–916 HV, is provided at the seam between the plate **16** and the side wall **18** for substantially preventing water seepage into the seam between the insulating material and the bottom wall **17**. The bead **23** extends up the side wall **18** from the plate **16** so that water in the container does not contact the walls, and when the drain assembly is operatively positioned in the unit, the bottom surface **22** declines from the front wall **20** to the rear wall **21** so that moisture collecting in the container flows against the bead **23** along the rear wall and through a flexible drain fitting **24** into a drain pipe **25** for disposal in any suitable manner.

A tubular end portion **26** of the fitting **24** telescopically receives the drain pipe **25** and a hose clamp **27** is tightened about the tubular portion **26** to secure the pipe in place. At an opposite end of the fitting **24**, a horizontally elongated attaching portion **28** has a continuous peripheral groove **29** (FIGURE 4) snugly receiving an edge portion **30** (FIGURE 2) of the rear wall **21** about a horizontally elongated aperture **31** in this wall, to form a liquid tight mounting of the fitting **24** on the container **14**. A drain passage **32** extends through the tubular portion **26** and a horizontally elongated port **33** in the attaching portion **28** has a lower surface **34** which, at the port **33**, is

substantially even with the inner bottom surface 22 of the container, so that moisture does not build up in the container but may flow through the drain passage into the drain pipe 25. By providing the horizontally elongated port 33, partial blockage of the port by material deposited therein has practically no effect in increasing the water level in the container and the lower surface 34 of the drain passage 32 is inclined appreciably downwardly from the port 33 to the tubular portion 26 so that any foreign material collecting in the port is washed downwardly to a lower elevation than the port, and thus further effectively prevents blocking the port and drain passage sufficiently to raise the water level in the container.

The drain fitting 24 is a suitable flexible material for facilitating alignment of the fitting with the drain pipe 25 and has a relatively lower thermal conductivity than the wall 18 for substantially preventing the formation of condensate on the fitting and adjacent portion of the rear wall 21 when the temperature of water passing through the fitting is below the dew point of ambient air. By way of example, a suitable material is neoprene compound ASTM SC 615 BCF 1, to meet the requirements of ASTM specification D-735 having a thermal conductivity coefficient of .112. In the event that a metal drain pipe 25 is used, it may be insulated to prevent condensate forming thereon.

In assembling the drain assembly 15, the fitting groove 29 is seated about the rear wall aperture 31 and the insulating plate 16 is then inserted into the container body and deforms about the fitting attaching portion 28 to conform to and tightly engage the fitting. If desired, a small amount of caulking material may be applied along the seam between the insulating plate and the fitting, suitable care being taken to maintain the caulking material even with the bottom surface of the container for free flow of water from the container 14 into the drain passage 32.

While a preferred embodiment of the invention has been described and illustrated, it should be understood that the invention is not limited thereto but may be otherwise embodied within the scope of the following claims.

We claim:

1. A drain assembly for use with an air conditioning unit, said assembly being adapted to dispose of moisture from a portion of the unit, comprising a container attached to an air conditioning unit to receive said moisture, said container including four side walls sealingly interconnected, said side walls having relatively high thermal conductivity, a drain fitting having thermal conductivity substantially lower than said walls and including an attaching portion at one end mounted on one of said walls and at an opposite end a generally tubular portion adapted to receive a drain pipe, said fitting having a drain passage extending through said tubular portion and said one wall and opening into said container thereby substantially preventing conduction of sufficient heat through said fitting for the formation of condensate on said fitting or said walls about said fitting when the temperature of said moisture is below the dew point of ambient air, said attaching portion having a horizontally elongated port opening into said container and said drain passage extending through said port thereby substantially preventing matter deposited in said port affecting water level in said container, said container including a bottom wall sealingly connected to said side walls and a bottom plate having relatively lower thermal conductivity than said side walls and fitting against and substantially over the entire surface of said bottom wall between said side walls and providing an inner bottom surface of the container, and sealing material having low thermal conductivity extending completely around the periphery of said bottom plate and sealingly engaging said bottom plate and said side walls for substantially preventing said moisture contacting and chilling said bottom wall.

2. A drain assembly for use with an air conditioning unit, said assembly being adapted to dispose of moisture from a portion of the unit, comprising a container attached to an air conditioning unit to receive said moisture, said container including four side walls sealingly interconnected, said side walls having relatively high thermal conductivity, a drain fitting having thermal conductivity substantially lower than said walls and including an attaching portion at one end mounted on one of said walls and at an opposite end a generally tubular portion adapted to receive a drain pipe, said fitting having a drain passage extending through said tubular portion and said one wall and opening into said container thereby substantially preventing conduction of sufficient heat through said fitting for the formation of condensate on said fitting or said walls about said fitting when the temperature of said moisture is below the dew point of ambient air, said container including a bottom wall sealingly connected to said side walls and a bottom plate having relatively lower thermal conductivity than said side walls and fitting against and substantially over the entire surface of said bottom wall between said side walls and providing an inner bottom surface of the container, one of said side walls having an aperture, said attaching portion having a substantially continuous peripheral groove receiving said one wall about said aperture to connect said fitting and said one wall, said attaching portion having a horizontally elongated port opening into said container and said drain passage extending through said port and having a lower surface generally coplanar with said bottom surface at said port thereby substantially retarding matter blocking said port, and said lower surface declining from said port toward said tubular connecting portion for the passage of any said matter away from said port and to a lower elevation than said port so that moisture may drain freely from said container, said fitting being flexible to facilitate alignment of said tubular portion and said drain pipe and to receive a hose clamp about said tubular portion for securing the drain pipe to the fitting, and sealing material having low thermal conductivity extending completely around the periphery of said bottom plate and sealingly engaging said bottom plate and said side walls for substantially preventing said moisture contacting and chilling said bottom wall.

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