

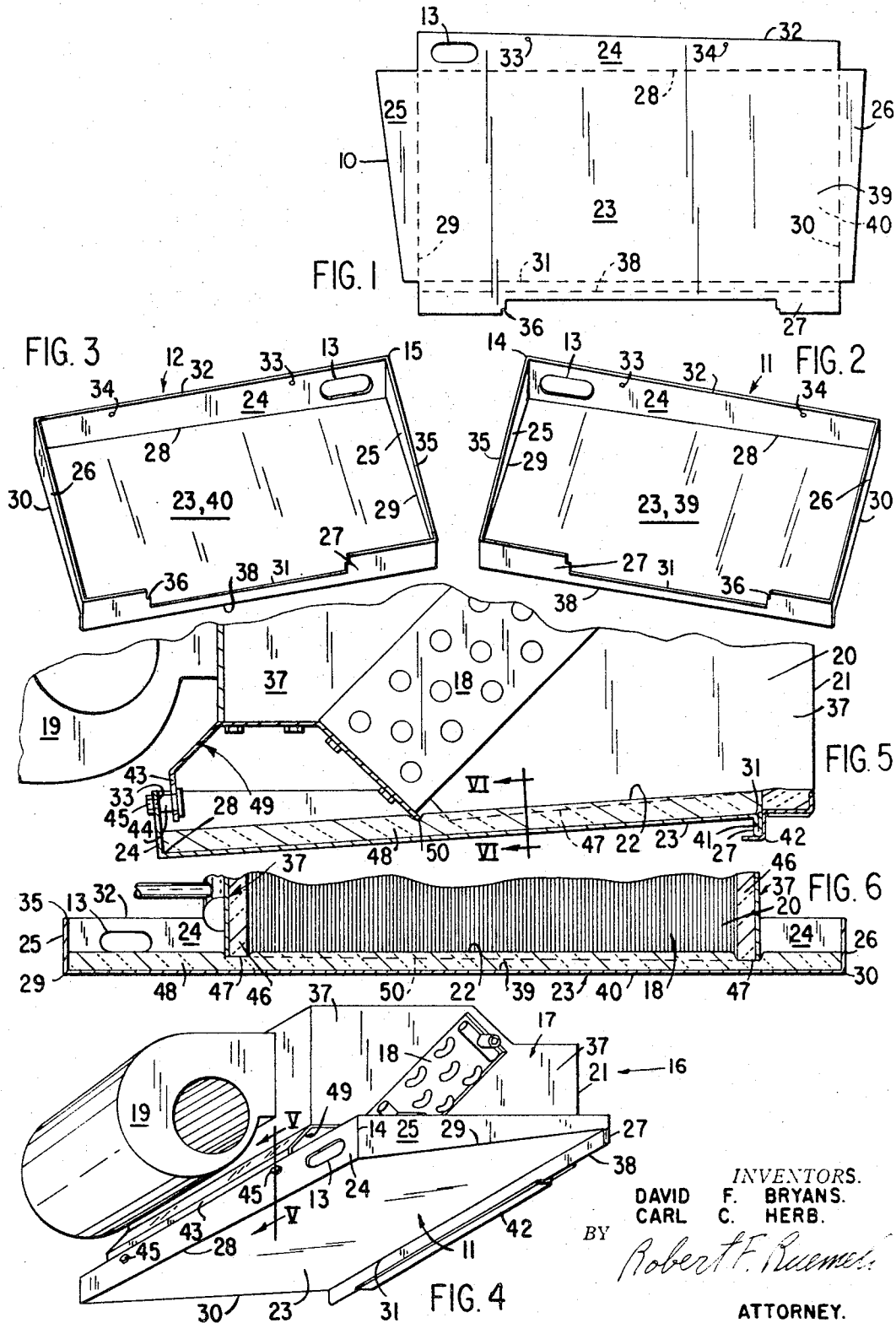
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AIR CONDITIONING EQUIPMENT

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AIR CONDITIONING EQUIPMENT

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ABSTRACT OF THE DISCLOSURE

A drain pan for an air conditioning unit adapted for right or left hand draining according to the direction that portions of the drain pan blank are bent.

This invention relates generally to an article of manufacture and, more particularly, to a drain pan for use in an air conditioning unit and to a blank for forming the drain pan.

Many air conditioning units include drain pans for catching moisture such as condensate which may drip from portions of the unit. These pans are often provided with drain connections so that the collected liquid may be removed from the pan. The drain connection is often preferably in a lower corner of the pan and the bottom of the pan is pitched downwardly to this corner for the flow of the liquid through the drain connection. In order to provide pans with the drain connection in either of opposite corners it has often been necessary to provide considerable duplication of tooling for forming the required blanks and then the pan. The extra tooling may be a considerable expense in the finished unit.

An object of this invention is to provide a new and improved drain pan for an air conditioning unit. A related object is provision of such a pan formed with a bottom wall which flexes as the pan is operatively mounted, in order to provide a downward pitch toward a drain connection at a corner of the pan.

Another object is to provide a new and improved blank for forming a drain pan. A related object is provision of such a blank which may be formed into a drain pan having a drain connection in either of opposite corners of the pan.

The invention contemplates a drain pan blank having flaps which may be bent in either of opposite directions to form sides of the pan, and in which a drain connection may be located in either of two opposite corners of the pan depending on the direction in which the flaps are bent. Mounting means are formed in the blank to permit flexing the bottom of the pan to provide a downward pitch toward the drain connection as the pan is operatively mounted.

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 plan view of a blank for forming a drain pan;

FIGURE 2 is a perspective view of the blank of FIGURE 1 folded in a first manner to provide a drain pan having a drain connection at a first of opposite corners;

FIGURE 3 is a perspective view of the blank of FIGURE 1 folded in a manner opposite that of FIGURE 2 to provide the drain connection at a second of the opposite corners;

FIGURE 4 is a perspective view looking upwardly at an air conditioning base unit including the drain pan of FIGURE 2;

FIGURE 5 is an enlarged, fragmentary, vertical sectional end view taken generally along lines 5-5 in FIGURE 4; and

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FIGURE 6 is a fragmentary, sectional front view taken generally along lines 6-6 in FIGURE 5.

Referring to FIGURE 1 of the drawing, a flexible galvanized steel sheet metal blank 10, for example, may be formed into either of the drain pans 11 or 12 shown in FIGURES 2 or 3, respectively. In FIGURE 2 a drain opening 13 is at one corner 14 of the pan and in FIGURE 3 the drain opening is at an opposite corner 15. An air conditioning unit in the form of a room terminal base unit 16 is shown in FIGURE 4 and includes a sheet metal casing 17 which mounts a chilled water coil 18 and a blower 19 for circulating air through a passage 20 (FIGURE 5) in the base unit and across the coil for discharge through an outlet portion 21 of the base unit from which the cooled air passes to the space having a cooling requirement. In the illustrated base unit, the pan 11 of FIGURE 2 is detachably secured to the casing 17 with the drain opening 13 at the left side of the unit. The drain opening 13 is adapted to receive a suitable drain fitting (not shown). The pan 11 provides a bottom wall 22 (FIGURES 5 and 6) of the air passage 20 as well as a means for receiving condensate dipping from other portions of the base unit 16, such as the coil 18.

The blank 10 shown in FIGURE 1 includes a rectangular, flat center section 23 and a first flap 24, second flap 25, third flap 26 and a fourth flap 27 on the four sides of the center section. These flaps are separated from the center section by generally straight first second, third and fourth imaginary boundaries or fold lines 28, 29, 30, and 31, respectively. The second and third flaps 25 and 26 are opposite each other with ends adjacent opposite ends of the first flap 24. The fourth flap 27 is formed by an edge portion of the blank opposite the first flap 24. An outer edge 32 of the first flap is skewed relative to the first fold line 28 and an elongated aperture generally parallel to this edge forms the drain opening 13 in an end of the first flap adjacent the second flap 25 at which the skewed edge 32 is farthest from the fold line 28. A pair of mounting holes is provided along this edge and these holes 33 and 34 are substantially equally spaced from the edge 32 so that the hole 33 is farther from the fold line 28 than the hole 34. An outer edge 35 of the second flap 25 is skewed relative to its fold line with the portion of this edge farthest from the fold line 29 adjacent the first flap 24 and the drain opening 13. The fourth flap 27 has a notch 36 to receive opposite end walls 37 of the casing 17 and has an intermediate fold line 38 generally parallel to the fold line 31 separating this flap from the center section 23 of the blank.

The center section 23 of the blank 10 has opposite faces, and as illustrated in FIGURE 1, an upper face 39 and a lower face 40. The four flaps 24-27 may be folded about their respective fold lines 28-31 in a first manner to form four sides in which the center section 23 forms the bottom wall of the pan and its upper face 39 forms a top surface of the pan bottom wall 23 with the drain opening 13 in the upper left-hand corner 14 of the pan as viewed in FIGURE 2. Alternatively, the flaps 24-27 may be folded about their respective fold lines 28-31 in the opposite direction so that the center section lower face 40 forms the upper surface of the bottom wall 23 of the pan and the drain opening 13 is in the upper right-hand corner 15 of the pan as shown in FIGURE 3. More particularly, as shown in FIGURE 2, the first flap 24, second flap 25, and third flap 26 are folded upwardly from the position shown in FIGURE 1, and the fourth flap 27 is folded downwardly about its fold line 31 and upwardly about its intermediate fold line 38 to form the return portion shown in FIGURE 5, thus providing a front edge portion 41 of the pan. The flaps enclose the upper face 39 of the center section.

All flaps are generally normal to the center section or bottom wall 23 and ends of adjacent flaps are brazed or otherwise suitably connecting to form strong, liquid-tight rear corners, as 14 in FIGURE 2 and 15 in FIGURE 3. The pan shown in FIGURE 3 is formed in a similar manner but with the flaps folded to enclose the lower face 40 of the bottom wall 23. Thus, the blank shown in FIGURE 1 may be utilized to form a drain pan 11 or 12 having a drain opening 13 in either of opposite corners.

The drain pan 11 has its front edge portion 41 supported on a generally horizontal L-shaped flange 42 (FIGURE 5) depending from the outlet portion 21 of the casing so that the bottom wall 23 is horizontal along the fourth flap 27 when the base unit 16 is operatively installed. A generally vertical flange 43 opposed to the L-shaped flange 42 has a pair of generally horizontal aligned and spaced nuts 44 suitably secured to the flange as by brazing. The nuts 44 extend through horizontally aligned holes in the flange 43 and outwardly from this flange toward the first flap 24 to receive bolts 45 extending through each of the mounting holes 33 and 34 in the first flap 24. The holes 33 and 34 in the first flap 24 are spaced equal distances from the first flap skewed edge 32 and therefore unequal distances from the first flap fold line 28, and the L-shaped flange 42 and the vertical flange 43 are so positioned that with the mounting bolts 45 in place, the pan bottom wall 23 is pitched downwardly toward the drain opening 13 from the third flap 26 and the horizontal portion of the bottom wall along the fourth flap 27.

The opposite end walls 37 of the casing 17 have their inner surfaces covered with suitable insulation 46 and have generally parallel bottom edges 47 which indent to different depths a pliable or crushable insulating plate 48 (FIGURE 6) on the bottom wall 23 and provide seals along the air passage 20 through the base unit 16. A coil support 49, which includes the vertical mounting flange 43 for the drain pan, has a bottom edge 50 opposite this flange and this edge similarly indents the insulating plate 48 to provide a seal between the bottom of the coil 18 and the plate 48 and with the end walls 37 holds the plate 48 in place pitched with the bottom wall 23 of the pan toward the drain opening 13 and holds the plate against the bottom wall.

When it is desired that the drain opening 13 be on the opposite side of the base unit 16, the pan 12 shown in FIGURE 3 is utilized in lieu of the pan 11 shown in FIGURE 2. In either event, the first flap edge 32 and second flap edge 35 are skewed relative to their respective fold lines 28 and 29 so that they are horizontal when the drain pans 11 or 12 and base unit 16 are operatively installed, and facilitate the use of a common bubble level on these edges in order to obtain proper positioning of the base unit.

In installing either of the pans 11 or 12, the edge portion of the bottom wall 23 along the fold line 31 and the fourth flange 27 is seated on the L-shaped flange 42 with the fourth flange notch 36 embracing the end walls 37 to center the pan. The mounting bolts 45 are inserted through the pair of holes 33 and 34 in the first flap 24 and are tightened into the nuts 44 on the

vertical flange 43 of the coil support 49, thus automatically pitching the bottom wall 23 of the pan toward the drain opening 13 when the skewed edges 32 and 35 are leveled.

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 sheet metal condensate drain pan for an air conditioning unit including:

a flat flexible section forming a bottom wall of said pan, said bottom wall having opposite faces,

first, second and third flaps extending from said flat section and delimited therefrom by generally straight first, second and third fold lines respectively, said flat section having an edge portion opposite said first flap, said second and third flaps being opposite each other and adjacent said first flap, said flaps extending outwardly in the same general direction about said fold lines past one of said faces to enclose the last said face to form sides on said pan, the adjacent ends of said flaps being joined to provide liquid tight corners at opposite ends of said first flap,

drain means at the corner including said second flap for draining liquid from said pan, said drain means being located in either of said corners depending on the bottom wall face enclosed by said flaps,

means associated with said first flap for operatively mounting said pan with said bottom wall pitched downwardly toward said drain means, said mounting means being adapted for cooperation with generally horizontally aligned mounting portions on the air conditioning unit whereby said first and second fold lines are inclined downwardly toward said drain means while said edge portion is maintained substantially horizontal.

2. A drain pan according to claim 1 in which said first and second flaps each has an upper edge generally coextensive with, and askew of, the respective fold lines with the ends of said edges farthest from the respective fold line being adjacent the other of said first and second flaps, said edges being skewed such that they are substantially level when the pan is operatively mounted, to facilitate properly pitching the pan.

3. A drain pan according to claim 2 wherein said mounting means includes a pair of holes formed in said first flap, said holes being equidistant from the edge of said flap for alignment with the generally horizontally aligned mounting portions, and said drain means includes at least a hole in said first flap proximate said second flap for passage of liquid therethrough.

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