Jan. 25, 1966 A. D. GOETTL 3,231,247

EVAPORATIVE COOLER CONSTRUCTION

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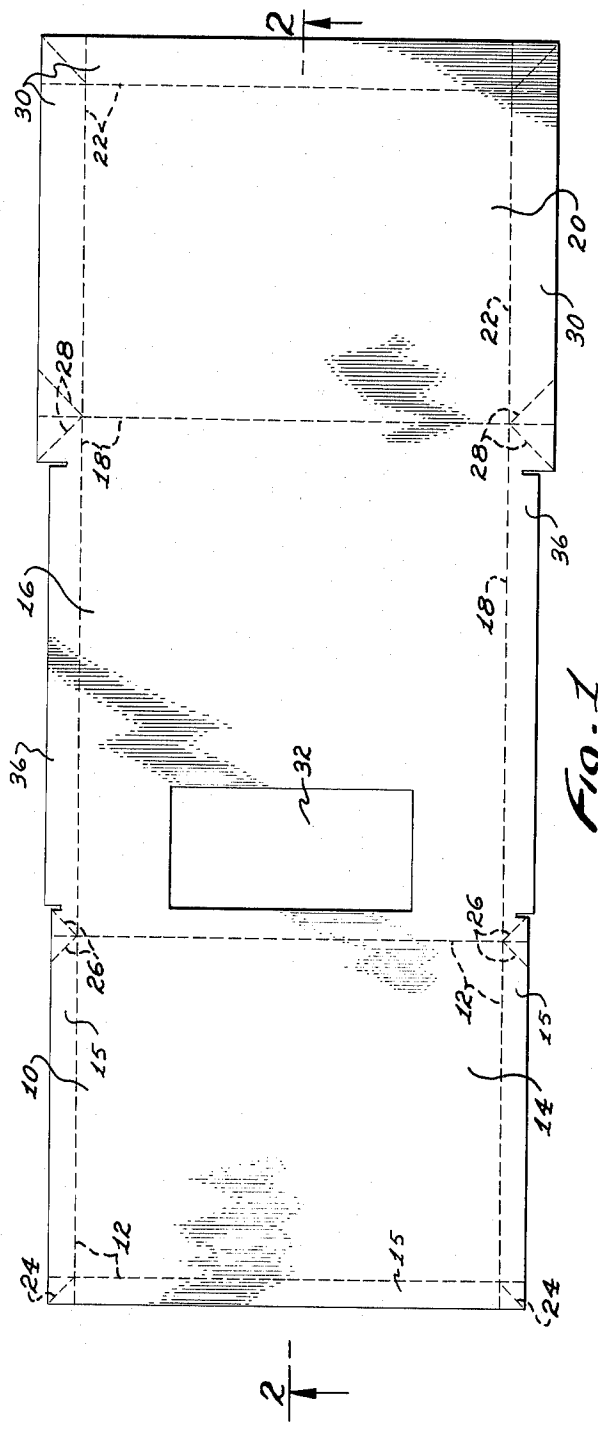


Fig. 1

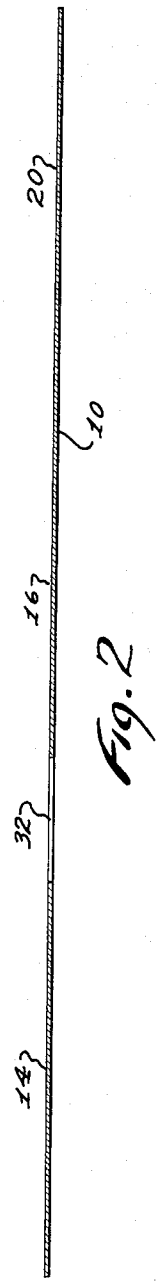


Fig. 2

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EVAPORATIVE COOLER CONSTRUCTION

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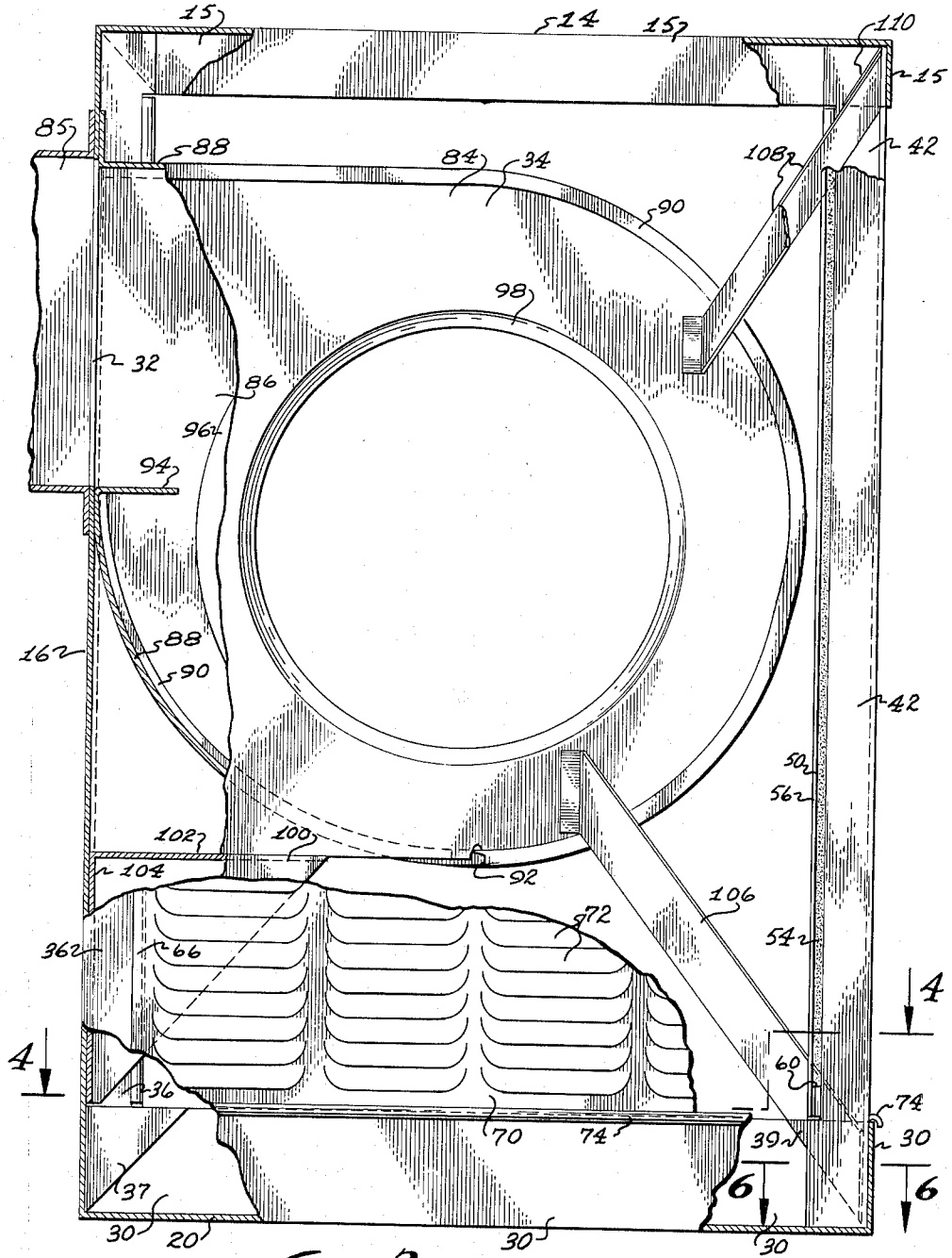


Fig. 3

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EVAPORATIVE COOLER CONSTRUCTION

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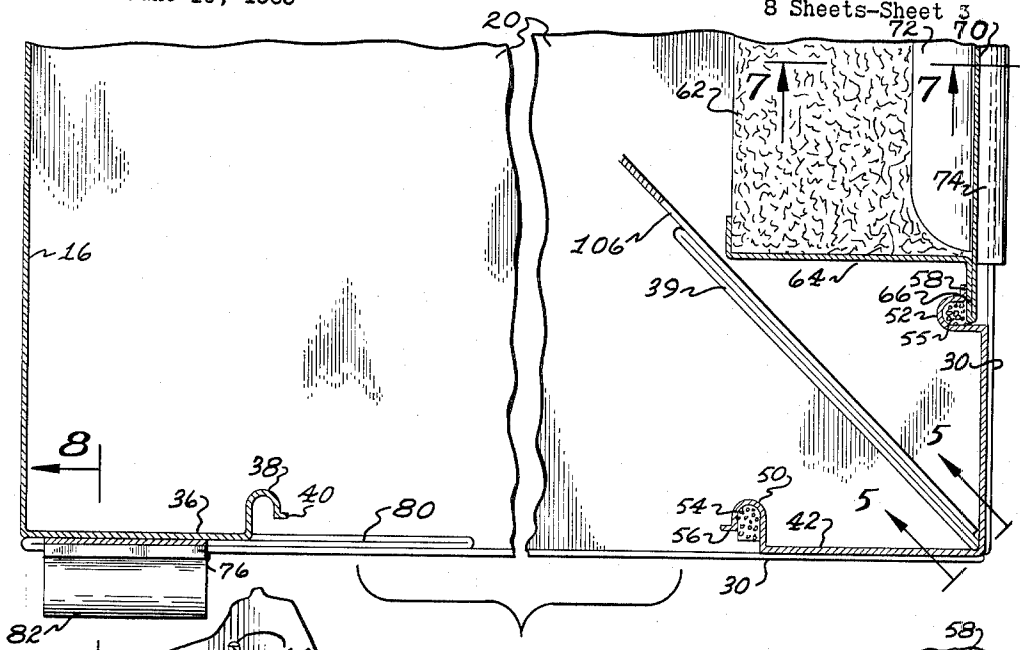


Fig. 4

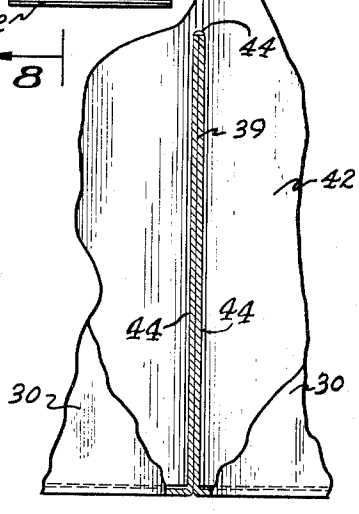


Fig. 5

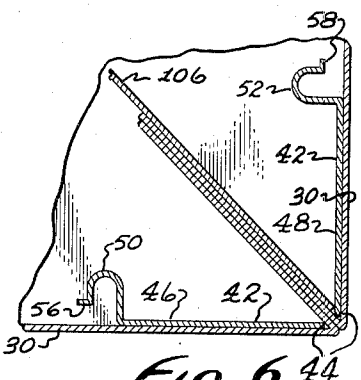


Fig. 6

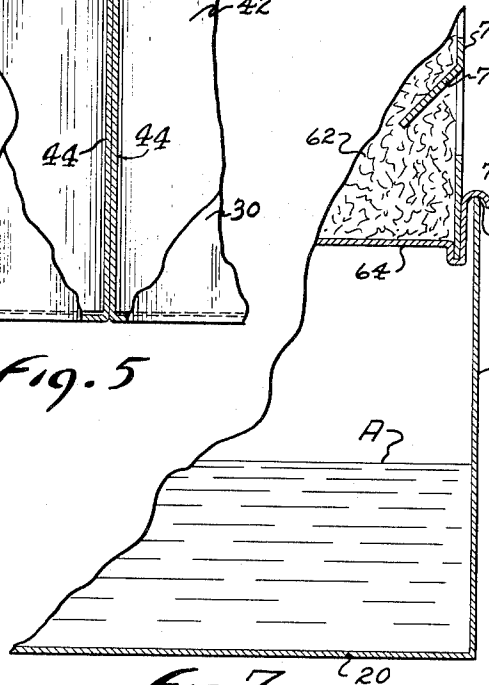


Fig. 7

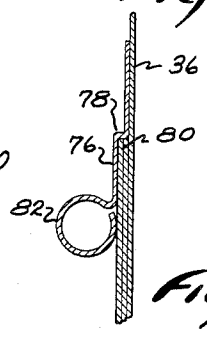


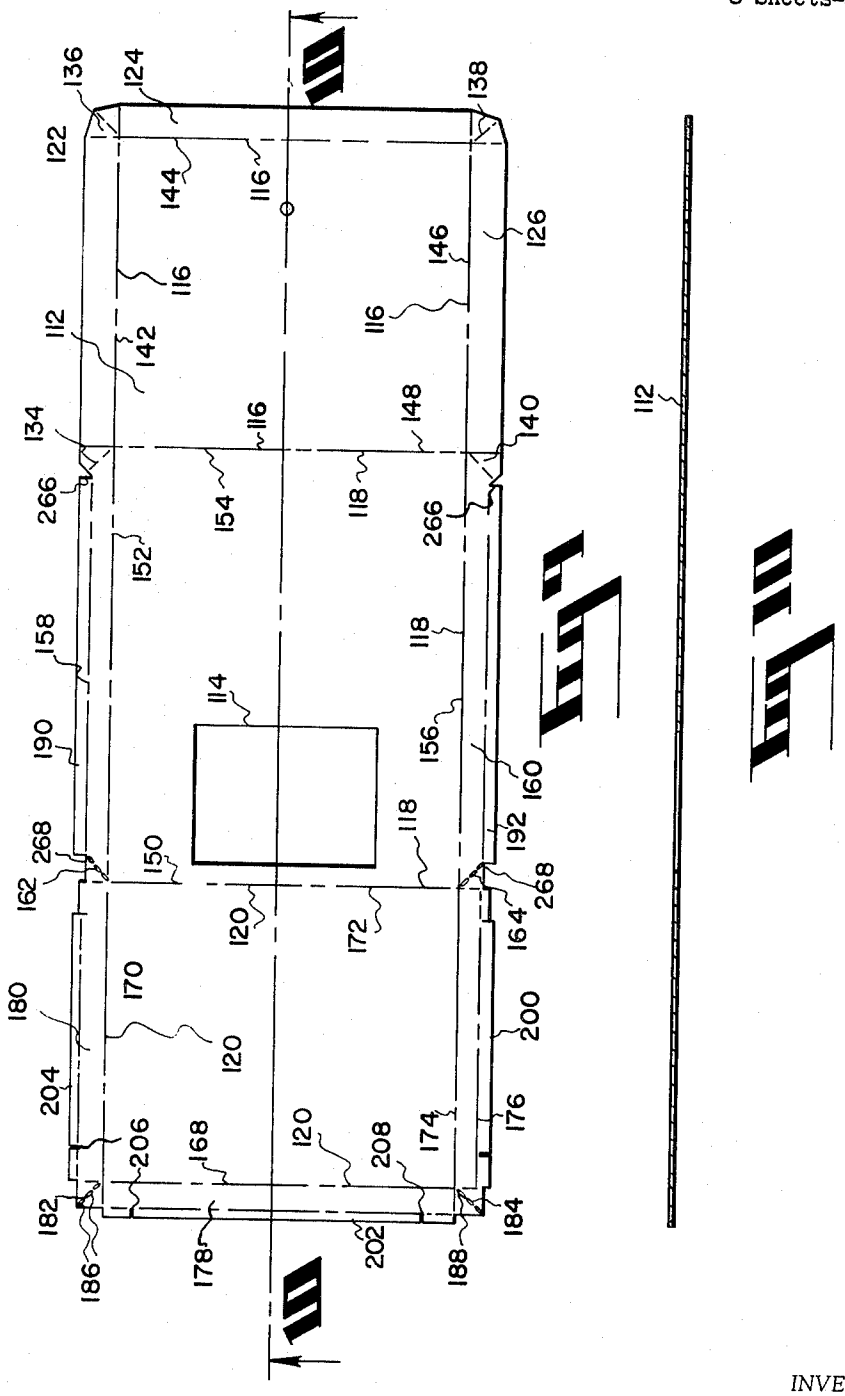
Fig. 8

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EVAPORATIVE COOLER CONSTRUCTION

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EVAPORATIVE COOLER CONSTRUCTION

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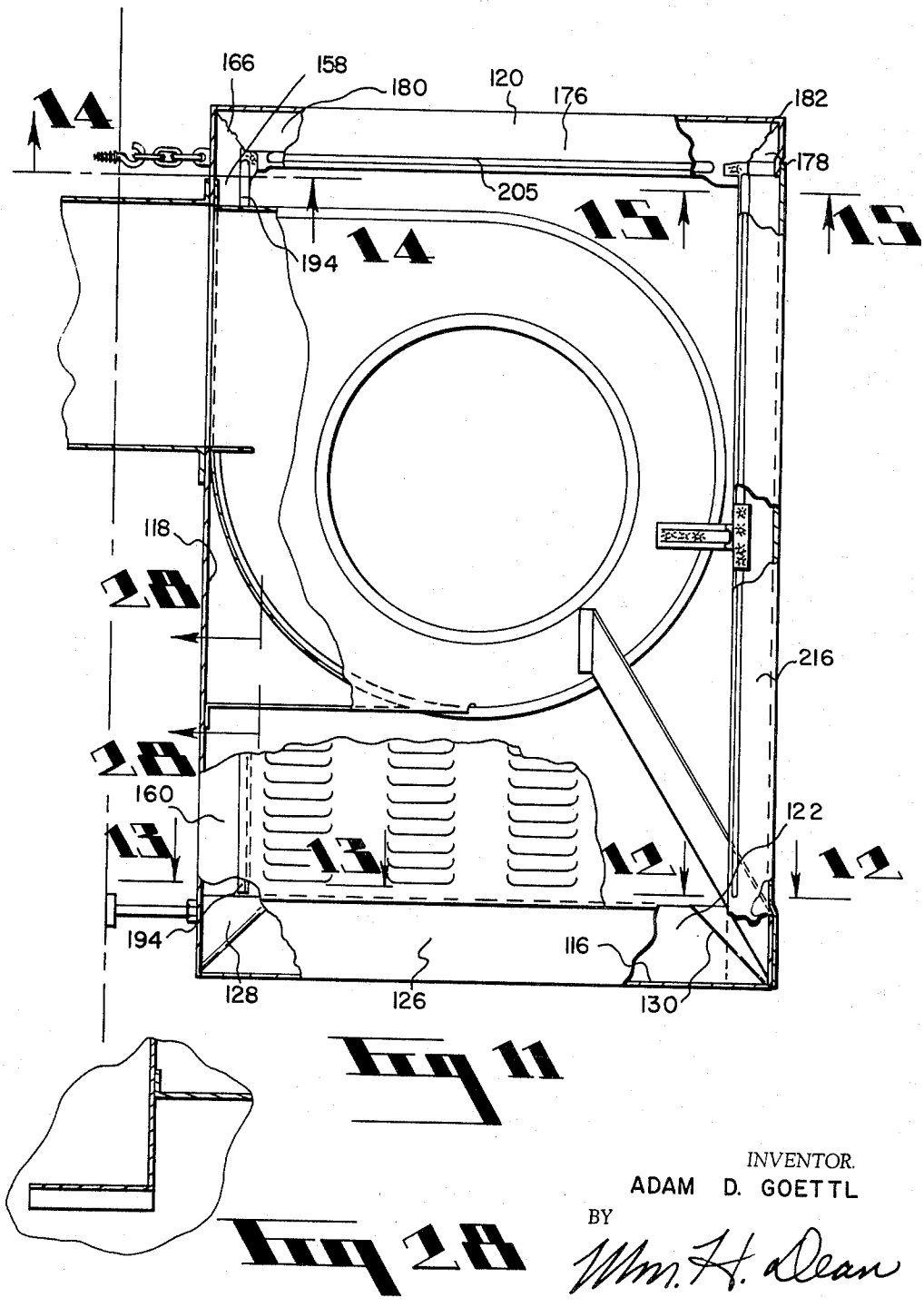


Fig 11

Fig 28

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EVAPORATIVE COOLER CONSTRUCTION

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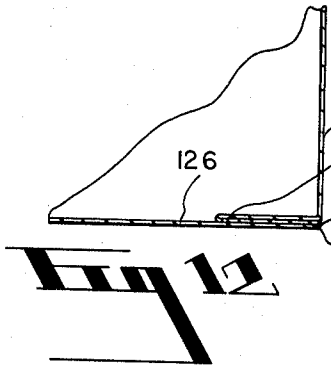


Fig 12

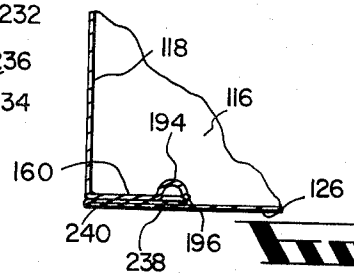


Fig 13

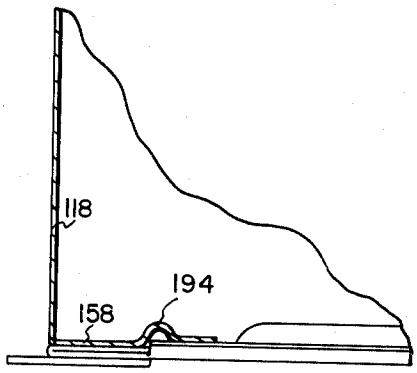


Fig 14

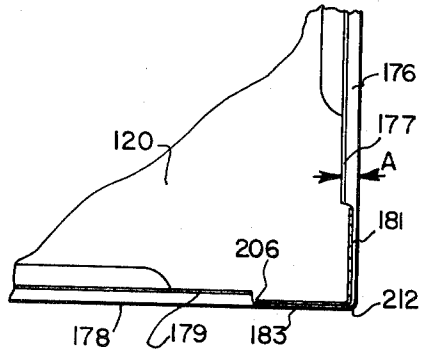


Fig 15

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EVAPORATIVE COOLER CONSTRUCTION

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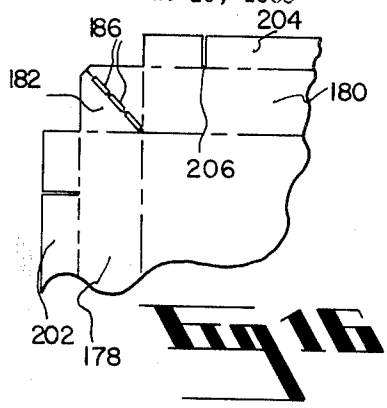


Fig 16

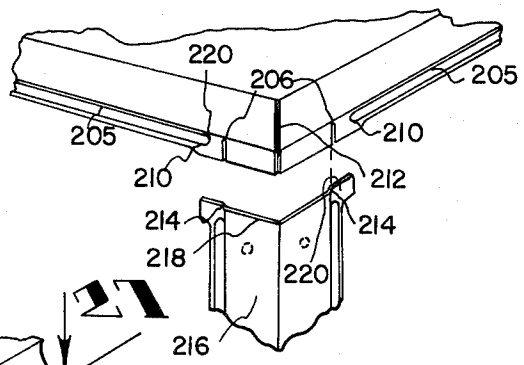


Fig 17

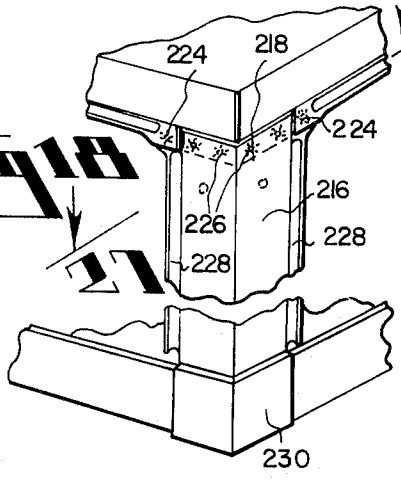


Fig 18

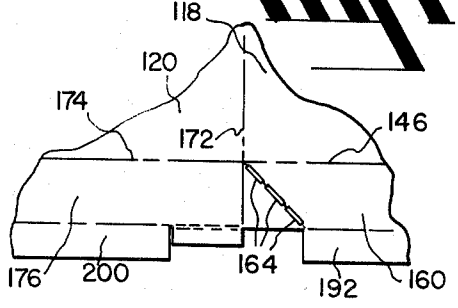


Fig 19

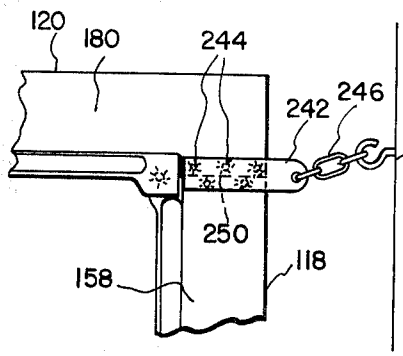


Fig 21

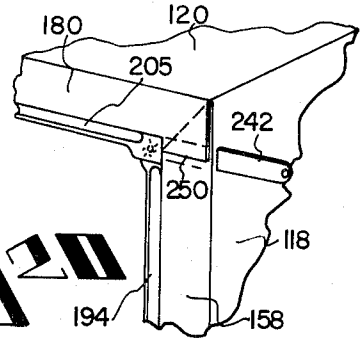


Fig 20

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EVAPORATIVE COOLER CONSTRUCTION

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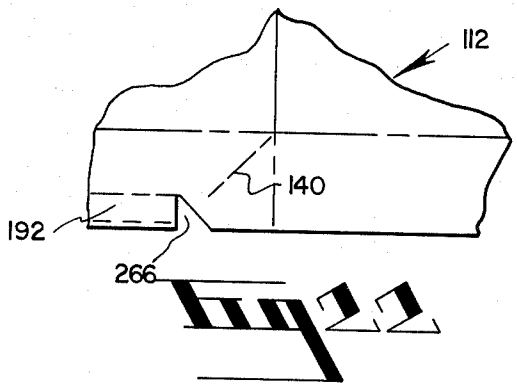


Fig 22

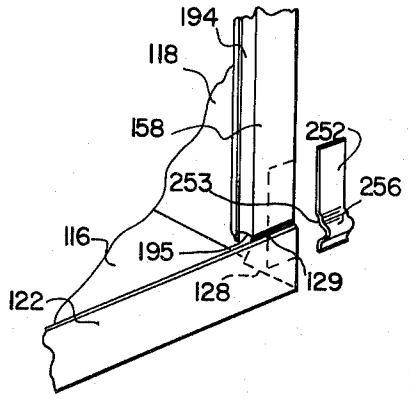


Fig 23

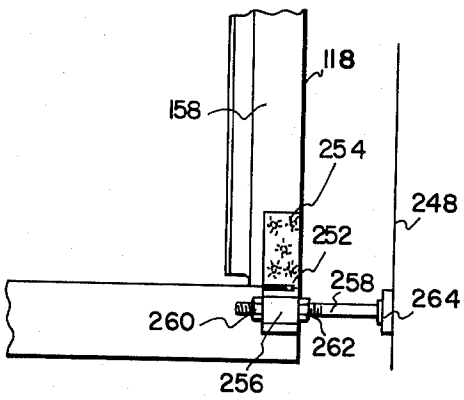


Fig 24

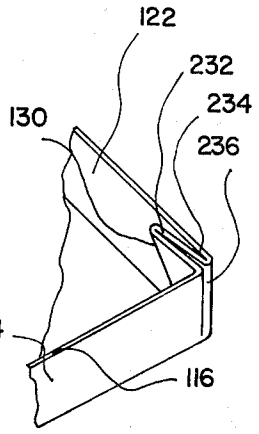


Fig 26

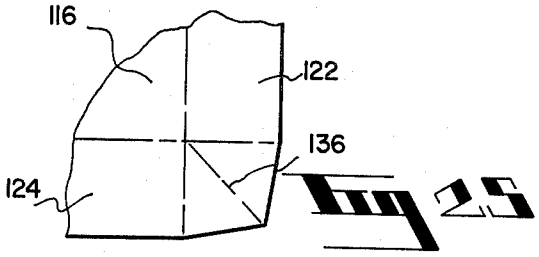


Fig 25

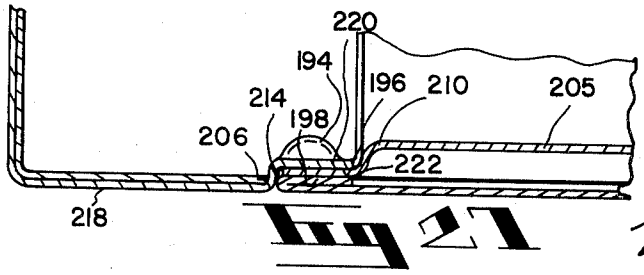


Fig 27

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United States Patent Office 3,231,247 Patented Jan. 25, 1966

3,231,247

EVAPORATIVE COOLER CONSTRUCTION

Adam D. Goettl, Phoenix, Ariz., assignor to McGraw-Edison Company, Milwaukee, Wis., a corporation of Delaware

Filed June 10, 1963, Ser. No. 292,184
22 Claims. (Cl. 261—24)

This application is a continuation-in-part of a copending application of Adam D. Goettl, Serial No. 859,757, filed December 15, 1959, now abandoned.

This invention relates to an evaporative cooler construction and more particularly to an evaporative cooler construction having a top, a sump pan and one side of the cooler all integral and formed of a single piece of sheet metal.

In the construction of evaporative coolers it has been common practice to form two separate pans, one for the sump of the cooler and one for the top thereof and to interconnect these pans by corner posts which are welded or otherwise secured to the pans. Such conventional construction usually involves extensive forming tools and also a substantial amount of labor in the production thereof.

Accordingly it is an object of the present invention to provide an evaporative cooler construction wherein the sump pan, the top and one side of an evaporative cooler are formed of a single piece of a sheet metal.

Another object of the invention is to provide an evaporative cooler construction wherein a single sheet of metal is utilized to form a top, a side and a sump pan of an evaporative cooler by folding the sheet metal at locations coinciding with the corners of the sump pan, one side and the top of the cooler whereby forming dies normally used to produce the top and the sump pan are not necessary to the construction of an evaporative cooler in accordance with the present invention.

Another object of the invention is to provide an evaporative cooler construction wherein a top pan and a sump pan are provided with folded corners and wherein two of such corners are interconnected by corner posts having slits in the ends thereof; said slits straddling the folded portions at the corners of the pan and the top to hold the folded portions together and to maintain a box shaped construction of the top and pan portions of the cooler.

Another object of the invention is to provide an evaporative cooler construction wherein the top, one side and a sump pan are all formed integral with each other from a single sheet of metal whereby facility and economy of production is attained.

Another object of the invention is to provide a very simple evaporative cooler cosntruction which requires a minimum amount of tooling attendant to the production thereof.

Another object of the invention is to provide an evaporative cooler construction having a novel centrifugal blower housing structure therein.

Another object of the invention is to provide a novel evaporative cooler construction wherein channel shaped evaporative cooler pad frame supports prevent water from being moved upwardly between the edges of the pad frames and the main frame of the cooler by vibratory action of the pad which may be imposed by airflow therethrough.

Another object of the invention is to provide an evaporative cooler construction wherein evaporative cooler pad frame supports are provided with a novel air sealing gasket means which prevents air leakage around the outer edges of the evaporative cooler pads and thereby increases the overall efficiency of an evaporative cooler.

Further objects and advantages of the invention may

be apparent from the following specification, appended claims and accompanying drawings in which:

FIG. 1 is a side elevational view of a flat blank of sheet metal illustrating by broken lines the bending and folding lines utilized to form the single sheet of metal into an integral structure comprising a top, one side and a sump pan of an evaporative cooler construction.

FIG. 2 is a sectional view taken from line 2—2 of FIG. 1.

FIG. 3 is an enlarged side elevational view of an evaporative cooler constructed in accordance with the present invention and showing portions thereof broken away and in section to amplify the illustration.

FIG. 4 is an enlarged fragmentary sectional view taken from the line 4—4 of FIG. 3.

FIG. 5 is a fragmentary sectional view taken from the line 5—5 of FIG. 4.

FIG. 6 is an enlarged fragmentary sectional view taken from the line 6—6 of FIG. 3.

FIG. 7 is a fragmentary sectional view taken from the line 7—7 of FIG. 4;

FIG. 8 is a fragmentary sectional view taken from the line 8—8 of FIG. 4;

FIG. 9 is a view similar to FIG. 1 showing a modified blank from which a cooler frame may be formed in accordance with the present invention;

FIG. 10 is a sectional view taken from the line 10—10 of FIG. 9;

FIG. 11 is a view similar to FIG. 3 showing details of a modified form of the invention;

FIG. 12 is an enlarged fragmentary sectional view taken from the line 12—12 of FIG. 11;

FIG. 13 is an enlarged fragmentary sectional view taken from the line 13—13 of FIG. 11;

FIG. 14 is an enlarged fragmentary sectional view taken from the line 14—14 of FIG. 11;

FIG. 15 is an enlarged fragmentary sectional view taken from the line 15—15 of FIG. 11;

FIG. 16 is an enlarged fragmentary side elevational view of one corner of the blank shown in FIG. 9 of the drawings;

FIG. 17 is an exploded fragmentary perspective view of a corner of the frame structure formed by the blank as shown in FIG. 9 of the drawings and a portion of a corner post structure adapted to be coupled therewith;

FIG. 18 is a view similar to FIG. 17 showing the corner of the frame structure and the corner post coupled and secured together;

FIG. 19 is a fragmentary enlarged side elevational view of a portion of the blank structure shown in FIG. 9;

FIG. 20 is an enlarged fragmentary perspective view of a cooler frame corner structure formed of the portion of the blank shown in FIG. 19 and illustrating a supports fixture in expoded position relative thereto;

FIG. 21 is a fragmentary side elevational view of the structure shown in FIG. 20 and showing the connection strap fixed to the corner of the frame and forming an anchor for holding the upper portion of the frame relative to the side wall of a building or the like;

FIG. 22 is a fragmentary side elevation of another portion of the blank structure shown in FIG. 9;

FIG. 23 is a fragmentary perspective of a corner frame portion of the modified structure shown in FIG. 11 and formed from the portion of the blank illustrated in FIG. 22;

FIG. 23 showing an exploded position of a clip part relative to the corner frame structure;

FIG. 24 is a side elevational view of the structure shown in FIG. 23 with the stamp clip fixed to the corner of the frame structure and illustrating a supporting leg operable as a standoff leg engagable with the side of the building

whereby the cooler frame may be supported incantly for position relative to the side of the building;

FIG. 25 is an enlarged fragmentary side elevational view of one corner of the blank shown in FIG. 9 of the drawings;

FIG. 26 is an enlarged fragmentary perspective view of a sump and corner portion of the cooler frame shown in FIG. 3 and formed of the corner structure of the blank shown in FIG. 25;

FIG. 27 is an enlarged fragmentary sectional view taken from line 27—27 of FIG. 18; and

FIG. 28 is a fragmentary sectional view taken from line 28—28 of FIG. 3.

As shown in FIG. 1 of the drawings, a flat blank 10 of sheet metal is utilized, in accordance with the present invention, to produce an evaporative cooler frame structure having one side of the cooler frame structure integral with the top and the sump pan. This blank 10 is provided with a rectangular portion outlined by broken lines 12 which is formed into a top 14 as will be hereinafter described in detail. This blank 10 is also provided with a rectangular side forming portion 17 outlined by one of the lines 12 and other broken lines 18. It will be seen that two of the broken lines 18 are aligned with two of the broken lines 12 which outline the rectangular top portion 14.

A sump pan section 20 is outlined by broken lines 22 and one of the broken lines 18. It will be understood that the broken lines 12, 18 and 22 represent break lines on which the single piece of metal is bent and folded to produce a structure having one side of an evaporative cooler integral with the top and the sump pan thereof.

The portion 14 outwardly of the lines 12 is provided with break lines 24 at which the metal is folded at angles of 45 degrees to permit the sections outwardly of the lines 12 to be folded at right angles to the portion 14 in order to complete a substantially boxed shaped structure of the portion 14. Likewise, the portion 16 is provided with break lines 26 at its corners which are integral with the portion 14; these break lines 26 being at 45 degrees to permit the folding of a portion at substantially 45 degrees at each corner of the evaporative cooler construction at the juncture of the top portion 14 with the side portion 16.

It will be seen that angular break lines 28 are disposed at substantially 45 degrees at a transition between the portion 16 and the section 20. These break lines 28 form two corners of a folded structure around the pan portion 20 so that sides 30 of the pan are formed outwardly of the lines 22 substantially at right angles to the plane of the portion 20 so that a water containing sump pan is formed integral with the adjacent side portion 16 which is disposed at right angles to both the portions 14 and 20 when the evaporative cooler construction is completed in accordance with the present invention as will be hereinafter described in detail.

As shown in FIG. 3 of the drawings the top portion 14 is provided with sides 15 which are disposed at right angles thereto on three sides outwardly of three of the lines 12 shown in FIG. 1 of the drawings.

The side portion 16 is provided with an opening 32 therein. This opening 32 is disposed to provide an outlet for a centrifugal blower 34 disposed within the interior of the evaporative cooler construction as will be hereinafter described.

The portion 16 which forms one vertical side of the evaporative cooler construction of the present invention is provided with narrow side portion 36 at the corners of the structure and these portions 36 are disposed generally at right angles to the plane of the portion 16 outwardly of the fold lines 18 shown in FIG. 1 of the drawings. These portions 36 are similar at opposite edges of the portion 16 and the side portion 36 as shown in FIG. 4 of the drawings is provided with a vertically disposed channel portion 38 having an edge 40 engageable with a conventional evaporative cooler pad frame as will be hereinafter described in detail.

The pan portion 20 is provided with folded corners 37 adjacent to the wall portion 16 and is also provided with folded portions 39 at corners opposite to the corners 36.

The folded portions 39 as shown in FIG. 4 of the drawings, extending inwardly at substantially an angle of 45 degrees from the sides 40 of the pan portion 20.

Corner posts 42 are provided with slots 44 in which the folded portions 39 are disposed whereby these inwardly folded portions are held together by the corner posts 42 since the folded portions 39 are held captive in the slots 44. The corner posts 42 are angle members having sides 46 and 48 disposed substantially at right angles to each other. Integral with these sides 46 and 48 are channel structures 50 and 52 respectively which are disposed to support flanges of an evaporative cooler pad frame structure. It being noted that each of the channels 50 and 52 is engageable with a respective evaporative cooler pad frame 64.

These channels 50 and 52 retain resilient gasket strips 54 and 55 for the purpose of sealing against the leakage of air between the posts 42 and evaporative cooler pad frame structures which bear against said channels 50 and 52 at edge portions 56 and 58 respectively. It will be noted that the sealing gasket strips 54 and 55 are disposed in the channel members 50 and 52 above the water level A in the sump portion 20 so that these gaskets do not tend to conduct water upwardly from the sump portion 20. As shown in FIG. 3 of the drawings, the gasket 54 has its lower end 60 well above the water level A in the sump 20.

As shown in FIG. 4 of the drawings, an evaporative cooler pad 62 is provided with a substantially conventional box shaped frame 64 having lateral flanges 66 which engage the edges 58 of the channel members 52. Additionally, this frame 64 is provided with a louver plate 70 having conventional louvers 72 therein. As shown in FIG. 3, it will be seen that the channel structures 50 and 52 extend from the upper edge of the sump pan in the bottom of the cooler to lower edges of the sidewalls 15 of the top 14 and accordingly, the upper end of each evaporative cooler pad frame 64 extends into close proximity with a respective side 15 of the top 14 in acordance with conventional evaporative cooler construction. With reference to FIG. 4 of the drawings, it will be seen that each evaporative cooler pad frame 64 at one of its laterally extending flanges is disposed adjacent a respective one of the channels 50 or 52.

The lower wall of the frame 64 is provided with an integral hook shaped edge 74 which rests on the upper edge 66 of a side 50 of the pan portion 20 or as shown best in FIG. 7 of the drawings.

As shown in FIGS. 4 and 8 of the drawings, a clip 76 is fixed to each of the vertical sections 36 of the side 16 and this clip 76 may be either spot welded or otherwise secured to the side sections 36 as desired. The clip 76 is provided with an offset portion 78 which extends over the folded portion 80 at the transition between the pan portion 20 and the side section 16. This folded portion 80 as shown in FIGS. 4 and 8 is formed about the fold lines 28 as shown in FIG. 1 of the drawings. The offset portion 78 of the clip 76 retains the folded portion 80 adjacent the side portion 36 at each respective side of the side portion 16.

Each clip 76 is provided with a cylindrical loop portion 82 arranged to receive the rod of a conventional standoff foot used to support an evaporative cooler in spaced relationship to the vertical wall of the building and particularly where an evaporative cooler is mounted to deliver air through the opening 32 and into a horizontal duct 84 communicating therewith as shown best in FIG. 3 of the drawings.

Communicating with the opening 32 is a blower 34 composed of a housing having spaced side plates 84 and 86. These side plates 84 and 86 are secured together by a wrap around plate 88 having side flanges 90 which overlap the sides of the side plates 84 and 86. These side plates 84 and 86 are provided with notches 92 in which the flanges 90 extend and pass from an outside position to an inside position between the side plates 84 and 86 permitting the wrap around plate 88 to extend between the side plates 84 and 86 upwardly to a position adjacent the outlet opening 32 and then inwardly to form a cutoff lip 94 adjacent the periphery of a blower wheel 96 internally of the blower housing. The side plates 84 and 86 are provided with inlet eye openings 98 concentric with the blower wheel 96.

Each of the side plates 84 and 86 is provided with an angular brace adjacent to the side portion 16 and fixed thereto. These braces are similar and the side wall portion is provided with a triangular brace 100 and a flange 102 which lends horizontal support to the lower edge of the side plate 84. This brace 100 is also provided with a flange 102 secured to the side wall section 16.

Angular braces 106 are connected to the side plates 84 and 86 near the lower portion thereof and these angular braces 106 are fixed to the inwardly folded portions 39 of the corner structure of the pan portion 20 or as shown best in FIGS. 3, 4, and 6 of the drawings.

Braces 108 are fixed to the side plates 84 and 86 adjacent to the upper portion of the blower housing and these braces 108 are connected to inwardly directed folded portions 110 in the corners of the top portion 14 which folded portions are formed about the fold lines 24 shown in FIG. 1 of the drawings. These fold lines 24 providing for an inwardly folded section disposed at 45 degrees. Thus the braces 108 are connected to folded structure which is similar to the folded structure 39 however, the folded structures 110 are disposed integral with the top portion 14 and extend inwardly at an angle of 45 degrees to the corners as do the folded sections 39.

In the modification of the present invention as disclosed in FIGS. 9 and 10 a blank 112 is utilized and this blank 112 is similar to the blank 10 shown in FIGS. 1 and 2 hereinbefore described. The blanks 10 and 112 are particularly formed and adapted for insertion in a forming machine as disclosed in a patent application of Adam Goettl and Robert Koble, Serial No. 252,243, filed January 17, 1963.

The blank 112 contains several improvements over the blank 10. The blank 112 is provided with an opening 114 similar to the opening 32 in the blank 10 and comprises sections 116, 118 and 120 which are all substantially rectangular and integral with each other and being of a common sheet of metal. The section 116 is adapted to be formed into a pan sump structure. The section 118 is adapted to be formed into a frame side portion, and the section 120 is adapted to be formed into a top structure all as will be hereinafter described.

As shown in FIG. 11 the blank 12 when formed into an evaporative cooler frame comprises a sump pan formed of the section 116 and comprising three upstanding sides 122, 124 and 126 which are integrally interconnected by folded corner portions 128, 130 and 132. These folded corner portions 128, 130 and 132 are folded at break lines 134, 136, 138 and 140 on the blank 112 about the section 116 which is defined by break lines 142, 144, 146 and 148. It will be seen that the frame side portion 118 is defined by break lines 150, 152, 154 and 156, the break lines 156 being predetermined break areas at which flanges 158 and 160 are formed at right angles to the frame side portion. These flanges 158 and 160 at the folded portions 128 formed at the break lines 134 and 140 are substantially contiguous with and in claims substantially coinciding with the respective upstanding sides 122 and 126 of the sump pan formed on the section 116. The flanges 158 and 160

are thus disposed vertically and corner break lines 162 and 164 are formed of a plurality of perforations to facilitate bending of the corner portions in the top of the frame structure thus these perforations facilitate forming and are not critical since the top structure of the evaporative cooler does not have to hold water. The pan or sump portion of the cooler formed of the section 116 of the blank 112 does not include perforations at the break lines 134, 136, 138 and 140 due to the fact that this pan must hold water.

The break lines 162 and 164 therefore facilitate bending at corners 166 as shown in FIG. 11 of the drawings. These two corners thus provide a folded corner between the upstanding frame side portion 118 and the flanges 158 and 160 and the downwardly directed sides of the top structure 120 as will be hereinafter described. The top structure 120 is formed of the section 120 shown in FIG. 9 of the drawings and break lines 168, 170, 172 and 174 define the angular break lines disposed to define the transitions between the downwardly extending sides 176, 178 and 180 of the top structure 120 shown best in FIG. 11. Folded corner portions 182 and 184 are formed by lines of perforations 186 and 188 similar to the hereinbefore described lines of perforations 162 and 164. Thus the corners 182 and 184 are formed in a very simple manner, however, these perforations forming break lines are not necessary as evidenced by the fact that the sump pan 116 at its corners is formed of water attached structure which does not include any perforations at the break lines. When forming an evaporative cooler frame by a machine such as disclosed in the aforementioned patent application 252,243 the perforations 162, 164, 186 and 188 facilitate neat folding of the metal at the corners.

The flanges 158 and 160 are provided with edge sections 190 and 192 which are subsequently formed into channel shaped in cross section evaporative cooler pad frame supporting portions 194. These portions 194 being channel shaped in cross section provide an edge 196 of narrow bearing width which are adapted to engage an evaporative cooler pad frame flange 198 and thus provide a minimum of bearing area so that the transfer of salt accumulations from the pad frame to the flange structures 158 and 160 may be minimized. As shown in FIG. 9 of the drawings the blank 112 is also provided with edge portions 200, 202 and 204 integral with the side forming portions 176, 178 and 180 hereinbefore described. These portions 200, 202 and 204 are formed into channel shaped in cross section portions 206 similar to the channel shaped in cross section portions 194 hereinbefore described in connection with FIGS. 13, 14 and 27. These channel shaped in cross section portions also provide a minimal bearing area for contact with evaporative cooler pad frames and for the same purpose as hereinbefore described in connection with the structure disclosed in FIG. 27.

The blank 112 adjacent to the corners 182 and 184 is provided with notches 206 and 208 which are beyond terminal portions 210 of the channel shaped in cross section portions 205. Thus the notches 206 are between the terminal portions 210 of the channel shaped in cross section portions 205 and a corner of the top structure 120.

Reference is made to FIG. 17 wherein such a corner designated 212 comprises the flange portions wherein the notches 206 are disposed. These notches 206 are disposed to receive joggled portions 214 disposed at the upper end of an L-shaped in cross section corner member 216 which fits over the outer side of the corner portion 212. The corner member 216 at its upper end 218 shown in FIGS. 17 and 18 is thus disposed on the outside of the corner 212 and the joggled portions are disposed in the notches 206. Tab portions 220 extending beyond the joggled portions 214 engage inner sides of

the top side structure adjacent to terminal ends 210 of the channel shaped in cross section portions 205.

Reference is made to FIGS. 18 and 27 wherein the upper end portion 218 is disclosed and each joggled portion 214 extends through one of the slots 206. Each tab 220 is disposed on an inner side 222 adjacent a terminal end portion 210 of a respective channel shaped in cross section portion 205. The tab 220 is thus spot welded at 224 as shown best in FIG. 18 thereby providing a very rigid structure. The upper end portion 218 is disposed at the outer side and welded by spot welds 226 all as shown best in FIG. 18 of the drawings.

Each of the corner posts 216 is substantially identical in construction and as shown in FIG. 3 of the drawings there are two of them in opposed relationship to the frame side portion 118. These corner members 216 interconnect the sump pan 116 and the top structure 120 at two respective corners in vertical alignment with each other. Each corner member 216 at its opposite edges is provided with channel shaped in cross section evaporative cooler pad frame supports 228 which are disposed vertically and in parallel relationship with the channel shaped in cross section portions 194 hereinbefore described.

Each corner member 216 at its lower end is provided with an outwardly offset portion 230 fitted over the outside of each corner of the sump pan formed about break lines 136 and 138, thus covering the folded corner portions from the outside of sump pan.

Each corner of the sump pan formed about the break lines 136 and 138 is substantially shown in FIG. 12 of the drawings wherein the upstanding sides 121 and 126 or other respective sides are provided with a portion 232 which is folded against itself and another portion 234 which is folded against the folded portion 232. These portions meet at 236 as shown in FIG. 12 of the drawings and the corner is thus formed and is covered by the portion 230 of each corner member 216 as shown in FIG. 18 of the drawings.

It will be seen that the lower portion of angular portion 130 as shown in FIG. 11 constitutes a lower portion of the folded structure 232 shown in FIG. 12 and that the upper edge of the folded structure at the angular folded portion 130 is above the normal water level in the sump 116.

The folded corner structures 128 as shown in FIG. 11 are shown in FIG. 13 in horizontal section and these folded portions 128 comprise angularly folded portions which are folded against each other at 238 contiguous with another folded portion 240 which is integral with an upstanding side 126 and the frame side structure 118 which forms another upstanding side of the pan 116. It will be noted that the flange 160 of the frame side portion 118 is integral with the channel shaped in cross section 194 hereinbefore described all as shown in FIG. 13 in the drawings.

Reference is made to FIG. 15 wherein the corner 212 shown in FIG. 17 is illustrated with the corner member 216 removed. Thus the slots 206 are shown in bottom plan position to illustrate an offset relationship of the structures adjacent the slots 206 and as shown in FIG. 27. It will be appreciated that the edge portions of the sides 176 and 178 of the top 120 are offset adjacent the slots 206. The edges 177 and 179 of the sides 176 and 178 adjacent to the slots 206 are offset inwardly with respect to edge portions 181 and 183 which are engaged by the upper portion 218 of each corner member 216. The offset relationship of these edges 177 and 181, and 179 and 183 as indicated by arrows A are of sufficient dimension to compensate for the thickness of the flange 198 of an evaporative cooler pad frame as shown in FIG. 27 of the drawings.

As shown in FIGS. 20 and 21 a clip structure 242 is secured by spot welds or other similar fastening means 244 to the sides 176 and 180 of the top 120 for securing by a chain 246 or other means the upper portion of the evaporative cooler to a building or other structure designated 248. The clip 242 overlaps a folded transition 250 of the respective flanges 158 and 160 and the respective sides 176 and 180 of the frame side portion 118. These clips 242 thus connect the upper portion of the evaporative cooler frame of the invention to the side of a building 248 while the lower portions of the cooler as indicated and illustrated in FIGS. 23 and 24 are provided with clips 252 which are secured by spot welds 254 to the flanges 158 and 160 of the side frame portion 118.

Each clip 252 is provided with an arcuate offset portion which is offset laterally, this portion being designated 256 in FIG. 23 of the drawing and shown connected to to a stand off bolt 258 in FIG. 24 in the drawing. This bolt is provided with jam nuts 260 and 262 screw threaded thereon and jammed against opposite sides of the offset portion 256 to hold the bolt 258 longitudinally fixed with respect to the clip 252. The bolt is provided with an engaging foot 264 disposed to engage the side 248 of a building also shown in FIG. 21 of the drawing.

As shown in FIGS. 22 and 23 the blank and the formed sump pan structure are so arranged that when the structure is folded up as hereinbefore described and shown in FIG. 23 that the folded portions 128 forward about to break line 140 include horizontal edge portions 129 of the folded structure which is disposed outwardly of each respective flange 158 and 160 of the frame side portion 118.

Each clip 252 is provided with an offset portion 253 which overlies the upper folded edge portions 129 and holds them in position.

The blank 112 shown in FIGS. 9 and 22 of the drawings is provided with notch portions 266 at the ends of the portions 190 and 192 from which the channel shaped in cross section portions 194 are formed in connection with flanges 158 and 160. These notches 266 provide relief at the lower end of the structures which form the channel shaped in cross section portions 194 hereinbefore described and similar notched sections 268 relieve upper ends of these sections 190 and 192 shown in FIG. 9 of the drawings so that the channel shaped in cross section portions 194 may be formed independently of the break lines 134, 140, 162 and 164 when the folded corner portions are formed. As for example, the folded corner portion 128 as shown in FIG. 23 when completely formed comprises a lower end of one of the channel shaped in cross section portions 194 substantially flush with the upper folded edge portion 129. Thus the lower end 195 of the channel shaped in cross section portion 194 shown in FIG. 23 is free of the folded structure by reason of the fact that the notch 266 is first formed in the blank 112 before folding occurs along the break line 140 to form the folded corner structure 128.

It will be obvious to those skilled in the art that various modifications of the present invention may be resorted to in manner limited only by just interpretation of the following claims.

I claim:

1. In an evaporative cooler construction the combination of: a rectangular box shaped sump pan having a bottom and two opposed pairs of upstanding sides; a frame side portion integral with one of said upstanding sides; two flange portions on said frame side portion substantially contiguous to an opposed pair of said upstanding sides of said sump pan portion, said frame side portion and said flange portions extending a considerable distance above said upstanding sides; and angularly folded portion at corners of said sump pan and integral with said upstanding sides thereof; a pair of said folded portions being integral with said two flange portions; said folded portions all disposed and extending upwardly at an inclined angle relative to said bottom and to an elevation above a liquid containing level in said sump pan.

2. The combination of claim 1 including: said flange portions disposed at substantially right angles to said frame side portion and forming corner structures; and channel portions integral with said flange portions and extending longitudinally thereof; and concaved sides of said channel portions disposed and directed outwardly in directions toward the outer sides of said sump pan.

3. The combination of claim 1 including: said flange portions disposed at substantially right angles to said frame side portions and forming corner structures; and integral channel portions extending longitudinally in said flange portions; concave sides of said channel portions disposed and directed outwardly in directions toward the outer sides of said sump pan; said channel portions being substantially parallel with said frame side portions and forming evaporative cooler pad frame supports disposed to support edge structure of evaporative cooler pad frames.

4. The combination of claim 1 including: a rectangular inverted box-shaped evaporative cooler top structure carried on said frame side portion and disposed in opposed relation with said sump pan and vertically superimposed thereover.

5. The combination of claim 1 including: a rectangular inverted box-shaped evaporative cooler top structure carried on said frame side portion and disposed in opposed relation with said sump pan and vertically superimposed thereover; and a pair of corner members interconnecting the corners of said sump pan and said top structure which are spaced from said side frame portion and said flange portions, whereby evaporative cooler pad frames may be disposed between said portions and said corner members.

6. The combination of claim 1 including: an inverted box-shaped top structure integral with said frame side portion and said flanges and having folded portions forming a transition at right angles between said frame side portion and said flange portions; perforated portions disposed to form a break line for said folded portions for precise folding between said frame side portion and said top structure.

7. In an evaporative cooler construction the combination of: a top box shaped portion, a side portion and a bottom pan sump portion, all integral with each other and formed of a single sheet of metal; integral folded portions extending inwardly at the corners of said top and pan portions at transitions of said side portion with said top and pan portions and at the corners of said top and pan portions opposite said side portion; vertical corner posts interconnecting the corners of the top and pan portions at corners opposite said side portion; and evaporative cooler pad frames disposed adjacent said corner posts, said corner posts having slots in the ends thereof straddling said folded portions of said top and pan portions opposite said side portions for holding said folded portions together at said corners, said folded portions extending above a liquid containing level in said sump.

8. In an evaporative cooler construction the combination of: a top box shaped portion, a side portion and a bottom pan sump portion, all integral with each other and formed of a single sheet of metal; integral angularly folded portions extending inwardly at the corners of said top and pan portions, at transitions of said side portion with said top and pan portions, said side portion having an opening therein; a pair of vertically disposed blower side plates secured to said side portion at opposite vertical sides of said opening and curved edges of said blower side plates spaced from said side portions; and a wrap around plate having flanged edges extending over said curved edges and adjacent to the outer sides of said blower side plates; said blower side plates having notches to permit portions of said flanges to be disposed inwardly of said side plates, said flanges extending through said notches and extending between said side plates near the lower portion thereof, said wrap around plate and said flanges there of extending upwardly in engagement with the inner sides of said plates into close proximity of said opening in said side portion; said wrap around plate having a lip portion extending inwardly toward the axial center of said curved portions of said blower side plates; and a blower wheel rotatably mounted between said side plates and slightly spaced from said lip of said wrap around plate.

9. In an evaporative cooler the combination of: an evaporative cooler pad frame having an evaporative cooler pad therein; a main cooler frame in which said evaporative cooler pad frame is removably mounted; said main cooler frame having vertical channel shaped supports providing lateral support for said cooler pad frame and engaged thereby, said cooler pad frame having lateral flange portions, said channel shaped supports of said cooler frame having narrow lips engaged with said lateral flange portions to provide a minimum contact surface between said evaporative cooler pad frame and said main cooler frame.

10. The combination of claim 9 including: resilient gasket means in said channels, said resilient gasket means disposed above the sump of said cooler and providing a seal between said cooler pad frame and said evaporative cooler main frame.

11. In an evaporative cooler construction the combination of: a top inverted box-shaped portion; a frame side portion; and a box-shaped bottom liquid holding pan sump portion, all integral with each other and formed of a single sheet of metal; corners of said pan portion having integral angularly folded portions, said folded portions extending inwardly of said corners and having substantially contiguous portions integral with each other, said integral folded portions extending above the normal liquid containing level of said pan sump portion thereby forming a water tight seal at said corners.

12. The combination of claim 11, including: vertical corner members interconnecting a first pair of said corners of said top and pan portions opposite said frame side portion, said frame side portion integral with said angularly folded portions in a second pair of said corners; and evaporative pad frames disposed adjacent said corner members.

13. The combination of claim 11 including: vertical corner members interconnecting a first pair of said corners of said pan portion and said top portion; said frame side portion being integral with said angularly folded portions in a second pair of said corners of said pan portions; said integral folded portions in said second corners being contiguous with adjacent upstanding sides of said pan portions; flange portions on said frame side portion disposed at right angles thereto and in alignment and integral with said folded portions in said second corners; and evaporative cooler pad frames disposed adjacent said corner members.

14. In an evaporative cooler construction the combination of: a rectangular box shaped sump pan having a bottom and two opposed pairs of upstanding sides; a frame side portion integral with one of said upstanding sides; two flange portions on said frame side portion substantially contiguous to an opposed pair of said upstanding sides of said sump pan portion, said frame side portion and said flange portion extending a considerable distance above said upstanding sides; and angularly folded portions integral with said upstanding sides and said flanges; said folded portions disposed and extending upwardly at an angle relative to said bottom and to an elevation above a liquid containing level in said sump pan; a rectangular inverted box shaped evaporative cooler top structure carried on said frame side portion and disposed in opposed relation with said sump pan and vertically superimposed thereover; and a pair of corner members interconnecting the corners of said sump pan and said top structure which are spaced from said side frame portion and said flange portions whereby evaporative cooler pad frames may be disposed adjacent said flange portions and said corner members; said corner members being substantially

L-shaped in cross section and having a pair of free edge portions directed substantially ninety degrees from each other; and channel portions integral with said edge portions and disposed longitudinally of said corner members to provide supports for evaporative cooler pad frames.

15. In an evaporative cooler construction the combination of: a rectangular box shaped sump pan having a bottom and two opposed pairs of upstanding sides; a frame side portion integral with one of said upstanding sides; two flange portions on said frame side portion substantially contiguous to an opposed pair of said upstanding sides of said sump pan portion, said frame side portion and said flange portion extending a considerable distance above said upstanding sides; and angularly folded portions integral with said upstanding sides and said flanges; said folded portions disposed and extending upwardly at an angle relative to said bottom and to an elevation above a liquid containing level in said sump pan; a rectangular inverted box shaped evaporative cooler top structure carried on said frame side portion and disposed in opposed relation wits said sump pan and vertically superimposed thereover; and a pair of corner members interconnecting the corners of said sump pan and said top structure which are spaced from said side frame portion and said flange portions whereby evaporative cooler pad frames may be disposed adjacent said flange portions and said corner members; said corner members being L-shaped in cross section and having lower portions extending downwardly over the outer sides of the corner portions of said sump pan.

16. The combination of claim 15 including: said sump pan having folded corner portions disposed on outer sides of said sump pan and inwardly of said lower portions of said corner members.

17. In an evaporative cooler construction the combination of: a rectangular box shaped sump pan having a bottom and two opposed pairs of upstanding sides; a frame side portion integral with one of said upstanding sides; two flange portions on said frame side portion substantially contiguous to an opposed pair of said upstanding sides of said sump pan portion, said frame side portion and said flange portion extending a considerable distance above said upstanding sides; and angularly folded portions integral with said upstanding sides and said flanges; said folded portions disposed and extending upwardly at an angle relative to said bottom and to an elevation above a liquid containing level in said sump pan; a rectangular inverted box shaped evaporative cooler top structure integral with said frame side portion and disposed in opposed relation with said sump pan and vertically superimposed thereover; and a pair of corner members interconnecting the corners of said sump pan and said top structure which are spaced from said side frame portion and said flange portions whereby evaporative cooler pad frames may be disposed adjacent said flange portions and said corner members; said inverted box shaped top structure having vertically slotted portions spaced from corners thereof; said corner members being L-shaped in cross section and having joggled portions extending through said vertically slotted portions; said joggled portions comprising L-shaped structure extending around the outer side of corners of said box shaped top structure, said joggled portions comprising portions of said corner members extending through said vertically slotted portions of said top structure and engaging inner sides of said box shaped structure inwardly and laterally of said slotted portions.

18. In an evaporative cooler construction the combination of: a rectangular box shaped sump pan having a bottom and two opposed pairs of upstanding sides; a frame side portion integral with one of said upstanding sides; two flange portions on said frame side portion substantially contiguous to an opposed pair of said upstanding sides of said sump pan portion, said frame side portion and said flange portion extending a considerable distance above said upstanding sides; angularly folded portions integral with said upstanding sides and said flanges; said folded portions disposed and extending upwardly at an angle relative to said bottom and to an elevation above a liquid containing level in said sump pan; a rectangular inverted box shaped evaporative cooler top structure carried on said frame side portion and disposed in opposed relation with said sump pan and vertically superimposed thereover; and a pair of corner members interconnecting the corners of said sump pan and said top structure which are spaced from said side frame portion and said flange portions whereby evaporative cooler pad frames may be disposed adjacent said flange portions and said corner members; clip structure coupled to said flange portions and overlying a pair of said upstanding sides of said pan, said clip structure having offset portions disposed to engage a stand-off bolt for supporting said evaporative cooler construction in laterally spaced relationship to a wall surface.

19. The combination of claim 18 including: second clip structures coupled to said evaporative cooler construction in the proximity of said flanges and said top structure, said last mentioned clip structure disposed to provide for a connection between an upper portion of said evaporative cooler construction and a building structure.

20. In a blower frame and housing construction the combination of: a pair of blower side plates having axial inlet openings and curved edges disposed radially outward from said openings, said side plates spaced to form axial ends of a blower; a wrap around plate wrapped around said curved edges and having inwardly directed flanges provided with first edge portions extending toward the axes of said openings and overlying the outer sides of said plates, said wrap around plate being curved and having a convex outer surface and adapted to substantially enclose a rotor therein; said side plates having second edge portions disposed beyond the convex surface of said wrap around plate thereby forming a transition with said flanges overlying said side plates; one of said edge portions having a notch therein at the transition of said overlying portions of said side plates and said overlying flanges of said wrap around plate, said notch of said one edge portion fitted over the other one of said edge portions permitting said flanges of said wrap around plate to extend from the outer sides of said side plates to the inner sides thereof; said side plates having connecting portions extending beyond said transition and forming brace structure for said side plates and said wrap around plate; an outlet for said blower housing disposed between opposite ends of said wrap around plate and said side plates; and frame structure at said blower outlet and connected to and supporting said connecting portions of said brace structure.

21. In an evaporative cooler construction the combination of: a top box shaped portion, a side portion and a bottom sump portion, all integral with each other and formed of a single sheet of metal; integral angularly folded portions extending upwardly at the corners of said top and pan portions at transitions of said side portion with said top and pan portions; and vertical corner posts interconnecting the corners of the top and pan sections at corners opposite said side position; and evaporative cooler pad frames supported adjacent said corner posts, said corner posts having slots in the ends thereof straddling said folded portions of said top and pan portions for holding said folded portions together, said corner posts having vertical channel portions provided with narrow lips disposed to form a support for evaporative cooler pad frames; and evaporative cooler pad frames engaging said narrow lips and supported thereby.

22. In an evaporative cooler the combination of: an evaporative cooler pad frame having an evaporative cooler pad therein; a main cooler frame in which said evaporative cooler pad frame is removably mounted; said main cooler frame having vertical channel shaped supports for providing lateral support for said cooler pad frame and

engaged thereby, said cooler pad frame having lateral flange portions, said channel shaped supports of said cooler frame having narrow lips engaged with said lateral flange portions to provide a minimum contact surface between said evaporative cooler pad frame and said main cooler frame; and resilient gasket means in said channels.

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