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Eckerle

[11] **3,893,387**

[45] **July 8, 1975**

[54] **COMPACTOR HAVING IMPROVED CABINET STRUCTURE**

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[73] Assignee: **General Electric Company**, Louisville, Ky.

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[52] **U.S. Cl.** ..... **100/229 A**; 100/289

[51] **Int. Cl.** **B30b 15/04**

[58] **Field of Search** ..... 100/214, 229 A, 289; 53/124 B; 141/73, 80

[56] **References Cited**

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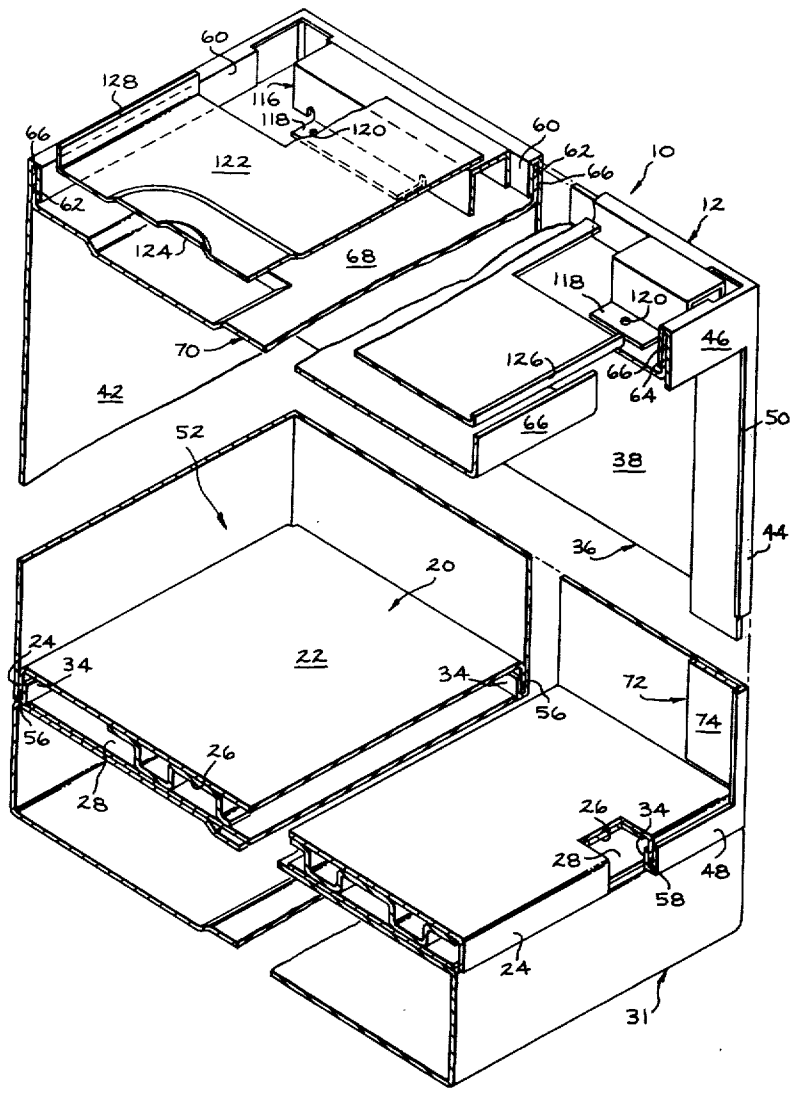
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Primary Examiner—Billy J. Wilhite

[57] **ABSTRACT**

There is disclosed a domestic refuse compactor cabinet which obviates the need for an internal stress-bearing frame. The cabinet is also designed without self-contained, stress-bearing columns. The reaction forces generated during compacting are accommodated by stressing the planar cabinet sides and back.

8 Claims, 3 Drawing Figures



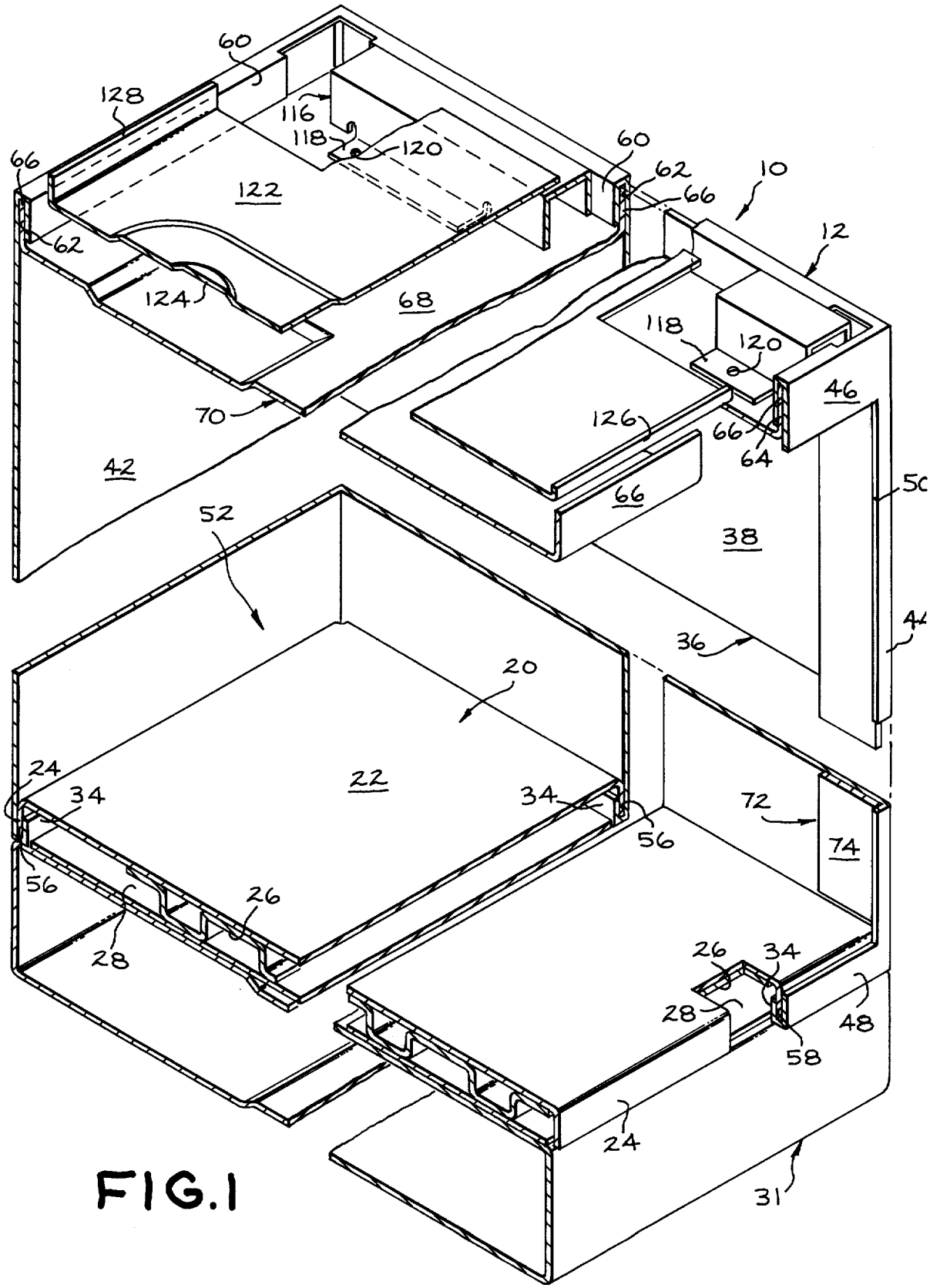
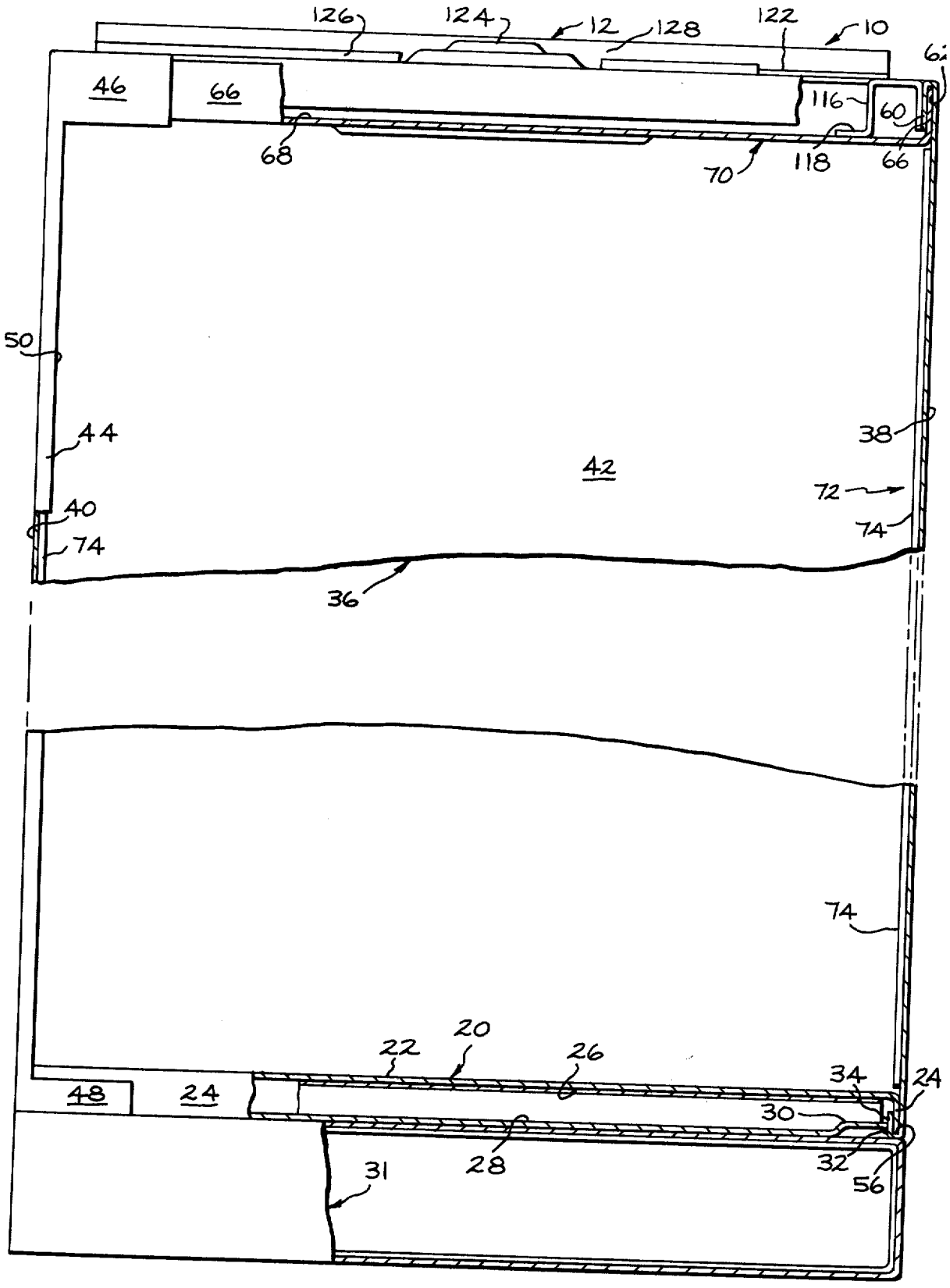

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124
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74
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12
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126
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FIG.1

FIG. 2


126
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116
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118
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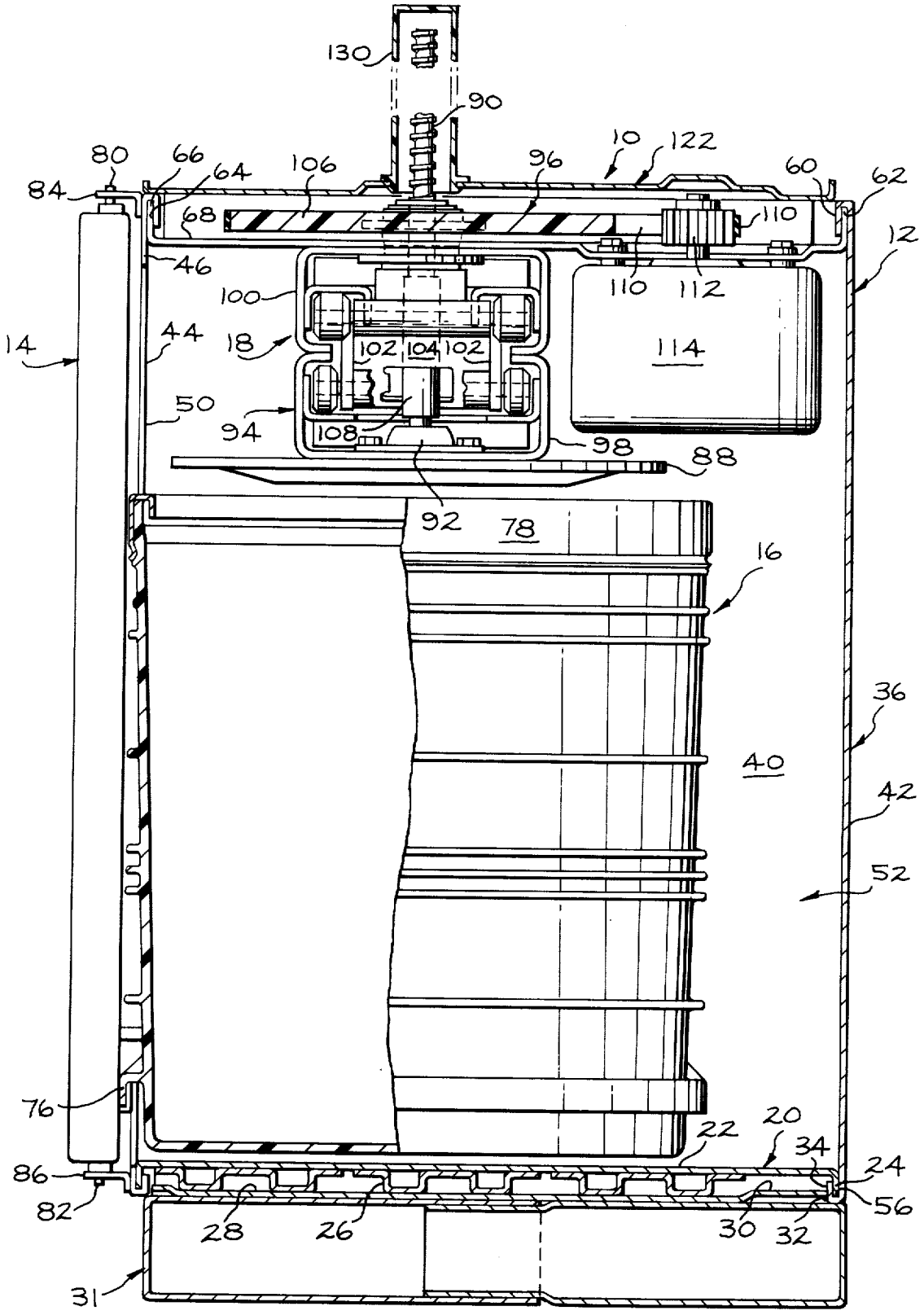

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90
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122
80
66
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106
96
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112
100
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18
102
104
102
114
14
50
94
108
98
88
92
78
16
36
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42
52
76
22
20
34
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86
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FIG. 3

COMPACTOR HAVING IMPROVED CABINET STRUCTURE

BACKGROUND OF THE INVENTION

Domestic refuse compactors presently on the market weigh approximately **180** lbs. An investigation made to determine the feasibility of a low cost, high quality compactor has revealed that a significant weight reduction can be achieved by redesigning the compactor cabinet. Since weight is roughly proportional to cost in mass-produced items, it is apparent that significant economies can be achieved by the use of a lighter cabinet.

It was noticed that the internal compactor frame and/or the stress-bearing columns in a compactor cabinet contribute substantially to the weight of the compactor and occupy a significant volume. It was therefore considered desirable to fabricate a light-weight compactor cabinet which would obviate the need for an internal frame and yet be strong enough to withstand the compacting forces generated during operation of the compactor.

Prior art attempts at providing light-weight compactor cabinets are shown in U.S. Pat. No. **3,589,277,** U.S. Pat. No. **3,680,475** and U.S. Pat. No. **3,786,744.** However, none of these attempts give the combined advantages of weight reduction and increased space within the compactor from a single cabinet, as does the cabinet of the present invention.

SUMMARY OF THE INVENTION

The invention includes a compactor cabinet of single-sheet wraparound design which is free of stress-bearing columns. The cabinet affords the maximum of interior compacting space and reduces the overall compactor weight. At the same time, the cabinet is also able to repeatedly withstand the stresses generated during the compacting operation. More specifically, the invention includes a compactor of the type comprising a cabinet having a top, a bottom, opposed sides, a closed back, an open front, and a door closing the open front; means for mounting an open-topped refuse receiving container to said door for movement through the open front between positions in and out of the cabinet, and means for compressing refuse in the container, including a downwardly movable platen adapted to enter the open top of the container when the container is in the cabinet; a floor inside the cabinet having a central section for supporting the container during the refuse compression and a downturned edge extending at least along both sides and the back of the cabinet, a one-piece sheet metal member generally U-shaped in horizontal cross-section providing opposed side walls, each lying substantially in a single plane, constituting the cabinet sides and a planar back wall constituting the closed cabinet back, the upper and lower portions of the side and back walls being reverted to provide an upper and lower groove, respectively, extending at least along both sides and the back of the cabinet and opening respectively downwardly and upwardly, the downturned floor edge cooperating with the lower groove; and a top wall having a central section for reacting against the compressing means during refuse compression and an upturned edge extending at least along both sides and the back of the cabinet and cooperating with the upper groove thereof; the cabinet being free of convolutions forming stress-bearing columns in the side walls and back.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a broken isometric view of the cabinet of this invention illustrating the right half thereof;

FIG. **2** is a broken front elevational view of the cabinet of FIG. **1**; and

FIG. **3** is a broken side elevational view of a compactor incorporating the cabinet of FIGS. **1** and **2.**

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, there is illustrated in FIG. **3** a compactor **10** having as major components a cabinet **12** providing a door **14** mounted to close the open front thereof, an open-topped container **16** adapted for movement through the open cabinet front, and means **18** for compacting refuse in the container **16.**

The cabinet **12** comprises a floor **20** having a central planar section **22** and a peripheral downturned edge **24.** Secured to the underside of the central section **22,** as by welding or the like, is a corrugated stiffening member **26** (FIG. **1**) which acts to strengthen the section **22** and prevent bowing thereof during refuse compaction. A reaction plate **28** may be affixed, as by welding or the like, to the underside of the stiffening member **26.** The section **22,** the downturned edge **24,** the stiffening member **26** and the plate **28** accordingly comprise a box-shaped structure of substantial strength. Optionally, this structure may be mounted on top of a stand **31** if the compactor is to be used as a free-standing unit. As shown best in FIG. **2,** the plate **28** provides a plurality of depressions **30** along the sides of the cabinet **12** inside the elevated sections of the corrugated stiffening member **26** for additional strength. Weld material **32** may be placed adjacent the depressions **30** to secure the plate **28** to a flange **34** provided by the cabinet side walls.

The cabinet **12** also comprises a one-piece sheet metal member **36** (FIG. **2**) providing planar side walls **38, 40** and a planar back wall **42.** The member **36** also provides a pair of front vertical flanges **44,** a pair of short upper horizontal channels **46** extending inwardly from the side walls **38, 40** and a pair of short lower horizontal channels **48** extending inwardly from the side walls **38, 40.** The cabinet **12** accordingly defines an enlarged opening **50** providing access into a compacting chamber **52** (FIG. **1**). The lower edge of the side and back walls **38, 40, 42** are reverted to provide the flange **34** to which the reaction plate **28** is secured. The flange **34** cooperates with the side and back walls **38, 40, 42** to provide a lower upwardly facing groove **56.** As is suggested in FIG. **1,** the lower horizontal channels **48** provide a groove **58** adjacent with the groove **56.** The side and back portions of the downturned edge **24** are received in the groove **56** while the lateral front ends of the edge **24** are received in the groove **58.** Preferably, the edge **24** is secured in the grooves **56, 58,** as by crimping, welding or the like.

The upper edges of the side and back walls **38, 40, 42** are reverted to provide a continuous flange **60** and an upper groove **62** facing downwardly and extending along the sides and back of the cabinet **12.** The upper horizontal members **46** comprising the front of the cabinet provide a groove **64** communicating with the groove **62.** The grooves **62, 64** receive an upturned

edge 66 of a generally planar section 68 comprising a top wall member 70. The upturned edge 66 is desirably secured in the grooves 62, 64, as by crimping, welding or the like. Since the side and back walls 38, 40, 42 are planar, it will be seen that the grooves 56, 58, 62, 64 reside in common planes bounding the compacting chamber 52.

As shown best in FIG. 1, the upper flange 60 is not one piece but instead terminates adjacent the corners of the cabinet 12 for convenience during manufacture. Similarly, although not shown, the lower flange 34 terminates short of the corners of the cabinet 12.

As will be apparent to those skilled in the art, the sheet metal member 36, the floor 20 and the top wall 70 comprise a reaction structure placed in tension when the compacting means 18 is compressing refuse in the receptacle 16. During compaction, the receptacle 16 is forced downwardly against the floor 20 while the compacting means 18 is forced upwardly against the top wall 70. Since the floor 20 and top wall 70 are constrained against movement by the member 36, forces which tend to separate the floor 20 from the top wall 70 are transferred to the member 36 which comprises the sides and back of the cabinet 12.

An important feature of the cabinet 12 is a lack of columns or convolutions in the sides, front and back thereof which normally are welded to the base and top wall and which contribute substantially to the reaction structure resisting or accommodating compression forces. In the present invention, the cabinet itself resists loads generated during compacting. Accordingly, the usable horizontal area in the compacting chamber 52 approaches the horizontal cross-sectional area of the cabinet 12.

There is also provided means 72 for substantially preventing bowing of the side walls 38, 40 adjacent the open cabinet front when the cabinet 12 is unstressed. the bow preventing means 72 comprises a metal strap 74 affixed, in any suitable fashion as by welding or the like, to each of the side walls 38, 40 adjacent the flanges 44. Since the metal straps 74 are not required to withstand compression generated forces, the straps 74 are conveniently merely connected to the side walls 38, 40 and not directly connected to either the floor 20 or top wall 70 as may be seen best in FIG. 2.

Referring generally to the other parts of the compactor, it can be seen in FIG. 3 that the container 16 is preferably a one-piece plastic molding substantially cylindrical in shape although it may be tapered slightly in order to be removed from its mold. A flange 76 extends circumferentially about the container 16 providing a groove for receiving a support carried by the door 14. At the upper end of the container 16 there is provided a clamp 78 which likewise may provide means for attachment to the door 14. The container 16 is preferably carried by the door 14 during opening and closing movement thereof in order to move the container 16 into and out of the compacting chamber 52. The preferable mounting mechanism for manipulation of the cylindrical container 16 through the access opening 50 is disclosed in U.S. patent application, Ser. No. 464,530, filed Apr. 26, 1974. In an alternative, the container 16 may be mounted on the door 14 for simple pivotal movement therewith if the side walls 39, 40 (FIG. 2) are spaced apart sufficiently.

The door 14 is preferably pivotally mounted on the cabinet 12, as by upper and lower pivot pins 80, 82 which cooperate with brackets 84, 86 (FIG. 3) rigid with the cabinet 12.

The compacting means or press 18 may be of any suitable design and is illustrated as comprising: a pressure plate or platen 88 for contacting refuse in the container 16; a screw member 90 connected to the plate 88 by a suitable bearing 92; a linkage mechanism 94 for maintaining the plate 88 in a substantially horizontal position and a drive mechanism 96 for translating the screw 90 up and down. The compacting means 18 is illustrated in substantially greater detail in U.S. patent application, Ser. No. 464,507, filed Apr. 26, 1974, to which reference is made for a more complete description thereof.

For present purposes it is sufficient to say that the linkage mechanism 94 comprises a generally channel-shaped reaction structure 98 affixed to the plate 88, a similarly configured reaction structure 100 affixed to the central section 68 of the top wall 70 and a plurality of links 102, 104 interconnecting the structures 98, 100. The reaction structure 100 preferably spans a substantial part of the top wall 70 and acts to distribute compression generated forces along a substantial portion of the width of the top wall 70. Because of the bracing effect provided by the reaction structure 100, no additional stiffening members are required for the top wall 70.

The drive mechanism 96 is illustrated as comprising a gear wheel 106 drivably rotating an internally threaded member 108 which receives the screw 90. The gear wheel 106 is mounted for rotation and is driven by a toothed belt 110 meshing with a gear wheel 112 driven by a suitable motor 114 suspended from the top wall 70. It will be apparent that energization of the motor 114 rotates the gear wheel 112 to drive the belt 110 thereby rotating the gear wheel 106 to reciprocate the screw 90 through the internally threaded member 108. Accordingly, the pressure plate 88 moves downwardly into the container 16 or moves upwardly out of the container 16 in response to the direction of rotation of the motor 114.

Referring to FIGS. 1 and 2, there may be provided a conduit forming section 116 above the top wall 70 extending along one, or preferably both, of the sides of the cabinet 12 for receiving electrical wiring (not shown) constituting part of the controls of the compactor 10. The conduit forming section 116 is conveniently of inverted U-shaped cross section having a plurality of tabs or flanges 118 thereon which are releasably attached to the top wall 70 by metal screws 120 or the like.

There is preferably provided a cover plate 122 above the gear wheel 106 for enclosing the components of the drive mechanism 96. The cover plate 122 includes an elevated section 124 overlying the gear wheel 112, the belt 110 and the gear wheel 106. The cover plate 122 is desirably releasably attached, as by metal screws, clips or the like, to the conduit forming sections 116 in order to provide access to the drive components between the cover plate 122 and the top wall 70. The cover plate 122 provides a front upturned edge 126 and a rear upturned edge 128 which afford stiffness or beam rigidity to the cover plate 122.

Having thus described the invention, what is claimed is:

1. A compactor of the type comprising a cabinet having a top, a bottom, opposed sides, a closed back, an

open front and a door closing the open front; means for mounting an open-topped refuse receiving container to said door for movement through the open front between positions in and out of the cabinet; and means for compressing refuse in the container, including a downwardly movable platen adapted to enter the open top of the container when the container is in the cabinet;

a floor, inside the cabinet, having a central section for supporting the container during refuse compression and a downturned edge extending at least along both sides and the back of the cabinet;

a one-piece sheet metal member, generally U-shaped in horizontal cross section, providing opposed side walls each lying substantially in a single plane constituting the cabinet sides and a planar back wall constituting the closed cabinet back, the upper and lower portions of the side and back walls being reverted to provide an upper and lower groove respectively extending at least along both sides and the back of the cabinet and opening respectively downwardly and upwardly, the downturned floor edge cooperating with the lower groove; and

a top wall having a central section for reacting against the compression means during refuse compression and an upturned edge extending at least along both sides and the back of the cabinet and cooperating with the upper groove thereof;

the cabinet being free of convolutions forming stress-bearing columns in the side walls and back.

2. The compactor of claim **1** wherein the floor comprises a corrugated stiffening member under the floor central section, and the top wall central section is generally planar.

3. The compactor of claim **2** wherein the cabinet floor is generally planar.

4. The compactor of claim **3** wherein the cabinet walls are generally planar and sections of the upper and lower grooves reside in common planes.

5. The compactor of claim **4** wherein the cabinet further comprises means preventing bowing of the planar side walls adjacent the open front when the platen is out of the container.

6. The compactor of claim **5** wherein the bowing preventing means comprises a metal strap secured to the planar side walls adjacent the open front.

7. The compactor of claim **6** wherein the one-piece sheet metal member comprises coplanar vertical flanges, integral with the side walls and perpendicular thereto, on opposite sides of the open cabinet front.

8. The compactor of claim **7** wherein the one-piece sheet metal member comprises pairs of upper and lower horizontal channels adjacent the open cabinet front extending toward each other from the cabinet sides and providing an upper and lower groove section respectively communicating with the upper and lower grooves of the side walls; the downturned floor edge extending along at least part of the cabinet front into the lower groove section; and the upturned top wall edge extending along at least part of the cabinet front into the upper groove section.

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