

KITCHEN CABINET

[0001] The present application relates to a kitchen cabinet. It also relates to a method making, installing and recycling the kitchen cabinet.

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[0002] Typically, wooden boards are used for constructing kitchen cabinets. For example, Medium Density Fibreboard (MDF), as a type of particleboards, is an engineering wood product that is extensively used Europe for fabricating carcasses of furniture since 1980s. The particleboards are often decorated with melamine based overlays for making finished particleboards to be water resistant, fireproof or insect proof. In contrast, kitchen cabinets in Asia are more commonly made of plywood because plywood is flexible, inexpensive, workable, reusable, and can usually be locally manufactured. Plywood, in addition to its general high degree of strength, is also is resistant to cracking, shrinking, splitting, twisting and warping.

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[0003] However, main disadvantages of using the wood based carcass include:

1. hazardous emissions from formaldehyde, which is used in preservatives when making the particleboards;
2. difficulty in recycling the particle boards;
3. structural failure due to particle boards' susceptibility to water or moisture resulting in bloating, expansion, wood rot, delamination etc.;
4. low degree of flammability;
5. heavy weight for handling;
6. short period of life span at around 10 years maximum even when used in dry, well ventilated place; and
7. deformation or warping when exposed to fluctuating humidity or temperature.

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[0004] For kitchen or bathroom, the wood based carcasses tend to fail within a few years of usage due to high moisture content of their ambient, which is undesirable for users.

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[0005] The present invention aims to provide a new and useful kitchen cabinet that overcome or at least alleviate the above-mentioned disadvantages. Essential features

of the invention are provided in an independent claim, whilst important features of the invention are presented in the dependent claims.

[0006] According to an aspect of the invention, the present application provides a kitchen cabinet that comprises a carcass having a honeycomb structure sandwiched between two opposing plates; a first strut having a first receptacle for receiving the carcass at a first side of the carcass; a second strut having a second receptacle for receiving the carcass at a second side of the carcass; and a fixture that is connected both the first strut and the second strut for fixing the carcass.

[0007] The fixture can comprise a third strut having two ends connected to the first strut and the second strut respectively.

[0008] One of the two opposing plates of the carcass can comprise aluminum or aluminum alloy.

[0009] One of the first strut, the second strut, the fixture, the third strut and the honeycomb structure may comprise aluminum or aluminum alloy.

[0010] The fixture can comprise a L-shaped joint that is configured to be inserted into a slot of the strut or the fixture for fixing two struts together.

[0011] The fixture further may comprise a strut support that is configured to be tightened to one of the strut for anchoring another strut.

[0012] According to an embodiment, the honeycomb structure is made of aluminum or aluminum alloy, whilst the struts are molded or extruded. The kitchen cabinet can be constructed by aluminum carcass/panel/board/plate/sheet with the honeycomb structure. Wood can be eliminated from making the cabinet, thus avoiding above-mentioned issues related to the wooden structure.

[0013] The honeycomb structure is adopted for providing a sandwich-structured composite board (i.e. carcass), instead of using solid aluminum sheets. Solid aluminum sheets are expensive for mass consumer market application, cumbersome

to handle and difficult to shape, as compared to the honeycomb structure based carcass. The honeycomb structure based sandwich-structured composite board has much reduced cost for implementation, ease for assembling, and simplicity for modification. The carcass can be swiftly and easily cut to desired sizes and shapes.

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[0014] If the carcass is mainly made of aluminum or aluminum alloy, including the honeycomb structure, the carcass can be recycled easily. The aluminum based carcass can offer 30 years of usage life, in contrast to 5 years for wood-based kitchen cabinets.

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[0015] The struts provide solid frame work for supporting the carcass. Both the carcass and the strut can have various types of coating, films, or surface processing, which is desirable in consumer market for individual preferences. For example, a user of the aluminum carcass can perform face-lift to a used carcass by painting, polishing, adhering pictures without the worry of damaging the carcass.

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[0016] The carcass can be modified for providing doors, shelves, tables or other furniture for boats, luxury yachts, planes of the sea where weight and corrosion resistivity are important.

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[0017] The accompanying figures (Figs.) illustrate embodiments and serve to explain principles of the disclosed embodiments. It is to be understood, however, that these figures are presented for purposes of illustration only, and not for defining limits of relevant inventions.

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[0018] Figure 1 illustrates a partially assembled kitchen cabinet that has an aluminum carcass with honeycomb structure;

[0019] Figure 2 illustrates three struts of the kitchen cabinet which are connected together at their ends by a corner joint;

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[0020] Figure 3 illustrates a lateral strut for holding by a screw of a strut support on a vertical strut;

[0021] Figure 4 illustrates an isometric view of a front strut;

[0022] Figure 5 illustrates a top view of the front strut;

[0023] Figure 6 illustrates an isometric view of an end of a common strut;

	[0024] Figure 7	illustrates a top view of the common strut;
	[0025] Figure 8	illustrates several views of a corner joint;
	[0026] Figure 9	illustrates three projections of the corner joint;
	[0027] Figure 10	illustrates two isometric views of the strut support;
5	[0028] Figure 11	illustrates two projections of a screw of the strut support;
	[0029] Figure 12	illustrates two projects of a nut of the strut support;
	[0030] Figure 13	illustrates a first strut, a second strut and a third strut for joining together by a first L-joint and a second L-joint;
10	[0031] Figure 14	illustrates the first L-joint and the second L-joint on the first strut and the third strut respectively;
	[0032] Figure 15	illustrates a third L-joint and a fourth L-joint for insertion into the first strut and the third strut at their bottom;
	[0033] Figure 16	illustrates a first carcass for supporting by a fourth strut and a fifth strut;
15	[0034] Figure 17	illustrates the first carcass, the fourth strut and the fifth strut for mounting onto the first and the third struts;
	[0035] Figure 18	illustrates four struts as legs for supporting the fourth and fifth struts;
20	[0036] Figure 19	illustrates screws for securing the legs onto the fourth and fifth struts;
	[0037] Figure 20	illustrates a fifth L-joint and a sixth L-joint for connecting the first and third struts;
25	[0038] Figure 21	illustrates a sixth strut and a seventh strut for connecting to the first and third struts via the fifth L-joint and the sixth L-joint respectively;
	[0039] Figure 22	illustrates a second and a third carcass for connecting to the sixth strut and the seventh strut via a seventh, an eighth, a ninth and a tenth L-joint;
30	[0040] Figure 23	illustrates the second and third carcass aligned for slotting into the sixth, seventh, ninth and tenth struts;
	[0041] Figure 24	illustrates an eleventh strut for holding the second and third carcass;
	[0042] Figure 25	illustrates an isometric view of two L-joints for connecting three perpendicular struts;

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[0043] Figure 26 illustrates an isometric view of a leg and a strut for connecting via a screw;

[0044] Figure 27 illustrates a carcass (flat strut) for connecting with a strut;

[0045] Figure 28 illustrates an assembled kitchen cabinet; and

5 [0046] Figure 29 illustrates an isometric view of a shelf support for supporting a strut, and another isometric view of strut secured by the shelf support.

10 [0047] Exemplary, non-limiting embodiments of the present application are described with references to the above-mentioned figures.

[0048] In particular, Figures 1-12 provides some detailed structures of an embodiment. Figures 13-29 offers explanation on how the embodiment is assembled.

15 [0049] Figure 1 illustrates a partially assembled kitchen cabinet 50 that has an aluminum carcass 52 with honeycomb structure (not shown).

[0050] Figure 2 illustrates three struts 54, 56, 58 of the kitchen cabinet 50 which are connected together at their ends by corner joints 60, 62. The three struts 54, 56, 58
20 include a first strut 54, a second strut 56 and a third strut 58.

[0051] Figure 3 illustrates a lateral strut 58 for holding by a screw 64 of a strut support 66 on a vertical strut 56.

25 [0052] Figure 4 illustrates an isometric view 70 of a front strut 68.

[0053] Figure 5 illustrates a top view 72 of the front strut 68.

[0054] Figure 6 illustrates an isometric view 74 of an end 76 of a common strut 56.

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[0055] Figure 7 illustrates a top view 78 of the common strut 56.

[0056] Figure 8 illustrates several views 80, 82, 84, 86 of a corner joint 60. These views 80, 82, 84, 86 comprise a front view 80, a side view 82, an isometric view 84 and another isometric view 86.

- 5 [0057] Figure 9 illustrates three projections 88, 90, 92 of the corner joint 60. The projections 88, 90, 92 are a front projection 90, a side projection 92 and a bottom projection 88.

- 10 [0058] Figure 10 illustrates two isometric views 94, 96 of the strut support 66. These views 94, 96 are an assembled view 94 and an exploded view 96.

[0059] Figure 11 illustrates two projections 100, 102 of a screw 64 of the strut support 66. The projections 100, 102 include a top projection 100 and a front projection 102.

- 15 [0060] Figure 12 illustrates two projections 104, 106 of a nut 98 of the strut support 66. These 104, 106 are a top projection 104 and a front projection 106.

[0061] Figure 13 illustrates a first strut 202, a second strut 204 and a third strut 206 for joining by a first L-joint 208 and a second L-joint 210.

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[0062] Figure 14 illustrates the first L-joint 208 and the second L-joint 210 on the first strut 202 and the third strut 206 respectively.

- 25 [0063] Figure 15 illustrates a third L-joint 212 and a fourth L-joint 214 for insertion into the first strut 202 and the third strut 206 from bottom.

- 30 [0064] Figure 16 illustrates a first carcass 52 for supporting by a fourth strut 216 and a fifth strut 218. A fourth strut 216 and a fifth strut 218 are placed at opposite sides of the first carcass 52 such that the first carcass 52 can fit into slots of the fourth 216 and fifth strut 218. A first screw 221 and a second screw 223 are inserted from the fourth strut 216, whilst a third screw 225 and a fourth screw 227 are inserted from the fifth strut 218.

[0065] Figure 17 illustrates the first carcass 52, the fourth strut 216 and the fifth strut 218 for mounting onto the first 202 and the third struts 206.

[0066] Figure 18 illustrates four struts 220, 222, 224, 226 as legs for supporting the fourth 216 and fifth struts 218. The four struts 220, 222, 224, 226 consist of a first leg 220, a second leg 222, a third leg 224 (not shown) and a fourth leg 226 (not shown). The first leg 220 further includes a first leg screw 228, the second leg 222 further includes a second leg screw 230, the third leg 224 further includes a third leg screw 232 (not shown), whilst a fourth leg 234 includes a fourth leg screw 234.

[0067] Figure 19 illustrates screws 236, 238, 240, 242 for securing the legs 220, 222, 224, 226 onto the fourth 216 and fifth struts 218. A fifth screw 236 and a seventh screw 238 are secured to the fifth strut 218, and an eighth screw 240 and a ninth screw 242 are secured to the fourth strut 216.

[0068] Figure 20 illustrates a fifth L-joint 244 and a sixth L-joint 246 for connecting the first 202 and third struts 206.

[0069] Figure 21 illustrates a sixth strut 248 and a seventh strut 250 for connecting to the first 202 and third struts 206 via the fifth L-joint 244 and the sixth L-joint 246 respectively.

[0070] Figure 22 illustrates a second 252 and a third carcasses 254 for connecting to the sixth strut 248 and the seventh strut 250 via a seventh 256, an eighth 258, a ninth 260 and a tenth L-joint 262.

[0071] Figure 23 illustrates the second 252 and third carcasses 254 aligned for slotting into the sixth 216, seventh 218, ninth 248 and tenth struts 250.

[0072] Figure 24 illustrates an eleventh strut 268 for holding the second 252 and third carcasses 254. Two screws 264, 266 are tightened to the ends of the eleventh strut 268 from opposite sides.

[0073] Figure 25 illustrates an isometric view of two L-joints 60, 62 for connecting the perpendicular struts 54, 56, 58.

5 [0074] Figure 26 illustrates an isometric view of a leg 220 having a strut 220 for connecting via a leg screw 228. A further screw 236 is tightened to the opposite end of the leg screw 228.

10 [0075] Figure 27 illustrates a strut 68 for connecting with another strut 268. A first plate 270 and a second plate 272 are inserted into an end of the strut for tightening with the screw 236.

15 [0076] Figure 28 illustrates an assembled kitchen cabinet 280. The assembled kitchen cabinet 280 further includes another carcass 278 supported by two struts 274, 276 from opposite sides.

20 [0077] Figure 29 illustrates a first isometric view 282 of a shelf support screw 284 and a second isometric view 286 of the strut support screw 284 tightened. A first top view 288 is provided that corresponds to the first isometric view 282. A second top view 290 is provided, which corresponds to the second isometric view 286.

[0078] In the application, unless specified otherwise, the terms "comprising", "comprise", and grammatical variants thereof, intended to represent "open" or "inclusive" language such that they include recited elements but also permit inclusion of additional, non-explicitly recited elements.

25 [0079] As used herein, the term "about", in the context of concentrations of components of the formulations, typically means +/- 5% of the stated value, more typically +/- 4% of the stated value, more typically +/- 3% of the stated value, more typically, +/- 2% of the stated value, even more typically +/- 1% of the stated value,
30 and even more typically +/- 0.5% of the stated value.

[0080] Throughout this disclosure, certain embodiments may be disclosed in a range format. The description in range format is merely for convenience and brevity and should not be construed as an inflexible limitation on the scope of the disclosed

ranges. Accordingly, the description of a range should be considered to have specifically disclosed all the possible sub-ranges as well as individual numerical values within that range. For example, description of a range such as from 1 to 6 should be considered to have specifically disclosed sub-ranges such as from 1 to 3, from 1 to 4, from 1 to 5, from 2 to 4, from 2 to 6, from 3 to 6 etc., as well as individual numbers within that range, for example, 1, 2, 3, 4, 5, and 6. This applies regardless of the breadth of the range.

[0081] It will be apparent that various other modifications and adaptations of the application will be apparent to the person skilled in the art after reading the foregoing disclosure without departing from the spirit and scope of the application and it is intended that all such modifications and adaptations come within the scope of the appended claims.

Claims

1. Kitchen cabinet comprising
 - A carcass that has a honeycomb structure sandwiched between two opposing plates;
 - A first strut having a first receptacle for receiving the carcass at a first side of the carcass;
 - A second strut having a second receptacle for receiving the carcass at a second side of the carcass; and
 - A fixture that is connected to the first strut and the second strut for fixing the carcass.
2. Kitchen cabinet of Claim 1, wherein
The fixture comprises a third strut having two ends connected to the first strut and the second strut respectively.
3. Kitchen cabinet of Claim 1 or 2, wherein
One of the two opposing plates comprises aluminum or aluminum alloy.
4. Kitchen cabinet of any of the preceding Claims, wherein
One of the first strut, the second strut, the fixture, the third strut and the honeycomb structure comprises aluminum or aluminum alloy.
5. Kitchen cabinet of any of the preceding claims, wherein
The fixture comprises a L-shaped joint that is configured to be inserted into a slot of the strut or the fixture for joining two struts.
6. Kitchen cabinet of any of the preceding claims, wherein
The fixture further comprises a strut support that is configured to be attached to one of the strut for anchoring another strut.