SANDWICH TOP CONSTRUCTION FOR OFFICE FURNITURE

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10 Claims

ABSTRACT OF THE DISCLOSURE

A top structure for office furniture such as desks, tables, and credenzas, which is of a sandwich construction comprising a bottom plate defining upstanding marginal walls about its rim each including an inturned flange with the flanges being in coplanar relation, a cellular filler or core structure bonded to the bottom plate within but extending short of the bottom plate marginal walls, a top plate bonded to the core structure, and sheets of finishing material bonded to the top plate and side surfaces defined by the bottom plate walls in close fitting relation.

This invention relates to tops for office furniture such as desks, tables and credenzas, and more particularly, relates to an improvement over the desk top construction of Grube Pat. 2,911,274.

In accordance with the desk top construction shown in the Grube patent, the desk top comprises top and bottom metal plates formed with opposed edge flanges that receive between them a cellular filler structure to which both plates are bonded. A finishing sheet is bonded to the upper surface of the top sheet, and the opposed flanges of the top and bottom sheets are masked by a decorative edging which consists of a rigid strip which is fastened in place by the screws that secure the said flanges together and the screws are covered by an additional resilient decorative edging strip. This basic top arrangement has many advantages, an important one being a high strength to weight ratio.

A principal object of this invention is to provide a top construction that eliminates the two piece decorative edging and upper and lower plate flange securement of the Grube patent.

Another principal object of the invention is to provide a top construction in which the lower plate receives and houses the cellular core, and the upper plate is a simple flat plate.

Yet another principal object of the invention is to provide an improved method of making a top construction that insures a strong light weight structure of uniform characteristics.

Other objects of the invention are to provide a top construction for office furniture that is readily adapted to low cost assembly line techniques, that employs contact cement or other adhesive systems to bond the various parts together, and that is economical of manufacture, convenient to install, and adapted for use in a number of different types of furniture as a top therefor.

In accordance with this invention, the top comprises a bottom plate formed to define an upstanding marginal wall about its rim each including an inturned flange disposed in the plane of the top and in coplanar relation with each other, a cellular filler or core received in and bonded to the bottom plate and having its marginal configuration fitting within the marginal configuration of the bottom plate inturned flanges, a planar upper plate bonded to the core or filler, and a sheet of finishing material, such as linoleum, bonded to the top plate and forming the top surface of the desk. In one embodiment, the upper plate is proportioned to fit within the marginal configuration
The core 12 is also run through a suitable contact cement apparatus, such as a suitable roller coating arrangement, and preferably both of its sides 36 and 38 are treated in this manner. The core 12 is removed from the assembly after the sides 36 and 38 of the core, after which the assembly is passed through a suitable contact cement cementing apparatus, such as a suitable roller applying apparatus, for application to the top surface 48 of the top plate 20 and the undersurface 50 of the top sheet 22 of suitable contact cement, and they are then passed through a suitable heating arrangement to drive off volatiles, after which the top sheet 22 is centered on the subassembly with its surface 59 in engagement with the top sheet surface 48, after which the assembled parts are run through a suitable pressure roller arrangement to secure a good bond between sheet 22 and plate 20.

In this connection, it is to be noted that the top sheet 22, in the embodiment of FIGS. 1-4, is to be bonded to the upwardly facing surfaces 32 and 33 of the respective interturn flanges 21 and 23, and consequently the contact cement should be applied to these surfaces as well as the portion of the undersurface 50 of the sheet 22 that is to contact same.

The overhanging edges of the top sheet 22 are then trimmed flush with the outwardly facing surfaces 52 and 54 of the respective stripings or sheets 24 and 26, by employing a suitable high speed milling cutter mechanism or the like. In this trimming operation the marginal edges of the sheet 22 are given a chamfer, as indicated at 58, which preferably is at an angle of between from about 20 to about 45 degrees with respect to the plane of the top, and overlies and masks the upper marginal edges of the respective sheets 24 and 26.

The completed top 10 is then available for use as a top for desks. The same top may also be employed as a table top, and if made narrower form, it can be used as a top for credenzas.

In the modification of FIG. 7, the embodiment of FIGS. 1-4 is varied to have the top plate 20A extend to the surfaces 28 and 29 of the respective marginal walls 16A and 17A, with the walls 16A and 17A being decreased in height to accommodate the corresponding change in level of positioning of the top plate 20A. The top finishing or laminating sheet 22A of this embodiment is thus substantially coextensive with top plate 20A; and, as in the embodiment of FIGS. 1-4, sheet 22A is formed to define beveled edge or chamfer 58 that overlies and masks the upper edges of the material covering surfaces 28 and 29. Alternatively, as a cost saving simplification, top plate 20A may be eliminated and finishing sheet 22A bonded directly to the core 12A.

In the embodiment 10B of FIGS. 5 and 6, the marginal walls 16B and 17B of the bottom plate 14 have been extended to their inside surfaces 60 and 61 a bead support member 62 (see FIG. 6) which includes a flange 64 that is disposed in spaced overlying relation relative to the respective interturn flanges 21 and 23. The top plate 20B is in the plane of the flanges 64 but is spaced somewhat therefrom by gap 42. The top finishing sheet 22B is adhered to the top plate 20B and flanges 64, and has its marginal edges 65 ground flush with the end surfaces 66 of the flanges 64, while the top edges 68 of the stripings or sheets 24 and 26 are aligned with the top surfaces 32 and 33 of the respective interturn flanges 21 and 23, for application of a bead strip 70 that masks the edges 65 and 68. Walls 16B and 17B are of decreased height to accommodate the bead support member 62.

In the top 10C (see FIG. 8), the top plate 20C follows the form of FIG. 7 and overlies and is adhered to flanges 64, the form of FIG. 8, otherwise being the same as the embodiment of FIGS. 5 and 6. Similarly to the embodiment of FIG. 7, the top plate 20C may be eliminated and finishing sheet 22C bonded directly to core 12C, as a cost saving simplification.

**SPECIFIC DESCRIPTION**

The core or filler 12 may be of the same type described in said Grube patent, and thus may be formed from Kraft paper impregnated with a phenolic resin. It may be available for use in the desk tops herein described either in the single piece form shown in FIG. 2, or in the form of several segments placed side by side. As the type of filler core indicated is moisture and fire resistant, and is not subject
to deterioration, it is preferred, but of course other types of cellular structures may be employed as deemed desirable or necessary. Core 12 is proportioned so that its margin 81 complements but is somewhat smaller than the configuration defined by turned flanges 21 and 23 so that the core 12 may be readily placed within the space 40. This leaves a void 83 between the margin of the core 12 and margin walls 16 and 17 of plate 14 that needs no attention, in accordance with this invention. The other embodiments 10A, 10B and 10C are similar in this regard, mounting members 62 being mounted in this void in tops 10B and 10C.

The top and bottom plates are preferably formed from 22 gauge steel. The bottom plate or pan 14 has its corners 84 suitably mitered as at 82, and is preferably formed with suitable holes 84 and 86 at its ends to provide convenient means for hanging the sheet to dry after it has been painted. Sheet 14 is also preferably formed with a plurality of holes 88 arranged in accordance with FIGS. 13 or 14 of Abrahamson Pat. 3,125,387 for application thereto of the C-channels disclosed in that patent for attaching the top to desk pedestals.

Top plate 20 is formed with a pair of holes 90 at either end thereof to conveniently support the plate 20 when painted for drying.

As indicated, all surfaces of the top and bottom plates are suitably painted (as by spray painting or the like) to insure good bond contact with contact cement. However, painting is not considered an essential, but the metal surfaces must be free from dust, rust, oil and the like that would detract from good bond contact with contact cement.

The sheets or stripings 24 and 26 and the top sheet 22 may be formed from any substance suitable for covering the exposed surfaces of the bottom and top sheets and that is decorative and wear resistant. A suitable high pressure melamine laminate will be seen satisfactorily. "Textolite" is a trademark for plastic laminates made and sold by the Laminated Products Department of General Electric Company, see 1968 edition of Modern Plastics Encyclopedia at p. 1230.

At the corners 88 of the bottom plate 14, the rim walls 16 and 16D turned flanges 21 are fixed together by spot welding an angle member 92 therebetween, as and where indicated at 94 and 96 (see FIGS. 3 and 4). The bottom plates of the other embodiments are similarly equipped, the bend supports 62 being relieved at their ends as necessary to accommodate the angle members 92 in tops 10B and 10C, and their flanges 64 being mitered at adjacent corners (see FIG. 5).

In the embodiment 10 of FIGS. 1--4, the bottom plate 14 has affixed thereto its marginal edges a decorative device 97 comprising J-strip 98 that presents a planar surface 100 just below and spaced from the respective stripings or sheets 24 and 26. This presents a novel decorative effect suggesting that the top floats above its supports. The strips 98, which are coextensive with respective marginal walls 16 and 17 and are mitered at the corners 86, are secured in place by suitable screws 102. Device 97 is equally applicable to the other embodiments of the invention.

In the top 10B of FIGS. 5 and 6, the support member 62 that is affixed to the bottom plate marginal walls 16 and 17 is generally of U-shaped cross-sectional configuration defining a wing flange 110 that is affixed to the bottom plate marginal wall 16 at spaced points thereof as at 112, an integral extending wall 114 connecting with a back wall 116 which in turn connects with top wall 118 that forms the flange 64. As indicated, there is a member 62 for each marginal wall 16 and 17 and extending substantially coextensive therewith, with suitable mitering and angle members 92 at corners 80.

The respective strip members 70 each comprise a strip 120 formed from suitable sheet metal and appropriately plated and formed to define the convexly rounded edge 122 having a rectilinear terminus 124, with the other edge 126 of the strip 120 being substantially planar and proportioned for a friction fit between the flange 64 and the respective turned flanges 21 and 23 of the respective marginal walls 16 and 17.

The strip 122 is applied to each marginal wall 16 as the last procedure in completing the tops 10B and 10C. The contact cement employed in practicing this invention may be of any suitable standard type of contact cement. There is thus provided a top arrangement of general application that has a high strength to weight ratio, that is economical of manufacture, and aesthetically pleasing in appearance.

The foregoing description and the drawings are given merely to explain and illustrate the invention and the invention is not to be limited thereto, except insofar as the appended claims are so limited, since those skilled in the art who have the disclosure before them will be able to make modifications and variations therein without departing from the scope of the invention.

I claim:

1. A desk top comprising:
   a lower sheet metal substantially planar pan of generally quadrilateral configuration defining upstanding marginal side and end walls about its rim each including a planar outwardly facing surface and an turned flange disposed in the plane of the pan with said flanges being, in coplanar relation, and with the inner margins of said flanges defining an opening forming an open top for said pan;
   b said surfaces being of generally quadrilateral configuration and said side and end walls forming right angle corners for the pan,
   c a cellular filler structure bonded to said pan within and spaced from said walls and having a marginal configuration substantially complementing that of said opening,
   d with the space between said filler structure and said pan marginal walls being a void about the margin of said filler structure,
   e a layer of desk top finishing material on top of and made fast to said filler structure in substantial parallemism to the plane of said pan and extending over said flanges to present side edges in substantial alignment with the respective pan marginal walls and corners,
   f said layer covering said filler structure and said flanges, and a layer of finishing material bonded to and overlying each of the respective outwardly facing surfaces of the respective pan marginal walls with each layer of finishing material defining an upper marginal edge adjacent the plane of said flanges,
   g said layers of the respective side and end marginal walls at the respective pan corners terminating in beveled edges that overlie the respective pan corners and are in substantial abutting relation to mask the respective pan corners, and means for masking small upper marginal edges of the respective finishing material layers of said walls.

2. The desk top set forth in claim 1 wherein:
   a said means for masking said upper marginal edges of the respective finishing layers of said walls comprises:
   b said side edges of said desk top finishing material layer overlying and abutting said upper marginal edges of said respective wall layers,
   c said marginal edges of said respective wall layers, and said desk top finishing material layer beveling.

3. The desk top set forth in claim 1 wherein:
   a said means for masking said upper marginal edges of the respective finishing layers of said walls comprises:
   b a bevel strip extending the length of each marginal wall and applied thereto between the respective said upper marginal edges of said marginal wall
finishing material layers and said desk top finishing material layer side edges.

4. The desk top set forth in claim 1 including:
an upper planar metal sheet interposed between said filler structure and said desk top finishing material layer and bonded thereto,
said upper metal sheet covering said filler structure.

5. The desk top set forth in claim 4 wherein:
said upper metal sheet is proportioned to fit within said inturned flanges and is in coplanar relation therewith,
said top finishing material layer being bonded to the upwardly facing surfaces of said flanges and said upper sheet.

6. The desk top set forth in claim 4 wherein:
said upper metal sheet is proportioned to engage the upwardly facing surfaces of said flanges and extend to said rim of said pan,
said upper sheet being bonded to said flange surfaces and said filler structure in parallelism with the plane of said pan and said top finishing material overlying and masking said upper sheet.

7. The desk top set forth in claim 1 including:
an angle element at each corner thereof affixed between the respective marginal walls at such corner and the adjacent portions of said inturned flanges.

8. The desk top set forth in claim 4 including:
a bead strip extending the length of each marginal wall and applied along the respective side edges of said top finishing material and comprising said masking means,
a bead support member anchored to each of said walls and including a flange overlying said inturned flange thereof,
said support member flanges being in coplanar relation,
said bead strips each including a strip portion frictionally received between the respective support mem-

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ber flanges and the inturned flange underlying same, with said upper marginal edges of the respective marginal wall layers abutting the bead strip overlying same and said bead strips masking said side edges of said top layer of finishing material.

9. The desk top set forth in claim 8 wherein:
said upper metal sheet is proportioned to fit within said support member flanges and is in coplanar relation thereto,
said top finishing material being bonded to the upwardly facing surfaces of said support member flanges.

10. The desk top set forth in claim 8 wherein:
said upper metal sheet is proportioned to engage the upwardly facing surfaces of said support member flanges and extend substantially to said rim of said pan,
said upper sheet being bonded to said support member flange surfaces and said top finishing overlying said upper sheet.

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62—619, 623; 108—161; 161—68
UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,676,279 Dated July 11, 1972

Inventor(s) D. V. BEAVER

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:


Signed and sealed this 23rd day of January 1973.

(SEAL)
Attest:
EDWARD M. FLETCHER, JR. ROBERT GOTTSCHALK
Attesting Officer Commissioner of Patents
UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,676,279 Dated July 11, 1972

Inventor(s)  D. V. BEAVER

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

IN THE DRAWINGS: The Filing Date is indicated as "June 10, 1970" it should be -- June 16, 1970 --.

Signed and sealed this 15th day of May 1973.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
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