April 25, 1961 J. SHWAYDER ET AL 2,981,579

TOP FOR FOLDING TABLES AND THE LIKE

Filed May 6, 1957 2 Sheets-Sheet 1

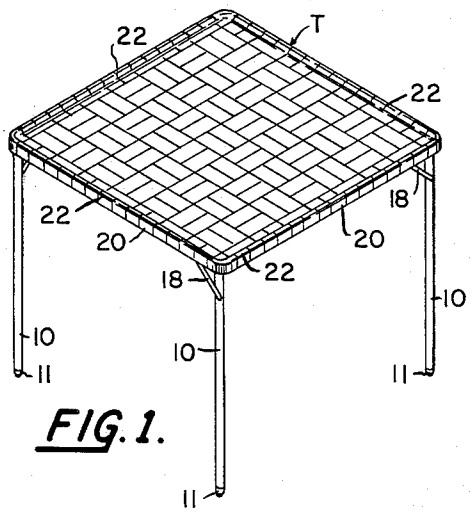


FIG. 1.

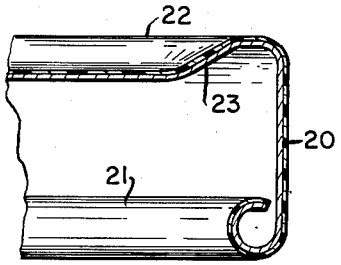


FIG. 2.

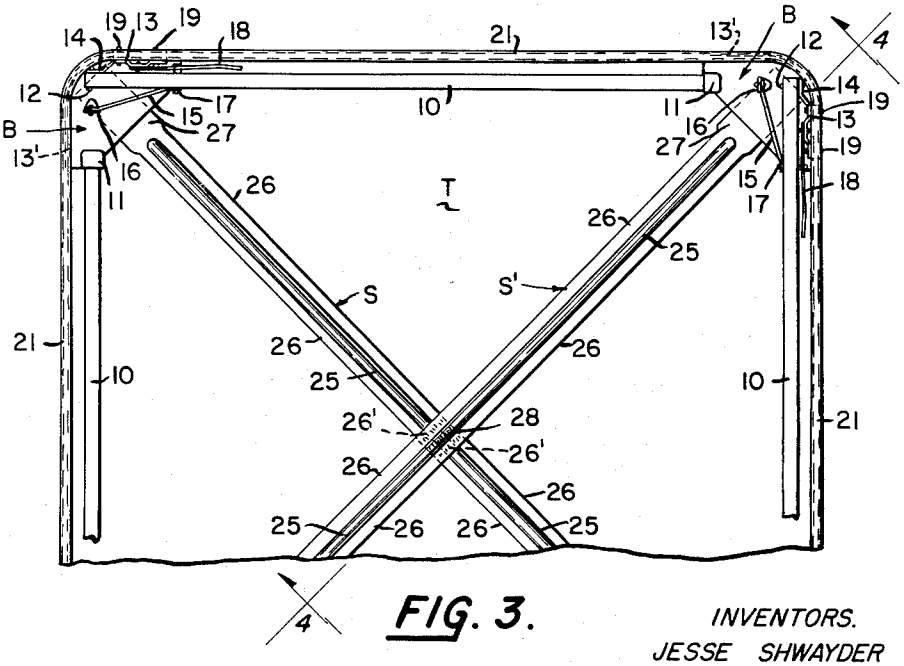


FIG. 3.

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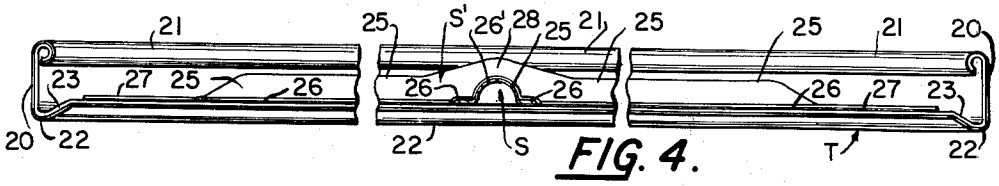


FIG. 4.

FIG. 5.

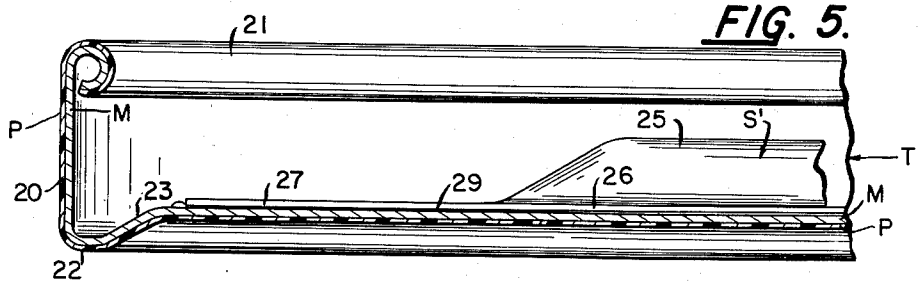


FIG. 6.

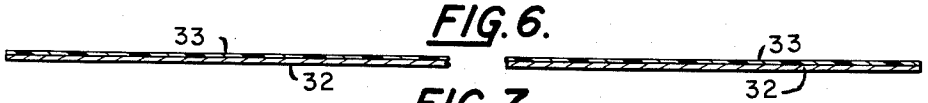
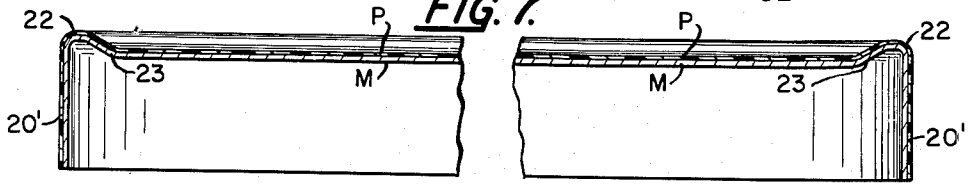


FIG. 7.



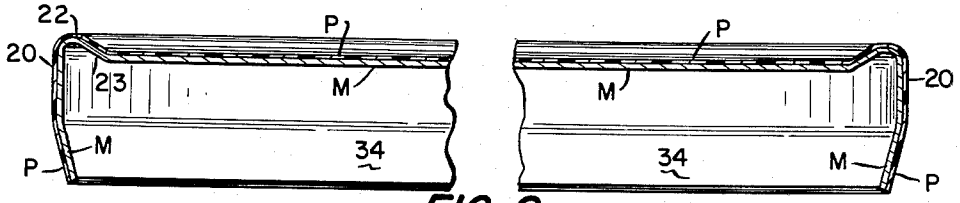


FIG. 8.

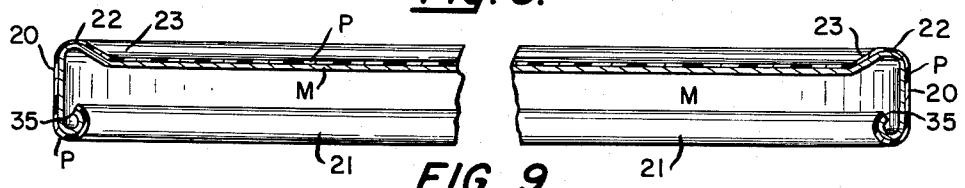


FIG. 9.

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2,981,579

TOP FOR FOLDING TABLES AND THE LIKE

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4 Claims. (Cl. 311—106)

This invention relates to tables, and more particularly to tops for auxiliary or folding tables, such as card tables.

An auxiliary or folding table, such as a card table, is often subjected to relatively rough usage and the materials of which such a table may be made, to provide a satisfactory and useful life, are thus limited. Previously, card tables have been made having wooden legs and metal brackets and hinges for attaching the legs to a wooden top or a wooden rim which extends around a top, formed of fibreboard, cardboard or the like. However, a complete wood construction may be objectionably heavy, while a fibreboard or cardboard top may be more readily punctured by a sharp instrument or the like. However, if the top is made of metal, problems are encountered in making the top sufficiently strong but sufficiently light in weight, while a metal top, when coated with enamel, paint or the like, is susceptible to being marred or scratched. The latter problem could be overcome if the top were covered with a layer of relatively tough plastic, such as polyvinyl resin, but the application of a plastic layer to a metal top of a card table or the like produces numerous problems in securing the plastic to the top and also in forming the plastic to fit over the flanges at the sides, with which the top must be provided in order to have sufficient strength. In addition, a metal table top acts as a drum, as it were, thus causing a reverberation of sound whenever an article, such as a glass filled with liquid, is placed thereon, or when the top is accidentally struck. In addition, card table tops have generally been substantially level or flat from each edge to the opposite edge, so that if a glass of liquid is accidentally spilled, the liquid tends to run off onto the floor or onto the clothing of a person sitting at the table.

Among the objects of the present invention are to provide a novel table, particularly an auxiliary or folding table, such as a card table; to provide a novel top for such a table; to provide such a table top which is formed of metal provided with a layer of plastic or the like and which has adequate strength yet is comparatively light in weight; to provide such a table top which is adequately reinforced; to provide such a table top in which the sounding or drum effect is minimized; to provide such a table top which will minimize the possibility of liquid spilled thereon running off the edges; to provide a method of forming a table top by which a plastic layer is securely attached to a metal layer; to provide such a method in which the difficulties in shaping the plastic layer and securing the same to depending flanges around the sides are overcome; to provide such a method which may be carried out readily; and to provide such a table top which may be manufactured readily and will withstand the rigours of hard usage.

The foregoing and additional objects, as well as the novel features of this invention, will become apparent from the description which follows, taken in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of a card table having a top constructed in accordance with this invention;

Fig. 2 is an enlarged, fragmentary vertical section, taken at one edge of the table top;

Fig. 3 is a partial bottom plan view, on a larger scale, of the card table of Fig. 1, in folded position, as for storage or the like;

Fig. 4 is a condensed oblique section, taken through the table top at the position of line 4—4 of Fig. 3, but omitting the legs and means for pivotally attaching the legs to the top;

Fig. 5 is a fragmentary section, comprising a portion of one end of Fig. 4, on an enlarged scale;

Fig. 6 is a condensed transverse section of a strip from which the table top may be made;

Fig. 7 is a condensed vertical section illustrating an initial step in the forming of the table top; and

Figs. 8 and 9 are similar condensed sections illustrating subsequent steps in the forming of the table top.

As illustrated in Fig. 1, a table top T constructed in accordance with this invention may be incorporated in a folding or card table adapted to be supported by legs **10** during use. The legs **10** may be pivotally attached to the top T in any suitable manner, such as disclosed in Adler U.S. Patent 2,567,417. Thus, each leg **10** may be tubular and provided with a cap **11** at its lower end, while the upper end of each leg, as in Fig. 2, may be pivotally attached, as by a rivet **12**, to a corner box B which extends around the inside corner of the table top and is attached thereto, as by rivets. Each corner box B may be provided with a flat base and an upstanding flange **13** having an offset section **14** at the point of attachment of the rivet **12**, while a brace **15** may be pivotally attached at its outer end to the leg and at its inner end, as by a rivet, to an ear **16**, conveniently struck from the base of the corner box B, with the rivet at ear **16** being in alignment with rivet **12**, so that each leg will be spaced inwardly from the corresponding side of the table top and will move pivotally parallel thereto. The outer end of brace **15** may be pivotally attached to leg **10** by a stud **17**, which conveniently extends through leg **10** so that its opposite, extending end may engage a slotted stay **18**, pivotally attached at its inner end to a second offset portion of flange **13**, as by a rivet. The slot in each stay **18** preferably limits the movement of the respective leg **10** between a position adjacent the table top, as in Fig. 3, and a position perpendicular thereto, as in Fig. 1, while each stay **18** may be sufficiently resilient that it will bear outwardly against the head of stud **17**, to maintain each stay locked with the table supported by the legs, as in Fig. 1. For the latter purpose, the outer end of the slot in each stay **18** may be enlarged and stud **17** provided with a neck inwardly of the outer end thereof, i.e., adjacent leg **10**, so that the slot in the stay will engage the neck during movement of a leg between the folded position of Fig. 2 and the upright position of Fig. 1. As will be evident, the stay **18** will spring outwardly when the position of Fig. 1 is reached, when the legs are being opened, but each stay must be pushed inwardly before the corresponding leg can be pivoted back to folded position. Thus, the table will be firmly supported when in upright position, as in Fig. 1.

In accordance with this invention, the table top is provided with a peripheral depending flange **20**, shown also in Fig. 2, and a curl **21**(which extends inwardly and around, as for a portion of a circle, as in Fig. 2, along the lower edge of each flange **20** and entirely around the top. This curl **21** adds to the strength of the top, since it resists deformation inwardly and outwardly, as well as upwardly and downwardly, due to its generally circular shape, as well as providing other advantages pointed out

later. A spacer (not shown) may be inserted between flange 13 of the corner box B, rivets 19 may extend through flange 20, the spacer and flange 13 for attachment purposes; and a continuation 13' of flange 13 of corner box B may extend into the spacer between curl 21 and the top of the table top, along the remainder of the outer edge of the corner box.

Also, in accordance with this invention, the top T is formed from a metal strip or layer M and a plastic layer P, the latter of which may be applied to the metal M in a manner described later and may be a relatively high strength polyvinyl resin which is provided with a pattern on the outside thereof, as indicated in Fig. 1, applied by embossing or the like at the time of forming the strip from which the plastic layer P is made. In further accordance with this invention, the top T may also be provided with a rim 22 around its edge, so that the remainder of the top forms a well of sufficient depth that in the event liquid or the like is spilled on the top, the liquid will be retained in the well and will not flow off the edge of the table. An inclined section 23, connecting rim 22 with the remainder of the top, is preferably slanted at a suitable angle, such as 30°, so that a sharp projection will not be formed at the inner edge of the rim. It will be noted that rim 22 increases the usefulness of the top T, as in playing card games, for instance, since cards may be more readily picked up merely by movement of the cards toward the rim so that an edge of each card will rest on the inclined section 23 and the card or cards may therefore be picked up more readily. The angularity of the inclined section 23, particularly when it extends completely around the top, as preferred, also increases the strength and resistance of the top to deformation.

Further in accordance with this invention, the underside of the top T is reinforced by a pair of reinforcing strips S and S', as shown in Figs. 3, 4 and 5, which conveniently are disposed at right angles to each other and extend between the opposite corners of the table top. Each of the strips S and S' may be formed generally with a central, semi-circular section 25, from the edges of which flanges 26 extend laterally outwardly, while the strips may terminate at each end in a flat section 27, into which the central section 25 merges. Due to the diagonal disposition of strips S and S', one strip crosses over the other strip and for this reason, the strip S' may be provided with a hump 28 at the center, as in Fig. 4, the underside of which, including lateral flange portions 26', corresponds to the transverse configuration of the top of strip S. The strips S and S' need not be secured together at the center, but may be attached together at the center, as by rivets or the like, if desired.

In accordance with this invention, the strips S and S' are not attached to the underside of the top T by rivets, welds or other type of metallic connection, but instead are attached to the underside of the top T, as in Fig. 5, by a non-metallic adhesive layer 29, which is conveniently a metal bonding resin. Due to the non-metallic layer 29, between the strips S and S' and the underside of top T, the drum effect of the table top is minimized. This is apparently due not to any change in the normal period of vibration produced by the presence of the strips S and S', but primarily to the presence of the non-metallic layer 29 and its effect not only upon the normal period of vibration of the assembly, but also its resistance to the transmission of sound. Thus, instead of sound reverberating when an article is placed on the table top or the table top is accidentally struck, either no discernible sound at all or merely a dull sound is produced. In addition, since the plastic layer P is also non-metallic, the sharpness of any sound produced by placing an object on the table top, or when the table top is accidentally struck, is further minimized.

In further accordance with this invention, as illustrated in Fig. 6, a metal strip or sheet 32 of suitable width and any desired length, such as cold rolled steel of appropriate thickness, as on the order of 0.030 in., may be first bonded, while both are flat, to a strip 33 of a suitable semi-rigid plastic, such as a plasticized polyvinyl chloride resin having a suitable thickness, such as on the order of 0.012 in., and the upper surface of which may be embossed or printed with a desired pattern, such as indicated in Fig. 1 at the time of manufacture. Such bonding may be carried out in a suitable manner, such as in accordance with U.S. Patent 2,728,703. Thus, steel strip 32 may be cleaned chemically and treated to produce a deposit of iron phosphate on the surface. The steel sheet may then be coated with a layer, such as one-half mil in thickness of a suitable adhesive, such as "Kotol" cement (supplied by the Naugatuck Chemical Division of the U.S. Rubber Company) and then subjected to a temperature, such as of 175° F. in an oven, as for approximately 1 minute, so as to evaporate the solvent in the adhesive. The temperature of the oven may then be raised to heat the sheet rapidly to a suitable temperature, such as 400° F., and as the steel sheet emerges from the oven, the plastic strip 33 is applied and subjected to pressure, as by rolls, to insure a firm bond between the steel and plastic strips. As will be evident, the bond between the steel and plastic strips is readily produced through heat and pressure, in the manner described above, while the strips are flat. Then the steel strip, with the plastic strip bonded thereto, may be cut into suitable lengths to form blanks which are placed in a die, such as conforming to the configuration of Fig. 7. Thus, in an initial forming step, the dished top, including the rim 22 and inclined section 23, as well as depending flanges 20', may be produced. Then, as in Fig. 8, the lower edges 34 of the flanges may be bent inwardly in another die in a precurling operation, thus providing flanges 20 of the desired depth, following which the inwardly bent or precurled edges 34 may be bent around in still another die to the arcuate shape of Fig. 9, thereby forming the curl 21 at the lower edge of each flange 20. It will be noted that the corners of the table top are preferably rounded on a sufficient radius that the curl 21 may extend around each corner without the possibility of the metal attempting to fold upon itself, so that the plastic layer P will follow the curvature of the metal during the forming operation, without causing the plastic to tend to be folded upon itself and thereby produce the possibility of the plastic layer being separated, by shear forces, from the metal. It will be noted that the curl 21, the inner edge of which preferably faces the inside of the depending flanges 20, places the terminal edges 35 of the metal and plastic strips in a protected position, in which the possibility of such edge being accidentally struck is eliminated. Thus, since it is difficult to separate the plastic and metal layers mechanically, except at the extreme edges thereof, the protected position of the inner edges 35 of curls 21 minimizes the possibility of the metal and plastic layers being separated accidentally.

After the table top T has been produced in the manner described above, the holes for the rivets by which the corner boxes are attached may be punched in side flanges 20, strips S and S' may be cemented to the underside of the top and the leg assemblies, consisting of the corner boxes B, legs 10 and the remainder of the parts associated with legs 10 may then be installed, it being noted that the base of each corner box conveniently overlies a flat end of a strip S or S'.

From the foregoing, it will be evident that a table top constructed in accordance with this invention fulfills to a marked degree the requirements and objects hereinbefore set forth. As will be evident, the rim and inclined sections, as well as the depending flanges and curls at the lower edges of the flanges, reinforce the table top, while the reinforcing strips on the underside of the table top add considerable stability thereto. Also, a non-metallic layer between the reinforcing strips and the

underside of the table top, conveniently a layer by which the strips are attached to the table top, reduces the reverberation of sound produced when an object is placed on the table top or the table top is accidentally struck.

As will further be evident, by securing the plastic layer to a metal strip prior to forming the dish shape of the top and the side flanges and curls, a better bond may be obtained between a plastic strip and the metal strip, since the plastic strip may be applied to the metal strip when both are flat. This permits sufficient pressure to be applied in order to secure a good bond.

Although a specific embodiment of this invention has been illustrated and described, it will be understood that other embodiments may exist and various changes made therein, without departing from the spirit and scope of this invention.

What is claimed is:

1. A table top formed at least in part of thin sheet metal, with the underside of said top being of such sheet metal; and at least one metal reinforcing member extending across the underside of said top and having at least one flat surface secured to the underside of said top by a non-metallic adhesive which is disposed between said reinforcing member and the underside of said top to provide a non-metallic connection separating the metal of said reinforcing member from the metal of said top and eliminating metal to metal contact between said reinforcing member and said top at substantially all points therebetween, so as to minimize the drum effect of the sound produced by an object striking said top.

2. A table top, as defined in claim 1, including a plurality of reinforcing members disposed angularly with respect to each other.

3. A table top, as defined in claim 2, wherein each said reinforcing member comprises a central, generally rounded section connected at each side to a laterally extending flange secured to the underside of said table top by said adhesive.

4. A table top as defined in claim 3, wherein said reinforcing members comprise two members extending diagonally across said table from corner to corner and crossing at the center, each said member having a flat end adjacent the corresponding corner and attached to the underside of said table top by said adhesive.

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