Feb. 13, 1968 J. F. CONIKER 3,368,600

FOLIO CONSTRUCTION

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FIG.1

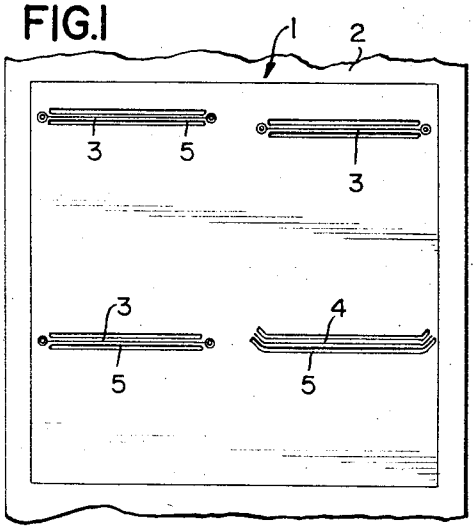


FIG.6

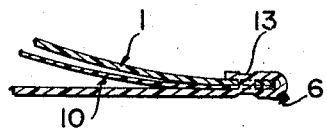


FIG.2

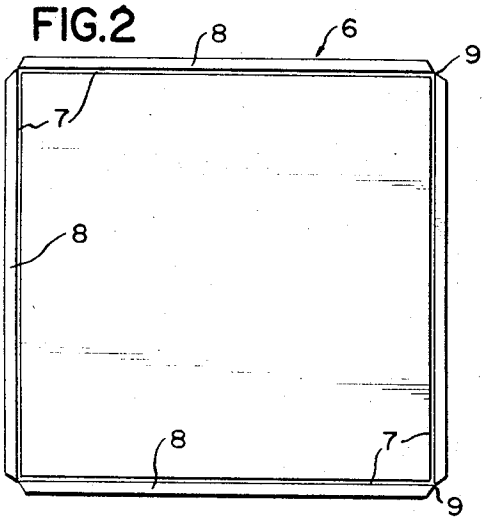


FIG.3

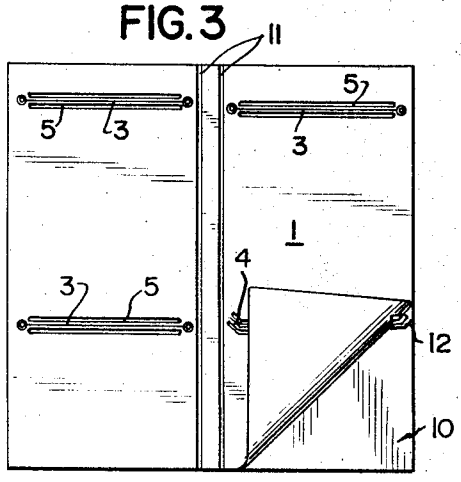
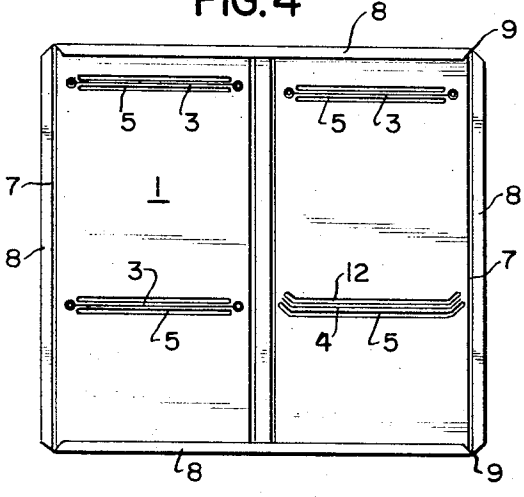


FIG.4



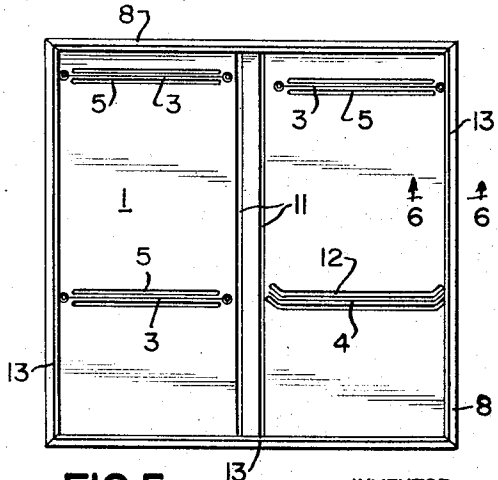


FIG.5

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FIG. 7

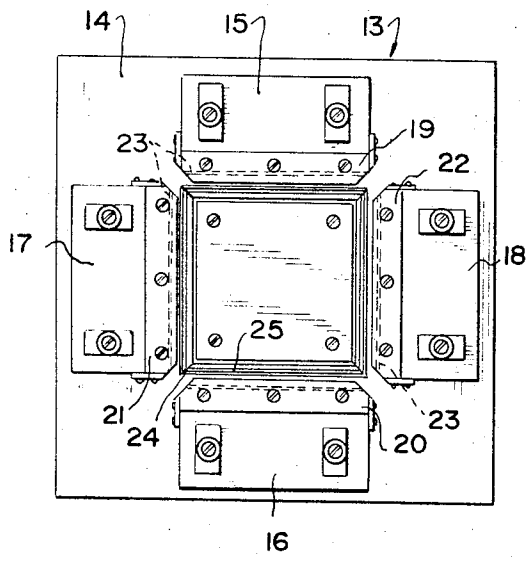


FIG. 8

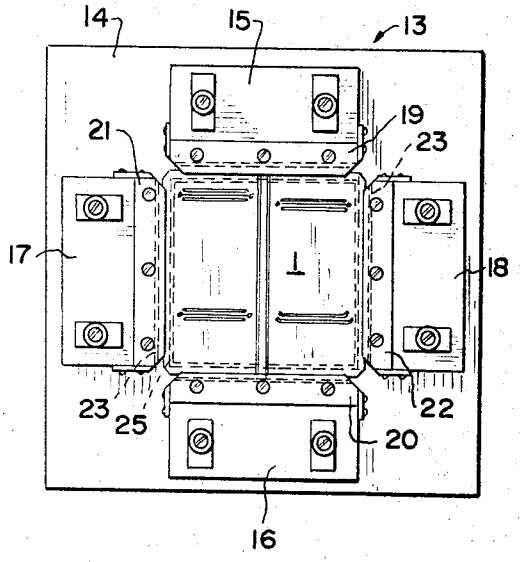


FIG. 9

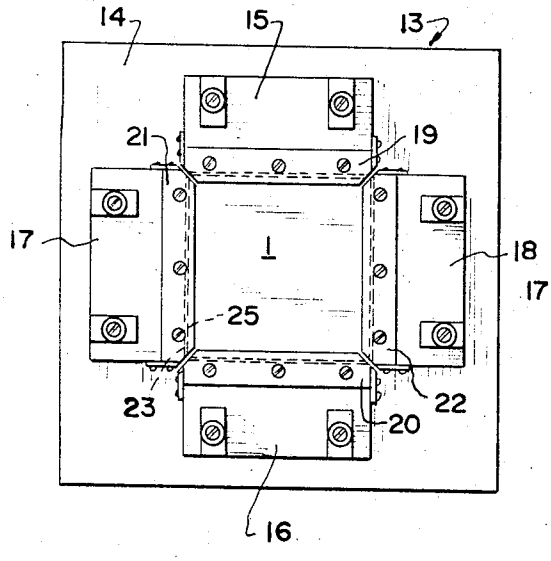
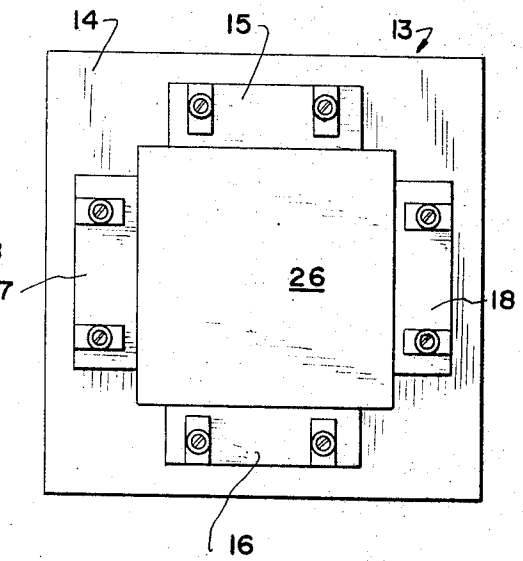


FIG. 10



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United States Patent Office 3,368,600
Patented Feb. 13, 1968

3,368,600

FOLIO CONSTRUCTION

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Filed Oct. 22, 1965, Ser. No. 501,845
5 Claims. (Cl. 150—28)

ABSTRACT OF THE DISCLOSURE

This invention discloses a folio formed of one or more sheets of a suitable plastic or other material, said sheets being sealed together and creases formed therein by heat and radio frequency waves.

This invention relates to a folio construction and to a method for producing folios.

The use of relatively low cost plastic materials in the production of a wide variety of folios constructed to simulate leather has, in recent years, met with considerable success. In spite of the wide employment of such materials in the manufacture of the folios, however, a common problem has been generally experienced by the users of such folios. Whether in the form of a billfold, breast pocket or a letter-sized folio, the mating edges formed by the junction of the outer folio cover and the inner folio face tend to become separated after varying periods of use with the ultimate deterioration and discarding of the folio. This obviously is a nuisance and source of irritation to the consumer. As a result, the consumer-user frequently becomes displeased with the manufacturer and also with the distributor of that which he feels to be an inferior product.

Both gluing and stitching have been employed by manufacturers in a variety of ways to overcome the shortcomings of edge separations in plastic folios, particularly folios simulating leather folios. Neither method has produced a commercially economical solution to the problem.

The folio construction of the present invention has been developed as a commercially economical solution to this edge separation problem for plastic folios. It permits the utilization of widely available plastic compositions which are relatively inexpensive but which can be used to produce tough, durable, long-lasting and readily-ornamented folios. The turned edge construction of the invention utilizing plastic compositions produces a folio which, due to the relatively bulky turned edges, simulates the appearance of leather to a large degree. No substantial modification of existing manufacturing or handling techniques are required to produce the folios of the invention according to the process of the invention.

The folio of the invention is generally fabricated from one of the commercially available thermoplastic materials such as an unsupported polyvinyl film. "Unsupported" means without a fabric backing. What will ultimately be the inner face of the folio is ordinarily blanked out of a sheet of vinyl film of suitable thickness and embossd or ornamented as desired. In some instances, one or more liners which may be formed from sheets of plastic material, fibrous compositions or metal, may be employed to reinforce or support the inner face of the folio. The folio cover is generally blanked out of a sheet of material similar to and compatible with that of the inner face sheet.

The cover sheet is made larger in dimension than the liner and the sheet forming the inner face. The border of the cover sheet is scored along each edge to permit the turning of each of these edges to overlap the liner and inner face sheet when they are placed over the cover sheet

and the edges thereof are placed in parallel and equidistantly-spaced relationship to the peripheral edges of the protruding cover sheet. The corners of the cover sheet are cut off in such a manner that the folding of the protruding cover sheet edges over the edges of the liner and the inner face sheet produces abutting and, therefore, not excessively bulky, overlapping edges at the corners of the folio.

After the inner face sheet has been positioned within the limits of the cover sheet and equidistantly from its edges and the edges have been turned or folded over to overlap the inner face sheet and the liner, if one is employed, a combination of the radio frequency waves and heat of a predetermined magnitude is simultaneously applied around substantially the entire perimeter of the top overlapping edge and the area directly beneath it on the bottom sheet. This acts to fuse or seal a peripherally-continuous portion of the overlapping edge of the thermoplastic cover sheet to the thermoplastic inner face sheet and to fuse a corresponding portion of the bottom face of the cover sheet to the liner. In the event no liner is employed, the turned edge exposed to the surface of the inner sheet will be fused, and the opposite surface thereof will be fused to the inner surface of the cover sheet along the same line.

The heat and radio frequency wave fusion of the turned edge portion of the cover to the inner face sheet of the folio and the bottom cover surface to this inner face sheet overcomes the prior art problems arising from gluing and stitching such edges together, and results in a folio having a turned edge construction simulating the turned edge construction of folios made of leather. In fusing the inner face sheet to the cover sheet, an integral seam is produced on the folio which is thicker and stronger than either of the sheets comprising it.

Other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings illustrating presently preferred embodiments thereof and wherein:

FIG. 1 is a plan view of a sheet of thermoplastic material with a blanked out inner face sheet of a folio;

FIG. 2 is a plan view of a cover sheet;

FIG.3 is a perspective view illustrating the connection of the inner face sheet to a liner sheet;

FIG. 4 is a plan view showing the inner face sheet-liner combination of FIG. 3 positioned on the cover sheet with a pair of the parallel edges thereof folded over and overlapping the edges of the FIG. 3 combination;

FIG. 5 is a plan view of a completed folio;

FIG. 6 is a partial enlarged cross-sectional view taken along lines 6—6 of FIG. 5 illustrating the turned edge construction of the folio and the top and bottom fusion thereof;

FIG. 7 is a plan view of a die apparatus used to produce the folios of the invention;

FIG. 8 is a plan view of the apparatus of FIG. 7 with the cover sheet shown in FIG. 2 and the inner face and liner sheets shown in FIG. 3 positioned therein for assembly;

FIG. 9 is a plan view of the apparatus and sheets shown in FIG. 8 illustrating the closure of the die elements to produce the turned edges of the folio of the invention; and

FIG. 10 is a plan view of the apparatus and sheets shown in FIG. 9 illustrating the application of a pressure-conductor plate to the die apparatus.

In the preferred method of producing the folios of the invention an inner face sheet, generally designated 1, is blanked out of a sheet of thermoplastic material 2, as is shown in FIG. 1. The thermoplastic sheet material preferred is a vinyl composition or vinyl resin such as

the polyvinyl film known in the trade as "Plyhide" and sold under that name by Plymouth Rubber Co. of Canton, Massachusetts, which has the characteristic of being readily fused by the application of radio frequency waves and heat assisted by pressure. The blanking out operation is ordinarily carried out utilizing well-known blanking dies which define the configuration of the sheet to be blanked out and which are brought into compressive contact with the thermoplastic sheet 2 on a suitable platen in a conventional manner. Simultaneously with the blanking out of the inner face sheet 1, pocket slits 3 and 4 may be formed in the thermoplastic sheet by the same die. This slit forming step is preferably performed separately from the blanking operation. In forming the pocket slits 3 and 4, enlarged reinforcing lips 5 of material are produced on each side of each of the slits. The reinforcing lips run parallel to the axes of these slits. These slits can be die cut or heat sealed, as shown in the drawing.

Next, a blanked out cover sheet, generally designated 6 and shown in FIG. 2, is produced by a conventional scoring and tear sealing operation. This cover sheet has larger overall dimensions than inner face sheet 1 and is designated to provide a border around sheet 1 when they are placed back-to-back. The cover sheet is scored, utilizing conventional apparatus, inwardly of its edges along lines 7. The rectangular configuration defined by the scoring lines 7 on cover sheet 6 is just slightly larger than the inner face sheet 1 which is designed to overlie the cover sheet. The blanking apparatus also results in a tear seal periphery on the sheet 6. The scoring of the cover sheet produces a border 8 which extends substantially around its entire periphery. The border 8, however, is interrupted at each of the corners of the cover sheet by portions 9 which are cut out during the blanking-tear seal operation. Portions 9 of the border 8 are removed at the corners of the cover sheet outwardly of the area of the intersection of the scoring lines 7 to produce the abutment or minimal overlap of adjacent border edges at the corners of the rectangular sheet 6 when the border 8 is folded back upon itself in the formation of the completed folio of the invention. The angle defined by the cut border portion 9, and the scoring lines 7 producing the border is less than a right angle.

A step in the production of a folio utilizing a relatively thin thermoplastic liner sheet 10 is shown in FIG. 3. The inner face sheet 1, blanked out as shown in FIG. 1, is placed over liner sheet 10 which has substantially the same planar dimensions as the inner face sheet. Radio waves, heat and pressure are then applied to liner 10 and sheet 1 to produce the fusion of liner sheet 10 to the sheet 1 along parallel lines 11 located about midway between a pair of the parallel edges of sheet 1. As is shown in FIG. 3, in this instance, radio waves, heat and pressure are also applied to the upper edge bordering slit 4 to fuse this upper edge to the liner sheet along line 12. This is done to produce a pocket in the completed folio above the fusion line 12 formed above slit 4. The spaced parallel lines 11 serve in addition to fusing the liner 10 to inner face sheet 1 to also establish fold or hinge lines whereby the completed folio may be readily folded in half without creasing cover sheet 6 and can contain bulky papers or materials within.

In practice it has been found that liners may be required in instances where it is desired to produce a stiffer more firm folio. In some applications, thermoplastic vinyl liners have been employed, but other plastic, fibrous or metal liners may be employed for other particular applications.

To produce a completed folio according to the method of the invention, an edge turning and fusing apparatus generally designated 13, as shown in FIG. 7, is employed. The apparatus 13 consists of a base plate 14 upon which are reciprocally-mounted four edge turning fixtures 15, 16, 17 and 18. The innermost edges of the fixtures are provided with metal plates 19, 20, 21 and 22 (preferably

of brass). The plates 19, 20, 21 and 22 are connected to conventional sources (not shown) for producing radio frequency waves and heat. The under side of each of the plates 19, 20, 21 and 22 is provided with a raised edge 23 which runs parallel to the innermost edge of the plate but is spaced inwardly therefrom. When fixtures 15, 16, 17 and 18 have been closed, as is shown in FIG. 9, the raised edges of each of the fixtures abut to form a rectangular configuration defining the fusion lines of the turned edges of sheet 6 and sheet 1.

As is also shown in FIG. 7, an inner fixture 24, having the rectangular configuration and general dimensions of the cover sheet 6 is spaced inwardly of fixtures 15, 16, 17 and 18. Slightly inwardly of the border of fixture 24, a raised edge 25, corresponding to the raised edge 23 of the plates 19, 20, 21 and 22, is provided which circumscribes a rectangle on the fixture. Inner fixture 24 is also connected to conventional sources (not shown) for producing radio frequency waves and heat in conjunction with plates 19, 20, 21 and 22.

The apparatus 13 is designed in a manner such that the raised edge 25 contacts the back surface of cover sheet 6 and is located opposite the rectangle defining raised edges 23 of plates 19, 20, 21 and 22 when the fixtures 15, 16, 17 and 18 are in closed position. The raised edge 25 and the corresponding edge 23 of the plates are preferably serrated to produce a more attractive folio.

In operation, the cover sheet 6 is placed on inner fixture 24 and in alignment with the edges of the fixture as illustrated in FIG. 8. The face of sheet 6 carrying scoring lines 7 faces upwardly in apparatus 13. An inner face sheet 1, to which a liner sheet, such as 10, may be fused, depending upon the particular application, is positioned in overlying relationship with respect to the cover sheet 6. Sheet 1 is aligned on sheet 6 within the confines of scoring lines 7 and with the slit reinforcing lips 5 facing upwardly.

After the sheets have been properly aligned in apparatus 13, in sequence, fixtures 15, 16, 17 and 18 are closed. With the closure of the fixtures, side borders 8 formed by scoring lines 7 on cover sheet 6 are folded over on to the exposed surface of inner face sheet 1. The result of the closure of fixtures 15 and 16, in sequence, is shown in FIG. 4 wherein side borders 8 at the top and bottom of the incomplete folio have been turned upon inner face sheet 1.

After the fixtures 15, 16, 17 and 18 have been closed, as shown in FIG. 9, and the borders 8 of the cover sheet 6 have been folded over and brought into surface-to-surface contact with the body portions of inner face sheet 1 bordering the edges thereof, a pressure plate 26 is applied over the fixtures as is shown in FIG. 10. At this time, radio frequency waves and heat are applied simultaneously to the raised edges 23 and 25, which in turn are applied to borders 8 and the back surface of the cover sheet. While the radio frequency waves and heat are transmitted by pressure plate 26 through the raised edges 23 and 25 to the plastic surfaces of the back of cover sheet 6 and the top surface of the borders of the cover sheet, the cover sheet becomes fused to both the front and the back of inner face sheet 1 along a generally continuous line 27, as shown in FIG. 6. The continuous line 27 extends around the folios on the front and back thereof, just inwardly of the periphery of the folio, defining a generally rectangular configuration, (FIG. 5).

After the sheets have been fused together, as is shown in FIG. 5 of the drawings, the abutting edges of the intersecting borders 8 in the corners of the folio do not generally overlap and thereby produce a corner which simulates leather in appearance.

The fusion of the layers is most clearly shown in the enlarged partial sectional view of FIG. 6. Sheet 1 is shown fused at 27 to the folded-over border 8 of sheet 6. One or more liner sheet 10 may be fused along the same line

to sheet **1** and the bottom of cover sheet **6** is shown fused to a liner **10** along the same line **27**.

As can be seen in FIG. 6, the fused sheets at the line **27** produce an essentially unitary inseparable fused junction of the sheets which is of substantially greater thickness and strength than any of the component sheets. The folio produced by the method of this invention provides an essentially one-piece seam construction which may be formed from two or more sheets.

I claim:

1. A folio construction comprising a first sheet, a second sheet of smaller dimensions than the first sheet and having a configuration generally corresponding to that of the first sheet, the second sheet overlying the first sheet, the peripheral edges of the second sheet being spaced inwardly of the peripheral edges of the first sheet, the peripheral edges of the first sheet being turned back over the body of the sheet and positioned in overlapping relation to the body portion of the second sheet, the overlapping peripheral edges of the first sheet being fused to the body portion of the second sheet adjacent the edges thereof along substantially the entire overlapped border of the second sheet to provide a folio with a substantially inseparable junction between mating sheets and to produce an essentially one-piece folio formed from separate sheets, the second sheet being provided with an elongated score extending substantially between opposed edges forming one dimension of the folio and being spaced from opposed edges forming another dimension of the folio to facilitate folding of the folio.

2. The folio construction of claim **1** wherein the first

and second sheets comprise fusible materials, a third sheet is interposed between the first and second sheets and the periphery thereof is fused between the peripheries of the first and second sheets and wherein the third sheet is fused to the second sheet along the fold facilitating score line thereof.

3. The folio construction of claim **1** wherein at least one pocket is provided in the folio, the edges bordering the pocket being beaded for reinforcement and to prevent damage thereof.

4. The folio construction of claim **1** wherein a plurality of pockets are provided in the second sheet, some of the pockets being formed on one side of the score line and at least one pocket being formed on the opposite side of the score line.

5. The folio construction of claim **1** wherein a plurality of spaced score lines are provided in the second sheet to facilitate folding of the folio with bulky material interposed between the faces thereof.

References Cited

UNITED STATES PATENTS

1,671,297	5/1928	L'Enfant	150—39
1,683,996	9/1928	Snow	150—39
2,732,874	1/1956	Carstensen	150—39
2,970,634	2/1961	Hantscho	156—216
3,075,862	1/1963	Hoyer	156—216

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