May 30, 1950 R. E. PAIGE 2,509,397

CURVED SCORE DISPLAY DEVICE

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FIG. 1

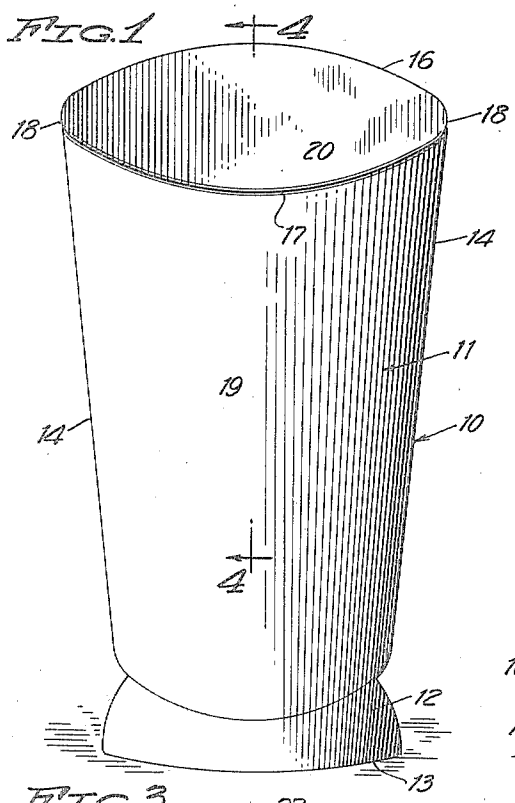


FIG. 2

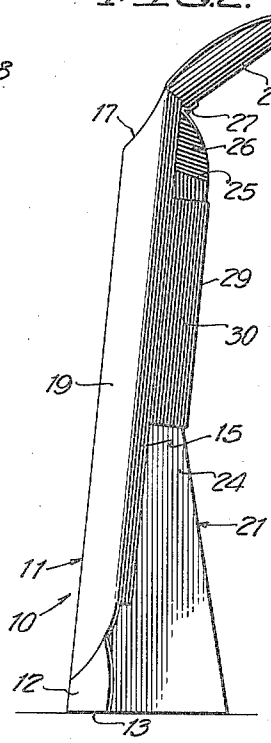


FIG. 4

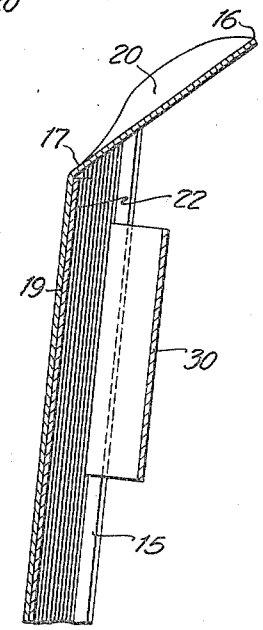


FIG. 3

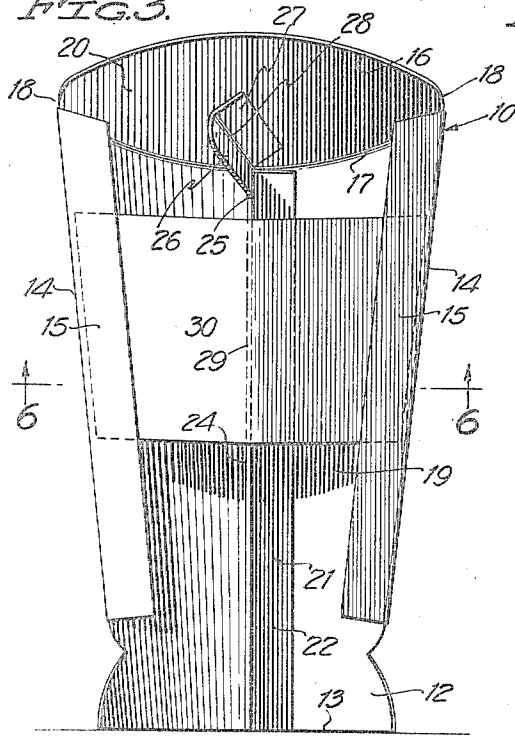
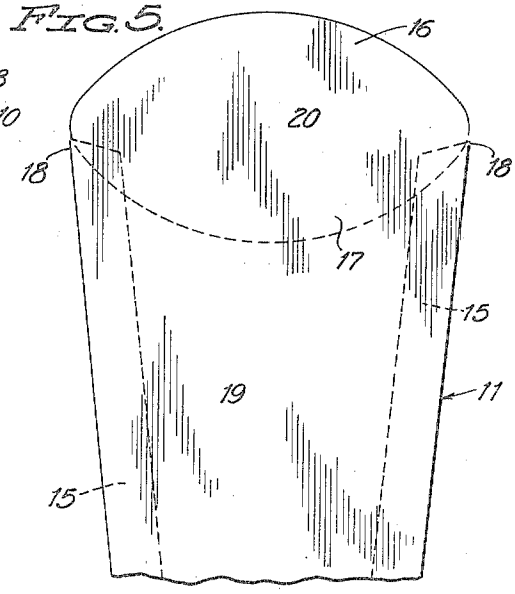


FIG. 5



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FIG. 6.

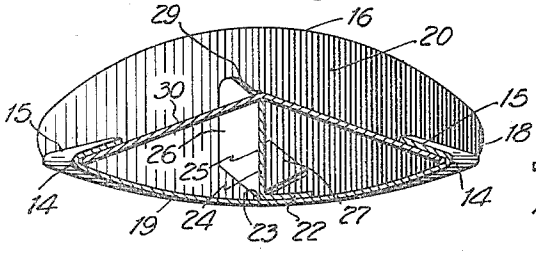


FIG. 7.

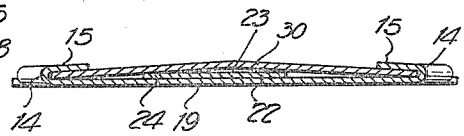


FIG. 8.

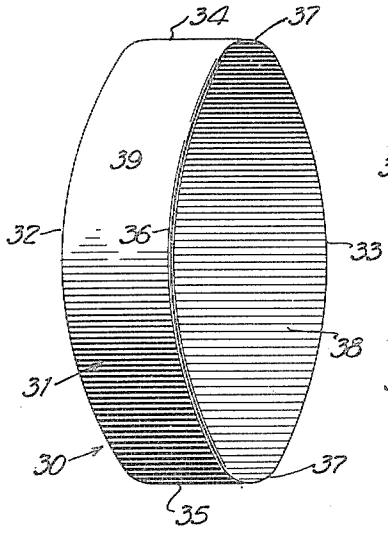


FIG. 9.

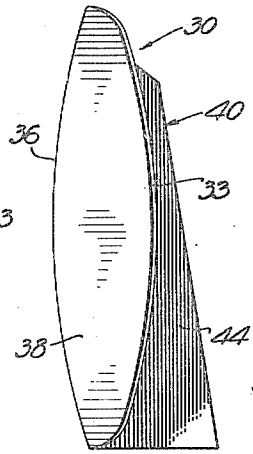


FIG. 10.

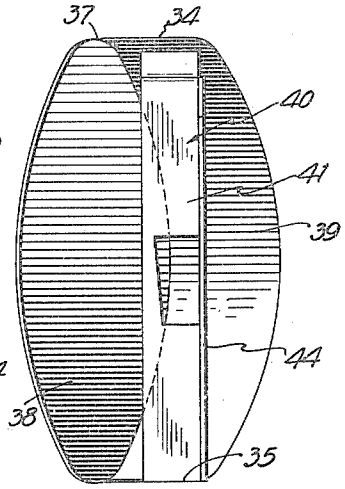


FIG. 11.

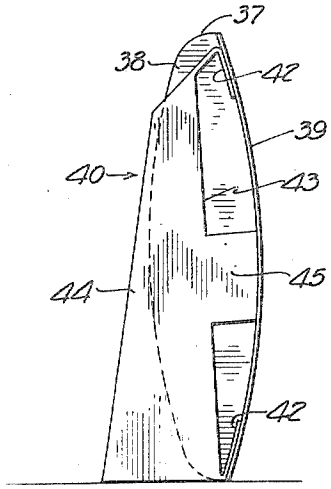
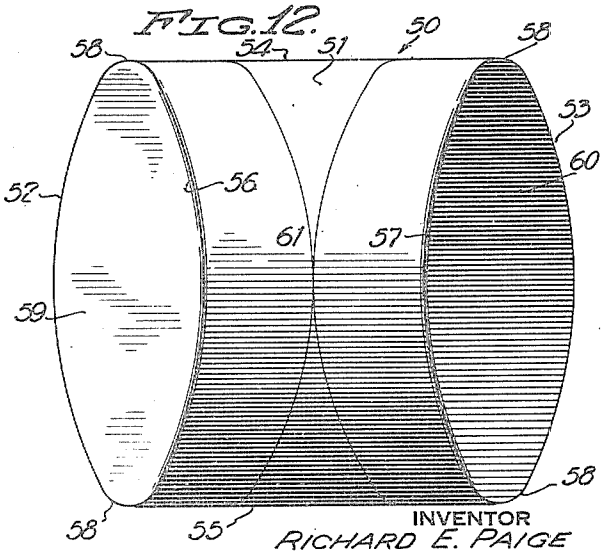


FIG. 12.



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FIG. 13.

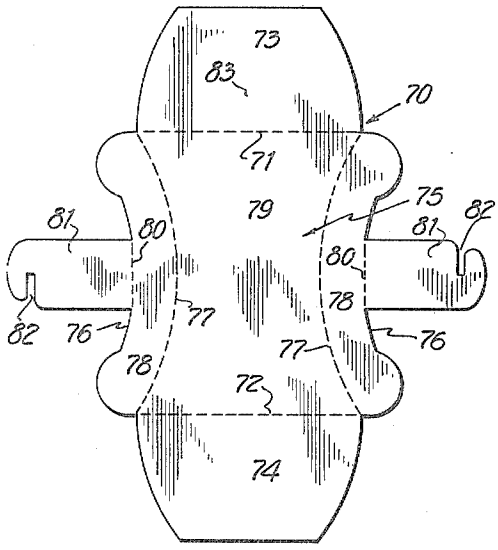


FIG. 16.

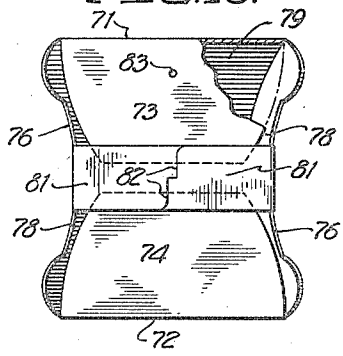


FIG. 17.

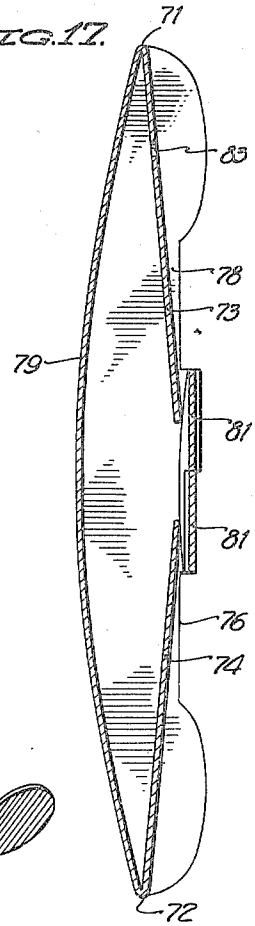


FIG. 14.

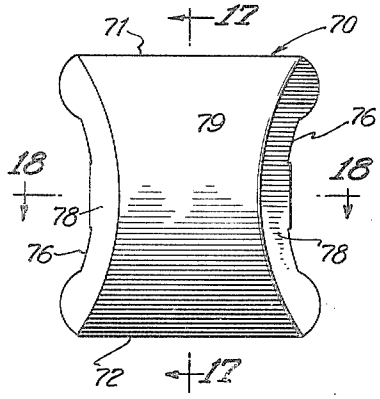


FIG. 15.

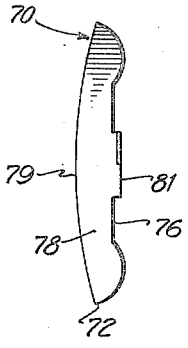
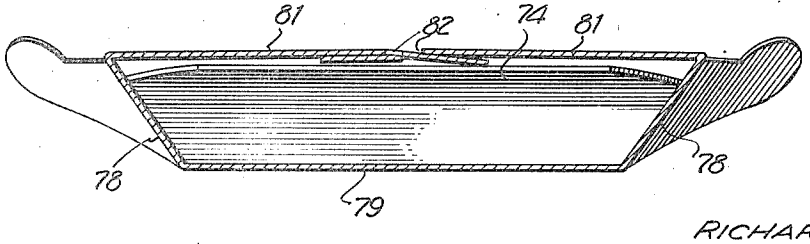


FIG. 18.



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Patented May 30, 1950

2,509,397

UNITED STATES PATENT OFFICE

2,509,397

CURVED SCORE DISPLAY DEVICE

Richard E. Paige, New York, N. Y.

Application June 8, 1945, Serial No. 598,388

3 Claims. (Cl. 40—126)

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This invention relates to improvements in the art of folding cardboard or other equivalent material, and more particularly to a means of curved scoring and flexing to impart a three-dimensional effect to display devices, toys, and other objects constructed of foldable material.

My prior U. S. Letters Patent No. 2,050,894, dated August 11, 1936, for folded blank boxes, sets forth a means of compensated scoring for the construction of cardboard boxes in which scores similar to those shown here are made to flex by making them in pairs, in opposed relationship constituting a tubular form. In this form, the scores act one upon the other to hold each other in flexed position thereby giving form to the box and to themselves. As distinguished from my aforesaid prior patent, this invention embodies the feature of curved scoring of a flat blank of cardboard to divide the same into two or more panels in angular relation to each other, one always being convex and the other concave. In this invention it becomes necessary to provide additional means of holding the rest of the blank in bowed position in order to cause said curved scores to assume their flexed position. With the addition of art work thereupon, unusual depth is given to such devices, allowing them to appear as actual glasses, cans, tires, or other appropriate devices. The appearance of the curved score does not present a concave form to the eye of the observer. It looks like the flat top surface of the drinking glass, can, tire, or other object. It is this optical illusion which constitutes the greater part of the novelty of this invention. However, in certain forms, the curved surfaces are used decoratively, without thought to optical illusion.

Another feature of the invention resides in the art of curve scoring and folding cardboard in a novel manner to present an optical illusion of bulk and depth not present in the actual object display. While the invention is not limited in its display use, such items as canned food products, soft drink beverages in glasses, and other merchandise may be made the subject matter of display devices constructed in accordance with my invention, and when so displayed, the items stand out with startling realism due to the three-dimensional effect present therein.

Another feature of the invention is the provision of a simple and inexpensive means of forming three-dimensional objects such as display devices, toys, plaques, calendars, and other objects from flat cardboard by curve scoring and folding to place the cardboard under bowed tension, there being means associated with the

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device to maintain the same in set position under tension.

While I have set forth above certain of the features of my invention, other novel features thereof will become apparent as the following specification is read in conjunction with the accompanying drawings, in which,

Figure 1 is a perspective view of my invention embodied in a drinking glass display device, the same being in set up display position.

Figure 2 is a side elevational view.

Figure 3 is a rear elevational view.

Figure 4 is an enlarged detail vertical sectional view on the line 4—4 of Figure 1.

Figure 5 is a fragmentary front elevational view of the drinking glass display device in flat position prior to folding to set up position.

Figure 6 is an enlarged horizontal sectional view on the line 6—6 of Figure 3 looking in the direction of the arrows.

Figure 7 is a view similar to Figure 6 but illustrating the parts in flat collapsed position.

Figure 8 is a front elevational view of a single disk-like display device constructed in accordance with my invention.

Figure 9 is a side elevational view looking from the right of Figure 8.

Figure 10 is a rear elevational view of the device shown in Figure 8.

Figure 11 is a side elevational view looking from the left of Figure 8.

Figure 12 is a front elevational view of a double disk-like display.

Figure 13 is a plan view of a blank from which a plaque display device may be formed in accordance with my invention.

Figure 14 is a front elevational view of a plaque display device in set up position formed from the blank shown in Figure 13.

Figure 15 is a side elevational view of the plaque display device.

Figure 16 is a rear elevational view of the plaque display device with part broken away in section.

Figure 17 is an enlarged vertical sectional view on the line 17—17 of Figure 14.

Figure 18 is an enlarged horizontal sectional view on the line 18—18 of Figure 14.

Referring to the drawings by reference characters and at present to the embodiment of the invention illustrated in Figures 1 to 7 inclusive, the numeral 10 designates a display device in its entirety which is of a shape resembling a drinking glass.

The display device 10 includes an elongated

body 11 constructed of a single blank of cardboard or other equivalent material capable of being cut, scored, and flexed under tension for reasons to be hereinafter appreciated. Normally the body 11 is flat as shown in Figure 5 and is die cut to provide a base 12 having a straight bottom edge 13. The body 11 is provided with upwardly diverging side scores 14—14 along which rearwardly and inwardly folded side flaps 15—15 are integrally connected. The top edge 16 of the body is convexly curved and the flaps 15—15 extend from adjacent the ends of the top edge to a point adjacent the base 12 for reenforcing and tensioning purposes to be hereinafter explained.

The upper end of the body 11 is crease-scored on the curved line 17 which is struck from an arc greater than the arc from which the edge 16 is struck and which extends in a reverse direction so as to be elliptically complementary to the curved edge 16. The ends of the crease-score 17 are respectively connected to the curved edge 16 by curved end edges 18—18 to complete the ellipse. It will be noted that the curved crease-score 17 extends across the cardboard body from one edge to the opposite edge thereof and divides the body 11 into a relatively long lower panel 19 and a smaller upper panel 20.

From the description thus far, it will be understood that if the panels 19 and 20 are folded relative to each other on the curved score 17 they will assume positions in angular relation under tension and will cause the panel 19 disposed on the convex side of the score 17 to bow or flex forwardly while the panel 20 disposed on the concave side of the said score will bow or flex rearwardly or in a direction opposite to that of the panel 19. The direction of the outward bow of the panel 19 extends from the opposite side edges or fold scores 14—14 while the inward bow of the panel 20 extends from one end of curved edge 18 to the other. The panels 19 and 20 are now in the position as shown in Figures 1 to 4 and 6, but due to the tension which is now presen' by the reversely bowed panels 19 and 20, some means must be provided for holding the body 11 in such position. Therefore I provide a foldable easel construction which will now be described.

The combined easel and tension holding means includes a cardboard easel member 21 formed from a single blank of cardboard which is cut to provide an elongated attaching glue flap 22 extending the length of the panel 19 medial thereof and secured to its rear side by glue. Integral with the flap 22 and connected thereto along a hinge score 23 is a prop flap 24. Integrally connected to the upper end of the prop flap 24 along a hinge score 25 is a folding web 26 to which an attaching glue flap 27 is integrally connected along a diagonal hinge score 28. The glue flap 27 is glued to the rear side of the panel 20 as best illustrated in Figure 3. The easel 21 forms an operative connection between the folded reversely bowed panels 19 and 20 and also acts to reenforce the same.

The easel 21 is locked in set up position by the engagement of the free longitudinal edge of the prop flap 24 with the vertical crease-score 29 provided on a cardboard bridge web 30 which has its ends glued respectively to the inner surfaces of the side flaps 15—15. When the display device 10 is in flat or collapsed position as shown in Figure 7, the bridge web is substantially flat but when the device is in set up position, the prop flap 24 wedgingly engages the mid portion of the

web, causing the same to assume a V-shape as seen in Figure 6, during which time an inward pull is exerted along the side edges of the body to maintain the reversely bowed panels 19 and 20 in folded position under tension. Also, the wedgingly engaging easel and web serve to impart an outward bow to the panel 19 throughout its entire length, otherwise the panel 19 would only bow adjacent the curve score 17 and gradually flatten out toward the base 12, due to the elongated nature of the panel 19.

The display device 10 is shipped or delivered to its place of display in a flat collapsed position as indicated in Figures 5 and 7. It will be understood that the front surface of the body 11 will have art work printed thereon to impart a more realistic effect. The body 11 simulating a drinking glass may be provided with art work simulating a glass containing a beverage and bearing the trade-mark and other advertising indicia appropriate to the advertised beverage. To set up the device 10 from its flat collapsed position, the operator folds the body 11 on the curved score 17, causing the panel 20 to bow rearwardly and the panel 19 to bow forwardly in angular relation to each other, the direction of the reverse bows being at right angle to each other. Next, the prop flap 24 is swung to a position at right angle to the glue flap 22 into wedging engagement with the bridge web 30, thus exerting a pull upon the opposed side edges of the panel 19 to maintain the tension upon the reversely bowed panels 19 and 20. The folding web 26 and glue flap 27 act to exert a downward pull upon the concave panel 20 when the prop flap is in tight frictional engagement with the bridge web 30. The base 12 and prop flap 24 serve to support the display device in an upright rearwardly inclined position as shown in Figure 2. When the set up display device is viewed from the front, a third dimension is imparted, due to the forwardly bowed panel 19 and the rearwardly receding concave front surface of the panel 20. The impression obtained by one's sight is that of looking downwardly in perspective upon a glass containing a beverage. To collapse the display device 10, it is only necessary to swing the prop flap 24 to a position flat against the attaching flap 22, thus relieving the tension upon the bowed panels 19 and 20, whereupon they will unfold to flat position due to their inherent tendency. I wish to point out that it is the curved score 17 which causes the panels 19 and 20 divided thereby to bow or flex under tension in opposite directions. The easel construction acts to maintain the tension upon the flexed panels and to support the display device in a set up position for use.

In Figures 8 to 11 inclusive I have illustrated my invention embodied in a single disk-like display device 30, which in reality is the same construction shown in Figures 1 to 7, except that the body 31 is turned to a position at right angle to the body 11, and is relatively narrow instead of elongated. The body 31 is constructed of a single blank of cardboard having convexly curved end edges 32 and 33, and straight top and bottom edges 34 and 35 respectively. The body 31 is provided with a curved crease score 36 which extends from the top edge 34 to the bottom edge 35 and which is connected to the curved edge 33 by top and bottom curved edges 37. The curved edges 33, 37—37 and curved score 36 cooperate to provide an elliptical concave panel 38. The portion of the body 31 on the convex side of the

curved score 36 constitutes a convex panel 39. When the panels 38 and 39 are folded along the curved score 36 to a position in angular relation, the panel 38 assumes a concave or inwardly bowed position while the panel 39 bows outwardly to a convex position. Both panels are now reversely bowed under tension and for maintaining such tension I provide an easel 40.

The easel 40 includes a cardboard bridge piece 41 having its ends 42—42 folded inwardly and glued to the rear surface of the outwardly bowed panel 39 adjacent the upper and lower ends thereof. Integral with the bridge piece 41 and connected thereto along a hinge score 43 is a prop member 44. Integral with the prop member and cut from the bridge piece 41 is a presser tab 45 which tightly bears against the rear face of the convexly bowed panel 39 when the easel is set up as shown in Figure 11 to maintain the panel 39 and consequently the panel 38 in reverse bowed positions under tension. The bottom edge of the prop member 44 rests upon a flat supporting surface to support the display device 30 in set up display position. A display device of the design shown in Figures 8 to 11 inclusive may contain art work indicative of a tablet, disk, tire, or other circular object and when viewed from the front, imparts a third dimension to the eye of the observer.

In Figure 12 I have illustrated the principle of my invention embodied in a double disk-like display device 50. The device 50 is constructed from a single blank of cardboard in which the body 51 is provided with reversely convexly curved end edges 52 and 53, and opposed straight top and bottom edges 54 and 55. The body 51 is provided with suitably spaced reverse curved scores 56 and 57 which are complementary to and oppositely curved with respect to the respective convexly curved end edges 53. The curved scores 56 and 57 extend from the top edge 54 to the bottom edge 55 and are joined with the adjacent end edges 52 and 53 respectively by rounded edge portions 58. The curved scores 56 and 57 divide the body 51 into a pair of elliptical end panels 59 and 60 and an intermediate panel 61. When the body 51 is folded on the double curved scores 56 and 57, the intermediate panel 61 bows forwardly from the top edge 54 to the bottom edge 55 while the elliptical end panels 59 and 60 bow inwardly. Suitable easel means such as shown at 40 in Figures 8 to 11 may be employed for securing the panels 59, 60, and 61 in bowed positions under tension, and will also serve to support the device 50 in an upstanding display position. The double disk display shown in Figure 12 may contain art work suggestive of a pair of candy disks, tires, or other circular objects.

In Figures 13 to 18 inclusive I have embodied my principle of curve scoring in a plaque-like display device 70, the same being formed from a single blank of cardboard as illustrated in Figure 13. The blank is scored horizontally on the parallel fold scores 71 and 72 to divide the same into top and bottom rear flaps 73 and 74 respectively and an intermediate body 75. The opposed side edges 76—76 of the body 75 are of scroll shape. The body 75 is provided with reversely curved scores 77—77 which extend from the ends of the score 71 to the ends of score 72. The reversely curved scores 77—77 are in suitably spaced relation to the edges 76—76 and divide the body 75 into end panels 78—78 and an intermediate panel 79. Integral with the mid portion of the end panels 78—78 and connected thereto along hinge scores 80—80 are locking tongues 81—81. Slots 82—82 extend inwardly from the respective opposed edges of the tongues.

To set up the display device 70 from the flat blank, the operator folds the body 75 on the reverse curved scores 77—77 causing the intermediate panel 79 to bow forwardly and the end panels 78—78 to extend rearwardly at an angle to the panel 79 and to bow inwardly from one end to the other. The top and bottom flaps 73 and 74 are folded rearwardly and inwardly with their adjacent free end edges in spaced relation. To impart an inward pull upon the convexly bowed end panels 78—78, the tongues 81—81 are folded rearwardly on the hinge scores 80—80 into overlapping position and the slots 82—82 thereof brought into interlocking engagement. The slots 82—82 are so positioned upon the tongues that they can only be brought into interlocking engagement when the panels 79 and 78—78 are folded under tension on the double curved scores 77—77 as best illustrated in Figure 16. When in folded and locked position, the display device 70 when viewed from the front appears as in Figure 14 and when appropriate art work is applied, the same imparts the appearance of a scroll having three dimensions. A hole 83 may be provided in the top flap 73 to facilitate the hanging of the set up device upon a nail or hook. The free ends of the top and bottom flaps underlie the locked tongues 81—81 which prevent them from accidentally unfolding.

While I have set forth herein several designs of display devices embodying the features of my invention, I wish it to be understood that such changes in design, material, and construction as come within the scope of the appended claims may be resorted to if desired without departing from the spirit of my invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An article for display which imitates the appearance of an object viewed in perspective, comprising a blank shaped and marked to give the contour of said object when the latter is completely formed, said blank bearing a curved score line thereon delineating a section adjacent one edge of the blank, said line extending substantially wholly across the blank and being concave with respect to said edge, and means attached to said blank for exerting a force between opposed edges of the blank to bend the said section to present a concave curved surface to the front and adjacent part of the blank, a convex curved surface likewise to the front, with the section tilted rearward to give the blank the desired resemblance to said object in full three-dimensional visual effect.

2. An article for display which imitates the appearance of an object viewed in perspective, comprising a blank shaped and marked to give the contour of said object when the latter is completely formed, said blank bearing a curved score line thereon delineating a section adjacent one edge of the blank, said line extending substantially wholly across the blank and being concave with respect to said edge, and means attached to said blank for exerting a force between opposed edges of the blank to bend the said section to present a concave curved surface to the front and adjacent part of the blank, a convex curved surface likewise to the front, with the section tilted rearward to give the blank the desired resemblance to said object in full three-dimensional visual effect, said line and said edge representing

one end of said object and the adjacent part of the blank the forward part of the outer lateral face of the body thereof.

3. An article for display which imitates the appearance of an object viewed in perspective, comprising a blank shaped and marked to give the contour of said object when the latter is completely formed, said blank bearing a curved score line thereon delineating a section adjacent one terminal edge, said line being concave with respect to said edge, the latter being curved in the opposite direction, said line and said edge enclosing an elliptical figure at one end of the blank, and means at the rear of said blank for applying a force between opposed edges of the blank thereof to bend approximately the whole remainder of the blank to present a convex curved surface to the front and said section to present a concave curved surface likewise at the front and tilted rearward to impart to the blank the desired resemblance to said object in full three-dimensional visual effect, with said elliptical figure representing one end in its entire outline, with half of the lateral face of the body of said object connected thereto.

RICHARD E. PAIGE.

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