June 4, 1963 C. R. LUCHSINGER 3,091,877

DISPLAY DEVICE

Filed March 3, 1961

FIG. 1

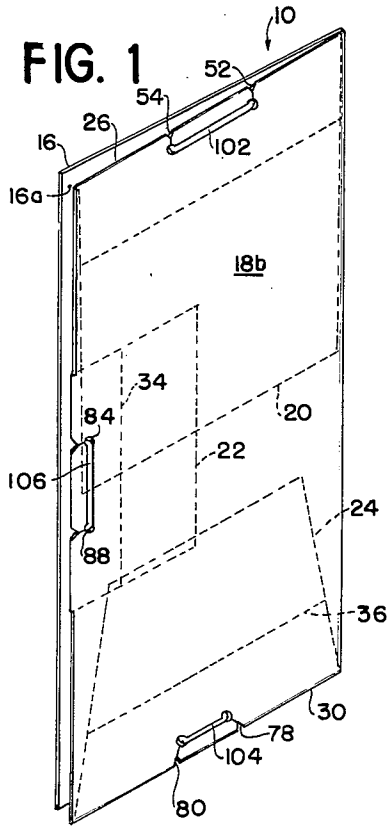


FIG. 2

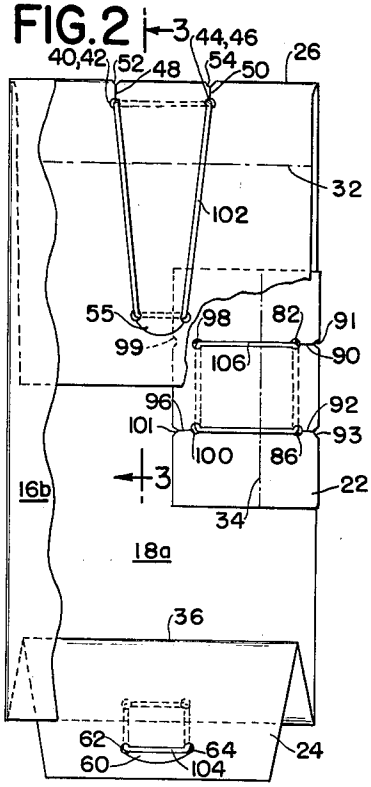


FIG. 3

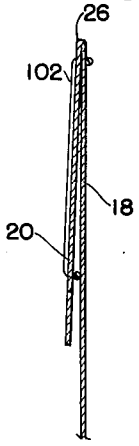


FIG. 4

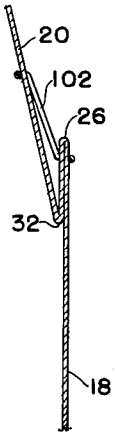
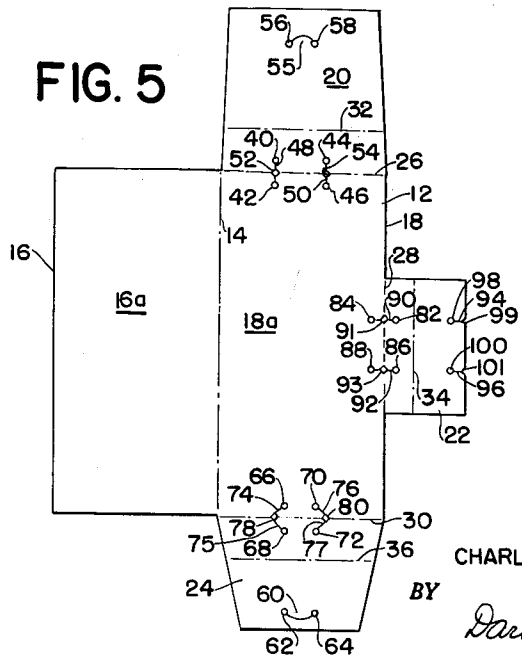


FIG. 5



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DISPLAY DEVICE

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This invention relates to display devices in general and more particularly relates to display devices, such as greeting cards which when folded lie flat and when opened have a portion actuated by resilient power element to spring outwardly automatically in response to the opening of the card to form a display for illustrations, designs, indicia material, or the like.

According to the present invention, a resilient power element, such as rubber band or other yieldable member, is associated with a folded flap and adapted to cause the flap to pop-out or assume an extended position as soon as restraining pressure, such as results from the normal folding of the device, is released or when the device is released from confinement, such as in a mailing or containing envelope.

It is an object of the present invention to provide a display device which may be prepared from a single sheet of material, which when folded lies flat for insertion in an envelope and the like, and which when opened has a portion springing outwardly automatically.

A further object of this invention is to provide a display device prepared from a single sheet of material and having an elastic band mounted thereon and cooperating with a flap for causing the flap to extend outwardly automatically from a flat folded condition as soon as the restraint of holding it in the folded position is removed.

Another object of the present invention is to provide a display device having a pop-out flap in which an elastic projector, such as a rubber band, is so connected to the flap and device that the degree and rate of movement can be varied.

Still another object of the present invention is to provide a display device such as a greeting card having a pop-out display to which a resilient and stretchable power element is so mounted to insure the proper movement and direction of the flap during opening and closing.

A still further object of the present invention is to provide a display device having a pop-out flap, scored and foldable from a single piece of flexible sheet material, such as cardboard, in which the movable parts are connected by an elastic power element without the necessity of adhesive or stapled connections.

Another object is to provide a display device having a flap spring outwardly by means of an elastic power element which flap has a large portion available for writing, printing, drawing or the like thereon.

Another object of the present invention is to provide a folded display device incorporating the above features which is easy to manufacture and fabricate, inexpensive to make, simple in construction, positive acting in operation, capable of mass production and durable in use.

Other and more detailed objects of the invention will be apparent from the following description of the preferred embodiments elected for illustration in the attached drawings wherein:

FIGURE 1 is a perspective, elevational view of the rear face of a display device, incorporating the present invention in its closed or folded position;

FIGURE 2 is a front elevational view of the device with the front panel and one of the flaps partially broken away showing the flaps in folded position and one flap in partially open position.

FIGURE 3 is a cross-sectional view taken along line

3—3 of FIGURE 2 showing a flap in its closed or folded position;

FIGURE 4 is a cross-sectional view similar to FIGURE 3 showing the flap in its extended or open position; and

FIGURE 5 is an expanded flat view showing a punched, scored blank of material in accordance with the present invention in which the device of FIGURE 1 produced.

Referring now to the drawing, a display device in the form of a greeting card **10** incorporating the present invention is shown having flaps retained in their folded-over position by the pressure of the closed position of the panels of the greeting card and adapted to forcefully expand such as to "pop out" in their extended position in selected sequence, when the card is opened. In its folded, or closed position, such as shown in FIGURE 1, the card can be easily inserted in a conventional envelope for mailing purposes.

Greeting card **10** embodying the features of the present invention is made of a single sheet **12** of flexible material such as cardboard, paper, plastic or the like which has a transverse fold line **14** to provide two substantially similar panels or plates **16** and **18**. As blank **12** is viewed in FIGURE 5, the faces shown on panels **16** and **18** are the inner faces or surfaces and designated **16***a* and **18***a* respectively. The surfaces on the opposite side of panels **16** and **18** which are not shown are the outward, or outer surfaces and designated **16***b* and **18***b* respectively. Fold line **14** is scored such as to aid in folding panels **16** and **18** so that inner surfaces **16***a* and **18***a* abut in their folded position as shown best in FIGURES 1 and 2. The outer edges of panel **18** have flaps **20**, **22** and **24** extending therefrom. While three flaps are shown attached to panel **18**, more or less may be used depending upon the effect and desired results to be obtained and may be attached similarly to panel **16**. These flaps may be of various sizes and shapes. Flaps **20**, **22** and **24**, are foldable with respect to panel **18** about fold lines **26**, **28** and **30** respectively. Fold lines **26**, **28** and **30** are scored so as to allow corresponding flaps **20**, **22** and **24** to be folded toward inner surface **18***a*. Each of flaps **20**, **22** and **24** has a fold line thereacross **32**, **34** and **36** respectively, spaced from and preferably parallel to their corresponding fold lines **26**, **28** and **30**.

The embodiment used in connection with flap **20** will be discussed first. Straddling fold line **26** and spaced from its ends are a pair of openings **40** and **42** which are equidistant from fold line **26** and are disposed along a line perpendicular to fold line **26** so that when flap **20** is folded about fold line **26**, openings **40** and **42** are coaxial, such as seen in FIGURE 2. Straddling fold line **26** and spaced from openings **40** and **42** respectively are a pair of openings **44** and **46**. Openings **44** and **46** are equidistant from fold line **26**. Openings **40** and **44** are disposed between fold lines **26** and **32**. Openings **40** and **42** are connected by a passageway such as a slit or cut **48**. Similarly openings **44** and **46** are connected by a passageway **50**. Advantageously, slit **48** is enlarged where it intersects fold line **26** as is indicated by aperture **52**. Similarly slit **50** is enlarged where it intersects fold line **26** as indicated by opening **54**. Openings **52** and **54** aid in assembling the resilient power element and prevent tearing of sheet **12** in a manner as will be disclosed hereinbelow. Flap **20** has a generally rounded tongue **55** cut therein. At opposite ends of tongue **55** are openings **56** and **58**. Tongue **55** is spaced from fold line **32** and is preferably disposed between openings **40** and **44**.

In a manner similar to that described with respect to flap **20** a rounded tongue **60** is cut in flap **24** and terminates in openings **62** and **64**. Also, straddling and equi-

distant from fold line 30 are a pair of openings 66 and 68. Straddling fold line 30 and equidistant therefrom and spaced from openings 66 and 68 respectively are openings 70 and 72. When flap 24 is folded about fold line 30 opening 66 is coaxial to opening 68 and opening 70 is coaxial to opening 72. Openings 66 and 68 are connected by angularly directed passageways 74 and 75 which intersect at 78 on fold line 30. Openings 70 and 72 are connected by angularly directed passageways 76 and 77 which intersect at 80 on fold line 30. Preferably intersections 78 and 80 are enlarged such as by openings.

Another embodiment is shown in panel 22 which has a pair of openings 82 and 84 straddling and equidistant from fold line 28. Spaced from openings 82 and 84 and on opposite sides of and equidistant from fold line 28 are openings 86 and 88. When flap 22 is folded about fold line 28 openings 82 and 84 are coaxial and similarly opening 86 is coaxial to openings 88. Openings 82 and 84 are interconnected by a passageway 90 and openings 86 and 88 are interconnected by a passageway 92. Preferably slits 90 and 92 are enlarged where intersecting fold line 28 as indicated at 91 and 93 respectively. The edge of flap 22 opposite to fold line 28 has a pair of spaced apart slits or cuts therein, 94 and 96. Preferably slits 94 and 96 have enlarged portions at each end indicated at 98 and 99 and 100 and 101 respectively.

In order to assemble greeting card 10, the flap desired to open last, here flap 22, is folded first about its respective fold line with panel 18 and similarly the remaining flaps are folded in inverse order of opening.

The manner of assembling flap 20 will be discussed first. After flap 20 is folded about fold line 26, a resilient and stretchable power element, such as an ordinary commercial rubber band, 102 having the required length and strength is hooked over tongue 55 and received in openings 56 and 58. Flap 20 is folded about fold line 32 outwardly. The free end of rubber band 102 is inserted through openings 52 and 54 through passageways 48 and 50 and received in openings 40—42 and 44—46 as shown in FIGURES 1 and 2. The length of rubber band 102 is chosen so that when flap 20 fully abuts inner surface 18*a* as shown in FIGURES 2 and 3, rubber band 102 is in tension. When rubber band 102 is stretched or in tension, it tends to urge or bias panel 20 about fold line 32 to its extended position as shown in FIGURE 4, if not restrained in some manner. Advantageously the portions of flap 20 which support rubber band 102 in tension, such as tongue 55 should be wide enough to diffuse the force of the rubber band, so that there is no distortion of the flap during the tensioning operation which otherwise may be incurred.

In a similar manner, the remaining panels are folded and assembled. Panel 24 is folded about fold line 30 and a rubber band 104 is hooked over tongue 60 and rests in openings 62 and 64. The opposite end of rubber band 104 is passed through slits 74 and 76 and rests in aligned openings 66—68 and openings 70—72. The length of rubber band 104 is so chosen as to be in tension or stretched when flap 24 is fully folded as in FIGURE 1 with its inner surface abutting inner surface 18*a* of panel 18. In this condition rubber band 104 tends to rotate flap 24 about fold line 36 to its extended position as seen in FIGURE 2. In this extended position rubber band 104 is unstressed.

In order to activate panel 22 a rubber band 106 is passed through slots 94 and 96 and rests in openings 98 and 100 respectively. The other end of rubber band 106 is passed through slots 90 and 92 and received in aligned openings 82 and 84 and 86 and 88 respectively as seen in FIGURES 1 and 2. In this embodiment the rubber band is seated in openings 98 and 100 instead of being hooked over a tongue, such as 55 or 60 in panels 20 and 24. Flaps 20, 22 and 24 may be folded about their respective fold lines and placed in tension by means of their respective rubber bands in any desired sequence to produce the desired sequence of pop outs. The spacing of tongues 55 and 60 with respect to respective fold lines 32 and 36 provides control over the tension on the flap so as to vary the speed of the pop out. Also the speed of opening or pop out can be varied by the length of the rubber band with respect to the distance between the ends of the tongue and the slots along the base of the flap in extended and closed positions. Similarly with respect to flap 22 the distance can be varied by varying the distance between the ends of corresponding slots.

Advantageously the flaps are retained in their closed and tensioned positions by panel 16 being folded about fold line 14 when card 10 is closed. The tension of the resilient power element on the respective flaps may be reduced so that the force is insufficient to separate panels 16 and 18 and open card 10. When panel 16 is swung away from panel 18 as when the device is being opened by the viewer or user, rubber bands 102, 104 and 106 will swing their respective flaps 20, 24 and 22 outwardly about their respective fold lines 32, 36 and 34 to the position similar to that shown for flap 20 in FIGURE 4 and flap 24 in FIGURE 2. If desired the tension of the resilient power element can be made sufficiently large to open the device automatically as soon as it is removed from the envelope or other restraining device. The desired tension on a resilient power element can be varied by varying the distance between the far end of the element such as those held by tongues 55 and 56 to their respective intermediate fold line to provide a more snappy and quicker swinging action of the flap to provide for surprise of the user.

While the flaps were shown to be substantially rectangular or tapered, they can be of various designs and shapes and forms to provide unusual effects. Further, the number of the flaps can be varied as well as their location and the sequence of their opening predetermined.

While a conventional rubber band has been shown as providing the resilient power, portions of a rubber band or expandible strips may be attached or mounted to the panels.

It will be apparent to those skilled in the art that various other changes may be made in the construction of the device without departing from the spirit and scope of this invention which is defined by the appended claims.

What is claimed is:

1. A display device of flexible paperboard material comprising a pair of foldable panels, a flap extending outwardly from an edge of one of said panels and being foldable about a first fold line, a pair of spaced apart slits in said one panel and said flap with their axes extending perpendicular to and intersecting said first fold line, a tongue cut in said flap facing away from said first fold line, a second fold line in said flap substantially parallel to said first fold line and intermediate of said tongue and said first fold line, and elastic means received in said slits and said tongue for urging said flap outwardly about said second fold line to extended position from coplanar position, said elastic means being tensioned and stretched when said flap is folded inwardly coplanarly and juxtaposed with said one panel, said other panel being adapted to be folded over said flap for maintaining said flap in inwardly folded position and when said panels are separated said flap swinging outwardly about said second fold line in extended position by said elastic means.

2. A display device comprising flexible sheet material, scored and foldable to provide a pair of connecting panels and a flap on one of said panels foldable about a first fold line and juxtaposed to said one panel, a second fold line disposed across said flap and spaced from and substantially parallel to said first fold line for dividing said flaps into a first portion and a second portion, said second portion including the free edge parallel to said second fold line, and yieldable means coacting with

said flap and said one panel for swinging said flap outwardly about said second fold line in extended position when said panels are separated, said means comprising an elastically stretchable means attached to said second portion of said flap, said elastic means extending in tensioned condition when said flap is coplanar and folded inwardly between said panels, separating movement of said panels being operative to disengage said flap to permit movement about said second fold line in extended position by said yieldable means.

3. A display device comprising flexible sheet material, scored and foldable to provide a pair of connecting panels and a flap on one of said panels foldable about a first fold line and juxtaposed to said one panel, a second fold line disposed across said flap and spaced from and substantially parallel to said first fold line, a first pair of openings in said flap and said one panel equidistant from said first fold line and coplanar for being axially aligned when said flap is juxtaposed with said one panel, a second pair of aligned openings in said flap and said one panel spaced from said first pair and equidistant from said first fold line and coplanar for being axially aligned when said flap is juxtaposed with said one panel, said openings in said flap being disposed between said first and second fold lines, and a stretchable element passing through said first and second pairs of openings and attached to said flap on the other side of said second fold line, said stretchable element extending in tensioned condition when said flap is coplanar and folded inwardly between said panels, separating movement of said panels being operative to disengage said flap and permit movement about said second fold line to extended position by said stretchable element.

4. A display device of flexible paperboard material comprising a pair of foldable panels, a plurality of flaps each hingedly connected at one end to an edge of one of said panels, each of said flaps having a fold line thereacross and spaced from its respective said one end, said flaps normally folded about their corresponding one end in selected sequence into parallel planes to form a

relatively flat configuration and yieldable means coacting with said one panel for swinging said flaps selectively outwardly about their respective fold lines, said means including elastic elements attached to said one panel and each extending across a fold line of and attached to corresponding flap, said elastic elements extending in tensioned condition when said corresponding flap is folded coplanarly between said panels for urging its corresponding flap to swing outwardly about its respective fold line, whereby separating movement of said panels being operative to swing said flaps outwardly in inverse order of folding.

5. A display device comprising flexible sheet material, scored and foldable to provide a pair of connecting panels and a flap on one of said panels foldable about a first fold line and juxtaposed to said one panel, a second fold line disposed across said flap and spaced from and substantially parallel to said first fold line, first and second spaced apart pairs of openings in said flap and said one panel, each pair of openings being equidistant from said first fold line and being axially aligned when said flap is juxtaposed with said one panel, said openings in said flap being disposed between said first and second fold lines, means defining passageways from said first fold line to said first and second pairs of openings, retaining slits cut in said flap on the other side of said second fold line and a stretchable element passing through said first and second pairs of openings extending in the fold line and being received in said receiving slits in said flap, said stretchable element extending in tensioned condition when said flap is coplanar and folded inwardly between said panels, separating movement of said panels being operative to disengage said flap and permit pivoting movement of said flap about said second fold line to extended position by said stretchable element.

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