May 22, 1962 C. R. LUCHSINGER 3,035,363

DISPLAY DEVICE

Filed March 3, 1961

FIG. 1

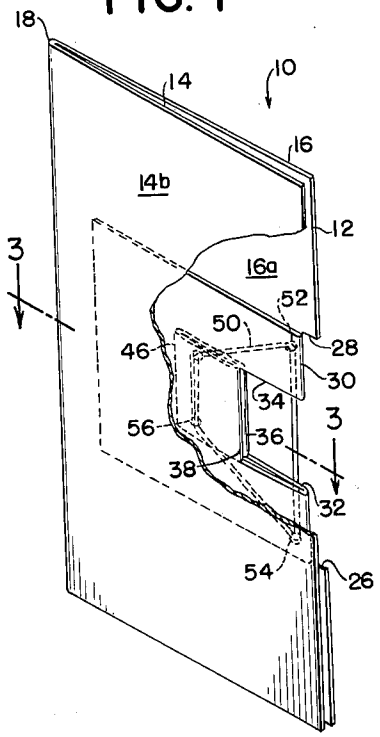


FIG. 2

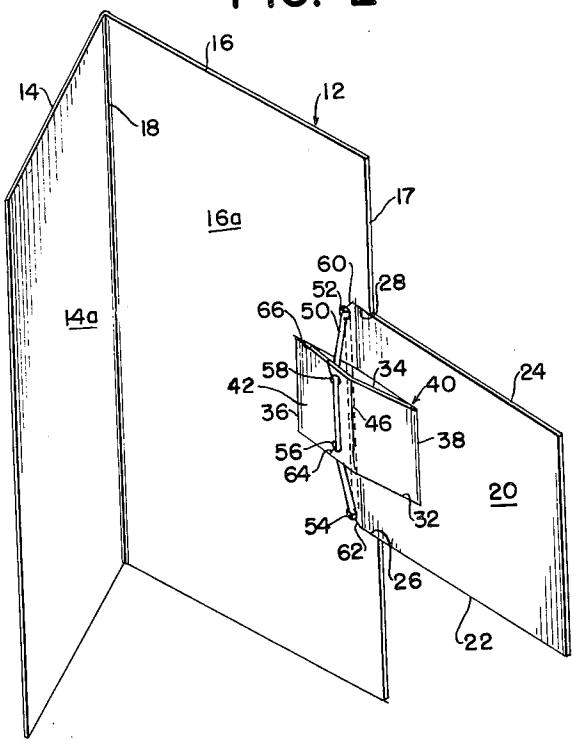


FIG. 3

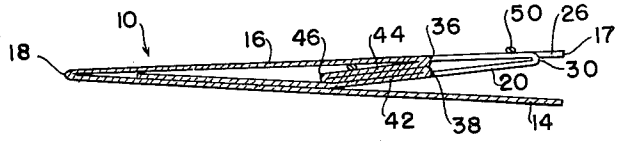
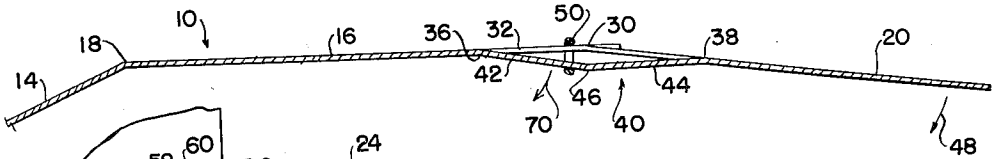


FIG. 4



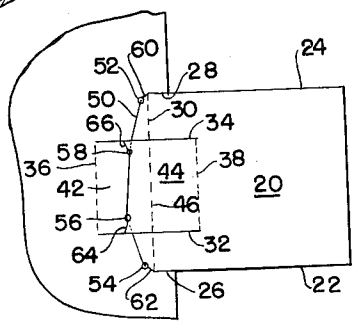


FIG. 5

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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 member, such as rubber band or other resilient member, is associated with a folded flap and adapted to cause the flap to pop-out or assume an extended position as soon as 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 attached to 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 power element is so mounted to insure the proper movement 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 is substantially completely usable for writing, printing, drawings or the like.

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 a display device in the form of a greeting card in its closed or folded position with portions of one panel removed;

FIGURE 2 is a perspective elevational view showing the card in semi-extended position with a flap in its fully extended position;

FIGURE 3 is a cross-sectional view of the card taken along line 3—3 of FIGURE 1;

FIGURE 4 is an enlarged cross-sectional view of the

flap portion of the card showing the flap in its fully extended position; and

FIGURE 5 is a plan view of a portion of the device showing the flap construction.

Referring now to the drawing, there is shown a display card **10** incorporating one form of the invention. A sheet of flexible material **12**, such as cardboard, paper, plastic, or the like, is cut and scored to form a pair of integral panels or sections **14** and **16**, foldable about a transverse fold line **18**. As shown, panel **14** has a front face or surface **14***b* and an inner surface or face **14***a*. Similarly, panel **16** has an inner surface **16***a* which faces surface **14***a* when card **10** is in a closed condition, as shown in FIGURE 1. An outer transverse edge **17** of panel **16** has a flap **20** extending therefrom with longitudinally extending edges **22** and **24**. As shown, panel **16** has longitudinal slits **26** and **28** directed inwardly from transverse edge **17** and contiguous respectively to lines containing longitudinal edges **22** and **24** of flap **20**. Slits **26** and **28** extend inwardly for a predetermined distance as will be discussed hereinafter. Extending between slits **26** and **28**, is a transverse fold line **30** which may be scored or otherwise marked to aid in folding.

Advantageously fold line **30** is placed inwardly of edge **17** of panel **16** to reduce the strain on the material of the card and the possibility of tearing along the fold line. Panel **16** and flap **20** contain a pair of spaced-apart slits or cuts **32** and **34** with each slit intersecting fold line **30**. Extending between corresponding ends of slits **32** and **34** are fold lines **36** and **38**. Slits **32** and **34** and fold lines **36** and **38** define an area or fold **40**. Area **40** is divided into two portions **42** and **44** by a fold line **46** which is axially aligned with fold line **30** when area **40** is coplanar with panel **16** and flap **20**. Fold line **46** is scored so as to urge portions **42** and **44** out of the planes of panel **16** and flap **20** respectively, when flap **20** is moved about fold line **30** towards surface **16***a*. Hence, moving flap **20** in the direction of arrow **48** in FIGURE 4, bends area **40** about fold line **46** to the position shown in FIGURE 3 when fully closed, so that the rear surfaces of portions **42** and **44** abut.

In order to actuate flap **20**, a resilient power element is mounted on panel **16** and portion **42** of area **40** which element in the embodiment illustrated is an elastic or a rubber band **50** of the ordinary commercial type. Rubber band **50** is connected to panel **16** by providing openings such as holes **52** and **54** therein spaced from slits **32** and **34** and shown adjacent respective ends of fold line **30**. Portion **42** of area **40** similarly have openings such as holes or apertures therein shown at **56** and **58**. The use of holes of a larger diameter than the diameter of the elastic power element allows free movement of the element so that it may stretch evenly when subjected to force and when the force is released retract evenly. Openings **56** and **58** are offset inwardly from a line connecting openings **52** and **54**. The axis of openings **56** and **58** are preferably offset from the axis of openings **52** and **54** in panel **16** to provide that area **40** moves in the proper direction and prevents it from reversing direction during opening and closing of the card as will be discussed hereafter. Rubber band **50** may be inserted in openings **52** and **54** via cuts **60** and **62** respectively extending from slits **28** and **26** respectively. Similarly, rubber band **50** may be inserted into openings **56** and **58** via cuts **64** and **66** respectively, advantageously extending diagonally outwardly from slits **32** and **34** respectively. Advantageously, slits **60**, **62**, **64** and **66**, lead towards their corresponding openings **52**, **54**, **56** and **58** in a direction opposite to the direction rubber band **50** is urged when in tension.

In using pop-up card **10**, illustrative material or writing may be placed on any surface of panels **14** and **16** and

on either surface of flap **20**. Flap **20** is urged in a clockwise direction **48**, about fold line **30**, toward surface **16***a*, as seen in FIGURE 4. Movement of flap **20** in the direction indicated by arrow **48** urges area **40** to be bent about fold line **46**, so that fold line **46** is urged outwardly in the same direction as flap **20**. Continued clockwise movement about score line **30** brings the front face of flap **20** substantially abutting surface **16***a*, and portions **42** and **44** of panel **40** are in back-to-back contiguous relation as best seen in FIGURE 3. In assembled position, as seen in FIGURE 1, the card lies flat and can be easily inserted in a conventional envelope.

As mentioned above in folding flap **20** clockwise about fold line **30** portion **42** of area **40** is likewise caused to move clockwise in the direction shown by arrow **70** in FIGURE 4. Since rubber band **50** is affixed to portion **42** by reason of its passing through openings **56** and **58** therein, and is also affixed to panel **16**, rubber band **50** is extended or stretched as shown in FIGURES 1 and 3 by the clockwise movement of portion **42**. The portion of rubber band **50** between openings **52** and **58** and between openings **54** and **56** are extended. Thus, with card **10** folded as shown in FIGURE 1 rubber band **50** is in tension and tends to urge portion **42** of area **40** outwardly for return to its unstretched condition, such as when the card is open as shown in FIGURE 2. When panel **14** is moved away from panel **16**, the natural pull or draw of the tensioned rubber band **50** rotates portion **42** counter-clockwise, as viewed in FIGURE 3, and hence forces flap **20** to be rotated counter-clockwise about fold line **30** to return to its open and unstressed position, as shown in FIGURES 2 and 4.

The pressure of the resilient power element tending to open or extend flap **20** may be reduced, so that the force is not sufficient to separate panels **14** and **16** and open card **10** of its own accord. Hence, the card will remain in its closed position until intentionally opened by the viewer or user. In this manner, the opening of the card by the user, allows flap **20** to be swung outwardly, as shown in FIGURES 2 and 4. If desired the tension of the resilient power element can be made sufficiently large to open the card automatically as soon as it is removed from the envelope or other restraining device.

While flap **20** has been shown to be rectangular, the shape can be varied for producing different and attractive displays. Further, only one flap was shown and this flap was positioned along a transverse edge; however, a plurality of flaps may be used simultaneously and positioned at various edges of either panel.

Various degrees of tension of the elastic power element can be provided by varying the distance between openings **52** and **58** and the distance between openings **54** and **56** during the card's closed position. By adjusting the offset distance between the axes of openings **52** and **54** and **56** and **58** in relation to the movement of portion **42**, the distance between the axis of openings **56** and **58** and the axis of openings **52** and **54** during flap **20**'s open and closed positions can be controlled. Making this distance larger increases the tension on rubber band **50** and making this distance smaller decreases the tension. Further increasing the distance between fold line **36** and the portion of rubber band **50** between openings **56** and **58** will increase the tension on rubber band **50** when the flap **20** is closed due to the greater distance the rubber band is extended.

While a conventional rubber band **50** has been shown, portions of a rubber band or expandible strips can be attached to or mounted on panel **16** in any suitable manner, such as staples or threading through opening **52** and **54** and preventing its return in some manner.

Also, the distance between openings **56** and **58** on section **42** can be varied so that section **42** will not distort under the force of the elastic during the tensioning operation which otherwise may be incurred.

From the above description, it will be seen that those skilled in the art can provide specifications which are within the scope of the subject matter as disclosed and for this reason protection is provided by the scope of the claims as distinguished from the scope of the single embodiment herein disclosed.

While the invention has been particularly shown and described with reference to a preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. A display device of flexible paperboard material comprising a first and a second panel foldable about a first transverse fold line, a flap extending outwardly from an edge of said first panel and foldable about a second fold line, spaced apart slits in said first panel and said flap and intersecting said second fold line, third and fourth fold lines in said first panel and said flap respectively and each interconnecting said slits, a fifth fold line disposed between and parallel to said third and fourth fold lines and interconnecting said slits for forming a first and second area defined by said slits and said third fold line and said fourth fold lines respectively, said first and second areas being foldable away from said first panel and said flap respectively when said flap is folded inwardly, said first panel having an opening spaced from each of said slits, said first area having an opening adjacent each of said slits and offset from the axis of said first mentioned openings, elastic means received in each of said openings and overlying said first area between the openings therein, said elastic means adapted to be stretched when said flap is urged into folded position and said first area is juxtaposed with said first panel thereby allowing said second panel to be folded over said flap and maintain said flap in said folded position and when opened permit said flap to swing outwardly in extended position.

2. A display device in accordance with claim 1 wherein said fifth fold line is axially aligned with said second fold line when said first panel and said flap are coplanar and means defining passageways from said edge of said first panel to said first mentioned openings and from each of said slits to its adjacent opening in said first area.

3. A display device in accordance with claim 2 wherein said elastic means is an endless resilient band and is received in said openings via said passageways.

4. A display device in accordance with claim 2 wherein said second fold line is displaced inwardly from said panel edge and slits extending inwardly from said edge to said second fold line for allowing said flap to be folded about said fold line.

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 fold line, a strip having opposite ends hingedly mounted on a said one panel and said flap respectively and extending across said fold-line, said strip having a fold-line responsive to the closing of said flap for folding said strip about said strip fold line in a direction opposite from said first mentioned fold-line and in back-to-back relationship when said flap and said panel are in face-to-face relationship, and means for swinging said flap outwardly when said device is opened by having said strip separate from a back-to-back relationship to a substantially extended relationship and said flop swing to an extended position, said last mentioned means comprising means defining an opening in said one panel spaced from each of opposite side edges of said strip and adjacent said flap and elastic means received in said openings and overlying said strip between said strip fold line and said panel when said flap is in extended position, said elastic means being stretched by said strip in response to the folding of said flap, said rubber band being maintained in said stretched condition during said card being closed and urging said strip to its

generally extended position and said flap to its extended position when said card is opened.

6. A display device in accordance with claim 5 further including means on said strip for cooperating with and maintaining said elastic means in operative position during folding and unfolding operations.

7. A display device in accordance with claim 6 wherein said further means are openings angularly directed from opposite edges of said strip facing oppositely to the direction said stretched elastic means is being urged.

8. A display device of flexible material comprising first and second panels connected by a score line and readily foldable thereabout to open and closed positions, means for maintaining said panels in closed position, and means for swinging said second panel outwardly to open position in response to the removal of said maintaining means, said panel swinging means comprising an area hingedly mounted to and movable with respect to said panels, said area lying substantially parallel to said panels when said panels are in open coplanar position and being adapted to be urged outwardly from said panels when said panels are folded to closed position, and elastic means carried by said first panel and overlying said area when said panels are in open position, said elastic means being stretched by movement of said area in response to the folding of said panels to abutting closed position and exerting a force on said area while the panels are in their closed position to return said area and said second panel to their open positions.

9. A display device comprising first and second panels

of flexible material hingedly connected and readily foldable to open and closed positions, a flap mounted on one edge of one of said panels and foldable about a fold-line to closed and extended positions, a pair of spaced apart, generally parallel slits in said one panel and said flap and intersecting said fold-line, said slits being generally perpendicular to said fold-line and defining a strip, said strip having a fold-line responsive to the closing of said flap for folding said strip about said strip fold-line in a direction opposite from said first-mentioned fold-line and in a back-to-back relationship when said flap and said one panel are in face-to-face relationship, and yieldable means for swinging said flap outwardly to extended position when said device is opened by having said strip separate from a back-to-back relationship to a substantially extended relationship, said yieldable means comprising means defining an opening in said one panel spaced from each opposite side edges of said strip and adjacent said flap, and elastic means received in said openings and overlying said strip between said strip fold-line and said one panel when said flap is in extended position, said elastic means being stretched by said strip in response to the folding of said flap.

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