United States Patent [19]

Wright

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[45] **May 21, 1974**

[54] **TRANSPARENCY DISPLAY DEVICES**

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[21] Appl. No.: **222,060**

[52] **U.S. Cl.** ..... **40/106.1,** 240/2 AT
[51] **Int. Cl.** **G09f 13/10**
[58] **Field of Search** ..... 40/106.1; 240/2 AT

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Primary Examiner—Robert W. Michell
Assistant Examiner—John F. Pitrelli
Attorney, Agent, or Firm—Thomas O. Kloehn; Thomas W. Ehrmann

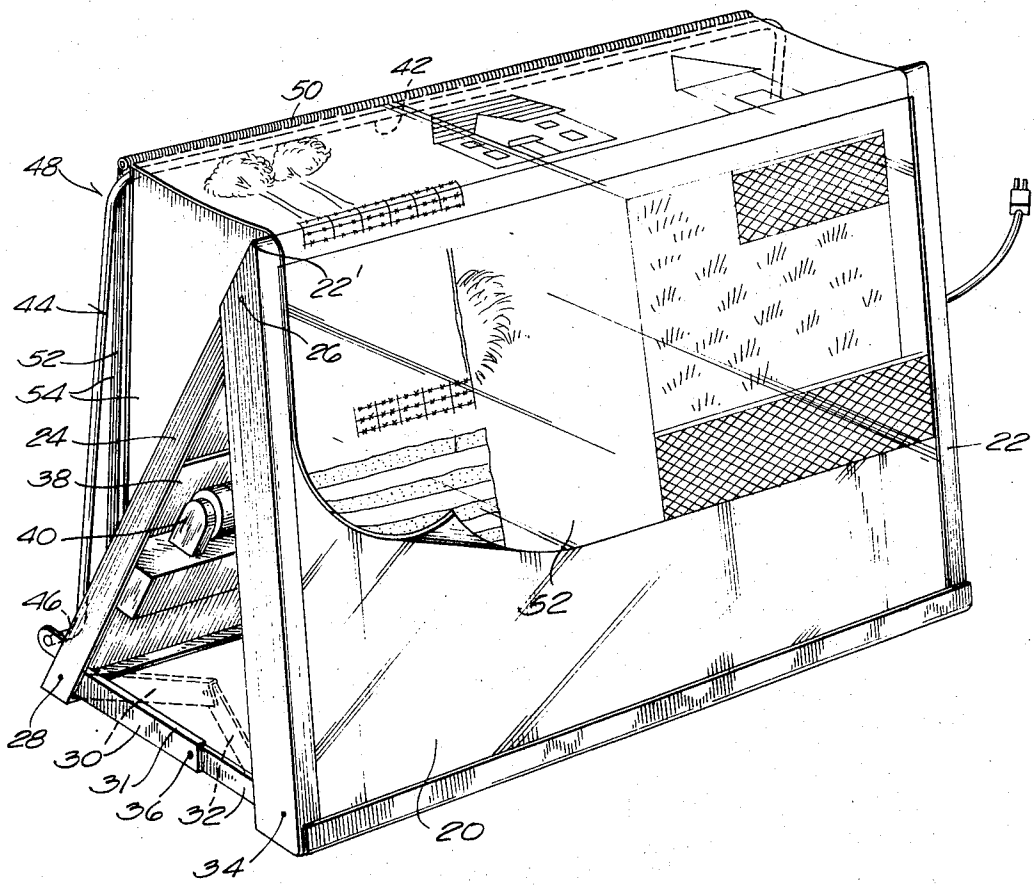
[57] **ABSTRACT**

Transparency display devices to display bound books of transparencies include a translucent screen mounted in a frame which is at a substantial angle to the horizontal plane when the translucent screen is arranged for viewing. A light source is provided behind the translucent screen and a transparency book support is arranged to oscillate to and from proximity with a margin of the screen to facilitate the removal of transparencies from viewing position to storage position. Two modifications of this support are shown, which respectively oscillate and reciprocate. Two support cabinets include one capable of being folded into a relatively flat package for transportation, and one permanent cabinet having storage for the transparencies in the form of tracks to receive the ring binder portion of the book while allowing the transparencies to hang in a protected place.

One version of the transparencies has an aperture at each corner of its free margin. The support cabinet has a stud which supports the transparency when the aperture is placed over the stud, the stud being removable automatically when the support is reciprocated to simultaneously release the free margin of the transparency and to pull the support away from the translucent screen to permit the transparency to return of its own weight to its storage position.

A method of changing displayed transparencies by moving a support for a binder of transparencies away from a translucent display screen, returning the support to the vicinity of the screen margin and inverting another transparency about the binding to overlie the translucent display screen is also disclosed.

1 Claim, 10 Drawing Figures



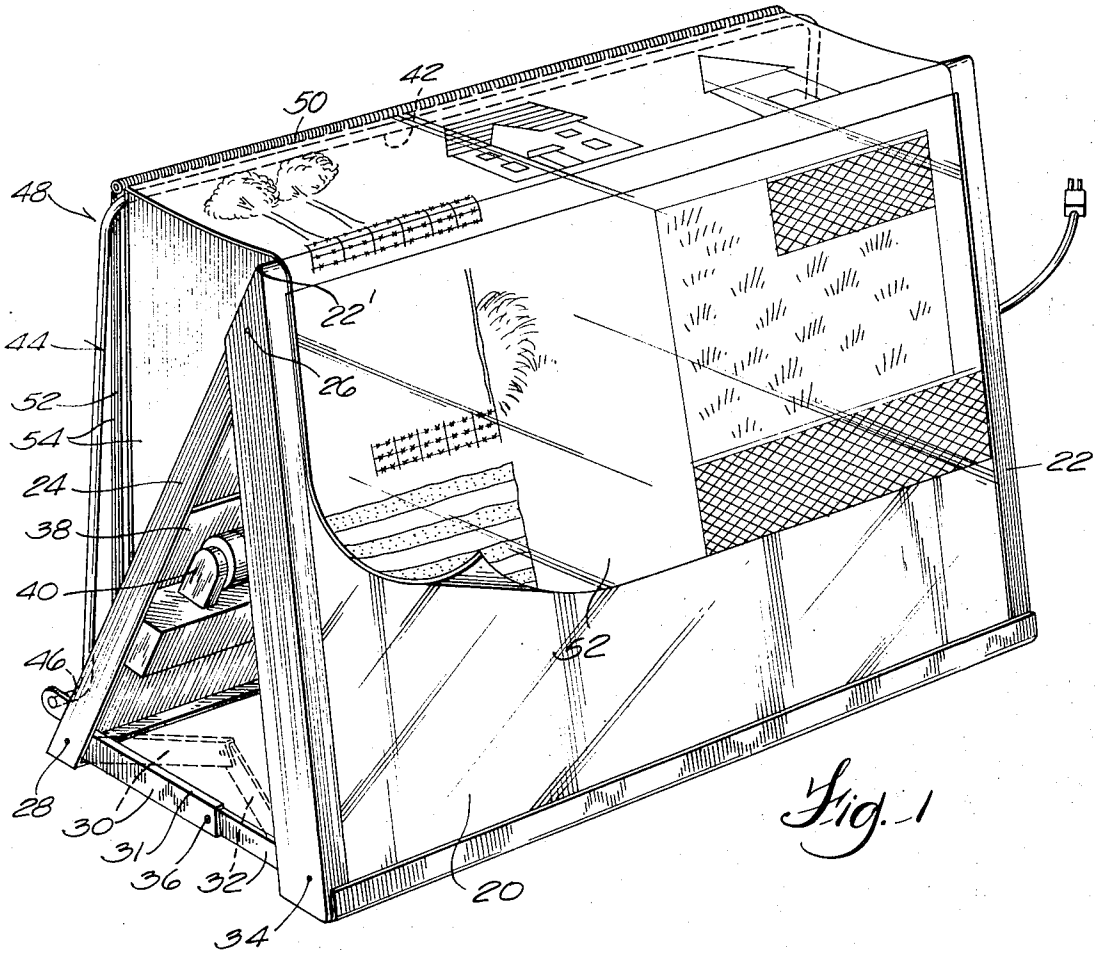

42
50
48
22'
44
26
52
54
24
38
40
46
22
52
28
30
31
36
32
34
20

Fig. 1

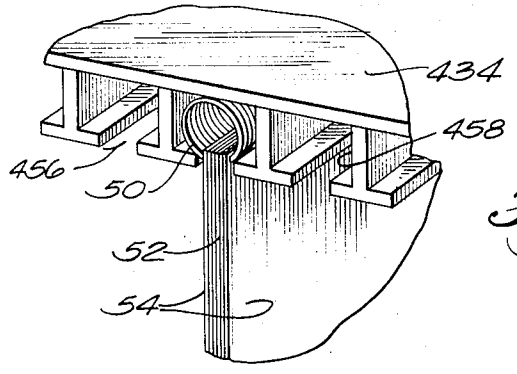

434
458
456
50
52
54

Fig. 10

Fig. 2

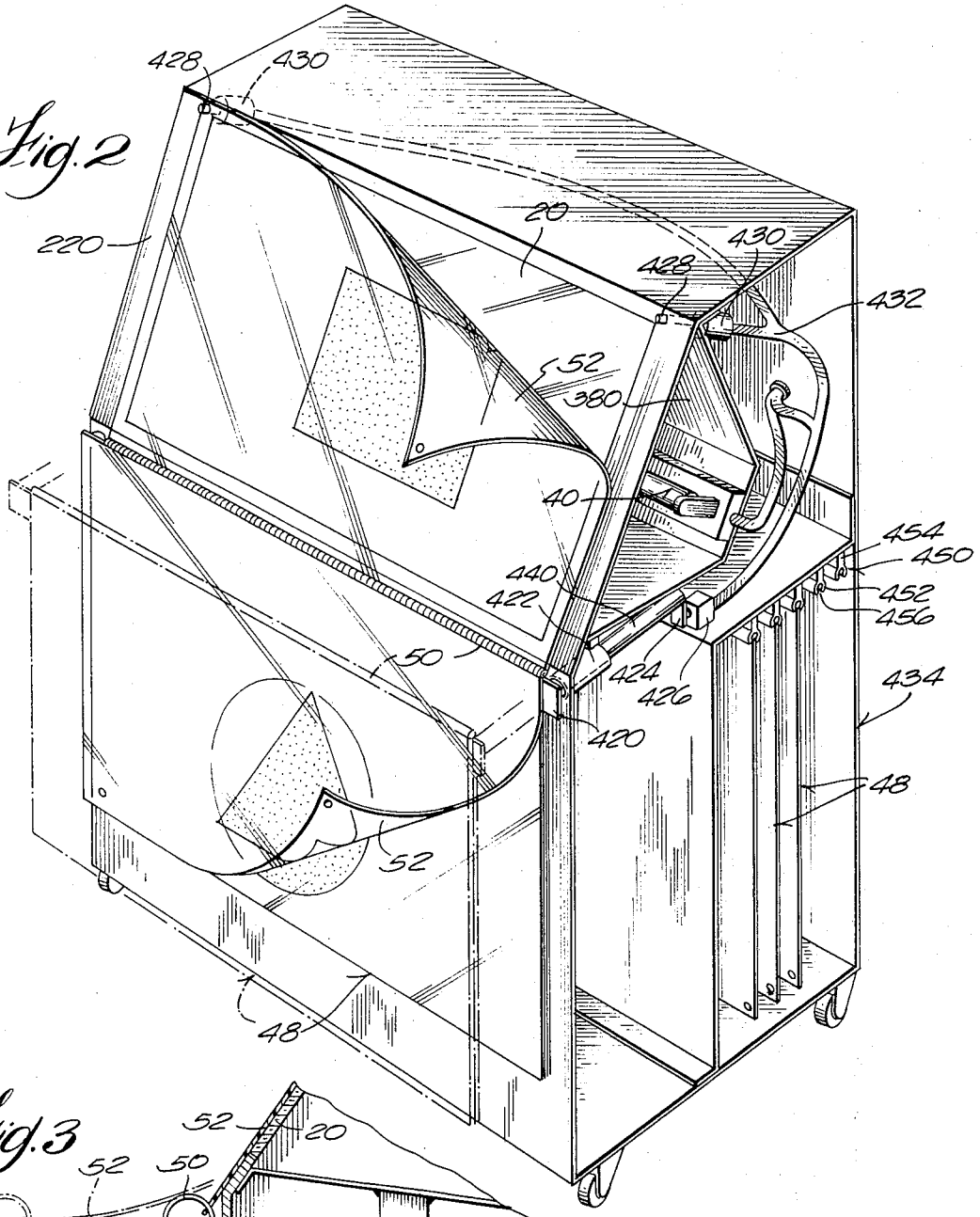
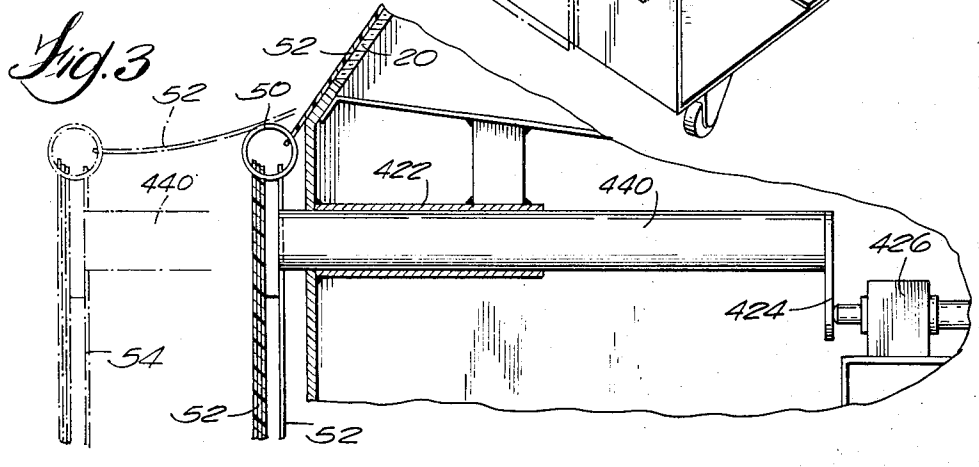

428
430
220
20
430
428
432
52
380
40
454
450
440
422
452
456
50
424
426
434
420
48
52
48

Fig. 3


52
20
52
50
422
440
440
426
424
54
52
52

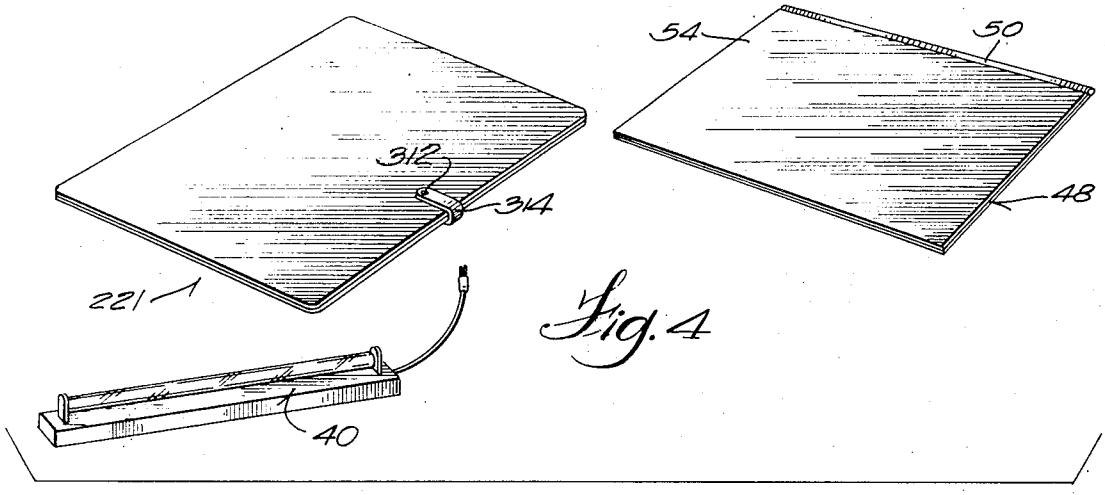


Fig. 4

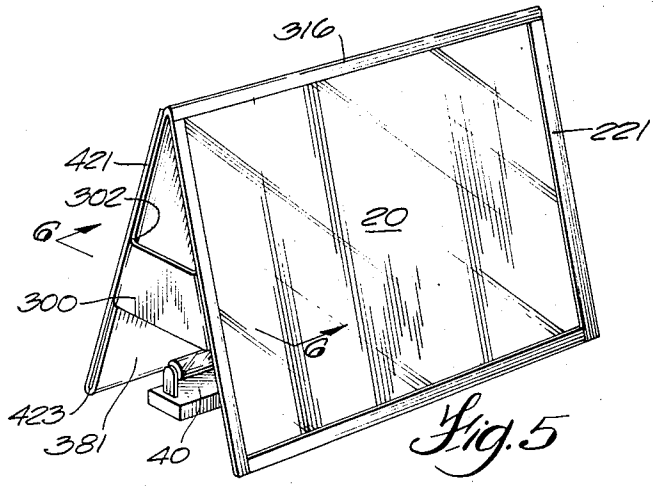


Fig. 5

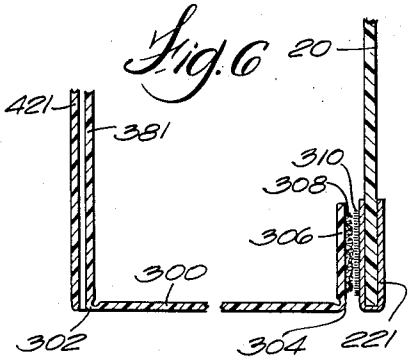


Fig. 6

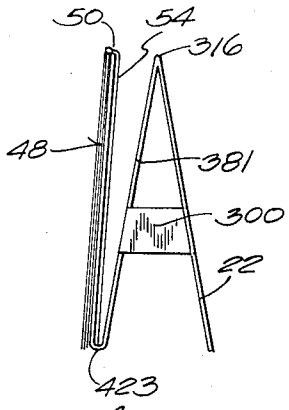


Fig. 7

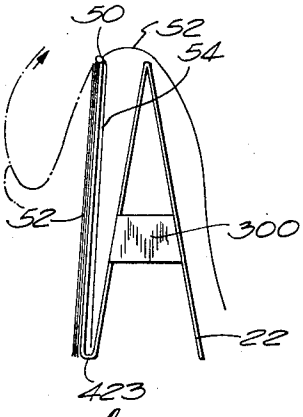


Fig. 8

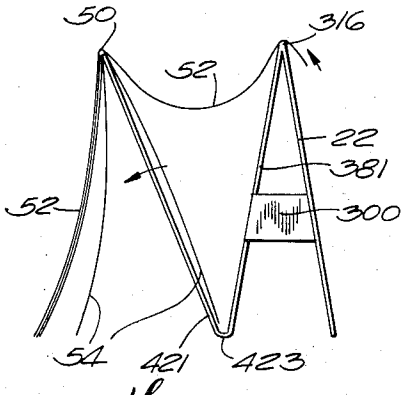


Fig. 9

TRANSPARENCY DISPLAY DEVICES

BACKGROUND OF THE INVENTION

The invention constitutes a further development in the visual aids transparency art, whether that art is used for education, for sales presentations, or decoration, or for any other purpose. My Patents Nos. 3,253,358 and 3,524,703 and my co-pending applications Ser. Nos. 43,086 and 77,570 are the background for the present invention.

SUMMARY OF THE INVENTION

The invention consists of the combination with a translucent panel and illumination means behind the panel of a transparency book support comprising a bar upon which the binding of the book is supported and means to support the bar for movement toward and away from a margin of the translucent panel. In one embodiment the last mentioned means comprise legs at the ends of the bar extending a substantial distance downward from the bar to pivot points whereby the bar may be oscillated away from and toward the margin of the translucent panel. In another embodiment the support bar for the binding is provided with a pair of laterally slidable legs extending below the lower margin of the translucent panel for movement away from and toward the panel in a reciprocating motion. In this embodiment the transparency in display position is above the binding and requires support at its free edge. For this purpose the invention includes a pair of studs or other supports at the top margin of the translucent panel which secure the free margin of the transparency during display. Means are provided to release the upper margin of the transparency when the support bar is moved away from the lower edge of the translucent panel. In the form illustrated the support means are studs engageable with apertures in the transparency and the means for releasing the support means comprise solenoid coils actuated by switches upon initiation of movement of the support legs to retract the studs. Upon return of the support bar and support legs to their initial position adjacent the lower margin of the translucent panel, the studs return to their normal position and a further transparency of the bound set may be supported on the studs to secure it for display.

In either form of the device the transparency is changed merely by moving the support bar away from the translucent panel to permit the transparency to fall between the support bar and the panel whereupon it assumes a planar vertical position for smooth storage without wrinkling by the usual manual manipulations. The support bar is then returned to the vicinity of the edge of the translucent panel and a further transparency is rotated about the binding until it lies against the translucent panel, and in case of the second modification described above is secured at the upper free margin, for instance by placing the apertures over the studs. It is apparent that the support bar, the securing means and the linkage between the support bar legs and the securing means may take other forms.

The invention herein also contemplates novel transparency book storage means for use in conjunction with any display device within the scope of the appended claims. The storage device includes tracks as long as the binders of the transparency books, the tracks being spaced sufficiently so that the transparencies in each book may hang vertically from a binding supported on the track for safe wrinkle-free storage. The track, in the disclosed embodiment, consists of a tube wide enough to receive a helical wire bookbinding, and having a longitudinal slot wide enough to receive the stack of transparencies bound in the wire binding, so that the binding may be telescopically received in the tube without substantial contact between the transparencies and the margins of the slot. The margins of the slot are desirably spaced sufficiently to receive a transparency book of any thickness appropriate to the size of the helical wire binding together with protective covers which further protect the transparencies. By storing the transparency books in this way they are protected from deformation from uneven surfaces or superimposed loads, abrasion in handling, and the like, to a far greater extent than is provided by known systems of storage.

DRAWINGS

FIG. 1 shows a portable transparency display device showing one embodiment of my transparency support means.

FIG. 2 is a perspective view of a transparency display cabinet showing a modified form of transparency book support and coordinated transparency support means and storage means.

FIG. 3 shows a fragmentary vertical cross-sectional view on line 3—3 of FIG. 2.

FIG. 4 is an expanded view of a further modification of my transparency display device.

FIG. 5 is a perspective view of the assembled device of FIG. 4

FIG. 6 is a cross-sectional view on line 6—6 of FIG. 5.

FIG. 7 is an end elevational view of the device of FIG. 4 showing the first step in my method.

FIG. 8 is a view like FIG. 7 showing step two.

FIG. 9 is a view like FIG. 7 showing step three.

FIG. 10 is a fragmentary perspective view of a modified storage unit similar to that of FIG. 2.

DESCRIPTION

The descriptions herein are given by way of exemplification rather than by way of limitation, the scope of the invention being defined by the claims.

As shown in FIG. 1 the first embodiment of my device consists of a translucent panel 20 which may be frosted glass, translucent plastic, or the like but is desirably translucent plastic for impact resistance. The panel 20 is secured within a frame 22. Frame 22 is supported in near vertical position, desirably about 10° from vertical, by a leg 24 pivoted at 26 to frame 22. Frame leg 24 is pivoted at 28 to a link 30. Link 32 is pivoted at 34 to frame 22 and links 30 and 32 are pivoted at 36 to each other. At least link 30 is desirably formed with a top flange 31 to serve as a stop to limit downward motion, positively establishing the size of the triangle formed by frame 22, frame leg 24, and links 30 and 32. In FIG. 1 only the portion of frame leg 24 and the links 30 and 32 at one end of my device are shown but the structure is duplicated at the other end of frame 22. Frame leg 24 also includes a back panel 38 which serves to support a conventional lighting structure which may preferably take the form of a fluorescent lamp and fixture 40. Panel 38 may desirably be of reflective material to assist in directing the light for-

wardly toward the translucent screen panel 20. Panel 38 also serves to give increased rigidity to the structure and to protect the light and light fixture 40.

Support bar 42, as shown, is formed integral with its legs 44 and with pivot 46, which is symmetrical with a similar pivot at the other end of the device. The whole is formed from a length of tubing formed in the shape of a rectangular U, the horizontal support bar 42 comprising the central portion of the U, the legs 44 comprising the legs of the U, and the pivots 46 comprising outwardly turned end portions. Pivots 46 are received in apertures in legs 24 to support the support bar 42 for oscillation to and from a location adjacent the top margin of panel 20 and frame 22. A transparency book 48 consisting of a wire binding 50, transparencies 52 and a pair of covers 54. In use the binding 50 is supported above the support bar 42 with the covers 54 on either side of the bar 42 maintaining the binding in position and protecting the transparencies 52 against contact with the support bar 42. The top margin 22' of the frame 22 is very smooth, and rounded. When the support bar 42 is moved away from the frame 22 and the translucent panel 20, as shown in FIG. 1, a transparency 52 is pulled to a generally horizontal position without moving in any direction which would tend to crease or wrinkle it. (See FIGS. 7, 8, and 9) When a sufficient span of transparency 52 is horizontal, the weight of the transparency causes it to fall to a vertical position parallel with covers 54. The bar 42 is then returned to rest at the margin of frame 22 adjacent the top of translucent panel 20 and a new transparency 52 is rotated about binding 50 to overlie translucent panel 20 for display. When the final transparency 52 has been displayed, the transparency book 48 is closed and removed from support bar 42, whereupon light 40 may be turned off, and if desired the entire structure may be folded flat by lifting pivot 36 and swinging frame legs 24 to a position within frame 22, the width of the side of frame 22 being proportioned to accommodate frame leg 24 and the light source 40 secured to it.

FIGS. 2 and 3 show a further embodiment of my invention. In these figures a support 420 normally occupies a position adjacent the lower margin of frame 220 and translucent panel 20 and supports binding 50 in the manner that support bar 42 does. In this instance support bar 420 is shown as a flat bar on edge. Legs 440 at either end of the support bar outside the margins of book 48 are telescopically supported in tubes 422 for movement away from and toward the margin of panel 20 and frame 220, as shown by the dotted line showing in FIG. 2. The end of one leg 440 is provided with a flange 424 which serves as an actuator for switch 426. A pair of studs 428 are mounted in frame 220 at the top corners of panel 20 and are retractable by solenoids 430 when switch 426 is not acutated by actuator 424. The necessary electrical connections are conventional and are illustrated schematically by wires 432 which also supply current to light 40 either independently of switch 426 or when switch 426 is actuated by actuator 424. It will be apparent that other conventional switch means may be used.

A reflector 380 is attached to the rear of frame 220 to direct the light to translucent panel 20 as shown. Desirably the structure described is enclosed in a cabinet 434.

A further feature of the invention is the novel storage rack incorporated in the cabinet 434. A group of tracks 450 having a tubular portion 452 and a support web 454 are attached to the cabinet 434. Extending the entire length of each tubular portion 453 is a slot 456 opening downwardly to receive transparencies 52 and covers 54. Slot 456 has a width less than the diameter of tube 452 but greater than the width of the book 48 that may be bound on the wider helical wire binding 50. However, tube 452 is a close fit for wire binding 50 which accordingly may be slid in telescopically so that the transparencies 52 and covers 54 hang vertically, secure from wrinkling and abrasion. Desirably the cabinet 434 has a side wall with a door (not shown) so that the storage area is also free of dirt. It will be evident that the storage area may be extended. The tracks may also take other forms. For instance, the tracks may take the form of simple T-shaped extrusions with the cross-bar of the T extending laterally below the vertical portion of the T, the cross-bars of the T being spaced sufficiently to form slots 456, thus forming square tubes 458 to receive bindings 50. (FIG. 10)

FIGS. 4 through 9 show a modification of my device which is foldable flat with the exception of light 40. Translucent panel 20 is bound in a frame 221 which preferably comprises plastic materials such as vinyl heat sealed into place. The panel 381 back of light 40 is also of plastic material and is hinged at the top margin of frame 22 by a flexible plastic hinge. The oscillatable book support 421 is, like panel 381, a full rectangular panel having a top margin which supports binding 50 of the transparency book 48 in the manner above described. The hinged connection 423 between panel 421 and 381, also preferably made of a flexible plastic material, serves the function of the pivot in the first device described and of the telescopic tubes in the second device described to allow the top margin of panel 421 to oscillate to and from a point adjacent the top margin 221 of the frame for translucent screen 20 as best shown in FIGS. 7 through 9 so that the transparency displayed moves to a storage position.

Taking the place of the links 30 and 32 in the first device described is a link 300 hinged with a plastic hinge 302 to panel 381 in a manner similar to the hinging of panel 381 to frame 22 and to panel 421. A further hinge 304 connects link 300 to a short flange 306 which is secured removably to frame 221, preferably by means of plastic fiber hook and eye material 308, 310 sold commercially under the trademark "Velcro". Thus an extremely simple portable device for showing the transparencies of book 48 is provided. The panels 381 and 421 are preferably stiffened in a known manner, such as the provision of a cardboard interior panel between sheets of vinyl heat-sealed at the edges, so that they are sufficiently rigid to support book 48 and oscillate it to and from proximity with the top margin of translucent panel 20. Preferably a snap 312 on a strap 314 is provided to hold the unit in its closed position. In closing the unit the panel 20 and frame 221 are rotated about hinge 316 so that panel 20 lies between panels 381 and 421, and link 300 is folded in, after which panels 421 and 381 are brought together and snap 312 is fastened. If desired, book 48 may also be folded in for safe storage during transportation. Only light 40 must be carried separately. The end of the device not illustrated is desirably complementary to that which is illustrated, in each embodiment.

The steps of my novel method, as applied to any of the devices described, include mounting the transpar-

ency book **48** with its binding **50** on the support bar of the various structures shown preferably with a cover **54** on each side of the support bar. A transparency **52** is then rotated about binding **50** to overlie translucent panel **20** while the panel is illuminated to display the transparency. The next step includes moving the support away from the margin of panel **20** so that the thin flexible transparency **52** is pulled away from panel **20** and falls to a storage position. Another transparency **52** is then rotated to overlie panel **20** and the steps are repeated until all of the transparencies have been displayed. If desired, the separate transparencies of my application Ser. No. 43,086 filed June 3, 1970 may be used in conjunction with transparencies **52** for additional display presentations. The steps of the method are shown in FIGS. **7** through **9.**

I claim:

1. A transparency display device for handling and displaying large substantially nonresilient flexible transparencies, the combination comprising

a translucent illuminated panel substantially vertically oriented for display;

a frame having a horizontal support rod movably mounted adjacent to a horizontal margin of said translucent illuminated panel for substantially horizontal movement toward and away from said translucent illuminated panel

a book of a plurality of large substantially nonresilient flexible transparencies having a pair of rigid covers and having a loose-leaf binding on one edge such that said transparencies and said rigid covers may swing about said binding through substantially a full circle,

and said book being suspended over said horizontal support rod with said binding resting on said horizontal support rod and said covers hanging freely from said binding on opposite sides of said horizontal support rod to stabilize said book on said support rod and said transparencies freely suspended from said binding on either side of said horizontal support rod said horizontal support rod is an inverted U-shaped member having a horizontal top member and vertical legs extending down from ends of said top member, and is mounted behind said translucent illuminated panel; and said vertical legs are pivotably mounted at their bottom ends to swing said horizontal top member toward and away from a top margin of said translucent illuminated panel.

* * * * *