United States Patent

Youngblood

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[45] **Oct. 3, 1972**

[54] **COLLAPSIBLE SCREEN ASSEMBLY**

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[22] Filed: **April 6, 1970**

[21] Appl. No.: **31,071**

Related U.S. Application Data

[60] Division of Ser. No. 739,909, June 14, 1968, abandoned, which is a continuation of Ser. No. 535,149, , abandoned.

[52] **U.S. Cl.** **350/124,** 312/258, 352/104, 353/71

[51] **Int. Cl.**.....**G03b 21/58**

[58] **Field of Search** 350/124; 352/15, 34, 104; 312/258; 353/71

[56] **References Cited**

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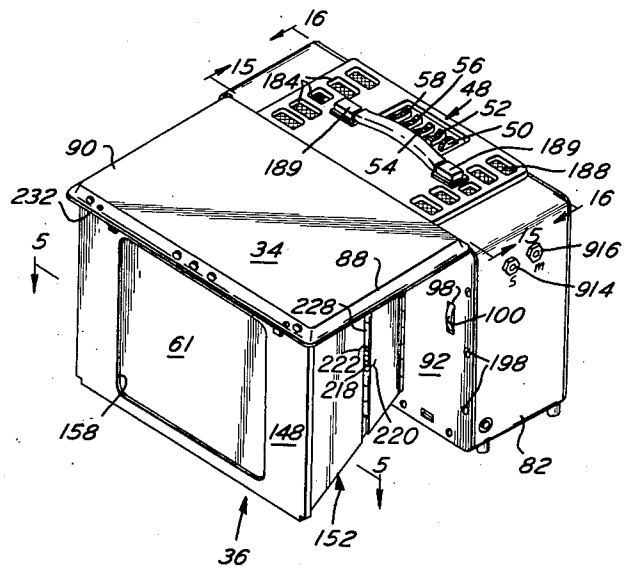
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Primary Examiner—S. Clement Swisher
Attorney—D. R. Pressman

[57] **ABSTRACT**

A collapsible screen assembly for a self-contained audio-visual apparatus comprising a forward wall having a translucent screen, a pair of foldable, spring-loaded side walls securing said forward wall to opposite sides of a projection opening in a front wall of the apparatus, and a hood pivotably secured to said front wall above said side walls so as to enclose said forward and side walls when folded and provide a light shield above said forward and side walls when the latter are opened. One side wall can be detached from said front wall and secured to the other side of said projection opening, thereby to provide a front screen projector. The assembly includes various brackets, locating posts, and other members, for facilitating operation, locking, and alignment of the screen assembly.

8 Claims, 14 Drawing Figures



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SHEET 1 OF 4

FIG. 1

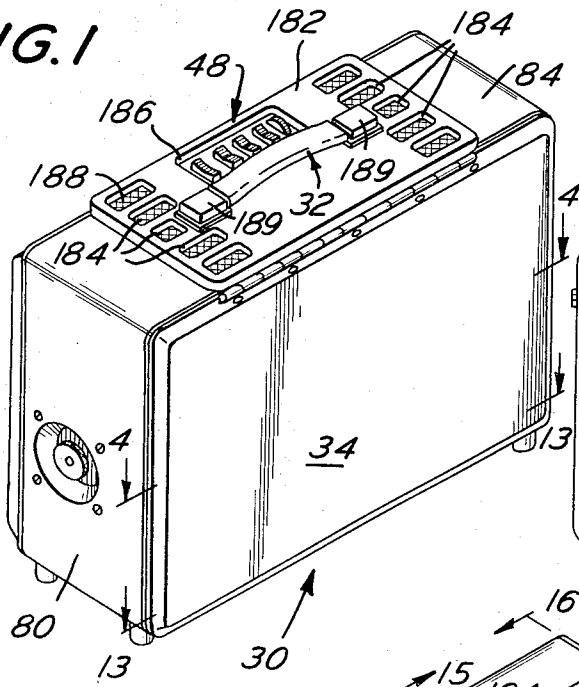
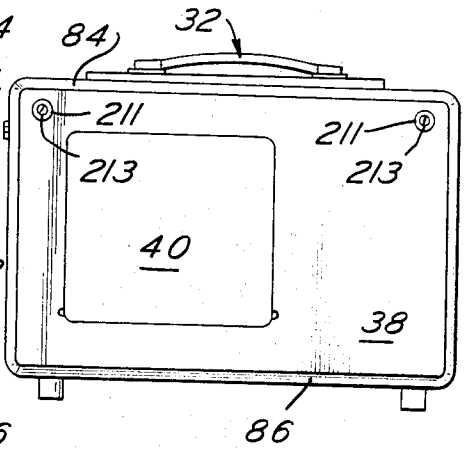


FIG. 3



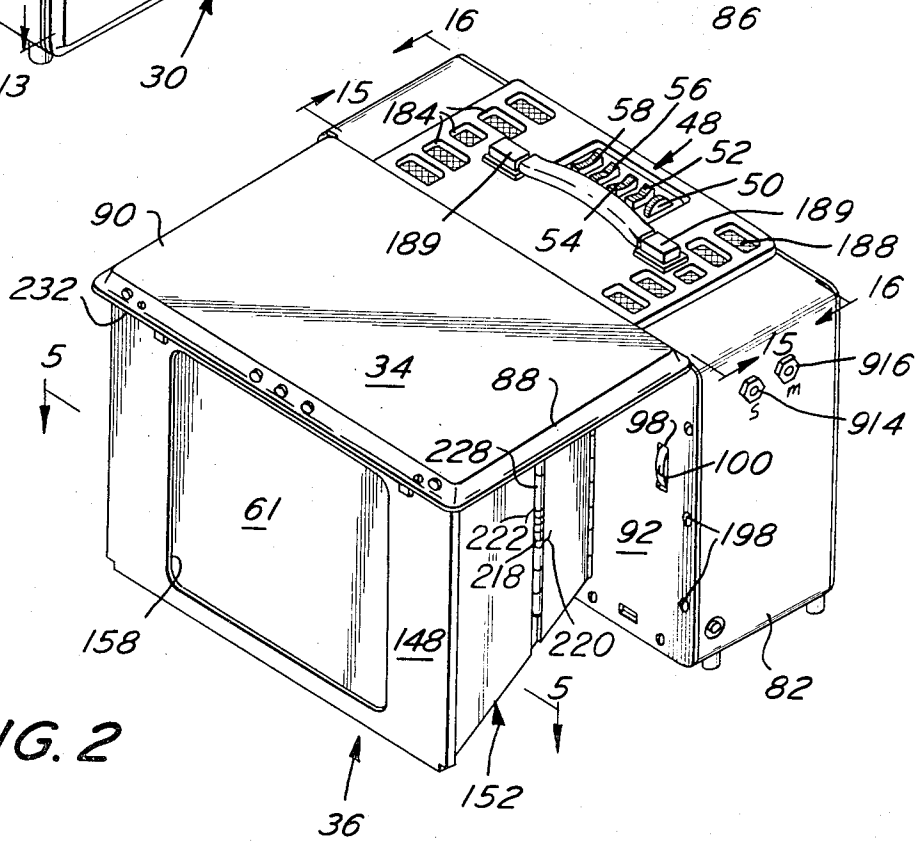


FIG. 2

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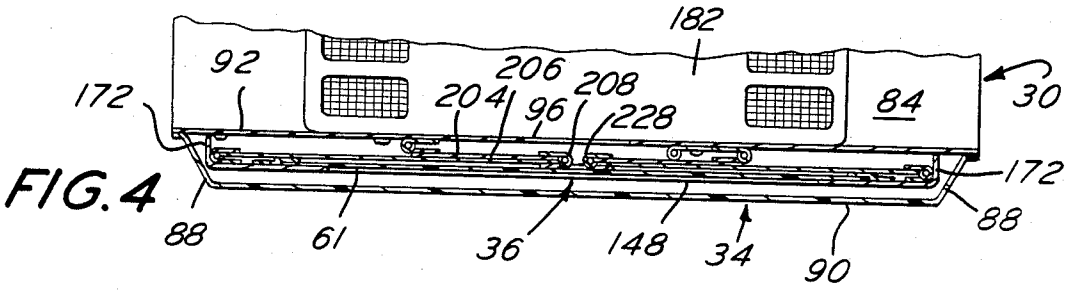


FIG. 4

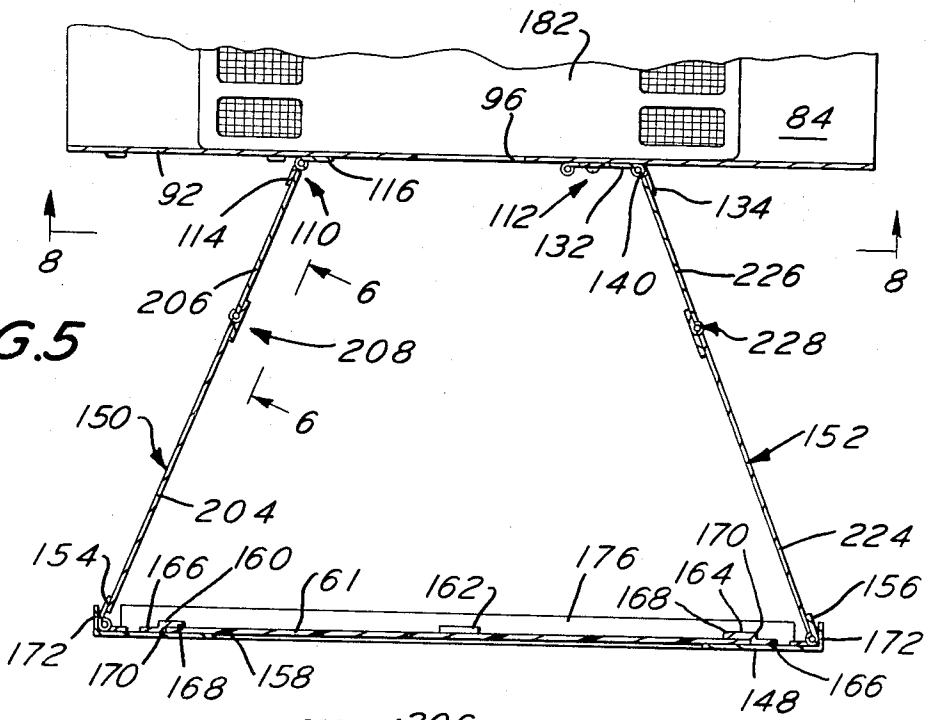


FIG. 5

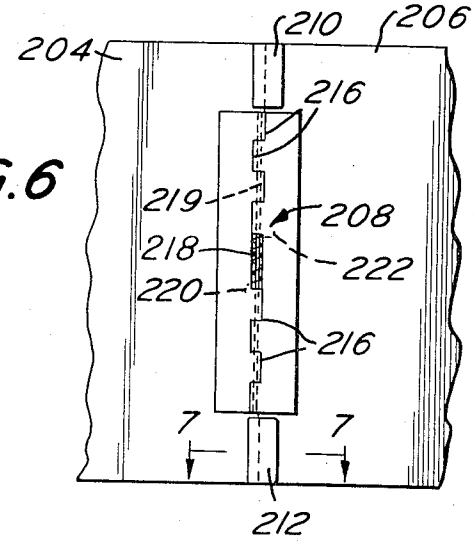


FIG. 6

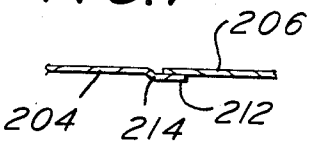


FIG. 7

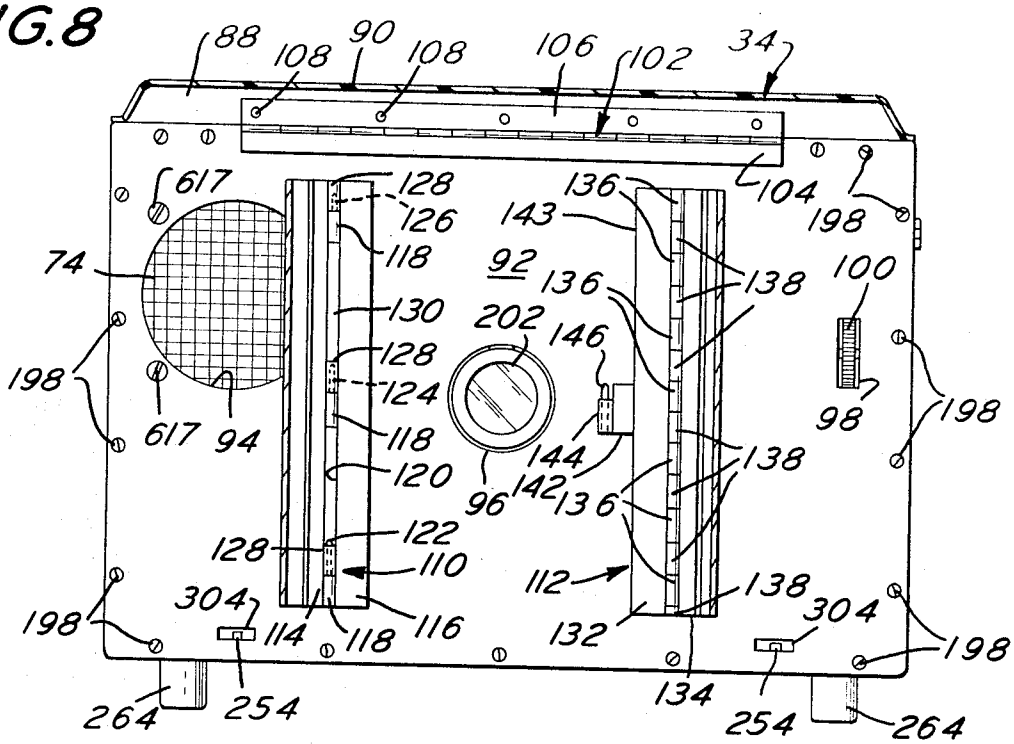
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FIG. 8



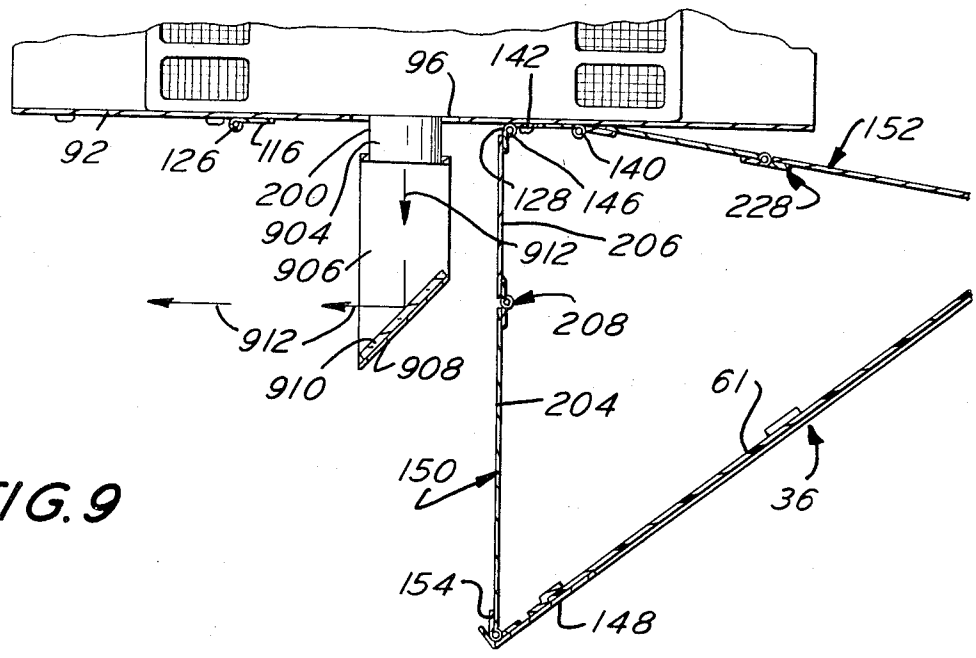


FIG. 9

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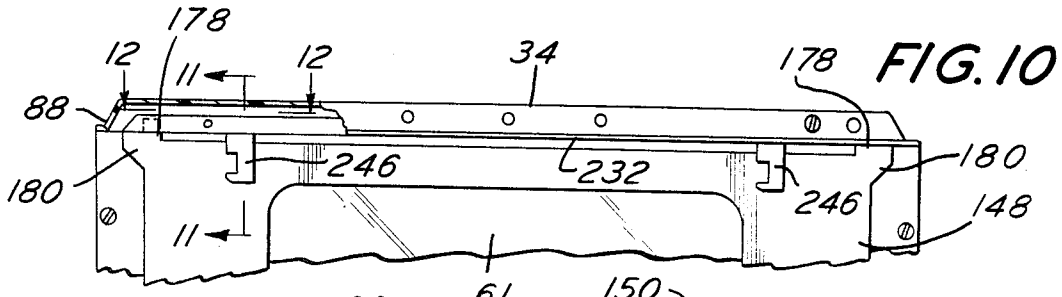


FIG. 10

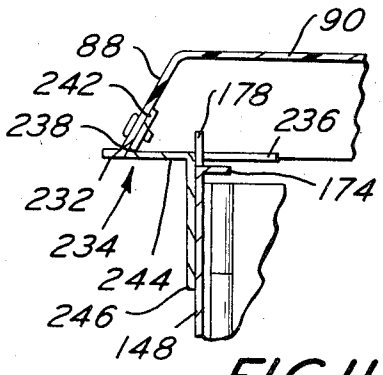


FIG. 11

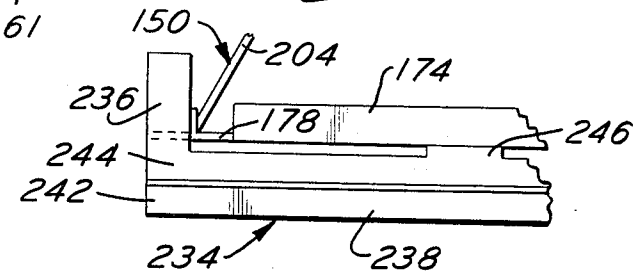


FIG. 12

FIG. 13

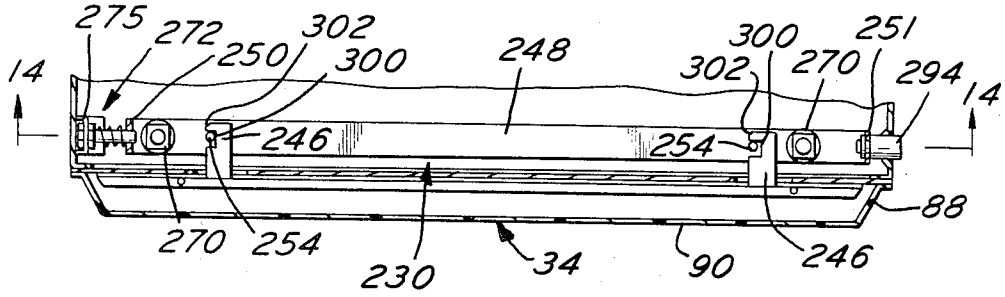
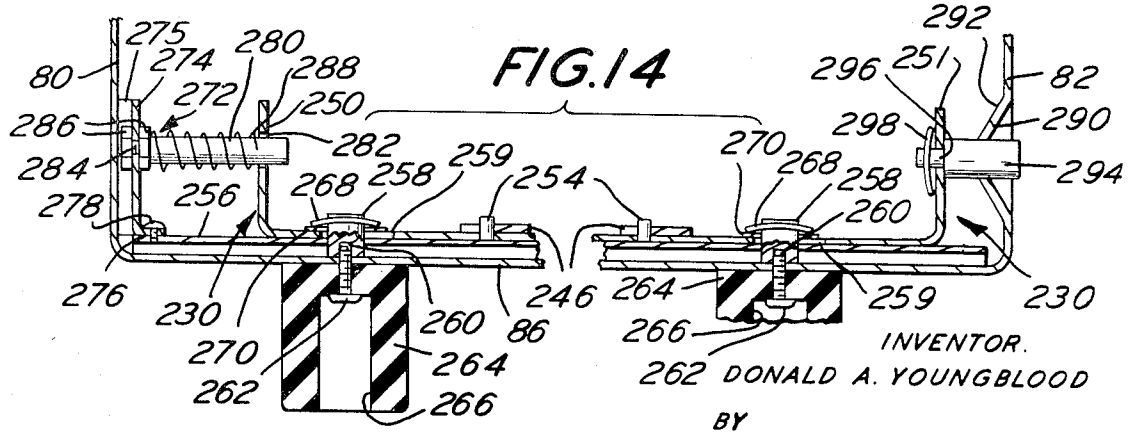


FIG. 14



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COLLAPSIBLE SCREEN ASSEMBLY

This is a division of parent application Ser. No. 739,909, filed June 14, 1966 (now abandoned), which parent application in turn is a continuation of grandparent application Ser. No. 535,149 (now abandoned). Three other divisional applications of said parent application (Ser. Nos. 25,707, 25,805, and 31,072 and filed on even dates herewith) describe inventions related to that of the present application.

This invention relates to an entertainment and/or educational device and more particularly to a collapsible screen assembly for a combination visual and sound apparatus.

Combination audio and visual devices are known to be an important tool of education as well as sales. That is, where untrained teachers or salesmen are used, a device which combines a visual production with an audio background enables the untrained to present to a potential client or student a complete and well-prepared program.

These combination visual and sound apparatus, however, have been inadequate because they are either inflexible or too difficult to operate for an untrained worker. At present, those which are easy to operate are so because they do not allow flexibility of programming. That is, in these devices, the apparatus is prepared in advance for presentation of a sound and film program in the factory and thus are able to show only a single presentation. In order to show an additional or alternate audio-visual presentation, it is necessary that the apparatus be transmitted to the factory which produced the apparatus originally and be returned with a different program. Or the user would have to have a plurality of such devices, one for each program.

Those devices which are flexible enough to present various programs are difficult to operate. The operator of such a device must be given an intensive orientation as to the capabilities of the machine and must be capable of trouble shooting if any disorder results. These devices normally require threading of the film through the various guide and sprocket wheels in the device. If it is necessary to use a different sound track with the pre-threaded film, the operator is required to manually synchronize the audio with the visual presentation.

Therefore there has been a recognized need for a combination visual and sound presentation device which is flexible enough so that various programs may be shown in the device yet is so uncomplicated to use that a relatively unskilled person may operate the device. For example where the device is to be used in various countries, the sound track should be easily interchangeable so that a plurality of sound tracks may be used with a single film. However the device must be easy to operate.

It is therefore an object of this invention to provide a new and improved combination visual and sound apparatus.

Another object of the invention is to provide a new and improved visual and sound apparatus which is both portable and easy to operate.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein only those

drawings necessary to explain the invention of the present divisional application have been retained.

FIG. 1 is a perspective view of the combination visual and sound apparatus embodying the invention in a closed position;

FIG. 2 is a perspective view of the combination visual and sound apparatus embodying the invention in an open position for projection on a built-in screen;

FIG. 3 is a view of the rear side of the visual and sound apparatus;

FIG. 4 is an enlarged fragmentary sectional view taken along the line 4—4 in FIG. 1;

FIG. 5 is an enlarged fragmentary sectional view taken along the line 5—5 in FIG. 2;

FIG. 6 is an enlarged fragmentary elevational view taken along the line 6—6 in FIG. 5;

FIG. 7 is an enlarged fragmentary sectional view taken along the line 7—7 in FIG. 6;

FIG. 8 is a sectional view taken along the line 8—8 in FIG. 5;

FIG. 9 is a sectional view similar to FIG. 5 with the combination visual and sound apparatus in a position for projection on a wall or screen;

FIG. 10 is a fragmentary side elevational view of the hood and screen with parts shown in section for the purpose of clarity;

FIG. 11 is an enlarged fragmentary sectional view taken along the line 11—11 in FIG. 10;

FIG. 12 is an enlarged fragmentary sectional view taken along the line 12—12 in FIG. 10;

FIG. 13 is an enlarged fragmentary sectional view taken along the line 13—13 in FIG. 1;

FIG. 14 is an enlarged discontinuous fragmentary sectional view taken along the line 14—14 in FIG. 14; and

FIG. 15 is an enlarged sectional view taken along the line 15—15 in FIG. 2.

Referring now in greater detail to the various figures of the drawing wherein similar reference characters refer to similar parts, a combination visual and sound apparatus embodying the invention is generally shown at 30 in FIG. 1.

The outer body of the combination visual and sound apparatus is in the configuration of small suitcase or attache case. The device includes a handle 32 which facilitates carrying of the device. As best seen in FIG. 2, when the apparatus is in use, hood 34 for screen assembly 36 is urged outwardly by springs provided in the walls thereof.

A rear side wall 38 (FIG. 3) includes a cartridge receptacle 40 which is pivotably mounted in the wall. When pivoted outwardly, receptacle 40 is adapted to receive a cartridge (not shown). The cartridge is adapted to removably receive a film holder 44 and a tape magazine. The film holder and tape magazine are adapted to house an endless strip and an endless tape, respectively. The outer walls of the apparatus, when in a closed position, comprise hood 34, rear side wall 38, end walls 80 and 82, top wall 84, and bottom wall 86. Hood 34 is generally rectangular, tray-shaped, and includes a peripheral wall 88 and a planar portion 90. Wall 88 extends from the rectangular planar portion 90 of hood 34.

As best seen in FIG. 4, peripheral wall 88 is comprised of elongated strips which are integral with the

periphery of portion 90 and which extend at an angle therefrom.

As best seen in FIGS. 2 and 8, an inner wall 92 is provided under hood 34. Inner wall 92 is planar and generally rectangular and includes openings 94, 96, and 98. Opening 94 is circular and provides an opening through which the projected image passes to screen 61. Opening 98 is a vertically extending rectangular opening which enables a portion of a dial 100 to be exposed for adjusting the focus of the projected image.

Hood 34 is pivotably mounted to the inner wall 92 by a hinge 102 which is connected at the upper edges of the hood 34 and inner wall 92. Hinge 102 comprises a first hinge plate 104 and a second hinge plate 106. First hinge plate 104 is preferably secured along the upper edge of inner wall 92 by welding. Hinge plates 104 and 106 are horizontally disposed, longitudinally elongated, and substantially planar. They are secured to the upper strip of peripheral wall 88 by suitable fasteners 108. Thus hood 34 is pivotable about hinge 102. In a closed position hood 34 is vertically disposed. To open the screen assembly hood 34 is pivoted upwardly until it is disposed horizontally.

As best seen in FIG. 8, screen assembly 36 is connected to inner wall 92 at hinges 110 and 112. Hinge 110 is vertically positioned and includes a pair of hinge plates 114 and 116. Hinge plate 116 is substantially planar, elongated, vertically disposed, and is preferably secured by welding to the outer surface of inner wall 92. Hinge plate 116 includes three journals 118 which are integral with a vertical lateral edge 120 of hinge plate 116. Journals 118 are each comprised of hollow cylindrical sleeves which extend vertically. Each of the sleeves is aligned vertically with respect to each other. The sleeves are vertically spaced from each other with bottom journal 118 adjacent the bottom edge of plate 116 and upper journal 118 spaced from and adjacent the top edge of hinge plate 116. Middle journal 118 is located centrally along the edge 120. Elongated pins 122, 124 and 126 are mounted in the lowermost, middle, and uppermost journals 118 respectively. Pin 122 is larger than pins 124 and 126 for reasons which will hereinafter appear. Similarly, pin 124 is larger than pin 126. The lowermost portions of pins 122, 124, and 126 are secured within journals 128.

Hinge plate 114 includes three journals 128 which are of hollow cylindrical configuration and which extend vertically. Journals 128 are integral with vertical lateral edge 130 of the plate 114.

Journals 128 are vertically spaced from each other with the uppermost journal 128 adjacent the uppermost edge of the plate 114. The middle journal 128 is located centrally along edge 130 and the lowest journal 128 is secured adjacent but is spaced upwardly from the lowermost edge of hinge plate 114. Hinge plate 114 is removably secured to hinge plate 116 by telescoping journals 128 over pins 122, 124 and 126. The decreasing heights of pins 122, 124 and 126 enable journals 128 to be aligned with and placed easily over the pins. That is, when the lowermost journal 123 is aligned with and started over pin 122, the uppermost journals 128 can be aligned over pins 124 and 126. If pins 122, 124, and 126 were each the same length, the insertion of a portion of the lowest journal 128 over any portion of pin 122 would prevent the upper journals 128 from being pivoted over pins 124 and 126.

Hinge 112 comprises hinge plates 132 and 134. Hinge plates 132 and 134 are pivotably connected to each other and are each planar and extend in a vertical direction. Hinge plate 132 is preferably secured to wall 92 in a vertical position by welding. Hinge plate 132 includes a plurality of journals 136 which are integral therewith and are each vertically spaced along a lateral edge of the plate. Journals 136 are formed as hollow vertically extending cylindrical sleeves. Hinge plate 134 includes a plurality of journals 138 which are integral with and are spaced along a lateral edge of hinge plate 134. Journals 136 are spaced from each other by a distance substantially equal to the length of journals 138. Similarly journals 138 are spaced from each other by a distance substantially equal to the length of journals 136. Hinge plates 132 and 134 are secured together by vertically aligning journals 136 and 138 and inserting a longitudinally extending pin 140, which is best seen in FIG. 5, therethrough. A tab 142 which is rectangular and planar is secured to inner wall 92 by welding adjacent vertical lateral edge 143 of hinge plate 132 and is located centrally therealong. Tab 142 is integrally secured to a journal 144 which is comprised of a vertically extending hollow cylindrical sleeve. The lowermost portion of an elongated vertically extending pin 146 is secured in the journal 144. The purpose of journal 144 and pin 146 will hereinafter appear.

Screen assembly 36, which is best seen in FIGS. 2, 5, and 9, comprises a front wall 148 which includes a screen 61 and collapsible side walls 150 and 152. Side wall 150 is preferably secured to front wall 148 by a hinge 154 which is similar in construction to hinge 112. Hinge 154 is elongated and disposed in a vertical position so that wall 152 is pivotable about a vertical axis with respect to front wall 148. Hinge 154 is connected to side wall 150 and front wall 148, preferably by welding. Similarly, side wall 152 is pivotably connected by hinge 156 to front wall 148. Hinge 156 is also similar in construction to hinge 112. Hinge 156 is longitudinally extended and vertically disposed and is preferably secured along vertical edges of side wall 152 and front wall 148 by welding. Thus wall 152 is also pivotable about a vertical axis with respect to front wall 148.

Front wall 148 is substantially planar and rectangularly shaped. It includes a centrally disposed rectangular opening 158 behind which screen 61 is mounted. Screen 61 is secured adjacent opening 158 by mounting brackets 160, 162 and 164. These brackets are similar to each other and comprise a flat rectangular base portion 166 which is secured to the inner surface of wall 148 by welding and a flat lip portion 168 which is parallel to the base 166 and spaced therefrom approximately the thickness of screen 61. Lip 169 and base 166 are bridged by an integral perpendicular portion 170. Mounting brackets 160 and 164 are each mounted adjacent a vertical edge of opening 158 and disposed centrally therealong. Mounting bracket 162 is mounted adjacent the lower horizontal edge of opening 158 and is located centrally therealong. The lip portion thereof extends upwardly and prevents the screen from movement vertically.

Front wall 148 further includes a pair of integral perpendicular flanges 172 which extend vertically. Flanges 172 extend around hinges 154 and 156 and are adjacent thereto. Front wall 148 also includes a top flange

174 (best seen in FIG. 11) and a bottom flange 176 (best seen in FIG. 5). Flanges 174 and 176 are integral with wall 148 and extend perpendicularly from the rear surface thereof along the top and bottom edges respectively. As best seen in FIG. 10 there is provided along the upper edge of wall 148 a pair of upwardly extending locating posts 178. The function of locating posts 178 will hereinafter be seen. Locating posts 178 are located at opposite ends of the top edge of wall 148. Extending laterally from posts 178 and wall 148 are a pair of laterally extending ledges 180 which coact with locating posts 178 to position hood 34 over the screen assembly 36.

Walls 80, 82, 84, and 86 are comprised of an integral elongated planar sheet of metal which encompasses the internal organization of elements in apparatus 30. Top wall 84 has affixed on the outer surface thereof a cover plate 182. Cover plate 182 is planar and rectangular and includes a plurality of openings 184 at opposite ends thereof. Top wall 84 also includes similar openings which are vertically aligned with openings 184. A large rectangular opening 186 is also provided in cover plate 182 for access to a bank of switches 48. The cover plate 182 is located in the center of wall 84 lengthwise and is coextensive width-wise with said wall. A grill 188 is encapsulated between the cover plate 182 and wall 184. The openings in wall 84 and the aligned openings 184 in cover plate 182 provide ventilation for the cooling of a projector lamp (not shown). Top wall 84 further includes rectangular openings which are located within opening 186 of cover plate 182. Switches 50, 52, 54, 56, and 58 are mounted within said openings and extend upwardly therefrom so that they are accessible to the operator of apparatus 30.

Cover plate 182 is positioned on the outer surface of top wall 84 by locating posts (not shown) which extend through openings provided in top wall 84. The cover plate is secured in place by mounting brackets 189 which include projections that extend through top wall 84 and are secured at the lower surface of the wall. Mounting brackets 189 also serve to secure handle 32 at opposite ends thereof.

Collapsible wall 152 (FIG. 5) of screen assembly 36 is pivotably connected to inner wall 92 by hinge 112. As best seen in FIGS. 5 and 9, collapsible wall 150 is connected to hinge plate 114 which is detachably connected to hinge plate 116 of hinge 110 when the visual presentation is to be shown by projection of the image on the back of screen 61. When the visual portion of a program is to be projected on an outer surface such as a wall or screen, the collapsible wall 150 is connected to tab 142 by telescoping the middle journal 128 over pin 146. Thus as best seen in FIG. 9, the area adjacent opening 96 through which the visual portion of a program is projected is clear. An adapter 200 is inserted through opening 96 in place of the lens 202 for presentation of the program on an external screen. The adapter enables the image to be projected parallel to wall 92.

Collapsible walls 150 and 152 are each comprised of two flat rectangular panels. Wall 150 is comprised of a rectangular forward panel 204 and a smaller rectangular rear panel 206. These panels are connected together by a spring loaded hinge 208. As best seen in FIG. 6, the hinge plates of hinge 208 are welded to panels 204 and 206, respectively. Panel 204 includes a pair of rectangular fingers 210 and 212 which extend laterally from a vertical edge of panel 204 adjacent the top and bottom of said edge. As best seen in FIG. 7, these fingers are parallel to panel 204 and are spaced therefrom substantially the thickness of panel 206 by an integral bridging portion 214. Hinge 208 includes a plurality of journals 216 which are discontinuous at the center of the hinge. That is, there is no journal provided on either of the hinge plates at the center of the hinge so that a spring 218 may be located therein. Spring 218 along with journals 216 are secured together by a pin 219 which passes through journals 216 and spring 218. Spring 218 has a pair of L-shaped ends 220 and 222 which bear against the outer surface of panels 204 and 206, respectively. Therefore the spring 218 urges panels 204 and 206 at an angle of 180° away from each other.

Fingers 210 and 212 of panel 204 prevent the panels from opening greater than at a 180° angle. That is, as best seen in FIG. 4, panels 204 and 206 may be folded together about hinge 208 so that they are substantially parallel to each other. The spring 218, as mentioned hereinabove, urges panels 204 and 206 away from each other. However, when in the position shown in FIG. 4, hood 34 prevents the screen assembly from opening up. When in an open position, as shown in FIG. 5, panels 204 and 206 are prevented from opening farther than 180° by fingers 210 and 212 which bear against the inner surface of panel 206 when panels 204 and 206 are pivoted at an angle 180° from each other. Similarly, collapsible wall 152 is comprised of a forward panel 224 and a rear panel 226 which are pivotably connected to each other by hinge 228 which is identical to hinge 208. Panel 224 also includes a pair of fingers similar to fingers 210 and 212 of panel 204 to prevent the opening of panels 224 and 226 beyond an angle of 180°.

As previously mentioned, when screen assembly 36 is collapsed by folding panels 204 and 224 against panels 206 and 226, respectively, hood 34 encapsulates the screen assembly 36. As best seen in FIG. 4, flanges 172, 174 and 176 of front wall 148 abut the outer surface of inner wall 92 so that the collapsible walls 150 and 152 cannot be urged against screen 61 and thereby injure or scratch the screen. When hood 34 is pivoted to a vertical position and covers forward wall 148 and screen assembly 36, a locking mechanism 230 maintains hood 34 in a closed position.

As best seen in FIGS. 10 and 11, hood 34 includes along its lowermost horizontal edge 232 and within its peripheral wall 88 a U-shaped support bracket 234. As best seen in FIGS. 11 and 12, bracket 234 includes a pair of flat rectangular legs 236 and an elongated web 238 which has a V-shaped cross-section. Legs 236 extend rearwardly from the edge 232 in a plane parallel to the plane of rectangular planar portion 90 of hood 34. Web 238 of the bracket extends along edge 232 substantially the length of hood 34 and is secured to the inner surface of wall 88 by fastening means such as machine screws 240. Machine screws 240 pass through openings provided therefor in wall 88 of the hood and are secured in threaded openings provided therefor in an elongated planar leg 242 of web 338. The lower leg 244 of web 238 is also elongated and planar and is

disposed in the same plane as legs **236** and is integral therewith. A pair of planar fingers **246** depend from and are integral with the leg **244** of web **238**. These fingers **246** are perpendicular to the plane of leg **244** and extend towards the inner compartment of the apparatus **30**. Fingers **246** are adapted to be releasably locked in locking mechanism **230**.

Locking mechanism **230** is best shown in FIGS. **13** and **14**. The mechanism comprises a U-shaped bar **248** having a pair of rectangular vertically extending planar legs **250** and **251** and a flat elongated and horizontally disposed bridging section **252**. Section **252** is perpendicular to, integral with and bridges legs **250** and **251**. Section **252** also includes a pair of upwardly extending cylindrical locking posts **254**. The bridging section **252** is supported by an inner lower wall **256** which is spaced from and parallel to outer lower wall **86**. A pair of posts **258** which are cylindrical extend from the inner surface of lower wall **86** and through circular openings in lower wall **256** and through rectangular slots **259** which are provided in the bridging section **252** of the U-shaped bar **248**.

Posts **258** each have a circular threaded bore **260** which extends axially from the lower edge towards the center of said post. Each of said posts is secured in place by a threaded screw **262** which extends through an opening in lower wall **86** and is threadedly engaged in bore **260**. Screws **262** also secure rubber support members **264** to the bottom of lower wall **86**. Support members **264** are cylindrical and have an axially extending cylindrical bore **266** which extends from the lower edge thereof to a point intermediate of the top edge. A smaller axially extending bore extends through the remaining portion of the support member **264** to provide an opening for screw **262** to pass through. The bridging section **252** is maintained against the top surface of lower wall **256** by means of locking nuts **268** which are telescoped over posts **258**. Locking nuts **268** are separated from the bridging section **252** by nylon washers **270** which are telescoped over the posts prior to the locking nuts **268**.

U-shaped bar **248** is movable longitudinally with respect to the post **258** as a result of longitudinally elongated openings **259**. U-shaped bar **248** is normally urged towards wall **82** by a spring assembly **272**. Assembly **272** comprises an upstanding bracket **274** which extends vertically from lower wall **256**. Bracket **274** includes a pair of lateral flanges **275** which are vertically disposed and which are adjacent to and bear against the inner surface of wall **80** for additional support when spring mechanism **272** urges the bar **248** towards wall **82**. Bracket **274** also includes a horizontally extending flange **276** which is secured to the inner lower wall **256** by a suitable fastener **278**. A cylindrical pin **280** is secured to bracket **274** and extends to and through a circular opening **282** in leg **250** of the bar **248**.

Pin **280** includes an integral lower threaded member **284** which extends through an opening in bracket **274**. The pin is secured to bracket **274** by threaded nuts **286** which are threadedly secured to pin **280** at threaded member **284**. The nuts **286** thus sandwich the bracket and prevent movement of pin **280** with respect to the bracket. A spring **288** is telescoped over pin **280** and extends between nut **286** and leg **250** of U-shaped bar **248**. Thus spring **288** urges bar **248** towards wall **82**.

Wall **82** has in indented portion **290** which has a circular opening **292** through the center thereof. A cylindrical button **294** extends from opening **292** to the outer surface of leg **251** of the U-shaped bar. The button has an integral axially extending cylindrical portion **296** of decreased diameter which extends through an opening provided therefor in leg **251**. Button **294** is secured to leg **251** by a locking washer **298** which is telescoped over member **296**.

Fingers **246** which depend from hood **34** have rectangular notches **300** along their leftmost lateral edge. Adjacent notch **300** at the forwardmost edge of fingers **246** there is provided a bevelled portion or chamfer **302** which enables the fingers **246** to move U-shaped bar **248** toward wall **80** as the bevelled portion abuts post **254** when hood **34** is closed. Posts **254** thereby slide over bevelled surface **302** until the opening to notches **300** of fingers **246** are aligned with the posts whereupon the bar **248** slides towards wall **82** as spring **288** urges the posts into the notches. In order to disengage hood **34**, button **294** should be pressed inwardly thereby moving bar **248** towards wall **80** and thereby removing posts **254** from notches **300**. The posts are thus removed as an obstruction to the removal of fingers **246** and hood **34** therefore can be pivoted open.

When hood **34** is opened, the spring loaded hinges **208** and **228** urge forward panels **204** and **224** away from rear panels **206** and **226**, respectively. Walls **150** and **152** thereby straighten out and project forward wall **148** away from the body of apparatus **30**. Front wall **148**, including screen **61**, is thereby disposed parallel to and spaced from wall **92**. As shown in FIG. **3**, hood **34** is then placed down over the screen **61** so that legs **236** of supporting bracket **232** are telescoped around locating posts **178**, thereby centering the hood over the screen. Legs **236** also rest on ledges **180** to support hood **34**.

If it is desired that the film portion of a presentation be shown on a screen or external surface other than the screen **61**, collapsible side wall **150** is removed from its position as shown in FIG. **5** and is moved to the position shown in FIG. **9** by separating hinge **110** so that journals **128** are slid upwardly over the pins **122**, **124** and **126**. Wall **150** is then disposed in the plane shown in FIG. **9** and middle journal **128** is telescoped over pin **146** and thereby aligned with journal **144**. An adapter **200** may then be inserted in place of lens **202** for projection of a visual program on an external surface.

In order to close the apparatus so that it may be easily transported, middle journal **128** is slid upwardly over pin **146** and the three journals replaced over pins **122**, **124** and **126** of hinge **110**. Screen assembly **36** may then be collapsed by exerting slight inward pressure to walls **150** and **152** so that forward panels **204** and **224** fold against panels **206** and **226**, respectively. The front wall **148**, which includes screen **61**, is then pressed against inner wall **92** so that the assembly assumes the collapsed position shown in FIG. **4**. Hood **34** is then pivoted downwardly so that fingers **246** pass through rectangular openings **304** which are provided in inner wall **92** and are then engaged by locking posts **254**. The hood is thus disposed in a position for easy transportation of apparatus **30**.

Thus it can be seen that screen assembly **36** has a plurality of advantages. The screen is collapsible and is

thereby compactly stored by apparatus **30** when not in use. Collapsible walls **150** and **152** are opaque and do not allow light within the screen assembly through either of the side walls. The engagement with hood **34** further precludes light from entering within the screen assembly in that hood **34** is opaque and includes a peripheral wall **88** which overlaps the side walls **150** and **152**.

It should also be noted that the lowermost edge of screen assembly **36** is disposed relatively close to the bottom wall **86** so that by placement of the apparatus **30** on a dark surface such as a desk, very little light can enter screen assembly **36** under the side walls **150** and **152** and front wall **148**. By preventing light from entering the screen assembly, enabling the apparatus can be operated in a well-lighted room.

The manner in which hood **34** is supported by screen assembly **36** is also an advantage in that the screen may be centered by location of posts **178** within legs **236**. The locating of the posts within the legs of bracket **234** ensures the screen is centered properly. When screen **61** is centered properly, it is parallel to wall **92** and is thereby perpendicular to the axis of lens **202**. In this manner, the image projected on screen **61** is centered properly. Also, parallax error is overcome and the image is completely in focus throughout the entire screen. Hood **34** is also advantageous in that it is not necessary to interlock the hood with screen assembly **36**. Thus screen **36** may be disposed as shown in FIG. **9** and apparatus **30** may therefore be used as a projector for projection of the visual presentation on an external surface. Hood **34** is supported by the screen assembly **36** while flexibility of movement of screen assembly **36** is not affected.

The spring loaded hinges **208** and **228** facilitate removal of the screen assembly **36** from its closed position in that the hinges project the screen outwardly automatically. Thus, reaching for the screen is avoided and injured fingers and fingernails are prevented. Finally, hood **34** enables the screen assembly to be packaged both securely and neatly when apparatus **20** is not in use.

When apparatus **30** is not in operation, hood **34** is locked in a vertical position, as shown in FIG. **1**, adjacent inner wall **92** by locking mechanism **230**. Cartridge receptacle **40** is pivoted into wall **38**, as shown in FIG. **3**.

To operate the apparatus, button **294** (best seen in FIG. **13**) of locking mechanism **230** is first pressed inwardly and the locking posts **254** are disengaged from locking fingers **246** of hood **34**. Hood **34** is then pivoted outwardly to a horizontal position, as shown in FIG. **2**, and screen assembly **36** is urged outwardly by spring loaded hinges **208** and **228** as shown in FIG. **5**. The hood **34** is positioned over the screen assembly **36** so that locating posts **178** (best seen in FIGS. **10** and **12**) of the screen assembly are engaged between legs **236** of support bracket **234** and the legs **236** rest on ledges **180** of the screen assembly to support hood **34**. The screen assembly is thus in position for projection of the film portion of the program on the rear of screen **61**.

It can be seen that the device is compact and easy to carry. When not in use, the screen assembly is completely enclosed within the narrow hood **34**, yet when in use, the screen provides a large viewing surface. Although compact, the apparatus also includes a self-contained sound reproduction unit for good reproduction of sound as well as the means for displaying the visual portion of the program. Thus a complete visual and sound program is provided within the compact confines of the apparatus.

The device also lends itself to use as an advertising aid. For example, where it is desired to provide an animated advertisement in a store window, the machine may be operated in a continuous fashion. Thus a program may be repeated over and over again automatically in a store window so that people passing by may view a complete advertising program.

The controls for the device are simple and easy to operate with the switches being labeled for easy identification of the proper switch. The apparatus is also easy to open and the operator may thus prepare the device for operation in a very short period of time. The device is also flexible enough to be used as a sound projector by plugging the leads to an external speaker into jack **914** and placing the screen to one side of the opening **96** as shown in FIG. **9** so that adapter **200** may be inserted in place of lens **202** for projection of the film program on an external screen.

Thus it can be seen that an extremely flexible device has been provided. The device is simple to operate, lends itself to quick operation, and may be used in a varied number of operations. It may be used by a salesman or an educator. It is extremely compact and may easily be taken wherever sales or instruction are needed.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. Therefore within the scope of the appended claims and their legal equivalents, the invention may be practiced otherwise than as specifically described.

I claim:

1. A collapsible screen assembly for a self-contained projector having a vertical planar front wall which includes a centrally-located opening for passing a beam of light from said projector and a hood which is pivotably secured about a horizontal axis mounted adjacent the top edge of said front wall, said assembly comprising a forward wall having a translucent screen, a pair of extendable side walls, each of said side walls being pivotably secured to said front wall on opposite sides of said opening, one of said side walls being pivotably secured to said front wall of said projector by a separable hinge, said front wall containing, between said opening and the hinge of said other of said walls, a securing member for detachably securing the edge of said one side wall such that said one side wall may be detached at said separable hinge and secured to said securing means so that said beam of light may be projected through said opening to a viewing surface remote from said projector, each of said side walls comprising a forward plate, a rear plate, and a spring loaded hinge pivotably securing said forward and rear plates together and urging said forward and rear plates to a 180° relationship when said screen assembly is open, said side walls each being pivotably connected to said forward wall, said forward wall including locating members which extend upwardly from the top edge of said wall at opposite ends thereof, said hood having positioning means adjacent the edge opposite the

pivotable edge thereof for engaging said locating members when said forward wall is fully extended from said front wall, said screen assembly being capable of being stored adjacent said front wall by collapsing said side walls and moving said forward wall toward said front wall and thereafter pivoting said hood to fold over said forward wall such that said forward wall, said hood, said plates of said side walls, and said front wall are all substantially parallel.

2. The screen assembly of claim 1 wherein said forward plates of said side walls each include a pair of rearwardly extending fingers arranged to prevent the outer surfaces of each pair of forward and rear plates from being angularly related by greater than 180°.

3. The screen assembly of claim 1 wherein said hood includes at its lowermost edge, a bracket which is arranged to receive said locating posts as it rests on the top edge of said screen assembly, said hood also including a peripheral flange which is arranged to prevent light from entering said screen assembly through the top thereof.

4. The screen assembly of claim 1 wherein said forward plate of each of said side walls is wider than said rear plate thereof, and wherein said forward wall is wider than the spacing of said points of pivotal securement of said side walls on said front wall.

5. A collapsible screen assembly for a self-contained projector of the type comprising a carrying case having a hood hinged adjacent an upper edge thereof and pivotable through about 90° from a closed position parallel to a front wall of said case to an open position substantially normal to said front wall, said case containing an optical system arranged to project a beam of light, through an opening in said front wall onto a translucent viewing screen mounted on a forward wall which is connected to said front wall by a pair of collapsible side walls that permit said forward wall to be moved from a position adjacent and parallel to said front wall to an extended position remote from but still parallel to said front wall, said side walls each comprising a front plate hinged together at their adjacent edges, and having remote edges hinged to said front and forward walls, respectively, characterized in that one of said side walls is secured to said front wall by a separable hinge, said front wall containing, between said opening therein and the hinge of the other of said side walls, a securing member for securing the edge of said one side wall such that said one side wall may be detached at said separable hinge and secured to said securing means so that said beam of light may be projected through said opening to a viewing surface remote from said projector, said hinge of front and rear plates of each side wall being spring loaded to urge said front and rear plates to a 180° relationship when said screen assembly is open, said forward wall including locating members which extend upwardly from the top edge of said front wall at opposite ends thereof, said hood containing positioning means adjacent the edge opposite the hinged edge thereof for engaging said locating members when said screen assembly is open.

6. The screen assembly of claim 5 wherein said forward plates of said side walls each include a pair of rearwardly extending fingers arranged to prevent the outer surfaces of each pair of forward and rear plates from being angularly related by greater than 180°.

7. The screen assembly of claim 5 wherein said hood includes at its lowermost edge, a bracket which is arranged to receive said locating posts as it rests on the top edge of said screen assembly, said hood also including a peripheral flange which is arranged to prevent light from entering said screen assembly through the top thereof.

8. The screen assembly of claim 5 wherein said forward plate of each of said side walls is wider than said rear plate thereof, and wherein said forward wall is wider than the spacing of said points of pivotal securement of said side walls on said front wall.

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