

[54] **WINDOW SHADE ASSEMBLY**

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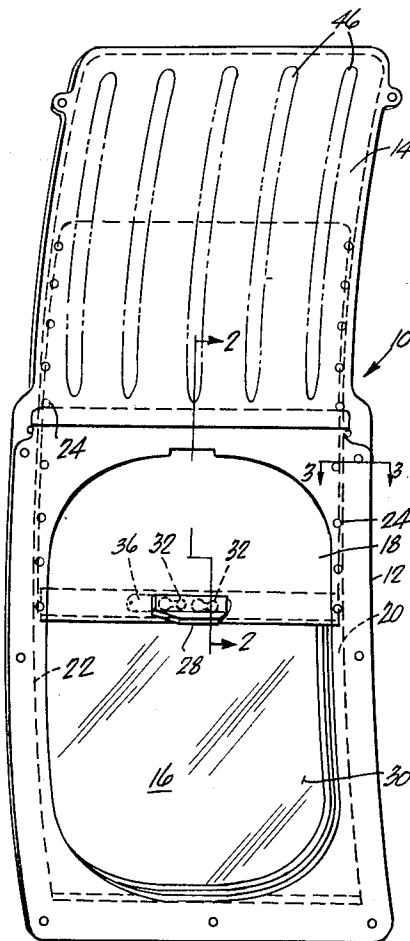
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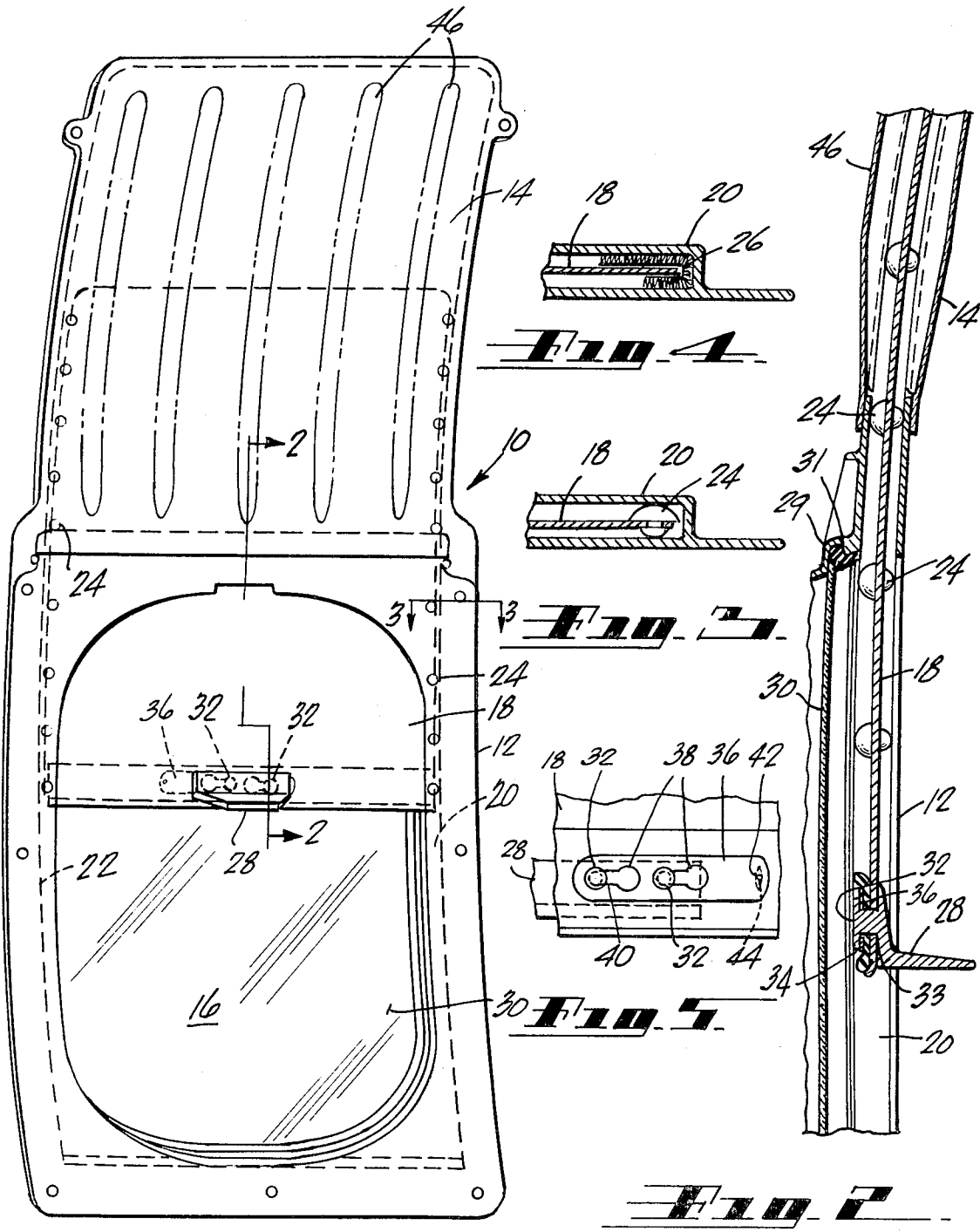
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[57] **ABSTRACT**

A window shade assembly including a curved shade frame and shroud in which a resilient shade having a curvature differing from that of the frame is installed. The shade has frictional means along the edges thereof to engage the frame and to enable restricted sliding motion therebetween. The shade also includes a handle and hidden locking means therefor to discourage handle theft.

6 Claims, 5 Drawing Figures





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WINDOW SHADE ASSEMBLY

BACKGROUND OF THE INVENTION

The window shade systems currently in use on passenger type commercial aircraft are generally of the roll-up or fold-up type which cause many production, assembly, installation and maintenance problems. This is because they utilize flexible shade material that is easily torn if the shade roll-up or fold-up mechanism malfunctions. The flexible shade materials are also effected by climatic changes which can greatly reduce the useful lives of the shades. Numerous unnecessary parts in the form of springs and brake shoes have also been required to enable a passenger to position and retain the shade in any desired position. These heretofore necessary parts have caused the cost and weight of such shade systems to be excessive. In addition, the shade handles employed heretofore are easily removed since their locking mechanisms can be seen by the passengers. This is undesirable because handles are an attractive item for souvenir hunters and therefore, they tend to be pilfered with regularity.

SUMMARY OF THE INVENTION

The present window shade assembly is designed to overcome the problems inherent in the roll-up or fold-up type window shade systems heretofore in use. The present shade assembly includes a resilient shade installed in a shroud and frame assembly which is slightly curved from top to bottom usually an amount to match the curvature of the aircraft fuselage wall in which it is installed. The resilient shade is also usually curved but with a curvature which is different from the curvature of the frame. The shade includes frictional sliders along the edges thereof which in combination with the difference in curvature between the frame and the shade, enable the shade to be easily positioned and yet which maintain the shade in any desired position.

The present shade assembly is extremely simple in function and it includes only one moving part, the shade itself. Due to the integral spring action of the shade, the assembly never requires any adjustment to assure the proper action thereof. The shade, since it is made of resilient rather than flexible material, is of sufficient strength and reliability to last the lifetime of the aircraft while the weight of the entire assembly is appreciably less than the weight of roll-up or fold-up systems or of contemporary polarized type window shade systems currently being proposed for commercial aircraft. The present assembly is relatively thin and therefore, the adjacent acoustic window pane can be mounted in a simple manner so that the pane is easy to install and remove for cleaning or replacement purposes. This novel construction also enables the use of hidden handle retainers to discourage the pilferage of shade handles.

It is therefore an object of the present invention to provide a reliable window shade for an aircraft.

Another object is to provide an aircraft window shade assembly which can be constructed from relatively light weight materials.

Another object is to provide a window shade having theft resistant handles.

Another object is to provide a window shade assembly which has a minimum of moving parts.

These and other objects and advantages of the present invention will become apparent after considering the following detailed specification which covers preferred embodiments thereof in conjunction with the accompanying drawing, wherein;

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a window shade assembly constructed according to the present invention;

FIG. 2 is an enlarged cross-sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is an enlarged cross-sectional view taken on line 3—3 of FIG. 1;

FIG. 4 is a cross-sectional view similar to FIG. 3 showing alternative slider means; and

FIG. 5 is a partial backside view of the assembly showing the shade handle retaining means.

DETAILED DESCRIPTION OF THE SHOWN EMBODIMENTS

Referring to the drawing more particularly by reference numbers, number 10 in FIG. 1 refers to a window shade assembly constructed according to the present invention. The window shade assembly 10 is comprised of a frame 12, and a shroud 14 therefor which outlines the adjacent window 16 and provides an enclosure for a window shade 18. The shade 18 is constructed of opaque or semiopaque resilient material such as tempered aluminum although other resilient materials such as plastic and other types of metal can also be employed. The shade 18 is usually coated with a suitable material such as Tedlar (trademark of DuPont) which improves its appearance and feel to the passengers.

The shade 18 is mounted in U-shaped channels 20 and 22 which are formed along the sides of the frame 12. The frame 12 including the U-shaped channels 20 and 22 has a predetermined radius of curvature as shown in FIG. 2. This curvature is usually about the same curvature as that defined by the associated aircraft fuselage structure in which the assembly 10 is installed. The shade 18 is also usually formed to have a predetermined but different curvature when it is in an unstressed condition. It has been found that for certain applications it is desirable to have the shade 18 curve more than the frame 12. Since the curvatures of the shade 18 and the U-shaped channels 20 and 22 are different, the shade 18 must be deformed from its unstressed condition when being installed in the channels 20 and 22. Frictional slider means such as nylon buttons 24 (FIG. 3) or pile material 26 (FIG. 4), such as Velcro (trademark of Velcro Corp.), felt, or other suitable material are attached along the edges of the shade 18. The combination of the different curvatures between the shade 18 and the U-shaped channels 20 and 22 plus the friction of the buttons 24 or the pile 26 causes the shade 18 to remain in any position in which it is placed. On the other hand, the integral spring action of the shade 18 is relatively weak and the frictional resistance between the channels 20 and 22 and the buttons 24 or pile 26 is minimal so the shade 18 is easily movable by the application of small vertical forces which are normally applied at the handle 28 thereof.

The frame 12 also includes a channel 29 in which the inner acoustic pane 30 of the window 16 is mounted.

The pane 30 is held in the frame 12 by a plastic or rubber molding strip 31 which can be easily removed from the channel 29 to allow removal of the window pane 30 for replacement or cleaning. Having a window shade assembly 10 that employs an easily removable inner acoustic window pane 30 enables the attachment of the handle 28 to the shade 18 by means which are completely behind the shade 18 and therefore, normally inaccessible to the passengers riding in the aircraft. When the window pane 30 is removed, the clearance behind the window shade 18 is increased sufficiently to provide room for maintenance personnel to release the handle 28 for replacement purposes.

The locking means for the handle 28 are shown in FIG. 5. The handle 28 includes two or more studs 32 which extend through holes 33 in the window shade 18. The studs 32 include integral ledges 34 on the backsides thereof. A locking member 36 including keyhole shaped cutouts 38 is placed over the studs 32. Then, with the orientation shown in FIG. 5, the member 36 is moved to the right so that the narrow portions 40 of the keyhole cutouts 38 slide under the ledges 34 of the studs 32 to thereby hold the handle 28 to the shade 18. The locking member 36 is itself held in the handle engaging position by a tab or depression 42 which engages a locking indentation 44 formed in the back of the shade 18 to prevent movement of locking member 36 when it is in the handle engaging position shown.

It should be pointed out that there is very little structural load on the window shade assembly 10 disclosed herein and therefore most portions thereof including the shroud 14, the shade 18, and the frame 12 can be constructed from relatively light materials, such as aluminum or plastic. This is especially true of the shroud 14 which merely serves as a dust cover and includes ribs 46 for stiffening against vibration.

Thus there has been shown and described novel window shade assemblies which are economical to manufacture, have only one moving part, and can be constructed from relatively cheap and easy to form materials, and thereby fulfill all of the objects and advantages sought therefor. Many changes, modifications, variations and other uses and applications of the subject invention will, however, become apparent to those skilled in the art after considering this specification together with the accompanying drawing. All such changes, modifications, variations and other uses and applications which do not depart from the spirit and scope of the invention are deemed to be covered by the invention which is limited only by the claims which follow.

What is claimed is;

1. A window shade assembly including:

a frame, said frame extending along and past the edges of an adjacent window, and having a predetermined curvature from top to bottom thereof;

an opaque shade member constructed of resilient material and having a free curvature different from the curvature of said frame, said shade member being installed in said frame for vertical movement with respect thereto, said frame also including means to releasably attach a window pane adjacent a first side of said shade so access to said

first shade side is restricted when the pane is attached and said shade member also including a shade handle extending outwardly from the shade side opposite to said first shade side and means to releasably attach said shade handle to said shade, said attachment means being located on said first side of said shade so access thereto is restricted when the pane is attached in said frame; and

frictional slider means positioned between said frame and said shade, whereby said means in combination with said different curvatures retain said shade in any desired position within said frame.

2. The assembly defined in claim 1 wherein said shade member defines a plurality of holes therethrough; and wherein said shade handle includes:

a plurality of studs, adapted to extend through said shade defined holes, said studs including abutment surfaces thereon adapted to engage with said attachment means.

3. The assembly defined in claim 2 wherein said attachment means define keyhole shaped slots therein which are of sufficient size at portions thereof to allow passage of said studs therethrough and of a smaller size at other portions thereof to engage and hold said stud abutment surfaces, said attachment means also including means to maintain said attachment means in the stud engaging position.

4. A window shade assembly including:

a movable shade member constructed of resilient material and having a predetermined free curvature generally aligned with the directions of movement thereof;

a frame having a predetermined curvature different from said shade member curvature and aligned with the directions of movement thereof, said frame being adapted to retain said shade member and to allow restricted movement thereof, said frame including means to releasably attach a window pane adjacent a first side of said shade so access to said first shade side is restricted when the pane is attached;

a shade handle extending outwardly from the shade side opposite to said first shade side;

means to releasably attach said shade handle to said shade, said attachment means being located on said first side of said shade so access thereto is restricted when the pane is attached in said frame; and

frictional means positioned in contact with said shade member and said frame, whereby said friction means in combination with said different curvatures retain said shade in any desired position within said frame.

5. The assembly defined in claim 4 wherein said shade member defines a plurality of holes therethrough; and wherein said shade handle includes:

a plurality of studs, adapted to extend through said shade defined holes, said studs including abutment surfaces thereon adapted to engage with said attachment means.

6. The assembly defined in claim 5 wherein said attachment means define keyhole shaped slots therein which are of sufficient size at portions thereof to allow passage of said studs therethrough and of a smaller size at other portions thereof to engage and hold said stud

abutment surfaces, said attachment means also including means to maintain said attachment means in the stud engaging position.

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