(57) Abstract: Disclosed is a roman shade assembly (100, 200) that utilizes lift bands (108, 208) rather than lift cords. The shade (110, 210) can be formed of textured materials or woven woods. The shade assembly includes lift bands (108, 208) that attach to a rotatable member (s) (115, 215) and can be extended or retracted within an architectural opening by rotating the member (s). The lift bands can be slidingly connected to the shade at multiple points along the vertical length of the shade. Accordingly, as the wide lift bands are extended or retracted, the attached shade is likewise extended or retracted to cover or uncover an architectural opening.
before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
BAND LIFT SYSTEM FOR SHADES

CROSS REFERENCE TO RELATED APPLICATION


BACKGROUND

[0002] Various different types of coverings exist for placement in architectural openings, such as windows, doors, archways and the like. Such coverings include roman shades as illustrated in FIG. 1. Roman shades comprise a covering 10, often formed of woven wood, that is placed in an architectural opening. As shown in FIG. 1, a roman shade includes a head rail assembly 12 that not only mounts the shade within the opening, but also provides a control mechanism for raising and lowering the shade as desired. The control mechanism includes vertical cords 14 that extend from the head rail assembly to the hem of the shade where they are connected to the shade. The cords are also slidingly connected to the shade at regular intervals 16 from the hem to the head rail, for instance by the use of rings connected at regular intervals along a vertical length of the shade, often in conjunction with horizontally placed battens or dowels 18. At the head rail 12, the cords are windingly received around a roller tube 15 and, as the tube is rotated, the cords are wrapped around the tube 15. This causes the shade 10 to fold and gather at the sliding connections 16 between the cords and the fabric as the cord 14 is wrapped on the roller tube 15, and the shade is raised such that the fabric hangs in a plurality of pleats having a desired drop length.

[0003] Rotating the roller of the head assembly in one direction causes the shade to extend and rotating the roller in an opposite direction causes the shade to retract. The roller is usually controlled by a manually driven control mechanism, though automatic mechanisms can also be used. Roman shades often include a variety of aesthetically appealing components, such as a valence 20 as illustrated in FIG. 2 that can cover all or part of the head rail and shade 10.
[0004] Unfortunately, the utilization of cords on shade coverings can lead to several undesirable characteristics. For instance, the cords can become tangled and can also become entangled with other objects, which can be problematic. In an attempt to alleviate such problems, roman shades have been formed such that the distance between lift points is be less than 8 inches, so as to decrease the distance between attachment points when the shade is lowered, preventing accidental entanglement with the cord. The limited distance between lift points can lead to the formation of additional pleats when the shade is raised and undesirable thickness of the raised shade, particularly when considering thicker shade materials such as woven wood. Additionally, no matter what the spacing between lift points on a shade, utilization of cords can form a visible line when viewed from the front of the shade, which can also be less than desirable.

[0005] In view of the above, a need currently exists for a roman shade that does not utilize lift cords while also providing an aesthetically pleasing presentation.

**SUMMARY**

[0006] According to one embodiment, disclosed is a roman shade assembly that can include a shade having a first end and a second and opposite end, a lift band slidably connected to the shade at a plurality of connection points between the first and second ends, and a rotatable member to which the lift band is attached. At least one of the connection points between the shade and the lift band can be a slidable connection point that allows the lift band to slide past the shade at the connection point. In addition, one of the connection points is a fixed connection point at the hem of the shade. Upon rotating the rotatable member in a first direction the shade can extend, and upon rotating the rotatable member in the opposite direction the lift band can wind around the rotatable member and cause the shade to retract. The shade can be formed of, e.g., a textile or a woven wood.

[0007] According to one embodiment, the connection points between the shade and the lift bands can be removably attachable to the shade, allowing the connection points to be moved and the overall look of the retracted shade to be variable. The utilization of removably attachable connection points can also simplify assembly of a shade and can allow for either large or small drop length on a shade, depending upon the desired appearance of the retracted shade.
According to one embodiment, a shade can include a horizontal tab on the back of the shade. The horizontal tab can define a hole or slot therethrough that can form a slidable connection point between the shade and the lift band. Thus, the hole through the horizontal tab can have an aspect ratio greater than one to accommodate the lift band therethrough. The horizontal tab can be defined by the shade itself, such as by a fold in the shade material itself, can be defined by a backing material, or can be formed from another material that can be attached to the shade.

Also disclosed is a backing sheet that can be slidably connected to a lift band. For example, a backing sheet can be adhered to a roman shade and the roman shade can be retracted and extended by the connection points on the adhered backing sheet. For example, a backing sheet can be directly adhered to a shade and the backing sheet can include one or more horizontal tabs that define the connection points used in conjunction with a lift band to raise and lower the shade. Alternatively, the backing sheet can be adjacent to but separated from a shade.

Other features and aspects of the present disclosure are discussed in greater detail below.

BRIEF DESCRIPTION OF THE DRAWINGS
A full and enabling disclosure of the present invention, including the best mode thereof to one skilled in the art, is set forth more particularly in the remainder of the specification, including reference to the accompanying figures, in which:

FIG. 1 illustrates the back of a roman shade as is known in the art.

FIG. 2 illustrates the head rail section of a roman shade as is known in the art.

FIG. 3 illustrates the back of a roman shade as described herein.

FIG. 4 illustrates a sliding attachment point of a roman shade as described herein.

FIG. 5 illustrates the head rail section of a roman shade as described herein.

FIG. 6A and FIG. 6B illustrate attachment pins as may be utilized in conjunction with a roman shade as described herein.
FIG. 7 illustrates a roman shade as described herein in a fully raised position.

FIG. 8A - 8E present several views of a fastener for securing a lift band to the hem of a roman shade system.

FIG. 9A - 9E present several views of a spool system as may be utilized for securing a lift band to a head rail of a roman shade system.

FIG. 10 illustrates an embodiment of a roman shade as disclosed herein.

FIG. 11 is another view of the roman shade of FIG. 10.

FIG. 12 is another view of the roman shade of FIG. 10.

FIGS. 13A-13F present another embodiment of a roman shade system as disclosed herein.

Repeat use of reference characters in the present specification and drawings is intended to represent the same or analogous features or elements of the present invention.

DETAILED DESCRIPTION

It is to be understood by one of ordinary skill in the art that the present discussion is a description of exemplary embodiments only, and is not intended as limiting the broader aspects of the present disclosure.

In general, the present disclosure is directed to a roman shade assembly that utilizes lift bands rather than cords. In one embodiment, the roman shade assembly is well suited for use with a shade made from a textured material. The textured material may be relatively heavy and/or stiff. The roman shade assembly is particularly well suited in one embodiment for use with shades made from woven woods. The roman shade assembly includes one or more rotatable members that can be mounted adjacent the top of an architectural opening and adjacent the top of the shade. The lift band(s) can be attached to the rotatable member(s) and can be extended or retracted within the architectural opening by rotating the member(s). In accordance with the present disclosure, the lift bands are slindingly connected to the shade or a backing sheet of the shade at multiple points along the vertical length of the shade and are fixed near or at the bottom of the shade. Accordingly, as the lift bands are extended or retracted, the shade and/or backing sheet is likewise extended or retracted to cover or uncover the architectural opening. As the shade is retracted, a series of
pleats can form between the gathered connection points that can have a characteristic drop length.

[0027] Referring to FIG. 3 one embodiment of a roman shade assembly 100 made in accordance with the present disclosure is shown. As illustrated, the roman shade assembly 100 includes a shade 110 that is attached to two lift bands 108 at multiple connection points 111, 119. The lift bands 108 are in turn attached to a cylindrical member 115 in the head rail 112. More particularly, one end of each lift band 108 is attached or connected to the cylindrical member 115. One end of each lift band 108, for instance, can be adhered to the cylindrical member 115 using an adhesive or can be mechanically affixed to the cylindrical member by being, for instance, inserted into a slot. The other end of each lift band 108 can be adhered to the shade at secure connection points 111. In addition, each lift band can include a series of slidable connection points 119 that slidably connects the lift band to the shade along the vertical length of each lift band. The cylindrical member 115 is rotatably mounted within the roller shade assembly. Thus, rotating the cylindrical member 115 in one direction causes the lift bands 108 to extend and lower the shade 110 and rotating the cylindrical member 115 in an opposite direction causes the lift bands 108 to wind around the cylindrical member 115 (see FIG. 5) and retract and raise the shade 110 with a series of pleats each having a desired drop length formed in the shade as the shade is raised and the connection points are gathered and stacked together (see FIG. 7).

[0028] A shade 110 can be formed of any material as is generally known in the art. In one embodiment, the roman shade assembly 100 as shown in the figures is particularly well suited for use with shades made from highly textured materials. In FIG. 3, for instance, the shade 110 comprises a woven wood material. A woven wood material can be made from, e.g., natural wood, grasses, bamboo, jute, reeds, or mixtures thereof. Woven woods are generally highly textured and tend to be relatively stiff across the width of the shade. A woven wood can be formed with either a tight or loose weave, as is generally known in the art.

[0029] In addition to woven woods, it should be understood, however, that a shade can be made from any suitable material, and in one embodiment any textured, relatively stiff and/or heavy material. Textured materials, for instance,
generally refer to materials having a non-uniform thickness. The shade material, for instance, may have a thickness that varies by at least about 2%, such as at least about 5%, such as at least about 7%, such as at least about 10%, over the surface area of the material.

[0030] In accord with one embodiment of the present disclosure, one or more lift bands 108 can be attached to the back of a shade 110 of a roman shade assembly 100. As shown in Fig. 4, a lift band 108 can be wider than a cord, for instance a lift band can have a cross sectional aspect ratio that is greater than 1. As utilized herein, the cross sectional aspect ratio is intended to refer to the ratio of the thickness of a cross section of the a lift band to the width of the cross section of the lift band, the thickness and width being perpendicular to one another. When considering a lift band with a non-rectangular cross section, e.g., an oval-shaped cross section, the thickness and width dimensions are the minor axis and the major axis of the cross section, respectively. In general, a lift band can have a thickness dimension that is less than that of a typical lift cord and a width that is greater than that of a typical lift cord. By way of example, a lift band can have a cross sectional width that is greater than about ½ inch, greater than about ½ inch, or greater than about 1 inch. A lift band can have a cross sectional thickness that is less than about 0.1 inch, for instance less than about 0.05 inch, or less than about 0.01 inch, in one embodiment. For example, a lift band cross section can be between about 2 and about 10 inches in width and less than about 0.010 inches in thickness. The cross sectional dimensions of lift band 108 can prevent possibility of band entanglement with itself or other structures and can provide an aesthetically pleasing shade from both the front and back.

[0031] A lift band can be formed of any material that exhibits suitable flexibility so as to be collected in a head rail (e.g., wrapped around a cylindrical member 115 of a head rail 112) and that can be both slidingly connected to a shade at connection points 119 and securely connected to a shade at the hem of the shade at connection points 111. In addition, a band can exhibit limited stretch. By way of example a lift band can be formed of a textile material or a polymeric tape.

[0032] The term 'textile' as utilized herein generally refers to any structure produced by the interlacing of yarns, multi-filament fibers, monofilament fibers, or some combination thereof. A textile can be generally planar or can be
manipulated to form higher dimensional geometries. A textile can include fibers in a predetermined, organized, and interlaced pattern, herein referred to as a weave or knit fabric (i.e., a fabric formed according to a weaving and/or knitting process), or optionally can include the fibers in a random pattern (a nonwoven fabric), or in a unidirectional prepreg fabric, in which multiple unidirectional fibers are aligned and held in a matrix of a polymeric binding agent.

[0033] A lift band can be formed of a textile of any suitable basis weight. For instance, a lift band can be formed of a relatively light weight textile, for example a nonwoven web having a basis weight of, e.g., between about 0.5 ounces per square yard and about 3 ounces per square yard. A light weight web can be translucent, and as such can cast little shadow and can be less visible when viewed from the front of the shade, even when considering a shade that is itself somewhat translucent, e.g., having an open weave. Of course, a heavier textile can also be utilized as a lift band, for instance a web having a basis weight of greater than about 3 ounces per square yard. A heavier textile can be preferred in those embodiments in which a shade is itself relatively heavy.

[0034] In one embodiment, a lift band can be formed of a polymeric film, such as a polyester, a polycarbonate, or polyolefin film. For instance, a transparent polymeric film can form a lift band. A transparent polymeric material can provide a lift band that is less visible on a shade. For example, when considering an open weave shade of a textile or a woven wood, a transparent lift band can be essentially invisible, particularly when viewed from the front of the shade, even when the shade is in full sunlight.

[0035] In one embodiment, a polymeric tape lift band can have a surface finish, for instance a matte finish, and can provide a less visible lift band to a shade system. For instance, a polyester tape having a slight matte finish can be utilized in one embodiment. Exemplary polymeric tapes as may be utilized in a roman shade system include those available from SMI Gaskets of Sante Fe Springs, CA.

[0036] Referring again to FIG. 3, a lift band 108 can be slidingly connected to a shade 110 at multiple connection points 119 along the vertical length of a shade 110. As utilized herein, the terms vertical and horizontal are intended to refer to the vertical and horizontal of a hung shade, i.e., vertical is considered to be the longitudinal length of a shade that is perpendicular to the ground or floor.
when the shade is hung in a standard fashion, and the horizontal direction is
parallel to the ground or floor when the shade is hung.

[0037] Beneficially, as the lift band 108 lessens the possibility of tangling and entanglement as compared to utilization of previously known lift cords, the
distance between adjacent sliding connection points 119 and between the lowest sliding connection point 119 and fixed connection point 111 can be greater than the 8 inch maximum for lift cords found in current roman shades. By way of example, adjacent connection points can be greater than eight inches apart, or greater than about 10 inches apart, in one embodiment. For instance, the
distance between adjacent connections points can be between eight inches and about 24 inches. Of course, in other embodiments, the distance between connection points can be less (i.e., smaller drop length), for instance in those embodiments in which a larger uncovered expanse of an architectural opening is desired when the shade is fully retracted. According to this embodiment, the
connection points can be less than about eight inches apart, for instance between about three and about eight inches apart, for instance about four inches apart.

[0038] The increased variability capable between adjacent vertical connection points can allow for increased design capabilities of a system. For example, a 36 inch shade can have the connection points located with a six inch spacing, while a 72 inch shade can have the connection points located with a 12 inch spacing, both shades having six full pleats when the shade is gathered in a raised orientation. This can be particularly beneficial when a shade is formed of a heavily textured material, such as a woven wood. The ability to form a shade assembly with greater distance between adjacent connection points can
decrease the total number of pleats formed when the shade is in a raised orientation, which also decreases the thickness of the gathered shade. This can improve the look of the raised shade, particularly when a shade assembly includes a valence.

[0039] The increased variability in the distance between adjacent connection points can be used to improve the overall appearance of the shade, particularly when raised, for instance when a shade includes a patterned front. For example, a shade can be woven or printed with a patterned front and the vertical pattern dimension can be coordinated with the distance between adjacent connection points of the shade. By way of example, a three inch vertical pattern
on the front of a shade can have three, six, nine, or twelve inch adjacent
connection points coordinated with the shade pattern.

[0040] As seen in FIG. 4, a slidable connection point can be provided in
one embodiment by use of a pin 120 that can be secured to a shade 110 and can
define an opening 122 through which a lift band 108 can freely slide. A pin 120
can be permanently or removably attachable to a shade. By way of example,
FIGS. 6A and 6B illustrate a pin 120 that can be removably attached to a shade
110. The pin 120 includes a member 121 that can pass through a material of a
shade and a member 123 including latch 124. Member 121 and member 123
can be unitary through a bend 126, as illustrated, or alternatively can be attached
to one another through a joining member, as is known. Members 121, 123 can
flex with respect to one another so as to provide the latch in an open position, as
in FIG. 6A and in a closed position, as in FIG. 6B.

[0041] FIG. 4 illustrates a pin 120 with latch 124 in a closed position and
the pin member 121 passing under warp yarns 125 of a woven wood shade 100.
As can be seen, pin 120 can be formed to a size such that bend 126 and latch
124 fit between two warp yarn sections of shade 100. Of course, this is not a
requirement of disclosed systems, and such an arrangement is but one method
for providing a secure attachment between a slidable connection point and a
shade or backing sheet.

[0042] In this illustrated embodiment, pin 120 is removably attached to
shade 100. Specifically, latch 124 can be opened and member 121 slid out from
engagement with warp yarns 125 to remove pin 120. A removable attachment
device, such as removable pin 120 can provide a route for simple alteration of the
connection points on a shade and related alteration of the appearance of the
gathered pleats upon raising the shade.

[0043] Of course, a pin can be more permanently secured to a shade by
adhesively or otherwise attaching the pin to the shade. Moreover, any other
attachment device as is generally known in the art can alternatively be utilized to
provide connection points between a lift band and a shade. For instance, an
elongated ring can be sewn or adhesively secured to the back of a shade.

[0044] Referring again to FIG. 3, at the hem of shade 110 (e.g., the hem
can be approximately ½ of the drop length of the shade), lift bands 108 can be
securely fixed to shade 110 at connection points 111. In the illustrated
embodiment, connection points 111 have been formed with a pin 120 as discussed above, though alternative fixed connections could be utilized. In the illustrated embodiment, lift bands 108 have been passed around member 121 of pin 120 and secured to themselves, forming a closed loop in the end of lift bands 108. Any similar securement can be utilized, provided a lift band 108 can slide freely through slidable connection points 119 and avoid tangles with itself upon raising and lowering the shade. For example, the end portions of lift bands 108 can be sewn or otherwise adhered directly to shade 110.

[0045] By way of example, FIGS 8A-8E illustrate a method and device for securing the end of a lift band at the hem of a shade. As can be seen, FIG. 8A illustrates a tape retainer 300 that includes a slit 301 through which a lift band can be slid. In FIG. 8B, a lift band 302 extends through the slit 301 of the tape retainer 300. Also shown in FIG. 8B is a tie-off bar 303 that can be attached to a shade or a backing sheet to form a connection point at the hem. As shown in FIG 8C, the tape retainer 300 can be located within an opening 305 of the tie-off bar 303. The dimensions of the tie-off bar 303 and tape retainer 300 can be such that the tape retainer 300 will not be easily removed from the opening 305 of the tie-off bar 303 following attachment to one another. An end of lift band 302 can be held securely between the tape retainer 300 and the tie-off bar 303 so as to prevent motion of the lift band 302 through the tape retainer 300. For instance, the end of the lift band 302 can wrap partially around the exterior of the tape retainer 300 and be held between the tape retainer 300 and the tie-off bar 303, as shown in FIG. 8D. Moreover, tape retainer 300 can define ridges 306 (FIG. 8C) that can interlock with tabs 307 of tie-off bar 303 and thus, following insertion of the tape-retainer 300 into the opening 305 of the tie-off bar 303, the two can be secured together.

[0046] In FIG. 8E is shown a fastening system following assembly including a tape retainer 300 attached to a tie-off bar 303. In this embodiment, the fastening system is secured to a backing sheet 310 of a roman shade system. The lift band 302 passes through the slit of the tape retainer 300 and is then secured between the tape retainer 300 and the tie-off bar 303, as described above. As can be seen, a portion of the material of backing sheet 310 is between the tie-off bar 300 and the tape retainer, providing additional coupling to the system between the connection point and the material of backing sheet 310. In
this particular embodiment, the tie-off bar 303 extends and is secured across a
horizontal length of the backing sheet 310, though this is not a requirement of the
fastening system.

[0047] Referring again to FIG. 5, the roller shade assembly can include a
head rail 112. Head rail 112 can house cylindrical member 115 as well as a
tensioning mechanism 130. The control mechanism 130 can be operatively
connected to at least one end of the cylindrical member 115. The control
mechanism 130 is for rotating the cylindrical member 115 and causing the shade
110 to extend or retract.

[0048] In general, any suitable control mechanism can be used in
conjunction with the shade system of the present disclosure. In the embodiment
illustrated, for instance, a manual control mechanism 130 is shown that includes
a cord 150.

A cord 150 can either be an endless loop that is affixed to the wall or wall
opening or can have separate, detached ends. In other embodiments, however,
the control mechanism 130 may comprise an electric motor or any other suitable
device capable of rotating the cylindrical member 115. For instance, a control
mechanism can include a cordless system that includes an automatic winding
mechanism or a cordless balanced system. Automatic winding mechanisms are
generally known in the art and have been described, for instance in U.S. Patent
Application Publication 2009/0283223 to Liu, which is incorporated herein by
reference. When utilizing an automatic winding mechanism, a user can provide
suitable pressure at the base of a shade, thereby instigating the automatic
winding mechanism to retract or extend the shade. A cordless balanced system
as is known can alternatively be utilized. For example, spring balanced system
as described in U.S. Patent No. 7,063,122 to Colson, et al., which is incorporated
herein in its entirety by reference, can be utilized.

[0049] The manual control mechanism 130 illustrated in FIG. 5 comprises
a ball chain cord 150 in the shape of an endless loop. The cord 150 at one end
engages a sprocket wheel and engages at the opposite end a tensioning device
(not shown). The tensioning device is configured to be mounted within the
architectural opening for providing tension to the cord 150. The cord 150 is
looped over and operatively connected to the sprocket wheel, which is in turn
operatively connected to the cylindrical member 115 via a clutch device. By
pulling on one of the chain portions 151 and 152, a user can rotate the sprocket wheel to a desired direction for extending or retracting the shade 110.

[0050] In one embodiment, the sprocket wheel can include a circumferential outer surface with a plurality of radially extending sprocket teeth that form pockets. In such an embodiment, the balls of the cord 150 fit within the pockets of the sprocket wheel. The housing of head rail 112 helps to maintain the cord 150 suitably engaged with the pockets of the sprocket wheel. In particular, the housing is designed to prevent the cord 150 from disengaging the sprocket wheel. In this arrangement, pulling one of the chain portions causes the bails on the cord to engage the sprocket wheel and to rotate the sprocket wheel a desired direction. In one embodiment, a stop mechanism can also be associated with the cord 150 for preventing the sprocket wheel from being over rotated in a certain direction.

[0051] Thus, pulling one of the chain portions 151 or 152 causes the cord 150 to engage the sprocket wheel and to rotate the sprocket wheel counter clockwise or clockwise. The cylindrical member 115 rotates with the sprocket wheel for rolling or unrolling the shade 110.

[0052] In another embodiment, rather than a single cylindrical member upon which multiple lift bands are wound, as illustrated, a head rail can include a single shaft that can be in mechanical communication with a control mechanism, for instance a sprocket wheel as described. A plurality of spools can be driven by the single shaft, and each spool can be connected to a single lift band. Accordingly, as the single shaft is rotated, each lift band can be wound or unwound from the associated spool.

[0053] FIGS. 9A - 9E illustrate one embodiment of a head rail embodiment including a tape spool 400 upon which a lift band of a system can be individually wound. With reference to FIG. 9A, a tape spool 400 can be formed so as to be attachable to a tape retainer 300 as illustrated in FIG. 8A. More specifically, the end of a lift band (not shown in FIG. 9A) can be slid through the slit 301 of the tape retainer 300 as described above. The tape retainer 300 can then be located in an opening defined in the tape spool 400, as shown, thereby securing the end of the lift band to the tape spool 400. The tape spool 400 can be located within a tape spool frame 401, a cut-away view of which is provided in FIG. 9A.
FIG. 9B illustrates a side view of the cut-away view of FIG. 9A. As can be seen, an opening 402 is defined through the tape spool 400 and through the tape spool frame 401 through which a shaft of the head rail can pass. Tape spool frame 401 includes arm 403 and support structure 404 for locating and holding a tape spool frame 401 in a head rail.

FIG. 9C provides a perspective view of a tape spool frame 401, more clearly showing the openings 402 through which a shaft of the head rail can pass and also illustrating the arm 403 and support structure 404 for securing the tape spool frame 401 in the head rail.

FIG. 9D is a perspective view of a tape spool 400 located within a tape spool frame 401. Tape spool 400 can be secured within tape spool frame 401 merely by the shaft of the head rail that passes through the openings 402. Optionally, tape spool 400 and tape spool frame 401 can define interlocking pieces, e.g., a ridge 405 defined at the opening 402 of tape spool 400 that fits within the opening 402 defined by tape spool frame, so as to provide additional securement between the two.

FIG. 9E illustrates two tape spools 400 within their respective tape spool frames 401 following insertion in a head rail 412. Head rail 412 can define various features as are generally known in the art for securement to the top of an architectural opening, e.g., a window or archway. A shaft (not shown) can pass through the openings 402 of the tape spool/tape spool frame structures that can function in conjunction with a control mechanism, as described above and as is generally known in the art.

Suitable control mechanisms that may be incorporated into the roller shade assembly of the present disclosure are disclosed, for instance, in U.S. Patent No. 7,353,857 to Koop, U.S. Patent No. 7,571,756 to Smith, et al., and in U.S. Patent Application Publication No. 2008/0142171 to Koop, et al., which are all incorporated herein by reference.

Referring now to FIGS. 10-12, an alternative embodiment of a roman shade assembly generally 200 is shown. As can be seen, shade assembly 200 includes a backing sheet 202 (shown in a cut-away view in FIG. 10 and FIG. 11). In this particular embodiment the backing sheet 202 is adhered to the back of shade 210. The inclusion of a backing sheet 202 adhered, e.g., laminated, to a shade 210 can improve the overall appearance of a shade.
assembly 200. For example, when considering a shade 210 formed of a highly
textured material, such as a woven wood, the stiffness and texture of the material
typically causes skewing to occur on conventional roller shade assemblies. The
attachment of a backing sheet 202 to a shade 210 can also provide additional
stability to an assembly 200 and prevent skew, shrinking, twisting, edge-to-edge
motion, and other motion that can lead to misalignment of a shade.

[0060] Similar to the embodiment in FIGS. 3-5, the roman shade assembly
200 includes lift bands 208 wound upon a cylindrical member 215 as particularly
shown in FIG. 10. In addition, roman shade assembly 200 includes backing
sheet 202 adhered to shade 210. Moreover, backing sheet 202 includes
horizontal tabs 206 at intervals along the vertical length of shade 200.

[0061] A horizontal tab 206 can extend across the width of backing sheet
202, as shown. In one embodiment, a horizontal tab 206 can be formed by
simply folding and taking a gather in the backing sheet material prior to
adherence of the backing sheet 202 to the shade 200. Additional stiffness can be
incorporated into a horizontal tab, in one embodiment. By way of example, a tab
206 can be formed with a batting material or the like enclosed within or adhered
externally to the horizontal tab 206. In general, a horizontal tab will extend from
the surface of the shade to a distance of less than about one inch, for instance
less than about ¾ inch, or less than ½ inch, in one embodiment.

[0062] FIG. 11 illustrates another view of the roman shade of FIG. 10. As
can be seen, the horizontal tabs 206 can define openings 222 through which lift
bands 208 can freely slide. Thus, openings 222 can serve as slidable connection
points between the lift bands 208 and the shade 210. In order to accommodate
the lift bands, the openings 222 can be formed with an aspect ratio greater than
one, e.g., the openings can be a slit in the horizontal tab. In one embodiment, an
opening 222 can define a rectangular or ovoid shape. In any case, the openings
222 can allow the lift band to slide through the opening and retract or extend the
shade 200.

[0063] The lift band 208 can pass through the openings 222 defined in the
horizontal tabs 206 to provide the slidable connection points on the shade
system. The vertical distance between adjacent horizontal tabs (and openings
therein) can be varied as desired. For instance, adjacent horizontal tabs can be
greater than about three inches apart, in one embodiment. The lift points for a
specific shade system can be varied as desired through utilization of all or only a portion of the horizontal tab openings. For example, a shade system can include horizontal tabs and openings therein relatively closely together, such as every three inches vertically. If one were to desire a shade with a short drop length (e.g., 1.5 inches), then the lift bands can be threaded through all of the openings along the vertical length of the shade. Alternatively, the same design can be utilized for a shade system having a longer drop length, merely through utilization of only a portion of the openings in the horizontal tabs. If the lift bands are threaded through every other opening in the vertical direction (i.e., horizontal tabs that are six inches apart), then the drop length of the retracted shade will be doubled, to three inches. Similarly, only every third opening, or every fourth opening in the vertical direction can be utilized to provide increasing drop length. Thus, a single design can be utilized with a variety of different looks provided to the shade system. Of course, a system can include horizontal tabs at greater distances, such as greater than about eight inches, with no intervening horizontal tabs in another embodiment.

[0064] The lift band 208 can be secured at the hem of the shade 210 at fixed connection points 211, for instance through use of a device as described above, to provide a secured connection point for lifting the shade.

[0065] A backing sheet 202 can be formed of any suitable material, for instance a woven or nonwoven web. In one embodiment, a backing sheet 202 can be formed of a relatively low basis weight material, for instance less than about 3 ounces per square yard, and can serve as a light filtering backing for an open weave shade. For example, a low basis weight backing sheet can be translucent and provide some light filtering affects, which can also serve to prevent the lift bands from being visible on the front of the shade assembly 200, the front of which is illustrated in FIG. 12.

[0066] Alternatively, a backing sheet can be a material that can provide a black-out capability to a shade assembly. By way of example, a black-out laminate material can be utilized as a backing sheet to maximize the room darkening effect of the window covering when the shade is extended. One exemplary black-out laminate material is a three ply laminate comprising a polyester film such as MYLAR sandwiched between two layers of a spun bonded or spun laced polyester nonwoven material. Black-out laminates of this type are
generally known in the art and have previously been used in other types of window coverings.

[0067] In one embodiment, the shade material itself can be used to form the horizontal tabs that can define openings through which the lift bands can be threaded. For instance, a shade can be formed of a textile, either a highly textured textile or a textile of more uniform thickness. In either case, the shade material can be folded and gathered during formation to form horizontal tabs across the width of the shade that can then have openings formed therein through which lift bands can be threaded for lifting the shade during retraction.

As with a tabbed backing material, a tabbed shade can include additional stiffening material in conjunction with the tabs.

[0068] In yet another embodiment, a horizontal tab can be a single horizontal piece, for instance a wooden or molded slat, that can be attached to the back of a shade and define the slidable connection points. For example, a slotted dowel can be attached to the back of a shade to form slidable connection points that are defined by the dowel or formed at the junction between the dowel and the shade. A horizontal tab can extend across all or a portion of the shade system in the horizontal direction as defined above. For instance, a horizontal tab can extend across a shade from edge to edge and define multiple openings therein, each for a different lift band. In another embodiment, a horizontal tab can extend across less than the entire width of the shade, and a single horizontal tab can define only one or multiple openings therethrough for lift bands.

[0069] FIGS. 13A - 13F illustrate another embodiment in which a band lift system as described herein can be utilized with a backing sheet that is not directly adhered to the shade. For instance, as illustrated in FIG. 13A, a backing sheet 500 can define a horizontal tab 501 that passes across the back of the backing sheet, as shown. In the illustrated embodiment, the horizontal tab 501 is formed from the material used to form backing sheet 500. Of course, other methods of forming a horizontal tab, such as those described previously, may alternatively be utilized.

[0070] The horizontal tab 501 can define one or more openings 522 therethrough as illustrated in FIG. 13B. A lift band 508 can pass through the opening 522 and thus be slidably connected to the backing sheet 500. FIG. 13C presents a rear view of the complete backing sheet 500. As can be seen, when
utilizing a lift band 508 formed of a polymeric tape, the lift band 508 is not overly visible and, in the front view of the backing sheet 500 shown in FIG. 13D, the lift band is invisible, even when the backing sheet is translucent. Of course, a translucent backing sheet is not required and any backing sheet can be used, for instance a black-out-type backing sheet.

[0071] At the hem of the backing sheet 500 the lift tape 508 is secured to the backing sheet 500 with a fastening system such as that illustrated in FIGS. 8A - 8E and previously described. Of course, any suitable connection system may alternatively be utilized for securing the lift tape 508 at the hem of the backing sheet. FIGS. 13E and 13F provide two views of the backing sheet 500 fully retracted.

[0072] The backing sheet system of FIGS. 13A - 13F can be used with a roman shade as described herein or alternatively a different shade system, as desired. For instance, a roman shade assembly 200 as illustrated in FIGS. 10-12, which includes a backing sheet 202 directly adhered to the roman shade, the backing sheet including tabs 206 for attaching lift bands 208, can be combined with a second backing sheet as illustrated in FIGS. 13A-13F that can provide additional light blocking to an assembly.

[0073] In one embodiment, a second independent backing sheet can be used in conjunction with an adjacent shade through utilization of a combination lift system as is generally known in the art.

[0074] A combination system can include, for instance, a second lift system that includes a single or a plurality of roller assemblies that are utilized to extend and retract the backing sheet behind the roman shade assembly. The second lift system can simultaneously raise or lower the backing sheet to be extended or retracted across a designated portion of an architectural opening. The backing sheet associated with the second lift system can be retracted by use of lift bands and associated roller(s) so that vision through the covering is through the roman shade assembly. In another position, the roman shade assembly can be fully retracted with the backing sheet system also retracted. In still another position, both the roman shade assembly and the backing sheet lift system can be fully extended, to provide additional light blocking capability to a system. In another embodiment, both the roman shade assembly and the backing sheet component can be partially extended to the same or different lengths.
In another embodiment, a backing sheet can be adjacent to a roman shade and the two can utilize a single lift system. For instance, the roman shade and the backing sheet can be aligned back to back and attached to each other at the horizontal tabs between the two. In one embodiment, the horizontal tabs can be defined by the material of the backing sheet and optionally stiffened, and these horizontal tabs can then be attached to the back of the adjacent roman shade.

In another embodiment, the horizontal tabs that define the openings for the lift bands can be formed of a third material (e.g., a polymeric material) and the tabs can be aligned between and adhered to both the roman shade and the backing material. Thus, the lifting system including the lift bands threaded through the openings of the horizontal tabs can lift both the shade and the backing sheet.

As discussed above, the horizontal tabs can generally extend from the surface of the shade and backing material by less than about an inch, for instance less than about ¾ inch, or less than about ½ inch, which will define the space between the shade and the backing sheet when the shade system is hung in an architectural opening.

These and other modifications and variations to the present invention may be practiced by those of ordinary skill in the art, without departing from the spirit and scope of the present invention, which is more particularly set forth in the appended claims. In addition, it should be understood that aspects of the various embodiments may be interchanged both in whole or in part.

Furthermore, those of ordinary skill in the art will appreciate that the foregoing description is by way of example only, and is not intended to limit the invention so further described in such appended claims.
What Is Claimed:

1. A roman shade assembly comprising:
   a shade having a first end and a second and opposite end;
   a lift band slidably connected to the shade at a plurality of connection points that are spaced between the first end and the second end, at least one of the connection points being a slidable connection point that allows the lift band to slide past the shade at the connection point and one of the connection points being a fixed connection point at the hem of the shade; and a rotatable member adjacent the first end of the shade, the lift band being attached to the rotatable member, wherein rotating the rotatable member in a first direction causes the shade to extend and wherein rotating the rotatable member in an opposite direction causes the lift band to wind around the rotatable member and causes the shade to retract.

2. The roman shade according to claim 1, further comprising a horizontal tab on the back of the shade, the horizontal tab defining at least one opening therethrough, the opening having an aspect ratio greater than one, the opening forming the slidable connection point.

3. The shade assembly according to claim 1 or claim 2, wherein the shade is formed of a textile, and the horizontal tab is a folded portion of the shade.

4. The roman shade assembly according to any of the preceding claims, wherein the shade comprises a textile.

5. The roman shade assembly according to any of the preceding claims, wherein the shade comprises a woven wood.

6. The roman shade assembly according to claim 5, further comprising a backing sheet attached to the shade.

7. The roman shade assembly according to any of the preceding claims, wherein the shade assembly comprises at least two lift bands.
8. The roman shade assembly according to claim 7, wherein the rotatable member is a cylindrical member, the at least two lift bands both attached to the cylindrical member.

9. The roman shade assembly according to any of the preceding claims, wherein the rotatable member is a spool, the spool being in mechanical communication with a shaft.

10. The roman shade assembly according to any of the preceding claims, wherein adjacent connection points are more than eight inches apart.

11. The roman shade assembly according to any of the preceding claims, wherein the lift band is transparent or is translucent.

12. The roman shade assembly according to any of the preceding claims, wherein the lift band is a textile or a polymeric tape.

13. The roman shade assembly according to any of the preceding claims, wherein the slidable connection point is removably attachable to the shade.

14. The roman shade assembly according to any of the preceding claims, further comprising a control mechanism in mechanical communication with the rotatable member.

15. A shade assembly comprising:
   a roman shade;
   a backing sheet for backing the roman shade, the backing sheet having a first end and a second and opposite end;
   a lift band slidably connected to the backing sheet at a plurality of connection points that are spaced between the first end and the second end, at least one of the connection points being a slidable connection point that allows the lift band to slide past the backing sheet at the connection point and one of the connection points being a fixed connection point at the hem of the backing sheet; and
a rotatable member adjacent the first end of the backing sheet, the lift band being attached to the rotatable member, wherein rotating the rotatable member in a first direction causes the backing sheet to extend and wherein rotating the rotatable member in an opposite direction causes the lift band to wind around the rotatable member and causes the backing sheet to retract.

16. The shade assembly according to claim 15, further comprising a horizontal tab on the back of the backing sheet, the horizontal tab defining at least one opening therethrough, the opening having an aspect ratio greater than 1, the opening forming the slidable connection point.

17. The shade assembly according to claim 16, wherein the horizontal tab is a folded portion of the backing sheet.

18. The shade assembly according to any of claims 15-17, wherein the backing sheet is adjacent to the roman shade.

19. The shade assembly according to any of claims 15-18, wherein the backing sheet is adhered to the roman shade.

20. The shade assembly according to any of claims 15-19, wherein the roman shade comprises a woven wood.

21. The shade assembly according to any of claims 15-20, wherein the shade assembly comprises at least two lift bands.

22. The shade assembly according to claim 21, wherein the rotatable member is a cylindrical member, the at least two lift bands both attached to the cylindrical member.

23. The shade assembly according to any of claims 15-22, wherein the rotatable member is a spool, the spool being in mechanical communication with a shaft.

24. The shade assembly according to any of claims 15-23, wherein adjacent connection points are more than eight inches apart.
25. The shade assembly according to any of claims 15-24, wherein the lift band is transparent or translucent.

26. The shade assembly according to any of claims 15-25, wherein the slidable connection point is removably attachable to the shade.

27. The shade assembly according to any of claims 15-26, further comprising a control mechanism in mechanical communication with the rotatable member.

28. The shade assembly according to any of claims 15-27, wherein the backing sheet is translucent or is a black-out backing sheet.
FIG. 12
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

**INV. E06B9/262 E06B9/40**

According to International Patent Classification (IPC) and to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

E06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database consulted during the international search (name of database and, where practical, search terms used)

EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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<td>CN 201 433 692 Y (SUZHOU HONGYI DECORATION MATERIAL COMPANY) 31 March 2010 (2010-03-31) abstract; figure 6</td>
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Additional information:

- * Special categories of cited documents:
  - "A" document defining the general state of the art which is not considered to be of particular relevance
  - "E" earlier application or patent but published on or after the international filing date
  - "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  - "O" document referring to an oral disclosure, use, exhibition or other means
  - "P" document published prior to the international filing date but later than the priority date claimed
  - "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
  - "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
  - "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
  - "A" document member of the same patent family

Date of the actual completion of the international search: 17 April 2012

Date of mailing of the international search report: 26/07/2012

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016

Authorized officer: Cornu, Olivier
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This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. □ Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. □ Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. □ Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. □ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. □ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. □ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. X No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-14

Remark on Protest

□ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

□ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

□ No protest accompanied the payment of additional search fees.
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-14
   A roman shade assembly
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2. claims: 15-28
   A shade assembly
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