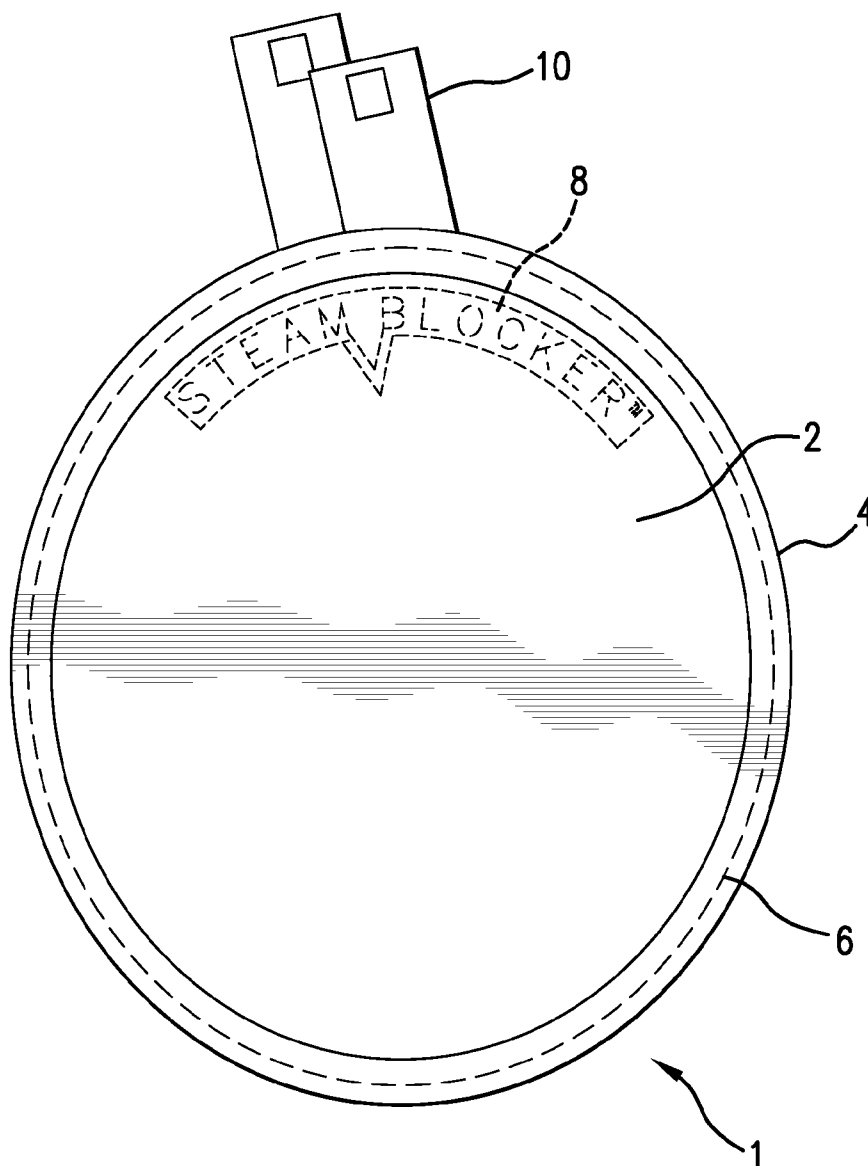




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(19) **United States**(12) **Patent Application Publication****Ilvento**(10) **Pub. No.: US 2011/0051241 A1**(43) **Pub. Date: Mar. 3, 2011**(54) **ANTI-FOG SCREEN AND METHODS**(52) **U.S. Cl. 359/511**(76) Inventor: **Gregory A. Ilvento**, Eatontown, NJ
(US)(57) **ABSTRACT**(21) Appl. No.: **12/551,979**

The present invention is directed to removable and collapsible moisture blocking screens that inhibit moisture from condensing on a surface when steam is present. The screens include a shaped vinyl film adapted to releasably contact a surface, a fabric component secured around a periphery of the film, and a flexible perimeter of fixed length having two attached ends, which perimeter is encased at least substantially within the fabric and is disposed around at least a substantial portion of the periphery of the film. Methods of inhibiting steam from accumulating on a surface are also described.

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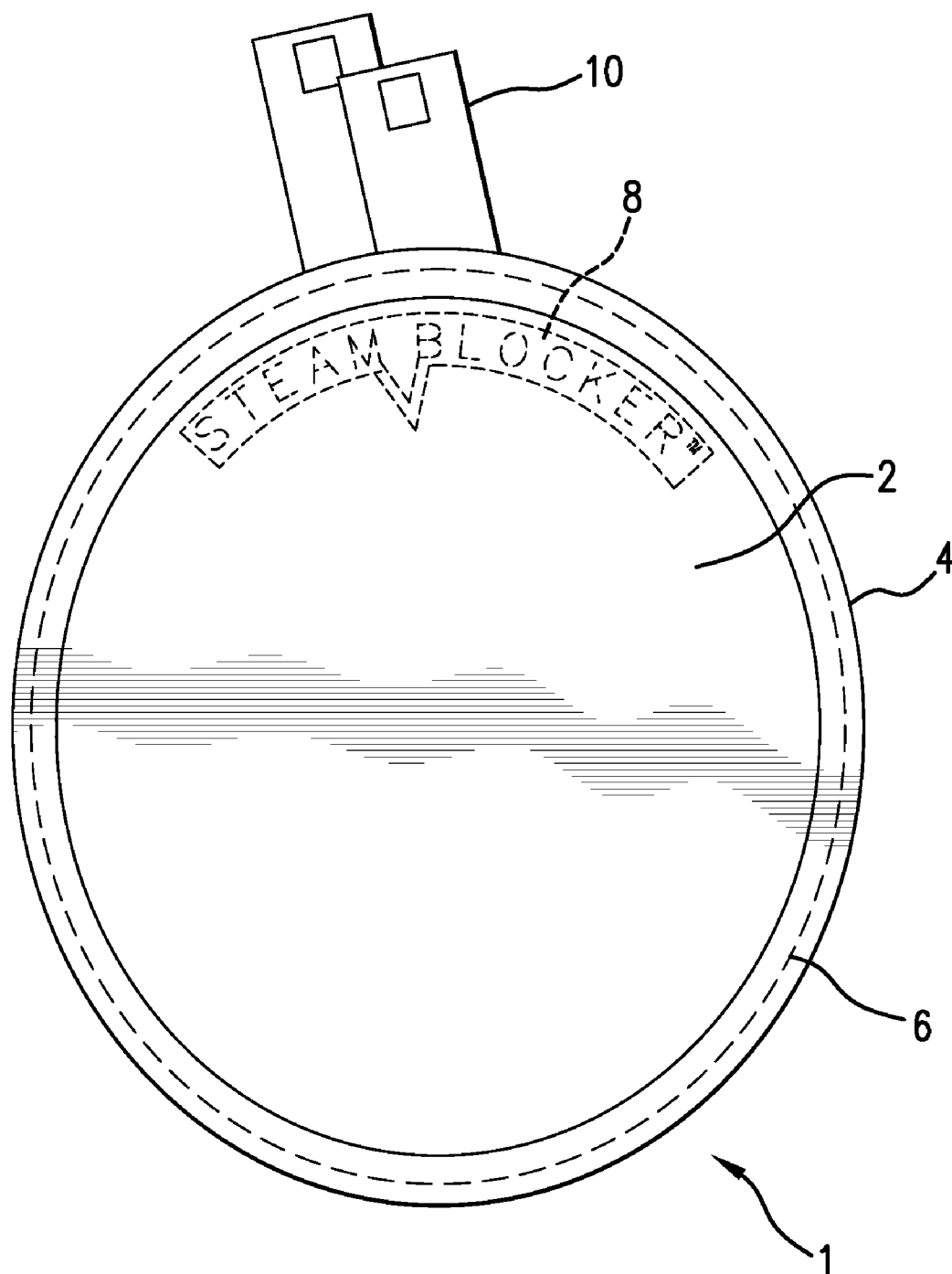


FIG. 1

ANTI-FOG SCREEN AND METHODS

TECHNICAL FIELD

[0001] The present invention relates to moisture blocking screens that inhibit moisture from condensing on a surface. The invention further relates to methods of inhibiting steam from accumulating on a cooler surface.

BACKGROUND OF THE INVENTION

[0002] When a person showers, bathes, cooks, or engages in other activities involving hot liquids such as hot water in a bathroom or kitchen, steam is naturally produced. When a cooler surface comes in contact with warmer moist air, condensation tends to occur on the cooler surface. Depending on temperature differences, the condensation may take the form of fog or frost on the surface and, particularly with substantially transparent surfaces such as glass, affect light transmission and impair visibility. Thus, for example, glass surfaces in the bathroom often become fogged up after a hot shower or bath.

[0003] In a high humidity environment, such as a bathroom, water tends to condense on conventional mirrors, making these mirrors unusable for a significant period of time. While one may use a cloth or rag to wipe away the condensation, condensation often quickly recurs, especially just after one has taken a shower or bath resulting the humidity level in the bathroom remaining high. Further, wiping a fogged-up mirror with a cloth tends to leave undesirable streak marks that are visible even after the humidity in the bathroom decreases, and the mirror no longer has condensation. One may also direct a hair dryer at the mirror in hopes of obtaining a small steam-free area, but this typically takes several minutes at a minimum during a time of day when most people do not have several additional minutes to wait for steam-free mirrors to proceed with their grooming ritual.

[0004] One way of preventing condensation and fogging on a mirror is to maintain the surface of the mirror at a temperature higher than the dew point of water. Use of heating elements to prevent fog formation on a mirror is known. For example, U.S. Pat. No. 7,131,739 describes a fogless mirror that includes a heater element. Similarly, U.S. Publication No. 2009/0052070 describes an electrically heatable mirror. Such heated mirrors, however, are relatively expensive to purchase and costly to operate due to energy consumption, and as such have not achieved widespread use.

[0005] Another way to prevent fogging is to apply multi-layer film assemblies to a desired substrate. For example, U.S. Publication No. 2007/0077399 describes an anti-fog film assembly that includes an anti-fog layer formed from a polyurethane-film forming composition that is effective to provide the layer with anti-fog properties at certain temperatures. The assembly may be applied to refrigerator surfaces, windows, and other reflective surfaces. U.S. Pat. No. 5,402,265 describes a flexible fog-free mirror with multiple layers, including a first film sheet having an organic coating of anti-fog material and second sheet that has a reflective film metal coating for providing a mirrored finish. Such film assemblies are complex because of the multiple layers and different film materials required, and as a result tend to have lowered flexibility or even be formed in a fixed size.

[0006] Thus, there is still a need for a simple, convenient, and readily transportable device to inhibit or preferably prevent condensation from accumulating on a surface exposed to steam.

SUMMARY OF INVENTION

[0007] The present invention relates to a removable moisture-blocking screen that includes a shaped, vinyl-containing film adapted to releasably contact a surface, a fabric component secured around a periphery of the film, and a flexible perimeter of fixed length having two attached ends.

[0008] In one embodiment, the perimeter is encased at least substantially within the fabric component and is disposed around at least a substantial portion of the periphery of the film. The screen is adapted to inhibit moisture from condensing on the surface.

[0009] In one embodiment, the flexible perimeter is adapted to facilitate reversibly folding the screen to a closed state and expanding the screen to an opened state. Preferably, the closed state has an area that is no more than about one-third of an area of the screen in the opened state.

[0010] Generally, the flexible perimeter comprises a metal or plastic component. The attached ends of the flexible perimeter are usually riveted, clipped, or welded to each other. In one embodiment, the screen also includes an optional but preferred handle.

[0011] Preferably, the screen also includes a pouch for storage of the screen in the closed state. In this embodiment, the pouch typically includes a handle.

[0012] The shape of the screen may be any suitable shape, but preferably, the screen is shaped as a square, rectangle, oval, circle, or another polygon or a combination thereof. In a preferred embodiment, the vinyl film includes polyvinyl fluoride, polyvinylidene fluoride, or a combination thereof. In another embodiment, the screen is at least substantially opaque. The film may include a graphic component disposed on at least one side of the film.

[0013] The fabric component is preferably flexible, and generally includes a polyamide-based component such as nylon, spandex, rayon, a polyester-based component, or a combination thereof. In a preferred embodiment, the fabric component is secured to the film by at least stitching.

[0014] The present invention further relates to a collapsible, moisture-blocking screen that includes a vinyl film having a first surface and a second surface opposite the first surface, an elastic fabric secured around a periphery of the film, and a flexible ring at least substantially encased in the fabric that forms a periphery of the film to facilitate reversibly folding the screen from an opened state to a closed state. At least the first surface or second surface is adapted to act as a pressure-sensitive adhesive to releasably attach the film to a substrate. The screen inhibits moisture from condensing on the surface.

[0015] In one embodiment, the closed state of the ring is no more than about one-third the size of the ring in the opened state, with the flexible screen being accordingly smaller in the closed state.

[0016] The present invention also relates to a method of inhibiting steam from accumulating on a surface that includes selecting a preexisting surface on which steam will condense when present, contacting a shaped, vinyl film into a releasable adhesive contact with the surface, and removing the film from the surface to reveal an essentially steam-free surface underneath the film where the film contacted the surface.

[0017] The method further advantageously includes collapsing the screen to no more than about one-third of its original size after removal from the surface.

[0018] Preferably, the surface includes a planar surface. More preferably, the surface includes or is a mirror.

[0019] The present invention also relates to a method of inhibiting steam from accumulating on a surface that includes instructing a user to select a preexisting surface on which steam will condense when present, to contact a shaped, vinyl film into a releasably adhesive contact with the surface, and to remove the film from the surface to reveal an at least essentially steam-free surface where the film contacted the surface.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The present disclosure can be better understood from the following detailed description when read with the accompanying figures.

[0021] FIG. 1 illustrates a preferred embodiment of a moisture-blocking screen according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] The present invention relates to a removable screen for contact attachment on a surface, preferably an at least substantially or entirely planar surface, such as a mirror, glass, window, or a wall. Typically, the planar surface is oriented vertically and occasionally is subject to condensing liquids fogging up the appearance or transparency thereof. The releasably adhesive shaped, vinyl film of the invention advantageously can enable the screen to contact adhere to the surface, thereby inhibiting moisture typically in gaseous form from reaching the surface. For example, the screen prevents steam from fogging up a mirror during a shower, which is an acute problem in such an enclosed space. When the screen of the invention is removed, it reveals an essentially dry, clear surface underneath, allowing one to immediately use the mirror to shave, apply make up, preen, or otherwise pursue one's grooming ritual. The screen is flexible, such that in one preferred embodiment it is collapsible to substantially reduce its size, making it convenient for storage or portability such as airline travel. The screen is readily portable, typically weighing less than about a pound, and can be used in any location where steam or moisture condensation on a cooler surface might be a concern, such as a dorm room shower, a locker room, and other similar locations, or anywhere else for aesthetic reasons.

[0023] FIG. 1 illustrates a preferred embodiment of the moisture-blocking screen. Although the screen in FIG. 1 is oval-shaped, it should be understood that the screen may be any suitable shape, including square, rectangle, circle, or a combination thereof. Preferably, a screen can be shape and even size-matched to a particular brand of mirror or glass panel on which it will be used, which can advantageously inhibit condensation on essentially the entire surface over which the screen 1 is releasably applied. The screen 1 includes a vinyl film 2, typically shaped complementary to the screen as a whole, adapted to be releasably contacted in attachment to a surface, a fabric component 4 secured preferably in a fixed position around the periphery of the film 2 and relative thereto, and a flexible perimeter 6 of fixed length having two attached ends. The flexible perimeter is encased at least substantially within the fabric component and is disposed around at least a substantial portion of the periphery of

the film. By "substantially within the fabric" is meant that at least about 60 percent, preferably at least about 75 percent, more preferably at least about 90 percent, and most preferably at least about 95 percent, of the perimeter is encased. Similarly, the term "substantial portion" with respect to the periphery is meant that the perimeter is disposed around at least about 65 percent, preferably at least about 80 percent, more preferably at least about 90 percent, and most preferably at least about 95 percent, of the perimeter of the film. In the exemplary embodiment depicted in FIG. 1, the perimeter 6 is entirely encased within the fabric component 4 and entirely disposed around the periphery of the film 2. Preferably, the fabric component 4 is attached to both opposing sides of the film 2, and is preferably aligned in the same location on opposite sides of the film 2.

[0024] The vinyl film 2 includes any type of cling or adhesive vinyl compound or material that is capable of contact attachment to a surface. In one embodiment, the film 2 includes polyvinyl fluoride, polyvinylidene fluoride, or a combination thereof. Advantageously, the film 2 is substantially free of, or preferably entirely free of, adhesive such as glue to stay in contact with a surface to which it is applied, even if the surface is, e.g., completely vertical. Without being bound by theory, it is believed that the film 2 releasably adheres to the surface, e.g., glass or plastic, through the use of static electricity. The film 2 can be easily removed, repositioned, recontacted, transferred to different surfaces, etc., and reused over and over again on a suitable surface in any desired location.

[0025] Examples of preferred films for inclusion in the screen of the invention include Solar Stat® brand, Gila® brand, and Energy Film® brand window films that are commercially available. The film 2 used generally has a thickness of about 0.05 mm to 0.3 mm, preferably about 0.1 mm to 0.25 mm, and more preferably about 0.15 mm to 0.2 mm. The film 2 is also preferably substantially opaque, meaning the film transmits less than about 15 percent of light, preferably less than about 10 percent of light, and more preferably less than about 5 percent of light. In a preferred embodiment, however, the film transmits at least a visibly detectable amount of light as a reminder that there is a glass surface contacting the film in the screen.

[0026] In another embodiment, the film may be transparent and include any desired tint, such as black, gray, green, or any other suitable tint or any combination thereof. The tinted transparent film generally transmits less than about 90 percent of light, preferably less than about 80 percent of light, more preferably less than about 70 percent of light, and most preferably less than about 60 percent of light. In an exemplary embodiment, the tinted transparent film transmits less than about 50 percent of light. It should be understood that the black tint may be sufficiently opaque to inhibit a majority of light transmission through the film, or even to render the film completely opaque in another embodiment noted herein.

[0027] As seen in FIG. 1, the film 2 may further include a graphic component 8. The graphic component 8 may include letters, numbers, shapes, drawings, logos, or the like, or any combination thereof. The graphic component 8, when included, can be applied by any of a variety of techniques available to those of ordinary skill in the art. Preferred techniques for applying such a graphic component 8 include screen printing, pad printing, sublimation, laser printing, digital offset printing, lithography, offset printing, ink jet printing, digital ink jet printing, digital offset printing, heat

transfer printing, and the like. Advantageously, graphic component **8** may enhance the appearance and provide additional information including advertising, without impairing the function of the screen **1**. A single graphic component may be disposed on a surface of film **2** as shown in FIG. **1**, or there may be more than one graphic component disposed on the film **2** (not shown). In one embodiment, instructions for use of the screen **1** may be disposed thereon, including to apply the screen **1** to a surface before turning on a hot water faucet or before entering a shower or bathtub, optionally but preferably then opening a door or turning on a fan to release excess steam either before, during, or after bathing, and then removing the releasably contacting screen **1** from the surface.

[0028] The fabric component **4** is preferably formed of an elastic fabric, such as a polyamide (e.g., a nylon), spandex, rayon, a polyester, or a combination thereof. The fabric component **4** is preferably secured to the film **2** by any suitable method, including the use of fasteners, adhesives, or any combination thereof. Fasteners could include pins, safety pins, clothespins, rivets, clips, bands, or any other suitable physical component to retain the fabric component **4** in association with the film **2**. Preferably, the fastener included is stitching, and more preferably waterproof stitching, to ensure that the fabric component **4** remains secured to the film **2** even when wet, which often occurs during usage in high humidity environments.

[0029] Preferably, the perimeter **6** is formed of a band of resilient material, e.g., a flat strip of resilient material. Preferably, the ends of the perimeter **6** are riveted, welded, clipped, or otherwise fastened together to form the perimeter **6**. In one embodiment, the perimeter is formed as a unitary piece with no ends, and the fabric component **4** and film **2** are combined with the perimeter **6** and joined together as discussed above. The perimeter **6** is typically, however, formed of a metal, such as steel, iron, aluminum, or the like, or any combination thereof, with the most preferred metal being steel. In another embodiment, the perimeter is formed of a resilient plastic component that is sufficiently rigid or resilient to at least substantially or entirely maintain the shape of the screen when in an opened state. By "maintain the shape" is meant that in the opened state or the closed state, the perimeter will return to essentially the same shape in the opened or closed state, respectively, even when distorted temporarily from that shape in the respective opened or closed state. Examples of a suitable plastic component includes but is not limited to one or more of a polyethylene, polypropylene, polystyrene, and combinations thereof. The perimeter **6** is preferably formed of a material that resists or is immune to the corrosive effects of moisture with which the screen **1** is likely to come into contact. The perimeter **6** generally has a width of between about 1 mm and 15 mm, preferably about 2 mm to 10 mm. Preferably it is substantial enough to provide rigidity to keep the screen **1** in the open position even when applied to a vertical surface, but not so wide as to significantly inhibit or prevent the screen **1** from being adjusted to its closed position. In an exemplary embodiment, the perimeter **6** is formed in a circle or oval from a band of carbon spring steel about 22 inches long, having a width of about 10 mm with the ends riveted for durability. The effect of the perimeter **6** is to maintain the fabric component **4** in a tensioned and slightly stretched state that is rigid and substantially maintains shape even when the screen **1** is disposed vertically. A handle or plurality of handles **10** may be operatively associated with the screen **1**, such as by fastening or adhering the

one or more handles **10** to the film **2**, the fabric component **4**, the perimeter **6**, or any combination thereof.

[0030] The flexibility of the perimeter **6** allows the screen to reversibly fold to a closed state and expand to an opened state, i.e., readily change sizes such as when not being used or when being transported to another location. The size of the screen in the closed state is typically less than about half the size of the screen in the opened state. In one embodiment, the area of the screen **1** in the closed state is no more than about one-third of the screen **1** in the opened state. In the closed state, the screen is more compact and more easily stored or transported. When it is desired to collapse the screen, opposite sides of the screen are grasped and twisted to form loops of the flexible perimeter **6**, which can then be folded over. The folded screen can then be stowed in a pouch or other receptacle, such as a shelf, drawer, suitcase, or the like, if desired until it is needed.

[0031] An operatively associated pouch (not shown) that can preferably be used to store the screen may be formed of any suitable material, but in one embodiment it is waterproof, and more preferably is formed of a waterproof vinyl material. The pouch typically includes a zipper, or other suitable closing mechanism such as snaps, to facilitate opening and closing of the pouch. In a preferred embodiment, the pouch includes a handle for convenient transportation of the pouch. The pouch may also include a graphic component and a tag with printed instructions on how to use the screen, or such instructions on use of the screen can be included with the screen inside the pouch.

[0032] Alternatively, after use, the screen may be hung to dry using the optional but preferred handle **10**. The handle **10** preferably includes a Velcro® brand hook and loop fastener, or some other convenient fastener such as snaps or magnetic coupling devices in each portion of a two-part handle. The handle is preferably attached to the fabric component **4**. By having a two-part handle, the device can easily be affixed to a shower curtain bar or a closet bar, a clothes hook, a hangar, a towel bar, or the like to facilitate drying of excess moisture contacting the screen **2**, which the screen inhibited from contacting the surface.

[0033] To use the screen **1** of the invention, a pre-existing surface, such as a mirror or glass susceptible to formation of a condensate, is first selected. If the screen **1** was previously in the closed state, it is preferably unfolded or opened. This can be achieved by removing the screen from any pouch, and then pulling on opposite portions of the collapsed flexible perimeter **6** in the closed state so as to reversibly expand the perimeter **6** and screen **1** as a whole to the open state. The vinyl film **2** of the opened screen **1** is then preferably placed into contact with the selected surface. In one embodiment, the film is preferably manually flattened against the surface to remove some or all of the air that may be trapped between the surface and the film **2**, thereby facilitating reversible adherence of the film **2** to the surface. One is now free to take a shower or bath secure in the advantage that the applied screen **1** of the claimed invention will at least inhibit or even prevent condensation from forming on the surface, particularly not where the surface is in contact with the screen **1**. When one is finished, some of the steam is typically allowed to dissipate, such as by use of a fan or an open door to a cooler and/or less humid environment nearby the selected surface. The screen may then be removed to reveal an at least essentially steam-free surface underneath, preferably an entirely steam-free surface. It should be understood that in alternative embodiments, the screen article of the invention may be used for

various purposes including in non-humid or humid environments, such as to darken a room from sun shining through one or more windows, or as a portable sun shade for one or more windows in an automotive vehicle. Preferably, the screen article is adapted for anti-fogging use in a humid environment.

[0034] It should be understood that the articles of the invention are preferably constructed using environmentally-friendly materials. In one embodiment, one or more of the components, e.g., the perimeter, the film, the fabric component, or other materials, include a recyclable material. In a varying preferred embodiments, such component(s) are at least about 30% recycled, about 50% recycled, about 75% recycled, or entirely recycled. Recycled materials preferred include those made at least substantially, or entirely, of post-consumer material(s).

[0035] By “essentially steam-free” is meant that at least about 90 percent of the area of the surface does not contain steam, preferably at least about 95 percent of the area, and more preferably at least about 98 percent of the area, do not contain steam. The screen 1 may then be hung to dry using the handle 10 or it may be folded and stored even in a wet state. Preferably, the materials selected for the screen are antimicrobial, antifungal, or antibacterial in nature even when wetted. Even in its closed state, the screen advantageously includes air pockets that can be trapped between layers of the folded film, which can facilitate drying of the screen even in the folded state.

[0036] The term “about,” as used herein, should generally be understood to refer to both numbers in a range of numerals. Moreover, all numerical ranges herein should be understood to include each whole integer within the range.

[0037] Although preferred embodiments of the invention have been described in the foregoing description, it will be understood that the invention is not limited to the specific embodiments disclosed herein but is capable of numerous modifications by one of ordinary skill in the art. It will be understood that the materials used may be slightly different or modified from the descriptions herein without departing from the methods and devices disclosed and taught by the present invention.

What is claimed is:

1. A removable moisture-blocking screen comprising:
 - a shaped, vinyl-containing film adapted to be releasably contacted to a surface;
 - a fabric component secured around a periphery of the film; and
 - a flexible perimeter of fixed length having two attached ends, which perimeter is encased at least substantially within the fabric component and is disposed around at least a substantial portion of the periphery of the film, wherein the screen is adapted to inhibit moisture from condensing on the surface.
2. The screen of claim 1, wherein the flexible perimeter is adapted to facilitate reversibly folding the screen to a closed state and expanding the screen to an opened state.
3. The screen of claim 2, wherein the closed state has an area that is no more than about one-third of an area of the screen in the opened state.
4. The screen of claim 1, wherein the flexible perimeter comprises a metal or plastic component.

5. The screen of claim 4, wherein the attached ends of the flexible perimeter are riveted, clipped, or welded to each other.

6. The screen of claim 1, further comprising a handle attached to the fabric component adapted to facilitate removal of the screen from the surface.

7. The screen of claim 1, further comprising a pouch for storage of the screen in the closed state.

8. The screen of claim 1, wherein the screen is shaped as a square, rectangle, oval, circle, or a combination thereof.

9. The screen of claim 1, wherein the vinyl film comprises polyvinyl fluoride, polyvinylidene fluoride, or a combination thereof.

10. The screen of claim 1, wherein the film is at least substantially opaque.

11. The screen of claim 1, wherein the film comprises a graphic component on at least one side thereof.

12. The screen of claim 1, wherein the fabric component comprises a polyamide component, spandex, rayon, polyester, or a combination thereof.

13. The screen of claim 1, wherein the fabric component is secured to the film by at least stitching.

14. A collapsible, moisture-blocking screen comprising:

- a shaped, vinyl film having a first surface and a second surface opposite the first surface, wherein at least the first surface or second surface is adapted to act as a pressure-sensitive adhesive to releasably attach the film to a substrate;

an elastic fabric secured around a periphery of the film; and
a flexible ring at least substantially encased in the fabric component that forms a periphery of the film to facilitate reversibly folding the screen from an opened state to a closed state,

wherein the screen inhibits moisture from condensing on the surface.

15. The screen of claim 14, wherein the closed state of the ring is no more than about one-third of the opened state.

16. A method of inhibiting steam from accumulating on a surface, which comprises:

- selecting a pre-existing surface on which steam will condense when present;
- contacting a shaped, vinyl film into a releasable adhesive contact with the surface; and
- removing the film from the surface to reveal an essentially steam-free surface underneath the film where the film contacted the surface.

17. The method of claim 16, which further comprises collapsing the screen to no more than about one-third of its original size after removal from the surface.

18. The screen of claim 16, wherein the surface comprises a planar surface.

19. The screen of claim 18, wherein the surface comprises a mirror.

20. A method of inhibiting steam from accumulating on a surface, which comprises instructing a user to:

- select a pre-existing surface on which steam will condense when present;
- contact a shaped, vinyl film into a releasably adhesive contact with the surface; and
- remove the film from the surface to reveal an essentially steam-free surface underneath the film where the film contacted the surface.

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