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(54) Title: LIGHTED DÉCOR UNITS WITH AN ARCUATE, REMOVABLE DÉCOR SHEET

(57) Abstract: A décor fixture including a backing plate and an arcuate décor sheet that is removably mounted on the front side of the backing plate.

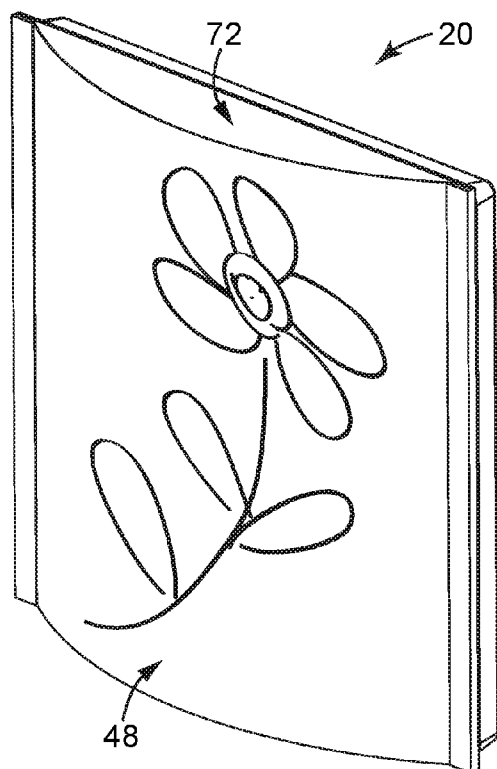


Fig. 1



AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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LIGHTED DÉCOR UNITS WITH AN ARCUATE, REMOVABLE DÉCOR SHEET**Background**

The present disclosure relates to lighted décor units useful with flexible wall decoration systems.

Summary

In broad summary, herein is disclosed a décor fixture including a backing plate and an arcuate décor sheet that is removably mounted on the front side of the backing plate, and various other features and components. These and other aspects will be apparent from the detailed description below. In no event, however, should this broad summary be construed to limit the claimable subject matter, whether such subject matter is presented in claims in the application as initially filed or in claims that are amended or otherwise presented in prosecution.

Brief Description of the Drawings

FIG. 1 is a front perspective view of an exemplary flexible décor system including a lighted décor unit;

FIG. 2 is a front, perspective exploded view of the lighted décor unit of FIG. 1;

FIG. 3 is a rear, perspective exploded view of the lighted décor unit of FIG. 2;

FIG. 4 is a top plan view of an exemplary flexible décor system including a lighted décor unit;

FIG. 5 is a magnified top plan view of an edge of the lighted décor unit of FIG. 4;

FIG. 6 is a perspective, partially-exploded view of an edge of an exemplary lighted décor unit;

FIG. 7 is a top plan view of an exemplary flexible décor system including a lighted décor unit.

Like reference numbers in the various figures indicate like elements. Some elements may be present in identical or equivalent multiples; in such cases only one or more representative elements may be designated by a reference number but it will be understood that such reference numbers apply to all such identical elements. Unless otherwise indicated, all figures and drawings in this document are not to scale and are chosen for the purpose of illustrating different embodiments of the invention. In particular the dimensions of the various components are depicted in illustrative terms only, and no relationship between the dimensions of the various components should be inferred from the drawings, unless so indicated. Although terms such as “first” and “second” may be used in this disclosure, it should be understood that those terms are used in their relative sense only unless otherwise noted.

As disclosed herein, “rearward”, “rear”, and like terms means toward a wall or other surface upon which wall décor system 20 is mounted; terms such as “forward” and “front” means away from the wall (e.g. toward a room). FIG. 1 is thus a view from the forward side of a lighted décor unit. The term inward means toward the geometric center of a lighted décor unit, and away from the closest perimeter edge. The term outward means away from the geometric centers and toward a perimeter edges.

As used herein as a modifier to a property or attribute, the term “generally”, unless otherwise specifically defined, means that the property or attribute would be readily recognizable by a person of ordinary skill but without requiring a high degree of approximation (e.g., within +/- 20 % for quantifiable properties). The term “substantially”, unless otherwise specifically defined, means to a high degree of

approximation (e.g., within +/- 10% for quantifiable properties). The term “essentially” means to a very high degree of approximation (e.g., within plus or minus 2 % for quantifiable properties); it will be understood that the phrase “at least essentially” subsumes the specific case of an “exact” match. However, even an “exact” match, or any other characterization using terms such as e.g. same, equal, identical, uniform, constant, and the like, will be understood to be within the usual tolerances or measuring error applicable to the particular circumstance rather than requiring absolute precision or a perfect match. All references herein to numerical parameters (dimensions, ratios, and so on) are understood to be calculable (unless otherwise noted) by the use of average values derived from a number of measurements of the parameter, particularly for the case of a parameter that is variable.

Detailed Description

The present disclosure relates to lighted décor units useful with flexible wall décor systems or kits. The décor systems can assume a variety of forms, and in some embodiments incorporate a two-part, adhesive-based releasable fastening unit for removable mounting to a wall surface. Examples of flexible wall décor systems are described, for example, in U.S. Application Serial No. 14/293,885, filed June 2, 2014 and entitled “Removable Wall Decoration Kits, Systems and Methods” the entire teachings of which are incorporated herein by reference. In the context of the present application, by flexible is meant that at least an outermost, visible portion of the décor system (e.g., an arcuate décor sheet as described herein) can be e.g. changed, replaced, and the like, e.g. to give a different visual appearance. In particular embodiments, the arcuate décor sheets as described herein may be swapped for other arcuate décor sheets; and/or, a lighted décor unit as disclosed herein may be swapped for another lighted décor unit or may be swapped for a non-lighted décor unit e.g. of the type described in the ‘885 application.

With the above background in mind, FIGS. 1-3 illustrate one non-limiting example of a flexible wall décor system 20 including a lighted décor unit 22 in accordance with principles of the present disclosure. The décor system 20 further includes an optional base 24 and a two-part releasable fastening unit 26 (as seen most easily in FIGs. 2 and 3). Such a two-part releasable fastening unit 26 facilitates releasable fastening of the base 24 to a wall surface. The décor unit 22 and the base 24 incorporate complimentary structures that promote detachable connecting of the décor unit 22 to the base 24. Finally, the décor unit 22 includes light management features that create unique illumination effects as described below. The décor unit 22 can easily be mounted to, and removed from, the base 24 by a user in accordance with the descriptions of the ‘885 application.

The décor unit 22 generally includes a décor fixture 40, a light source sub-assembly 42, a power source 44 and a backer 46. The décor fixture 40, the light source sub-assembly 42, and the power source 44 are illustrated in block form in FIGS. 2 and 3. The décor fixture 40 may incorporate various light management features as described below for distributing light from the light source sub-assembly 42 relative to an arcuate décor sheet 48 of décor fixture 40. The power source 44 provides power to the light source sub-assembly 42, with the power source 44 and the light source sub-assembly 42 being e.g. attached to, or carried by, one or both of the décor fixture 40 and the backer 46. For example in some

embodiments, the light source sub-assembly 42 is carried by the décor fixture 40 and the power source 44 is carried by the backer 46.

The backer 46 is connected to the décor fixture 40, and incorporates mounting features complementary with those of the base 24 for selective mounting of the backer 46, and thus the décor unit 22, with the base 24. For example, the backer 46 can have a bowl-like shape, including a frame 50 and a flange 52. The frame 50 is sized and shaped to nest within a cavity or pocket 54 centrally formed by the base 24. The base 24 and the backer 46 optionally carry complementarily-arranged magnets or magnetic elements 56, 58 (referenced generally), respectively, that promote a secure, releasable connection between the base 24 and the backer 46. Other mounting features can be incorporated into the backer 46 or the base 24.

The flange 52 provides a surface for attachment to the décor fixture 40. In this regard, the backer 46 can be permanently secured (e.g., bonded) to the décor fixture 40 at the flange 52 (e.g., the backer 46 can be considered a component of the décor fixture 40 in some embodiments). Alternatively, the décor fixture 40 can be removably assembled to the backer 46 in a variety of fashions, for example by adhesive strips 60 (e.g., pressure sensitive adhesive strips). The adhesive strips 60 can be permanently bonded to the backer 46 and provide a releasable adhesive connection with the décor fixture 40 (such that the décor fixture 40 is replaceable relative to the backer 46), or can be permanently bonded to the décor fixture 40 and provide a releasable adhesive connection with the backer 46 (such that the combination décor fixture 40/adhesive strips 60 can be replaced with another combination décor fixture 40/adhesive strips 60).

The light source sub-assembly 42 can assume a variety of forms, and generally includes one or more light sources 80 (as seen e.g. in Fig. 2) and corresponding operational circuitry. Suitable light sources include light emitting diodes (LED). The LED(s) may be provided in any available color including, for example, red, orange, yellow, green, blue and white. The light source may optionally include reflectors, diffusers, lenses, filters, and/or polarizers to modify and/or direct the light. A suitable LED is a Nichia Chip Type white LED (model number NSSW064AT) available from Nichia Corporation, Detroit, MI. Other, similar light source formats, such as linear light sources, are also envisioned. As described below, the light source sub-assembly 42 can include one, two or more of the LEDs (or other light source formats) arranged on a supportive circuit board otherwise providing necessary circuitry to deliver power to the LEDs from the power source 44 (and, where necessary, convert the supplied power to a format appropriate for powering the LEDs).

In many embodiments, a supportive circuit board that carries one or more LEDs may also have other components mounted to the forward face of the circuit board. The presence of such components (or other design considerations) may necessitate that the circuit board (and consequently, any LED carried by the circuit board) may be slightly offset rearward relative to aperture 176 of backplate 72. In some instances this may reduce the angular width of the light (emitted by the LED) that emerges from aperture 176. In specific instances, some light may e.g. be dissipated in the space behind the rearward face of backplate 72 (e.g., it may be “lost” into backer 46). Accordingly, in some embodiments (whether or not the light source is in fact offset rearwardly from aperture 176), a reflector may be positioned at least

rearwardly of the LED(s) to enhance the recycling of any such light toward and forward out of, aperture 176. In specific embodiments, such a reflector may take the form of e.g. a shallow bowl or a flat-bottom bowl, with the “bottom” of the bowl being nestled near or against the forward surface of the circuit board (e.g., rearward of the LED) and with the “sides” of the bowl extending at least generally forwardly toward
5 backplate 72 and at least partially circumferentially surrounding the LED so as to intercept and reflect light that might otherwise escape laterally (e.g. into the backer) behind the rearward surface of the circuit board.

The power source 44 is selected to generate sufficient power for energizing the LEDs (or other light source format), and in some embodiments includes one or more batteries, such as Ni-MH AA
10 batteries. Other power source formats known in the art are equally acceptable. For example, suitable power source formats of the present disclosure include direct plug, flat cable, replaceable batteries, rechargeable battery-pack, user-loadable battery-pack with optional charger, wireless energy transfer, solar-charging battery or capacitor, etc.

Regardless of an exact form, the décor unit 22 is configured, in some embodiments, such that the
15 light source sub-assembly 42 and the power source 44 are assembled to, or otherwise carried within, a footprint of the backer 46. For example, in some embodiments the frame 50 can form a pocket or similar structure sized and shaped to receive at least the power source 44. As reflected by FIGS. 2 and 3, in some embodiments a footprint of the backer 46 at the flange 52 is less than a footprint or size of the décor fixture 40. In such a construction, the light source(s) of the light source sub-assembly 42 will necessarily
20 be off-set from perimeter edges of the décor fixture 40; for example, in some embodiments, the décor unit 22 is configured such that the light source(s) is centrally arranged at, or in close proximity to, a center of the décor fixture 40 (e.g., a single LED or an array of LEDs (for example four LEDs) can be located at or about a center point of the décor fixture 40). As described below, light management features provided by the décor fixture 40 can e.g. serve to distribute light from the centrally-located light source(s) toward the
25 perimeter edges of the décor fixture 40.

With the above general parameters of the décor unit 22 in mind, the décor fixtures 40 of the present disclosure can assume a wide variety of forms and can have a regular shape (e.g., rectangle, square, etc.) akin to a tile. In some embodiments, the décor fixtures 40 of the present disclosure have a generally square shape (in height and width), with dimensions optionally on the order of 12 inch x 12 inch
30 although other dimensions are also acceptable.

Individual components of an exemplary décor fixture 40 are most easily seen in FIGs. 2 and 3. In the illustrated embodiment, décor fixture 40 comprises an arcuate décor sheet 48 and a backing plate 72 to which arcuate décor sheet 48 is mounted. Décor sheet 48 is the forwardmost (away from the wall to which system 20 is mounted) component of the system and is mounted on, e.g. supported by, backing
35 plate 72 as described later herein in detail.

At least one LED (or other light source) as described above is provided in proximity to (e.g., supported by, directly or indirectly) backing plate 72, and is arranged to “aim” toward the rearward surface 149 of décor sheet 48 (e.g., the light source(s) can be one or more front emitting LEDs that lay

flat on a plane of backing plate 72). As described below, in at least some embodiments décor fixture 40 may incorporate one or more features (e.g. of the décor sheet 48, of backing plate 72, or of both) that may help spread or direct emitted light from light source LED throughout the cavity 151 defined between décor sheet 48 and backing plate 72. Specifically, such features may assist in spreading the light (e.g. from a centrally located light source) toward perimeter edges 62 and/or 63 of décor sheet 48.

Backing plate 72 can be comprised of any suitable material (whether a single layer or multiple layers). In embodiments, at least a major portion of backing plate 72 may be substantially planar, or essentially planar. Backing plate 72 has a front side with a front surface 175, and a rear side with a rear surface. Often, backing plate 72 may be at least generally, substantially, or essentially square in shape (with a perimeter comprising a first set of edges 173 and a second set of edges 174 as described later herein). As positioned in the illustrative embodiments of FIGs. 1-3, edges 173 are “side” edges and edges 174 and “top” and “bottom” edges; however, the orientation of backing plate 72 (and in fact of décor unit 22 as a whole) can be chosen as desired. Backing plate 72 should be stiff and strong enough to support décor sheet 48 and may be made e.g. of plastic, chipboard, or the like. In at least some embodiments, backing plate 72 may be at least partially light-reflective at least with respect to light rays that impinge on backing plate 72 from the front (that is, from within cavity 151). This may be achieved e.g. by providing an at least semi-reflective layer, coating, treatment, or the like, on front surface 175 of backing plate 72. Or, it may be achieved e.g. by including one or more at least partially reflective fillers (e.g., TiO_2 , CaCO_3 , and so on) within backing plate 72 (for example, backing plate 72 may be made of an injection-molded thermoplastic material, or an extruded thermoplastic sheet material, that has one or more at least partially reflective fillers dispersed therein). The reflectivity of backing plate 72 may be diffuse or specular, or diffuse in some areas and specular in other areas, as desired.

Backing plate 72 may comprise at least one through-hole (aperture) 176 through which light emitted from light source 80 may pass. (If desired, some portion of light source 80 may actually protrude through hole 176 slightly into cavity 151.) If desired, in some embodiments a diffusing element (e.g., in the shape of a cup, bowl, cap, etc., with an open end facing toward through-hole 176 and an at least partially closed end facing away from through-hole 176) may be provided that may further assist in diffusing the light that is emitted by light source 80.

At least two opposing edges (e.g., edges 173 as shown in Fig. 2) of backing plate 72 may comprise retaining rails 301 that may at least assist in retaining arcuate décor sheet 48 in place as mounted on the front side of backing plate 72. Retaining rails 301 are discussed in detail later herein. In the illustrated embodiment, retaining rails 301 are provided on side edges of backing plate 72; however, in some embodiments they may be provided on top and bottom edges of backing plate 72.

Arcuate décor sheet 48 is a sheet that, although it may be supplied to a user e.g. as a flat sheet, is sufficiently flexible along at least one axis that it can be deflected (bowed) into an arcuate shape so as to be mounted to backing plate 72 e.g. as shown in FIGS 1-3. In use, arcuate décor sheet 48 is thus bowed to a sufficient extent that each of the two first major opposing edges 62 of décor sheet 48 can be seated (i.e.,

inserted and held) between the forward surface 175 of backing plate 72, and a retaining rail 301, as discussed in detail later herein.

Arcuate décor sheet 48 may be made of any suitable material (e.g., a sheet of extruded plastic, with or without any additional layers laminated thereto, with or without any images, patterns, etc. printed upon a surface thereof, and so on) and may be of any suitable thickness, which composition and thickness may be chosen in combination to provide arcuate décor sheet 48 with the appropriate bending stiffness. In many embodiments, sheet 48 is sufficiently bendable that it can easily be manually bowed by a user, but is not so weak or limp that it cannot easily remain mounted in place on backing plate 72. In other words, sheet 48 should have sufficiently high bending stiffness to take the form of a self-supporting arch when in place on backing plate 72. Arcuate décor sheet 48 will have a front side with a front surface 150 and a rear side with a rear surface 149.

Arcuate décor sheet (e.g., front surface 150 thereof) will be the most easily visible part of system 20 and so provides an intended, visually decorative effect (particularly when backlit by light source 80, but also when viewed only in reflected (e.g. room) light). Examples of possible decorative effects are limitless. For example, the decorative effect of arcuate décor sheet 48 can be a two-dimensional presentation of: a fanciful graphic; a representation (photograph or artistic rendition) of an object, person, place, animal, or combinations thereof; imaginary objects or characters (e.g., cartoon character); origami; faux surfaces (e.g., a wood grain appearance); etc. Alternatively or in addition, arcuate décor sheet 48 can include differing surfaces, such as a texture or similar attribute generating a three-dimensional visual effect, such as with woven fabrics or ribbons. In yet other embodiments, arcuate décor sheet 48 can be or can include a chalk board and/or a white board. Thus, arcuate décor sheet 48 can be, or can create the visual effect of a three-dimensional object such as a sculpture. It will be understood that the decorative effects described above are but a few envisioned by the present disclosure. Any such image, pattern, visual effect, or the like that is provided when light passes through (or reflects off of the forward face of) décor sheet 48 may be provided e.g. by printing or otherwise depositing an image onto the front surface 150 of sheet 48; or, by compounding ink or pigment into desired areas of sheet 48; or, by printing an image onto the rear surface 149 of sheet 48; or, by selectively removing material from sheet 48 so that it is thinner in areas in which it is desired to allow more light to pass. Virtually any visual effect can be embodied into arcuate décor sheet as described, for example, in US Application Serial No. 14/293,885. In particular, the term “printing” is used broadly and can encompass not merely e.g. the liquid-phase coating of a pigmented material, but also e.g. physical or chemical vapor deposition of metals, transfer of toner, and so on.

By arcuate is meant that as mounted to backing plate 72 to form décor fixture 40, décor sheet 48 does not exhibit an essentially or substantially planar shape but rather exhibits a radius of curvature of less than 2 meters (thus, while not being planar, décor sheet 48 as mounted on backing plate 72 may in some cases exhibit a very gentle or somewhat unobtrusive curvature). In various embodiments, the radius of curvature of sheet 48 (when mounted) may be less than about 2, 1, 0.5 meters, or less than 40, 30, or 20 cm. In further embodiments, the radius of curvature of sheet 48 (when mounted) may be at least about 10,

20, 30, 40, or 50 cm. All such radii of curvature will be average values taken along the main section of the arcuate length of sheet 48 as mounted, noting that the radius of curvature is not required to be strictly constant along the main section of the arcuate length of sheet 48. In the illustrated embodiments, the main section of arcuate décor sheet 48 exhibits a single-curvature shape rather than a compound-curvature shape (i.e., sheet 48 does not exhibit e.g. a paraboloid or hyperboloid or saddle type shape). Thus, in such embodiments, the radius of curvature of sheet 48 may be relatively constant along a direction that is perpendicular to the arcuate length of sheet 48 as mounted. In some embodiments, the radius of curvature of sheet 48 may gradually increase in going from the central portion of the sheet, toward a major edge 62. Regardless of such subtleties, arcuate décor sheet 48 will often be convex in appearance when viewed from in front of the lighting system, as is evident from FIGs. 1 and 2.

In the above discussions of shape and radius of curvature, the “main” section of arcuate décor sheet 48 will not include minor sections of sheet 48 that are proximate major edges 62 of sheet 48 (i.e., minor sections that are close to a retaining rail 301. It will be appreciated that depending on e.g. the stiffness of the décor sheet, the particular geometry of the retaining rail (e.g., the depth of cavity 305 and/or the angle of chamfer 304), and so on, the minor sections of sheet 48 that are proximate (e.g., within a cm or two of) major edges 62 may exhibit somewhat different curvature than that of the major section of sheet 48.

Management or spreading of light from the light source(s) 80 toward perimeter edges 62 and 63 of décor sheet 48 can be accomplished in a number of fashions in accordance with the present disclosure. It was already mentioned that backing plate 72, in particular forward surface 175 thereof, may be at least partially reflective in aid of this. Similar considerations apply to décor sheet 48, although of course with the added condition that light must (eventually) pass through décor sheet 48 (from cavity 151 forward into e.g. a room) in sufficient intensity to achieve the desired lighting effect. Thus, décor sheet 48 may be any suitable partially-reflective, partially-transmissive, sheet (the term sheet being used broadly to encompass a sheet that comprises a single layer, a sheet that comprises multiple layers attached together, and also encompasses multiple layers that are not attached to each other but are nevertheless stacked in such a form as to serve as a “sheet” in the sense used herein). Often, décor sheet 48 will exhibit an at least generally, or substantially, uniform thickness over the entire length and breadth of the sheet so that the front and rear surfaces are locally parallel to each other over the entire length and breadth of the sheet.

Such semi-reflective effects may be achieved by providing a semi-reflective layer, coating, treatment, or the like, on rearward surface 149 of décor sheet 48. Or, it may be achieved e.g. by including one or more at least partially reflective fillers (e.g., TiO_2 , CaCO_3 , and so on) within décor sheet 48 (for example, décor sheet 48 may be made of an injection-molded plastic material, or an extruded plastic sheet material, that has one or more at least partially reflective fillers dispersed therein.) The reflectivity with respect to light impinging on it from within cavity 151 of décor sheet 48 may be diffuse or specular, or diffuse in some areas and specular in other areas, as desired. The reflectivity of décor sheet 48 with respect to light that impinges onto its front surface 150 may be the same, or different, as the reflectivity with respect to light that impinges onto its rearward surface 149. The reflectivity of forward surface may

be chosen to provide décor sheet 48 with the desired appearance in room light (e.g. when not backlit by light source 80).

Surfaces 150 and 149 of décor sheet 48 may be diffuse-reflecting, specular-reflecting, may be somewhere in between, and/or may exhibit different reflectivity in different areas. One example of a specular reflector that may be used to provide a reflective surface is VIKUITI™ ENHANCED SPECULAR REFLECTION (ESR) film available from 3M Company of St. Paul, MN. Other highly specular reflective materials are also envisioned, and the reflective surfaces can be made from metal such as aluminum or silver, or a polymeric film having metal or metal alloy coating. Other suitable high reflectivity materials include DAYLIGHT FILM DF2000MA available from 3M Company; polished aluminum products available from Alanod under the trade designation MIRO-SILVER, a film made by laminating a barium sulfate-loaded polyethylene terephthalate film to Vikuiti™ ESR film; E-60 series LUMIRROR™ polyester film available from Toray Industries, Inc.; porous PRFE films such as those available from W.L. Gore & Associates, Inc.; SPECTRALON™ reflectance material available from Labsphere, Inc.; etc.

Examples of suitable diffuse reflectors include particulate loaded vinyl films such as LIGHT ENHANCEMENT FILM (LEF) 3655-100 (an optical lighting film), available from 3M Company. Other examples of diffuse reflectors include polymers, such as polyethylene terephthalate (PET), polycarbonate (PC), polypropylene (PP), or polystyrene (PS). The polymers can be loaded with diffusely reflective particles, such as titanium dioxide, barium sulphate, calcium carbonate, or the like. Other examples of materials or constructions useful as the diffuse reflective surface include an appropriately formulated paint or ULI-coated ESR.

Through whatever combination of the (partial) reflectivity of décor sheet 48 and/or at least partial reflectivity of backing plate 72 (optionally augmented e.g. by “bubble” diffuser mounted over aperture 176 of backing plate 72), at least some light that is emitted by light source 80 may be recycled within cavity 151 (as shown in idealized representation in FIG. 4, in which the arrows represent light rays), so as to at least partially spread over the extent of cavity 151 (i.e., toward perimeter edges of sheet 48) before eventually being transmitted through décor sheet 48 into e.g. a room.

Although embodiments discussed herein have primarily involved an arrangement in which a single layer of diffuse-reflective material is used as décor sheet 48, it will be appreciated that other arrangements may be used, e.g. involving multiple layers that may differ in their optical properties. For example, a rearwardly-positioned arcuate sheet might serve as a diffuse-reflective layer, with a forwardly-positioned arcuate sheet (i.e., positioned in front of the rearward sheet) being e.g. transparent except for including e.g. an image on at least portions thereof. In some embodiments, both such sheets might include images (which, broadly speaking, means that each has areas that differ in light transmission) such that when the sheets are superimposed (when both are mounted onto backing plate 72) they collectively form a desired image. In some embodiments, two such sheets may be e.g. laminated to each other to form a single multilayer décor sheet 48. In other embodiments, such sheets may be separate and may be individually mounted onto backing plate 72 (in such cases, the thickness of space 305 provided by a

retaining rail 301, which is described in detail later herein, can be adjusted to accommodate the thickness of the multilayer sheet or of the multiple sheets).

Décor sheet 48 is removably mounted on the front side of backing plate 72. By this is meant that décor sheet can be removed from backing plate 72 manually, by the fingers of a user, without the use of any special tools of any kind. Similarly, décor sheet can be mounted onto backing plate 72, manually without the use of any special tools. The mounting of décor sheet 48 to backing plate 72 may be by any convenient arrangement that retains décor sheet 48 securely in place, and yet allows décor sheet 48 to be removed by a user (e.g., when it is desired to replace a particular décor sheet 48 with another décor sheet, e.g. one with a different visual appearance). In some embodiments, décor sheet 48 is mounted to backing plate 72 without the use of any ancillary retaining devices (e.g., one or more of clips, pins, snaps, tabs of adhesive, or the like). That is, in such embodiments décor sheet is held in place without resort to the use of any movable or deformable retaining devices. One such exemplary embodiment of this type is visible in FIG. 4 and in magnified view in FIG. 5. In such an arrangement, backing plate 72 is provided with retaining rails 301 on two opposing major edges (edges 173, which will be referred to herein as mounting edges for convenience). Retaining rails 301 are mounted on the front side of backing plate 72 in spaced relation thereto (e.g., by way of a strip of double-faced adhesive tape 302 of desired thickness) with a portion of retaining rail 301 overhanging (protruding inwardly beyond) an inward edge 303 of adhesive tape 302 so as to define a space 305 between an inward portion of rail 301, and forward surface 175 of backing plate 72. When décor sheet 48 is appropriately bowed (e.g. as depicted in Fig. 4) a major edge 62 of sheet 48 can be inserted at least partially into space 305 as seen in exemplary embodiment in FIG. 5. A chamfered surface 304 can be provided at or near the inward edge of rail 301 (as shown in the embodiment of FIG. 5) to facilitate insertion of edge 62 of sheet 48, sufficiently far into space 305. In fact, in some embodiments at least a portion of major edge 62 of décor sheet 48, may contact a portion of an exposed inward edge 303 of the adhesive tape 302. This contact may provide extra friction that enhances the retaining of décor sheet 48 in place. While this effect may be most obvious e.g. when adhesive tape 302 is comprised only of a strip of pressure-sensitive adhesive (so that exposed inward edge 303 of the tape comprises a pressure-sensitive adhesive property), the effect may occur even if, e.g., the tape comprises a foam backing. That is, the roughness of an exposed edge of a foam tape backing may provide at least some friction to advantageous effect.

The dimensions of space 305 may be chosen in view of e.g. the thickness of décor sheet 48 and the angle at which it is desired to have major edges 62 of sheet 48 seated in space 304. In various embodiments the thickness (meaning in the forward-rearward direction as defined herein, which is the up and down direction in the view of FIG. 5) of the narrowest portion of space 305 (i.e., the outwardmost (unchamfered) portion) may be from about 1.5, 2.0, or 2.5 times the thickness of sheet 48, to about 5, 4, or 3 times the thickness of sheet 48. In various embodiments, the chamfer angle of chamfered surface 304 may be from at least about 15, 20, 25, or 30 degrees (measured relative to the major plane of surface 175 of backing plate 72) to at most about 50, 45, 40, or 35 degrees.

If desired, some or all of the surfaces of rails 301 that would otherwise be visible may be covered by a decorative skin 307 (in the exemplary embodiment shown in FIG. 5, decorative skin 307 also covers edges of backing plate 72 and adhesive strip 302 that might otherwise be visible at least from some angles).

It will thus be appreciated that arrangements of this general type can allow décor sheet 48 to be mounted and retained on backing plate 72 (e.g. as shown in FIG. 4) without the use of any ancillary fastening devices, tools, or the like, as mentioned above. In some embodiments a retaining feature (e.g. a protrusion such as a post, pin or knob) may be provided that occupies a portion of space 305 (such a retaining feature 306 is visible in the partial cutaway view of FIG. 6). A notch 308 may be provided in an edge 62 of décor sheet 48 (sheet 48 is shown in FIG. 6 in the process of being moved toward a retaining rail, as indicated by the block arrow) that mates with retaining feature 304 and that enhances the retaining of décor sheet 48 in place. In particular, if décor sheet 48 is mounted in the orientation shown in the FIGs. herein (in which side edges of the décor sheet 48 are the mounting edges) such features may enhance the ability of décor sheet 48 to resist being dislodged downward by gravity. Any such combination of features of décor sheet 48 and retaining rails 301 may be used, of any suitable design.

In some embodiments, cavity 151 may be open at one or both of the ends that are not mated to rails 301 (e.g. cavity 151 may be open at the top and/or bottom as seen in FIGs. 1 and 2). In other embodiments, an endcap 400 (as depicted in exemplary embodiment in FIG. 7) may be present at one or both such ends that partially or completely blocks light from passing therethrough. In some embodiments, the endcap may be provided by a sheet of enhanced specular reflector (ESR). In some particular embodiments, as shown e.g. in FIG. 7, the endcap may be provided by a perforated sheet, e.g. a perforated ESR sheet as shown in exemplary embodiment in FIG. 7. Such an endcap may be e.g. permanently or removably mounted to backing plate 72, in any suitable manner.

Returning to FIGS. 2 and 3, remaining components of the décor system 20 can assume a wide variety of forms, such as any of the descriptions set forth in U.S. Application Serial No. 14/293,885. The base 24 can have any format conducive to selective mounting of the décor unit 22. In other embodiments, the base 24 can be omitted (e.g., the décor unit 22 is directly mounted to a wall surface via the two-part releasable fastening unit 26). The two-part releasable fastening unit 26 can also assume a multitude of formats appropriate for effectuating releasable mounting of the base 24 and/or the décor unit 22 relative to a wall surface, including any of the formats described in U.S. Application Serial No. 14/293,885. The releasable fastening unit 26 generally includes a plurality of first fastening elements provided with the releasable fastening structure 320 (provided with or carried by the base 24) and a plurality of second fastening elements provided with complementary fastening structures 322. The first and second fastening elements have complementary structures that promote releasable, non-permanent mating there between. For example, the first and second fastening elements can mimic hook-and-loop type fastening systems. During use, the complementary fastening structures 322 are applied to a wall surface to provide a connection surface for the releasable fastening structure 320 (and thus the base 24). The holding power

established by the releasable fastening unit 26 can be in accord with the descriptions of U.S. Application Serial No. 14/293,885 in some embodiments.

Any of the décor unit constructions described above can optionally incorporate a power source in the form of a rechargeable battery pack as described in U.S. Provisional Application Serial No.

62/045999, filed 4 September 2014 and entitled Lighted Decor Units For Use With Removable Wall Decoration Kits, Systems and Methods, which is incorporated by reference herein in its entirety.

Décor system 20 may have any suitable control circuitry (e.g., comprising at least a switch) that may be used to turn the power off and on to the light source 80. In particular embodiments, the switch may be a capacitive switch (which may response to actual touch or may merely response to close physical proximity). In further embodiments, such a switch may have multiple settings, e.g. low, medium, and high light levels. The control circuitry may also include e.g. a timer for automatically turning off the light source after a given time. In particular embodiments, such a timer may repeatedly cycle the light source on and off at desired intervals over a set duration of time.

Lighted décor units, and corresponding wall decorating systems, kits and methods, of the present disclosure provide a marked improvement over previous designs. The appearance of any décor unit can be changed at will simply by replacing a particular arcuate décor sheet 48 with another arcuate décor sheet. Multiple décor units can be provided in a tile-like manner on a portion or on the entirety of e.g. a wall or any other desired surface of a room. The visual appearance of the room may then be quickly and easily strikingly changed merely by changing décor sheets.

In some embodiments, kits may be sold comprising one or more of the other components described herein (e.g., backing plate 72, light source sub-assembly 42, power source 44, backer 46, base 24, and fastening unit 26) along with multiple décor sheets 48 bearing a variety of images, appearances, light-transmission levels, front-side reflectivity, and so on.

List of Exemplary Embodiments

Embodiment 1 is a décor fixture for use with a décor unit of a flexible wall décor system, the décor fixture comprising: a backing plate with a front side and a rear side and that is at least partially reflective to light that impinges on the front side of the backing plate; an arcuate décor sheet that is removably mounted on the front side of the backing plate and that has a front side and a rear side, wherein the arcuate décor sheet is at least partially reflective and partially transmissive, to light that impinges on the rear surface of the arcuate décor sheet, and wherein the arcuate décor sheet and the backing plate at least partially define an at least partially light-reflective cavity therebetween, and, at least one light source positioned proximate the backing plate and that is configured to emit light into the at least partially light-reflective cavity in a direction toward the arcuate décor sheet.

Embodiment 2 is the décor fixture of embodiment 1 wherein the arcuate décor sheet is comprised of thermoplastic polymeric resin that includes at least some semi-reflective filler particles. Embodiment 3 is the décor fixture of any of embodiments 1-2 wherein at least a portion of a rear surface of the rear side of the arcuate décor sheet comprises a semi-reflective coating disposed thereon. Embodiment 4 is the décor fixture of any of embodiments 1-3 wherein the backing plate is comprised of thermoplastic

polymeric resin that includes at least some semi-reflective filler particles. Embodiment 5 is the décor fixture of any of embodiments 1-4 wherein at least a portion of a front surface of the front side of the backing plate comprises a semi-reflective coating disposed thereon. Embodiment 6 is the décor fixture of any of embodiments 1-5 wherein at least a portion of a front surface of the front side of the arcuate décor sheet comprises an image disposed thereon.

Embodiment 7 is the décor fixture of any of embodiments 1-6 wherein the at least one light source comprises at least one LED. Embodiment 8 is the décor fixture of any of embodiments 1-7 wherein the at least one light source consists essentially of a single LED that is at least substantially centrally located relative to a perimeter of the backing plate.

Embodiment 9 is the décor fixture of any of embodiments 1-8 wherein when the arcuate décor sheet is removably mounted on the front side of the backing plate the arcuate décor sheet exhibits a radius of curvature that is less than about 1 meter. Embodiment 10 is the décor fixture of any of embodiments 1-9 wherein when the arcuate décor sheet is a single one-layer sheet. Embodiment 11 is the décor fixture of any of embodiments 1-9 wherein the arcuate décor sheet is a multilayer sheet comprised of layers that are permanently laminated to each other. Embodiment 12 is the décor fixture of any of embodiments 1-9 wherein when the arcuate décor sheet comprises a multilayer assembly, the layers of which assembly are in the form of a multilayer stack but which layers are not attached to each other.

Embodiment 13 is the décor fixture of any of embodiments 1-12 wherein the backing plate comprises first and second retaining rails on first and second opposing major mounting edges of the backing plate, each retaining rail being non-removably attached to a front side of the backing plate so as to define a cavity between at least a portion of a rearward surface of the retaining rail and a portion of a forward surface of the backing plate, into each which cavity a major edge of the arcuate décor sheet is insertable so as to removably mount the arcuate décor sheet on the front side of the backing plate.

Embodiment 14 is the décor fixture of embodiment 13 wherein each retaining rail comprises an inwardmost portion that exhibits a chamfered surface against which a portion of a major surface of the arcuate décor sheet rests when the arcuate décor sheet is removably mounted on the front side of the backing plate.

Embodiment 15 is the décor fixture of embodiment 13 wherein the first and second retaining rails are each mounted on a front side of the backing plate by way of an adhesive strip, the thickness of which adhesive strip determines a thickness of at least a non-chamfered portion of the cavity into which the major edge of the arcuate décor sheet is insertable. Embodiment 16 is the décor fixture of embodiment 15 wherein each adhesive strip exhibits an exposed inward edge surface with which at least a portion of the major edge of the arcuate décor sheet comes into contact when the major edge of the arcuate décor sheet is inserted into the cavity to removably mount the arcuate décor sheet on the front side of the backing plate.

Embodiment 17 is the décor fixture of any of embodiments 1-16 wherein the décor fixture, when viewed from the front, exhibits an at least substantially square shape with a first set of two major opposing edges that correspond to the mounting edges of the backing plate and that each comprises a

retaining rail, and a second set of two major opposing edges that are each oriented perpendicular to the edges of the first set, and wherein the second set of two major opposing edges are unsealed edges so that along these edges, an unoccluded gap is present between the edge of the arcuate décor sheet and the edge of the backing panel.

Embodiment 18 is the décor fixture of any of embodiments 1-17 wherein the décor fixture, when viewed from the front, exhibits an at least substantially square shape with a first set of two major opposing edges that correspond to the mounting edges of the backing plate and that each comprises a retaining rail, and a second set of two major opposing edges that are each oriented perpendicular to the edges of the first set, and wherein the second set of two major opposing edges are occluded by an endcap that, along the length of each edge, extends from the front surface of the backing plate to the rear surface of the arcuate décor layer, and wherein the endcap comprises a sheet material that is at least partially reflective to light that impinges on the endcap from a direction within the cavity.

Embodiment 19 is a décor unit for use with a flexible wall décor system, the décor unit comprising: the décor fixture of any of embodiments 1-18, at least one light source that is proximate the back plate and that is at least generally centrally located relative to the perimeter of the back plate and that is oriented so as to emit light toward and onto the rear side of the arcuate décor sheet; a power source for powering the at least one light source; and a backer secured to the décor fixture. Embodiment 20 is the décor unit of embodiment 19, wherein the at least one light source consists essentially of a single LED that is at least substantially centrally located relative to a perimeter of the backing plate.

Embodiment 21 is a décor system comprising the décor unit of embodiment 19; and a base that is detachably fastenable to a wall and to which base the décor unit is detachably connectable. Embodiment 22 is the décor system of embodiment 21 wherein the décor unit is detachably connectable to the base by way of one or more magnets provided on the backer of the décor unit, and one or more complementary magnets provided on the base. Embodiment 23 is the décor system of embodiment 21 wherein the base is detachably fastenable to the wall by way of a two-part releasable fastening unit that includes at least one strip of double-faced adhesive.

It will be apparent to those skilled in the art that the specific exemplary elements, structures, features, details, configurations, etc., that are disclosed herein can be modified and/or combined in numerous embodiments. All such variations and combinations are contemplated by the inventor as being within the bounds of the conceived invention, not merely those representative designs that were chosen to serve as exemplary illustrations. Thus, the scope of the present invention should not be limited to the specific illustrative structures described herein, but rather extends at least to the structures described by the language of the claims, and the equivalents of those structures. Any of the elements that are positively recited in this specification as alternatives may be explicitly included in the claims or excluded from the claims, in any combination as desired. Any of the elements or combinations of elements that are recited in this specification in open-ended language (e.g., comprise and derivatives thereof), are considered to additionally be recited in closed-ended language (e.g., consist and derivatives thereof) and in partially closed-ended language (e.g., consist essentially, and derivatives thereof). To the extent that there is any

conflict or discrepancy between this specification as written and the disclosure in any document incorporated by reference herein, this specification as written will control.

What is claimed is:

1. A décor fixture for use with a décor unit of a flexible wall décor system, the décor fixture comprising:
 - 5 a backing plate with a front side and a rear side and that is at least partially reflective to light that impinges on the front side of the backing plate;
an arcuate décor sheet that is removably mounted on the front side of the backing plate and that has a front side and a rear side,
wherein the arcuate décor sheet is at least partially reflective and partially transmissive, to
10 light that impinges on the rear surface of the arcuate décor sheet, and
wherein the arcuate décor sheet and the backing plate at least partially define an at least partially light-reflective cavity therebetween,
and,
at least one light source positioned proximate the backing plate and that is configured to emit
15 light into the at least partially light-reflective cavity in a direction toward the arcuate décor sheet.
2. The décor fixture of claim 1 wherein the arcuate décor sheet is comprised of thermoplastic polymeric resin that includes at least some semi-reflective filler particles.
- 20 3. The décor fixture of claim 1 wherein at least a portion of a rear surface of the rear side of the arcuate décor sheet comprises a semi-reflective coating disposed thereon.
4. The décor fixture of claim 1 wherein the backing plate is comprised of thermoplastic polymeric resin that includes at least some semi-reflective filler particles.
25
5. The décor fixture of claim 1 wherein at least a portion of a front surface of the front side of the backing plate comprises a semi-reflective coating disposed thereon.
6. The décor fixture of claim 1 wherein at least a portion of a front surface of the front side of the
30 arcuate décor sheet comprises an image disposed thereon.
7. The décor fixture of claim 1 wherein the at least one light source comprises at least one LED.
8. The décor fixture of claim 1 wherein the at least one light source consists essentially of a single
35 LED that is at least substantially centrally located relative to a perimeter of the backing plate.

9. The décor fixture of claim 1 wherein when the arcuate décor sheet is removably mounted on the front side of the backing plate the arcuate décor sheet exhibits a radius of curvature that is less than about 1 meter.

10. The décor fixture of claim 1 wherein when the arcuate décor sheet is a single one-layer sheet.

11. The décor fixture of claim 1 wherein the arcuate décor sheet is a multilayer sheet comprised of layers that are permanently laminated to each other.

12. The décor fixture of claim 1 wherein when the arcuate décor sheet comprises a multilayer assembly, the layers of which assembly are in the form of a multilayer stack but which layers are not attached to each other.

13. The décor fixture of claim 1 wherein the backing plate comprises first and second retaining rails on first and second opposing major mounting edges of the backing plate, each retaining rail being non-removably attached to a front side of the backing plate so as to define a cavity between at least a portion of a rearward surface of the retaining rail and a portion of a forward surface of the backing plate, into each which cavity a major edge of the arcuate décor sheet is insertable so as to removably mount the arcuate décor sheet on the front side of the backing plate.

14. The décor fixture of claim 13 wherein each retaining rail comprises an inwardmost portion that exhibits a chamfered surface against which a portion of a major surface of the arcuate décor sheet rests when the arcuate décor sheet is removably mounted on the front side of the backing plate.

15. The décor fixture of claim 13 wherein the first and second retaining rails are each mounted on a front side of the backing plate by way of an adhesive strip, the thickness of which adhesive strip determines a thickness of at least a non-chamfered portion of the cavity into which the major edge of the arcuate décor sheet is insertable.

16. The décor fixture of claim 15 wherein each adhesive strip exhibits an exposed inward edge surface with which at least a portion of the major edge of the arcuate décor sheet comes into contact when the major edge of the arcuate décor sheet is inserted into the cavity to removably mount the arcuate décor sheet on the front side of the backing plate.

17. The décor fixture of claim 1 wherein the décor fixture, when viewed from the front, exhibits an at least substantially square shape with a first set of two major opposing edges that correspond to the mounting edges of the backing plate and that each comprises a retaining rail, and a second set of two major opposing edges that are each oriented perpendicular to the edges of the first set, and wherein the

second set of two major opposing edges are unsealed edges so that along these edges, an unoccluded gap is present between the edge of the arcuate décor sheet and the edge of the backing panel.

18. The décor fixture of claim 1 wherein the décor fixture, when viewed from the front, exhibits an at least substantially square shape with a first set of two major opposing edges that correspond to the mounting edges of the backing plate and that each comprises a retaining rail, and a second set of two major opposing edges that are each oriented perpendicular to the edges of the first set, and wherein the second set of two major opposing edges are occluded by an endcap that, along the length of each edge, extends from the front surface of the backing plate to the rear surface of the arcuate décor layer, and wherein the endcap comprises a sheet material that is at least partially reflective to light that impinges on the endcap from a direction within the cavity.

19. A décor unit for use with a flexible wall décor system, the décor unit comprising:
the décor fixture of claim 1,
at least one light source that is proximate the back plate and that is at least generally centrally located relative to the perimeter of the back plate and that is oriented so as to emit light toward and onto the rear side of the arcuate décor sheet;
a power source for powering the at least one light source; and
a backer secured to the décor fixture.

20. The décor unit of claim 19, wherein the at least one light source consists essentially of a single LED that is at least substantially centrally located relative to a perimeter of the backing plate.

21. A décor system comprising,
the décor unit of claim 19; and
a base that is detachably fastenable to a wall and to which base the décor unit is detachably connectable.

22. The décor system of claim 21 wherein the décor unit is detachably connectable to the base by way of one or more magnets provided on the backer of the décor unit, and one or more complementary magnets provided on the base.

23. The décor system of claim 21 wherein the base is detachably fastenable to the wall by way of a two-part releasable fastening unit that includes at least one strip of double-faced adhesive.

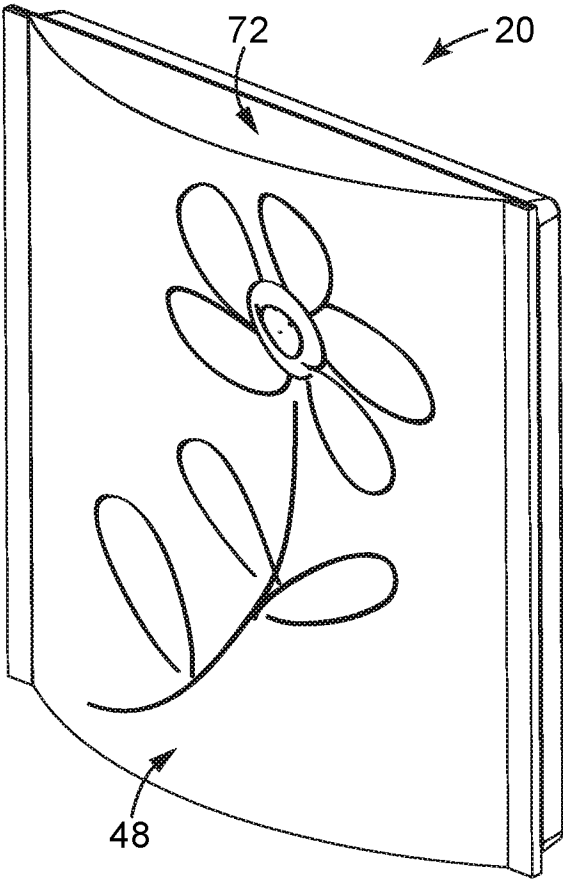


Fig. 1

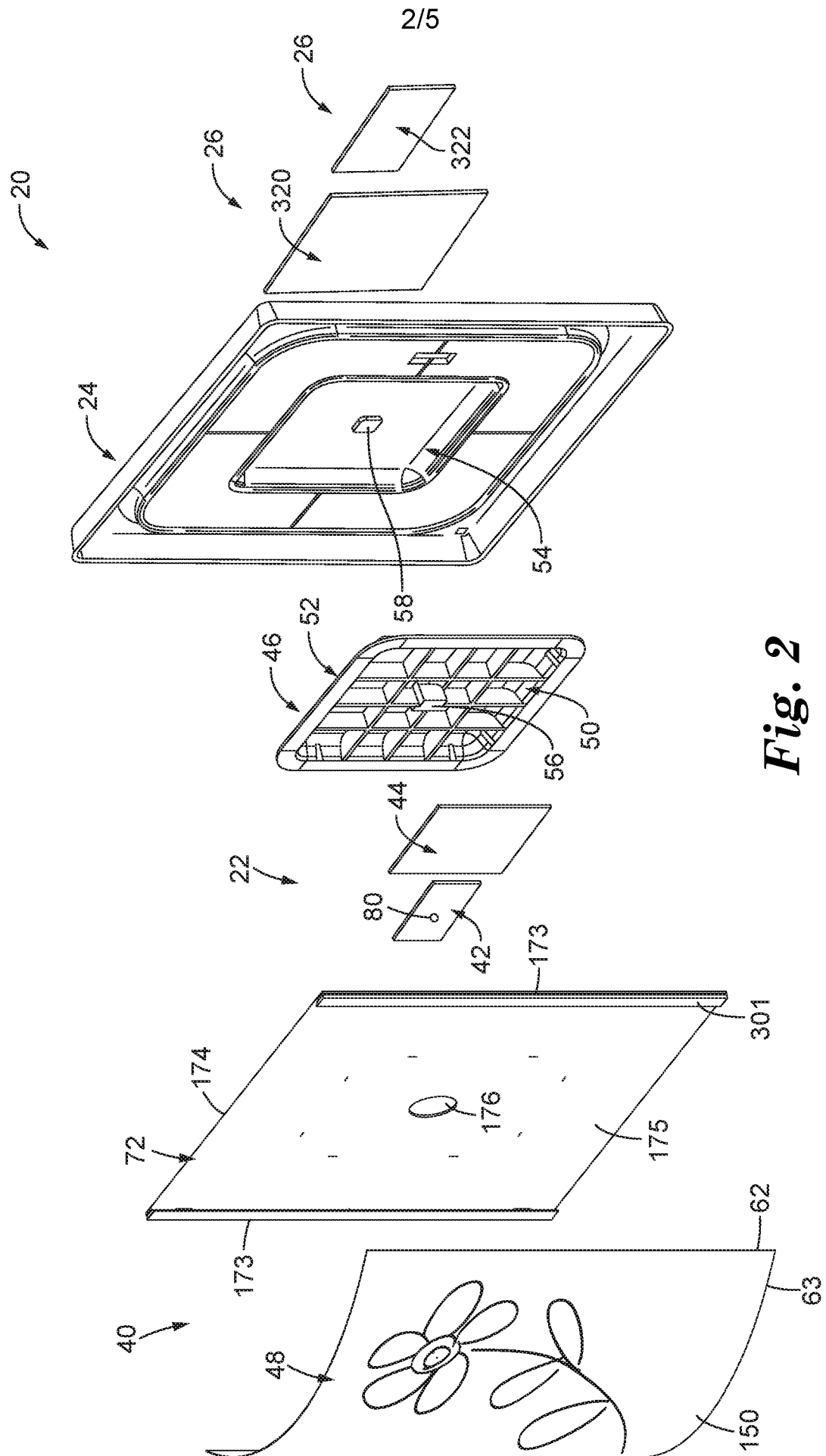


Fig. 2

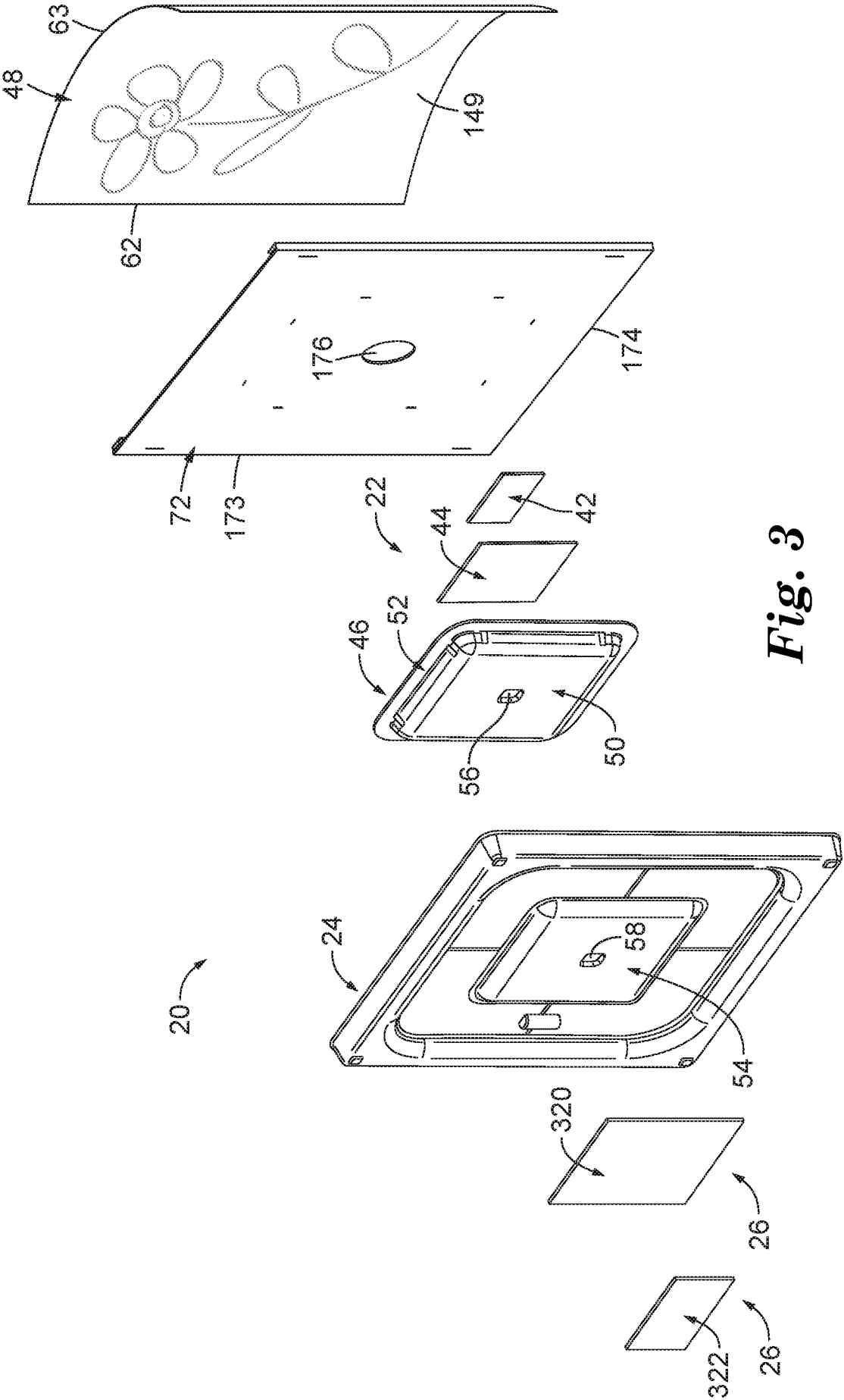


Fig. 3

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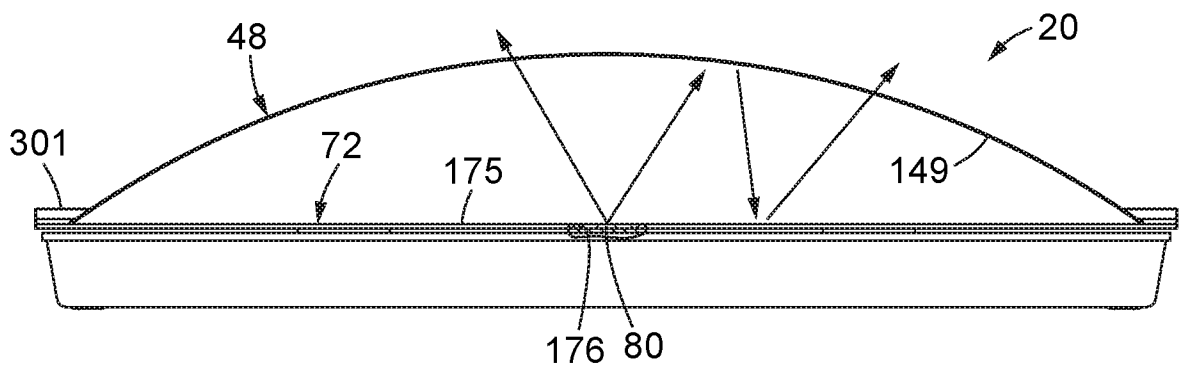


Fig. 4

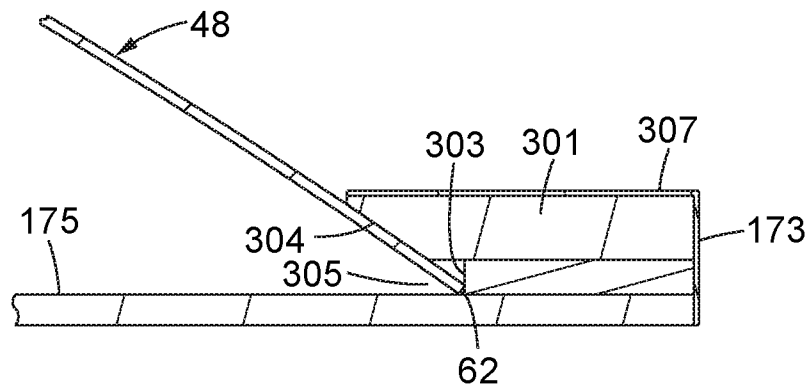


Fig. 5

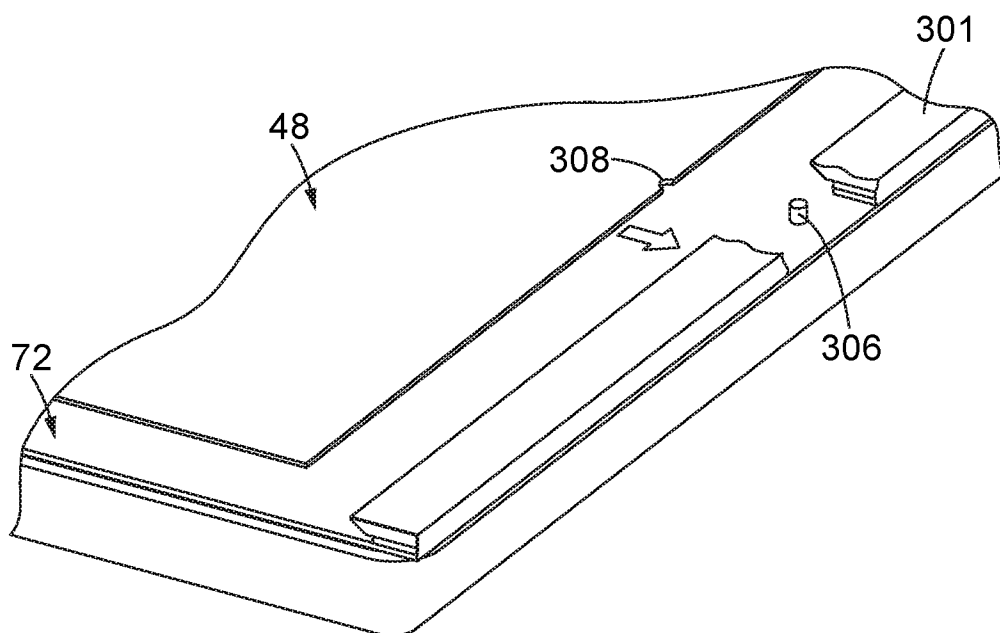


Fig. 6

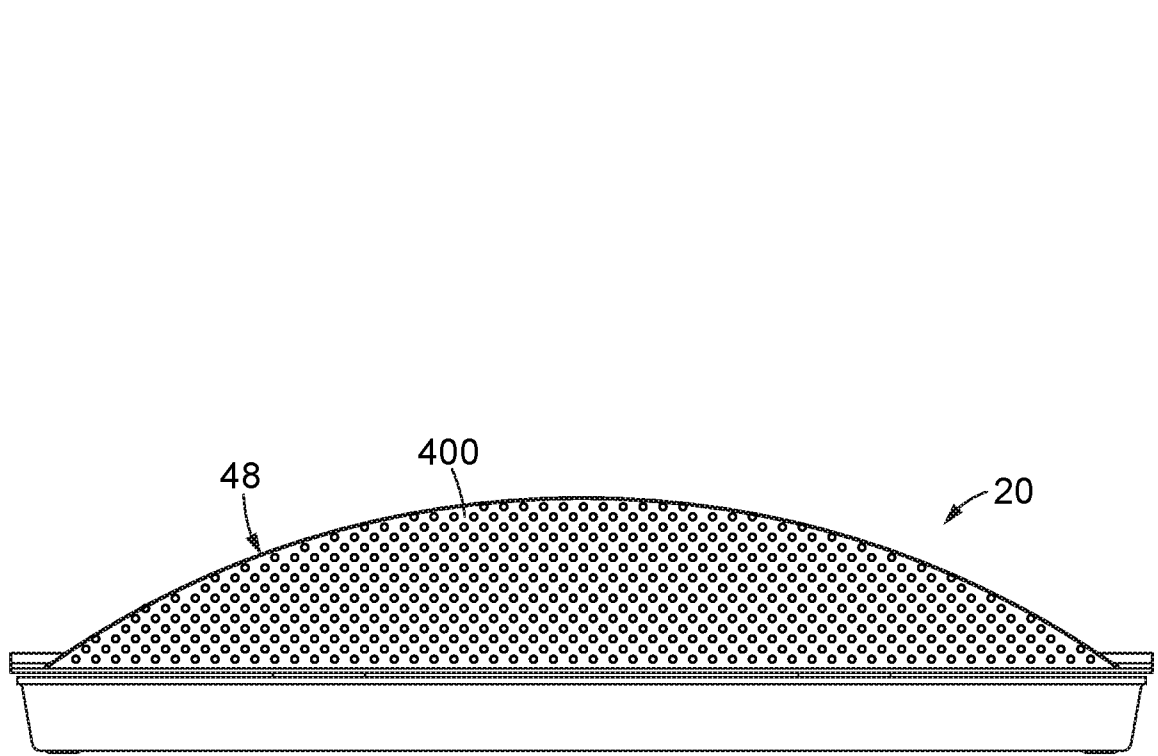


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2016/025573**A. CLASSIFICATION OF SUBJECT MATTER****B44C 5/04(2006.01)i, B44C 5/02(2006.01)i, A47G 1/16(2006.01)i, F21Y 115/10(2016.01)i**

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B44C 5/04; F21V 33/00; A47G 1/16; G09F 13/04; A47G 1/06; B44C 5/08; G09F 13/22; G09F 13/20; B44C 5/02; F21Y 115/10

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: decor, wall, arcuate, light, led, plate, sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2009-0130723 A (MIN, EUN HONG) 24 December 2009 See abstract; paragraphs [10]-[13]; claim 1; and figures 1-4.	1-23
Y	US 2014-0353455 A1 (3M INNOVATIVE PROPERTIES COMPANY) 4 December 2014 See abstract; paragraphs [0010], [0075], [0083]-[0100], [0127], [0141], [0143]; claim 1; and figures 1-28B.	1-23
A	KR 10-2012-0017239 A (LEE, SOOK YI) 28 February 2012 See abstract; paragraphs [0014]-[0022]; claims 1, 4; and figures 1, 2.	1-23
A	US 5566483 A (OGREN, A. R.) 22 October 1996 See abstract; column 1, lines 60-67; column 2, lines 10-67; claim 1; and figures 1-3.	1-23
A	JP 2001-130199 A (TOKAI RIKI CO., LTD.) 15 May 2001 See abstract; claims 1-4; and figure 1.	1-23



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"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

"&" document member of the same patent family

Date of the actual completion of the international search

28 September 2016 (28.09.2016)

Date of mailing of the international search report

28 September 2016 (28.09.2016)

Name and mailing address of the ISA/KR

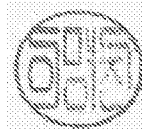
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2016/025573

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