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DECORATIVE PLATE, COVER PLATE AND ELECTRONIC DEVICE

Abstract

A decorative plate comprises a substrate and a texture layer disposed on the substrate. The texture layer comprises multiple texture units. The multiple texture units comprise multiple first linear textures disposed at intervals in a first direction, and each of the first linear textures comprises, in a first extension direction thereof, multiple first linear texture sub-segments connected to each other. The multiple first linear texture sub-segments are bent in a same first bending direction in the plane where the texture layer is located, and the first bending direction is different from the first extension direction of the first linear textures. The first extension direction of the first linear textures is different from the first direction.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation application of International Patent Application No. PCT/CN2023/108426, filed on Jul. 20, 2023, which is based on and claims priority to and benefits of Chinese Patent Application No. 202211392400.2 filed on Nov. 8, 2022. The entire content of all of the above-referenced applications is incorporated herein by reference.

FIELD

[0002] The present disclosure relates to the field of decoration, and in particular, to decorative plate, cover plate, and electronic device.

BACKGROUND

[0003] In the related art, the texture of the electronic device appearance decoration is relatively monotonous, and the appearance expression is insufficient, especially the change of light and shadow effects is monotonous, which cannot meet the needs of consumers. The industry often solves the above problems by simply changing the arrangement direction of the texture and the trend of the texture, or superimposing two different textures. However, the current superimposed textures are mostly the simple superposition of two groups of strip textures with convex or concave structures, which are interwoven to form two groups of different continuous light and shadow effects. Not only are the overall light and shadow effects still relatively monotonous, but also Moire lines are prone to appear, which seriously affects the appearance.

SUMMARY

[0004] In view of this, the present disclosure provides a decorative plate, the surface of which is provided with a special micro-nano texture structure, which allows light and shadow to flow within each texture unit when the user changes the viewing angle, and the three-dimensional effect is strong, thereby exhibiting a good decorative effect.

[0005] In some embodiments, the first aspect of the present disclosure provides a decorative plate, including a substrate and a texture layer disposed on the substrate. The texture layer comprises multiple texture units. The multiple texture units comprise multiple first linear textures disposed at intervals in a first direction, and each of the first linear textures comprises, in a first extension direction thereof, multiple first linear texture sub-segments connected to each other. The multiple first linear texture sub-segments are bent in a same first bending direction in the plane where the texture layer is located, and the first bending direction is different from the first extension direction of the first linear textures. The first extension direction of the first linear textures is different from the first direction.

[0006] Each first linear texture sub-segment is bent in the same bending direction in the plane where the texture layer is located to present a curved shape, which results in different reflection and scattering abilities of the first linear texture sub-segment towards the same light source at different positions. Therefore, the light and shadow effects at different positions of the first linear texture sub-segment are different. And within the single first linear texture, the light and shadow can also exhibit a flow effect in the extension direction of the first linear texture. The interior of each texture unit is provided with first linear textures arranged at intervals in the first direction, so that the superposition effect makes each texture unit show a clear effect of light and shadow flowing in the

first direction, and after the multiple texture units are superimposed, the decorative plate can show a gorgeous light and shadow effect, with rich texture, high visual recognition and less prone to Moire patterns.

[0007] A second aspect of the present disclosure provides a cover plate, including the decorative plate and the substrate provided in the first aspect of the present disclosure, wherein the decorative plate is disposed on the surface of the substrate.

[0008] A third aspect of the present disclosure provides an electronic device, including the cover plate provided in the second aspect of the present disclosure.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a schematic diagram of a cross-sectional structure of the decorative plate according to an embodiment of the present disclosure.

[0010] FIG. 2A is a top view schematic diagram of the texture unit in the decorative plate according to an embodiment of the present disclosure.

[0011] FIG. 2B is a top view schematic diagram of interior structure of the same texture unit observed from different perspectives in the decorative plate provided in an embodiment of the present disclosure;

[0012] FIG. 2C is a top view schematic diagram of the texture unit with the first thin light column in the decorative plate according to an embodiment of the present disclosure.

[0013] FIG. 3 is a top view schematic diagram of the first linear texture in an embodiment of the present disclosure;

[0014] FIG. 4A is a gray scale diagram of the first linear texture sub-segment according to an embodiment of the present disclosure.

[0015] FIG. 4B is a cross-sectional view of the first linear texture sub-segment according to an embodiment of the present disclosure;

[0016] FIG. 4C is a top view of the first linear texture provided with the strip texture on the surface thereof in the decorative plate according to an embodiment of the present disclosure;

[0017] FIG. 4D is a front view of the first linear texture provided with the strip texture on the surface thereof in the decorative plate according to an embodiment of the present disclosure;

[0018] FIG. 4E is a right side view of the first linear texture provided with the strip texture on the surface thereof in the decorative plate according to an embodiment of the present disclosure;

[0019] FIG. 5A is a top view schematic diagram of the texture unit in the decorative plate according to another embodiment of the present disclosure.

[0020] FIG. 5B is an enlarged view of a partial area of FIG. 5A;

[0021] FIG. 6A is a top view schematic diagram of the second linear texture according to an embodiment of the present disclosure.

[0022] FIG. 6B is a top view schematic diagram of the second linear texture within the texture unit provided with the second thin light column according to an embodiment of the present disclosure.

[0023] FIGS. 7A-7B are partial enlarged views of the texture unit in the decorative plate according to another embodiment of the present disclosure;

[0024] FIG. 8A is a top view schematic diagram of the texture unit in the decorative plate according to an embodiment of the present disclosure.

[0025] FIG. 8B is a top view schematic diagram of another texture unit in the decorative plate according to an embodiment of the present disclosure.

[0026] FIG. 9A is a top view schematic diagram of another texture unit in the decorative plate according to another embodiment of the present disclosure.

[0027] FIG. 9B is an enlarged view of a partial area of FIG. 9A;

[0028] FIG. **10** is a top view schematic diagram of another texture unit in the decorative plate according to an embodiment of the present disclosure.

[0029] FIG. **11** is a top view schematic diagram of the decorative plate according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0030] An embodiment of the present disclosure provides a decorative plate **100**, including a substrate **10** and a texture layer **20** arranged/disposed on the substrate **10**. The texture layer **20** includes multiple texture units **21**. Referring to FIG. **1**, the texture units **21** include multiple first linear textures **22** arranged at intervals in a first direction, and the multiple first linear textures **22** are arranged at intervals in parallel. Referring to FIGS. **2A-2B** and FIG. **3**, each first linear texture **22** includes, in an extension direction thereof (e.g., a first extension direction), multiple connected first linear texture sub-segments **221**, and the multiple first linear texture sub-segments **221** are connected end to end. The multiple first linear texture sub-segments **221** are bent in the same bending direction (e.g., a first bending direction) in the plane where the texture layer **20** is located, and the bending direction is different from the extension direction of the first linear texture **22**. The extension direction of the first linear texture **22** is different from the first direction.

[0031] The first linear texture sub-segment **221** is bent in the plane where the texture layer **20** is located, and at this time, each first linear texture sub-segment **221** is “lying flat” on the substrate **10**. The multiple first linear texture sub-segments **221** are bent in the same bending direction, so that a single first linear texture **22** includes multiple curved first linear texture sub-segments connected end to end. For example, the first linear texture sub-segment **221** mentioned above can be arc-shaped, parabolic-shaped, arched-shaped, etc. It should be noted that in the present disclosure, each first linear texture sub-segment **221** in the single texture unit **21** is bent in the same bending direction, which means that the bending direction of the each first linear texture sub-segment **221** is the same, taking the starting point of the first linear texture **22** as the origin, and the extension direction as the positive half-axis of the x-axis, a Cartesian coordinate system is established with the direction perpendicular to the x-axis in the texture layer **20** as the y-axis, so that each linear texture sub-segments **221** in the single first linear texture **22** is bent in the first quadrant or the fourth quadrant of the xOy coordinate system. Under this general premise, the relative positions of the orthographic projections of the highest point of curvature of each first linear texture sub-segment **221** on the line connecting its head end and tail end may be the same or different. It can be understood that the bending directions of the first linear texture sub-segments **221** of different texture units **21** may be the same or different.

[0032] The extension direction of the first linear texture **22** is different from the first direction, for example, the direction of the connecting line between the head end and tail end of the single first linear texture **22** is different from the first direction. In some embodiments, the extension direction of the first linear texture **22** is perpendicular or approximately perpendicular to the first direction, and the approximately perpendicular means that the angle between the two may be in the range of 80°-100°. It should be noted that the “first direction” mentioned above is relative to the single texture unit **21**, and the first direction of different texture units **21** may be the same or different.

[0033] In some embodiments of the present disclosure, in the first direction, continuous multiple adjacent first linear texture sub-segments **221** form a single first thin light column. The interior of the texture unit **21** is provided with first linear textures **22** arranged at intervals in the first direction, and continuous multiple adjacent first linear texture sub-segments **221** with the same bending direction can form the single first thin light column (see FIG. **2C**), and when natural light is irradiated, the decorative plate **100** can be slightly swung, the light and shadow can flow in the single first thin light column. The interior of each texture unit **21** is further provided with multiple first thin light columns continuously arranged in the extension direction of the first linear texture **22** without intervals, such a superimposed effect makes each texture unit **21** exhibit a clear effect of the light and shadow flowing in the first direction, and after the multiple texture units **21** are

superimposed, the decorative plate **100** can exhibit a gorgeous light and shadow effect, with rich texture and high visual recognition.

[0034] In some embodiments of the present disclosure, the texture unit further includes multiple second linear textures **23** arranged at intervals in the second direction (see FIGS. 5A-5B). Referring to FIG. 6A, each second linear texture **23** includes, in an extension direction thereof (e.g., a second extension direction), multiple connected second linear texture sub-segments **231**, the multiple second linear texture sub-segments **231** are connected end to end, the multiple second linear texture sub-segments **231** are bent in the same bending direction (e.g., a second bending direction) in the plane where the texture layer **20** is located, and the bending direction is different from the extension direction of the second linear texture **23**. The extension direction of the second linear texture **23** is different from the second direction. The extension direction of the second linear texture **23** is a direction where the connecting line of the head end and tail end of the second linear texture **23** is located. The internal structure of the second linear texture **23** is similar to the internal structure of the first linear texture **22**, and will not be repeated here. In an embodiment, within a single texture unit **21**, the second linear texture **23** is arranged at parallel intervals in the second direction. Within the second linear texture **23**, the “curvature” of the curved shape of the second linear texture sub-segment **231** may be the same as or different from that of the first linear texture sub-segment **221**. If the extension direction and the arrangement direction of the first linear texture **22** and the second linear texture **23** are different, then each first linear texture sub-segment **221** will intersect with at least one second linear texture sub-segment **231**, and each second linear texture sub-segment **231** will also intersect with at least one first linear texture sub-segment **221**, so that the texture layer **20** has a pattern superposition effect of the two textures. Because the extension direction and arrangement direction of the two linear textures are different, there must be some differences in the refraction and reflection effects of the same light source, not to mention the different flow directions of the light and shadow within the two texture structures. Therefore, the decorative plate **100** can present a cool effect of superimposed changes of the light and shadow of the two textures, and better avoid homogenization of appearance.

[0035] When the first linear texture sub-segment **221** and the second linear texture sub-segment **231** intersect, it can be understood that the intersection of the first linear texture sub-segment **221** and the second linear texture sub-segment **231** is not interrupted, but superimposing the two linear textures at the intersection, and the adaptation processing is performed to ensure the original outer contour of the first linear texture sub-segment **221** or the second linear texture sub-segment **231** remains unchanged. For example, both the first linear texture sub-segment **221** and the second linear texture sub-segment **231** are solid objects with a certain height, and assuming that they are respectively placed in a three-dimensional coordinate system, the coordinates of any point on the outer surface of the first linear texture sub-segment **221** are (x, y, z), the coordinates of any point on the outer surface of the second linear texture sub-segment **231** are (a, b, c), when $x=a$ and $y=b$, if $z>c$, the final height of the linear texture is z at the intersection (x, y) of the two, at this time, the intersection is connected with the outline of the first linear texture sub-segment **221**, forming a complete first linear texture sub-segment **221**, the second linear texture sub-segment **231** is fused into the first linear texture sub-segment **221** (see FIG. 7A). If when $c>z$, $x=a$ and $y=b$, the final height of the linear texture is c at the intersection (x, y) of the two, similarly, the intersection is connected with the outline of the second linear texture sub-segment **231**, forming a complete second linear texture sub-segment **231** in which the first linear texture sub-segment **221** is fused (see FIG. 7B). If when $x=a$, $y=b$ and $c=z$, it can be arbitrarily selected. Those skilled in the art can also adopt other treatment methods to achieve the effects of the present disclosure. Benefiting from the superposition treatment, the decorative plate **100** provided by the present disclosure is less prone to Moire patterns, has good integrity of textures, without a sense of fragmentation caused by simple superposition of two textures, and has good appearance recognition and ornamental properties.

[0036] In some embodiments of the present disclosure, in the second direction, continuous multiple adjacent second linear texture sub-segments **231** form a single second thin light column (see FIG. **6B**). At this time, the interior of texture unit **21** is provided with multiple first fine light column and multiple second fine light column arranged in an intersecting manner, and at this time, the light and shadow flowing effect of the decorative plate **100** is more diverse.

[0037] In some embodiments of the present disclosure, the first linear texture sub-segment **221** is bent in the first direction. The first linear texture sub-segments **221** is bent in the first direction, that is, each first linear texture sub-segment **221** lies on the substrate **10**, and the most obvious direction of the light and shadow flow within the single first thin light column is also parallel to the first direction. At this time, the decorative plate **100** has a more industrial aesthetic feeling. In some embodiments, referring to FIG. **2B**, the first linear texture sub-segment **221** is bent in the first direction, which may be “upward curved” relative to the first direction or “downward curved” relative to the first direction, depending on the viewing angle of the user. Of course, the above changes also apply when each texture unit **21** is only provided with the first linear texture **22** inside.

[0038] In a case where the texture unit **21** further includes the second linear texture **23**, in some embodiments of the present disclosure, the second linear texture sub-segment **231** is bent in the second direction. That is, each second linear texture sub-segment **231** lies on the substrate **10**, and the most obvious direction of the light and shadow flow within the single second thin light column is also parallel to the second direction. Further, the second linear texture sub-segment **231** may be “upward curved” relative to the second direction or may be “downward curved” relative to the second direction. In some embodiments, the first linear texture sub-segment **221** is bent in the first direction and the second linear texture sub-segment **231** is bent in the second direction. At this time, after the two textures are superimposed, the arrangement is more regular, and the flowing rhythm of the light and shadow on the surface of the decorative plate **100** is stronger, with a strong industrial aesthetic.

[0039] In some embodiments of the present disclosure, the first linear texture **22** presents wavy curve. In some embodiments, the second linear texture presents wavy curve when there is the second linear texture **23**. In some embodiments, each first linear texture **22** presents wavy curve and each second linear texture **23** presents wavy curve within the single texture unit **21**. At this time, in the extension direction of the first and second linear texture, the light and shadow flowing effect in the wave shape can be presented.

[0040] In some embodiments of the present disclosure, the angle between the extension direction of the first linear texture **22** and the extension direction of the second linear texture **23** is in the range of 80°-100°. For example, the above angle may be 80°, 85°, 86°, 87°, 88°, 89°, 90°, 91°, 92°, 93°, 94°, 95°, 100°, etc. The extension direction of the first linear texture **22** refers to the direction of a line connecting the head end of the first linear texture sub-segment **221** and the tail end of the last first linear texture sub-segment **221** within the first linear texture **22**. The extension direction of the second linear texture **23** is similar to it, and will not be repeated here. At this time, the superposition effect of the first linear texture **22** and the second linear texture **23** is more obvious, and it is more conducive to avoiding the generation of Moire.

[0041] In the present disclosure, the cross-sectional shape of each linear texture sub-segment can be a triangle, an arch, an arc, a trapezoid, etc., and the cross-sectional width of each linear texture sub-segment gradually decreases from the substrate **10** in the height direction thereof.

[0042] In some embodiments of the present disclosure, some of the continuous multiple first linear textures **22** arranged in the first direction, the multiple first linear texture sub-segments **221** of the multiple first linear textures **22** are arranged at intervals in the first direction, and adjacent end points of the multiple first linear texture sub-segments **221** arranged in the first direction are connected to form a straight line or a curve. Some of the continuous multiple second linear textures **23** arranged in the second direction, the multiple second linear texture sub-segments **231** of the

multiple second linear textures **23** are arranged at intervals in the second direction, and adjacent end points of the multiple second linear texture sub-segments **231** arranged in the second direction are connected to form a straight line or a curve. Referring to FIG. **8A**, taking the first linear texture as an example, the line connecting the end points of the multiple first linear texture sub-segments **221** adjacent in the first direction is the straight line, this refers to the line connecting the head end of the first linear texture sub-segment **1**, the first linear texture sub-segment **2**, . . . , and the first linear texture sub-segment **6** is the straight line, and the line connecting the tail end of the first linear texture sub-segment **1**, the first linear texture sub-segment **2**, . . . , and the first linear texture sub-segment **6** is also a straight line, and this law is also maintained for the other first linear texture sub segments **221** within the first linear texture **22**. Referring to FIG. **8B**, the line connecting the end points of the multiple first linear texture sub-segments **221** adjacent in the first direction is the curve, this refers to the line connecting the head end of the first linear texture sub-segment **1**, the first linear texture sub-segment **2**, . . . , and the first linear texture sub-segment **6** is the curve, and the line connecting the tail end of the first linear texture sub-segment **1**, the first linear texture sub-segment **2**, . . . , and the first linear texture sub-segment **6** is also the curve, and this law is also maintained for the other first linear texture sub-segments **221** within the first linear texture **22**. It can also be understood that the first linear textures **22** arranged in the first direction are displaced between each other. The curve may be an arc shape, a parabola shape, a wave shape, etc. At this time, the moving line of light in the single first thin light column is also curved, and the appearance is more diverse, which is conducive to presenting a sparkling feeling. Similarly, similar structural adjustment may be made to the second linear texture **23**, which will not be described herein. In some embodiments, within the single texture unit **21**, the first linear texture **22** in the first direction, the second linear texture **23** in the second direction is arranged in a straight line or in a curved line. In some embodiments, one of the first linear textures **22** in the first direction and the second linear texture **23** in the second direction is arranged in a straight line and the other is arranged in a curved line. In the present disclosure, the decorative plate **100** includes multiple texture units **21**, and the conditions within the multiple texture units **21** can be the same or different, and can be the combination of the above conditions, and those skilled in the art can design according to actual needs. Of course, the above changes also apply when each texture unit is only provided with the first linear texture **22** inside.

[0043] In some embodiments of the present disclosure, the maximum distance from the first linear texture sub-segment **221** and the second linear texture sub-segment **231** to the substrate **10** is each independently in the range of about 0.5 μm -20 μm . For example, the maximum distance from the first linear texture sub-segment **221**, the second linear texture sub-segment **231** to the substrate **10** may each independently be 0.5 μm , 0.6 μm , 0.7 μm , 0.8 μm , 0.9 μm , 1.0 μm , 2 μm , 5 μm , 10 μm , 15 μm , 20 μm , etc. Referring to FIGS. **1**, **3**, and **4B**, taking the first linear texture sub-segment **221** as an example, the maximum distance thereof to the substrate **10** refers to the absolute height h from the lowest point of the contour of the first linear texture **22** to the highest point of the contour thereof. Referring to FIGS. **1**, **3**, and **4A** to **4E**, the maximum distance from the first linear texture sub-segment **221** to the substrate **10** can also be understood as the maximum distance h from the highest point of the cross section to the bottom line of the cross section obtained by cutting the first linear texture sub-segment **221** with a plane perpendicular to the substrate **10** and the extension direction of the first linear texture sub-segment **221**. Of course, the above changes also apply when each texture unit **21** is only provided with the first linear texture **22** inside.

[0044] In some embodiments of the present disclosure, there are at least some texture units **21**, and the maximum distance from each first linear texture sub-segment **221** to the substrate **10** gradually changes in the extension direction of the first linear texture **22**. And/or the maximum distance from each second linear texture sub-segment **231** to the substrate **10** gradually changes in the extension direction of the second linear texture **23**. The above gradual change means that the maximum distance from the single first and second linear texture sub-segment **231** to the substrate **10** is the

same, but the maximum distance from multiple adjacent first linear texture sub-segments **221** to the substrate **10** gradually increases or gradually decreases. The maximum distance change from the second linear texture **23** to the substrate **10** also follows the above principle, and will not be described herein. In some embodiments, the maximum distance from the first linear texture sub-segment **221** to the substrate **10** gradually changes in the extension direction thereof, and the maximum distance from the second linear texture sub-segment **231** to the substrate **10** is unchanged. In some embodiments, the maximum distance from the second linear texture sub-segment **231** to the substrate **10** gradually changes in the extension direction thereof, and the maximum distance from the first linear texture sub-segment **221** to the substrate **10** is unchanged. In some embodiments, the maximum distance from the first and second linear texture to the substrate **10** may be changed or unchanged. Of course, when each texture unit **21** is only provided with the first linear texture **22** inside, the maximum distance from the first linear texture **22** to the substrate **10** may gradually change in the extension direction thereof.

[0045] In some embodiments of the present disclosure, there are at least some texture units **21**, and the maximum distance from the multiple first linear textures **22** to the substrate **10** gradually changes in the first direction. The maximum distance from the multiple second linear textures **23** to the substrate **10** gradually changes in the second direction. In other words, within the single first and/or second thin light column, the maximum distance from each linear texture sub-segment to the substrate **10** gradually increases or gradually decreases. Of course, the above changes also apply when each texture unit **21** is only provided with the first linear texture **22** inside.

[0046] In some embodiments of the present disclosure, there are at least some texture units **21**, and the maximum distance from the multiple first linear texture sub-segments **221** to the substrate **10** gradually increases first and then gradually decreases in the extension direction of the first linear texture sub-segments **221**, or gradually decreases first and then gradually increases. And/or the maximum distance from the multiple second linear texture sub-segments **231** to the substrate **10** gradually increases first and then gradually decreases in the extension direction of the second linear texture sub-segment **231**, or gradually decreases first and then gradually increases. It can be understood that each linear texture sub-segment presents a larger maximum distance from the middle portion to the substrate **10** (the middle portion of the linear texture sub-segment is convex in the direction away from the substrate **10** and in the thickness direction of the substrate **10**), or the maximum distance from both ends to the substrate **10** is larger, so that the visual effect that each linear texture sub-segment is “standing” on the substrate **10** can be presented, and the decorative plate **100** as a whole is more three-dimensional.

[0047] In some embodiments, there are at least some texture units **21**, and the maximum distance change trend of the first linear texture **22** and the second linear texture **23** to the substrate **10** is a combination of the above two variation modes, that is, it gradually changes not only with the extension direction of the first linear texture **22** and the second linear texture **23**, but also gradually changes in the first or second direction. At this time, the light and shadow changes of the decorative plate **100** are more brilliant. Further, on the basis of the above two changes, the above-described height change is superimposed on the single first and second linear texture sub-segments, and at this time, the pattern on the surface of the decorative plate **100** is full of three-dimensional effect.

[0048] In some embodiments of the present disclosure, referring to FIGS. **9A-9B**, the maximum distance from the first linear texture **22** and the second linear texture **23** to the substrate **10** within the single texture unit **21** of at least some texture units **21** is different. The larger the maximum distance from the linear texture to the substrate **10**, the more obvious the light and shadow effect of the single thin light column is. In some embodiments, within the single texture unit **21**, the maximum distance from all of the first linear textures **22** to the substrate **10** is greater than the maximum distance from all of the second linear textures **23** to the substrate **10**. At this time, the light and shadow effect of the first linear texture **22** (first thin light column) is more obvious than that of the second thin linear texture. In some embodiments, it may also be that the maximum

distance from the first linear texture **22** within the intersecting first and second fine light columns to the substrate **10** is much greater than the maximum distance from the second linear texture **23** to the substrate **10**. On the contrary, it is also possible. In some embodiments, the texture layer may have the following three kinds of texture units **21** at the same time: (1) the maximum distance from the first linear texture and the second linear texture to the substrate **10** is close (FIGS. 5A-5B, corresponding to the B area in FIG. 11); (2) the maximum distance from the first linear texture to the substrate **10** is much larger than the maximum distance from the second linear texture to the substrate **10** (FIGS. 9A-9B, corresponding to the A area in FIG. 11), and the resulting decorative plate is shown in FIGS. 11; and (3) The maximum distance from the first linear texture to the substrate **10** is much smaller than the maximum distance from the second linear texture to the substrate **10** (FIG. 10, corresponding to the C area in FIG. 11).

[0049] In some embodiments of the present disclosure, the texture layer **20** includes multiple first-level areas, and the multiple first-level areas present different light and shadow changes. At least some first-level areas include at least texture units **21**, the extension direction of the first linear texture **22** between the multiple first-level areas is different and/or the extension direction of the second linear texture **23** between the multiple first-level areas is different. The maximum distance from the first linear texture **22** to the substrate **10** between the multiple first-level areas and/or the maximum distance from the second linear texture **23** to the substrate **10** is different.

[0050] The extension direction of the first linear texture **22** between the multiple first-level areas is different and/or the extension direction of the second linear texture **23** is different, which can be understood as: defining any first-level area A and first-level area B as any two adjacent first-level areas, the first-level area A includes multiple texture units A, the first linear texture **22** within the multiple texture units A extends in the a direction, and the second linear texture **23** extends in the b direction. The first-level area B includes multiple texture units b, the first linear texture **22** within the multiple texture units b extends in the c direction, the second linear texture **23** extends in the d direction, and the a, b, c, and d directions are different, to ensure the texture patterns and the light and shadow effects presented between the multiple first-level areas are different, and the same decorative plate **100** includes multiple first-level areas with textures and light and shadow changes at the same time, and the appearance effect is more abundant. In still some embodiments, the above situation is that the first-level area A includes multiple texture units A, and the first linear texture **22** within the multiple texture units A extends in the a direction, and the second linear texture **23** extends in the b direction. The first-level area B includes multiple texture units B, the first linear texture **22** within the multiple texture units B extends in a direction, the second linear texture **23** extends in c direction. In some embodiments, the first-level area A includes multiple texture units A, and the first linear textures **22** within the multiple texture units A extend in the a direction, and the second linear textures **23** extend in the b direction. The first-level area B includes multiple texture units B, the first linear textures **22** within the multiple texture units B extend in c direction, the second linear textures **23** extend in b direction, etc. Of course, when each texture unit is only provided with the first linear texture **22** inside, the extension direction of the first linear texture sub-segment **221** in the first-level area A and the extension direction of the first linear texture sub-segment **221** in the first-level area B may be different.

[0051] At least some of the maximum distance from the first linear texture **22** to the substrate **10** is different and/or the maximum distance from the second linear texture **23** to the substrate **10** is different, and it can be understood that the maximum distance from the first linear texture **22** to the substrate **10** within the texture unit A in the first-level area A is ha1, and the maximum distance from the second linear texture **23** to the substrate **10** is ha2. The maximum distance from the first linear texture **22** to the substrate **10** within the texture unit B in first-level area B is hb1, and the maximum distance from the second linear texture **23** to the substrate **10** is hb2. In some embodiments, ha1 is different from hb1, and/or ha2 is different from hb2. In some embodiments of the present disclosure, the difference in the maximum distance to the substrate **10** and the

difference in the extension direction described above are combined to make the texture and the light and shadow change effects in different first-level areas more different. Of course, when each texture unit is only provided with the first linear texture **22** inside, the maximum distance from the first linear texture **22** to the substrate **10** is ha_1 within the texture unit A in the first-level area A, and the maximum distance from the first linear texture **22** to the substrate **10** is hb_1 within the texture unit B in the first-level B, and ha_1 may be different from hb_1 .

[0052] In some embodiments of the present disclosure, the orthographic projection length of the first linear texture sub-segment **221** and the second linear texture sub-segment **231** on the substrate **10** (that is, the curve width of the first linear texture sub-segment and the second linear texture sub-segment) is each independently in a range of about 0.5 mm-1.5 mm. The curve width of the first linear texture sub-segment **221** can be understood as a linear distance L between the head end and the tail end of a single first linear texture sub-segment **221** in the extension direction thereof (see FIG. 3), and similarly, the curve width of the second linear texture sub-segment **231** is understood in the same manner as the first linear texture sub-segment **221**. For example, the curve widths of the first linear texture sub-segment **221**, the second linear texture sub-segment **231** may each independently be 0.5 mm, 0.6 mm, 0.7 mm, 0.8 mm, 0.9 mm, 1.0 mm, 1.1 mm, 1.2 mm, 1.3 mm, 1.4 mm, 1.5 mm, etc. Of course, the above cases also apply when each texture unit **21** is only provided with the first linear texture **22** inside.

[0053] In some embodiments of the present disclosure, there are at least some texture units, and in the respective extension directions of the first linear texture **22** and the second linear texture **23**, the orthographic projection length of the single first linear texture sub-segment **221** and the single second linear texture sub-segment **231** on the substrate **10** gradually changes. The “gradually changes” may be gradually increase or gradually decrease. Taking the first linear texture **22** as an example, see FIG. 3, in the extension direction of the first linear texture **22**, the orthographic projection length of each first linear texture sub-segment **221** on the substrate **10** gradually decreases, that is, $L_1 > L_2 > L_3 > L_4 > L_5 > L_6$. In the present disclosure, the orthographic projection length change trend of each sub-segment of the first linear texture **22** on the substrate **10** within the single texture unit and the orthographic projection length change trend of each sub-segment of the second linear texture **23** on the substrate **10** may be the same or different. Of course, the above cases also apply when each texture unit **21** is only provided with the first linear texture **22** inside.

[0054] Referring to FIGS. 4A-4B, in some embodiments of the present disclosure, the surface of each first linear texture sub-segment **221** is provided with multiple strip textures **2211**. In some embodiments, the extension direction of the strip texture **2211** is basically the same as the outline of the first linear texture sub-segment **221**, and it can be understood that a line shaped linear texture sub-segment is provided, multiple linear strip textures **2211** arranged in parallel are arranged on the surface of the linear texture sub-segment, and each strip texture **2211** extends from the head end to the tail end of the linear texture sub-segment, and the each strip texture **2211** may be arranged continuously or at intervals. Then, the entire linear texture sub-segment is bent to obtain the first linear texture sub-segment **221**. Furthermore, the relative positions of each strip texture **2211** on the surface of the first linear texture sub-segment **221** are different, so that each strip texture **2211** has different reflection and scattering capabilities to the same light source, and then the each first linear texture sub-segment **221** can exhibit rich light and shadow effects, so that the decorative plate **100** can exhibit more gorgeous light and shadow effects. Of course, the above changes also apply when each texture unit **21** is only provided with the first linear texture **22** inside.

[0055] In the present disclosure, the cross-sectional shape of the strip texture **2211** may be a triangle, an arch, an arc, a trapezoid, etc., and the cross-sectional width of each strip texture **2211** gradually decreases from the bottom surface of the strip texture **2211** in the height direction thereof.

[0056] In some embodiments of the present disclosure, the number of the strip textures **2211** on the single first linear texture sub-segment **221** and the single second linear texture sub-segment **231** is 5-20. At this time, the light and shadow effects of the single linear texture are relatively abundant,

and when the number of strip textures **2211** on the surfaces of the first and second linear texture sub-segments is sufficiently large, the decorative plate **100** can have a colorful effect. Of course, the above cases also apply when each texture unit is only provided with the first linear texture **22** inside.

[0057] In some embodiments of the present disclosure, the absolute height of the strip texture **2211** is about 5%-15% of the maximum distance from the corresponding linear texture sub-segment to the substrate **10**. Referring to FIG. **4B**, the absolute height of the strip texture **2211** refers to the height *d* of the strip texture **2211** itself. For example, the absolute height of the strip texture **2211** may be 5%, 6%, 7%, 8%, 9%, 10%, 11%, 12%, 13%, 14%, 15%, etc. of the maximum height of the cross-section of the corresponding linear texture sub-segment. Of course, the above cases also apply when each texture unit is only provided with the first linear texture **22** inside.

[0058] In the present disclosure, the curvature of the first linear texture sub-segment **221** and the curvature of the second linear texture sub-segment **231** may be the same or different. In different first-level areas, the curvatures of the first and second linear texture sub-segments in the first-level area A and the curvatures of the first and second linear texture sub-segments in the first-level area B may be the same or different. In some embodiments, there are some first-level area A and first-level area B, the curvature of the first linear texture sub-segment in the first-level area A is different from that of the first-level area B, and/or the curvature of the second linear texture sub-segment in the first-level area A is different from that of the first-level area B. Of course, when each texture unit is only provided with the first linear texture **22** inside, the curvature of the first linear texture sub-segment **221** in the first-level area A and the curvature of the first linear texture sub-segment **221** in the first-level area B may be different. In some cases, the change in curvature, the change in height, and the change in extension direction described above can be organically combined to enrich the texture and the light and shadow changes of the decorative plate **100**.

[0059] In some embodiments of the present disclosure, the width of the orthographic projection of the first linear texture sub-segment **221** and the second linear texture sub-segment **231** on the substrate **10** is each independently between about 30 μm and 60 μm . For example, the width of the orthographic projection of the first linear texture sub-segment **221**, the second linear texture sub-segment **231** on the substrate **10** may each independently be 30 μm , 35 μm , 40 μm , 45 μm , 50 μm , 55 μm , 60 μm , etc. Of course, the above cases also apply when each texture unit is only provided with the first linear texture **22** inside.

[0060] In some embodiments of the present disclosure, the spacing between any two adjacent first linear textures **22** and any two adjacent second linear textures **23** is each independently between about 60 μm and 120 μm . For example, the spacing between any two adjacent first linear textures **22** and between any two adjacent second linear textures **23** may each independently be 60 μm , 70 μm , 80 μm , 90 μm , 100 μm , 110 μm , 120 μm , 130 μm , 140 μm , 150 μm , etc. At this time, the density of linear texture sub-segments in the single first and second thin light column is more appropriate, and the light and shadow effects are more obvious. Of course, the above cases also apply when each texture unit is only provided with the first linear texture **22** inside.

[0061] In some embodiments of the present disclosure, the decorative plate further includes a modification layer, the modification layer includes one or more of a color developing layer, a frosted layer, and a glitter layer, and the modification layer is arranged on the surface of the texture layer and/or the substrate. In some embodiments, for example, when the material of the substrate is glass, a coating layer is provided on the surface of the side of the substrate without the texture layer, and an ink layer is superimposed on the surface of the coating layer, to ensure the glass has the effect of light and shadow flow.

[0062] In the present disclosure, the material of the substrate is not limited, and metal, glass, polymer composite material, or the like may be used.

[0063] In the present disclosure, the preparation method of the texture layer includes one or more of etching, UV transfer printing, and hot press molding. In some embodiments, the substrate

includes a transparent film sheet, for example, the substrate may be a polyester substrate (PET film), a polycarbonate substrate (PC film), a polymethyl methacrylate substrate (PMMA film), or a PC/PMMA composite sheet, and the preparation method of the decorative plate includes: making a texture master having a texture pattern on a mold according to the pattern of the texture layer, and transferring the texture master to the surface of the substrate to obtain the decorative plate. In some embodiments, the substrate includes a plastic sheet, and the preparation method of the decorative plate includes: transferring the textured master to the surface of the substrate, and forming the decorative plate by hot press molding, and the obtained decorative plate is a textured plastic sheet. In some embodiments, the substrate includes glass, and the preparation method of the decorative plate includes: preparing a mask plate on the surface of the substrate according to the pattern of the texture layer, etching the substrate, the etching effect is stronger at a thinner part of the mask plate, and the etching effect is weaker at a thicker part of the mask plate, thereby forming a texture pattern on the surface of the substrate to obtain the decorative plate, and the obtained decorative plate is textured glass. The preparation method of the decorative plate provided by the present disclosure has mature technology, simple process and high stability of the produced product, thereby improving the yield rate of the product and being suitable for mass production.

[0064] The embodiment of the present disclosure also provides a cover plate, including the decorative plate provided by the embodiment of the present disclosure and the substrate, wherein the decorative plate is arranged on the surface of the substrate. Wherein, the substrate is used to improve the structural strength of the cover plate, and the substrate may be one or more of plastic, metal, ceramic and glass. The cover plate can present the delicate effect of light and shadow flow, thus greatly improving the aesthetic appearance and having good market prospects. In some embodiments of the present disclosure, the cover plate can be used for the housing of the communication device, and the cover plate has a unique appearance, which can improve the recognition of the product.

[0065] The embodiment of the present disclosure also provides an electronic device, including the cover plate provided by the embodiment of the present disclosure. In the embodiment of the present disclosure, the electronic device may be a mobile phone, a computer, a USB flash drive, an electronic cigarette, a wearable device such as a watch, a digital camera, etc.

[0066] The above is an exemplary embodiment of the present disclosure, and it should be pointed out that for those skilled in the art, some improvements and retouches can be made to the present disclosure without departing from the principles of the present disclosure, and these improvements and retouches are also regarded as the scope of protection of the present disclosure.

[0067] Reference numbers: **100**: decorative plate; **10**: substrate; **20**: texture layer; **21**: texture unit; **22**: first linear texture; **221**: first linear texture sub-segment; **2211**: strip texture; **23**: second linear texture; and **231**: second linear texture sub-segment.

Claims

1. A decorative plate, comprising a substrate and a texture layer disposed on the substrate, the texture layer comprising multiple texture units, the multiple texture units comprising multiple first linear textures disposed at intervals in a first direction, each of the first linear textures comprising, in a first extension direction thereof, multiple first linear texture sub-segments connected to each other, wherein the multiple first linear texture sub-segments are bent in a same first bending direction in a plane where the texture layer is located, the first bending direction is different from the extension direction of the first linear textures, and the first extension direction of the first linear textures is different from the first direction.
2. The decorative plate according to claim 1, wherein the multiple adjacent first linear texture sub-segments form a first thin light column in the first direction.
3. The decorative plate according to claim 1, wherein: each of the multiple texture units further

comprises multiple second linear textures arranged at intervals in a second direction, each of the multiple second linear textures comprises, in a second extension direction thereof, multiple second linear texture sub-segments connected to each other, the multiple second linear texture sub-segments are bent in a same second bending direction in a plane where the texture layer is located, and the second bending direction is different from the second extension direction of the second linear textures; the second extension direction of the second linear textures is different from the second direction; the second direction is different from the first direction, and the first extension direction of the first linear textures is different from the second extension direction of the second linear textures; and the first linear texture sub-segments intersect the second linear texture sub-segments.

4. The decorative plate according to claim 3, wherein the multiple adjacent second linear texture sub-segments form a second thin light column in the second direction.

5. The decorative plate according to claim 3, wherein: the first linear texture sub-segments are bent in the first direction; and/or the second linear texture sub-segments are bent in the second direction.

6. The decorative plate according to claim 3, wherein the first linear texture and/or the second linear texture is wavy.

7. The decorative plate according to claim 3, wherein surfaces of at least a part of the first linear texture sub-segments further comprise multiple strip textures; and/or surfaces of at least a part of the second linear texture sub-segments further comprise multiple strip textures.

8. The decorative plate according to claim 3, wherein the angle between the first extension direction of the first linear textures and the second extension direction of the second linear textures is in a range of about 80°-100°.

9. The decorative plate according to claim 3, wherein: the multiple first linear texture sub-segments of the multiple first linear textures are disposed at intervals in the first direction, and adjacent end points of the multiple adjacent first linear texture sub-segments in the first direction are connected to form a straight line or a curve; and/or the multiple second linear texture sub-segments of the second linear texture are disposed at intervals in the second direction, and adjacent end points of the multiple adjacent second linear texture sub-segments in the second direction are connected to form a straight line or a curve.

10. The decorative plate according to claim 3, wherein a maximum distance from the first linear texture sub-segments to the substrate is about 0.5 μm -20 μm , and a maximum distance from the second linear texture sub-segments to the substrate is about 0.5 μm -20 μm .

11. The decorative plate according to claim 3, wherein in at least some of the texture units, a maximum distance from each of the first linear texture sub-segments to the substrate varies in the first extension direction of the first linear textures, and/or a maximum distance from the each of the second linear texture sub-segments to the substrate varies in the second extension direction of the second linear textures.

12. The decorative plate according to claim 3, wherein in at least some of the texture units, a maximum distance from the multiple first linear textures to the substrate varies in the first direction, and/or a maximum distance from the multiple second linear textures to the substrate varies in the second direction.

13. The decorative plate according to claim 3, wherein in at least some of the texture units: a maximum distance from the multiple first linear texture sub-segments to the substrate increases in a first section and decreases in a second section, or decreases in the first section and increases in the second section, in the first extension direction of the first linear texture sub-segments; and/or a maximum distance from the multiple second linear texture sub-segments to the substrate increases in a first section and decreases in a second section, or decreases in the first section and increases in the second section, in the second extension direction of the second linear texture sub-segments.

14. The decorative plate according to claim 3, wherein in at least some of the texture units, within a same texture unit, a maximum distance from the first linear textures to the substrate and a

maximum distance from the second linear textures to the substrate are different.

15. The decorative plate according to claim 3, wherein: the texture layer comprises multiple primary areas, at least a part of the primary areas comprises at least one of the multiple texture units, first extension directions of the first linear textures in the multiple primary areas are different and/or second extension directions of the second linear textures in the multiple primary areas are different; and/or at least some of maximum distances from the first linear textures to the substrate are different and/or some of maximum distances from the second linear textures to the substrate are different.

16. The decorative plate according to claim 3, wherein: a length of an orthographic projection of each of the first linear texture sub-segments on the substrate is in a range of about 0.5 mm-1.5mm, and a length of an orthographic projection of each of the second linear texture sub-segments on the substrate is in the range of about 0.5 mm-1.5 mm; and a width of the orthographic projection of each of the first linear texture sub-segments on the substrate is in a range of about 30 μ m-60 μ m, and a width of the orthographic projection of each of the second linear texture sub-segments on the substrate is in the range of about 30 μ m-60 μ m.

17. The decorative plate according to claim 3, wherein in at least some of the texture units, a length of an orthographic projection of each of the first linear texture sub-segments on the substrate varies in the first extension direction of the first linear textures, and a length of an orthographic projection of each of the second linear texture sub-segments on the substrate varies in the second extension direction of the second linear textures.

18. The decorative plate according to claim 7, wherein absolute heights of the strip textures are about 5%-15% of a maximum distance from a corresponding first linear texture sub-segment to the substrate or a maximum distance from a corresponding second linear texture sub-segment to the substrate.

19. A cover plate, comprising a substrate and a decorative plate, the decorative plate disposed on a surface of the substrate, wherein: the decorative plate comprises a texture layer disposed on the substrate, the texture layer comprises multiple texture units, the multiple texture units comprise multiple first linear textures disposed at intervals in a first direction, each of the first linear textures comprises, in a first extension direction thereof, multiple first linear texture sub-segments connected to each other, and the multiple first linear texture sub-segments are bent in a same first bending direction in a plane where the texture layer is located, the first bending direction is different from the extension direction of the first linear textures, and the first extension direction of the first linear textures is different from the first direction.

20. An electronic device, comprising a cover plate comprising a substrate and a decorative plate, the decorative plate disposed on a surface of the substrate, wherein: the decorative plate comprises a texture layer disposed on the substrate, the texture layer comprises multiple texture units, the multiple texture units comprise multiple first linear textures disposed at intervals in a first direction, each of the first linear textures comprises, in a first extension direction thereof, multiple first linear texture sub-segments connected to each other, and the multiple first linear texture sub-segments are bent in a same first bending direction in a plane where the texture layer is located, the first bending direction is different from the extension direction of the first linear textures, and the first extension direction of the first linear textures is different from the first direction.
