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(76) **Title of Invention:**

Shading Ring Processing Method and Shading Ring

(77) **Abstract**

The present invention discloses a shading ring processing method and a shading ring, the method comprises the following steps: providing a shading ring, the shading ring comprises a body, an antistatic coating coated on the body and a through-hole formed on the body, the body is made of plastic material, the antistatic coating is a carbon powder layer; and a matte structure is formed on a hole-wall of the through-hole by etching with an alkaline solution. In the shading ring processing method and the shading ring of the present invention, the shading ring is processed with the alkaline solution in the ultrasonic generator to form a matte structure on the hole-wall of the through-hole of the shading ring, so as to avoid the occurrence of glare, halo and flare caused by the reflection from the hole-wall of the through-hole, thereby ensuring the capturing effect and improving the quality of the imaging products.

Providing a shading ring, the shading ring comprises a body, an antistatic coating coated on the body and a through-hole formed on the body, the body is made of plastic material, the antistatic coating is a carbon powder layer, and the through-hole is formed by stamping

S10

Forming a matte structure on the hole-wall of the through-hole by etching with an alkaline solution

S20

1. A shading ring processing method, wherein the shading ring processing method comprises the following steps:
 - providing a shading ring, wherein the shading ring comprises a body, an antistatic coating coated on the body, and a through-hole formed on the body; the body is made of a plastic material, the antistatic coating is a carbon powder layer, and the through-hole is formed by stamping;
 - forming a matte structure on the hole-wall of the through-hole by etching with an alkaline solution.
2. The shading ring processing method according to claim 1, wherein the steps of forming the matte structure on the hole-wall of the through-hole by etching with the alkali solution specifically comprises:
 - placing the alkali solution in an ultrasonic generator;
 - placing the shading ring into the alkaline solution and stirring.
3. The shading ring processing method according to claim 1, wherein the body is made of polyethylene terephthalate, the alkali solution is sodium bicarbonate solution, and the concentration thereof is from 5% to 35%.
4. The shading ring processing method according to claim 1, wherein a temperature of the alkali solution is from 35 to 55°C, and a period for stirring is from 3 to 5 hours.
5. The shading ring processing method according to claim 1, wherein a power of the ultrasonic generator is from 300 to 500 watts.
6. The shading ring processing method according to claim 1, wherein a thickness of the shading ring is 0.025 mm, and a diameter of the through-hole is 2.14 mm.
7. A shading ring, wherein the shading ring comprises a body, an antistatic coating coated on the body, and a through-hole formed on the body, the body is made of a plastic material, the antistatic coating is a carbon powder layer, the through-hole is formed by stamping, and a matte structure is formed on the hole wall.
8. The shading ring according to claim 7, wherein the body is made of polyethylene terephthalate.
9. The shading ring according to claim 7, wherein the matte structure is formed by etching with an alkaline solution.
10. The shading ring according to claim 9, wherein the alkali solution is a sodium bicarbonate solution, a concentration of the sodium bicarbonate solution is from 5% to 35%, and a temperature thereof is from 35 to 55°C.
11. The shading ring according to claim 7, wherein a thickness of the shading ring is 0.025 mm, a diameter of the through-hole is 2.14 mm.

Shading Ring Processing Method and Shading Ring

TECHNICAL FIELD

[0001] The present invention relates to the field of camera technology, particularly to a shading ring processing method and a shading ring.

BACKGROUND ART

[0002] Generally, 3 to 5 pieces of shading rings need to be placed inside the camera of high-pixel cell phones and digital cameras to adjust the aperture of the light and to block other stray light. In the past, a shading ring was processed by oxidation and blackening after metal punching to achieve the purpose of complete matting, but the cost was several times more expensive than that of a plastic shading ring. In the recent years, as the cost has dropped significantly, this type of shading ring has been replaced by a shading ring formed using polyethylene terephthalate (PET) raw material with antistatic high-shading coating on the surface via direct stamping. However, as the pixels get higher and higher, the stamping of the plastic material leaves a shiny cut-off section surface of the inner hole, which cannot be treated for blackening and matt like traditional metals, resulting in obvious glare, halo and flare and other undesirable effects.

SUMMARY

[0003] The main object of the present invention is to provide a shading ring processing method and a shading ring, which aims to solve the existing technical problems of glare, halo and flare and other undesirable effects caused by the existing shading rings due to the reflection from the inner-wall of the through-hole.

[0004] To achieve the above object, the present invention provides a shading ring processing method, which comprises the following steps:

[0005] providing a shading ring, the shading ring comprises a body, an antistatic coating coated on the body and a through-hole formed on the body, the body is made of plastic material, the antistatic coating is a carbon powder layer, and the through-hole is formed by stamping;

[0006] forming a matte structure on the hole-wall of the through-hole by etching with an alkaline solution.

[0007] Preferably, the steps of forming the matte structure on the hole-wall of the through-hole by etching with the alkali solution specifically comprise:

[0008] placing the alkali solution in an ultrasonic generator;

[0009] placing the shading ring in the alkaline solution and stirring.

[0010] Preferably, the body is made of polyethylene terephthalate, the alkali solution is sodium bicarbonate solution, and a concentration thereof is from 5% to 35%.

[0011] Preferably, a temperature of the alkali solution is from 35 to 55°C, and a period of stirring is from 3 to 5 hours.

[0012] Preferably, the ultrasonic generator has a power of 300 to 500 watts.

[0013] Preferably, a thickness of the shading ring is 0.025 mm, and a diameter of the through-hole is 2.14 mm.

[0014] Further, in order to achieve the above object, the present invention also provides a shading ring, the shading ring comprises a body, an antistatic coating coated on the body and a through-hole formed on the body, the body is made of plastic material, the antistatic coating is a carbon powder layer, and the through-hole is formed by stamping, and a matte structure is formed on the hole wall.

[0015] Preferably, the body is made of polyethylene terephthalate.

[0016] Preferably, the matte structure is formed by etching with an alkaline solution.

[0017] Preferably, the alkali solution is a sodium bicarbonate solution, a concentration of the sodium bicarbonate solution is from 5 % to 35 %, and a temperature thereof is from 35 to 55°C.

[0018] Preferably, a thickness of the shading ring is 0.025 mm, and a diameter of the through-hole is 2.14 mm.

[0019] In the shading ring processing method and the shading ring of the present invention, the shading ring is processed with the alkaline solution in the ultrasonic generator to form a matte structure on the hole-wall of the through-hole of the shading ring, so as to avoid the occurrence of glare, halo and flare caused by the reflection from the hole-wall of the through-hole, thereby ensuring the capturing effect and improving the quality of the imaging products.

DESCRIPTION OF THE DRAWINGS

[0020] FIG. 1 is a flowchart of an embodiment of the shading ring processing method of the present invention;

[0021] FIG. 2 is a flowchart of the process to form a matte structure on the hole-wall of the through-hole by etching with the alkali solution shown in FIG. 1;

[0022] FIG. 3 is a schematic view of the cross-sectional structure of the shading ring of the present invention.

[0023] The object, functional features and advantages of the present invention will be further described in conjunction with the embodiments with reference to the accompanying drawings.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0024] It should be understood that the specific embodiments described herein are only used to explain the present invention and are not intended to limit the scope of the present invention.

[0025] The present invention provides a shading ring processing method. Referring to FIG. 1, in one embodiment, the shading ring processing method comprises the following steps:

[0026] step S10: providing a shading ring, the shading ring comprises a body, an antistatic coating coated on the body and a through-hole formed on the body, the body is made of plastic material, the antistatic coating is a carbon powder layer, and the through-hole is formed by stamping.

[0027] Particularly in the present embodiment, the thickness of the shading ring is 0.025 mm, and the diameter of the through-hole is 2.14 mm, the body is made of polyethylene terephthalate.

[0028] Since the shading ring is manufactured in such a way that the body is formed first, and then the outer surface of the body is coated with an antistatic coating, and finally a through-hole is formed on the body by stamping; at this time, as the hole-wall of the through-hole is made of polyethylene terephthalate, which can be etched with the alkali solution to form a matte structure on the hole-wall; the rest of the shading ring is covered with the antistatic coating formed by the carbon powder layer, which is less sensitive to alkali solution and basically will not be etched with the alkali solution, thereby ensuring the feasibility of the method.

[0029] Step S20: forming a matte structure on the hole-wall of the through-hole by etching with the alkaline solution.

[0030] In particular, referring to FIG. 2, in the present embodiment, the steps of forming the matte structure on the hole-wall of the through-hole by etching with the alkali solution particularly comprise:

[0031] step S21: placing the alkali solution in an ultrasonic generator.

[0032] In particular, the alkali solution is a sodium bicarbonate solution, the concentration thereof is from 5% to 35%; the power of the ultrasonic generator is from 300 to 500 watts, preferably 400 watts. The ultrasonic generator emits ultrasonic waves to cause vibrations in the sodium bicarbonate solution placed in the ultrasonic generator, thereby ensuring the etching effect.

[0033] Step S22: placing the shading ring in the alkaline solution, and stirring the solution.

[0034] In particular, the temperature of the sodium bicarbonate solution is from 35 to 55°C, and the stirring period is from 3 to 5 hours. Heating and stirring further guarantee the etching effect; at the same time, the etching time is shortened and the processing efficiency is improved.

[0035] The shading ring processing method of the present invention is carried out by alkaline solution in the ultrasonic generator to form a matte structure on the hole-wall of the through-hole of the shading ring, so as to avoid the occurrence of glare, halo and flare caused by the reflection from the hole-wall of the through-hole, thereby ensuring the capturing effect and improving the quality of the imaging products.

[0036] The present invention also provides a shading ring, referring to FIG. 3, in one embodiment, the shading ring comprises a body 200, an antistatic coating 300 coated on the body 200 and a through-hole 220 formed on the body 200, the body 200 is made of plastic material, the antistatic coating 300 is a carbon powder layer, the through-hole 220 is formed by stamping, and a matte structure 222 is formed on the hole-wall.

[0037] Particularly in the present embodiment, the thickness of the shading ring is 0.025 mm, and the diameter of the through-hole 220 is 2.14 mm; the body 200 is made of polyethylene terephthalate; the matte structure 222 is formed by alkali solution etching.

[0038] Since the shading ring is manufactured in such a way that the body 200 is formed first, and then the outer surface of the body 200 is coated with an antistatic coating 300, and finally a through-hole 220 is formed on the body 200 by stamping; at this time, as the material of the hole-wall of the through-hole 220 is polyethylene terephthalate, which can then be etched with the alkali solution to form a matte structure 222 on the hole-wall; the rest of the shading ring is covered with an antistatic coating 300 formed by a carbon powder layer, which is less sensitive to alkali solution and basically will not be etched with the alkali solution, thereby ensuring the feasibility of the method.

[0039] Further, in the present embodiment, the alkali solution is a sodium bicarbonate solution, the concentration of the sodium bicarbonate solution is from 5% to 35%, and its temperature is between 35 to 55°C. Through heating, the etching effect is guaranteed and the etching time is shortened, and the processing efficiency is improved.

[0040] In summary, for the shading ring in the present invention, a matte structure is formed on the hole-wall of the through-hole of the shading ring, so as to avoid the occurrence of glare, halo and flare caused by the reflection from the hole-wall of the through-hole, thereby ensuring the capturing effect and improving the quality of the imaging products.

[0041] The above are only preferred embodiments of the present invention, and are not intended to limit the patent scope of the present invention, and all equivalent structures or equivalent process transformations made by using the contents of the description and drawings of the present invention, or any direct or indirect application of the contents of the description and drawings of the present invention in other related technical fields, are equally included in the scope of patent protection of the present invention.

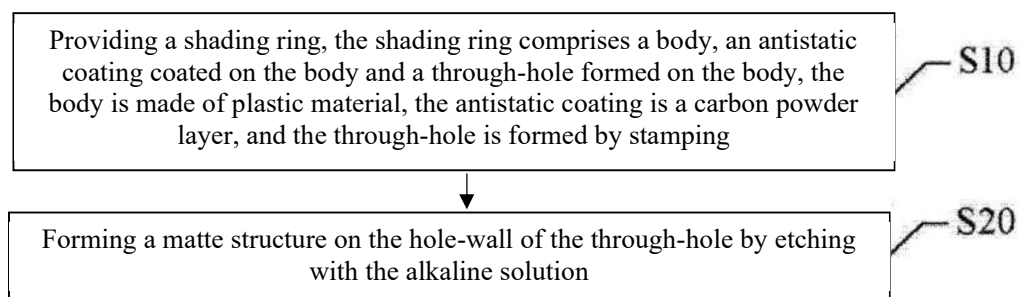


Figure 1

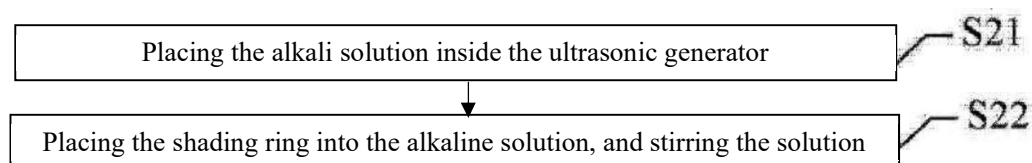


Figure 2

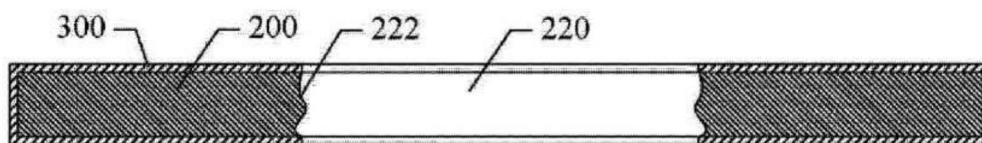


Figure 3



(12) 发明专利申请

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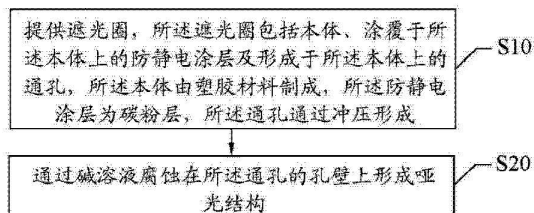
权利要求书1页 说明书3页 附图1页

(54) 发明名称

遮光圈的处理方法及遮光圈

(57) 摘要

本发明公开一种所述遮光圈的处理方法及遮光圈,所述方法包括如下步骤:提供遮光圈,所述遮光圈包括本体、涂覆于所述本体上的防静电涂层及形成于所述本体上的通孔,所述本体由塑胶材料制成,所述防静电涂层为碳粉层;通过碱溶液腐蚀在所述通孔的孔壁上形成哑光结构。本发明的遮光圈的处理方法及遮光圈,通过碱溶液在超声波发生器内对遮光圈进行处理,以在遮光圈的通孔的孔壁上形成哑光结构,以避免由于通孔的孔壁反光而造成的眩光、光晕及鬼影等不良状况的发生,进而保证了拍摄效果,提升了摄像产品的品质。



1. 一种遮光圈的处理方法,其特征在于,所述遮光圈的处理方法包括如下步骤:

提供遮光圈,所述遮光圈包括本体、涂覆于所述本体上的防静电涂层及形成于所述本体上的通孔,所述本体由塑胶材料制成,所述防静电涂层为碳粉层,所述通孔通过冲压形成;

通过碱溶液腐蚀在所述通孔的孔壁上形成哑光结构。

2. 如权利要求 1 所述的遮光圈的处理方法,其特征在于,所述通过碱溶液腐蚀在所述通孔的孔壁上形成哑光结构的步骤具体包括:

将碱溶液置于超声波发生器内;

将遮光圈置于所述碱溶液内,并搅拌。

3. 如权利要求 1 所述的遮光圈的处理方法,其特征在于,所述本体由聚对苯二甲酸乙二醇酯制成,所述碱溶液为碳酸氢钠溶液,其浓度为 5%~35%。

4. 如权利要求 1 所述的遮光圈的处理方法,其特征在于,所述碱溶液的温度为 35~55 度,所述搅拌的时间为 3~5 小时。

5. 如权利要求 1 所述的遮光圈的处理方法,其特征在于,所述超声波发生器的功率为 300~500 瓦。

6. 如权利要求 1 所述的遮光圈的处理方法,其特征在于,所述遮光圈的厚度为 0.025 毫米,所述通孔的直径为 2.14 毫米。

7. 一种遮光圈,其特征在于,所述遮光圈包括本体、涂覆于所述本体上的防静电涂层及形成于所述本体上的通孔,所述本体由塑胶材料制成,所述防静电涂层为碳粉层,所述通孔通过冲压形成,所述孔壁上形成有哑光结构。

8. 如权利要求 7 所述的遮光圈,其特征在于,所述本体由聚对苯二甲酸乙二醇酯制成。

9. 如权利要求 7 所述的遮光圈,其特征在于,所述哑光结构通过碱溶液腐蚀形成。

10. 如权利要求 9 所述的遮光圈,其特征在于,所述碱溶液为碳酸氢钠溶液,所述碳酸氢钠溶液的浓度 5%~35%,其温度为 35~55 度。

11. 如权利要求 7 所述的遮光圈,其特征在于,所述遮光圈的厚度为 0.025 毫米,所述通孔的直径为 2.14 毫米。

遮光圈的处理方法及遮光圈

技术领域

[0001] 本发明涉及摄像技术领域,尤其涉及一种遮光圈的处理方法及遮光圈。

背景技术

[0002] 高像素手机及数码相机内的摄像头内部一般需要放置 3 到 5 片遮光圈用来调整通光口径及遮挡其他杂光,以前都是用金属冲压后通过氧化发黑的方式处理,以达到全消光的目的,但是成本及塑胶遮光圈贵好几倍,近年来随着成本大幅下降,已经改用表面带防静电高遮光涂层的聚对苯二甲酸乙二醇酯 (PET) 原材料直接冲压后替代,但是随着像素越来越高,塑胶冲压后内孔的断面会留下发亮的切断面,而又不能像金属一样进行传统的发黑消光处理,以至于产生明显的眩光、光晕及鬼影 (FLARE) 等不良

发明内容

[0003] 本发明的主要目的在于提供一种遮光圈的处理方法及遮光圈,旨在解决现有的遮光圈由于通孔内壁反光而造成的眩光、光晕及鬼影等不良的技术问题。

[0004] 为实现上述目的,本发明提供一种遮光圈的处理方法,所述遮光圈的处理方法包括如下步骤:

[0005] 提供遮光圈,所述遮光圈包括本体、涂覆于所述本体上的防静电涂层及形成于所述本体上的通孔,所述本体由塑胶材料制成,所述防静电涂层为碳粉层,所述通孔通过冲压形成;

[0006] 通过碱溶液腐蚀在所述通孔的孔壁上形成哑光结构。

[0007] 优选地,所述通过碱溶液腐蚀在所述通孔的孔壁上形成哑光结构的步骤具体包括:

[0008] 将碱溶液置于超声波发生器内;

[0009] 将遮光圈置于所述碱溶液内,并搅拌。

[0010] 优选地,所述本体由聚对苯二甲酸乙二醇酯制成,所述碱溶液为碳酸氢钠溶液,其浓度为 5%~35%。

[0011] 优选地,所述碱溶液的温度为 35~55 度,所述搅拌的时间为 3~5 小时。

[0012] 优选地,所述超声波发生器的功率为 300~500 瓦。

[0013] 优选地,所述遮光圈的厚度为 0.025 毫米,所述通孔的直径为 2.14 毫米。

[0014] 此外,为了实现上述目的,本发明还提供一种遮光圈,所述遮光圈包括本体、涂覆于所述本体上的防静电涂层及形成于所述本体上的通孔,所述本体由塑胶材料制成,所述防静电涂层为碳粉层,所述通孔通过冲压形成,所述孔壁上形成有哑光结构。

[0015] 优选地,所述本体由聚对苯二甲酸乙二醇酯制成。

[0016] 优选地,所述哑光结构通过碱溶液腐蚀形成。

[0017] 优选地,所述碱溶液为碳酸氢钠溶液,所述碳酸氢钠溶液的浓度 5%~35%,其温度为 35~55 度。

[0018] 优选地,所述遮光圈的厚度为 0.025 毫米,所述通孔的直径为 2.14 毫米。

[0019] 本发明的遮光圈的处理方法及遮光圈,通过碱溶液在超声波发生器内对遮光圈进行处理,以在遮光圈的通孔的孔壁上形成哑光结构,以避免由于通孔的孔壁反光而造成的眩光、光晕及鬼影等不良状况的发生,进而保证了拍摄效果,提升了摄像产品的品质。

附图说明

[0020] 图 1 为本发明遮光圈的处理方法的一实施例的流程图;

[0021] 图 2 为图 1 中所示的通过碱溶液腐蚀在所述通孔的孔壁上形成哑光结构的流程图;

[0022] 图 3 为本发明遮光圈的剖面结构示意图。

[0023] 本发明目的实现、功能特点及优点将结合实施例,参照附图做进一步说明。

具体实施方式

[0024] 应当理解,此处所描述的具体实施例仅仅用以解释本发明,并不用于限定本发明。

[0025] 本发明提供一种遮光圈的处理方法,参照图 1,在一实施例中,所述遮光圈的处理方法包括如下步骤:

[0026] 步骤 S10、提供遮光圈,所述遮光圈包括本体、涂覆于所述本体上的防静电涂层及形成于所述本体上的通孔,所述本体由塑胶材料制成,所述防静电涂层为碳粉层,所述通孔通过冲压形成。

[0027] 具体地,在本实施例中,所述遮光圈的厚度为 0.025 毫米,所述通孔的直径为 2.14 毫米,所述本体由聚对苯二甲酸乙二醇酯制成。

[0028] 由于遮光圈的制造方式是,先形成本体,再在本体的外表面涂覆防静电涂层,最后在通过冲压的方式在本体上形成通孔,这时,所述通孔的孔壁是由聚对苯二甲酸乙二醇酯形成,那么机可以通过碱溶液进行腐蚀,以在孔壁上形成哑光结构,而遮光圈的其余部分则覆盖有由碳粉层形成的防静电涂层,其对碱溶液的敏感度较差,基本上不会受到碱溶液的腐蚀,进而保证了本发方法的可行性。

[0029] 步骤 S20、通过碱溶液腐蚀在所述通孔的孔壁上形成哑光结构。

[0030] 具体地,参照图 2,在本实施例中,所述通过碱溶液腐蚀在所述通孔的孔壁上形成哑光结构的步骤具体包括:

[0031] 步骤 S21、将碱溶液置于超声波发生器内。

[0032] 具体地,所述碱溶液为碳酸氢钠溶液,其浓度为 5%~35%;所述超声波发生器的功率为 300~500 瓦,优选为 400 瓦。超声波发生器发出超声波,以引起置于超声波发生器内的碳酸氢钠溶液的震动,进而保证了腐蚀效果。

[0033] 步骤 S22、将遮光圈置于所述碱溶液内,并搅拌。

[0034] 具体地,所述碳酸氢钠溶液的温度为 35~55 度,所述搅拌的时间为 3~5 小时。通过加热及搅拌的方式,进一步保证了腐蚀效果,同时缩短了腐蚀时间,提高处理效率。

[0035] 本发明的遮光圈的处理方法,通过碱溶液在超声波发生器内对遮光圈进行处理,以在遮光圈的通孔的孔壁上形成哑光结构,以避免由于通孔的孔壁反光而造成的眩光、光晕及鬼影等不良状况的发生,进而保证了拍摄效果,提升了摄像产品的品质。

[0036] 本发明还提供一种遮光圈,参照图 3,在一实施例中,所述遮光圈包括本体 200、涂覆于所述本体 200 上的防静电涂层 300 及形成于所述本体 200 上的通孔 220,所述本体 200 由塑胶材料制成,所述防静电涂层 300 为碳粉层,所述通孔 220 通过冲压形成,所述孔壁上形成有哑光结构 222。

[0037] 具体地,在本实施例中,所述遮光圈的厚度为 0.025 毫米,所述通孔 220 的直径为 2.14 毫米;所述本体 200 由聚对苯二甲酸乙二醇酯制成;所述哑光结构 222 通过碱溶液腐蚀形成。

[0038] 由于遮光圈的制造方式是,先形成本体 200,再在本体 200 的外表面涂覆防静电涂层 300,最后在通过冲压的方式在本体 200 上形成通孔 220,这时,所述通孔 220 的孔壁是由聚对苯二甲酸乙二醇酯形成,那么机可以通过碱溶液进行腐蚀,以在孔壁上形成哑光结构 222,而遮光圈的其余部分则覆盖有由碳粉层形成的防静电涂层 300,其对碱溶液的敏感度较差,基本上不会受到碱溶液的腐蚀,进而保证了本发方法的可行性。

[0039] 进一步地,在本实施例中,所述碱溶液为碳酸氢钠溶液,所述碳酸氢钠溶液的浓度 5%~35%,其温度为 35~55 度,通过加热的方式,保证了腐蚀效果,同时缩短了腐蚀时间,提高处理效率。

[0040] 综上所述,本发明的遮光圈,通过在遮光圈的通孔的孔壁上形成哑光结构,以避免由于通孔的孔壁反光而造成的眩光、光晕及鬼影等不良状况的发生,进而保证了拍摄效果,提升了摄像产品的品质。

[0041] 以上仅为本发明的优选实施例,并非因此限制本发明的专利范围,凡是利用本发明说明书及附图内容所作的等效结构或等效流程变换,或直接或间接运用在其他相关的技术领域,均同理包括在本发明的专利保护范围内。

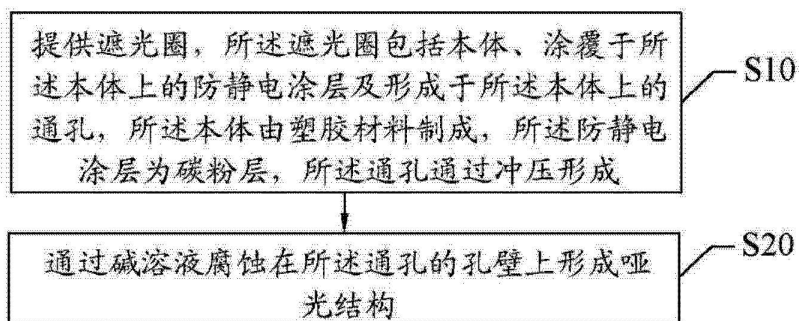


图 1

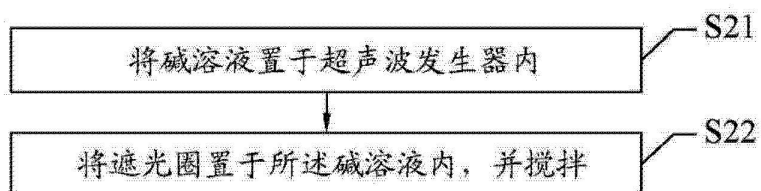


图 2

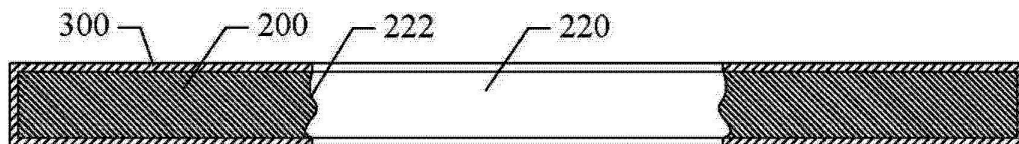


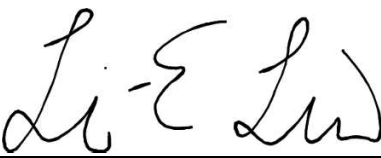
图 3

I, LI-E LIU, declare as follows:

1. I am over eighteen years of age and fully competent to make this affidavit. I have personal knowledge of the information contained in this affidavit, and it is true and accurate to the best of my knowledge.
2. I am a translator fluent in the Chinese and English languages.
3. I translated the Chinese patent file CN104460182A into English and the English translation is a true and accurate translation of the Chinese patent file CN104460182A.

I declare under penalty of perjury of the laws of the United States of America that the foregoing information is true and accurate to the best of my knowledge. I understand that willful false statements and the like are punishable by fine or imprisonment, or both {18 U.S.C. § 1001} and may jeopardize the validity of the application or any patent issuing thereon.

Executed on: March 7, 2024, at 2796 E Coventry Lane, Salt Lake City,
UT, 84121

(sign here) 

Signed by Li-E Liu