IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Wen-Sung Lee	Examiner:	LEE, Y MY QUACH
Serial No.:	13/969,615	Group Art Unit:	2875
Filed:	08/19/2013	Docket No.:	GFP-1028580
Title:	ZOOMABLE LED FLASHLIGHT		

CERTIFICATE UNDER 37 C.F.R. 1.8a:

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The undersigned hereby certifies that this Transmittal Letter and the paper, as described herein, are being transmitted to the United States Patent and Trademark Office via EFS.

Date: April 1, 2015 By: / Wen-Sung Lee /
Wen-Sung Lee

RESPONSE TO NON-FINAL OFFICE ACTION

Dear Sir/Madam:

This paper is being filed in response to the non-final office action dated Jan. 08, 2015, setting a three-month shortened statutory period for response that expires on April 08, 2015. Further examination and reconsideration of the present application in view of the remarks set forth herein are respectfully requested.

Listing / Amendments to the claims including status indicators begin on page **2** of this paper.

Remarks begin on page **4** of this paper.

Listing of and Amendments to the Claims Including Status Indicators:

1. (Currently Amended) A flashlight comprising:

a housing having a first end and a second end;

a LED light source coupled to the first end of the housing for generating a light to illuminate remotely located objects; ~~and~~

an asymmetrical biconvex lens formed by injection-molding a resin material, for condensing the light generated by the LED light source into a concentrated light beam having a pattern of consistent brightness, wherein the asymmetrical biconvex lens is located a given distance away from the LED light source in a location which is remote from the first end of the housing, the resin material includes PMMA (Poly(methyl methacrylate)); and

a sliding zoom assembly coupled to the first end of the housing, for housing the asymmetrical biconvex lens, the sliding zoom assembly operating to vary the given distance between the asymmetrical biconvex lens and the LED light source to provide a variable diameter light beam;

wherein the asymmetrical biconvex lens includes opposing first and second spherical surfaces, the first spherical surface being closest to the LED light source with a first radius of curvature; and the second spherical surface being farthest from the LED light source with a second radius of curvature; and wherein the first radius of curvature being finite and substantially at least five times more than the second radius of curvature for providing a substantially short focal distance and substantially minimizing spherical aberrations in the light beam; and

wherein the asymmetrical biconvex lens further has a circumferential seating surface extending between the first and second spherical surfaces; the circumferential seating surface having a width of at least 1.5 mm as required by the injection molding due to the circumferential seating surface is substantially formed at the place where the resin material including PMMA is injected in a cavity of a mold.

2. (Currently Amended) The flashlight of claim 1, wherein the asymmetrical biconvex lens has an overall width of approximately 11 mm and an aperture with a diameter of approximately 27.2 mm, and the asymmetrical biconvex lens further has a circumferential seating surface extending between the first and second spherical surfaces~~; the circumferential seating surface having a width of at least 1.5 mm~~.

3. (Original) The flashlight of claim 2, wherein the first radius of curvature of the asymmetrical biconvex lens is approximately 107.5 mm and the second radius of curvature is approximately 12.5 mm.

4. (Cancelled) ~~The flashlight of claim 1, wherein the resin material includes PMMA (Poly(methyl methacrylate)).~~

REMARKS

Claims 1 - 4 are pending in the case and claim 1 is independent. Claims 1, 2, and 3 have been amended and claim 4 is cancelled and support for the amendment can be found throughout the specification, figures and claims as originally submitted. Applicant respectfully notes that no new matter is added.

Reconsideration and allowance is respectfully requested in light of the foregoing amendments and the remarks that follow.

I. 35 U.S.C. §103(a) Rejections

Claims 1 to 4 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Palmer et al. (US 5,595,435).

Applicant respectfully submits that claims 1, 2, and 4 are amended as pages 2 - 3 of this paper, and then the claims 1 - 4 after being amended may overcome this rejection, please reference to following table and figures.

Reconsideration and favorable action is respectfully request.

Amended Claim 1 of this application	Palmer et al.	Difference
a housing having a first end and a second end;	housing: battery housing (12); first end: front section(14); second end: rear section (16).	N/A
a LED light source coupled to the first end of the housing for generating a light to illuminate remotely located objects;	LED light source: light source (24) and column 3, lines 34 to 42.	N/A
an asymmetrical biconvex lens formed by injection-molding a resin material, for condensing the light generated by the LED light source into a concentrated light beam having a pattern of consistent brightness, wherein the asymmetrical biconvex lens is located a given distance away from the LED light source in a	lens: beam condensing lens (94); resin material: column 4, line 57; for condensing the light generated by the LED light source into a concentrated light beam having a pattern of consistent brightness: column 5, lines 13 to 14; the asymmetrical biconvex lens is located a given distance away	Palmer et al. do not disclose or teach how to solve the thickness problem in injection molding process.

location which is remote from the first end of the housing, the resin material includes PMMA (Poly(methyl methacrylate)); and	from the LED light source in a location which is remote from the first end of the housing: figure 2B.	
a sliding zoom assembly coupled to the first end of the housing, for housing the asymmetrical biconvex lens, the sliding zoom assembly operating to vary the given distance between the asymmetrical biconvex lens and the LED light source to provide a variable diameter light beam;	sliding zoom assembly: sliding zoom assembly (26); the sliding zoom assembly operating to vary the given distance between the asymmetrical biconvex lens and the LED light source to provide a variable diameter light beam: column 5, line 28.	N/A
wherein the asymmetrical biconvex lens includes opposing first and second spherical surfaces, the first spherical surface being closest to the LED light source with a first radius of curvature; and the second spherical surface being farthest from the LED light source with a second radius of curvature; and wherein the first radius of curvature being finite and substantially at least **five** times more than the second radius of curvature for providing a substantially short focal distance and substantially minimizing spherical aberrations in the light beam; and	first and second spherical surfaces: light source side (108) and object side (110); first radius of curvature: R1; second radius of curvature: R2; the first radius of curvature being finite and substantially at least **few** times more than the second radius of curvature for providing a substantially short focal distance: column 4, line 58; substantially minimizing spherical aberrations in the light beam: column 4, lines 58 to 59.	Palmer et al. do not specifically disclose that the first radius of curvature is substantially at least five times more than the second radius of curvature. The "five times" in this application is a criteria for filling in a cavity of a mold in injection molding process.
wherein the asymmetrical biconvex lens further has a circumferential seating surface extending between the first and second spherical surfaces; the	circumferential seating surface: figure 4B.	Paragraph [0023] of this application: the circumferential seating surface 43 is substantially formed at the place where the PMMA material is

circumferential seating surface having a width of at least 1.5 mm as required by the injection molding due to the circumferential seating surface is substantially formed at the place where the resin material including PMMA is injected in a cavity of a mold.		injected in the cavity of the mold, therefore, the circumferential seating surface 43 of the lens 4 has a width W2 of at least 1.5 mm as required by the injection molding. Paragraph [0007] of this application: in practice, it is difficult to make a thick plano-convex lens, with a desired short focal distance, by injection-molding from a polymer material because the convex side of the plano-convex lens would be highly curved and thus the lens become relatively thick across its middle and thin at its upper and lower edges. That is to say, when molding such thick lens, problematic short shots occur because the polymer melt cannot fill the entire cavity. Thus, nowadays flashlights use mostly plano-convex lenses formed from a glass material.

Please reference to column 2, lines 11-14 of Palmer, Palmer disclosed that a primary object of the present invention to provide an improved night vision flashlight illuminator device which provides a much brighter and evenly focused light beam pattern.

Compared to this application, please reference to paragraph [0009] of this application, it discloses that it is another object of the present invention to provide a flashlight that employ a plastic molded lens with a relatively short focus distance and **the maximum possible molded thickness**.

It is obvious that the objects of the Palmer and this application are different.

Please reference to column 4, lines 56-67 to column 5, lines 1-14 of Palmer at al., (referring to FIGS. 4A and 4B) the light beam condenser 94 is preferably a clear optical acrylic aspheric lens that provides a very short focal distance and minimizes spherical aberrations in the light beam. As can be seen in FIG. 4A, the lens 94 includes a planar annular seating surface 96 which has a preferred outer diameter 98 of approximately 0.748 inches (18.9mm). A flattened area 100 called a gate or spur is provided on a circumferential seating surface 102 of the lens 94. The gate coats with an associated flattened area provide on the lens seat (not shown) to properly locate the lens 94 in the sliding zoom assembly 26. The aperture 104 of the lens 94 has a preferred diameter 106 of approximately 0.669 inches (16.9mm). In FIG. 4B, it can be seen that the lens 94 has two opposing convex spherical surfaces each having a different radius of curvature. The preferred radius of curvature R1 for the light source side 108 of the lens 94 is approximately 0.974 inches (24.7mm). The preferred radius of curvature R2 for the object side 110 of the lens 94 is approximately 0.604 inches (15.3mm). The circumferential seating surface 102 has a preferred width W1 of approximately 0.148 inches (3.7mm). The maximum overall width W2 of the lens 94 is approximately 0.305 inches (7.7mm) as measured from the apex of each spherical surface of the lens. The above-described lens 94 provides a very short focal distance and minimizes spherical aberrations in the light beam to provide a light pattern of consistent brightness around the target object.

The R1 is only 1.61 times more than R2. The thickness in the middle of the lens is not relatively thick as it lower and upper edges (shown as in FIG. 4B of Palmer et al.). This size and structure of lens have not problems in the injection molding process. Therefore, it should be not cited to reject this application because Palmer et al. cannot solve the problems as this application mentioned in paragraph [0009].

Compared to Palmer et al., this application discloses that the first radius of curvature is finite and substantially at least **<u>five</u>** times more than the second radius of curvature, not few times as OA mentioned. Because the first radius of curvature is finite and substantially at least **<u>five</u>** times more than the second radius of curvature, the injection molding process may produce the lens of this application with a relative thick middle and highly curved.

Furthermore, please reference to paragraph [0022], lines 17-21 of this application, in this manner, the lens 4 provides a substantially short focal distance because the first spherical surface 41 is slightly curved, rather than completely flat, and substantially minimizes spherical aberrations in the light beam because the first spherical surface 41 is close to flat.

In addition, please reference to paragraph [0023] of this application, the asymmetrical biconvex lens 4 has an overall width W1 of approximately 11 mm and an aperture with a diameter D1 of approximately 27.2 mm to meet the criteria. It is noted that, the circumferential seating surface 43 is substantially formed at the place where the PMMA material is injected in the cavity of the mold, therefore, the circumferential seating surface 43 of the lens 4 has a width W2 of at least 1.5 mm as required by the injection molding.

It is obvious that the structure of the lens of this application is different from Palmer et al., and the objects to be achieved are different therebetween. Therefore, the “five times” between the first and second radius of curvatures of this application is not only for desired design, but it has the purpose for solving the problem which is that the polymer melt cannot fill the entire cavity while injection molding. But Palmer et al. did not disclose or teach that.

That is, the amended independent claim 1 has overcome the issue of 35 U.S. C. 103(a) and is patentable and allowable. And then, the dependent claims depended on the amended claim 1 are also patentable and allowable.

CONCLUSION

In view of the remarks provided above, it is believed that all pending claims are in condition for allowance. Applicants respectfully request favorable reconsideration and allowance of pending claims 1 - 4.

Dated: April 01, 2015 Respectfully submitted,

/ Wen-Sung Lee /

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