UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SHENZHEN RONGLIDA TECHNOLOGY CO. LTD.
Petitioner,
v.

PATHWAY IP LLC
Patent Owner.

U.S. Patent No. 7,841,729
Case No. IPR2025-01231

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 7,841,729

TABLE OF CONTENTS

TABLE OF AUTHORITIES

Cases

Statutes and Regulations

LIST OF EXHIBITS

EXHIBIT	DESCRIPTION
EX1001	U.S. Patent No. 7,841,729
EX1002	Prosecution History for U.S. Patent Application No. 12/011,090
EX1003	Plaintiff's Claim Terms for Construction (No. 1:24-cv-5218)
EX1004	Defendants' Opening Claim Construction Brief (No. 1:24-cv-05218)
EX1005	U.S. Patent Application Publication No. 2007/0046626 to Cheng ("Cheng")
EX1006	U.S. Patent No. 2,682,603 ("Dine")
EX1007	U.S. Patent Application Publication No. 2006/0007666 to Cook ("Cook")
EX1008	U.S. Patent No. 6,799,861 ("Naghi")
EX1009	Japanese Patent Publication No. 1999-066930 to Masayuki ("Masayuki")
EX1010	Certified English Translation of Masayuki
EX1011	RESERVED
EX1012	Chinese Utility Model Patent No. CN 2235130 Y to Luo ("Luo")
EX1013	Certified English Translation of Luo
EX1014	U.S. Patent Application Publication No. 2007/0115672 to Nelson ("Nelson")
EX1015	U.S. Patent Application Publication No. 2007/0139515 to Du Breuil ("Du Breuil")
EX1016	RESERVED
EX1017	Declaration of Morgan Pattison, Ph.D.
EX1018	Ex Parte Reexamination Control No. 90/019,924
EX1019	Return of Service (No. 1:24-cv-05218)

I. INTRODUCTION

SHENZHEN RONGLIDA TECHNOLOGY CO. LTD. d/b/a ShutterLight ("Petitioner") requests *inter partes* review ("IPR") of claims 1-13 (the "Challenged Claims") of U.S. Patent No. 7,841,729 ("the '729 patent") (EX1001) in accordance with 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42.100 *et seq*. According to U.S. Patent and Trademark Office records, the '729 patent is assigned to PATHWAY IP LLC ("Patent Owner"). For the reasons below, the Challenged Claims should be found unpatentable and cancelled.

II. GROUNDS FOR STANDING

Pursuant to 37 C.F.R. § 42.104(a), Petitioner hereby certifies that the '729 patent is eligible for IPR, and that Petitioner and all real parties-in-interest are not barred or estopped from requesting review on the grounds presented. The '729 patent has an effective filing date of January 26, 2007, and was issued on November 30, 2010. It is subject to the America Invents Act ("AIA"), and this Petition is filed more than 9 months from the issue date. 37 C.F.R. § 42.102(a)(1). This Petition is also filed within one year of Petitioner being served with an allegation of infringement of the '729 patent. *Id.* § 42.101(b).

III. PRECISE RELIEF REQUESTED AND GROUNDS RAISED

Petitioner requests cancellation of the Challenged Claims pursuant to the grounds below:

Ground	Claim(s)	Pre-AIA 35 U.S.C. §	Reference(s)
Ground 1A	1-6	103	Naghi, Dine
Ground 1B	7	103	Naghi, Dine, Cheng
Ground 1C	8, 9	103	Naghi, Dine, Cook
Ground 2A	1-7	103	Nelson, Luo
Ground 2B	8, 9	103	Nelson, Luo, Cook
Ground 3A	1-4, 7	103	Cheng, Masayuki
Ground 3B	5, 6	103	Cheng, Masayuki, Nelson
Ground 3C	8, 9	103	Cheng, Masayuki, Cook
Ground 4A	10-13	103	Du Breuil, Dine

IV. FACTUAL BACKGROUND

A. Level of Ordinary Skill

As explained by Petitioner's expert, Dr. P. Morgan Pattison, a person having ordinary skill in the art ("POSITA") would have at least a bachelor's degree in electrical engineering or a related field and at least two years of experience with lighting technology. EX1017, ¶ 35. A POSITA would understand that all types of cameras (*e.g.*, analog and digital, photo and video) generally involve the same lighting considerations. EX1017, ¶ 35. For example, a POSITA would understand that it is important to provide light that evenly illuminates the target subject or object to minimize reflected glare and shadows. EX1017, ¶ 35.

B. Overview of the '729 Patent

The '729 patent claims priority to January 26, 2007. The '729 patent concerns an "illuminator device for a web camera" that "illuminates the face of the person who is viewed using a webcam." EX1001 at 1:10-13.

In some embodiments, the illuminator device has a bulb **25** in the shape of a toroid (a three-dimensional shape resembling a donut or a ring), which permits light illuminating the face of the user to be as diffused (scattered) as possible, thereby creating a more uniform distribution of light and minimizing any unflattering, harsh shadows. EX1001 at 3:66-4:7. The bulb **25** is surrounded by a conforming circular reflector **40** to reflect the light of the bulb towards the face of the user. EX1001 at 1:44-47, 1:53-57. The illuminator **10** may be connected to the frame of a computer screen equipped with a webcam **20** using a flexible arm **30** and a clamp **55**, as in Figure 2 (reproduced below on the left). Alternatively, the illuminator may be placed on a table surface adjacent the user, as in Figure 6 (reproduced below on the right):

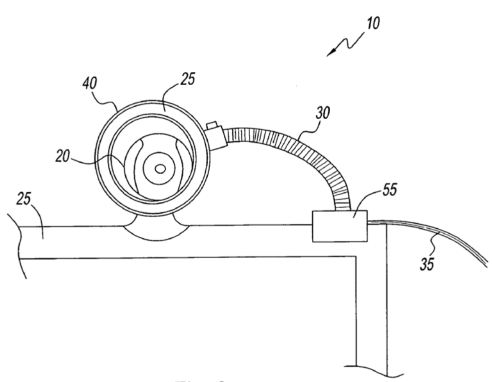


Fig. 2

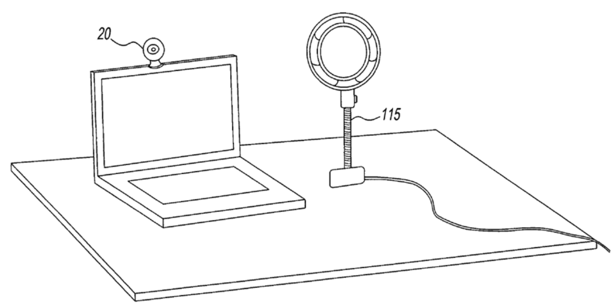
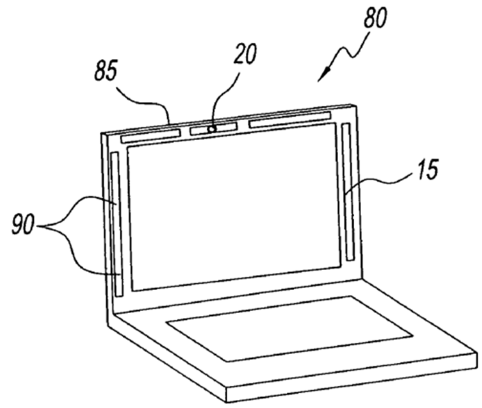


Fig. 6

In other embodiments (for example, Figure 4 below), the illuminator **80** comprises a plurality of lights **90** integrated into the frame **85** of the computer screen **15** and "configured to achieve a similar effect to the bulbs of earlier embodiments." EX1001 at 3:64-66.



The '729 patent has a total of 13 claims, including two independent claims (1 and 10). The full text of independent claims 1 and 10 is reproduced below:

Claim 1	Claim 10
[1pre] An illuminator device for illuminating one or more users in front of a web camera and a communication terminal comprising: **[1a]** a bulb having a toroidal shape for emitting light; **[1b]** a reflector having a circular configuration to conform to the toroidal shape of said bulb for projecting the emitted light; **[1c]** and an arm disposed between said bulb and the terminal for connection to the terminal, wherein said bulb is positionable relative to the web camera to provide optimal viewing of the user through the web camera.	**[10pre]** An illuminator device for illuminating one or more users in front of a web camera and a communications terminal having a frame and a screen comprising: **[10a]** a plurality of bulbs, wherein said plurality of bulbs are disposed in the frame of the terminal and one of said plurality of bulbs surrounds the web camera.

Independent claim 1 is drawn to the embodiments shown in Figures 2 and 6. It describes an illuminator device comprising a toroidal bulb, a reflector with a circular configuration to conform to the toroidal shape of the bulb, and an arm supporting the bulb. In dependent claims 5 and 6, the arm is "connected to the [communication] terminal by a clamp" (as in Figure 2). In dependent claim 7, the arm "has a base that supports the illuminator device on a flat surface adjacent to the terminal" (as in Figure 6). In dependent claims 8-9, a piece of fabric is disposed between the bulb and a user's face for diffusing the light emitted from the bulb.

Independent claim 10 and dependent claims 11-13 are drawn to the embodiment in Figure 4. Claim 10 describes an illuminator device in which a plurality of bulbs are disposed in the frame of the communication terminal, and at least one bulb "surrounds the web camera."

During prosecution, all original claims were rejected, primarily based on anticipation by Du Breuil and U.S. Patent No. 3,604,913 ("Crete"). EX1002 at 74-81. In response, the applicant amended the claims to emphasize specific structures—the toroidal bulb with its "conforming" circular reflector (claim 1) and a frame-integrated light "surrounding" the webcam (claim 10). EX1002 at 63-67. The Examiner accepted these narrow structural distinctions and allowed the claims. EX1002 at 46-52.

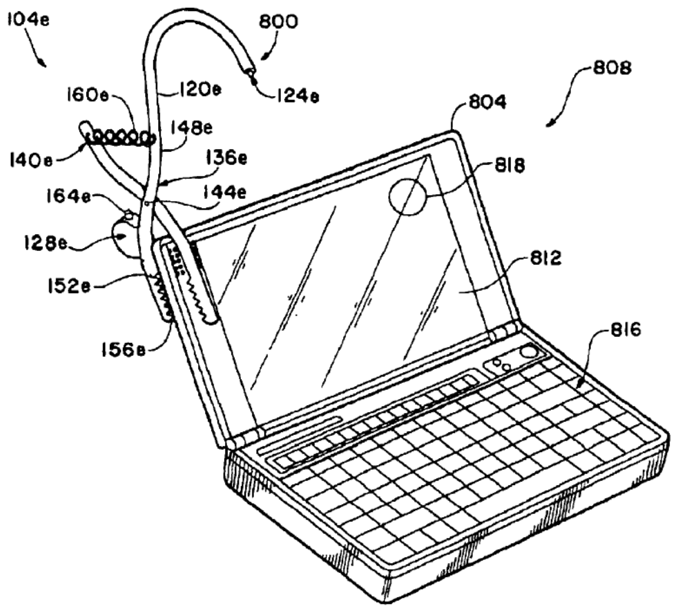
This Petition introduces significant prior art apparently not fully retrieved and considered by the Office during prosecution. These references show that, in fact, the structural elements relied upon by the applicant to secure allowance of the claims, like toroidal bulbs with conforming circular reflectors and/or frame-integrated lights, were well-recognized in the field of lighting systems as predictable solutions for achieving uniform, shadowless facial illumination.

C. Summary of Prior Art References Relied Upon

Relevant to claims 1-9, the prior art (Naghi, Nelson, Cheng) disclosed a number of portable lighting devices that could be removably attached to a laptop computer and/or placed adjacent to it. Also relevant to claims 1-9, the prior art (Dine, Luo, Masayuki) disclosed the use of toroidal (doughnut-shaped) bulbs with conforming circular reflectors to provide diffused, uniform lighting free of shadows. Relevant specifically to claims 8-9, the prior art (Cook) also disclosed the use of diffusion fabrics to diffuse light emitted by a light source. Finally, relevant to claims 10-13, the prior art (De Breuil) also disclosed integrating light sources directly into the frame of a computer screen or other electronic device.

1. Naghi

Issued on October 5, 2004, Naghi discloses a portable lighting apparatus with a light source (124e) attached to one end of an adjustable, bendable body (120e). EX1008 at Abstract, 2:62-65, 4:17-19. The body has a clamping mechanism (lower arm portions 152e with engagement teeth 156e) at the end other end for attachment to various devices, including a laptop computer (808) with a camera (818), which can be a video camera. EX1008 at 7:27-32.



Naghi was not before the Examiner during prosecution of the '729 patent and is not cumulative to any art cited during examination.

2. Nelson

Published May 24, 2007, Nelson describes an illuminating device (100) with a light source encased within a housing (115), the housing attached to one end of a flexible neck (130). EX1014, ¶ [0028]. A body/base (160) is attached to the other end of the flexible neck (130). EX1014, ¶¶ [0030], [0060]. The body/base (160) includes a clamp (120) configured to permit removable attachment to a variety of articles, such as laptop computers. EX1014, ¶ [0030].

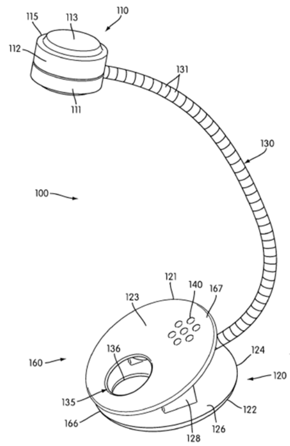


FIG. 1A

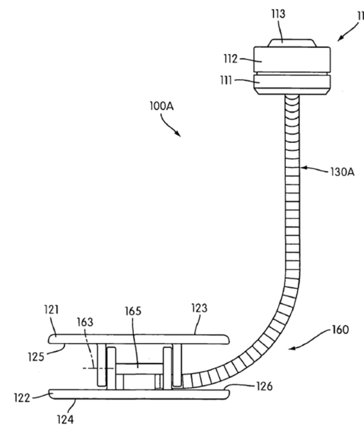
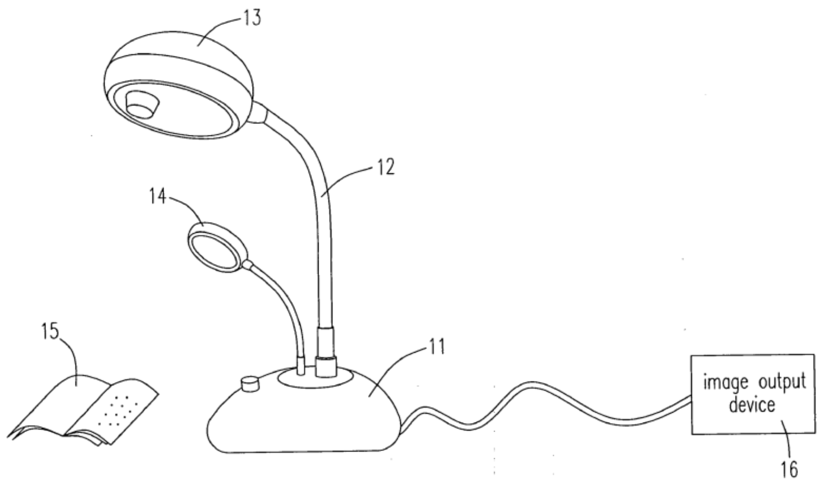


FIG. 3A

Nelson was not before the Examiner during prosecution of the '729 patent and is not cumulative to any art cited during examination.

3. Cheng

Published on March 1, 2007, Cheng discloses a "digital presenter" with a camera (13), a lamp (14), and a flexible support arm connecting the lamp to a base (11). EX1005, ¶ [0015]. The digital presenter is used to display the images captured by the camera (13) on an external image output device (16), such as a multimedia projector, rear projector television, general television, or liquid crystal display (LCD) monitor. EX1005, ¶ [0002]. In one embodiment, the digital presenter is used to conduct a video conference. EX1005, ¶ [0002].



Cheng was not before the Examiner during prosecution of the ‘729 patent and is not cumulative to any art cited during examination.

4. Dine

Issued on June 29, 1954, Dine teaches a portable photographic lighting unit with a circular (toroidal) gaseous discharge tube (10) (annotated in orange) disposed within a conforming annular chamber (21) (annotated in green) formed within a housing (17). EX1006 at 2:28-35. All surfaces of the housing, except for the portion of the front surface overlaying the tube, are painted with an opaque coating. EX1006 at 3:53-56. The housing thus acts as a reflector, providing for forward projection of light from the tube. EX1006 at 4:40-45, 6:1-5. The lighting unit is adapted for attachment concentrically about a camera lens to produce an intense flash of light “by which the subject to be photographed may be uniformly illuminated virtually free of any shadow.” EX1006 at 1:15-18.

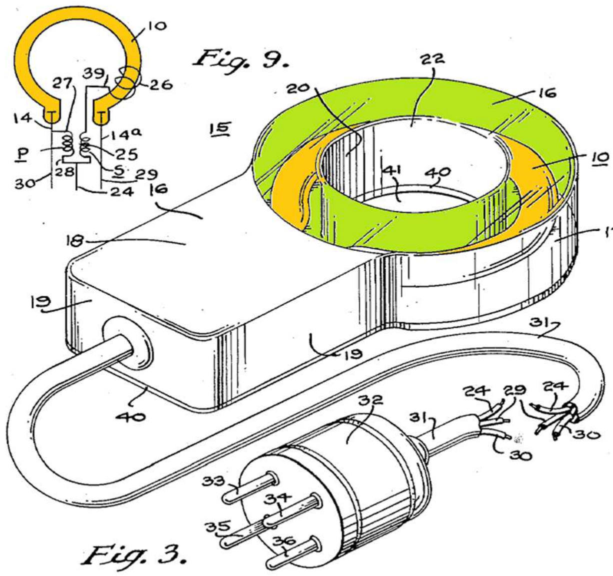


Fig. 1.

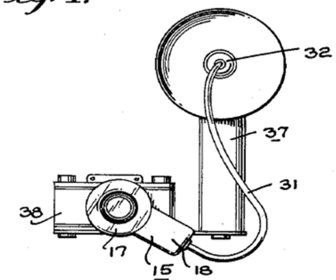
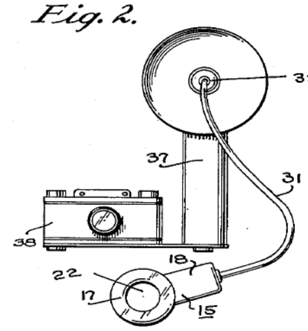


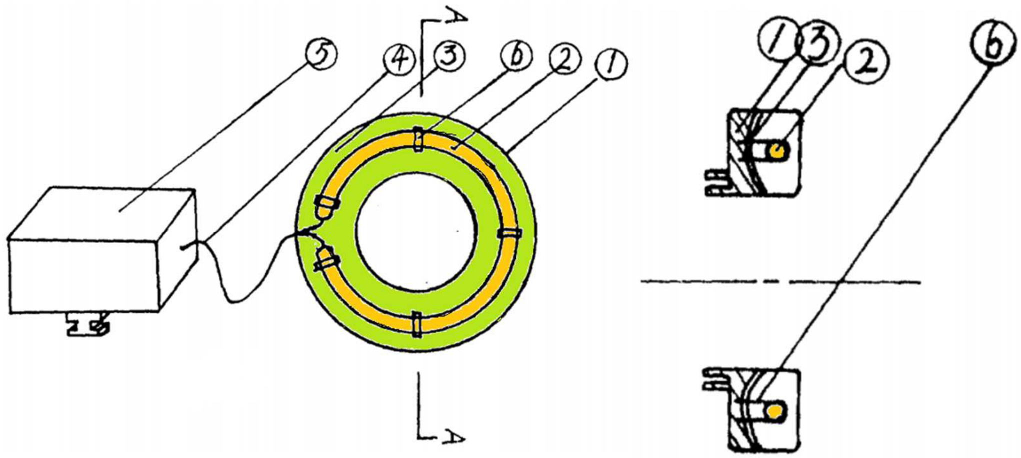
Fig. 2.



Dine was not before the Examiner during prosecution of the ‘729 patent and is not cumulative to any art cited during examination.

5. Luo

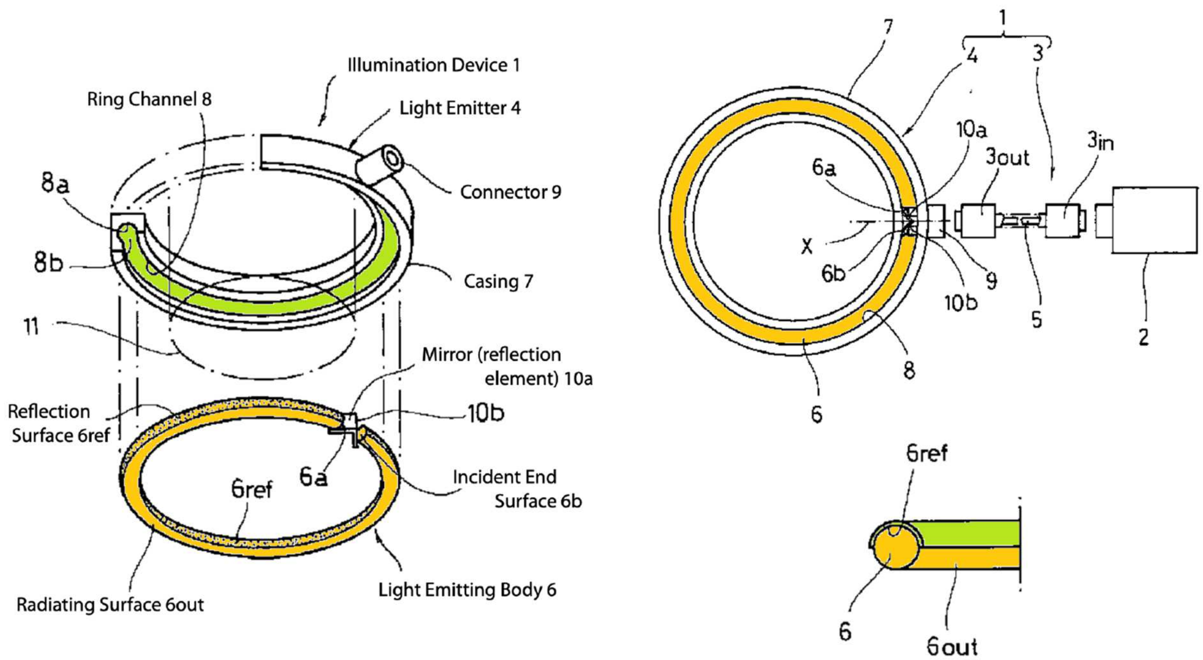
Published September 11, 1996, Luo discloses a “shadowless” flash device featuring a toroidal lamp tube (2) (annotated in orange) and a circular reflector (3) (annotated in green) secured inside a ring flash housing (1). EX1012 at 2. The ring flash aligns with a camera lens axis to eliminate shadows during image capture. EX1012 at 2.



Luo was not before the Examiner during prosecution of the '729 patent and is not cumulative to any art cited during examination.

6. Masayuki

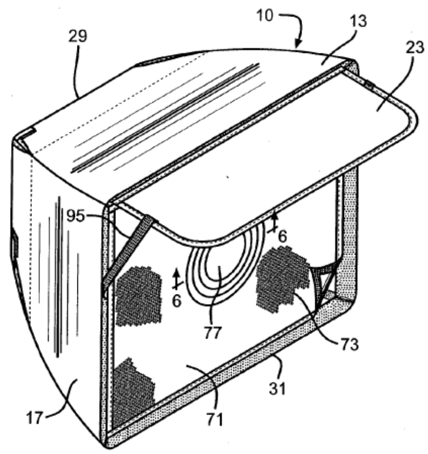
Published on March 9, 1999, Masayuki describes an illumination device that can be installed around the lens of a camera to project uniform light from the periphery of the lens onto the photographic subject. EX1009 at 1 (Abstract). The illumination device has a ring-shaped (toroidal) light emitting body (6) (annotated in orange), which is housed within a ring channel (8) formed inside of a casing (7). The light emitting body includes a reflection surface (6ref) (annotated in green) on one side and a radiating surface (6out) on the opposite side. EX1009 at 1 (Solution Means). The light emanating from the light emitting body is reflected from the reflection surface towards the radiating surface, "thereby undergoing diffusion reflection and being emitted to the exterior." EX1009 at 1 (Solution Means).



Masayuki was not before the Examiner during prosecution of the '729 patent and is not cumulative to any art cited during examination.

7. Cook

Published January 12, 2006, Cook describes a light modifier for creating an enhanced depth of lighting on a subject. EX1007 at Abstract. The light modifier includes a housing (13) formed from four generally trapezoidal panels. EX1007, ¶ [0013]. The first end (29) of the housing (13) is adapted to receive a light source. EX1007, ¶ [0014]. A panel (71) is removably secured to the second end (31) of the housing (13). EX1007, ¶ [0014]. The panel (71) is constructed from netting fabric (73). EX1007, ¶ [0014]. The netting acts to diffuse the light emanating from the light source. EX1007, ¶ [0014].



8. Du Breuil

Published on June 21, 2007, Du Breuil discloses a lighting system for video processing devices, including video telephones. EX1015, ¶¶ [0001], [0002]. The video telephone includes a base with a cordless handset and a screen assembly (220/720). EX1015, ¶¶ [0017], [0018]. The screen assembly includes light sources (220b/720b) (annotated in orange) integrated into a housing/frame (220a/720a) adjacent to a screen (220c/720c) and a camera (215/715) (annotated in blue). EX1015, ¶¶ [0017], [0018].

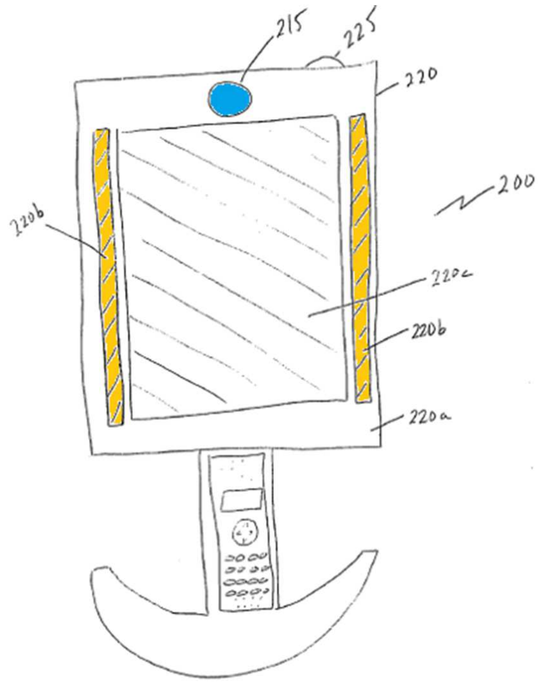


Figure 2

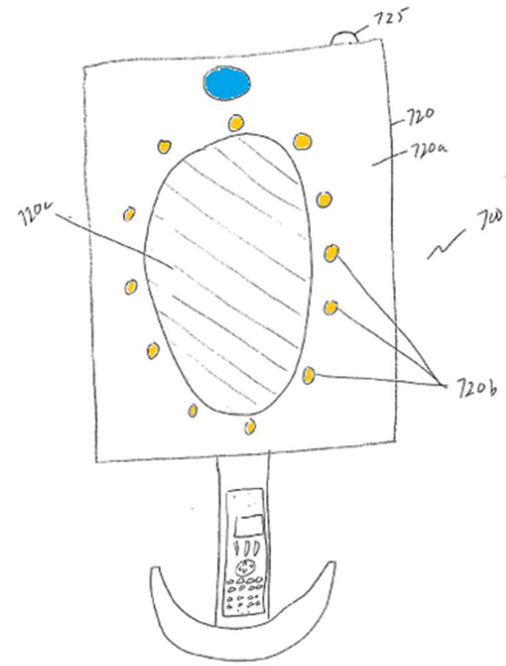


Figure 7

D. CLAIM CONSTRUCTION

In the parallel district court litigation (*see infra* at VII(B)), Patent Owner has proposed the following claim constructions (EX1003):

Claim Term	Patent Owner's Proposed Construction
Bulb	One or more elements that operate in unison to emit light
Circular configuration	Plain and ordinary meaning or a relative arrangement of elements having the form of a circle
Communication terminal	An electronic device capable of sending electronic messages such as, for example, a cellular phone
Conform	Plain and ordinary meaning, or to have the same shape, outline, or contour as another element
Optimal	Plain and ordinary meaning, or desirable or satisfactory
Positionable relative to the web camera	Plain and ordinary meaning, or being capable of change in relative position to each other either by moving the bulb or moving the web camera
Projecting the emitted light	Directing scattered, spillover, or other light emitted from the bulb in a desired direction

Claim Term	Patent Owner's Proposed Construction
Reflector	Plain and ordinary meaning, or an element or surface that has a surface layer that reflects at least a non-insubstantial amount of light
Toroidal	Plain and ordinary meaning, or having a shape of a toroid, *i.e.*, a surface formed by rotating a shape around an axis that lies in the same plane as the shape without intersecting the shape
Web camera	Either a separate camera device or a camera integrated into an electronic device such as, for example, a cellular phone

In the parallel district court litigation, Petitioner has proposed the corresponding claim constructions (EX1004):

Term	Petitioner's Proposed Construction
Bulb having a toroidal shape	Indefinite In the alternative: a single bulb having a three-dimensional torus shape
Reflector having a circular configuration to conform to the toroidal shape of said bulb	A three-dimensional reflector that is a separate and distinct structural component that surrounds or encases said bulb and which conforms to the three-dimensional toroidal shaped curvature of said bulb
Bulb is positionable relative the web camera	Bulb is independently movable relative to the fixed web camera
Optimal viewing	Indefinite
Emitting light	Emitting diffuse light directly from the bulb's surface

As of the filing of this Petition, the district court has not issued a *Markman* order.

Petitioner respectfully submits that the Board need not formally construe any claim terms in order to adjudicate the merits of this Petition. To the extent there are any differences between the parties' proposed claim constructions in the parallel district court litigation, such differences are not material to the grounds of unpatentability asserted in this Petition. Said differently, the Challenged Claims are unpatentable over the cited art under either party's proposed constructions.

Although Petitioner has argued in the parallel district court action that two terms in claim 1—"bulb having a toroidal shape" and "optimal viewing"—are indefinite under 35 U.S.C. § 112(b), this does preclude the Board from instituting an IPR. As the Federal Circuit has explained, "it is not always impossible to adjudicate a prior-art challenge, one way or the other, just because some aspect of a claim renders the claim indefinite." *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 801, 813 (Fed. Cir. 2021); *Samsung Electronics America, Inc. v. Prisua Eng'g Corp.*, 948 F.3d 1342, 1353 (Fed. Cir. 2020) (noting that indefiniteness "does not necessarily preclude the Board from addressing the patentability of the claims on section 102 and 103 grounds"). Rather, "[t]he indefiniteness of a limitation [] precludes a patentability determination only when the indefiniteness renders it logically impossible for the Board to reach such a decision." *Intel*, 21 F.4th at 813.

Thus, while Petitioner has argued in the district court action that the term "bulb having a toroidal shape" is indefinite because the specification alternately refers to "toroidal" and "ring" configurations for the bulb without clarifying whether a "toroidal" shape is different from a "ring" shape (and, if so, how), EX1004 at 8-11 (citing EX1001 at 2:55-58), there is no need for the Board to address that issue in order to apply the prior art cited in this Petition. This is because each of Dine, Luo, and Masayuki discloses a circular, doughnut-shaped bulb that is toroidal and/or ring-shaped under any reasonable interpretations of those terms. *See supra* at IV(C). Thus, the Board need not construe the outer bounds of the claims as part of these proceedings. *Intel*, 21 F.4th at 813; *Samsung*, 948 F.3d at 1353; *see also Motorola Solutions, Inc. v. STA Group LLC*, IPR No. IPR2024-00207, Paper 11 at 12-13 (P.T.A.B. Aug. 14, 2024) ("We agree with Petitioner that we can determine whether to institute trial without having to resolve Petitioner's assertion of indefiniteness.").

Similarly, while Petitioner has argued in the district court action that the term "optimal viewing" is indefinite because the specification provides no objective criteria for determining what constitutes "optimal" viewing conditions (an otherwise inherently subjective concept), EX1004 at 23-24, this issue does not prevent the Board from adjudicating the merits of the Petition, either. Although the application of the term "optimal viewing" to certain accused products may be inherently uncertain, it does not "render[] it logically impossible" for the Board to apply the prior art of record. *Intel*, 21 F.4th at 813.

V. DETAILED EXPLANATION OF GROUNDS

A. Ground 1A: Naghi and Dine Render Claims 1-6 Obvious Under 35 U.S.C. § 103.

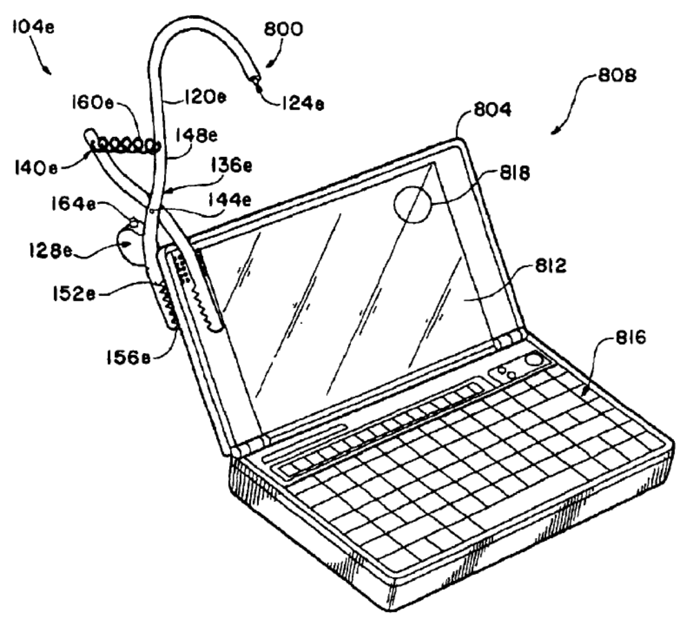
Naghi describes a portable lighting apparatus with a bulb attached to one end of an adjustable, flexible arm. The bendable body includes a clamp at the other end for clamping the portable light onto various objects, including a laptop computer equipped with a video camera. *See supra* at IV(C)(1). Dine describes a portable photographic lighting unit comprising a bulb in the shape of a toroid. The toroidal shape of the bulb enhances light diffusion, providing uniform, shadow-free illumination of the subject to be photographed. The bulb is positioned within a ring-shaped chamber of a housing that surrounds the bulb and acts as a reflector, projecting the light emitted by the bulb towards the subject. *See supra* at IV(C)(4). As explained below, a POSITA would have been motivated to combine the toroidal bulb shape and conforming reflector of Dine with Naghi's portable lighting apparatus to improve the diffusion and quality of light projected by the apparatus.

1. Claim 1

Preamble [1pre]: "An illuminator device for illuminating one or more users in front of a web camera and a communication terminal comprising"

Generally, a preamble of a claim is non-limiting and does not carry patentable weight. Thus, the terms "one or more users," "web camera," and "communication terminal" in the preamble of claim 1 are not limiting but merely relate to the intended use of the illuminator device of claim 1.

To the extent the preamble is limiting, Naghi teaches that "[a]n aspect of the invention involves a method of illuminating one or more objects associated with a laptop computer comprising the steps of attaching a light to a support surface of the laptop computer and illuminating one or more objects associated with the laptop computer with at least one LED of the light." EX1008 at 1:45-50. More specifically, Naghi describes an illuminator device (*e.g.*, laptop light **800**) for illuminating one or more users in front of a web camera (camera **818**) and a communication terminal (laptop computer **808**). EX1008 at 7:24-25.



Elements [1a] and 1[b]: "a bulb having a toroidal shape for emitting light" and "a reflector having a circular configuration to conform to the toroidal shape of said bulb for projecting the emitted light"

Dine's portable photographic light unit contains both elements. First, it contains a bulb in the shape of a toroid (circular tube **10**). EX1006 at 2:8-9, 3:1-2. The toroidal shape of Dine's tube **10** is depicted in Dine's drawings, including the perspective and side views shown in Figure 3.

Fig. 9.

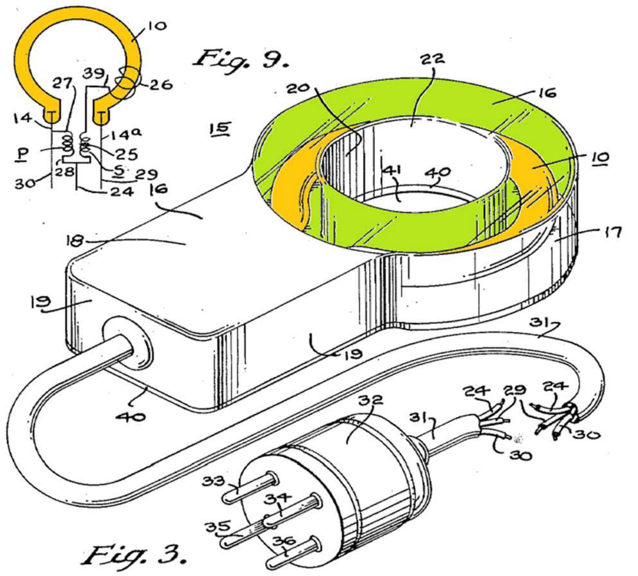


Fig. 3.

Fig. 1.

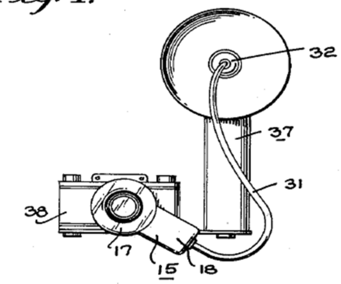
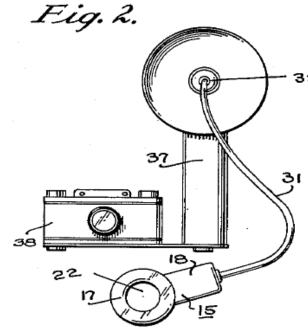


Fig. 2.



Second, Dine's portable light unit includes a circular reflector that conforms to the toroidal shape of the bulb. Specifically, Dine teaches that the tube **10** is housed within an annular (circular) chamber of a housing **17**. EX1006 at 2:28-34. Dine further teaches that all surfaces of the housing, except the front-facing circular portion overlying the tube **10**, are rendered opaque using a reflective coating **42**, so that light emitted from the tube **10** is projected axially forward towards the photographic subject. EX1006 at 3:49-57. Dine's housing thereby functions as a reflector for projecting forward light that would otherwise radiate backwards. EX1006 at 4:43-46; *see also* EX1017, ¶ 59.

As explained by Dr. Pattison, a POSITA would have been motivated to incorporate Dine's toroidal bulb shape and conforming reflector into Naghi's portable lighting apparatus. EX1017, ¶ 60. Naghi explicitly teaches the use of its portable lighting apparatus in conjunction with a laptop computer equipped with a video camera (*i.e.*, a webcam). EX1008 at 7:18-37. A POSITA would have appreciated that, to optimize the laptop user's on-camera appearance, Naghi's lighting apparatus should be capable of illuminating their face with ample, uniform light, without casting unflattering shadows. EX1017, ¶ 62. Indeed, the technical problem of insufficient, uneven lighting and its adverse effects on image quality was well-known in the fields of photography and videography. EX1017, ¶ 62. The Background of the Invention section of the '729 patent's specification itself admits that "[p]oor lighting is one of the primary reasons for the poor appearance of facial images" in webcam feeds, and that "there is a need to provide proper lighting for users that are viewed through a webcam to ensure that they appear aesthetically pleasing." EX1001 at 1:29-36. Further, the prior art, including Dine, explicitly recognized the need for photographic subjects to be "uniformly illuminated virtually free of any shadow." EX1006 at 1:16-18.

This need to uniformly illuminate a webcam user's face would have prompted a POSITA to seek a solution. *See KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 421 (2007) (explaining that motivation to combine may arise from "any need or problem known in the field and addressed by the patent"). A POSITA would have recognized that Dine provides one such solution. "Ring" lights were well-known in the art (*e.g.*, in photography, videography, makeup lighting, etc.) to achieve soft, uniform illumination of the subject's face. EX1017, ¶ 43-44. Dine itself teaches that uniform, shadow-free illumination of a photographic subject can be achieved using a ring-shaped, toroidal bulb and conforming circular reflector. EX1004 at 1:8-18, 3:57-61. Thus, a POSITA would have been motivated to incorporate Dine's lighting module comprising a toroidal bulb shape and conforming reflector into Naghi's lighting apparatus. EX1017, ¶¶ 60, 65, 66. A POSITA would have recognized that Dine's teachings could be readily applied in the webcam context, because the same general lighting principles apply to all camera types (*e.g.*, analog and digital, photo and video). EX1017, ¶ 44. Thus, the use of Dine's lighting module in place of Naghi's existing light source **124/124a-e** would have amounted to a simple "substitution of one element for another known in the field" to "yield a predictable result" (uniform, shadow-free illumination of the webcam user's face). *KSR*, 550 U.S. at 416; *see also* EX1017, ¶ 63.

Element [1c]: "and an arm disposed between said bulb and the terminal for connection to the terminal, wherein said bulb is positionable relative to the web camera to provide optimal viewing of the user through the web camera."

Naghi's portable lighting apparatus includes such an arm (bendable body portion **120/120a-e**) disposed between the bulb (light source **124/124a-e**) and a communications terminal (laptop computer **808**) for connection to the terminal. Naghi further teaches that the bulb is positionable relative to the web camera (camera **818**) associated with the communications terminal to provide optimal viewing of the user through the web camera. In that regard, Naghi states that "[t]he light source **124/124a-e** is oriented to a desired position by bending the adjustable, bendable body **120** to a desired configuration." EX1008 at 4:18-20.

2. Claim 2

"The illuminator device of claim 1, wherein said reflector is positioned proximate said bulb to project light towards a face of said user or said users."

Dine teaches this additional limitation. Dine's toroidal bulb is encased within the annular chamber **21** of the housing **17**. EX1006 at 2:30-35. Further, because all surfaces of the housing except the front portion overlaying the bulb are painted with a reflecting coating, the light emitted by the bulb is projected forward towards the photographic subject. EX1006 at 3:49-61. Thus, the housing of Dine's lighting module acts as a reflector and is positioned "proximate" the bulb to redirect light towards the photographic subject. EX1017, ¶ 68. More specifically, when incorporated into Naghi's portable lighting apparatus, Dine's housing would be projecting the light towards the face of the webcam user. EX1017, ¶ 69.

3. Claim 3

"The illuminator device of claim 1, wherein said reflector is lined with a reflective material or film."

Dine teaches that all surfaces of its housing **17**, except the front portion overlaying the circular tube **10**, are "rendered opaque by the application thereto of a suitable coating **42** of paint or other material." EX1006 at 3:54-56. As a result, the light emitted by the tube is "projected axially forward of the center of the tube." EX1006 at 3:58-60. Thus, the coating acts as a reflective material or film. EX1017, ¶ 70.

4. Claim 4

"The illuminator device of claim 1, wherein said arm is a flexible arm that permits said bulb to be positioned relative to the web camera."

Naghi teaches that the arm (body portion **120/120a-e**) of its portable lighting apparatus is "adjustable" and "bendable." EX1008 at 2:61-62 Naghi further teaches that the light source **124/124a-e** can be "oriented to a desired position by bending the adjustable, bendable body [**120/120a-e**] to a desired configuration." EX1008 at 4:18-20.

5. Claim 5

"The illuminator device of claim 1, wherein said arm is connected to the terminal by a clamp."

Naghi teaches that the arm (body portion **120/120a-e**) of its portable lighting apparatus can be connected to a laptop computer using a clamping mechanism comprising lower arm portions **152** and engagement teeth **156**. EX1008 at 4:1-2, 4:10-12.

6. Claim 6

"The illuminator device of claim 5, wherein the clamp is movable along an edge of the terminal to adjust the location of said bulb."

Naghi's clamping mechanism can be released to move the portable lighting apparatus to another location on the frame of a laptop computer. EX1008 at 7:18-22, 4:8-15.

B. Ground 1B: Naghi, Dine, and Cheng Render Claim 7 Obvious Under 35 U.S.C. § 103.

"The illuminator device of claim 1, wherein the arm has a base that supports the illuminator device on a flat surface adjacent to the terminal."

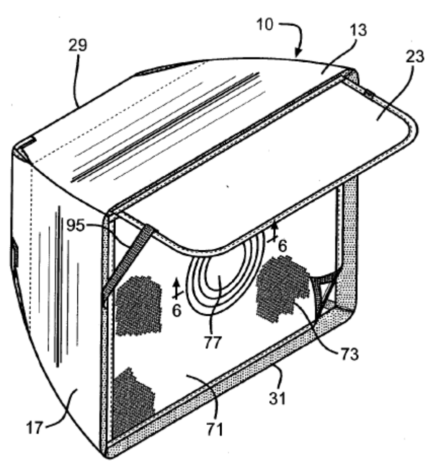
As discussed *supra* at V(A)(1), the combination of Naghi and Dine teaches all the limitations of independent claim 1. Further, Cheng teaches the additional limitation of claim 7. Specifically, Cheng teaches that its arm (arm **12**) has a base (base **11**) that supports the illuminator device on a flat surface adjacent to a communications terminal (image output device **16**). EX1005 at Abstract. A POSITA would have recognized that, instead of having a clamping mechanism at one end, the bendable body portion **120/120a-e** of Naghi's portable lighting apparatus could be modified to include a base like Cheng's base. EX1017, ¶ 75. A POSITA would have appreciated that such a modification of Naghi's apparatus would have benefits, including enabling the apparatus to be stably mounted on a flat surface. EX1017, ¶ 76. This modification would have been obvious to a POSITA as it would have involved the mere substitution of one element (Naghi's clamp) with another known element (Cheng's base) to produce a predictable result (stable mounting on a flat surface). EX1017, ¶ 77.

C. Ground 1C: Naghi, Dine, and Cook Render Claims 8 and 9 Obvious Under 35 U.S.C. § 103.

1. Claim 8

"The illuminator device of claim 1, wherein said reflector has a piece of fabric thereon disposed between said bulb and a user's face for diffusing the light emitted from said bulb."

As discussed *supra* at V(A)(1), the combination of Naghi and Dine teaches all the limitations of independent claim 1. Further, Cook teaches the additional limitation of claim 8. Specifically, Cook teaches a light modifier for creating an enhanced depth of lighting on a subject. EX1007 at Abstract. The light modifier includes a housing **13** with a first end **29** adapted to receive a light source and a second end **31** comprising a removably attached panel **71**. EX1007, ¶ [0015]. The panel is made from netting fabric **73**. EX1007, ¶ [0015]. Cook explicitly teaches that the netting acts to diffuse the light emitted by the light source. EX1007, ¶ [0015]. ("The layer of netting **73** acts to diffuse or modify the light that it receives from the light source **49**.").



Having incorporated Dine's toroidal bulb and conforming reflector into Naghi's portable lighting apparatus, a POSITA would have recognized that the resulting apparatus could be further improved by disposing a piece of fabric between the light source and the subject's face. EX1017, ¶ 81. In particular, Cook teaches that a fabric netting functions to diffuse light emanating from a light source. EX1007, ¶ [0015]. Thus, a POSITA would have been motivated to incorporate a fabric netting into the lighting apparatus of Naghi (modified in view of Dine to include a toroidal bulb and conforming reflector) to enhance the diffusion of light, thereby permitting even more uniform and shadow-free illumination of the subject. EX1017, ¶ 81.

2. Claim 9

"The illuminator device of claim 8, wherein said fabric is silk or muslin."

Cook teaches that "[e]xamples of netting that are particularly useful are cotton, nylon, polyester or similar fabric netting having the ability to withstand high heat applications." EX1007, ¶ [0015]. Muslin is a cotton fabric. EX1017, ¶ 83. Therefore, it would have been obvious to a POSITA to try using muslin as a diffusion fabric disposed between the light source and the subject's face. EX1017, ¶ 84.

D. Ground 2A: Nelson and Luo Render Claims 1-7 Obvious Under 35 U.S.C. § 103.

Nelson describes a portable illuminating device comprising a light source encased within a housing. The housing is attached to one end of a flexible neck. A body/base is attached to the other end of the flexible neck. EX1014, ¶¶ [0030],

[0060]. The body/base includes a clamp configured to permit removable attachment to a variety of articles, including laptop computers. *See supra* at IV(C)(2). Luo describes a "shadowless" flash device comprising a toroidal lamp tube and a conforming circular reflector. *See supra* at IV(C)(5). As explained below, a POSITA would have been motivated to combine the toroidal bulb shape and conforming reflector of Luo with Nelson's portable illuminating device to improve the diffusion and quality of light projected by the device.

1. Claim 1

Preamble [1pre]: "An illuminator device for illuminating one or more users in front of a web camera and a communication terminal comprising"

Generally, a preamble of a claim is non-limiting and does not carry patentable weight. Thus, the terms "one or more users," "web camera," and "communication terminal" in the preamble of claim 1 are not limiting but merely relate to the intended use of the illuminator device of claim 1.

To the extent the preamble is limiting, Nelson teaches a portable illuminating device "capable of attaching, grasping or securing itself to a number of structures," including a "laptop or notebook computer." EX1014, ¶¶ [0032], [0037].

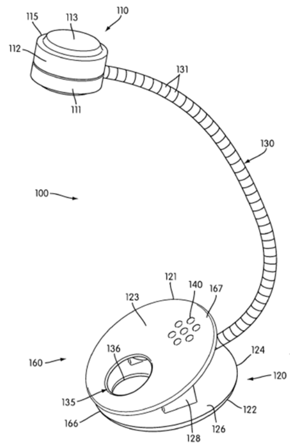


FIG. 1A

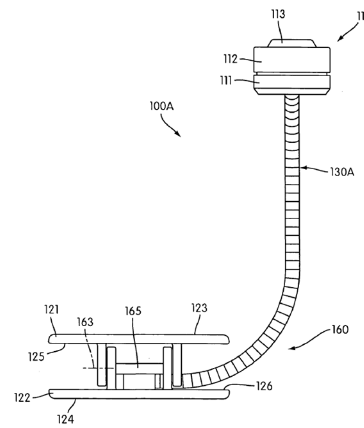
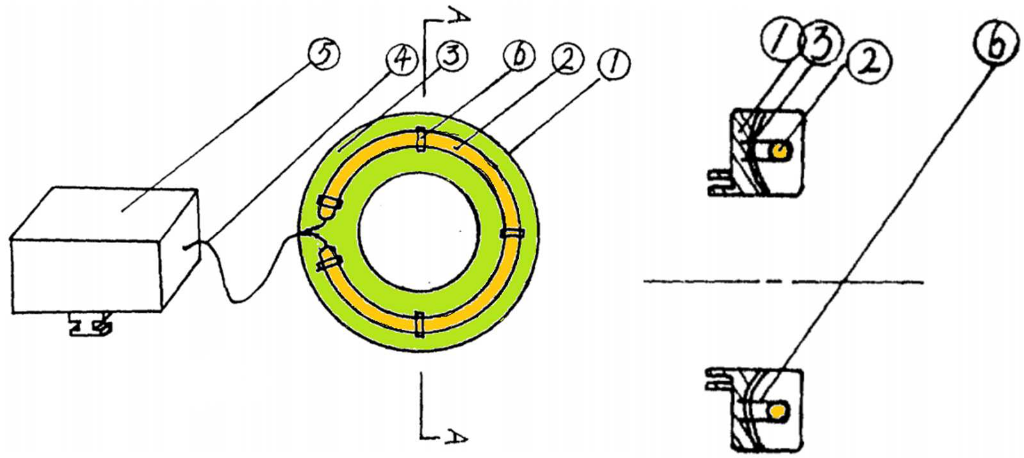


FIG. 3A

As of the January 26, 2007 effective filing date of the '729 patent, it was common for laptop computers to come equipped with video cameras. EX1017, ¶ 38. For example, Naghi (filed on March 15, 2001, almost six years prior to the '729 patent's effective filing date) described a laptop computer 808 that included a web camera 818. *See supra* at V(A)(1). Therefore, to the extent that Nelson contemplates using its portable illuminating device in conjunction with "laptop or notebook computer[s]," this would include the use of the illuminating device to illuminate one or more users in front of a web camera. EX1017, ¶ 86.

Elements [1a] and 1[b]: "a bulb having a toroidal shape for emitting light" and "a reflector having a circular configuration to conform to the toroidal shape of said bulb for projecting the emitted light"

Luo's portable flash device comprises a toroidal lamp tube **2**, which is surrounded by a circular reflector **3**. *See* EX1013 at 5 ("Referring to Figures 1 and 2 . . . [c]lips **(6)** are used to secure a toroidal lamp tube **(2)** and a circular reflector **(3)** inside the ring flash housing **(1)**, thereby forming an integrated structure.").



As explained by Dr. Pattison, a POSITA would have been motivated to incorporate the toroidal shape of Luo's lamp tube and its conforming circular reflector into Nelson's illuminator device. EX1017, ¶ 88. Nelson explicitly teaches the use of its illuminator device in conjunction with a laptop computer. EX1014, ¶¶ [0032], [0037]. As discussed *supra* at V(A)(1), a POSITA would have recognized that, when used in conjunction with a laptop computer, one of the functions of Naghi's illuminating device would be to illuminate the face of the user when the user was being viewed through a web camera. EX1017, ¶ 88. A POSITA would have appreciated that, to optimize the laptop user's on-camera appearance, Nelson's illuminating device should be capable of illuminating their face with ample, uniform light, without casting unflattering shadows. EX1017, ¶ 88. Indeed, the technical problem of insufficient, uneven lighting and its adverse effects on image quality was well-known in the field of photography and videography. EX1017, ¶ 39. The Background of the Invention section of the '729 patent's specification itself admits that "[p]oor lighting is one of the primary reasons for the poor appearance of facial images" in webcam feeds, and that "there is a need to provide proper lighting for users that are viewed through a webcam to ensure that they appear aesthetically pleasing." EX1001 at 1:29-36. Further, the prior art, including Luo, explicitly recognized the need to "prevent the occurrence of shadows during photography" and produce "more aesthetically pleasing photographs." EX1013 at 2, 4.

This need to uniformly illuminate a webcam user's face would have prompted a POSITA to seek a solution. *See KSR,* 550 U.S. at 421 (explaining that motivation to combine may arise from "any need or problem known in the field and addressed by the patent"). A POSITA would have recognized that Luo provides one such solution. "Ring" lights were well-known in the art (*e.g.*, in photography, videography, makeup lighting, etc.) to achieve soft, uniform illumination of the subject's face. EX1017, ¶¶ 43, 44. Luo itself teaches that uniform, shadow-free illumination of a photographic subject can be achieved using a ring-shaped, toroidal bulb and conforming circular reflector. EX1013 at 1. Thus, a POSITA would have been motivated to incorporate Luo's lighting module comprising a toroidal lamp tube and conforming reflector into Nelson's lighting apparatus. EX1017, ¶ 88. A POSITA would have recognized that Luo's teachings could be readily applied in the webcam context, because the same general lighting principles apply to all camera types (*e.g.*, analog and digital, photo and video). EX1017, ¶ 39. Thus, the use of

Luo's lighting module in place of Nelson's existing light source would have amounted to a simple "substitution of one element for another known in the field" to "yield a predictable result" (uniform, shadow-free illumination of the webcam user's face). *KSR*, 550 U.S. at 416; *see also* EX1017, ¶ 89.

Element [1c]: "and an arm disposed between said bulb and the terminal for connection to the terminal, wherein said bulb is positionable relative to the web camera to provide optimal viewing of the user through the web camera."

Nelson's portable illuminating device **100** includes such an arm (flexible neck **130**) disposed between the bulb encased within the housing **115** and a communications terminal (*e.g.*, laptop computer) for connection to the terminal. Nelson further teaches that the "neck **130** enables the head **110** to be adjustably positioned relative to the body **160**. In an illustrative arrangement, the neck **130** is a universally adjustable elongated flexible connecting structure." EX1014, ¶ [0030]. Thus, a POSITA would have understood that the bulb in Nelson's illuminating device would be positionable relative to a web camera associated with the communications terminal to provide optimal viewing of the user through the web camera.

2. Claim 2

"The illuminator device of claim 1, wherein said reflector is positioned proximate said bulb to project light towards a face of said user or said users."

Luo teaches this additional limitation. Luo's toroidal lamp tube **2** is surrounded by a circular reflector **3**. EX1013 at 2. Thus, Luo's reflector is positioned "proximate" the lamp tube **2** to redirect light towards the photographic subject. More specifically, when incorporated into Nelson's portable illuminating device, Luo's reflector would be projecting the light towards the face of the webcam user. EX1017, ¶ 93.

3. Claim 3

"The illuminator device of claim 1, wherein said reflector is lined with a reflective material or film."

A POSITA would have recognized that Luo's reflector is necessarily lined with a reflective material or film to achieve its reflective properties. EX1017, ¶ 94.

4. Claim 4

"The illuminator device of claim 1, wherein said arm is a flexible arm that permits said bulb to be positioned relative to the web camera."

Nelson teaches that the arm (neck **130**) of its portable illuminator device is "flexible." EX1014, ¶ [0030]. Nelson further teaches that the "neck **130** enables the head **110** to be adjustably positioned relative to the body **160**. In an illustrative arrangement, the neck **130** is a universally adjustable elongated flexible connecting structure." EX1014, ¶ [0030]. Thus, a POSITA would have understood that the light source in Nelson's illuminator device would be positionable relative to a web camera when attached to a webcam-equipped laptop computer. EX1017, ¶ 95.

5. Claim 5

"The illuminator device of claim 1, wherein said arm is connected to the terminal by a clamp."

Nelson teaches that the arm (neck **130**) of its portable illuminator device can be connected to a laptop computer using a clamp **120**. EX1014, ¶¶ [0032], [0037].

6. Claim 6

"The illuminator device of claim 5, wherein the clamp is movable along an edge of the terminal to adjust the location of said bulb."

Nelson's clamp **120** can be released to move the portable illuminator device to another location on the frame of a laptop computer. *See* EX1014, ¶ [0032] ("Generally, the clamp **120** has a clamped position and an open position").

7. Claim 7

"The illuminator device of claim 1, wherein the arm has a base that supports the illuminator device on a flat surface adjacent to the terminal."

Nelson teaches that its arm (neck **130**) can have a body/base **160** that supports the illuminator device **100** on a flat surface, as shown in Figures 1A and 3A of Nelson.

E. Ground 2B: Nelson, Luo, and Cook Render Claims 8 and 9 Obvious Under 35 U.S.C. § 103.

1. Claim 8

"The illuminator device of claim 1, wherein said reflector has a piece of fabric thereon disposed between said bulb and a user's face for diffusing the light emitted from said bulb."

As discussed *supra* at V(D)(1), the combination of Nelson and Luo teaches all the limitations of independent claim 1. Further, Cook teaches the additional limitation of claim 8. Specifically, Cook teaches a light modifier for creating an enhanced depth of lighting on a subject. EX1007 at Abstract. The light modifier includes a housing **13** with a first end **29** adapted to receive a light source and a second end **31** comprising a removably attached panel **71**. EX1007, ¶ [0015]. The panel is made from netting fabric **73**. EX1007, ¶ [0015]. Cook explicitly teaches that the netting acts to diffuse the light emitted by the light source. EX1007, ¶ [0015]. ("The layer of netting **73** acts to diffuse or modify the light that it receives from the light source **49**.").

Having incorporated Luo's toroidal bulb shape and conforming reflector into Nelson's portable illuminator device, a POSITA would have recognized that the resulting device could be further improved by disposing a piece of fabric between the light source and the subject's face. EX1017, ¶ 101. In particular, Cook teaches that a fabric netting functions to diffuse light emanating from a light source. EX1007, ¶ [0015]. Thus, a POSITA would have been motivated to incorporate a fabric netting into the illuminator device of Nelson (modified in view of Luo to include a toroidal bulb and conforming reflector) to enhance the diffusion of light, thereby permitting even more uniform and shadow-free illumination of the subject. EX1017, ¶ 102.

2. Claim 9

"The illuminator device of claim 8, wherein said fabric is silk or muslin."

Cook teaches that "[e]xamples of netting that are particularly useful are cotton, nylon, polyester or similar fabric netting having the ability to withstand high heat applications." EX1007, ¶ [0015]. Muslin is a cotton fabric. EX1017, ¶ 105. Therefore, it would have been obvious to a POSITA to try using muslin as a diffusion fabric disposed between the light source and the subject's face. EX1017, ¶ 106.

F. Ground 3A: Cheng and Masayuki Render Claims 1-4 and 7 Obvious Under 35 U.S.C. § 103.

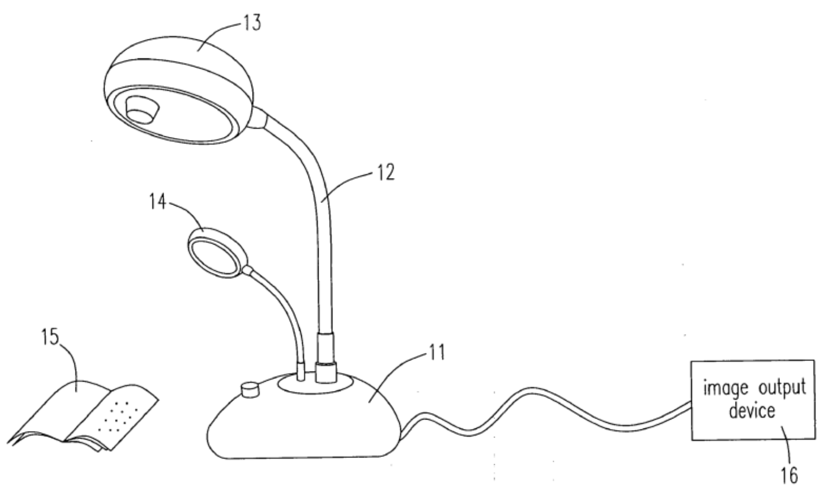
Cheng describes a "digital presenter" with a camera, a lamp, and a flexible support arm connecting the lamp to a base. The digital presenter is used to display the images captured by the camera on an external image output device, including for videoconferencing. *See supra* at IV(C)(3). Masayuki describes an illumination device comprising a ring-shaped (toroidal) bulb and a reflection surface on one side of the bulb. Masayuki's illumination device can be installed around a camera lens to project uniform light from the periphery of the lens onto a photographic subject. *See supra* at IV(C)(6). As explained below, a POSITA would have been motivated to combine the toroidal bulb shape and conforming reflector of Masayuki with Cheng's digital presenter to improve the diffusion and quality of light projected by its lamp.

1. Claim 1

Preamble [1pre]: "An illuminator device for illuminating one or more users in front of a web camera and a communication terminal comprising"

Generally, a preamble of a claim is non-limiting and does not carry patentable weight. Thus, the terms "one or more users," "web camera," and "communication terminal" in the preamble of claim 1 are not limiting but merely relate to the intended use of the illuminator device of claim 1.

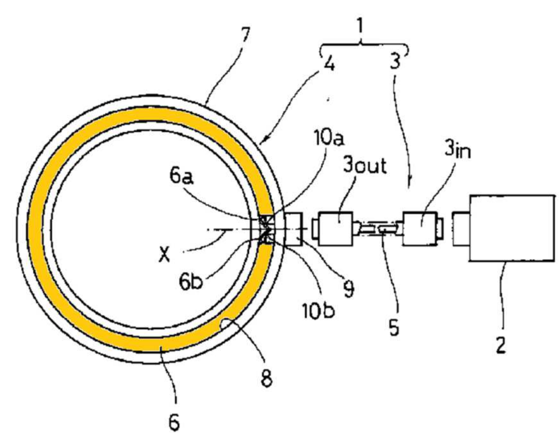
To the extent the preamble is limiting, Cheng teaches a digital presenter with a camera and a lamp. EX1005, ¶ [0007].

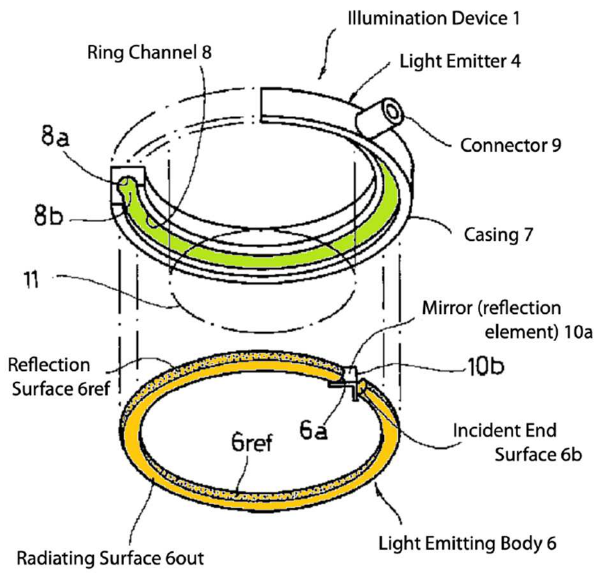


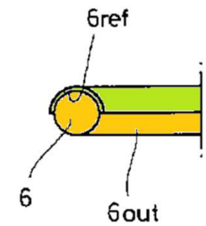
Cheng further teaches that the digital presenter can be used to display the images captured by the camera on an external image output device, including, but not limited to, a multimedia projector, rear projector television, general television, or liquid crystal display (LCD) monitor. EX1005, ¶ [0002]. Among other things, the digital presenter can be used to conduct a video conference. EX1005, ¶ [0002]. Thus, Cheng teaches an "illuminator device" (digital presenter) that illuminates (via lamp **14**) one or more users in front of a "web camera" (camera **13**) and a "communication terminal" (image output device **16**, *e.g.*, desktop computer). EX1005, ¶ [0015]

Elements [1a] and 1[b]: "a bulb having a toroidal shape for emitting light" and "a reflector having a circular configuration to conform to the toroidal shape of said bulb for projecting the emitted light"

Masayuki describes an illumination device comprising a ring-shaped (toroidal) light emitting body **6**, which is housed within a ring channel **8** formed inside of a casing **7**. EX1009 at 1. The light emitting body is surrounded by a conforming circular reflector (reflection surface **6ref**) on one side. EX1009 at 1. The light emitted from the light emitting body is redirected from the reflection surface towards the opposite, radiating surface **6out**, "thereby undergoing diffusion reflection and being emitted to the exterior." EX1009 at 1.







Masayuki teaches that the illumination device that can be installed around the lens of a camera to project uniform light from the periphery of the lens onto the photographic subject. EX1009, ¶ [0002].

As explained by Dr. Pattison, a POSITA would have been motivated to incorporate the toroidal shape of Masayuki's light emitting body and its conforming circular reflector into Cheng's digital presenter. EX1017, ¶ 112. Cheng explicitly teaches the use of its digital presenter as a web camera to conduct a videoconference. EX1005, ¶ [0002]. A POSITA would have appreciated that, to optimize the user's on-camera appearance, Cheng's digital presenter should be capable of illuminating their face with ample, uniform light, without casting unflattering shadows. EX1017, ¶ 112. Indeed, the technical problem of insufficient, uneven lighting and its adverse effects on image quality was well-known in the field of photography and videography. EX1017, ¶ 39. The Background of the Invention section of the '729 patent's specification itself admits that "[p]oor lighting is one of the primary reasons for the poor appearance of facial images" in webcam feeds, and that "there is a need to provide proper lighting for users that are viewed through a webcam to ensure that they appear aesthetically pleasing." EX1001 at 1:29-36. Further, the prior art, including Masayuki, explicitly recognized the need to "provid[e] uniform diffusion illumination" of a photographic subject. EX1009, ¶ [0015].

This need to uniformly illuminate a webcam user's face would have prompted a POSITA to seek a solution. *See KSR*, 550 U.S. at 421 (explaining that motivation to combine may arise from "any need or problem known in the field and addressed by the patent"). A POSITA would have recognized that Masayuki provides one such solution. "Ring" lights were well-known in the art (*e.g.*, in photography, videography, makeup lighting, etc.) to achieve soft, uniform illumination of the subject's face. EX1017, ¶ 114. Masayuki itself teaches that "uniform diffused illumination" of a photographic subject can be achieved using a ring-shaped, toroidal bulb and conforming circular reflector. EX1009, ¶ [0004]; *see also* EX1009, ¶¶ [0006], [0013], [0015]. Thus, a POSITA would have been motivated to incorporate Masayuki's lighting module comprising a toroidal light emitting body and conforming reflector into Cheng's digital presenter. EX1017, ¶ 115. A POSITA would have recognized that Masayuki's teachings could be readily applied in the webcam context, because the same general lighting principles apply to all camera types (*e.g.*, analog and digital, photo and video). EX1017, ¶ 116. Thus, the use of Masayuki's lighting module in place of Cheng's existing lamp would have amounted to a simple "substitution of one element for another known in the field" to "yield a predictable result" (uniform, shadow-free illumination of the webcam user's face). *KSR*, 550 U.S. at 416; *see also* EX1017, ¶ 117.

Element [1c]: "and an arm disposed between said bulb and the terminal for connection to the terminal, wherein said bulb is positionable relative to the web camera to provide optimal viewing of the user through the web camera."

Cheng's digital presenter includes such an arm disposed between the lamp **14** and a communications terminal (image output device **16**, *e.g.*, desktop computer). EX1005, ¶ [0002]. Further, the lamp **14** is "positionable relative to the web camera [**13**]" because the arm of the lamp **14** is depicted in a bent position, clearly indicating that it is bendable. EX1017, ¶ 118 . To the extent the arm of the lamp **14** is inflexible, the lamp is still "positionable relative to the web camera [**13**]" because Cheng's specification clearly states that the *arm of the camera* is "flexible." EX1005, ¶ [0015]. Said differently, even if the arm of Cheng's lamp is rigid, the lamp's position relative to the camera can still be changed by adjusting the position of the camera. In that regard, Patent Owner has explicitly proposed a construction of "positionable relative to the web camera" as "capable of change in relative position to each other *either* by moving the bulb *or* moving the web camera." *See supra* at IV(D) (emphasis added).

Additionally, to the extent the arm of Cheng's lamp is not already bendable, a POSITA would have been motivated to replace it with a bendable arm, like the bendable arm supporting Cheng's camera. EX1017, ¶ 120. A POSITA would have understood the benefit of such a modification, as it would have permitted the position of the lamp relative to the camera to be adjusted by bending the arm of the lamp as well as by bending the arm of the camera (or by doing both). EX1017, ¶ 120. This modification would have amounted to a mere substitution of one element (the rigid support arm) with another known element (a flexible support arm) to yield a predictable result. EX1017, ¶ 120.

2. Claim 2

"The illuminator device of claim 1, wherein said reflector is positioned proximate said bulb to project light towards a face of said user or said users."

Masayuki teaches this additional limitation. Masayuki's toroidal light emitting body **6** is surrounded on one side by a reflection surface **6ref**. EX1009 at 1. The purpose of the reflection surface **6ref** is to reflect light towards the radiating surface **6out** on the opposite side of the light emitting body **6**. EX1009 at 1. Thus, Masayuki's reflection surface **6ref** is positioned "proximate" the light emitting body **6** to redirect light towards the photographic subject. More specifically, when incorporated into Cheng's digital presenter, Masayuki's reflector would be projecting the light towards the face of the webcam user. EX1017, ¶ 121.

3. Claim 3

"The illuminator device of claim 1, wherein said reflector is lined with a reflective material or film."

Masayuki teaches that the reflecting surface **6ref** comprises a reflective coating. *See* EX1009, ¶ [0010] ("[A]s shown in Fig. 4, a reflective coating is applied to its peripheral surface at the Bottom Section 8a side of Ring Channel 8, thereby forming Reflection Surface 6ref for causing diffusion reflection of the light advancing through Light Emitting Body 6 and directing it toward the Opening Section 8b side of Ring Channel 8.").

4. Claim 4

"The illuminator device of claim 1, wherein said arm is a flexible arm that permits said bulb to be positioned relative to the web camera."

As discussed *supra* at IV(D), the lamp **14** is connected to the base of Cheng's digital presenter via a flexible arm; alternatively, to the extent the arm supporting the lamp is not already flexible, it would have been obvious to a POSITA to replace with a flexible arm. EX1017, ¶ 123.

5. Claim 7

"The illuminator device of claim 1, wherein the arm has a base that supports the illuminator device on a flat surface adjacent to the terminal."

As shown in Figure 1 of Cheng, the arm **12** connects the lamp **14** to a base **11** that supports the illuminator device on a flat surface adjacent to a communications terminal (image output device **16**). EX1017, ¶ 124.

G. Ground 3B: Cheng, Masayuki, and Nelson Render Claims 5 and 6 Obvious Under 35 U.S.C. § 103.

1. Claim 5

"The illuminator device of claim 1, wherein said arm is connected to the terminal by a clamp."

As discussed *supra* at V(F)(1), the combination of Cheng and Masayuki teaches all the limitations of independent claim 1. Further, Nelson teaches the additional limitation of claim 5. Specifically, Nelson teaches that an illuminating device comprising a lamp, a flexible neck **130**, and a body/base **160** adapted both to clamp onto various objects (*e.g.*, a laptop computer) and to be positioned on a flat, stable surface. EX1014, Figs. 1 & 3A, ¶ [0037]. Thus, it would have been obvious to a POSITA that the utility of Cheng's digital presenter would be enhanced by replacing its base **11** with a base like Nelson's body/base, so that the digital presenter could be removably attached to a computer or another external image output device **16**. EX1017, ¶ 126 . Utilizing Nelson's teaching of a base with a clamping functionality to improve Cheng's digital presenter would have amounted to a mere substitution of one element (Cheng's base) with another known element (Nelson's base) to achieve a predictable result (increased positioning flexibility). EX1017, ¶ 127 .

2. Claim 6

"The illuminator device of claim 5, wherein the clamp is movable along an edge of the terminal to adjust the location of said bulb."

Nelson's clamp **120** can be released to move the portable illuminator device to another location on the frame of a laptop computer. *See* EX1014, ¶ [0032] ("Generally, the clamp **120** has a clamped position and an open position").

H. Ground 3C: Cheng, Masayuki, and Cook Render Claims 8 and 9 Obvious Under 35 U.S.C. § 103.

1. Claim 8

"The illuminator device of claim 1, wherein said reflector has a piece of fabric thereon disposed between said bulb and a user's face for diffusing the light emitted from said bulb."

As discussed *supra* at V(F)(1), the combination of Cheng and Masayuki teaches all the limitations of independent claim 1. Further, Cook teaches the additional limitation of claim 8. Specifically, Cook teaches a light modifier for creating an enhanced depth of lighting on a subject. EX1007 at Abstract. The light modifier includes a housing **13** with a first end **29** adapted to receive a light source and a second end **31** comprising a removably attached panel **71**. EX1007, ¶ [0015]. The panel is made from netting fabric **73**. EX1007, ¶ [0015]. Cook explicitly teaches that the netting acts to diffuse the light emitted by the light source. EX1007, ¶ [0015]. ("The layer of netting **73** acts to diffuse or modify the light that it receives from the light source **49**.").

Having incorporated Masayuki's toroidal bulb shape and conforming reflector into Cheng's digital presenter, a POSITA would have recognized that the resulting device could be further improved by disposing a piece of fabric between the light source and the subject's face. EX1017, ¶ 131. In particular, Cook teaches that a fabric netting functions to diffuse light emanating from a light source. EX1007, ¶ [0015]. Thus, a POSITA would have been motivated to incorporate a fabric netting into the digital presenter of Cheng (modified in view of Masayuki to include a toroidal bulb and conforming reflector) to enhance the diffusion of light, thereby permitting even more uniform and shadow-free illumination of the subject. EX1017, ¶ 132.

2. Claim 9

"The illuminator device of claim 8, wherein said fabric is silk or muslin."

Cook teaches that "[e]xamples of netting that are particularly useful are cotton, nylon, polyester or similar fabric netting having the ability to withstand high heat applications." EX1007, ¶ [0015]. Muslin is a cotton fabric. EX1017, ¶ 135. Therefore, it would have been obvious to a POSITA to try using muslin as a diffusion fabric disposed between the light source and the subject's face. EX1017, ¶ 136.

I. Ground 4A: DeBreuil Renders Claims 10-13 Obvious Under 35 U.S.C. § 103, Either Alone or in Combination with Dine.

1. Claim 10

Preamble [10pre]: "An illuminator device for illuminating one or more users in front of a web camera and a communications terminal having a frame and a screen comprising"

Generally, a preamble of a claim is non-limiting and does not carry patentable weight. Thus, the terms "one or more users," "web camera," "communication terminal," "frame," and "screen" in the preamble of claim 10 are not limiting but merely relate to the intended use of the illuminator device of claim 10.

To the extent the preamble is limiting, DeBreuil discloses an illuminator device for illuminating one or more users in front of a web camera (video camera **215**) and a communications terminal (video telephone **200/700**) having a frame (screen assembly **220/720** and/or housing **220a/720a**) and a screen (screen **220c/720c**). EX1015, ¶¶ [0017], [0018].

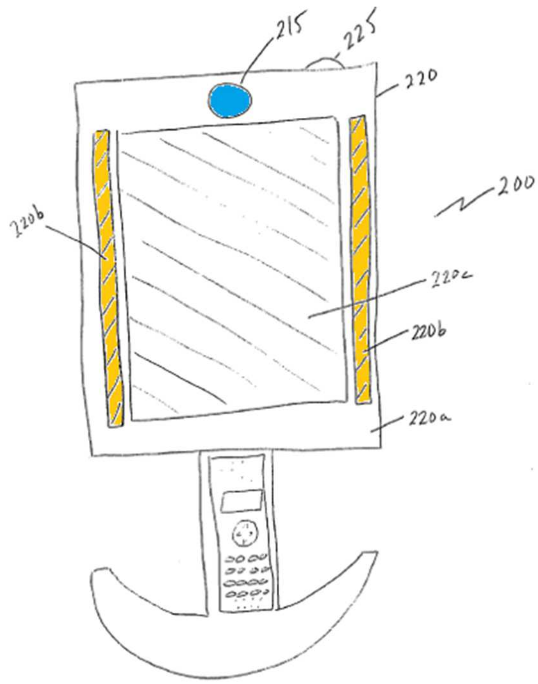


Figure 2

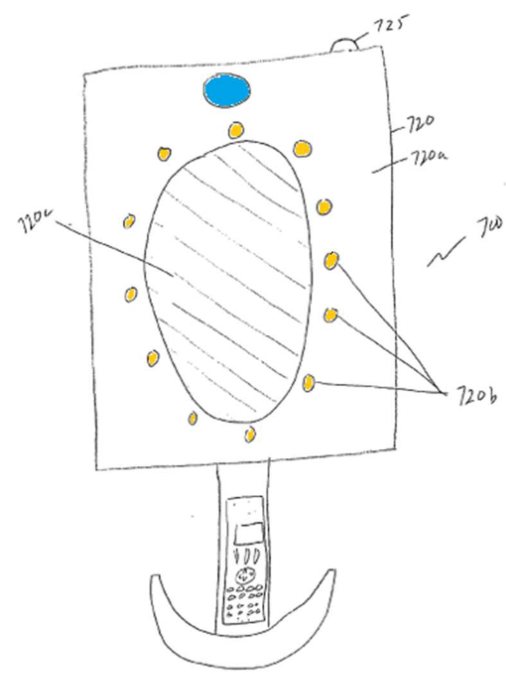


Figure 7

Element [10a]: "a plurality of bulbs, wherein said plurality of bulbs are disposed in the frame of the terminal and one of said plurality of bulbs surrounds the web camera."

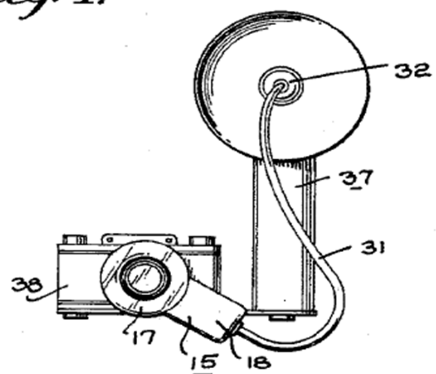
Du Breuil teaches a plurality of bulbs (light source **220b/720b**) disposed in the frame (screen assembly **220/720** and/or housing **220a/720a**) of the communications terminal (video telephone **200/700**).

During prosecution, the applicant overcame an *anticipation* rejection over DeBreuil by asserting that "[i]n none of the embodiments of DeBreuil does one of the bulbs surround the webcamera," because "[i]n DeBreuil[,] the lights are beneath the webcamera." EX1002 at 66. However, to the extent De Breuil does not teach an arrangement of bulbs in which at least one bulb "surrounds" the web camera **215**, such an arrangement would have been *obvious*. EX1017, ¶ 140.

First, De Breuil itself recognizes that, "[i]f the user's face is not properly lit, the image displayed at the receiver video telephone 100[/200/700] will be dark and distorted, especially in the shadow areas of faces." EX1015, ¶ [0012]. Thus, as explained by Dr. Pattison, it would have been obvious to a POSITA to try rearranging Du Breuil's existing frame-mounted light elements 220b/720b to optimize the quality of the image. EX1017, ¶ 140 . Further, a POSITA would have recognized that there was a limited number of places in the frame of the terminal (video telephone 200/700) where Du Breuil's light elements could be located: above the camera, below the camera, around the camera, and/or to the sides of the camera. EX1017, ¶ 141. Thus, rearranging the lights so that at least one light (*e.g.*, **220**) surrounded the web camera **215** would have been one of a finite number of predictable solutions for achieving direct, uniform illumination of the user's face. EX1017, ¶¶ 140, 141; *see also Uber Techs., Inc. v. X One, Inc.*, 957 F.3d 1334, 1339-1340 (Fed. Cir. 2020) ("Because terminal-side plotting (as described in Okubo) and server-side plotting (as described in Konishi and claimed in the '593 patent) would have been two of a finite number of known, predictable solutions at the time of the invention of the '593 patent, a [POSITA] would have faced a simple design choice between the two, and therefore would have been motivated to combine the teachings of Okubo and Konishi to achieve the limitation.").

Second, to the extent the above modification (rearranging Du Breuil's existing frame-mounted light elements **220b/720b** so that at least one light surrounded the camera) would not have been obvious over Du Breuil alone, it would have been obvious over Du Breuil in view of Dine. EX1017, ¶ 142. Specifically, Dine teaches the attachment of a toroidal bulb "in close relation to and concentrically about the camera lens" so that the photographed subject is "uniformly illuminated virtually free of any shadow." EX1006 at 1:11-12. The camera lens of camera **38** is clearly depicted as being surrounded by the enclosure housing **17**, which holds the toroidal bulb:

Fig. 1.



As explained by Dr. Pattison, in light of Dine's explicit teaching that this positioning of the bulb relative to the camera lens improves image quality (*e.g.*, by producing a uniform distribution of light without shadows), it would have been obvious to a POSITA that the arrangement of Du Breuil's frame-mounted lights could be modified to position one or more of the lights around Du Breuil's web camera. EX1017, ¶ 143.

2. Claim 11

"The illuminator device of claim 10, wherein one of said plurality of bulbs is on one side of the web camera and another of said plurality of bulbs is on the other side of the web camera."

Du Breuil explicitly teaches embodiments in which one of the plurality of bulbs is on one side of the web camera and another of the plurality of bulbs is on the other side of the web camera. EX1015, Figs. 2 & 7.

3. Claim 12

"The illuminator device of claim 10, wherein in each of said plurality of bulbs are rectangularly shaped."

Du Breuil explicitly teaches an embodiment in which each of the plurality of bulbs is rectangularly shaped. EX1015, Fig. 2.

4. Claim 13

"The illuminator device of claim 10, wherein said plurality of bulbs are a plurality of electrodes spaced in the frame of the screen."

The term "electrode" has a meaning in the field of electronics that does not appear to be applicable in the context of claim 13. Specifically, "electrode" is generally understood to refer to an electrical conductor that allows electrical current to flow into or out of a non-metallic substance or device. Electrodes do not emit light. Therefore, it is unclear how a bulb can be an "electrode." EX1017, ¶ 146. Nevertheless, the only time the specification of the '729 patent uses the term "electrode," it appears to use that term interchangeably with "light." *See* EX1001 at 4:8-9 ("FIG. 5 shows a more decorative arrangement of lights or electrodes **100** much like a make-up mirror."). Applying this definition, Du Breuil explicitly teaches an embodiment in which each of the plurality of lights is "spaced in the frame of the screen." EX1015, Figs. 2 & 7.

VI. CONCLUSION

For the reasons given above, each of the claims 1-13 of the '729 patent is unpatentably obvious. Petitioner therefore requests *inter partes* review of claims 1-13.

VII. MANDATORY NOTICES

A. 37 C.F.R. § 42.8(b)(1): Real Parties-in-Interest

The real party-in-interest is SHENZHEN RONGLIDA TECHNOLOGY CO. LTD. d/b/a ShutterLight.

B. 37 C.F.R. § 42.8(b)(2): Related Matters

The '729 patent is involved in the following co-pending district court action: *Pathway IP, LLC v. The Individuals Corporations, Limited Liability Companies, Partnerships, and Unincorporated Associations Identified on Schedule A to the Complaint*, No. 1:24-cv-05218 (N.D. Ill.). Petitioner is a defendant in the district court action. Petitioner was served with the complaint in that action no earlier than August 6, 2024. EX1019 at 3 (¶ 4), 9 (row 9).

The '729 patent is involved in the following co-pending *ex parte* reexamination: *Ex Parte* Reexamination Control No. 90/019,924. EX1018. The Central Reexamination Unit granted the reexamination request on May 13, 2025, and ordered reexamination of claims 1-9. EX1018. That proceeding remains pending before Art Unit 3993. No final action or reexamination certificate has been issued.

C. 37 C.F.R. § 42.8(b)(3), (4): Counsel and Service Information

Petitioner provides the following designation of lead and back-up counsel:

Lead Counsel	Back-Up Counsel
Hasan A. Almashat, Esq. Reg. No. 79,166 Dinsmore & Shohl LLP 550 S. Hope Street Suite 1765 Los Angeles, CA 90071 T: (619) 400-0533 Hasan.Almashat@Dinsmore.com	Wei Wang, Esq. (p*ro hac vice admission to be requested*) New York Bar No. 5932249 Glacier Law LLP 41 Madison Avenue, Suite 2529 New York, NY 10010 T: (212) 729-5073 Wei.Wang@Glacier.Law

Pursuant to 37 C.F.R. § 42.10(b), a Power of Attorney for Petitioner accompanies this Petition. Please address all correspondence to lead and back-up counsel at the addresses above. Petitioner also consents to electronic service by email at the email addresses listed above.

Dated: July 11, 2025

Respectfully submitted,

/ Hasan A. Almashat / Reg No. 79,166
Hasan A. Almashat
Reg. No. 79,166
DINSMORE & SHOHL LLP
550 S. Hope Street
Suite 1765
Los Angeles, CA 90071
T: (619) 400-0533
Hasan.Almashat@Dinsmore.com
Attorney for Petitioner

CERTIFICATE OF WORD COUNT

I, the undersigned, do hereby certify that the attached petition contains 10,507 words, as measured by the Word Count function of Microsoft Word. This is less than the limit of 14,000 words as specified by 37 C.F.R. § 42.24(a)(1)(i).

Dated: July 11, 2025

Respectfully submitted,

/ Hasan A. Almashat / Reg No. 79,166

Hasan A. Almashat
Reg. No. 79,166
DINSMORE & SHOHL LLP
550 S. Hope Street
Suite 1765
Los Angeles, CA 90071
T: (619) 400-0533
Hasan.Almashat@Dinsmore.com
Attorney for Petitioner

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 7,841,729, including all Exhibits, is being served on July 11, 2025, via Priority Mail Express delivery directed to the attorney of record for the patent at the following address:

Jeffrey Finn, Esq.
Lance Pritikin, Esq.
Finn IP Law, PC
11400 W. Olympic Boulevard, 9th Floor
Los Angeles, CA 90064
United States

Dated: July 11, 2025

Respectfully submitted,

/ Hasan A. Almashat / Reg No. 79,166

Hasan A. Almashat
Reg. No. 79,166
DINSMORE & SHOHL LLP
550 S. Hope Street
Suite 1765
Los Angeles, CA 90071
T: (619) 400-0533
Hasan.Almashat@Dinsmore.com
Attorney for Petitioner