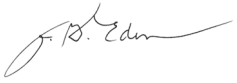
IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

SIGNIFY NORTH AMERICA CORPORATION, et al., Plaintiffs, v. **MENARD, INC.** Defendant., Third-Party Plaintiff **v.** **LUMINEX INTERNATIONAL COMPANY, LTD., et al.,** Third-Party Defendants.	**Case No. 22-cv-00706-jdp** **JURY TRIAL DEMANDED**

OPENING EXPERT REPORT OF DR. J. GARY EDEN REGARDING INVALIDITY OF U.S. PATENT NOS. 10,299,336 AND 7,658,506

Dated April 29, 2024



Dr. J. Gary Eden

Luminex v. Signify
IPR2024-00101
Exhibit 2024

TABLE OF CONTENTS

Page

I. INTRODUCTION 1
II. QUALIFICATIONS 2
III. LEGAL PRINCIPLES APPLIED 6
A. Level of Ordinary Skill in the Art 6
B. Claim Construction 8
C. Presumption of Validity 9
D. Prior Art 9
1. Pre-AIA (the '506 Patent) 10
2. AIA (the '336 Patent) 11
E. Priority Date 12
F. Written Description, Enablement, and Indefiniteness 12
G. Anticipation 14
H. Obviousness 14
IV. BASES OF OPINIONS AND MATERIALS CONSIDERED 16
V. SUMMARY OF CONCLUSIONS 16
VI. BACKGROUND OF THE TECHNOLOGY AND ASSERTED PATENTS 18
A. The Asserted Patents 18
1. The '336 Patent 18
2. The '506 Patent 22
B. Technology Background 23
1. The '336 Patent 23
(a) Correlated Color Temperature (CCT) 23
(b) Electrical Switches Were Well-Known Long Before The Alleged Invention of The '336 Patent 26
(c) Tunable White Light Technology Has Been Known In The Field of Architectural Lighting For Two Decades 27
2. The '506 Patent 32
C. Prosecution Histories of the Asserted Patents 34
1. The '336 Patent 34
2. The '506 Patent 35
VII. BACKGROUND OF THE PRIOR ART 36
A. The '336 Patent 36

TABLE OF CONTENTS
(continued)

Page

1. Chaimberg 36
2. Roberge 38
3. Halliwell 42
4. Reiff 45
5. Chen 47

B. The '506 Patent 50

1. U.S. Patent No. 7,722,220 ("Van De Ven") 50
2. U.S. Patent No. 5,709,460 ("Lester") 51
3. Japanese Publication No. 1984/035302 ("Yoshimi") 52
4. U.S. Patent No. 7,161,313 ("Piepgras") 53

VIII. THE ASSERTED CLAIMS OF THE '336 PATENT ARE INVALID UNDER 35 U.S.C. §§ 102 AND/OR 103 54

A. The Asserted Claims Have A Priority Date No Earlier Than June 21, 2018 54

B. Ground [1a] – Chaimberg Anticipates And/Or Renders Obvious Claims 1, 3, 7, 9, 11-13, 15, and 19 Of The '336 Patent 58

1. Claim 1 58

(a) Preamble: "A luminaire comprising" 59

(b) Element 1a: "a housing comprising at least one outer surface that forms a first cavity;" 59

(c) Element 1b: "at least one electrical component disposed, at least in part, within the first cavity;" 61

(d) Element 1c: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component; and" 63

(e) Element 1d: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing," 64

(f) Element 1e: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire." 65

(g) Conclusion For Claim 1 66

2. Claim 3: "The luminaire of claim 1, wherein each position of the plurality of positions is discrete." 66

(a) Conclusion For Claim 3 67

TABLE OF CONTENTS
(continued)

Page

3. Claim 7: "The luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch." 67
   (a) Conclusion For Claim 7 71
4. Claim 9: "The luminaire of claim 1, wherein the switch is a slide switch." 71
   (a) Conclusion For Claim 9 71
5. Claim 11: "The luminaire of claim 1, wherein the switch is inaccessible when the housing is installed." 71
   (a) Conclusion For Claim 11 73
6. Claim 12: "The luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location." 73
   (a) Conclusion For Claim 12 74
7. Claim 13: 75
   (a) Preamble: "A switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising:" 75
   (b) Element 13a: "a body;" 76
   (c) Element 13b: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and" 77
   (d) Element 13c: "an actuator disposed on the body, wherein the actuator has a range of positions," 78
   (e) Element 13d: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire." 81
   (f) Conclusion For Claim 13 82
8. Claim 15: "The switch of claim 13, wherein each position is discrete within the range of positions." 82
   (a) Conclusion For Claim 15 82
9. Claim 19: "The switch of claim 13, wherein the body is configured to be disposed within a junction box." 83
   (a) Conclusion For Claim 19 83

TABLE OF CONTENTS
(continued)

Page

C. Ground [1b] – Chaimberg Alone Or In View of Roberge Renders Obvious Claims 4, 5, and 16 of the '336 Patent 83

1. Motivation To Combine Chaimberg And Roberge 83

2. Color Control In Roberge With Manual *and* Electronic Switches 85

3. Claim 4: "The luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position." 89

(a) Conclusion For Claim 4 91

4. Claim 5: "The luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources." 92

(a) Conclusion For Claim 5 95

5. Claim 16: "The switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position." 95

(a) Conclusion For Claim 16 96

D. Ground [2] – Halliwell Anticipates And/Or Renders Obvious Claims 1, 3-5, 7, 9, 11-13, 15, 16, and 19 of the '336 Patent 96

1. Halliwell's Switch 30 Would Function As A "Junction Box Mounted" CCT Switch 96

2. Claim 1 98

(a) Preamble: "A luminaire comprising" 98

(b) Element 1a: "a housing comprising at least one outer surface that forms a first cavity;" 99

(c) Element 1b: "at least one electrical component disposed, at least in part, within the first cavity;" 100

(d) Element 1c: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component; and" 102

(e) Element 1d: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing," 103

TABLE OF CONTENTS
(continued)

Page

(f) Element 1e: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire." 104

(g) Conclusion For Claim 1 106

3. Claim 3: "The luminaire of claim 1, wherein each position of the plurality of positions is discrete." 106

(a) Conclusion For Claim 3 107

4. Claim 4: "The luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position." 107

(a) Conclusion For Claim 4 108

5. Claim 5: "The luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources." 108

(a) Conclusion For Claim 5 110

6. Claim 7: "The luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch." 110

(a) Conclusion For Claim 7 111

7. Claim 9: "The luminaire of claim 1, wherein the switch is a slide switch." 112

(a) Conclusion For Claim 9 113

8. Claim 11: "The luminaire of claim 1, wherein the switch is inaccessible when the housing is installed." 113

(a) Conclusion For Claim 11 113

9. Claim 12: "The luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location." 114

(a) Conclusion For Claim 12 114

TABLE OF CONTENTS
(continued)

Page

10. Claim 13: 114
    (a) Preamble: "A switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising:" 114
    (b) Element 13a: "a body;" 116
    (c) Element 13b: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and" 116
    (d) Element 13c: "an actuator disposed on the body, wherein the actuator has a range of positions" 118
    (e) Element 13d: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire." 121
    (f) Conclusion For Claim 13 122
11. Claim 15: "The switch of claim 13, wherein each position is discrete within the range of positions." 122
    (a) Conclusion For Claim 15 122
12. Claim 16: "The switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position." 122
    (a) Conclusion For Claim 16 123
13. Claim 19: "The switch of claim 13, wherein the body is configured to be disposed within a junction box." 123
    (a) Conclusion For Claim 19 123

E. Ground [3a] – Claims 1, 3, 9, 13, and 15 Are Anticipated And/Or Rendered Obvious by By Reiff 123

1. Claim 1 123
    (a) Preamble: "A luminaire comprising" 123
    (b) Element 1a: "a housing comprising at least one outer surface that forms a first cavity;" 124
    (c) Element 1b: "at least one electrical component disposed, at least in part, within the first cavity;" 125
    (d) Element 1c: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component; and" 127

TABLE OF CONTENTS
(continued)

Page

(e) Element 1d: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing," 128

(f) Element 1e: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire." 129

(g) Conclusion For Claim 1 130

2. Claim 3: "The luminaire of claim 1, wherein each position of the plurality of positions is discrete." 130

(a) Conclusion For Claim 3 131

3. Claim 9: "The luminaire of claim 1, wherein the switch is a slide switch." 131

(a) Conclusion For Claim 9 131

4. Claim 13 131

(a) Preamble: "A switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising:" 131

(b) Element 13a: "a body;" 133

(c) Element 13b: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and" 134

(d) Element 13c: "an actuator disposed on the body, wherein the actuator has a range of positions," 135

(e) Element 13d: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire." 137

(f) Conclusion For Claim 13 137

5. Claim 15 137

(a) Conclusion For Claim 15 138

F. Ground [3b] – Reiff Alone And/Or In View Of Chaimberg And/Or Roberge Renders Obvious Claims 4, 5, 7, 11, 12, 16, and 19 of the '336 Patent 138

1. Motivation To Combine Reiff, Chaimberg, And Roberge 138

TABLE OF CONTENTS
(continued)

Page

2. Claim 4: "The luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position." 140

(a) Conclusion For Claim 4 143

3. Claim 5: "The luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources." 143

(a) Conclusion For Claim 5 145

4. Claim 7: "The luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch." 145

(a) Conclusion For Claim 7 146

5. Claim 11: "The luminaire of claim 1, wherein the switch is inaccessible when the housing is installed." 147

(a) Conclusion For Claim 11 147

6. Claim 12: "The luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location." 148

(a) Conclusion For Claim 12 148

7. Claim 16: "The switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position." 148

(a) Conclusion For Claim 16 149

8. Claim 19: "The switch of claim 13, wherein the body is configured to be disposed within a junction box." 149

(a) Conclusion For Claim 19 149

G. Ground [4a] – Roberge Anticipates And/Or Renders Obvious Claims 1, 3-5, 9, 13, 15, 16, and 19 of the '336 Patent 150

1. Claim 1 150

(a) Preamble: "A luminaire comprising" 150

TABLE OF CONTENTS
(continued)

Page

(b) Element 1a: "a housing comprising at least one outer surface that forms a first cavity;" 151

(c) Element 1b: "at least one electrical component disposed, at least in part, within the first cavity;" 152

(d) Element 1c: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component; and" 153

(e) Element 1d: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing," 154

(f) Element 1e: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire." 156

(g) Conclusion For Claim 1 157

2. Claim 3: "The luminaire of claim 1, wherein each position of the plurality of positions is discrete." 157

(a) Conclusion For Claim 3 158

3. Claim 4: "The luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position." 158

(a) Conclusion For Claim 4 159

4. Claim 5: "The luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources." 159

(a) Conclusion For Claim 5 161

5. Claim 9: "The luminaire of claim 1, wherein the switch is a slide switch." 161

(a) Conclusion For Claim 9 162

6. Claim 13: 162

TABLE OF CONTENTS
(continued)

Page

(a) Preamble: "A switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising:" 163

(b) Element 13a: "a body;" 164

(c) Element 13b: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and" 164

(d) Element 13c: "an actuator disposed on the body, wherein the actuator has a range of positions" 165

(e) Element 13d: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire." 166

(f) Conclusion For Claim 13 167

7. Claim 15: "The switch of claim 13, wherein each position is discrete within the range of positions." 167

(a) Conclusion For Claim 15 168

8. Claim 16: "The switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position." 168

(a) Conclusion For Claim 16 169

H. Ground [4b] – Roberge Alone And/Or In View Of Chaimberg Or Halliwell Renders Obvious Claims 7, 11, and 12 Of The '336 Patent 169

1. Motivation to Combine Roberge With Chaimberg Or Halliwell 169

2. Claim 7: "The luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch." 171

(a) Conclusion For Claim 7 171

3. Claim 11: "The luminaire of claim 1, wherein the switch is inaccessible when the housing is installed." 172

(a) Conclusion For Claim 11 172

4. Claim 12: "The luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location." 172

(a) Conclusion For Claim 12 173

TABLE OF CONTENTS
(continued)

Page

5. Claim 19: "The switch of claim 13, wherein the body is configured to be disposed within a junction box." 173

(a) Conclusion For Claim 19 173

I. Ground [5a] – Chen Anticipates And/Or Renders Obvious Claims 1 and 3-5 of the '336 Patent 173

1. Claim 1 173

(a) Preamble: "A luminaire comprising" 173

(b) Element 1a: "a housing comprising at least one outer surface that forms a first cavity;" 176

(c) Element 1b: "at least one electrical component disposed, at least in part, within the first cavity;" 179

(d) Element 1c: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component; and" 181

(e) Element 1d: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing," 182

(f) Element 1e: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire." 184

(g) Conclusion For Claim 1 187

2. Claim 3: "The luminaire of claim 1, wherein each position of the plurality of positions is discrete." 187

(a) Conclusion For Claim 3 189

3. Claim 4: "The luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position." 189

(a) Conclusion For Claim 4 192

4. Claim 5: "The luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources." 192

TABLE OF CONTENTS
(continued)

Page

(a) Conclusion For Claim 5 193

J. Ground 5[b] – Chen Alone And/Or In View Of Chaimberg Renders Obvious Claims 4, 5, 7, 9, 11-13, 15, 16, and 19 of the '336 Patent 193

1. Motivation to Combine Chen and Chaimberg 193

2. Claim 7: "The luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch." 197

(a) Conclusion For Claim 7 199

3. Claim 9: "The luminaire of claim 1, wherein the switch is a slide switch." 199

(a) Conclusion For Claim 9 199

4. Claim 11: "The luminaire of claim 1, wherein the switch is inaccessible when the housing is installed." 200

(a) Conclusion For Claim 11 200

5. Claim 12: "The luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location." 200

(a) Conclusion For Claim 12 200

6. Claim 13: 201

(a) Preamble: "A switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising:" 201

(b) Element 13a: "a body;" 202

(c) Element 13b: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and" 204

(d) Element 13c: "an actuator disposed on the body, wherein the actuator has a range of positions" 205

(e) Element 13d: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire." 208

(f) Conclusion For Claim 13 210

7. Claim 15: "The switch of claim 13, wherein each position is discrete within the range of positions." 211

TABLE OF CONTENTS
(continued)

Page

(a) Conclusion For Claim 15 211
8. Claim 16: "The switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position." 211
(a) Conclusion For Claim 16 211
9. Claim 19: "The switch of claim 13, wherein the body is configured to be disposed within a junction box." 212
(a) Conclusion For Claim 19 212
K. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS 212
IX. THE ASSERTED CLAIMS OF THE '336 PATENT ARE INVALID UNDER 35 U.S.C. § 112 ARE INVALID BECAUSE THE SPECIFICATION DOES TEACH A SWITCH THAT IS CAPABLE OF CCT TUNING 215
X. THE ASSERTED CLAIMS OF THE '506 PATENT ARE INVALID UNDER 35 U.S.C. §§ 102 and/or 103 221
A. VAN DE VEN ANTICIPATES CLAIMS 1-5, 7, 14, AND 15 OF THE '506 PATENT 224
1. Van De Ven Anticipates Claim 1 224
2. Van De Ven Anticipates Claim 2 229
3. Van De Ven Anticipates Claim 3 231
4. Van De Ven Anticipates Claim 4 232
5. Van De Ven Anticipates Claim 5 233
6. Van De Ven Anticipates Claim 7 234
7. Van De Ven Anticipates Claim 14 235
8. Van De Ven Anticipates Claim 15 236
B. VAN DE VEN ALONE AND/OR IN VIEW OF LESTER RENDERS CLAIMS 1-5, 7, 14, AND 15 OF THE '506 PATENT OBVIOUS 241
1. Claim 1 is Obvious Over Van De Ven 241
2. Claim 2 is Obvious Over Van De Ven in View of Lester 245
3. Claim 3 is Obvious Over Van De Ven 248
4. Claim 4 is Obvious Over Van De Ven in View of Lester 249
5. Claim 5 is Obvious Over Van De Ven in View of Lester 250
6. Claim 7 is Obvious Over Van De Ven 252
7. Claim 14 is Obvious Over Van De Ven in View of Lester 253
8. Claim 15 is Obvious Over Van De Ven in View of Lester 254

TABLE OF CONTENTS
(continued)

Page

C. LESTER ANTICIPATES CLAIMS 1-5, 7, 14, AND 15 OF THE '506 PATENT 259
1. Lester Anticipates Claim 1 259
2. Lester Anticipates Claim 2 263
3. Lester Anticipates Claim 3 263
4. Lester Anticipates Claim 4 264
5. Lester Anticipates Claim 5 264
6. Lester Anticipates Claim 7 265
7. Lester Anticipates Claim 14 266
8. Lester Anticipates Claim 15 266
D. LESTER ALONE AND/OR IN VIEW OF PIEPGRAS RENDERS CLAIMS 1-5, 7, 14, AND 15 OF THE '506 PATENT OBVIOUS 269
1. Claim 1 is Obvious Over Lester in View of Piepgras 269
2. Claim 2 is Obvious Over Lester in View of Piepgras 275
3. Claim 3 is Obvious Over Lester in View of Piepgras 276
4. Claim 4 is Obvious Over Lester in View of Piepgras 277
5. Claim 5 is Obvious Over Lester in View of Piepgras 277
6. Claim 7 is Obvious Over Lester in View of Piepgras 278
7. Claim 14 is Obvious Over Lester in View of Piepgras 279
8. Claim 15 is Obvious Over Lester in View of Piepgras 280
E. YOSHIMI ALONE AND/OR IN VIEW OF VAN DE VEN AND LESTER RENDERS CLAIMS 1-5, 7, 14, AND 15 OF THE '506 PATENT OBVIOUS 284
1. Claim 1 is Obvious Over Yoshimi in View of Van De Ven 284
2. Claim 2 is Obvious Over Yoshimi in View of Van De Ven and Lester 289
3. Claim 3 is Obvious Over Yoshimi in View of Van De Ven 291
4. Claim 4 is Obvious Over Yoshimi and Van De Ven 293
5. Claim 5 is Obvious Over Yoshimi in View of Van De Ven and Lester 294
6. Claim 7 is Obvious Over Yoshimi in View of Van De Ven 295
7. Claim 14 is Obvious Over Yoshimi in View of Van De Ven and Lester 296

TABLE OF CONTENTS
(continued)

Page

8. Claim 15 is Obvious Over Yoshimi in View of Van De Ven and Lester 297

F. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS 306

XI. CONCLUSION 308

TABLE OF APPENDICES

Appx.	DESCRIPTION
A	CV of Dr. J. Gary Eden
B	Materials Considered

I. INTRODUCTION

1. My name is Dr. J. Gary Eden. I am an electrical engineer and professor at the University of Illinois. I submit this report at the request of counsel for Defendant Menard, Inc. ("Menard"), and the Third-Party Defendants (Luminex International Company, Ltd.; Richpower Industries, Inc.; Alert Reel Manufacturing, LLC; Best Lighting Products, Inc.; CL Corporation d/b/a Pinegreen Lighting; Good Earth Lighting, Inc.; GT Industrial Products, L.L.C.; Zone Industry Corporation; Canarm, Ltd., and Test-Rite Products Corp.) (collectively, the "Joint Defense Group") to offer my opinions concerning the validity of U.S. Patent Nos. 10,299,336 (the "'336 Patent"), and 7,658,506 (the "'506 Patent") which are asserted by Signify North America Corp. and Signify Holding B.V. (collectively, "Signify") in the above captioned case.

2. I understand that Signify alleges that certain products sold by Menard (and supplied by the Third-Party Defendants) infringe claims 1, 3-5, 7, 9, 11-13, 15, 16, and/or 19 of the '336 Patent (the "'336 Patent Asserted Claims") and/or claims 1-5, 7, 14, and/or 15 of the '506 Patent (the "'506 Patent Asserted Claims"). I have been asked to provide my opinions concerning whether the '336 Patent Asserted Claims and the '506 Patent Asserted Claims are valid in view of the prior art under 35 U.S.C. §§ 102, 103, and invalid for failure to satisfy the written description, enablement, and definiteness requirements 35 U.S.C. § 112. In particular, I have been asked to analyze the validity of the asserted claims in view of the following prior art references identified by the Joint Defense Group ("the Asserted Prior Art"):

Short Name	Prior Art Reference
'336 Patent	
Chaimberg	U.S. 10,234,091
Roberge	U.S. 7,178,941
Halliwell	U.S. 9,801,250
Reiff	U.S. 7,192,160
Chen	U.S. 10,136,503

'506 Patent	
Van De Ven	U.S. 7,722,220
Lester	U.S. 5,709,460
Yoshimi	JP 1984/035302
Piepgras	U.S. 7,161,313

3. It is my opinion that the Asserted Claims of the '336 Patent and the Asserted Claims of the '506 Patent are invalid for the reasons set forth in this report.

II. QUALIFICATIONS

4. My qualifications for forming the opinions set forth in this declaration are summarized here and explained in more detail in my *curriculum vitae*, which is attached as Appendix A and incorporated herein. Appendix A also includes a list of my publications and the patent matters in which I have testified at a deposition, hearing, or trial during the past ten years. The following description is meant to be exemplary, and for brevity I omit some of my relevant experience from the approximately 51 years I have spent working in the optoelectronics field.

5. I received the B.S. degree in Electrical Engineering from the University of Maryland (College Park) in 1972, the M.S. degree in Electrical Engineering in from the University of Illinois (Urbana) in 1973, and the Ph.D. degree in Electrical Engineering from the University of Illinois in 1976. During my graduate research at the University of Illinois, I conducted experiments with some of the earliest semiconductor lasers and LEDs (Gallium Arsenide – GaAs) that had been fabricated at IBM by Dr. John Marinace. Professor Nick Holonyak, Jr., the inventor of the first LEDs (Aluminum Gallium Arsenide – AlGaAs), was a member of my Ph.D. Committee.

6. In 1975, I was appointed a National Research Council (NRC) Postdoctoral Research Associate at the U.S. Naval Research Laboratory (NRL) in Washington, D.C. where I conducted research on ultraviolet and visible lasers. From 1976 through August of 1979, I served as a Laser Physicist on the staff of NRL's Optical Sciences Division. In that capacity, I discovered

and developed a variety of ultraviolet and visible (primarily violet, blue, and green) lasers, and received the NRL Research Publication Award for the discovery of a particular laser.

7. In 1979, I joined the faculty of the University of Illinois (Urbana-Champaign) and have now served in the Department of Electrical and Computer Engineering (ECE) for more than 44 years. I have served as Assistant Dean in the College of Engineering, Associate Dean of the Graduate College, and Associate Vice-Chancellor for Research. I have served (and continue to serve) as Director of the Laboratory for Optical Physics and Engineering, as well as Research Professor in the Coordinated Science Laboratory, and Professor in the Holonyak Micro and Nanotechnology Laboratory (HMNTL). I have received affiliate faculty appointments in the Departments of Bioengineering, Materials Science and Engineering, and Nuclear, Plasma and Radiological Engineering for a number of years. During my career, I have taught a wide range of courses in electronic circuits, electromagnetics (study of antennas, theory of light, etc.), semiconductor devices such as transistors and LEDs, lasers, nonlinear optics, and plasmas.

8. During my tenure at the University of Illinois, I have conducted research devoted to the discovery and development of numerous types of light sources in the visible, ultraviolet (UV), and vacuum ultraviolet (VUV) regions of the electromagnetic spectrum, including light emitting diodes (LEDs), lasers, and plasma lamps. My research has involved studying the atomic and molecular physics, material properties (including optical properties), and laser spectroscopy of both solid state (semiconductor and non-semiconductor) and plasma (gas discharge)-based optical sources. I have worked on both the light emitting elements of these devices and their packaging for use in a variety of applications.

9. To date, 65 individuals have received the Ph.D. degree in ECE, Physics, Materials Science and Engineering, Chemistry, Bioengineering, Nuclear, Plasma, and Radiological

Engineering, or Environmental Engineering under my direction. I am the author or co-author of more than 330 peer-reviewed scientific publications and 104 patents. The claims for several other patent applications have recently been allowed.

10. I am a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), the Optical Society of America, the American Physical Society, the American Association for the Advancement of Science (AAAS), and the Society of Photo-Optical Instrumentation Engineers (SPIE). I have served in several official positions of the IEEE Photonics Society and, in 1998, I served as President of the Society.

11. I am a co-founder of four companies, three of which are manufacturing products today. Two of these (Eden Park Illumination and Cygnus Photonics) are devoted to visible/ultraviolet optical sources and their applications in industry and medicine. For a number of years, Eden Park manufactured large (1 ft^2 in area) but flat white lamps for the cinematography and videography markets. Producing more than 3000 lumens with a color rendering index (CRI) above 90, these lamps received awards from the National Association of Broadcasters. Today, Eden Park manufactures a wide range of flat and efficient UV and VUV lamps. These lamps are used for applications such as materials identification, curing of polymers, medical phototherapeutics, and surface disinfection. Indeed, Eden Park lamps emitting at 222 nm are presently (and during the COVID-19 pandemic) being applied worldwide to disinfect air and surfaces in public spaces. These lamps have been installed in restaurants, restrooms, commercial buildings, and military installations because 222 nm UV "light" is not harmful to human tissue (as are UV "germicidal" lamps) but is lethal for viral and bacterial pathogens. Cygnus Photonics manufactures ultraviolet photolithography systems, as well as systems for the photo-assisted growth of semiconductor thin films and electronic and optical devices.

12. During my formal education, I acquired a background in electrical engineering and physics, particularly in the sub-fields of optics, optical engineering, semiconductor physics, microelectronics, and optoelectronics. This background facilitated my academic, governmental, and industrial research and development activities. Over the past 51 years, my work has centered on research in, and the development of, light-emitting devices including LEDs, lasers, and lamps. In short, my academic, government laboratory, and industry experience in creating, developing, and manufacturing optoelectronic devices and products has explored most of the visible and UV emitters in existence (in the solid or gas phase).

13. In addition to the above educational background, I hold two licenses from the Federal Communications Commission (FCC). The first is a professional "First Class Radiotelephone" license that qualifies me to control commercial radio stations. The second is also a radio license that authorizes me to operate a private radio station. Qualifying for these licenses, and operating stations, gave me considerable experience with electronic circuits.

14. I have received a number of research honors, including, among others, the SPIE Harold E. Edgerton Award (2010), the C.E.K. Mees Medal from the Optical Society of America (2007), the Aron Kressel Award from the IEEE Lasers and Electro-Optics Society (2005) (now known as the IEEE Photonics Society), the Third Millennium Medal from the IEEE (2000), and the Distinguished Service Award from the IEEE Lasers and Electro-Optics Society (1996). In 2014, I was elected into the National Academy of Engineering (NAE) and the National Academy of Inventors (NAI). In 2020, I was elected into the Innovation Hall of Fame of the A. James Clark School of Engineering at the University of Maryland.

15. As noted earlier, this summary of my research and experience is meant only to provide general background, and additional experience is set forth in my CV. Nevertheless, I

believe that my experience provides the background necessary for me to provide expert testimony on the issues set forth in this declaration.

III. LEGAL PRINCIPLES APPLIED

16. I have been asked to provide my opinion as to whether '336 Patent Asserted Claims and the '506 Patent Asserted Claims are invalid under 35 U.S.C. §§ 102, 103, and/or 112.

17. I am an electrical engineer by training and profession. The opinions I am expressing in this report involve the application of my knowledge and experience to the evaluation of certain prior art with respect to the '336 Patent and '506 Patent. My formal knowledge of patent law is no different than that of any lay person. Therefore, I have requested the attorneys who represent the Joint Defense Group, to provide me with guidance as to the applicable law in this matter. The paragraphs below express my understanding of how I must apply current principles related to patent validity to my analysis.

18. I understand that the '336 Patent is governed by the AIA, while the '506 Patent is pre-AIA. I understand that there is a large overlap in the pre-AIA and AIA requirements largely overlap, but there are some key differences as addressed below.

A. Level of Ordinary Skill in the Art

19. I have been informed that certain questions in patent law are assessed from the perspective of a hypothetical person of ordinary skill in the art to which the invention pertains. I understand that a person of ordinary skill in the art is a person with a level of experience, education, or training generally possessed by those individuals who work in the area or field of the invention at the time of the invention. A person of ordinary skill is also a person of ordinary creativity that can use common sense to solve problems.

20. The ’336 Patent has an earliest-claimed priority date of February 19, 2016. However, as I explain below, the asserted claims of the ’336 Patent are not entitled to the 2016 priority date of provisional application No. 62/297,424 (the “’424 Provisional”), the 2017 priority dates of Application No. 15/811,062 (the “’062 Application”), or Application No. 15/435,141 (the “’141 Application”). Rather, as discussed in detail below, the ’336 Patent Asserted Claims are entitled to a priority date of June 21, 2018, the date on which the application for the ’336 Patent was filed.

21. Based on my review of the ’336 Patent and my background and experience in the fields of LEDs and lighting design, it is my opinion that a person of ordinary skill in the art of the ’336 Patent would have had a bachelor’s degree in mechanical engineering, electrical engineering, or physics with at least three years of experience working in LEDs and lighting design; a master’s degree in one of the above disciplines with at least two years of experience working in LEDs and lighting design; or other equivalent experience. This definition for the POSA would have been applicable: (i) at the ’336 patent’s earliest-claimed priority date of February 19, 2016; and also (ii) at the June 21, 2018 priority date to which the ’336 Patent Asserted Claims are entitled.

22. The ’506 Patent has an earliest-claimed priority date of May 12, 2006. Based on my review of the ’506 Patent and my background and experience in the fields of LEDs and lighting design, it is my opinion that a person of ordinary skill in the art of the ’506 Patent, much the same as a person of ordinary skill in the art for the ’336 Patent, would have had a bachelor’s degree in mechanical engineering, electrical engineering, or physics with at least three years of experience working in LEDs and lighting design; a master’s degree in one of the above disciplines with at least two years of experience working in LEDs and lighting design; or other equivalent experience.

This definition for the POSA would have been applicable at the '506 Patent's earliest-claimed priority date of May 12, 2006.

23. As described above, my own training and experience exceeds that of a person of ordinary skill in the art.

B. Claim Construction

24. I understand that a patent's claims define the scope of the alleged invention.

25. I understand that claim construction is a legal issue to be decided by the Court. I further understand that this Court does not hold a formal claim construction process, but instead construes claims on an as-needed basis based upon those issues which they affect. It is thus my understanding that no claim terms have yet been construed in this case, but the parties have instead offered differing constructions on the following terms:

Disputed Term	Patent No.	Defendants' Proposed Construction	Plaintiffs' Proposed Construction
"at least one electrical component"	'336 Patent	Indefinite	Plain and ordinary meaning
"each position of the plurality positions of the switch corresponds to a discrete correlated color temperature (CCT) output by one or more light sources"	'336 Patent	Indefinite	Plain and ordinary meaning
"wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire"	'336 Patent	An electrical connection terminal, at a location that is remote from the luminaire housing, for connecting to an electrical cable	Plain and ordinary meaning
"an electrical cable"	'336 Patent	An insulated wire or wires wrapped in a protective casing, jacket or sheathing	Plain and ordinary meaning
"gap defined by the architectural surface/gap in an architectural surface"	'506 Patent	Gap defined only by the architectural surface	Plain and ordinary meaning

"at least a portion"	'506 Patent	Indefinite	Plain and ordinary meaning

26. I apply the same scope of the claim terms that Signify applied in its August 12, 2022 complaint against Menard, its supplemental infringement contentions served on October 19, 2023, and the parties respective proposed constructions where applicable. In my further analysis below, I have applied the parties' proposed respective constructions where applicable. In my opinion, the asserted claims are invalid under either parties' proposed constructions for each disputed term, as further analyzed below.

C. Presumption of Validity

27. I understand that the claims of an issued patent are presumed to be valid, and that invalidity must be proven by clear and convincing evidence. I have applied that presumption throughout my analysis in this report.

D. Prior Art

28. I understand that a patent or other publication must first qualify as prior art before it can be used to invalidate a patent claim. It is my understanding that prior art may include items that were publicly known, used, or offered for sale, and may also include publications or patents that disclose the claimed invention or elements of the claimed invention. To be prior art, the item or reference must have been made, known, used, published, or patented either before the invention was made, or more than one year before the filing date of the patent application if the prior art is from the inventor.

29. I understand that a patent is entitled to claim priority to an earlier application through one or a series of continuation, continuation-in-part, divisional, or provisional applications. I also understand that the party asserting a patent's earlier claim to priority has the

burden of showing the patent's claims are entitled to a priority date earlier than the patent's filing date.

30. I understand that for a non-provisional application to claim priority to a provisional application for prior art purposes, the specification of the provisional application must contain a written description of the invention in such full, clear, concise, and exact terms, to (1) enable a POSA to practice the invention claimed in the non-provisional application; and (2) adequately support the claims of the non-provisional application.

1. Pre-AIA (the '506 Patent)

31. I understand that prior to the America Invents Act, which was legislation passed more than 10 years ago, the United States operated on a first-to-invent priority system. I understand that in this first-to-invent system, when a patent application was rejected, the application could overcome the rejection through 37 C.F.R. § 1.131 by "swearing behind" the asserted prior art and establishing an earlier invention date for the patent claims under examination.

32. I understand a patent application attempting to swear behind a reference is required to demonstrate, with sufficient documentation, that the applicant was in possession of the later-claimed invention before the effective date of the reference. I understand an applicant may demonstrate possession in one of two ways. *First*, an applicant may show he reduced his claimed invention to practice with evidence he: (1) constructed an embodiment that met all limitations of the claims; and (2) determined that the invention would work for its intended purpose. I understand the applicant's documentation must provide specific dates or acts tied to several elements of the claims. *Second*, an inventor can antedate a reference by showing that the invention was conceived before the effective date of the reference, and that the inventor acted with diligence to complete an actual or constructive reduction to practice. I understand conception is the formation, in the mind

of the inventor, of a definite and permanent idea of the complete and operative invention, as it is thereafter to be applied in practice. To establish conception, I understand the applicant must provide evidence sufficient to show he conceived of the claimed subject matter, and when such conception occurred.

2. AIA (the '336 Patent)

33. I understand that a U.S. or foreign patent qualifies as prior art to an asserted patent if the date of issuance of the patent is prior to the effective filing date of the asserted patent. I further understand that a printed publication, such as an article published in a magazine or trade publication, qualifies as prior art to an asserted patent if the date of publication is prior to the effective filing date of the asserted patent.

34. I understand that a U.S. or foreign patent of the inventor qualifies as prior art to an asserted patent if the date of issuance of the patent is more than one year before the effective filing date of the asserted patent. I further understand that a printed publication of the inventor, such as an article published in a magazine or trade publication, constitutes prior art to an asserted patent if the publication occurs more than one year before the effective filing date of the asserted patent.

35. I understand that a U.S. patent or published patent application qualifies as prior art to the asserted patent if the application for that patent or publication was made by another and filed in the United States before the effective filing date of the asserted patent.

36. I understand that a system or device qualifies as prior art to the asserted patent if it was in "public use," meaning it was either accessible to the public or was commercially exploited.

37. I understand that to qualify as prior art, a reference must contain an enabling disclosure that allows one of ordinary skill to practice the claims without undue experimentation.

38. I understand that documents and materials that qualify as prior art can be used to invalidate a patent claim as anticipated or as obvious.

39. I understand that invalidity must be shown by clear and convincing evidence. However, I also understand that if the patentee asserts that the accused infringer's product or method infringes a patent claim under the "doctrine of equivalents," the patentee cannot assert a scope of equivalency that would encompass, or "ensnare," the prior art. In the case where patentee asserts that the accused infringer's product or method infringes under the doctrine of equivalents, I understand that the patentee has the burden to show that the asserted scope of equivalency would not ensnare the prior art.

E. Priority Date

40. I understand that a patent may be entitled to the priority date of an earlier application if that application fulfills the written description and enablement requirements for the claimed invention.

F. Written Description, Enablement, and Indefiniteness

41. I understand that a patent satisfies the written description requirement if its specification would convey to a person of ordinary skill in the art that the inventor had possession of the full scope of the claimed invention. I understand that this description need not be in the exact words of the claim, and may be satisfied by any combination of the words, structures, figures, diagrams, formulas, etc., contained in the patent specification. However, I understand that the specification must describe the full scope of the claimed invention, including each element thereof, either expressly or inherently, and that it is not enough that the specification discloses enough to make the claimed invention obvious. I understand that the written description requirement is

assessed from the viewpoint of a person of ordinary skill in the art as of the effective filing date for the ’336 Patent and the date of the invention for the ’506 Patent.

42. I understand that a patent satisfies the enablement requirement if the specification contains a sufficiently full and clear description to have allowed a person of ordinary skill in the art to make and use the full scope of the claimed invention without undue experimentation. I understand that the question of undue experimentation may depend on several factors including the time and cost of any necessary experimentation, how routine any such experimentation is in the field, whether the patent discloses specific working examples of the claimed invention, the amount of guidance presented in the patent, the nature and predictability of the field, the level of ordinary skill in the field, and the nature and scope of the claimed invention. I understand that the enablement requirement is assessed from the viewpoint of a person of ordinary skill in the art as of the effective filing date for the ’336 Patent and the date of the invention for the ’506 Patent.

43. I further understand that a patent claim term is indefinite when it fails to provide sufficient notice of its scope when it depends on the unpredictable vagaries of any one person’s opinion. I thus understand that a patent claim is indefinite if, read in light of the patent’s specification and prosecution history, it fails to inform, with “reasonable certainty,” those skilled in the art about the scope of the invention.

44. I understand that invalidity for lack of adequate written description or enablement must be shown by clear and convincing evidence.

45. I have written this Report with understanding that invalidity for lack of written description or enablement must be shown by clear and convincing evidence.

G. Anticipation

46. I understand that a patent may be invalid as anticipated under 35 U.S.C. § 102. I understand a claim may be anticipated if all its limitations are disclosed in a single prior art reference. I also understand that, although the prior art reference does not have to use the same words as the claim, all the claim limitations must be present and arranged as in the claim.

47. In addition, I understand that even if a prior art reference does not explicitly disclose all the claimed limitations, it may still inherently disclose them. I understand that a limitation is inherent if it is necessarily present in the prior art reference. I also understand that the test for infringement and anticipation is the same, meaning that an invention that infringes if it comes after the priority date would anticipate if it came before the priority date.

H. Obviousness

48. I understand that a patent may be invalid as obvious under 35 U.S.C. § 103. I understand that when assessing the potential obviousness of a patent, a fact finder must determine if the differences between the patented subject matter and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a POSA.

49. I understand that in cases where a single reference does not disclose all of the limitations of a claim, the claim may still be invalid if: (1) in view of a prior art reference and the common knowledge of a POSA, the claimed invention would have been obvious to a POSA at the time of the claim's effective filing date; or (2) all of the limitations of the claim are disclosed in multiple reference and it would have been obvious to a POSA to combine those references.

50. I also understand that an obviousness inquiry includes consideration of the following four factors, although not necessarily in this order:

(a) the scope and content of the prior art;

(b) the differences between the prior art and the claims at issue;

(c) the level of ordinary skill in the pertinent art; and

(d) whatever objective factors indicating obviousness or non-obviousness may be present in any particular case.

51. I further understand that other factors, known as "secondary considerations" of non-obviousness, should be considered if evidence of them has been presented. I understand these factors may include: (i) commercial success of a product due to the merits of the claimed invention; (ii) a long-felt need for the solution provided by the claimed invention; (iii) unsuccessful attempts by others to find the solution provided by the claimed invention; (iv) copying of the claimed invention by others; (v) unexpected and superior results from the claimed invention; (vi) praise of the claimed invention by others in the art; (vii) independent invention of the claimed invention by others before or at about the same time as it was conceived by the named inventors; (viii) whether others expressed surprise or disbelief regarding the invention; (ix) whether others sought or obtained rights to the claimed invention from the patentee; and (x) whether the inventor proceeded contrary to accepted wisdom in the art. I also understand that there must be an association or "nexus" demonstrated between the claimed elements and the secondary considerations.

52. I understand that there also must have been a reason for a POSA to have combined or modified the elements or concepts from the prior art in the same way as in the claimed invention, and that the skilled artisan would have had a reasonable expectation of success from doing so.

53. I understand that when assessing the potential obviousness of a patent, one should be careful not to use the benefit of hindsight and instead one should put oneself in the position of a POSA as of the effective filing date of the claimed invention and should not consider what is known today or what is learned from the teaching of the patent.

IV. BASES OF OPINIONS AND MATERIALS CONSIDERED

54. My opinions are based primarily on my review of the ’336 Patent, the file history of the ’336 Patent, the ’506 Patent, the file history of the ’506 Patent, and the prior art references cited herein, including, but not limited to the following references:

a) U.S. Patent No. 10,234,091 (“Chaimberg”);

b) U.S. Patent No. 7,178,941 (“Roberge”);

c) U.S. Patent No. 9,801,250 (“Halliwell”);

d) U.S. Patent No. 7,192,160 (“Reiff”);

e) U.S. Patent No. 10, 136,503 (“Chen”);

f) U.S. Patent No. 7,722,220 (“Van De Ven”);

g) U.S. Patent No. 5,709,460 (“Lester”);

h) JP Patent Publication No. 1984/035302(“Yoshimi”); and

i) U.S. Patent No. 7,161,313 (“Piepgras”).

55. A complete list of the materials I considered in reaching my opinions is attached as Appendix B.

56. If I am called upon to testify at deposition, trial, or a hearing before the Court, I may cite other documents or information similar to that specifically identified in this report. I may also use graphics, animations, pictures, demonstrations, and/or other audio/visual aids to explain my analysis and opinions.

V. SUMMARY OF CONCLUSIONS

57. It is my opinion that the asserted claims of the ’336 Patent are invalid over the prior art on the following grounds:

- Ground 1a – Chaimberg anticipates and/or renders obvious claims 1, 3, 7, 9, 11-13, 15, and 19 of the ’336 Patent;
- Ground 1b – Chaimberg alone and/or in view of Roberge renders obvious claims 4, 5, and 16 of the ’336 Patent;
- Ground 2 – Halliwell anticipates and/or renders obvious claims 1, 3-5, 7, 9, 11-13, 15, 16, and 19 of the ’336 Patent
- Ground 3a – Reiff anticipates and/or renders obvious claims 1, 3, 9, 13, and 15 of the ’336 Patent;
- Ground 3b – Reiff alone and/or in view of Chaimberg and/or Roberge renders obvious claims 4, 5, 7, 11, 12, 16, and 19 of the ’336 Patent;
- Ground 4a – Roberge anticipates and/or renders obvious claims 1, 3-5, 9, 13, 15, and 16 of the ’336 Patent;
- Ground 4b – Roberge in view of Chaimberg and/or Halliwell renders obvious claims 7, 11, 12, and 19 of the ’336 Patent;
- Ground 5a – Chen anticipates and/or renders obvious claims 1, and 3-5 of the ’336 Patent; and
- Ground 5b – Chen alone and/or in view of Chaimberg renders obvious claims 7, 9, 11-13, 15, 16, and 19 of the ’336 Patent.

58. It is my opinion that the asserted claims of the ’506 Patent are invalid over the prior art on the following grounds:

- Ground 1a – Van De Ven anticipates claims 1-5, 7, 14, and 15 of the ’506 Patent;

- Ground 1b – Van De Ven alone and/or in view of Lester renders obvious claims 1-5, 7, 14, and 15 of the '506 Patent;
- Ground 2a – Lester anticipates claims 1-5, 7, 14, and 15 of the '506 Patent;
- Ground 2b – Lester alone and/or in view of Piepgras renders obvious claims 1-5, 7, 14, and 15 of the '506 Patent; and
- Ground 3 – Yoshimi alone and/or in view of Van De Ven and Lester renders obvious claims 1-5, 7, 14, and 15 of the '506 Patent.

VI. BACKGROUND OF THE TECHNOLOGY AND ASSERTED PATENTS

A. The Asserted Patents

1. The '336 Patent

59. The '336 Patent is titled "Configurable Lighting System." '336 Patent, (54). The '336 Patent relates to "lighting systems that can be readily configured to produce illumination of different color temperatures." *Id.*, Abstract, 1:19-22. In particular, the '336 Patent discloses a luminaire that includes a housing, including one or more LEDs, an electrical cable connecting the housing to a power source (*e.g.*, a junction box), and a switch for controlling the CCT output of the luminaire. *Id.*, 11:21-29, Fig. 9B. It should be noted that the specification of the '336 Patent focuses on LED lighting systems but the claims appear to me to be broader than LED lighting system alone.

60. The '336 Patent acknowledges that LED luminaires were well known in the art. For example, Fig. 8 of the '336 Patent "shows a top-side perspective view of [a] luminaire 800 currently known in the art." *Id.*, 10:66-67. The prior art luminaire 800 includes a "housing 805," which is low profile and mounted in surface of the ceiling or wall, and a "remotely located junction box 890." *Id.*, 11:1-12. The '336 Patent discloses that there are "one or more [electrical]

components (*e.g.* light sources) disposed on and/or within the housing 805." *Id.* The prior art luminaire also includes "an electrical cable 827." *Id.* "One end of the electrical cable 827 is connected to one or more components (*e.g.*, light source) disposed on and/or within the housing 805" whereas the other end "is coupled to one or more [] electrical components disposed in the junction box 890." *Id.*, 11:5-20, 11:45-50.

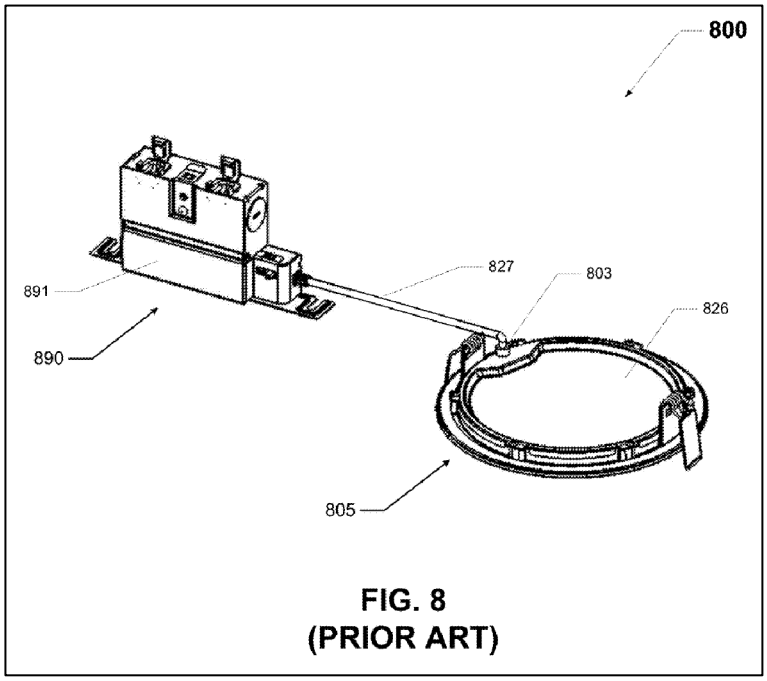


FIG. 8
(PRIOR ART)

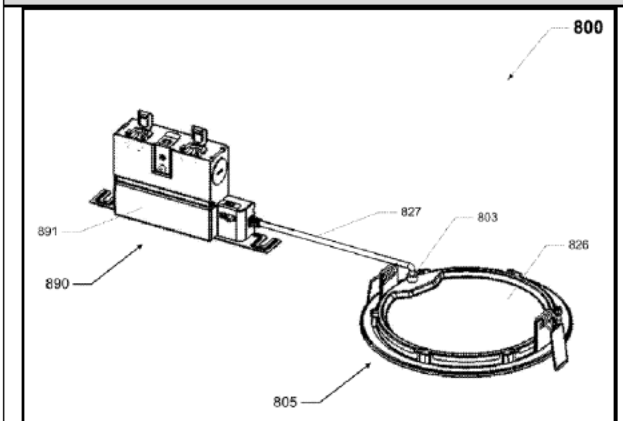
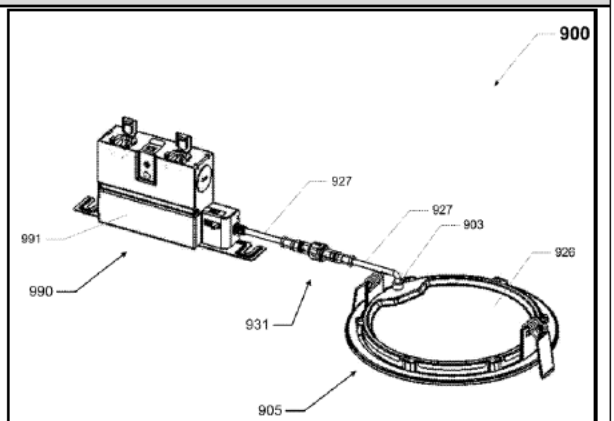
Id., Fig. 8.

61. The '336 Patent admits that prior art luminaires "provide flexibility in terms of correlated color temperature (CCT or color temperature) and light output (lumen output). For example, a compact fluorescent downlight might accept 6-, 32-, and 42-watt lamps in 2700, 3000, and 3500 K CCT." *Id.*, 1:31-41. The '336 Patent states:

> Need is apparent for a technology to provide a light emitting diode system that can adapt to various applications, for example, by delivering multiple color temperatures.

62. *Id.*, 1:50-53. However, as described below, precisely this capability in lighting control was available in commercial systems nearly two decades before the alleged invention of the '336 Patent.

63. The claimed "luminaire 900 of FIGS. 9A and 9B is ***substantially the same as*** the [admitted prior art] luminaire 800 of FIG. 8, except that the luminaire 900 of FIGS. 9A and 9B includes the example switch 931." *Id.*, 11:26-29 (emphasis added). Indeed, as shown in the comparison below, the only feature that the inventors allegedly added over the admitted prior art was the switch 931.

Applicant Admitted Prior Art	**Alleged Invention**
 FIG. 8 (PRIOR ART)	 FIG. 9B

64. The '336 Patent states that the "switch 931 is used to adjust the CCT output by one or more of the light sources in the luminaire 900, and each selection of the switch 931 corresponds to a CCT within a range of CCTs." *Id.*, 12:16-21. The "switch 931 can have a range of selections that are either continuous or discrete." *Id.*, 12:16-21. The switch (931) can be coupled to the electrical cable (927) by "one or more coupling features." *Id.*, 12:1-5.

65. The ’336 Patent discloses that the switch (931) can be coupled to the cable (927), or on or within the junction box itself. *Id.*, 13:6-19. Figure 10 of the ’336 Patent, reproduced below, illustrates an embodiment of a luminaire similar to that of Fig. 9B but, in this case, the switch (1031) is disposed either within or on the side of the junction box (1090). ’336 Patent, 13:6-19, Fig. 10.

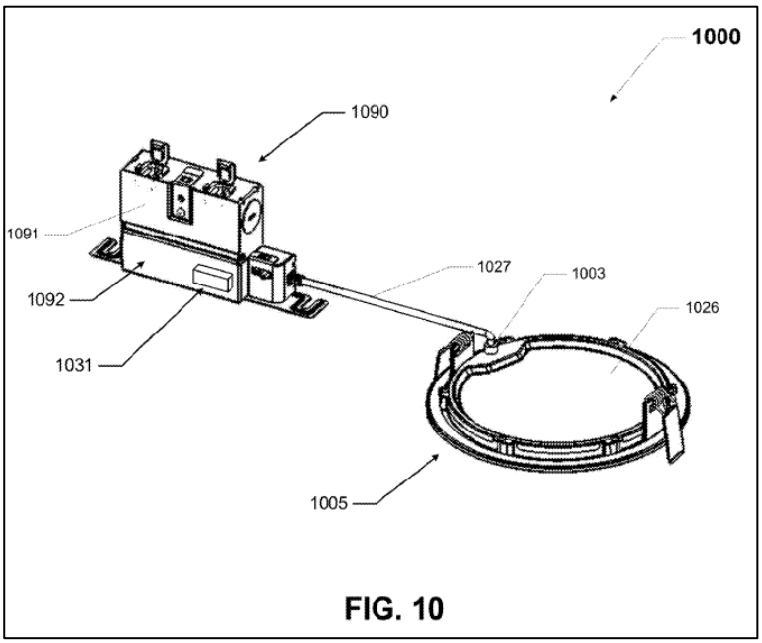


FIG. 10

Id., Fig. 10.

66. The ’336 Patent includes two independent claims and 18 dependent claims. These claims all relate to luminaires having a color temperature control switch. Independent claim 1, and its dependent claims (including Asserted Claims 3-5, 7, 9, 11, and 12), relate to a luminaire with a CCT switch located remotely from the housing of the light source. *Id.*, 14:30-15:20. Independent claim 13, and its dependent claims (including Asserted Claims 15, 16, and 19) relate solely to a switch for a luminaire that is electrically coupled to an electrical cable of the luminaire. *Id.*, 15:21-16:26. As discussed herein, the alleged inventions of claims 1-20 were well known in

the art. Moreover, as noted above, the claims of the ’336 Patent do not mention LED lighting devices specifically.

67. In summary, the ’336 Patent acknowledges that LED luminaires with a junction box located remotely from the LED housing, connected by an electrical cable, were known in the prior art. The ’336 Patent also acknowledges that adjustable CCT luminaires were also known in the prior art. In fact, Ducharme (discussed in detail below) is cited on the face of the ’336 Patent. The ’350 Patent, the specification of which (in my opinion) does not support the claims of the ’336 Patent, also discloses that LED luminaires with adjustable CCT output were known in the prior art. Accordingly, the only potentially inventive feature of the ’336 Patent is a CCT switch electrically coupled to an electrical cable of the LED fixture which is located remotely from the LED housing. This, too, was well known in the art in June of 2018.

2. The ’506 Patent

68. The ’506 Patent, which has an earliest claimed priority date of May 12, 2006, is generally directed to a “cove lighting apparatus for architectural surfaces and, more particularly, to recessed cove lighting apparatus[es] employing LED-based light sources and methods of their manufacture and installation.” ’506 Patent, 1:13-16. As the ’506 Patent discusses, gaps are often created in architectural surfaces, such as drywall, for purposes of depositing recessed lighting illumination options. Such recessed lighting options allow for “the majority of a lighting fixture [to be] disposed substantially behind or recessed into an architectural surface or feature.” ’506 Patent, 1:44-47.

69. At the time of the ’506 Patent, it was standard practice to achieve such recessed lighting using “a housing, a light source, … and some means for electrically connecting the fixture to a source of operating power.” ’506 Patent, 1:47-50. The ’506 Patent thus sought to integrate a

lighting "cove" with an architectural surface. '506 Patent, 2:22-24. For example, the '506 Patent discloses arranging LEDs "within a wall as part of a cove, without the need for a special bezel or frame, so as to create intriguing 'light surface effects.'" '506 Patent, 2:25-28.

B. Technology Background

1. The '336 Patent

70. Because LEDs are more electrically efficient and compact than traditional lighting sources, such as the incandescent bulb and fluorescent lamps, LEDs have risen to prominence in the lighting industry over the past two decades and the process of gradually replacing traditional, less-efficient light sources is well underway. LED lamps are currently manufactured in various packages or forms, including the familiar bulb and cylindrical replacements for fluorescent tubes. One or more LED lamps installed into a light fixture is a complete lighting unit known as a luminaire. At the risk of a loss of precision, the terms "light fixture" and "luminaire" will be treated interchangeably throughout the remainder of this report.

(a) Correlated Color Temperature (CCT)

71. An important consideration in the design of white LEDs and white light luminaires is the desired spectrum. Although white light generally comprises all the colors of the rainbow, manufacturers offer a range of white LEDs and LED lamps that produce differing hues and tones. For example, "warm white" is the term given to white light that has an orange or red hue. Such a "warm white" LED or lamp emits light for which the spectrum has been intentionally skewed to the red portion of the visible region such that the spectrum produced by the lamp contains *proportionately* more red and orange light than that generated by the sun, for example. Consequently, the preponderance of the light emitted by the lamp or luminaire is red, orange, and yellow. Conversely, "cool white" LED lamps emit light having a bluish-tinge and a spectrum that

is blue "rich" (i.e., having a spectrum with the blue portion of the spectrum proportionately more intense than the same portion of the sun's spectrum).

72. The term correlated color temperature (CCT) has been adopted by industry as a guide describing the hue of light emitted by a lamp or light fixture. The "warm" white light discussed above, for example, will have a CCT value between approximately 2500 K and 3500 K, where K represents Kelvin which is a measure of temperature similar to Fahrenheit and Celsius. Those lamps producing relatively more orange and red light will have a lower CCT value. Conversely, a lamp or luminaire producing "cool" white light has a blue tint. Because it produces relatively more blue light than the sun's spectrum, it will typically be assigned a value of CCT above 5000 K by the manufacturer. For reference, the color temperature of the spectrum radiated by the sun is 5700 K.

73. The desired location for a particular LED lamp or fixture often has a strong influence on the CCT of the lamp. The set of photographs below, for example, illustrates the impact of varying the CCT of the lighting on the appearance of a particular residential setting. Architectural lighting is the occupation concerned with the design of interior lighting through the control of CCT and light intensity throughout a given interior or exterior space. Speaking generally, lighting of lower CCT can be found in restaurants and homes whereas higher CCT lighting (above 4500 K) is more common in office settings and industrial areas.



CCT: Understanding the Basics, superbrightleds.com (March 2, 2016) (https://www.superbrightleds.com/blog/what-is-cctunderstanding- the-basics.html).

74. Another important measure of the light emitted by an LED lamp is that of the Color Rendering Index (CRI). The CRI is a number between zero and 100 that indicates the degree to which the light spectrum of the lamp or fixture matches that for the sun. A CRI of 100 represents a perfect match to the sun's spectrum. The CRI also provides an indicator of how colors will appear to the human eye when viewed by a particular light or set of lights. For example, those demanding retail applications (such as the display of jewelry) in which the illumination must closely match the sun's clarity and brightness generally require a CRI above 90.

75. The ability to independently control the CCT of luminaires and their intensity, and to vary these values throughout the day, has come to be the dominant theme in architectural lighting and is known as "tunable white technology". A recent article by Gregory Kay, an architectural lighting designer, described the development and status of "Architectural SSL [Solid State Lighting]: Tunable white light and its benefits become more accessible", *LEDS Magazine* (September 14, 2023). Changing ("tuning") the CCT of lighting has been of considerable interest to lighting designers since at least the early 2010s and Kay describes the installation in 2016 of

"time-controlled, Kelvin-changing lighting" in the Amsterdam offices of a major European company. *Id.*

(b) Electrical Switches Were Well-Known Long Before The Alleged Invention of The '336 Patent

76. Electrical switches were developed early in the history of electrotechnology because of the need, for reasons of safety, power conservation, preparation for maintenance, and others, to be able to interrupt at will the power flow to any electrical system. Today, switches are ubiquitous and include ignition of one's automobile, spring-loaded foot switches and rotary switches on lights, power switches on appliances, power tools, and many more. It is inconceivable for any electrical system such as consumer product, electronics, etc. to not have at least one electrical switch. Over the past century, switches have also been developed into a wide variety of forms such as toggle switches, slide switches, rotary switches, and button switches. Furthermore, switches serve a variety of functions beyond simply breaking the electrical circuit that delivers power to a device or system. For example, switches in radios and televisions serve to direct the user from one station or network to another, or switch audio from one speaker to another. The applications of switches are limited only by our imagination.

77. As discussed in greater detail later, the electrical switch has a central role in the '336 patent. The Abstract of the '336 patent states:

> The luminaire can also include a switch coupled to the electrical cable, where the switch is disposed remotely from the housing, where the switch has multiple positions, wherein each position of the switch corresponds to a discrete color temperature (CCT) output by one or more light sources of the luminaire.

'336 Patent, Abstract. The importance of an electrical switch to the '336 Patent is evident because each of the 20 claims mention the switch, and four claims mention specific switches (dial, slide, and rotary). Furthermore, claims 13-20 are directed to the switch. In three separate sections of

the ’336 Patent’s specification, 7:34-44, 9:54-63, and 11:66-12:15, the patent enumerates the types of switches that might be used, all of which were well-known and incorporated into electronic systems on a massive scale long before the earliest possible priority date for the ’336 Patent. *Id.*, 7:34-44, 9:54-63, and 11:66-12:15.

78. Because the specification emphasizes the slide switch (*cf. id.*, Fig. 6C and 9:64-10:27), a few comments regarding its history are warranted. The electrical slide switch was patented at least as early as March of 1958 by Wingard (U.S. Patent No. 2,828,393), and Bailey et al. subsequently patented a significantly improved version in 1970 (U.S. Patent No. 3,502,825). Further improvements were achieved by the Switchcraft Corp. in the early 1970s. The point to be made, therefore, is that the technology for this switch was established almost fifty years ago and has remained essentially unchanged since. The history of each of the switches mentioned in the ’336 Patent is similar to that for the electrical slide switch. As discussed below, therefore, it is my opinion that the ’336 Patent is not inventive in employing a switch, or in its use of the switch to energize groups (pluralities) of LEDs at will for altering the CCT of interior or outdoor lighting.

(c) Tunable White Light Technology Has Been Known In The Field of Architectural Lighting For Two Decades

79. As discussed above, the ability to independently control the CCT of luminaires and their intensity, and to vary these values at will, is well known in the field of architectural lighting and is known as “tunable white technology” or “CCT tuning.” The origins of this technology were developed and manufactured early in this century. The ’336 patent states:

> Need is apparent for a technology to provide a light emitting diode system that can adapt to various applications, for example, by delivering multiple color temperatures.

'336 Patent, 1:50-52. This statement implies that the '336 Patent is the first to "deliver[] multiple color temperatures" when, in fact, the concept of controlling the CCT of the spectrum emitted by an ensemble of LEDs extends back over at least two decades. *Id.*

80. For example, U.S. Patent No. 7,014,336 ("Ducharme"), awarded to Color Kinetics in the early 2000s, disclosed a number of lighting fixtures, including luminaires, that "comprise a plurality of LEDs" producing "white light within a range of color temperatures such as, but not limited to, the range 500K to 10,000K." Ducharme, 4:54-61.

81. Much like the '336 Patent nearly two decades later, Ducharme's "lighting fixture may include a controller and/or processor for controlling the intensities of the LEDs to produce various color temperatures in the range." *Id.*, 4:62-64. Figure 10a of Ducharme shows "a manual control"—*i.e.*, a switch—for controlling the CCT output of a LED lighting fixture. *Id.*, 7:23-24. Figure 10b shows the control unit 2036 in detail, which is a "dial [switch] marked to indicate a range of color temperatures, e.g., from 3000K to 10,500K." *Id.* 16:64-17:2. Ducharme discloses that the switch 2036 "would be useful on a lighting fixture to produce a range of color temperatures ('colors') of white light." *Id.* While the switch 2036 is shown as a dial switch, Ducharme discloses that it could be "a dial, slider, switch, multiple switch, console … or any other … combination of controllers to permit a user to modify the illumination conditions." *Id.*, 16:45-50. In summary, the use of any of a wide range of switches to vary the CCT of light produced by an LED light fixture (luminaire) was well known at least as early as 2000, eighteen years before the alleged invention of the '336 Patent.

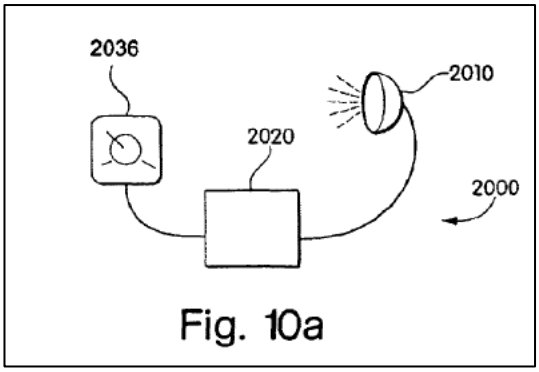


Fig. 10a

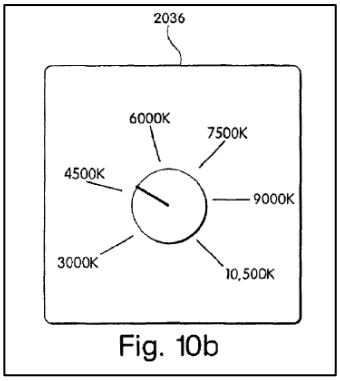
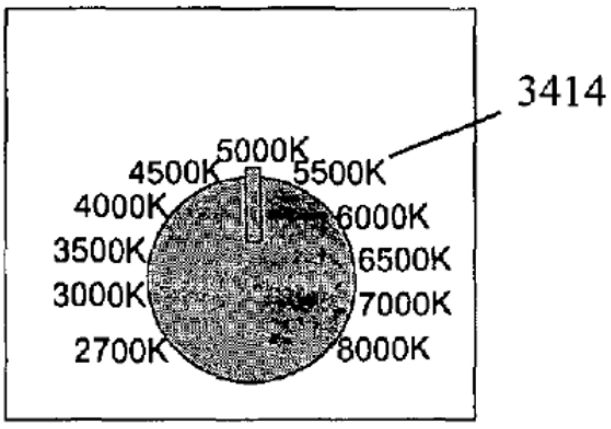


Fig. 10b

Id., Figs. 10a, 10b.

82. Roberge, described in more detail in Section VII.A.2 below, provides another example of a manual CCT switch that was disclosed in May 2003, more than fifteen years before the alleged invention of the '336 Patent. Roberge discloses a number of LED "[l]ighting methods and systems [with] a plurality of LEDs." Roberge, 1:28-31. Roberge includes "a dial [that] allows a user to select one or more color temperatures from a scale 3414[, which can] include different color temperatures of white light." *Id.*, 42:51-54. Roberge Fig. 34i is a depiction of a manual CCT switch that was known in the art more than 15 years before the alleged invention of the '336 Patent.

Fig. 34i



Id., Fig. 34i.

83. During the following decade, the LED lighting industry made enormous improvements in optimizing the CCT of indoor and outdoor lighting. For example, on December 22, 2014—four years before the alleged invention of the Patent-in-Suit—Mr. Chen, Luminex's owner, disclosed in a patent application that issued as U.S. Patent No. 9,345,112 (the "'112 Patent") a color-tunable CCT light fixture.[1] The invention of Mr. Chen's '112 Patent goes far beyond simple mechanical switches that are inaccessible when installed. Mr. Chen's '112 Patent discloses a light fixture with a microcontroller-based switch that uses infrared ray sensors to detect a user's instructions regarding the desired value of CCT. Other possible switch configurations are also described, including a button switch. For example, the touchless switch such as an infrared ray, or a direct touch switch such as a push button, generates a sensing signal that results in controlling "the color temperature of the blended light" output of the '112 Patents' LED light fixture. '112 Patent, 10:43-45. The '112 Patent discloses a range of CCT values, ranging from 3000 K to 5700 K, that can be selected with the microcontroller based switch. *Id.*, 6:47-7:11.

84. The invention disclosed in Mr. Chen's '112 Patent enables the blending of the light produced by two sets of LEDs having different CCT values in order to create a third CCT value that is determined by: (1) the CCTs of the two sets of LEDs, and (2) the ratios of power level respectively delivered to each of the two sets of LEDs. This method is known as CCT or, as described earlier, "white light" tuning. Mr. Chen's '112 Patent performs "color temperature tuning [by] controlling different levels of electric power transmission to the two lighting loads [reversely and complementary] 2a [LEDs of a first temperature] and 2b [LEDs of a second temperature] by

[1] As addressed below, Chen was filed as a continuation of the family of applications that issued as the '112 Patent, accordingly, Chen includes the same disclosures, and priority date, as the '112 Patent.

controlling" the power delivered to the LEDs as shown in Fig. 8A below. '112 Patent, 8:4-8, Fig. 8A.

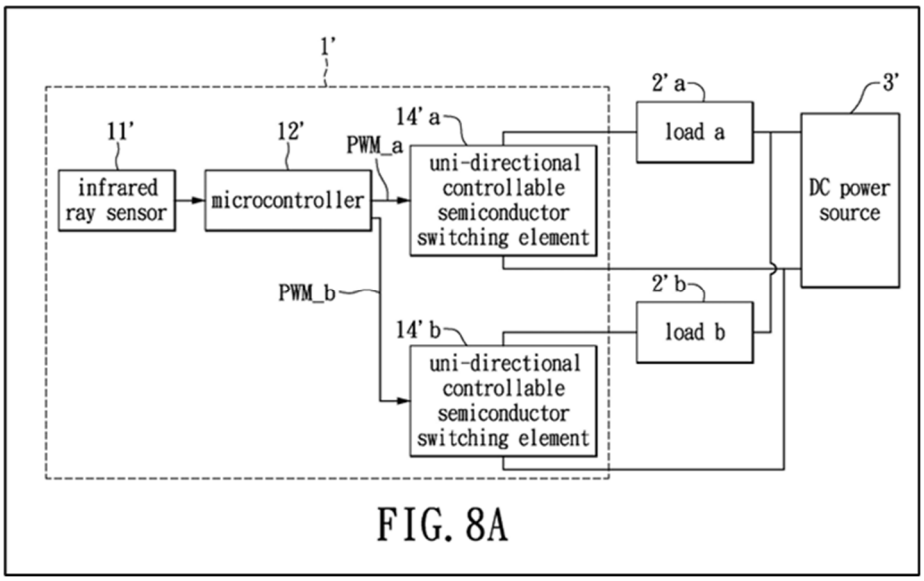
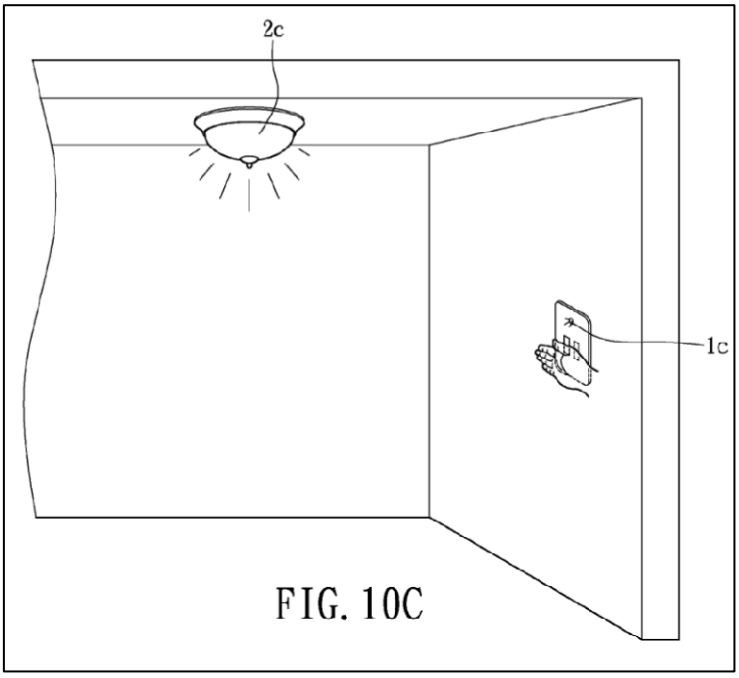


FIG. 8A

Id., Fig. 8A.

85. Mr. Chen's '112 Patent also presents "a wall switch construction electrically connected to a ceiling light for the performance of three working modes" in Fig. 10C. *Id.*, 22:19-21. By waving a hand in front of the wall switch 1c, a user can "select a desired illumination color temperature" of the light fixture 2c. *Id.*, 22:19-39.



Id., Fig. 10C.

86. In short, tuning the CCT of a LED luminaire with a manual switch was well known in the art at least as early as 2000, well before the alleged invention occurred in 2018. By 2014, industry had moved far beyond manual CCT switching with traditional switches (such as slide or rotary switches), even utilizing infrared sensors and hand motion to adjust the CCT output of a LED light fixture.

2. The ’506 Patent

87. Many conventional architectural surfaces are constructed from relatively inexpensive, yet fairly strong, materials such as drywall. One of the advantages of such materials is their ability to be manipulated in a wide array of shapes and sizes to accommodate various different types of settings. When using drywall, for example, after having large sheets to cover an expansive area, various portions can be removed to accommodate different types of architectural surfaces such as windows and electrical outlets. The flexibility of such materials provides benefits with regards to lighting systems, and in particular recessed lighting fixtures utilizing such lighting

elements as incandescents, fluorescents, and light emitting diodes (LEDs). With recessed lighting fixtures, the light fixture itself is disposed mostly behind, or recessed into, the primary architectural surface.

88. Such configurations do have associated drawbacks, in particular the heat generated by the lighting fixture within the housing. Other associated drawbacks include unwanted visibility of the lighting fixture and glare resulting from the light bulb. '509 Patent, 1:20-2:3. And while fluorescent bulbs are known to be more efficient than incandescent bulbs (Van De Ven, 1:18-29), many standard fluorescent lighting fixtures are extremely inefficient as a result of their use of a translucent plastic diffuser over the fixture. These configurations can reduce the amount of light provided in a room by as much as 50%. Lester, 1:14-25. And while the standard means of countering such inefficiencies in fluorescent light fixtures at the time of the invention claimed in the '506 Patent was to utilize indirect lighting fixtures, despite solving the problem of unwanted viewing of the fixture itself as well as less harsh dispersion of light and glare reduction, such indirect fixtures further decreased the efficiency of the lighting fixture by blocking even more of the projected light. Lester, 1:26-35. This led to a transition to LEDs in many configurations, which are even more efficient than fluorescents despite having slightly shorter life spans. Van De Ven, 1:18-37.

89. As conventional surfaces surrounding many recessed lighting fixtures provide poor reflective capabilities, the use of reflectors became increasingly common. These reflectors were typically coated with a reflective material, such as white paint, which would help to better scatter the light throughout the room. Additional components of common recessed LED lighting fixtures include a packaged LED mounted to a circuit board and a heat sink for helping to dissipate heat generated by the fixture during operation. Van De Ven, 1:65-2:5. At the time the '506 Patent was

filed, recessed lighting fixtures had already undergone the transition to LEDs from either incandescent or fluorescent lighting fixtures, and a POSA would have understood both the benefits and limitations associated with such recessed LED lighting fixtures. A POSA would have thus understood that it was neither novel nor inventive to configure a recessed LED lighting fixture within a gap in an architectural surface such that the lighting fixture was hidden from view.

C. Prosecution Histories of the Asserted Patents

1. The '336 Patent

90. The '336 Patent was filed by Eaton Intelligent Power Limited on June 21, 2018, as Patent Application No. 16/014,394 (the "'394 Application."). '336 Patent, (21), (22). The '394 Application was filed as a continuation-in-part of U.S. Patent Application No. 15/811,062 (the "'062 Application"). '336 Patent, (63). The '062 Application was filed on November 13, 2017 as a continuation of application No. 15/435,141 (the "'141 Application") which was filed on February 16, 2017 and issued as 9,820,350 (the "'350 Patent"). '336 Patent, (63). The '141 Application claims priority to provisional application No. 62/297,424, which was filed on February 19, 2016. '336 Patent, (60), (63).

91. The '336 Patent was allowed without rejection on October 16, 2018, less than four months after the '394 Application was filed. '336 Patent File History, 94-100 (October 16, 2018 Notice of Allowance). In the notice of allowance, the examiner indicated that the "primary reasons for the allowance of the claims are in the inclusion of the limitations" disclosing a CCT switch located away from the housing, and a CCT switch with a range of positions (claims 1-12), and the fact that the CCT switch was coupled to an electrical cable of the luminaire (claims 13-20). *Id.* The applicant filed an amendment after allowance on December 31, 2018. In this amendment, the applicant slightly modified the description of the embodiment disclosed in Figs. 9A and 9B. *See*

id., 130-193 (December 31, 2018 Amendment). The applicant then filed a request for continued examination on January 16, 2019 in which the applicant submitted an additional information disclosure statement. *Id.*, 221-229 (January 16, 2019 Request for Continued Examination). The examiner issued a second notice of allowance, again without rejection, on February 12, 2019. *Id.*, 246-250 (February 12, 2019 Notice of Allowance). The issue notification was issued on May 1, 2019 and the '336 Patent published on May 21, 2019. *Id.*, 278; '336 Patent, (45).

92. I have been informed that Eaton Intelligent Power Limited assigned the '336 Patent to Signify Holding B.V. in March 2020, nearly a year after the issuance of the '336 Patent.

93. The prior art cited under grounds 1a, 1b, 2, and 3a, 3b, 4a, and 4b (to be discussed in Section VIII) was not provided to the Examiner. Chen, discussed above and in Sections VIII.I-J below was listed on the face of the patent, but was not substantively reviewed by the examiner during prosecution.

2. The '506 Patent

94. Having reviewed the file history of the '506 Patent, it is my understanding that the application that went on to issue as the '506 patent contained 15 claims as originally filed. The '506 Patent then went on to issue with the 15 originally-filed claims, which were not amended during prosecution. Only a single rejection was issued during prosecution of the '506 Patent. The examiner initially rejected originally filed claims 1-6 and 14-15 under § 102 as anticipated by U.S. Patent Publication No. 2007/0171631 to Davis ("Davis"), and claims 7-13 under § 103 as obvious over the combination of Davis in view of U.S. Patent No. 6,016,038 ("Mueller II"). ('506 Pros. His. at 65-68.)

95. In response to the §§ 102 and 103 rejections, the applicant for the '506 Patent submitted arguments traversing the grounds of the rejection. With regards to Davis, the applicant

argued that this reference lacked any disclosure relating to fitting the lighting fixture within a gap, thus failing to disclose the "fit within a gap defined by the architectural surface" limitation. The applicant further argued that fitting the disclosure of Davis into a gap would render it inoperable for its intended purpose, as the objective of Davis requires the light to be directed from outside the wall. The '506 Patent, in contrast, requires directing the light from within the wall. The applicant also argued that Davis did not disclose recessed lighting from the architectural surface that is concealed from the viewer, but rather a lighting fixture external to the surface that can be observed by the viewer. '506 Pros. His., 83-85.

96. In response to the applicant's arguments, the examiner allowed all 15 claims as originally filed. It is my understanding that the examiner did not provide any substantive reasoning for his allowance of the claims, but simply indicated that "applicant's remarks … persuaded the examiner to place this application in condition for allowance." '506 Patent Pros. His., 94. I further understand that the examiner did not consider references such as Van De Ven, Lester, and Yoshimi. As such, the examiner did not consider or cite the critical prior art that teaches the exact subject matter claimed in the '506 Patent.

VII. BACKGROUND OF THE PRIOR ART

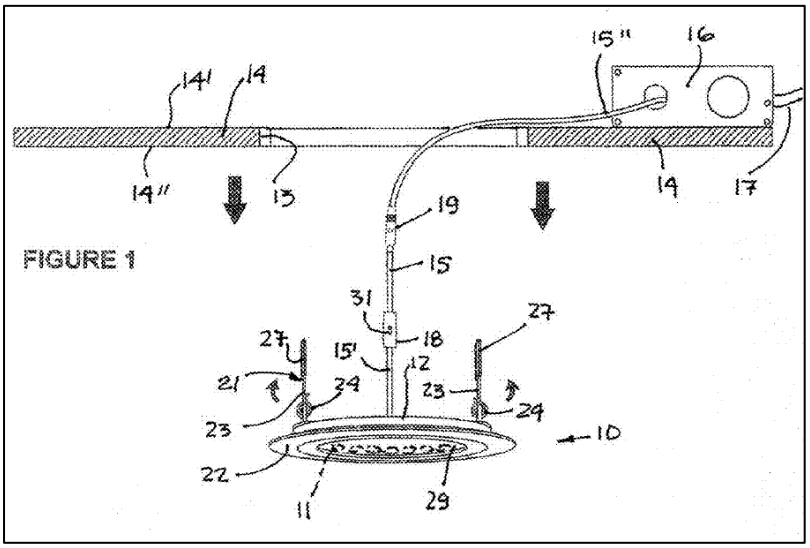
A. The '336 Patent

1. Chaimberg

97. U.S. Patent No. 10,234,091 ("Chaimberg") was filed as Application No. 15/932,801 on April 27, 2018 and issued on March 19, 2019. Chaimberg, (10), (21), (22), and (45). I understand that Chaimberg properly claims priority to Canadian Patent Application CA 2999308, which was filed on March 26, 2018. *Id.*, (30). Accordingly, Chaimberg is prior art to the '336 Patent under at least 35 U.S.C. § 102(a)(2).

98. Like the '336 Patent, Chaimberg discloses "[a] ceiling mountable LED light fixture … wherein at least two sets of LED's of different correlated color temperatures (CCT) are mounted in its housing." Chaimberg, Abstract, 1:7-10, 2:24-44. Chaimberg's LED light fixture is "adapted to be removably secured" in a ceiling. *Id.*, Abstract. "A cable [15] is secured to [Chaimberg's] light fixture to supply drive current to the LED sets." *Id.*, Abstract, 3:61-4:3. Like the embodiment disclosed in Fig. 9 of the '336 Patent, Chaimberg's LED light fixture includes a CCT switch (18) mounted on the electrical cable (15), and the user can set the CCT output "by displacing a slide switch button to select one of three positions" which correspond to "three different color temperature (CCT) light" settings. *Id.*, Abstract, 3:17-20.

99. Like the luminaire claimed in the '336 Patent, Chaimberg's LED light fixture is typically installed into a ceiling. In "Fig. 1, the LED light fixture 10 is shown retracted from its fixture mounting hole" in a ceiling. *Id.*, 3:13-15. Figure 2 is an illustration of Chaimberg's LED light fixture "mounted in the fixture mounting hole" in the ceiling. *Id.*, 2:58-61, Fig. 2.



Id., Fig. 1.

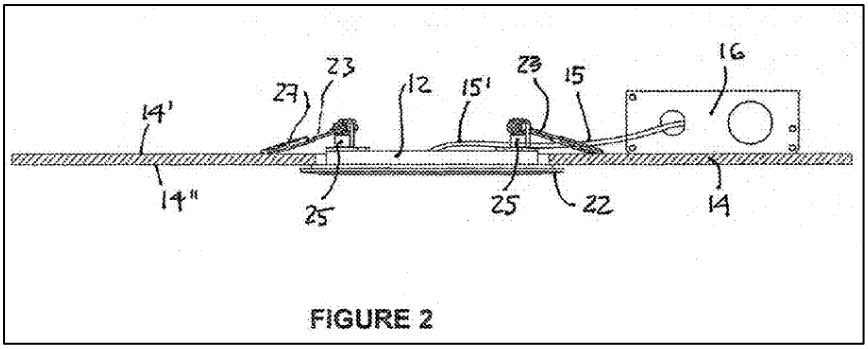


FIGURE 2

Id., Fig. 2.

100. While Chaimberg introduces an LED light fixture with the CCT switch located on the electric cable 15, Chaimberg states that, in March of 2018, typical CCT adjustable LED light fixtures included a switch "mounted on the driver housing to select a desired color temperature of the LED light fixture." *Id.*, 1:44-50; *see also id.*, 3:28-32 ("Usually, a selector switch is mounted on the driver housing 16 to select a desired color temperature to be emitted by the light fixture."). In my opinion, in view of these disclosures, a POSA would have understood Chaimberg to state plainly that the CCT switch 18 could be placed in or on the driver housing 16 (*i.e.*, junction box). Chaimberg also recognizes that moving the switch from the junction box to a location on the cord makes the switch more accessible to the user after the light fixture is installed. In addition, while the example LED light fixture in Chaimberg's luminaire includes LEDs emitting light having *two* distinct correlated color temperatures (CCTs) so as to make possible the generation of light having one of *three* CCT outputs, it also mentions that the light fixture could include more than two sets of LEDs. One skilled in the art would conclude from Chaimberg's instructions that the invention could be scaled so as to provide an arbitrary number of LEDs, or groups of LEDs, each producing light having a different CCT value. From the perspective of a POSA, the number of CCT values available from Chaimberg's system is limited only by financial considerations.

2. Roberge

101. U.S. Patent No. 7,178,941 ("Roberge") was filed as application no. 10/839,765 on May 5, 2004. Roberge, (21) (22). Roberge claims priority to provisional application No. 60/467,847, filed on May 5, 2003. *Id.*, (65). Roberge issued on February 20, 2007 and was initially assigned to Color Kinetics, Incorporated. *See* Assignment History for U.S. Patent No. 7,178,941, 1-7. Color Kinetics subsequently assigned Roberge to Philips Solid-State Lighting Solutions, Inc. on September 26, 2007, but Roberge was ultimately assigned to Signify on February 1, 2019. *See id.*, 8-55. Accordingly, Roberge is prior art to the '336 Patent under at least 35 U.S.C. 102(a)(2).

102. Like Chaimberg and the '336 Patent, Roberge discloses a number of LED "[l]ighting methods and systems… [with] … a plurality of LEDs." Roberge, 1:28-31. Roberge discloses a number of embodiments and styles of LED lighting systems, such as the linear light system depicted in Fig. 71 that can be mounted on a "wall, beam, ceiling, or other surface" using the bracket 5850. Roberge, 65:19-23, 66:43-50, Fig. 71. The lighting fixture of Fig. 71 shows a housing 800 that forms a cavity in which the board 204 is located. *Id.*, 66:43-50, Fig. 71. Thus, a POSA would have understood that the lighting fixtures disclosed in Roberge could be installed in ceiling-mounted luminaires such as those disclosed in the '336 Patent and Chaimberg. Roberge states that the board 204 shown in Fig. 71 is a circuit board "supporting a plurality of LEDs," which have been highlighted in yellow in Fig. 71 below. *Id.*, 1:30-31, 19:46-51, Fig. 71. While Fig. 71 shows a housing in a linear shape, Roberge informs us that the "[h]ousings 800 can take various shapes, such as one that resembles a point source, such as a circle or oval. Such a point source can be located in a conventional lighting fixture, such as a lamp or a cylindrical fixture." *Id.*, 17:23-26.

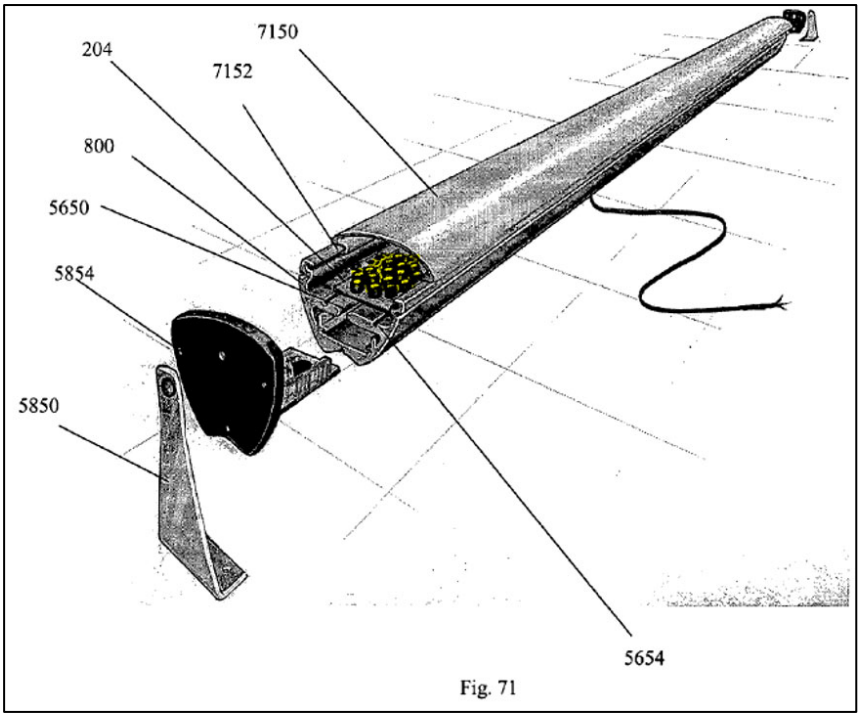


Fig. 71

Id., Fig. 71 (color added).

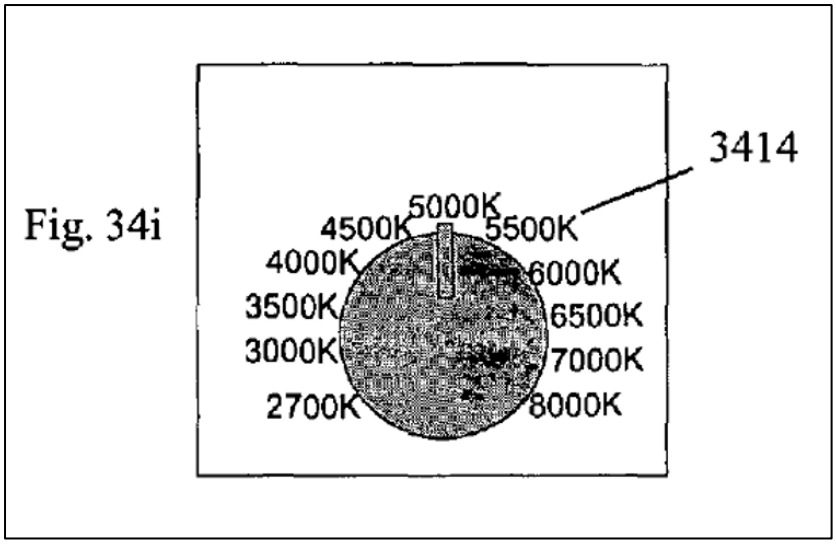
103. Roberge discloses that its embodiments can include "mixed [LEDs] to allow light of different colors or color temperatures, including color temperatures of white." *Id.*, 7:29-31. Roberge discloses that, like Chaimberg, the LEDs can include "two white sources of varying characteristics, three white sources of varying characteristics, or four or more white sources of varying characteristics." *Id.*, 7:33-36. The "white source can be mixed with, for example, an amber or red source to provide a warm white light or with a blue source to produce a cool white light." *Id.*, 7:36-7:39. The LEDs can be arranged such that the "light generated by two or more of the light sources combines to produce a mixed color light (including essentially white light having a variety of color temperatures)." *Id.*, 7:40-46. Roberge discloses that "[t]he various embodiments described throughout [its] specification encompass all possible combinations of LEDs in lighting unit 102, so that light of varying color, intensity, saturation and color temperature can be produced on demand." *Id.*, 7:53-60. The lighting systems 100 "may include one or more

lighting units 102." *Id.*, 36:34-37. On the basis of these and other statements by Roberge, one concludes that the inventors envisioned (and realized) in 2004 the production of light having a variable or "tunable" CCT. This is precisely the same feature that the '336 Patent wishes to provide nearly 15 years later:

> Need is apparent for a technology to provide a light emitting diode system that can adapt to various applications, for example, by delivering multiple color temperatures.

'336 Patent, 1:50-53.

104. Like Chaimberg and the '336 Patent, Roberge discloses controls and switches for specifying the CCT of the light produced by the luminaire. For example, Fig. 34i (reproduced below) shows "a dial [that] allows a user to select one or more color temperatures from a scale 3414[, which can] include different color temperatures of white light." Roberge, 42:51-54. "The lighting designer can specify use of a particular color temperature of light, which the installer can select by setting the right position on the scale 3414 with the dial." *Id.*, 42:54-57. As shown below, the rotary switch of Fig. 34i allows the user to select the following white light LED outputs: 2700 K, 3000 K, 3500 K, 4000 K, 4500 K, 5000 K, 5500 K, 6000 K, 6500 K, 7000 K, and 8000 K. Rotary switches operate in precisely the same manner as a slide switch except that the switch shaft is simply rotated so as to select the desired CCT value, as opposed to moving the slide of a slide switch in a straight line. Rotary switches have been employed widely in electronic systems for almost a century.



Id., Fig. 34i.

105. While Fig. 34i shows a rotary switch, Roberge discloses that "[a] slide mechanism [*i.e.*, switch] can be used like the dial to set a particular color temperature of white light." *Id.*, 42:57-59. At this point, it should be mentioned that the specific CCT values shown in Fig. 34i of Roberge are simply suggestions, and a POSA would realize quickly that any set of specific CCT values within the capability of white LEDs, or combinations of white LEDs, could be provided to the consumer.

3. Halliwell

106. U.S. Patent No. 9,801,250 ("Halliwell") was filed as Application No. 15/274,575 on September 23, 2016 and issued on October 24, 2017. Halliwell, Cover. Accordingly, I understand that Halliwell is prior art to the '336 Patent under at least 35 U.S.C. § 102(a)(2).

107. Like the '336 Patent, Halliwell describes a number of LED lighting devices and lamps. *See* Halliwell, Abstract. For example, Halliwell states that its "LED lighting device 20 may be a lighting fixture, a luminaire, … and/or the like." *Id.*, 6:36-42. In particular, Halliwell's

LED lighting device includes a "device housing 24" that "may be configured to house … one or more LED packages 18…" as shown in Fig. 2 below. *Id.*, 6:51-56.

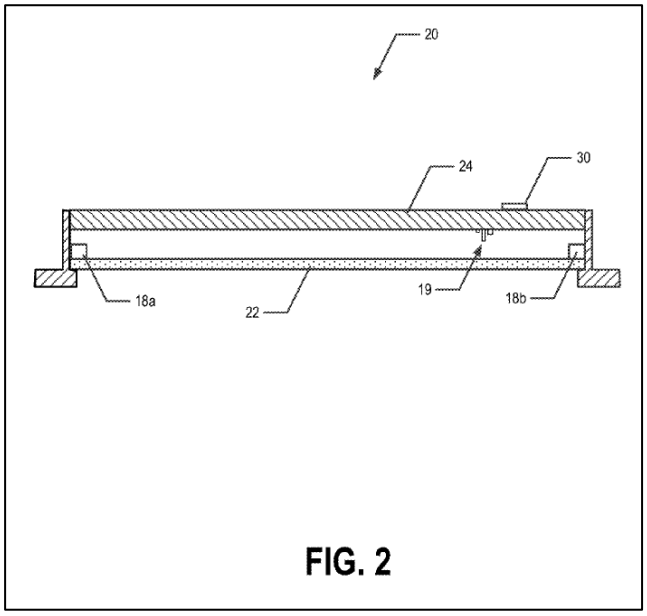


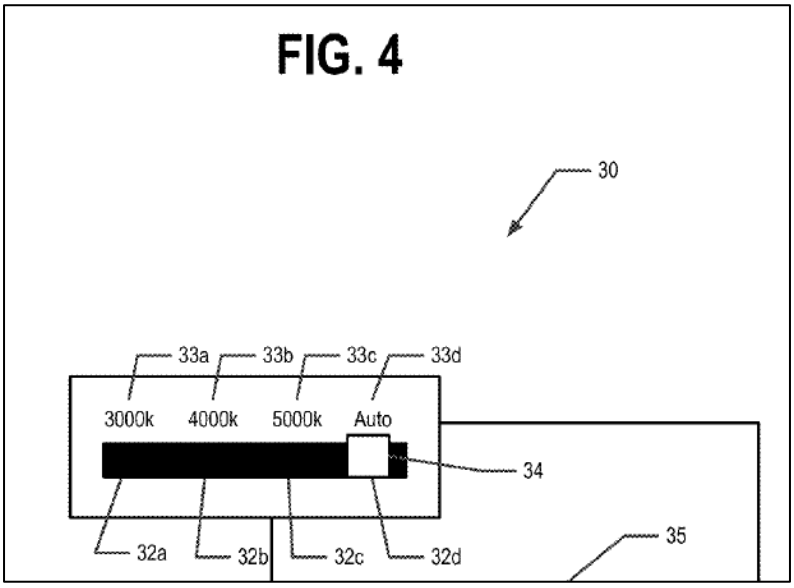
FIG. 2

Id., Fig. 2.

108. Halliwell further discloses that the "electrical components of the LED lighting device 20 (e.g., the driver circuitry 19, switch control unit 35, and/or the like) may be directly wired to line voltage (e.g., through a junction box) or may be configured to be connected to line voltage through a power cord comprising a two- or three prong polarized plug." *Id.*, 7:8-19. When the electrical components are "directly wired to line voltage" as described by Halliwell, the LED lighting device would necessarily include an electrical cable that is connected to electrical components such as the power supply. *Id.*

109. Figure 4 (reproduced below) is a "block diagram of at least some of the electrical components of [Halliwell's] LED lighting device," including a slide switch for selecting the CCT output of the LED lighting device. *Id.*, 3:26-29, Fig. 4. This exemplary switch 30 includes four

positions corresponding to four "color temperature mode[s]," including 3000 K, 4000 K, and 5000 K. *Id.*, 12:60-13:14, Fig. 4.



Id., Fig. 4.

110. However, the switch in Halliwell's LED lighting device is not limited to four positions. Indeed, Halliwell states that the "switch 30 may comprise a plurality of switch positions," including "two, three, four, five, six, seven, eight or more switch positions." *Id.*, 11:55-67. Moreover, Halliwell discloses that the LED packages "may be configured to emit light of at least one of 2700K, 3000K, 3500K, 4000K, 5000K, 5700K, 6000K, 7000K, 7500K and/or other color temperatures, as appropriate for the application." *Id.*, 7:61-67. Thus, a POSA would have understood that Halliwell's switch, the remaining electrical circuitry and components, and the number and CCTs of the LEDs themselves could easily be chosen to as to support the generation of light having as many values of the CCT as one might wish.

111. Halliwell discloses that the CCT switch can be located remotely from the housing, including as a "junction box mounted toggle switch." *Id.*, 17:39-42. Accordingly, a POSA would have understood that Halliwell's LED luminaire could use the switch of Fig. 4 (or many other

switches, for that matter) as the "junction box mounted" CCT switch. The slide switch chosen by Halliwell for Fig. 4 is one of many switch types that a POSA could have chosen. Furthermore, the position of the switch within the luminaire (i.e., on the housing, inserted into the power cord, mounted in/on the junction box, etc.) is one of many choices that a POSA must make often. These same decisions have been made for a broad range of electrical products (such as floor lamps, desk lamps, household and industrial fans, audio equipment, etc.) for decades.

4. Reiff

112. U.S. Patent No. 7,192,160 ("Reiff") was filed as Application No. 10/889,411 on Jul. 12, 2004 and issued on March 20, 2007. Reiff, (10), (21), (22), and (45). Accordingly, I understand that Reiff is prior art to the '336 Patent under at least 35 U.S.C. § 102(a)(2).

113. Reiff discloses a number of lighting devices that "include[] fluorescent and/or LED light sources," "wherein the color of the emitted light can easily be switched." Reiff, Abstract. The exemplary lighting device shown in Fig. 2 of Reiff "is a perspective view of an [] embodiment of a light in accordance with the invention," that includes both LED light sources (32) and a fluorescent light source (30). *Id.*, 2:45-46.

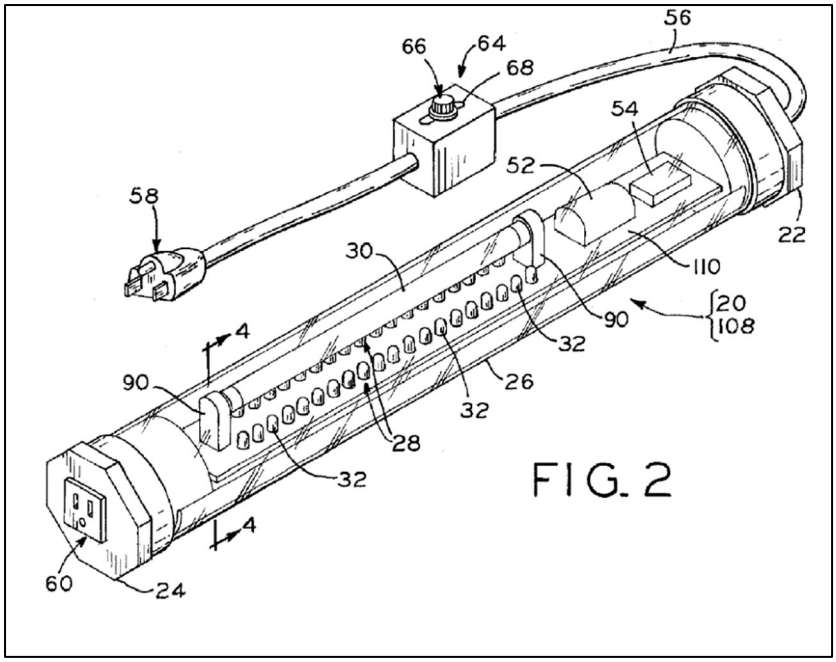


FIG. 2

Id., Fig. 2.

114. When Reiff's light "is powered by conventional 120-volt power, electrical cord 56 extends from one end 22 of the light" and has a "plug 58 at a distal end of the cord for insertion into a conventional electrical outlet." *Id.*, 4:16-19. As shown above, Reiff's control box 64 is "[l]ocated along electrical cord 56." *Id.*, 6:18-20. The "control box 64 [] includes a switch [66] for … selecting between the different light sources [28] … [E]ither a regular white light fluorescent light source can be selected, or a 'colored' LED light source can be selected." *Id.*, 4:28-36. As briefly discussed above, Reiff has chosen to insert a control box (containing a switch) into the electrical power cable.

With regard to the switch within the control box, Reiff describes the switch as follows: the "switch 66 which is a stepped dimmer switch linearly slidable in slot 68 to select a light source 28." *Id.* "Switch 66 has three positions, one position being the off position as shown in Fig. 2, one position operating the fluorescent lamp and one position operating the LEDS. Switch 66 slides into one of the three positions…" *Id.*, 6:20-24. Reiff also notes that "[e]ach of the light sources

emits a different color of light." *Id.*, 2:19-22. Therefore, because the light emitted by the fluorescent lamp has a CCT that is determined by the phosphor, the fluorescent lamp can be chosen to have a CCT value that complements those available from the LEDs. Therefore, a POSA would recognize that two values of the CCT are available with the switch having the configuration shown by Reiff. A POSA would also have understood that the control box in Reiff includes body for the switch and the piece identified as the switch 66 functions as an actuator.

5. Chen

115. U.S. Patent No. 10,136,503 ("Chen") was filed as application No. 15/702,837 on September 13, 2017. Chen, (21) & (22). Chen was filed as a continuation of application No. 15/292,395, which was filed on October 13, 2016 and issued as Patent No. 9,795,008, which was filed as a continuation of continuation of application No. 15/095,540, filed on April 11, 2016, now (and issued as Patent No. 9,497,834), which was filed as a continuation of application No. 14/579,248, filed on December 22, 2014 (and issued as Patent No. 9,345,112), which was filed as a continuation-in-part of application No. 13/792,002, filed on March 9, 2013 (and issued as Patent No. 8,947,000). Thus, Chen has a prior art date of either March 9, 2013 or December 22, 2014, either of which pre-date *any* possible priority date of the '336 Patent. Accordingly, Chen is prior art to the '336 Patent under at least 35 U.S.C. § 102(a)(2).

116. Like the '336 Patent, Chen relates to a number lighting apparatuses, including lighting apparatuses "comprising a first lighting load, a second lighting load, a diffuser and a microcontroller based electronic switch." *Id.*, 3:15-18. Chen discloses a number of lighting fixture applications for its microcontroller based switch. For example, Fig. 10C shows "an exemplary embodiment of the present disclosure for a wall switch construction electrically connected to a ceiling light for the performance of three working modes." *Id.*, 5:29-32.

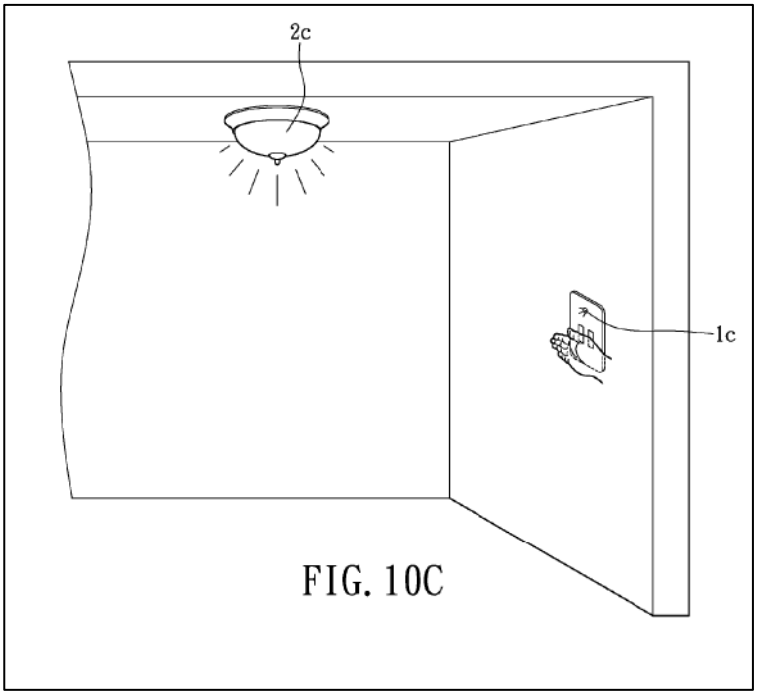


FIG. 10C

Id., Fig. 10C.

117. However, Chen goes far beyond simple mechanical switches that are inaccessible when installed. Chen discloses a light fixture with a microcontroller-based switch that uses infrared ray sensors to detect a user's instructions regarding the desired value of CCT. Other possible switch configurations are also described, including a button switch. For example, the touchless switch such as an infrared ray, or a direct touch switch such as a push button, generates a sensing signal that results in controlling "the color temperature of the blended light" output of Chen's LED light fixture. Chen, 10:65-11:7. Chen discloses a range of CCT values, ranging from 3000 K to 5700 K, that can be selected with the microcontroller based switch. *Id.*, 7:14-33. In particular, Chen disclosed the following details—years before any application related to the '336 Patent was filed:

> In another example, X-watt can be zero watts and Y-watt can be twelve watts, such that the power of the first lighting load 2 *a* ranges from zero watts to twelve watts, and the power of the second lighting load 2 *b* ranges from twelve watts to zero watts, wherein X+Y watt

> can be fixed to twelve watts. When the color temperatures of the first lighting load 2 *a* and the second lighting load 2 *b* are respectively 3000K and 5700K, the apparent color temperature of the diffused light of the first lighting load 2 *a* and the second lighting load 2 *b* can range from 3000K (twelve watts of the first lighting load 2 *a* and no power of the second lighting load 2 *b*) to 5700K (twelve watts of the second lighting load 2 *b* and no power of the first lighting load 2 *a*) depending on the electric power transmission levels fed to the first lighting load 2 *a* and the second lighting load 2 *b*. Thus, a desired color temperature may be generated by controlling the power levels of the first lighting load 2 *a* and the second lighting load 2 *b* to create proper color blending effect under a fixed total lighting power level with this type of microcontroller based electronic switch.

Id.. But a POSA would have understood that Chen could have been modified with additional temperatures.

118. Chen's invention enables the blending of the light produced by two sets of LEDs having different CCT values in order to create a third CCT value that is determined by: (1) the CCTs of the two sets of LEDs, and (2) the ratios of power level respectively delivered to each of the two sets of LEDs.

119. This method is known as CCT or, as described earlier, "white light" or CCT tuning. Chen performs "color temperature tuning [by] controlling different levels of electric power transmission to the two lighting loads [reversely and complementary] 2a [LEDs of a first temperature] and 2b [LEDs of a second temperature] by controlling" the power delivered to the LEDs as shown in Fig. 8A below. Chen, 8:24-59, Fig. 8A.

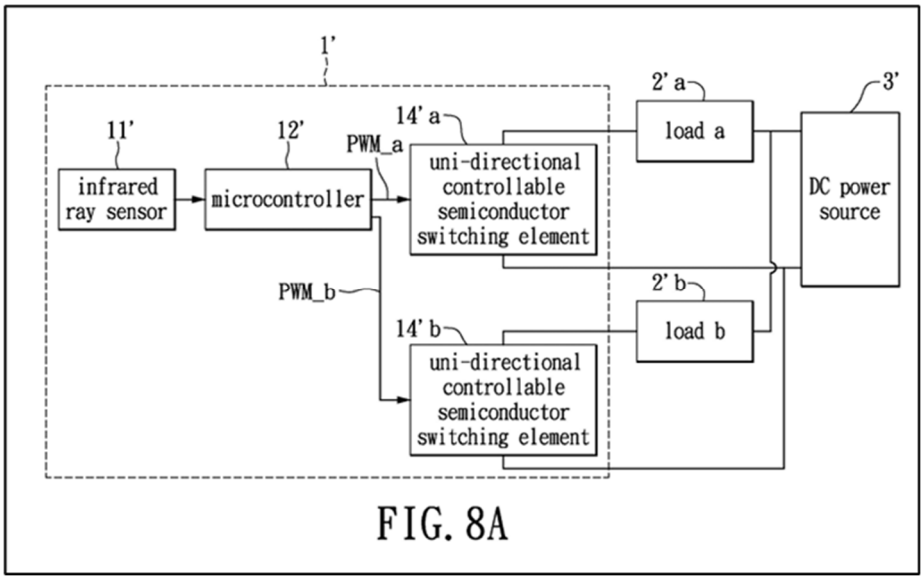


FIG. 8A

Id., Fig. 8A.

B. The '506 Patent

1. U.S. Patent No. 7,722,220 ("Van De Ven")

120. Van De Ven was filed on May 3, 2007 and claims priority to a provisional patent application filed on May 5, 2006. It is my understanding that Van De Ven, therefore, qualifies as prior art to the '506 Patent. Van De Ven describes a lighting device "which includes one or more solid state light emitters," and is related to "a 'recessed can' lighting device." Van De Ven, 1:12-15. As discussed by Van De Ven, a priority of the lighting industry at the time (and now) was replacement of conventional lighting fixtures in those locations in which access is restricted or difficult. where access to the lighting fixtures is difficult or restricted. Van De Ven, 1:54-59. Van De Ven also describes several desirable aspects of lighting sources such as the available emission wavelengths (*i.e.*, colors) and preventing line-of-sight observation of the light emitter(s) by a viewer. Van De Ven, 2:28-35; 2:60-67.

121. In response to these perceived limitations in the art, Van De Ven sought to develop "ways by which solid state light emitters can be used in place of" conventional light sources,

primarily as a result of the advantages of LEDs with respect to energy efficiency, color rendering index, contrast, and longevity. Van De Ven, 3:23-32. Van De Ven discloses installing such LED lighting devices "in a construction surface, e.g., in a ceiling, a wall or a floor," as well as "lighting devices which would be obtained by designs created by rotating any of [various profiles] to create a toroidal fixture, or by extruding to create regular shapes such as squares, rectangles, extended rectangles or irregular shapes." Van De Ven, 21:15-20, 21:55-61. According to Van De Ven, a "reflective element can comprise numerous concave surfaces, and one or more light emitting diodes can be mounted on any or all of such concave surfaces." Van De Ven, 12:23-36. The lighting device is then installed into the surface, for example where "a construction surface opening is formed in the construction surface, and the lighting device is positioned such that the contact region of the thermal conduction element … surrounds the construction surface opening … [such that] the lighting device is attached to the construction surface in any suitable manner. Van De Ven, 12:66-13:12.

122. Van De Ven then further discloses that the placement of the lighting device "can be set such that the bulb is not directly visible to the people standing in the room and the light from the fixture is directed so that it principally illuminates an area below the fixture." Van De Ven, 2:52-55. In addition to concealing the bulb from an observer through placement of the light emitters, Van De Ven also introduces a "blocking member" or "shield member" which "extends from the first side of the thermal conduction element away from the second side of the thermal conduction element, in order to obstruct the solid state light emitters from view." Van De Ven, 13:59-67.

2. U.S. Patent No. 5,709,460 ("Lester")

123. Lester was filed on December 17, 1996. It is my understanding that Lester therefore qualifies as prior art to the '506 Patent. Lester is generally directed to a lighting fixture wherein "light bulbs are hidden in a cove on either side of the fixture, and the light from each bulb radiates upward and is reflected off of a domed upper portion of the fixture." Lester, 1:8-12. Lester addresses perceived deficiencies of using direct fluorescent lighting, wherein indirect lighting fixtures would be used such that "a light source is not visible from outside the light source, but emanates into the room from a reflection off of another surface." Lester, 1:26-30.

124. Lester describes mounting two "longitudinally extending u-shaped channel-like coves" on either side of a dome for housing fluorescent bulbs. The fixture is "mounted in place of ceiling panels in a grid-type ceiling, so that the coves and the edges of the dome are hidden behind the ceiling panels on either side of the fixture." Lester, 2:1-13. According to Lester, such a configuration "allows the light from the bulbs inserted therein to escape and be evenly reflected off the inner face of the dome and down into the room." Lester, 2:37-39. Lester further discloses using an "inner wall" of the cove, "integrally formed with a bracket" so as to prevent the bulbs from being seen by an observer. Lester, 3:42-44.

3. Japanese Publication No. 1984/035302 ("Yoshimi")

125. Yoshimi was filed on August 23, 1982. It is my understanding that Yoshimi qualifies as prior art to the '506 Patent. Yoshimi is generally directed to a "lighting fixture which is mounted on a ceiling, such as a ceiling-embedded type, and emits only reflected light to the outside of the lighting fixture." Yoshimi (translation), page 5, col. 2. Yoshimi discloses accomplishing such reflected-light emission through a "reflector with its central part curved upward in a dome shape," where the reflector has detachable sides to the inner surfaces of the main body. According to Yoshimi, this configuration results in the lamp emitting light "directed to the

vicinity of the central part of the reflecting plate, and light directed to the end edge of the reflecting plate and both side edges of the light shielding frame." Yoshimi (translation), page 6, col. 4; page 7, col. 1. Thus, the lamp is "concealed by fitting and fixing the luminaire main body … in the recessed hole of the ceiling surface, attaching the light shielding frame, and bringing the edge frame part into close contact with the ceiling surface, and only the central part in the reflecting plate is exposed from the opening part of the lights shielding frame." Yoshimi (translation), page 7, col. 1.

4. U.S. Patent No. 7,161,313 ("Piepgras")

126. Piepgras was filed on April 14, 2005. It is my understanding, therefore, that Piepgras qualifies as prior art to the '506 Patent. Piepgras is generally directed to seeking a solution for incorporating "programmable, multi-colored lighting systems to enhance user experience with sophisticated color-changing effects, including systems that operate autonomously and systems that are associated with wired or wireless computer networks." (Piepgras at 3:4-9.) Piepgras sought to meet this perceived need by disclosing controlled lighting devices via user interfaces, which may utilize control information or programs store in device memory or sensors responsive to various operating or environmental conditions. (Piepgras at Abstract.)

127. Piepgras further discloses using a "reflector," which can be a "contoured reflective surface … placed apart from a plurality of LEDs, such that radiation from the LEDs is directed toward the reflective surface." According to Piepgras, this configuration allows "radiation from the LEDs [to be] redirected out in a circle about the reflective surface." (Piepgras at 17:36-44.)

VIII. THE ASSERTED CLAIMS OF THE '336 PATENT ARE INVALID UNDER 35 U.S.C. §§ 102 AND/OR 103

128. I understand that Signify has asserted claims 1, 3-5, 7, 9, 11-13, 15, 16, and 19 against certain accused products. I explain in this section why each of the Asserted Claims of the '336 Patent are invalid under 35 U.S.C. §§ 102 and/or 103 as discussed in detail below.

A. The Asserted Claims Have A Priority Date No Earlier Than June 21, 2018

129. The '336 Patent was filed as a continuation-in-part application on June 21, 2018 and claims priority to: the '062 Application, which was filed on November 13, 2017, the '141 Application, which was filed on February 16, 2017, and the '424 Provisional, which was filed on February 19, 2016. *See* '336 Patent, Cover. As explained below, however, the '141 Application, the '062 Application, and the '424 Provisional fail to provide written description support for claims 1-20 of the '336 Patent, and it is my understanding that these claims are, therefore, entitled to a priority date no earlier than the '336 Patent's filing date of June 21, 2018.

130. Claims 1-12 (including Asserted Claims 1, 3-5, 7, 9, 11, and 12) require a CCT switch with discrete positions that is "coupled to [an] electrical cable [of the light fixture], wherein the switch is disposed remotely from the housing" of the light fixture. *Id.*, 14:39-45. Claims 13-20 (including Asserted Claims 13, 15, 16, and 19) similarly require a CCT switch that is "coupled" to an electrical cable of the light fixture. Indeed, as noted above, the examiner identified these features as the "primary reasons for the allowance of the claims." '336 Patent File History, 94-100 (October 16, 2018 Notice of Allowance). However, I am unable to find *any* description of these features in the '424 Provisional, the '141 Application, or the '062 Application.

131. Specifically, the '424 Provisional describes a lighting system that can be "configured to produce illumination of different color temperatures." '424 Provisional Application, 15. The luminaire includes "[s]witches 210 [that] provide an input for configuring

the luminaire 100 to operate at a selected [CCT]. In the illustrated embodiment [of the '424 Provisional], the circuit 200 comprises two manual switches 210" mounted on the circuit board. *Id.*, 19. The '424 Provisional further states that the switches 210 could comprise "dual inline pin (DIP) switches," and they could "be mounted to the housing 105 of the luminaire" or "mounted on the substrate 125," which is also located within the housing. *Id*. A POSA would have understood that these disclosures do not describe a CCT switch that is coupled to an electrical cable of the luminaire, or remotely located from the housing. Accordingly, the '336 Patent is not entitled to '424 Provisional's February 19, 2016 priority date.

132. The Applicant added additional disclosures when it filed the '141 Application on February 16, 2017. However, the '141 Application (which issued as the '350 Patent) similarly did not disclose a remotely-located CCT switch coupled to an electrical cable of the lighting device. *See* '350 Patent. For example, Applicant updated Fig. 1E with an illustration, and additional corresponding text, of the circuit board-mounted switch (131) disclosed in the '424 Provisional. However, the switch is still described as "a dual inline pin switch 131 [that] is mounted on a circuit board." *Id.*, 5:12-14. The '141 Application does give several types of switches beyond the three examples presented by the '424 Provisional (*e.g.*, rocker, reed, magnetic, slide or rotary switches). However, the '141 Application again states clearly that even these new switches are still mounted to the substrate, circuit board, or housing. *Id.*, 6:28-50, 8:12-25. Thus, even the additional disclosures in the '141 Application do not describe a remotely located switch and/or a switch coupled to an electrical cable of the luminaire as required by claims 1-20.

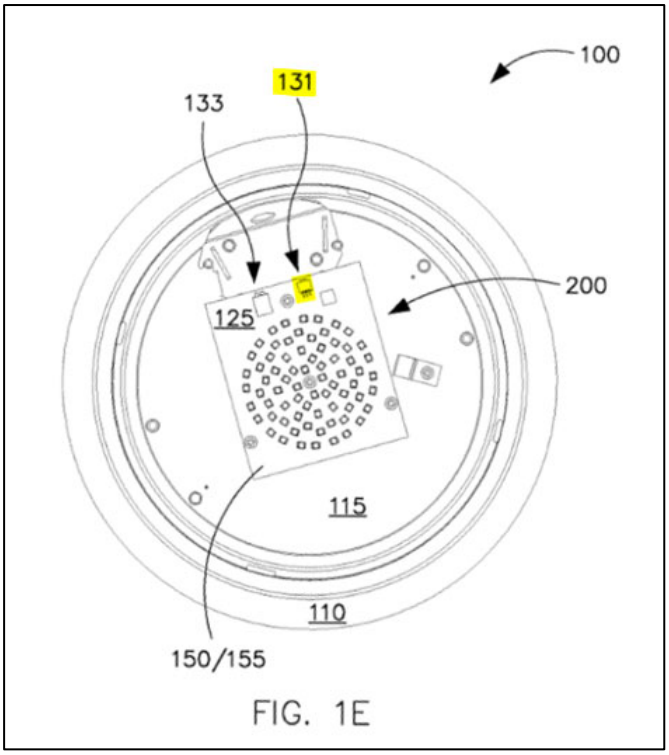


FIG. 1E

Id., Fig. 1E (color added).

133. The ’062 Application was filed as a continuation of the ’141 Application and therefore contains the same disclosures; the ’062 Application; therefore, does not describe the claimed switch for the same reasons set forth above with respect to the ’141 Application. Accordingly, it is my understanding, therefore, that the ’336 Patent is not entitled to the ’141 Application’s February 16, 2017 priority date, or the ’062 Application’s November 13, 2017 priority date.

134. When the ’394 Application was filed on June 21, 2018 as a continuation-in-part, the Applicant introduced new material, such as Figures 5-10 and the related descriptions. In the ’394 Application, for example, the Applicant described for the first time a CCT switch (931/1031) located remotely from the housing (905/1005) that includes “one or more coupling features (*e.g.*, terminal points) that are used to couple to one or more electrical conductors of one or more

electrical cables 927[/1027]." '336 Patent, 11:61-12:5; *see also id.*, Fig. 10 (showing the CCT switch 1031 mounted on the junction box 1090). This switch location and coupling features are not disclosed in the '424 Provisional, '141 Application, or the '062 Application.

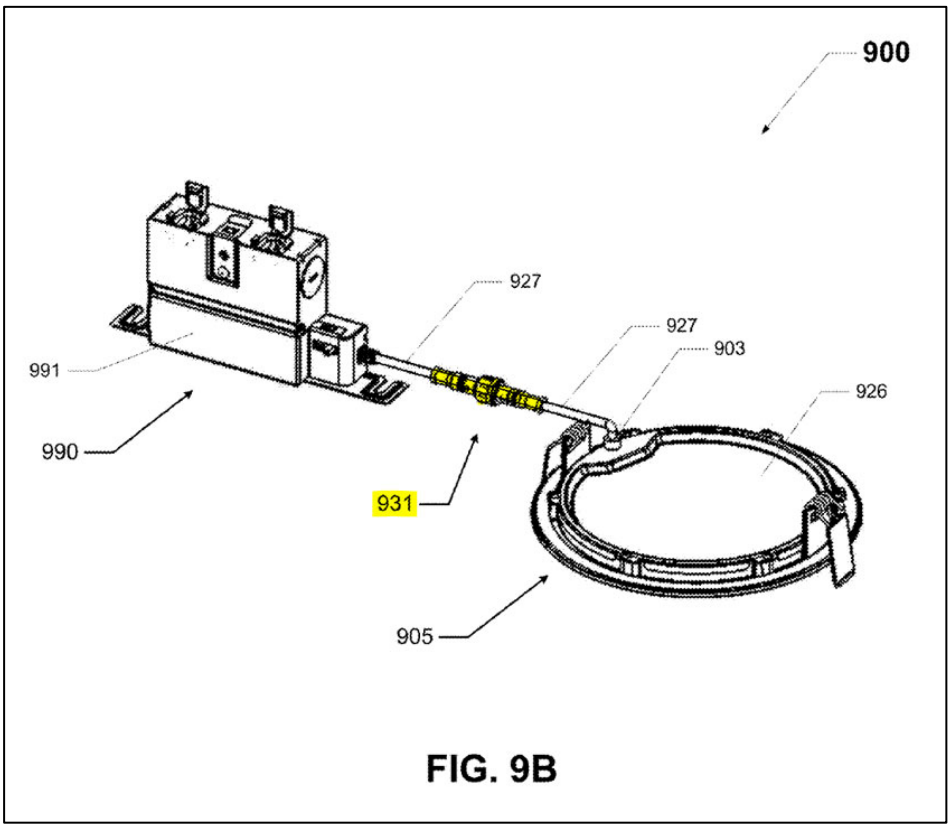


FIG. 9B

'336 Patent, Fig. 9B (color added).

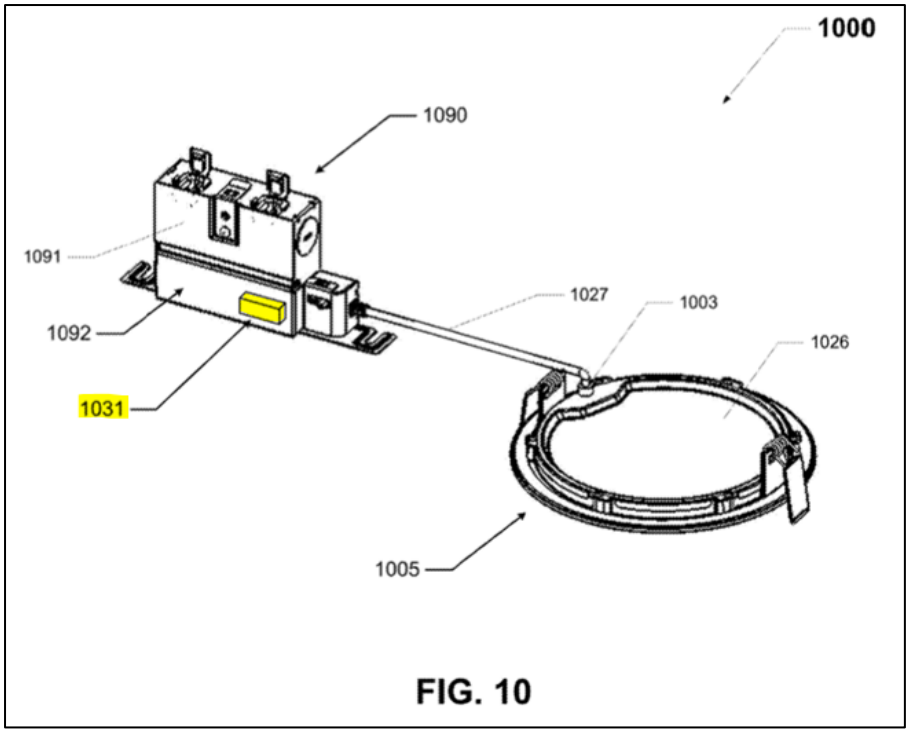


FIG. 10

'336 Patent, Fig. 10 (color added).

135. In addition, the disclosure of a remotely located switch and/or a switch coupled to an electrical cable of the luminaire was, for the first time, included in the '394 Application. The disclosure submitted with the '394 Application acknowledged that in "embodiments discussed previously [*i.e.*, Figs. 1-8], the example switch is located on the housing of the luminaire or within the housing of the luminaire." *Id.*, 11:61-63.

136. In summary, neither the '424 Provisional, the '141 Application, nor the '062 Application provide written description support for the switch, as required by claims 1-20 of the '336 Patent. These claims are, therefore, entitled to a priority date no earlier than June 21, 2018, the date on which the '336 Patent was filed.

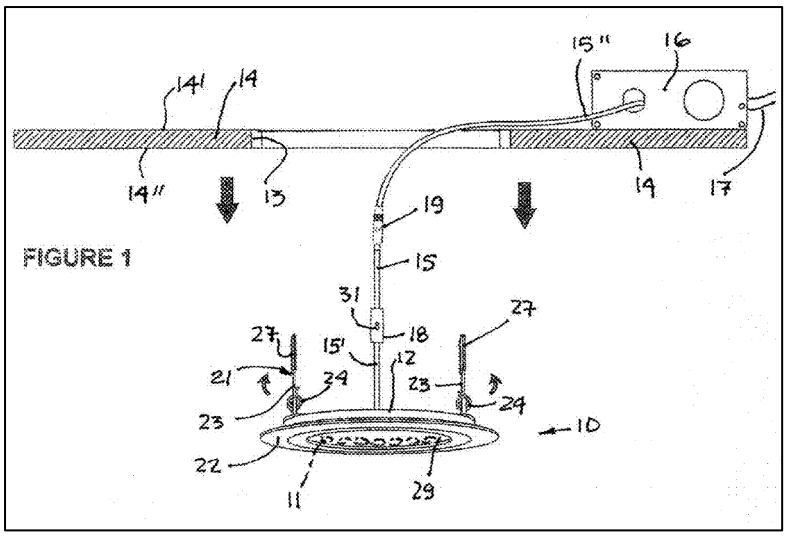
B. Ground [1a] – Chaimberg Anticipates And/Or Renders Obvious Claims 1, 3, 7, 9, 11-13, 15, and 19 Of The '336 Patent

1. Claim 1

(a) Preamble: "A luminaire comprising"

137. The preamble of claim 1 includes: "[a] luminaire comprising…" '336 Patent, 14:31.

138. Chaimberg discloses "[a] ceiling mountable LED light fixture." Chaimberg, Abstract. Figure 1 of Chaimberg illustrates "the LED light fixture of the present invention." *Id.*, 2:51-52. As described above, the terms "light fixture" and "luminaire" are synonymous because both refer to a complete lighting unit. Consequently, a POSA would have understood Chaimberg's LED light fixture to be a luminaire.



Id., Fig. 1.

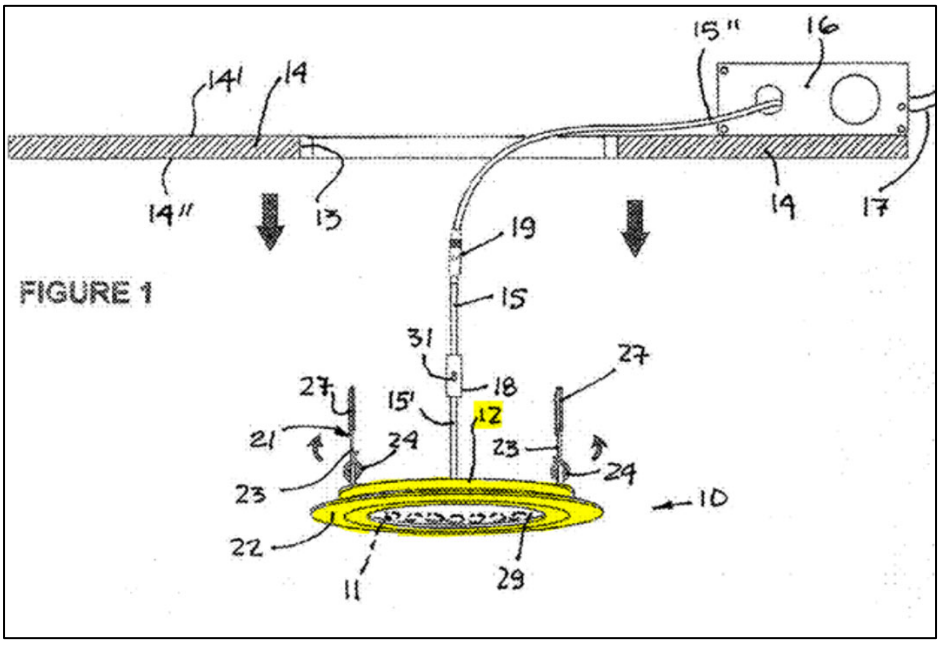
139. Therefore, to the extent the preamble is limiting, Chaimberg's LED light fixture is "[a] luminaire."

(b) Element 1a: "a housing comprising at least one outer surface that forms a first cavity;"

140. Element 1a requires: "a housing comprising at least one outer surface that forms a first cavity." '336 Patent, 14:32-33.

141. Chaimberg's LED light fixture includes a "LED light fixture housing 12." Chaimberg, 3:10-11. Chaimberg's LEDs 11 "are mounted … *inside* a wall of the housing 12." *Id.*, 3:3-5 (emphasis added). A POSA would also recognize that Chaimberg's housing forms a "first cavity." As shown in Fig. 1 below, the light fixture includes an unnumbered vertically-oriented, circular retainer "wall" lying above the circumferential flange 22. *Id.*, 3:3-5. All of the LEDs 11 are mounted within or "*inside* a wall of the housing 12." *Id.*, 2:66-3:12, Fig. 1; (emphasis added). Note, too, that the arrow labeled "12" in Fig. 1 appears to point to the circular wall in the illustration.

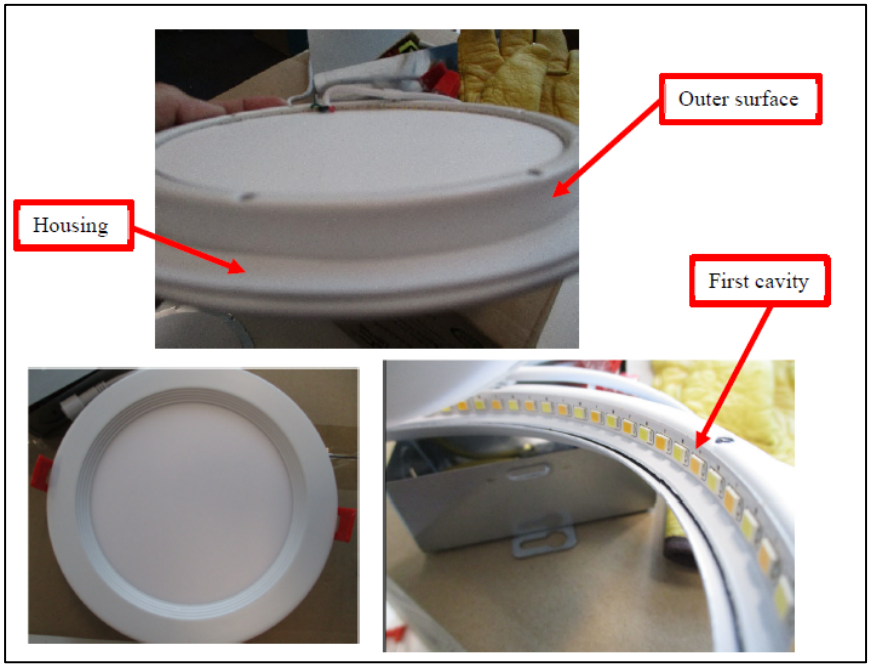
142. In Fig. 1, reproduced below, both the circumferential wall 22 and the circular, vertically-oriented wall are highlighted for convenience. Both the Fig. 1 drawing and the Chaimberg specification show clearly that the individual LEDs 11 are located inside the housing 12. *Id.*, Fig. 1. Because the LEDs are mounted within the housing wall, it is apparent that the outer surface(s) of housing 12 "forms a first cavity."



Chaimberg, Fig. 1 (color added).

143. Thus, Chaimberg's housing 12 is "a housing comprising at least one outer surface that forms a first cavity."

144. Moreover, I understand that in its infringement contentions, Signify has interpreted the "housing" of claim 1 as encompassing a structure nearly indistinguishable from the circular wall and circumferential flange 22 of Chaimberg. A portion of the specific luminaire, and the labels applied by Signify to that luminaire, are shown in the photographs below. Note that the LEDs are mounted within a "First Cavity" that is bounded by two, orthogonally-oriented surfaces that could be termed walls, flanges, or "lips".



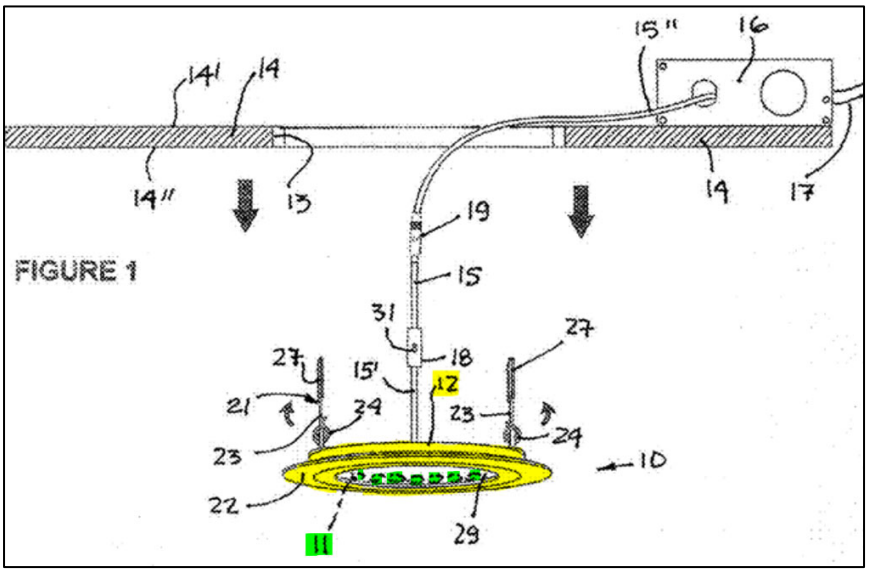
Appx. G-1 to Signify's Infringement Contentions, at 5.

145. Finally, let me mention that the '336 Patent concedes this claim element to have been known in the prior art. Indeed, Fig. 8 (labeled "prior art") depicts a housing 805 with an outer surface that forms a cavity. *See, e.g.*, '336 Patent, Fig. 8.

(c) Element 1b: "at least one electrical component disposed, at least in part, within the first cavity;"

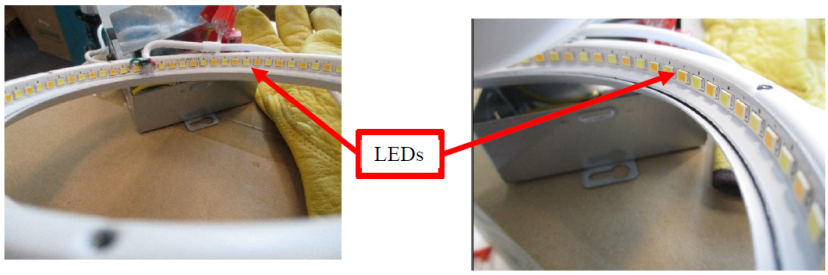
146. Element 1b recites: "at least one electrical component disposed, at least in part, within the first cavity." '336 Patent, 14:34-35.

147. LEDs are electrically-powered components, so Chaimberg's LEDs 11 are electrical components that "are mounted … inside a wall of the housing 12." Chaimberg, 3:3-5. Thus, the LEDs 11 are within the first cavity formed by the housing 12 as discussed above with respect to element 1a of claim 1. *Id.* Further, Fig. 1 (reproduced once more below) illustrates the LEDs 11 ("shown in phantom lines") which are "mounted [] inside a wall of the housing 12"—*i.e.* inside the first cavity of the housing 12. *Id.*, 2:66-3:12, Fig. 1. For the sake of clarity, the LEDs 11 and the outer wall of the housing 12 are highlighted in green and yellow, respectively, in Fig. 1:



Id., Fig. 1 (colors added).

148. One concludes, therefore, that Chaimberg's LEDs 11 mounted in the housing 12 are "at least one electrical component disposed at least in part, within the first cavity." Further, I understand that in its infringement contentions, Signify has interpreted the "at least one electrical component" of claim 1 as encompassing LEDs such as those disclosed in Chaimberg:

[1.b] at least one electrical component disposed, at least in part, within the first cavity;	The 349-1292 product includes at least one electrical component disposed, at least in part, within the first cavity. For example, the 349-1292 product includes LEDs disposed within the first cavity. 

Appx. G-1 to Signify's Infringement Contentions, 6.

149. Finally, the '336 Patent also concedes that this claim element was known in the prior art. Specifically, Fig. 8 of the '336 Patent, labeled "Prior Art" is described as follows: "Fig. 8 shows another luminaire currently known in the art", and the specification states, in reference to Fig. 8: "One end of the electrical cable 827 is connected to one or more components (*e.g.*, light sources) disposed on and/or within the housing 805 of the luminaire 800." '336 Patent, 3:24-25, 11:5-12; Fig. 8.

(d) Element 1c: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component; and"

150. Element 1c recites: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component." '336 Patent, 14:36-38.

151. Chaimberg's LED light fixture includes "a cable 15 [that] is secured at one end 15', to the light housing 12 and has wires therein secured to the two sets of LED's to supply driving current to each of the sets." Chaimberg, 3:14-25. "The cable 15 is also secured at a far end 15" to a driver circuit 20 … [which] … is mounted in a driver housing 16 [that] is supplied line voltage from live wire 17." *Id.* Thus, the cable 15 has two ends, and the first end (15') is coupled to the LEDs 11 which are located in the housing 12.

152. In summary, Chaimberg's cable 15 is "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component." Moreover, the '336 Patent even states that this claim element was known in the prior art. Indeed, Fig. 8 (labeled "Prior Art") depicts an electrical cable 827 that is "connected to the one or more [electrical] components (*e.g.*, light sources) disposed … within the housing 805." *See, e.g.*, '336 Patent, Fig. 8, 11:5-12.

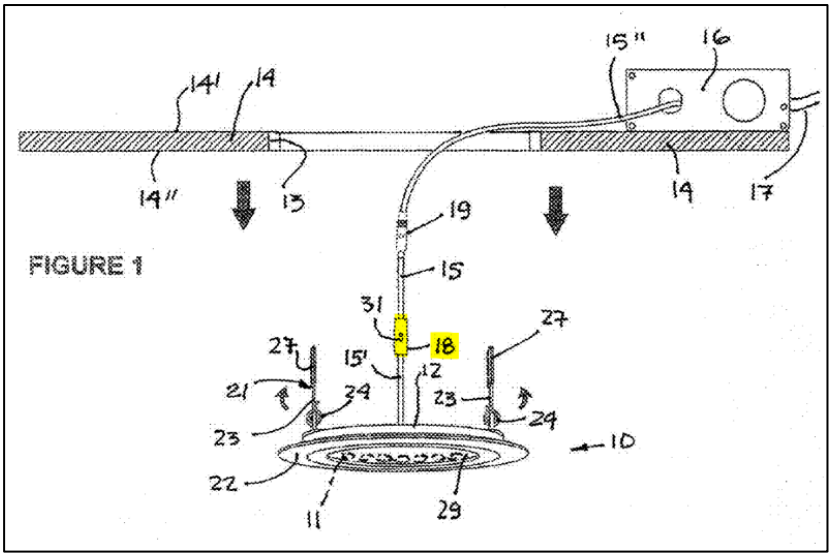
(e) Element 1d: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing,"

153. Element 1d recites: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing." '336 Patent, 14:39-40.

154. Chaimberg's LED light fixture includes a "selector switch 18 [which] is mounted on the cable 15." Chaimberg, 3:49-54. The switch 18 controls the "color temperature (CCT)" output of Chaimberg's LED luminaire. *Id.*, Abstract. Because the switch 18 is inserted in the electrical cable 15 and manipulation of the switch causes drive current to be supplied to one or more of the sets of LEDs, it is "coupled to the electrical cable" 15.

155. Chaimberg describes the switch as located "adjacent to the LED light fixture housing," and notes that this layout "provide[s] access to the switch 18 without having to withdraw the driver housing 16 from" the ceiling. *Id.*, 3:49-54. Because the switch is located on the cable 15, it is "disposed remotely from the housing" 12.

156. Figure 1 of Chaimberg shows the location of the switch 18 on the cable 15. *Id.*, Fig. 1. For convenience, the switch 18 has been highlighted in Fig. 1 below. As shown below and noted above, the switch 18 is mounted on the electrical cable 15 and located remotely from the housing 12.



Id., Fig. 1 (color added).

157. Thus, Chaimberg's switch 18 is "a switch coupled to the electrical cable [*i.e.*, cable 15], wherein the switch is disposed remotely from the housing."

(f) Element 1e: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire."

158. Element 1e recites: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire." '336 Patent, 14:40-45.

159. Chaimberg's "switch 18 is a toggle switch provided with a slide button 31 having two conducting arms 32 and 33 and displaceable to three switch positions." Chaimberg, 4:34-37. When the slide button 31 of the switch 18 is set "[a]t a first position," Chaimberg's LED light fixture emits light at 3000 K (CCT). *Id.*, 4:37-48. When the slide button 31 of the switch 18 is set "to a second position," Chaimberg's LED light fixture produces a light color on the order of "5000 K CCT." *Id.*, 4:49-59. When the slide button 31 of the switch 18 is set to a third position,

Chaimberg's LED light fixture "produces a light color of the order of 4000 Kelvin (CCT)." *Id.*, 4:60-5:10. Chaimberg's LED light fixture emits light characterized by a CCT value of 3000 K by powering only a specific set of LED—the 3000 K LEDs 11, and emits light having a CCT value of 5000 K by powering only the 5000 K LEDs 11. Chaimberg also produces light having an apparent CCT value of 4000 K by powering a combination of the 3000 K and 5000 K LEDs. While the embodiment disclosed by Chaimberg includes LEDs having one of only CCTs (3000 K and 5000 K), the light fixture of Chaimberg includes "at least two sets of LED's of different correlated color temperatures." *Id.*, Abstract.

160. Thus, the slide switch 18 of Chaimberg is a switch "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire."

(g) Conclusion For Claim 1

161. As described in detail in the preceding sections, Chaimberg satisfies each element of claim 1 of the '336 Patent. Accordingly, Chaimberg anticipates and/or renders obvious claim 1 of the '336 Patent.

2. Claim 3: "The luminaire of claim 1, wherein each position of the plurality of positions is discrete."

162. Claim 3 recites: "[t]he luminaire of claim 1, wherein each position of the plurality of positions is discrete." '336 Patent, 14:47-48.

163. As discussed above, Chaimberg's "switch 18 is a toggle switch provided with a slide button 31 having two conducting arms 32 and 33 and displaceable to three switch positions." Chaimberg, 4:34-37. Chaimberg describes three positions for the slide button 31, a "first,"

"middle," and "right." *See Id.*, 4:30-63. Accordingly, the three positions of Chaimberg's switch 18 are discrete and correspond to discrete temperature (CCT) outputs.

164. In conclusion, Chaimberg's CCT switch 18 is a switch "wherein each position of the plurality of positions is discrete" and, therefore, Chaimberg anticipates and/or renders obvious claim 3 of the '336 Patent.

(a) Conclusion For Claim 3

165. As I have explained in Section VIII.B.1, Chaimberg anticipates and/or renders obvious claim 1 of the '336 Patent. This section has shown that Chaimberg discloses the additional elements of claim 3 of the '336 Patent. Accordingly, Chaimberg anticipates and/or renders obvious claim 3 of the '336 Patent.

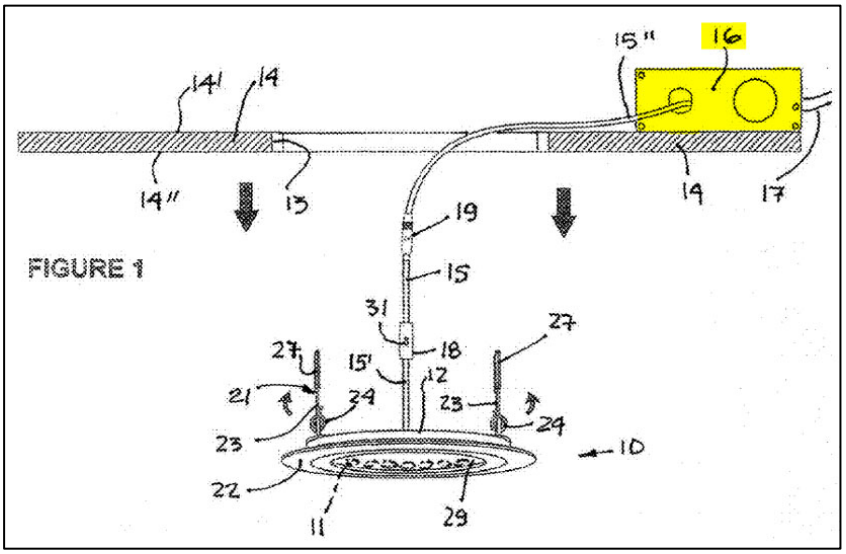
3. Claim 7: "The luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch."

166. Claim 7 recites: "[t]he luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch." '336 Patent, 14:65-15:2.

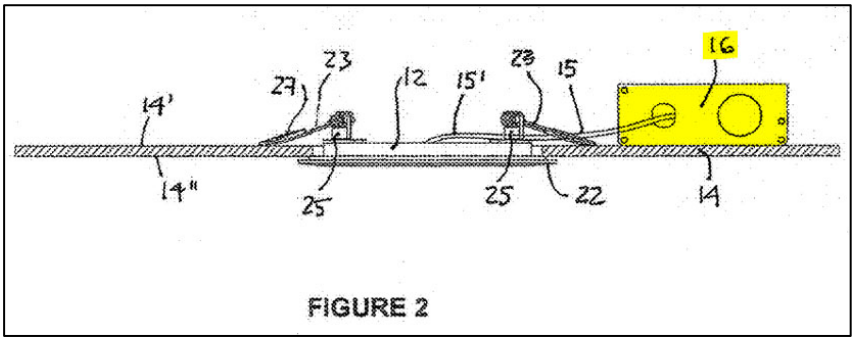
167. Chaimberg's LED light fixture includes driver housing 16. Chaimberg, 4:30-32. Power is supplied to the LED driver circuit 20 by "line voltage from live wire 17." *Id.*, 3:24-25. Thus, a POSA would have understood that Chaimberg's driver housing 16 functions as a "junction box" because it is an enclosure, distinct from the luminaire housing, that receives line voltage ("live wire 17", typically 110 VAC). In particular, the driver housing electrically connects the "live wire 17" to the LED driver circuit 20. Because Chaimberg's "driver circuit 20 is mounted

in a driver housing 16," the driver housing 16 includes an internal space. *Id*. This internal space within the driver housing 16 constitutes a "second cavity."

168. Figures 1 and 2 of Chaimberg (reproduced below) show the driver housing "mount[ed] behind a ceiling sheet material and spaced from" the LED light fixture housing. *Id.*, 2:25-30. That is, the driver box 16 (highlighted below) is mounted above the ceiling and serves to receive the AC power cable:



Id., Fig. 1 (color added).



Id., Fig. 2 (color added).

169. The exemplary embodiment described in Chaimberg includes the CCT switch 18 located on the electrical cable 15, and situated between the LED light fixture and driver housing

(*i.e.*, junction box). *Id.*, Fig. 1. However, Chaimberg mentions that it was common in prior art to mount a switch "on the driver housing to select a desired color temperature of the LED light fixture" *Id.*, 1:44-50. The switch to which Chaimberg refers is the CCT selection switch discussed earlier. Chaimberg explains that inserting the CCT switch in the electrical cable is preferable to locating it on the junction (or driver) box because the former provides easier access to the switch after installation. *Id.*, 1:44-67. Consequently, Chaimberg specifically acknowledges what was well known—namely, locating the CCT switch at the junction box was common in the prior art, but is not desirable *if* one wishes to provide the customer or service personnel ready access to the CCT switch.

170. Thus, Chaimberg discloses, or at least would have rendered obvious, the condition of Claim 7 that "the switch is disposed within the second cavity" of the junction box. Chaimberg states correctly that it was known in the art to mount a CCT switch "on the driver housing to select a desired color temperature of the LED light fixture." *Id.*, 1:44-50. While Chaimberg does not expressly describe locating the switch 18 *inside* the driver housing—*i.e.*, "within the second cavity" of the junction box, as claimed—a POSA would view the installation of the switch in the driver housing or junction box as being standard for *some* applications. For example, placing the switch within the junction box could protect the switch from elements like dust, debris, insects, and rodents.

171. A recurring theme in this report is the placement of the CCT switch during the installation of a "tunable white" luminaire. It must be emphasized that the choice of switch location by an illumination engineer is, in practice, determined by the industrial, commercial, public, or residential application at hand. As an example, luminaires to be installed in an office building or high-bay commercial building may be designed to produce light having one of two

"daylight" CCTs (such as 4000 K and 4500 K). During construction and installation, the decision of lighting designers may be to set the CCT of all luminaires at 4500 K. In this situation, the CCT switches for all luminaires are likely to be installed in a junction or driver box or other inaccessible location. If the decision is made later to lower the CCT for employee or customer comfort, technicians will make the change (as opposed to the user or luminaire customer) and will access the switch in or outside a junction box that has the capability to serve several luminaires.

172. In summary, the CCT switch will be made accessible to luminaire customers only in those situations, such as restaurants, in which one or more changes in the CCT value are expected during the life of the LEDs and the customer is willing to make the necessary change. Placing the switch in the cable between a junction box or power supply and the luminaire allows a commercial or residential customer to make a CCT change quickly without the assistance of an electrician or a technician.

173. Finally, Chaimberg discloses or at least would have rendered obvious "wherein the second end of the electrical cable is coupled to the switch." As described above for Element 1c of claim 1, the first end of Chaimberg's cable 15 is coupled to the LEDs 11 (*i.e.*, "coupled to the at least one electrical component," as claimed). Connecting the remaining (second) end of the electrical cable to the switch and then connecting the other side (electrical terminal) of the switch to the power source is necessary to have a complete circuit. Chaimberg is not explicit (indeed, it is not necessary to be explicit) concerning basic aspects of electrical circuits that would have been known to undergraduate students in electrical engineering.

174. Thus, Chaimberg discloses or would have rendered obvious that the CCT switch could be located in or on the driver housing 16. Furthermore, a POSA would have known that locating the switch in a driver housing or a junction box is the best choice in various industrial and

commercial settings for which desired changes in the CCT value of the lighting are occasional or rare.

(a) Conclusion For Claim 7

175. As explained previously in Section VIII.B.1, Chaimberg anticipates and/or renders obvious claim 1 of the '336 Patent. As I have explained in this section, Chaimberg also discloses every element of claim 7. Accordingly, Chaimberg anticipates and/or renders obvious claim 7 of the '336 Patent.

4. Claim 9: "The luminaire of claim 1, wherein the switch is a slide switch."

176. Claim 9 recites: "[t]he luminaire of claim 1, wherein the switch is a slide switch." '336 Patent, 15:13-14.

177. As discussed above, Chaimberg's switch 18 is described as: "a toggle switch provided with a slide button 31." Chaimberg, 4:34-37. Thus, a POSA would have understood that Chaimberg's switch 18 is a "slide switch." To the extent that Chaimberg does not explicitly disclose a "slide switch", as I explain above and below, switches, including slide switches have been employed widely in electronic systems for almost a century. Therefore, it would have been obvious for a POSA to use a "slide switch" as Chaimberg's CCT switch 18.

(a) Conclusion For Claim 9

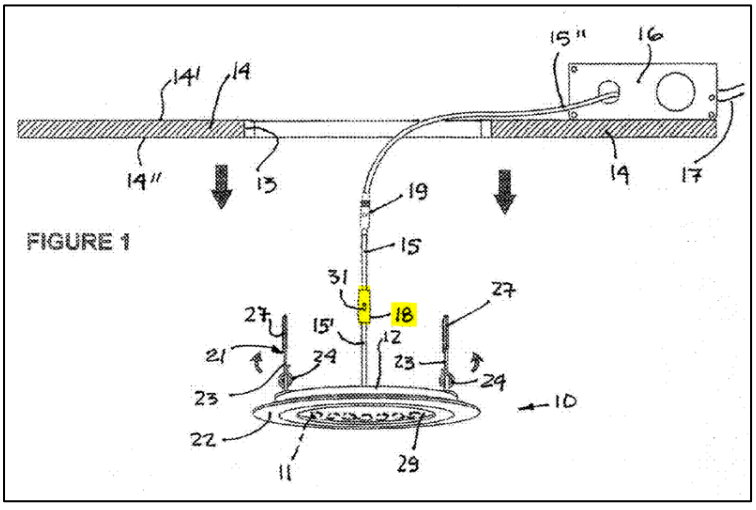
178. The discussion of Section VIII.B.1 demonstrated that Chaimberg anticipates and/or renders obvious claim 1 of the '336 Patent. As described above, Chaimberg also discloses the additional elements of claim 9. Accordingly, Chaimberg anticipates and/or renders obvious claim 9 of the '336 Patent.

5. Claim 11: "The luminaire of claim 1, wherein the switch is inaccessible when the housing is installed."

179. Claim 11 states: "[t]he luminaire of claim 1, wherein the switch is inaccessible when the housing is installed." '336 Patent, 15:17-18.

180. Chaimberg's LED light fixture is "adapted to be removably secured in a housing mounting hole in a ceiling sheeting material." Chaimberg, Abstract. As discussed above, Chaimberg's CCT "selector switch 18 is mounted on the cable 15" and is typically located between the light fixture housing 12 and driver housing 16. *Id.*, 3:49-54, Fig. 1. Furthermore, Chaimberg's CCT selector switch 18 "is made accessible and visible by simply withdrawing the light fixture from" the ceiling. *Id.*, Abstract. Because the switch is "made accessible and visible by" withdrawing it from the ceiling, the switch is inaccessible when the LED housing is installed in the ceiling.

181. Chaimberg states: "In Fig. 1, the LED light fixture 10 is shown retracted from its fixture mounting hole." *Id.*, 3:13-15. As shown below, switch 18 (highlighted for convenience) is located on the cable 15 and is accessible to the user when the housing is retracted from the ceiling. *Id.*, Fig. 1.



Id., Fig. 1 (color added).

182. Figure 2 is an illustration of Chaimberg's LED light fixture "mounted in the fixture mounting hole." *Id.*, 2:58-61, Fig. 2. I have highlighted the cable 15 in Fig. 2 below. Figure 2 shows that the cable 15 (in which the switch 18 is electrically inserted or "mounted") lies above the ceiling 14. *Id*, 4:16-29, Fig. 2. Therefore, Fig. 2 confirms that the switch 18 is inaccessible when the LED light fixture is installed.

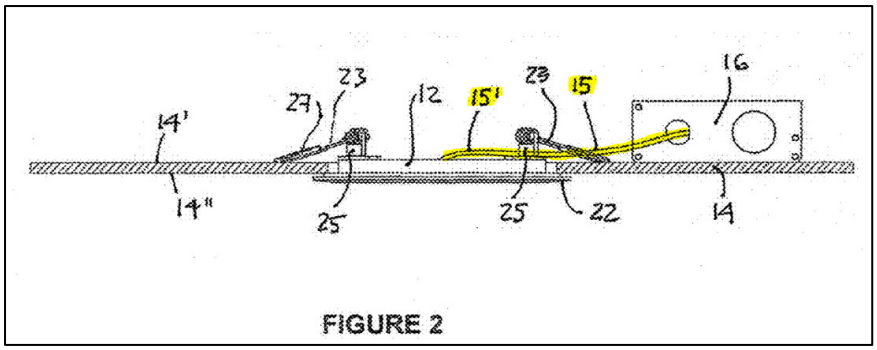


FIGURE 2

Id., Fig. 2 (color added).

183. Thus, Chaimberg's switch 18 is a switch that "is inaccessible when the housing is installed."

(a) Conclusion For Claim 11

184. As discussed previously in Section VIII.B.1, Chaimberg anticipates and/or renders obvious claim 1 of the '336 Patent. Since the previous subsection shows that Chaimberg discloses the additional elements of claim 11, I have concluded that Chaimberg anticipates and/or renders obvious claim 11 of the '336 Patent.

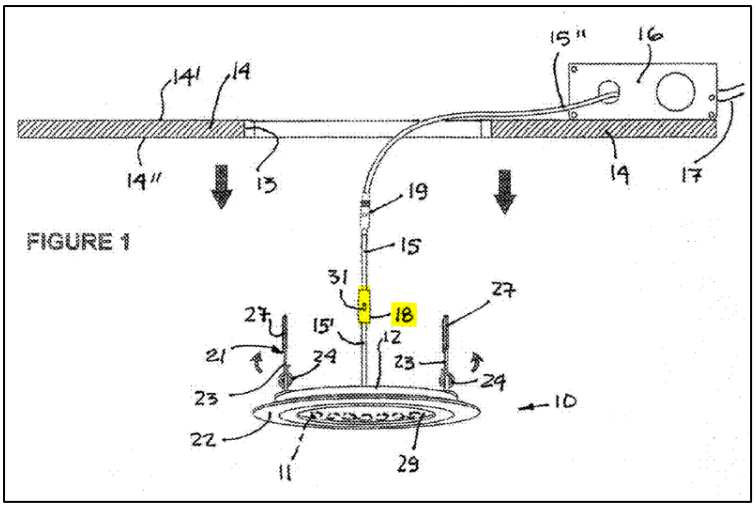
6. Claim 12: "The luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location."

185. Claim 12 recites: "[t]he luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location." '336 Patent, 15:19-21.

186. As discussed above, Chaimberg's LED light fixture is "adapted to be removably secured in a housing mounting hole in a ceiling sheeting material." Chaimberg, Abstract.

Moreover, the CCT "selector switch 18 is mounted on the cable 15" in between the light fixture housing 12 and driver housing 16. *Id.*, 3:49-54, Fig. 1. Chaimberg discloses that its CCT selector switch 18 "is made accessible and visible by simply withdrawing the light fixture from" the ceiling. *Id.*, Abstract.

187. In "Fig. 1, the LED light fixture 10 is shown retracted from its fixture mounting hole." *Id.*, 3:13-15. As shown in Fig. 1 below, Chaimberg's CCT switch 18 (highlighted for convenience) is "accessible and visible" and suspended below the "ceiling sheeting material 14" because the LED light fixture is removed from the ceiling 14. *Id.* at Abstract, 4:16-29. In other words, the switch 18 can readily be reached when the housing is removed from the ceiling—i.e., the installed location.



Id., Fig. 1 (color added).

188. Thus, Chaimberg's switch 18 is a switch that "is accessible to a user when the housing is removed from its installed location."

(a) Conclusion For Claim 12

189. As explained previously in Section VIII.B.1, Chaimberg anticipates and/or renders obvious claim 1 of the '336 Patent. Since the discussion above shows that Chaimberg discloses

the additional elements of claim 12, I conclude that Chaimberg anticipates and/or renders obvious claim 12 of the '336 Patent.

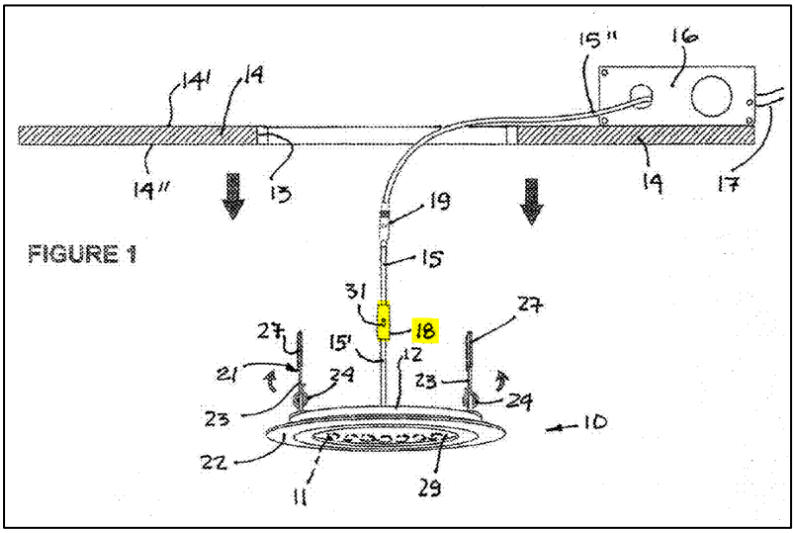
7. Claim 13:

(a) Preamble: "A switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising:"

190. The preamble of claim 13 recites: "[a] switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising…" '336 Patent, 15:22-24.

191. Chaimberg's LED light fixture includes a "selector switch 18 [which] is mounted on the cable 15." Chaimberg, 3:49-54. Chaimberg's CCT switch 18 "permit[s] selective activation of either one of the at least two sets of LED's or both sets of LED's simultaneously to cause the LED light fixture to generate light at a selected desired correlated color temperature (CCT)." *Id.*, 2:41-45.

192. Figure 1 shows the location of the CCT switch 18 which is highlighted in yellow in Fig. 1 below.



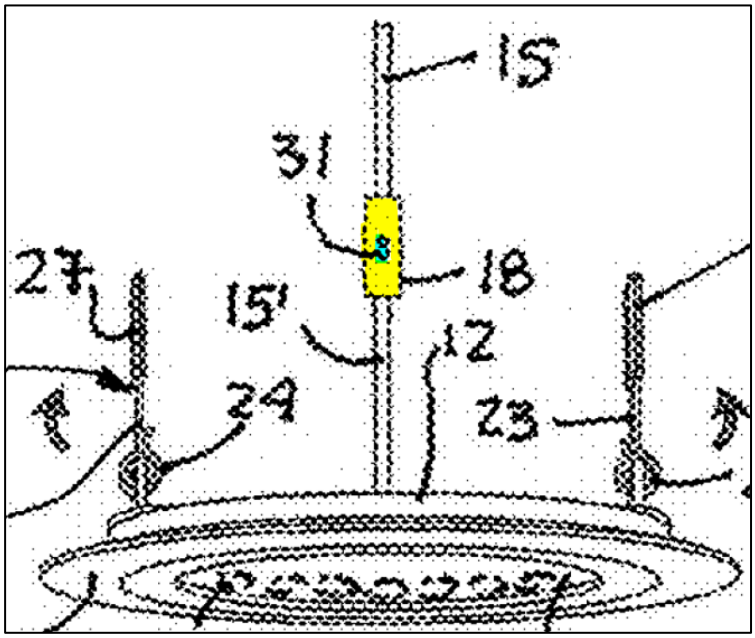
Id., Fig. 1 (color added).

193. Thus, to the extent the preamble is limiting, Chaimberg's CCT switch 18 is "[a] switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire."

(b) Element 13a: "a body;"

194. Element 13a requires the switch to have "a body." '336 Patent, 15:25.

195. Chaimberg's CCT "switch 18 is a toggle switch provided with a slide button 31 having two conducting arms 32 and 33 and displaceable to three switch positions." Chaimberg, 4:34-37. As discussed earlier in this declaration, Chaimberg describes three discrete positions for the slide button 31: "first," "middle," and "right" positions. *Id.*, 4:30-63. Thus, the switch 18 has a body in which the slide button 31 is located. Fig. 1 shows the CCT switch 18 and slide button 31. The body portion of switch 18 is highlighted in yellow, the slide button 31 is highlighted in blue in Fig. 1 below, and the perimeter of the switch "body" is represented by the dashed rectangular box.



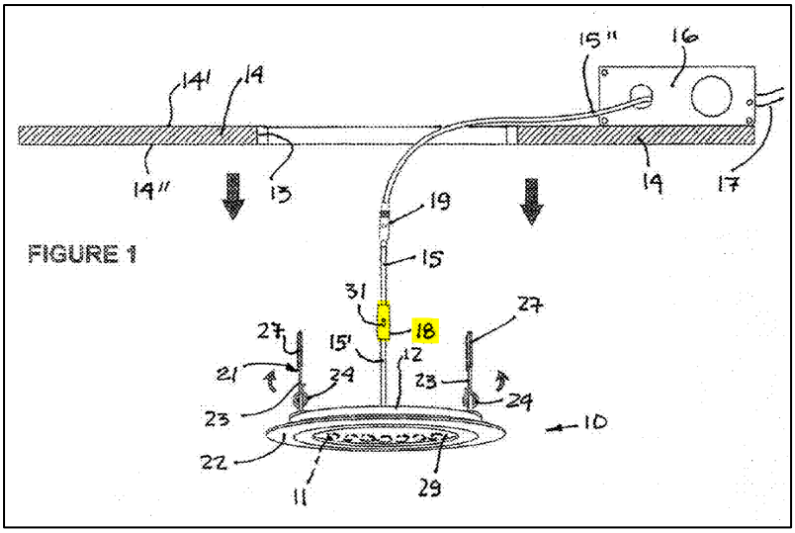
Id., Fig. 1 (cropped and colors added).

196. Consequently, Chaimberg's switch 18 is, indeed, a switch and, like all switches, it has "a body."

(c) Element 13b: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and"

197. Element 13b of the '336 Patent requires: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and." '336 Patent, 15:26-15:29.

198. Chaimberg clearly satisfies this claim element. In particular, Chaimberg states that the "switch 18 is mounted on the cable 15 adjacent to the LED light fixture housing 12." Chaimberg, 3:49-51. Therefore, Chaimberg requires the "coupling" of switch 18 to cable 15, or "mounting" of switch 18 onto cable 15 by any of the methods by which a switch is electrically connected to a cable or any conductor—namely, terminal connections, a wire pair, pin or tab soldering, compression fittings, etc. In short, the switch of Chaimberg has "at least one first coupling feature disposed on the [switch] body" as Chaimberg implies in Fig. 1 below (with switch 18 again highlighted) by showing the parallel lines, representing the cable perimeter, continue without interruption on both ends of the switch. A POSA would have understood the diagram below to show electrical continuity between the cable 15 and the switch 18.



Id., Fig. 1 (color added).

199. As mentioned earlier, Chaimberg's CCT switch 18 "permit[s] selective activation of either one of the at least two sets of LED's or both sets of LED's simultaneously to cause the LED light fixture to generate light at a selected desired correlated color temperature (CCT)." *Id.*, 2:41-45. Because the "activation" mentioned in the previous sentence must be provided by the switch, and must be electrical, then the switch is "electrically couple[d]" to the cable 15. Indeed, the switch 18 is described by Chaimberg as adjusting the power supplied to the LEDs 11 through the cable 15, a feat which would *not* be possible if a "first coupling feature" did not exist on the switch. In fact, the switch would not function at all.

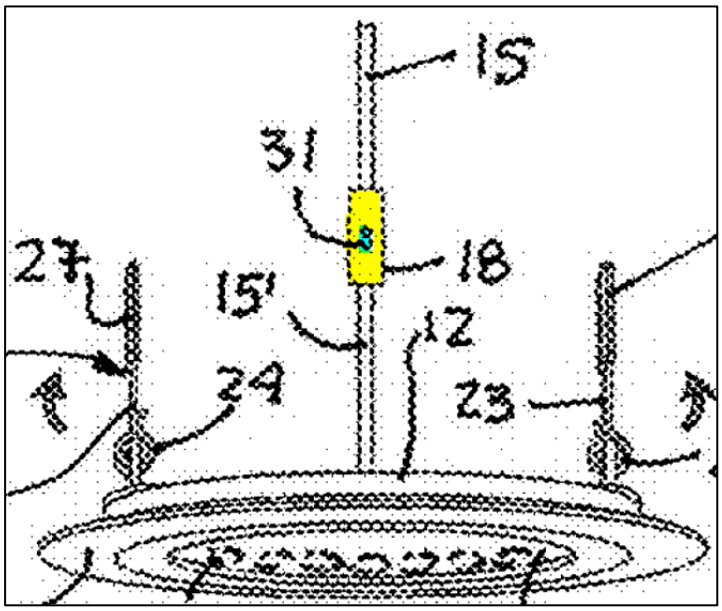
200. Thus, because the CCT switch 18 is mounted on the electrical cable 15 and serves to adjust the CCT output of the LED light fixture, the switch 18 includes "at least one first coupling feature disposed on the body, wherein the at least first one coupling feature is configured to electrically couple to an electrical cable of the luminaire."

(d) Element 13c: "an actuator disposed on the body, wherein the actuator has a range of positions,"

201. Element 13c requires "an actuator disposed on the body, wherein the actuator has a range of positions." '336 Patent, 16:1-2.

202. As discussed above, Chaimberg's "switch 18 is a toggle switch provided with a slide button 31 having two conducting arms 32 and 33 and displaceable to three switch positions." Chaimberg, 4:34-37. Chaimberg's slide button 31 acts as an "actuator", allowing one to choose either the "first," "middle," or "right" positions by sliding the "button" with one's finger or thumb. *See id.*, 4:30-63.

203. The body portion of Chaimberg's switch 18, highlighted again in yellow and slide button 31, highlighted again in blue-green, can be seen in Fig. 1 below.



Id., Fig. 1 (cropped and colors added).

204. Consequently, Chaimberg's switch has the same structure as all slide switches-namely slide button 31 is "an actuator disposed on the body, wherein the actuator has a range of positions."

205. It should also be mentioned that the ’336 Patent also depicts an actuator (673) as a button that the user can slide “along the length” of a slot within the body of a switch (631) (’336 Patent, 10:17-20) like the slide button disclosed in Chaimberg:

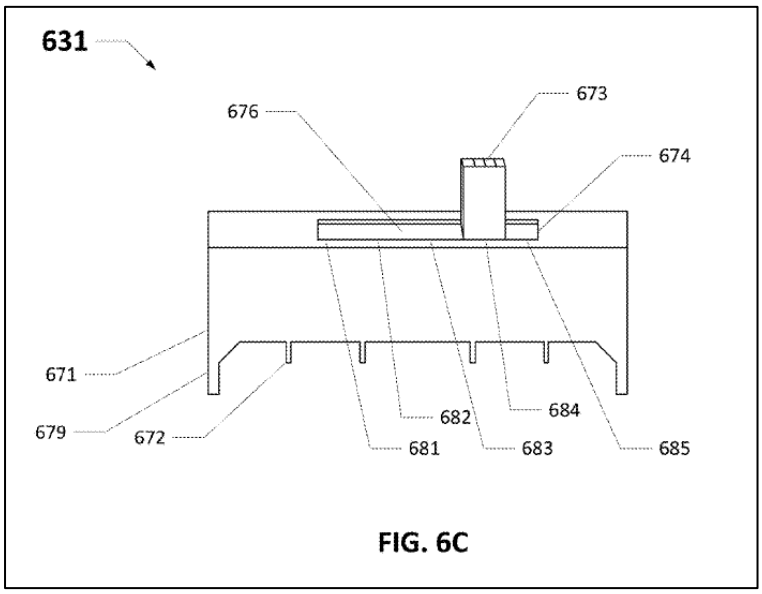
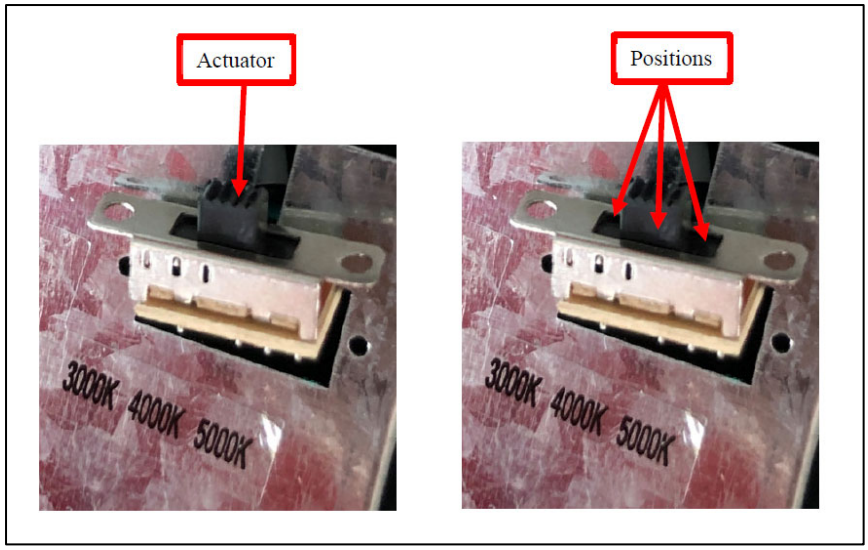


FIG. 6C

Id., Fig. 6C.

206. The diagram of the slide switch shown in Fig. 6C of the ‘336 Patent is virtually identical to many other slide switches that have been mass-produced for several decades.

207. I understand that, in its infringement contentions, Signify has interpreted the “actuator” of claim 13 as encompassing slide “buttons” such as those disclosed in Chaimberg:



Appx. G-1 to Signify's Infringement Contentions, 27.

208. Electrical switches are a type of "actuator" that is manually or electrically switched. A slide switch is generally switched manually, as shown by the black plastic slide that has a corrugated surface, as pictured above. A wide range of types of actuators were well known in the art decades before the alleged invention of the '336 Patent. An example of electrically-activated switches is the high-current contact switches that "open" or "close" when the current flowing through a motor reaches a preset value.

209. Finally, it should be reiterated that Chaimberg's switch has three positions: "first," "middle," and "right". These three positions constitute a "range of positions." Chaimberg, 4:30-63. Accordingly, Chaimberg discloses "an actuator disposed on the body [of the switch 18] wherein the actuator has a range of positions."

(e) Element 13d: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

210. Element 13d recites: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire." '336 Patent, 16:3-5.

211. As discussed above, Chaimberg's CCT switch 18 "permit[s] selective activation of either one of the at least two sets of LED's or both sets of LED's simultaneously to cause the LED light fixture to generate light at a selected desired correlated color temperature (CCT)." Chaimberg, 2:41-45. Each of the three positions of the slide button 31 corresponds to the production of light having a specific CCT value by Chaimberg's LED light fixture. *Id.*, Abstract.

212. Thus, Chaimberg's CCT switch 18 is a switch "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

(f) Conclusion For Claim 13

213. As described in the preceding paragraphs, Chaimberg discloses every element of claim 13 of the '336 Patent. Accordingly, Chaimberg anticipates and/or renders obvious claim 13 of the '336 Patent.

8. Claim 15: "The switch of claim 13, wherein each position is discrete within the range of positions."

214. Claim 15 recites: "[t]he switch of claim 13, wherein each position is discrete within the range of positions." '336 Patent, 16:8-9.

215. As discussed above, Chaimberg's CCT "switch 18 is a toggle switch provided with a slide button 31 having two conducting arms 32 and 33 and displaceable to three switch positions." Chaimberg, 4:34-37. Chaimberg describes three positions for the slide button 31: "first," "middle," and "right." *See id.*, 4:30-63. The three positions of Chaimberg's CCT switch 18 are discrete and constitute a range of positions.

216. Thus, Chaimberg's CCT switch 18 is a switch "wherein each position of the plurality of positions is discrete within the range of positions."

(a) Conclusion For Claim 15

217. As discussed in Section VIII.B.7, Chaimberg anticipates and/or renders obvious claim 13 of the '336 Patent. Furthermore, Chaimberg discloses the additional elements of claim 15. Accordingly, Chaimberg anticipates and/or renders obvious claim 15 of the '336 Patent.

9. Claim 19: "The switch of claim 13, wherein the body is configured to be disposed within a junction box."

218. Claim 19 recites: "[t]he switch of claim 13, wherein the body is configured to be disposed within a junction box." '336 Patent, 16:23-24.

219. As discussed above in Section VIII.B.7 with respect to claim 7, Chaimberg discloses and or renders obvious a luminaire with a CCT switch "wherein the switch is disposed within" the junction box. There appears to be no significant distinction between "wherein the body [of the switch] is disposed within" the junction box, and "wherein the body is disposed within" the junction box. Therefore, for the same reasons presented in Section VIII.B.3, Chaimberg's switch 18 is, in my opinion, a switch "wherein the body is configured to be disposed within a junction box."

(a) Conclusion For Claim 19

220. As discussed in Section VIII.B.7, Chaimberg anticipates and/or renders obvious claim 13 of the '336 Patent. Furthermore, Chaimberg discloses the additional elements of claim 19. Accordingly, Chaimberg anticipates and/or renders obvious claim 19 of the '336 Patent.

C. Ground [1b] – Chaimberg Alone Or In View of Roberge Renders Obvious Claims 4, 5, and 16 of the '336 Patent

1. Motivation To Combine Chaimberg And Roberge

221. Chaimberg and Roberge both disclose LED lighting systems capable of producing white light for which the CCT is adjustable ("tunable"). In particular, both references disclose applying LEDs of multiple color temperatures to the generation of white light having a variety of

color temperatures (CCTs), and both references employ any of a wide range of switches to perform the change in CCT.

222. As discussed above in Section VII.A.1, Chaimberg discloses "[a] ceiling mountable LED light fixture … wherein at least two sets of LED's of different correlated color temperatures (CCT) are mounted in its housing." Chaimberg, Abstract. Chaimberg discloses that the CCT "switch 18 is a toggle switch provided with a slide button 31 having two conducting arms 32 and 33 and displaceable to three switch positions." *Id.*, 4:34-37. The three positions on Chaimberg's slide switch 18 correspond to the three white light CCT values of 3000 K, 4000 K, and 5000 K. *Id.*, 4:30-5:10. Chaimberg's LED light fixture emits light having a CCT of 3000 K by powering only the 3000 K LEDs and, similarly, emits 5000 K light by powering only the 5000 K LEDs. *Id.* Light having the intermediate CCT value of 4000 K is produced by powering a mixture of the 3000 K and 5000 K LEDs, combining the light of each sets LEDs, and adjusting relative numbers dependent upon the relative intensities of the 3000 K and 5000 K LEDs until the CCT value of 4000 K is attained. *Id.* While the embodiment disclosed by Chaimberg only includes LEDs having one of two temperatures (e.g.—3000 K and 5000 K), Chaimberg also states that its luminaire includes "at least two sets of LED's of different correlated color temperatures." *Id.*, Abstract.

223. In considering Chaimberg, therefore, one skilled in the art would have understood that the luminaire could include additional LEDs having CCTs other than 3000 K or 5000 K. In other words, expanding the number of CCT values available from the luminaire is generally accomplished in one of two ways: 1) simply installing in the luminaire at least one LED emitting light having the desired CCT, or 2) combining and controlling the relative intensities of at least two LEDs (or sets of LEDs) having different CCT values. If LEDs of additional CCT values were incorporated into Chaimberg's LED light fixture, switch 18 would of course require additional

switch positions, but a wide variety of switches able to accommodate more positions have long been available. Rotary switches, in particular, are known to conveniently offer multiple positions.

224. In considering other examples of tunable white LED systems and the breadth of switches that can be employed, in particular, one must also mention Roberge. Like Chaimberg, Roberge discloses LED "[l]ighting methods and systems [having] a plurality of LEDs." Roberge, 1:28-31. Roberge states that its LED lights "can be located in a conventional lighting fixture, such as a lamp or a cylindrical fixture," similar to the luminaire described by Chaimberg. *Id.*, 17:23-26. Roberge also discloses that the LEDs can include "two white sources of varying characteristics, three white sources of varying characteristics, or four or more white sources of varying characteristics." *Id.*, 7:33-36. In a manner similar to that described by Chaimberg and the '336 Patent, Roberge selectively arranges and electrically powers LEDs such that the "light generated by two or more of the light sources combines to produce a mixed color light (including essentially white light having a variety of color temperatures)." *Id.*, 7:40-46. For example, Roberge notes that: "Mixing all three sources [of LED light] produces white light, such as along a black body curve 1310. Different mixtures produce different color temperatures of white light along or near the black body curve 2610." *Id.*. 33:29-33. In addition: "Amber and white light sources can offer a color temperature selectable white source… [T]he color temperature selection is useful for specifying particular color temperature values for the lighting sources." *Id.*, 8:28-34.

2. Color Control In Roberge With Manual *and* Electronic Switches

225. Despite having been filed almost 20 years ago, well before any possible priority date for the '336 Patent, Roberge envisions the control of luminaire color temperature (CCT) by including a wide variety of both manual and electronic switches. As illustrated by the quotations given in the preceding paragraph, Roberge has the goal of designing lighting systems that generate

light having a wide range in CCTs: "Sources 300 may be constructed and arranged to produce a wide range of variable color radiation." *Id.*, 7:40-41.

226. In order to not only control the CCT of light sources, but also intensity and other characteristics, Roberge proposes the introduction of electronic control:

> The methods and systems disclosed herein also include a variety of methods and systems for light control, including central control facilities 3500 as well as control facilities that are local to lighting units 102.

Id., 33:1-4. Both of these control methods—for a single luminaire or a large group of lighting fixtures—employ an electronic switch:

> In embodiments, the lighting control signals are relayed by an Ethernet switch to one or more power/data supplies and are in turn relayed to light systems that are equipped to execute the instructions, such as by turning LEDs on or off, controlling their color or color temperature, changing their hue, intensity, or saturation, or the like.

Id., 35:17-22.

227. Despite the introduction of an electronic switch, Roberge also employs the switches mentioned by the '336 Patent and Chaimberg. In describing the electronic "modes" that can be used to control luminaire output characteristics, Roberge states:

> Modes [for lighting control] include white and non-white illumination modes. The modes can be configured in a cycle, so that upon a mode change, the next stored mode is retrieved from memory 3700 and signals for that mode are delivered to the lighting unit 102, such as using a switch, slide, dial, or dimmer.

Id., 38:66-39:3. Roberge notes that this control method need not be sophisticated:

> Referring to FIG. 34 simple interfaces can be used to trigger control signals. Fig. 34a shows a push button 3402 that triggers stored modes when pressed. FIG. 34b and FIG.34c show user interfaces 4908 involving slides 3404 that can change the intensity or color, depending on the mode. . . . FIG. 34d and 34e show dials 3408. The dial can trigger stored modes or adjust color or intensity of light.

Id., 42:11-19.

228. Later, Roberge states: "Referring to FIG. 34i, in embodiments a dial allows a user to select one or more colors or color temperatures from a scale 3414. For example, the scale 3414 can include different color temperatures of white light," where "dial" refers to a rotary switch. *Id.*, 42:51-56.

229. Finally, Roberge states:

> Sources 300 may be constructed and arranged to produce a wide range of variable color radiation. For example, the source 300 may be particularly arranged such that the processor-controlled variable intensity light generated by two or more of the light sources combines to produce a mixed colored light (including essentially white light having a variety of color temperatures).

Id., 7:40-46.

230. In summary, Roberge anticipates the very same control of the color temperature of one or more LEDs as that described earlier—namely, through the use of user-actuated switches, such as push-buttons, slide switches, or rotary switches (dials). However, the activation of the switch by the user does more than simply energize different sets of LEDs. The "stored modes" triggered by the activation of the switch by the user results in commands sent to the luminaire that might also change the intensity of the light, or its hue: "In various embodiments the slides, switches, dials, dipswitches and the like can be used to control a wide range of variables, such as color, color temperature, intensity, hue, and triggering of lighting shows of varying attributes." *Id.*, 42:35-38.

231. Although Roberge wishes to apply this capability to "lighting shows", a POSA immediately recognizes the potential of combined manual/electronic switch control to varying the characteristics of light generated by luminaires. As the scale of the number of luminaires in an installation rises, the appeal of the common control offered by Roberge grows enormously.

232. Roberge states:

> In embodiments the system 100 can respond to control of a user interface 4908, which may provide control directly to the lighting unit 102, such as through a switch, dial, button, dipswitch, slide mechanism, or similar facility or may provide control through another facility, such as a network interface 4902, a light system manager 5000, or other facility.

Id., 5:27-33. This statement (and others cited above) is clear in emphasizing that changes in the color temperature of LED light sources or intensity or hue, for example, can be achieved with any of the switches cited above which serves as a "user interface".

233. Not surprisingly, Roberge discloses a number of switches so as to generate "white light having a variety of color temperatures." *Id.*, 7:45-46. For example, Fig. 34i of Roberge presents "a dial [that] allows a user to select one or more color temperatures from a scale 3414 [, which can] include different color temperatures of white light." *Id.*, 42:51-54. While Fig. 34i shows a "dial" (rotary) switch, Roberge also discusses a slide switch as follows: "[a] slide mechanism [*i.e.*, switch] can be used like the dial to set a particular color temperature of white light." *Id.*, 42:57-59. A POSA would have understood that the additional CCT values available with Roberge's rotary switch would expand the capability of Chaimberg's slide switch, thereby enabling Chaimberg to produce white light having CCT values beyond those discussed in the specification (3000 K, 4000 K, and 5000 K).

234. For the reasons cited above, the motivation to combine Chaimberg and Roberge is strong.

235. Briefly, Roberge anticipates the very same control of the color temperature of one or more LEDs through the use of user-actuated switches, such as push buttons, slide switches, or rotary switches (dials). Because several switches introduced by Roberge, such as rotary and Ethernet switches, provide a greater range in luminaire light CCT values, for example, a POSA

would have been quite motivated to combine Chaimberg and Roberge. The introduction of electronic control of the switches by Roberge, as well as the ability to control other characteristics of the light emitted by one or more luminaires (such as intensity and hue) are additional incentives for a POSA to combine Chaimberg and Roberge.

3. Claim 4: "The luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position."

236. Claim 4 recites: "[t]he luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position." '336 Patent, 14:49-52.

237. As discussed above in Section VIII.B.2 with respect to Claim 3, Chaimberg's switch 18 has three positions corresponding to three color temperatures (3000 K, 4000 K, and 5000 K). Chaimberg's LED light fixture emits light having a CCT value of 3000 K by powering only the 3000 K LEDs, and emits light having a CCT value of 5000 K by powering only the 5000 K LEDs. Chaimberg's luminaire emits light having an apparent temperature of 4000K by powering a mix of the 3000K and 5000K LEDs. While the embodiment disclosed by Chaimberg accommodates LEDS having only two CCT values (e.g., 3000 K and 5000 K), Chaimberg does note that its light fixture could include "*at least* two sets of LED's of different correlated color temperatures." Chaimberg, Abstract (emphasis added). Thus, Chaimberg opens the door to luminaires having more than two sets of LEDs, each characterized by a different CCT value.

238. If Chaimberg's LED light fixture incorporated additional LEDs with temperatures other than 3000 K or 5000 K, then switch 18 would require more than three positions. For example, if Chaimberg's exemplary luminaire had included LEDs with three CCT values—2700 K, 3000 K, and 5000 K, for example—it would have been straightforward (and obvious) for

someone skilled in the art to purchase a switch 18 having at least two additional positions in order to accommodate the 2700 K light as well as the mixture of 2700 K and 5000 K light. Both slide and rotary switches will readily accommodate five switch positions or more. We should note that the POSA would likely not add an option for the mixture of 2700 K and 3000 K light because the mixture CCT of 2850 K would likely not be distinguishable to the eyes of most individuals.

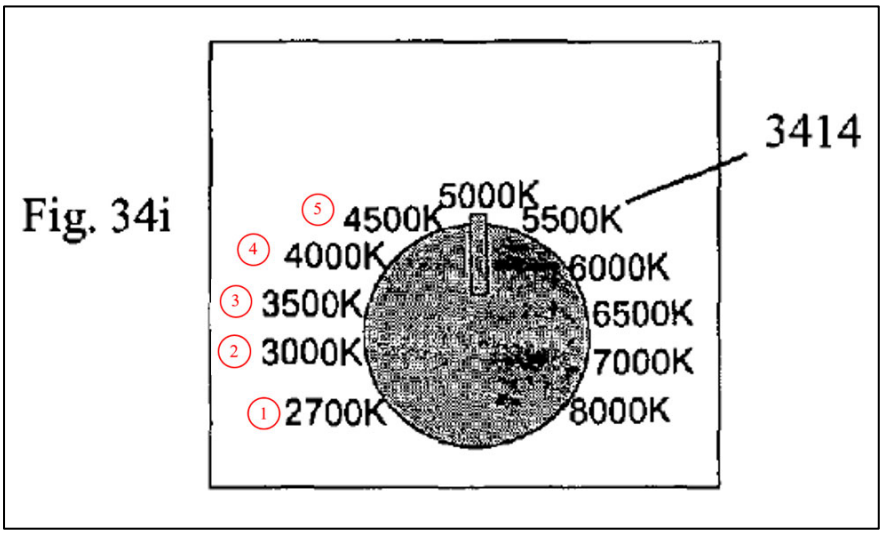
239. Accordingly, it would have been obvious for a POSA to modify Chaimberg's switch 18 to include a fourth and fifth position.

240. To the extent that modifying the switch 18 with fourth and fifth positions is not disclosed by Chaimberg, Section VIII.C.1 above explains why it would have been obvious for a POSA to modify Chaimberg's switch 18 with one of the switches of Roberge.

241. As discussed above, Chaimberg discloses an LED-based luminaire that can generate multiple light having selectable color temperature values (CCTs). Roberge likewise discloses LED light fixtures capable of generating light having selectable CCT values. Roberge, 1:28-31, 7:33-36. Embodiments provided by Roberge can, for example, include "two white sources of varying characteristics, three white sources of varying characteristics, or four or more white sources of varying characteristics." *Id.*, 7:33-36. Thus, as discussed above, a POSA would have been motivated to adopt one of the switches described in Roberge, such as the rotary ("dial") switch of Fig. 34i, in Chaimberg's LED luminaire.

242. As discussed above, Fig. 34i of Roberge shows "a dial [that] allows a user to select one or more color temperatures from a scale 3414[, which can] include different color temperatures of white light." *Id.*, 42:51-54. Roberge states that "[t]he lighting designer can specify use of a particular color temperature of light, which the installer can select by setting the right position on the scale 3414 with the dial." *Id.*, 42:54-57. Roberge's rotary switch of Fig. 34i (reproduced

below) allows the user to select from the following white light CCT values: 2700 K, 3000 K, 3500 K, 4000 K, 4500 K, 5000 K, 5500 K, 6000 K, 6500 K, 7000 K, and 8000 K. Thus, this CCT switch includes 11 positions, including a first, second, third, fourth, and fifth position. For convenience, these first five positions are numbered in the annotated version of Roberge's Fig. 34i below.



Id., Fig. 34i (annotated).

243. While Fig. 34i shows a "dial" (rotary) switch, Roberge also notes correctly that "[a] slide mechanism [*i.e.*, switch] can be used like the dial to set a particular color temperature of white light." *Id.*, 42:57-59. This additional alternative presented by Roberge provides another incentive for a POSA to incorporate Roberge's switch into Chaimberg's LED luminaire.

244. Accordingly, Roberge's CCT switch "comprises a first position, a second position, a third position, a fourth position, and a fifth position."

(a) Conclusion For Claim 4

245. As described in Section VIII.B.2 of this report, Chaimberg anticipates and/or renders obvious claim 3 of the '336 Patent. In addition, the preceding text demonstrates that Chaimberg alone and/or in combination with Roberge disclose the additional elements of claim 4. Accordingly, Chaimberg alone, or in view of Roberge, renders obvious claim 4 of the '336 Patent.

4. Claim 5: "The luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources."

246. Claim 5 recites: "[t]he luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources." '336 Patent, 14:53-62.

247. As discussed above with respect to Claim 4, Chaimberg's switch 18 has a first, second, and third position. When Chaimberg's switch 18 is set in its first position, the LED light fixture produces light having a CCT value of 3000 K. Chaimberg, 4:34-48. When Chaimberg's switch 18 is set to its second, or "middle" position, the LED light fixture "produces a light color of the order of 4000 Kelvin (CCT)." *Id.*, 4:60-5:10. When Chaimberg's switch 18 is set to the third, or "right" position, the LED light fixture produces a light having a CCT value of 5000 K. *Id.*, 4:49-59.

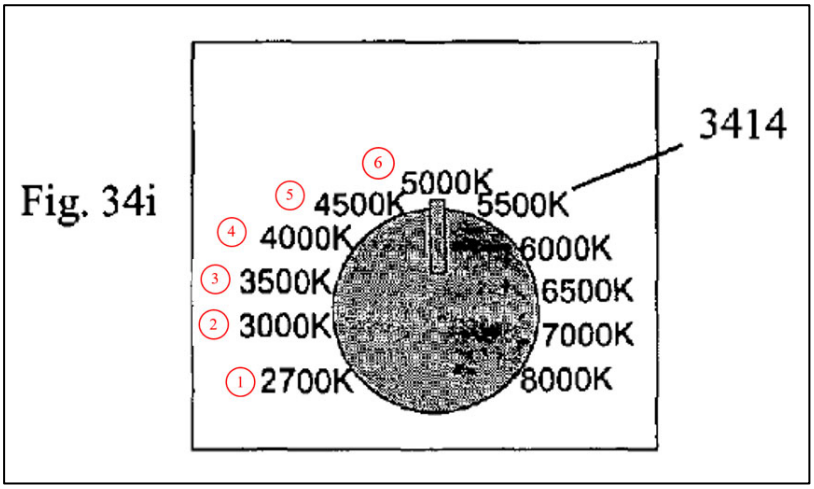
248. As discussed above with respect to Claim 4, a POSA would know immediately to modify Chaimberg's switch 18 to include additional LEDs with different CCT values, if the application under consideration required (or would benefit from) additional CCT values. Such a modification would require additional positions on the switch and is straightforward. For example,

if a POSA wished to follow Chaimberg so as to modify the design of a luminaire by adding LEDs having CCT values of 2700K and 4000 K, the POSA would know that it would have been desirable to add at least two additional positions on the switch 18. It must be emphasized that, by adding LEDs having just two additional CCT values, the POSA will recognize that many more "mixed" CCT values now become available. For example, the simplest set of CCT value selections the POSA could offer are: (1) 2700 K (only 2700 K LEDs powered); (2) 3000 K (only the 3000K LEDs powered); (3) 3500 K (a mixture of the 3000 K and 4000 K LEDs powered); (4) 4000 K (only the 4000 K LEDs powered, or a mix of the 3000 K and 5000 K LEDs); and (5) 5000 K (only the 5000 K LEDs powered). However, if the POSA's application concerned residential or commercial lighting (the latter in, for example, a furniture or interior design business), the POSA might also wish to offer the following combinations: (6) 3250 K (3000 K + 3500 K); (7) 3850 K (2700 K + 5000 K), and so on, none of which require additional LEDs. My point is that the POSA would have had a number of lighting "tools" available to, in consultation with the customer, provide luminaires providing the light CCT (spectrum) required by the application. Another alternative for the POSA would have been to minimize cost by not providing every CCT in each luminaire but, rather, by separating luminaires by the appropriate distance and dividing all of the necessary CCT values between adjacent luminaires, the desired lighting effect can be achieved by "staggering" the CCT values that are produced by each luminaire. Lastly, it should again be emphasized that the CCT values mentioned above, achieved by combining the light produced by separate LEDs, or separate sets of LEDs, require adjusting the intensity of at least one of the LEDs, or one set of LEDs, to obtain the desired CCT.

249. To the extent that modifying the switch 18 with fourth and fifth positions is not disclosed by Chaimberg, Section VIII.C.1 above explains why it would have been obvious to

modify Chaimberg's switch 18 with one of the switches of Roberge. Moreover, as discussed above in Section VIII.C.3 with respect to claim 4, Chaimberg, in view of Roberge, renders obvious a LED light system having a CCT switch that "comprises a first position, a second position, a third position, a fourth position, and a fifth position."

250. As discussed earlier, the switch of Roberge Fig. 34i includes 11 positions, including a first (2700 K), second (3000 K), third (3500 K), fourth (4000 K), fifth (4500 K), and sixth (5000 K) position. For convenience, FIG. 34i of Roberge is reproduced below:



Roberge, Fig. 34i (annotated).

251. While Roberge's fifth position corresponds to the generation of light having a CCT value of 4500 K, and the sixth position corresponds to 5000 K, it would have been obvious for a POSA include any other CCT values required by the application at hand. Indeed, as discussed above, Roberge discloses that the eleven temperatures are exemplary and the "designer can specify a particular setting." *Id.*, 42:51-65.

252. Consequently, Roberge's switch, illustrated in Fig. 34i, is a switch wherein the "first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or

more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources."

253. Before concluding the discussion for Claim 5, a few comments are warranted as to why a POSA would have been motivated to modify Chaimberg to include the generation of light having CCT values of 2700 K and 3500 K. Luminaires producing light having CCT values at and below 3500 K are of particular value for residential and restaurant lighting. It is well-known in the lighting industry that "warm" lighting (i.e., CCT values below approximately 3500 K) is highly-valued by customers, and particularly those in the Americas and Europe. This is the reason that many restaurants in North America (and elsewhere) lower both the intensity and CCT value of the lighting after dusk each evening. Moreover, 2700 K is a common CCT for traditional incandescent bulbs that consumers would have been familiar with.

(a) Conclusion For Claim 5

254. As discussed previously in Section VIII.B.3, Chaimberg alone, or in view of Roberge, renders obvious claim 4 of the '336 Patent. As explained in this section, Chaimberg and Roberge disclose the additional elements of claim 5. Accordingly, Chaimberg alone or in view of Roberge renders obvious claim 5 of the '336 Patent.

5. Claim 16: "The switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position."

255. Claim 16 recites: "[t]he switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position." '336 Patent, 16:11-13.

256. As discussed above in Section VIII.C.3 with respect to claim 4, Roberge's switch is a switch with a range of positions that "comprises a first position, a second position, a third position, a fourth position, and a fifth position."

(a) Conclusion For Claim 16

257. As discussed in Section VIII.B.8, Chaimberg anticipates and/or renders obvious claim 15 of the '336 Patent. As explained in this section, Chaimberg and Roberge disclose the additional elements of claim 16. Accordingly, Chaimberg alone or in view of Roberge renders obvious claim 16 of the '336 Patent.

D. Ground [2] – Halliwell Anticipates And/Or Renders Obvious Claims 1, 3-5, 7, 9, 11-13, 15, 16, and 19 of the '336 Patent

1. Halliwell's Switch 30 Would Function As A "Junction Box Mounted" CCT Switch

258. As discussed earlier in Section VII.A.3VII.A.3, Halliwell discloses several potential locations for its CCT switch. For example, Halliwell discloses a CCT switch 30 that can be mounted on, or within, the housing of the LED lighting device, as illustrated in Fig. 2 below.

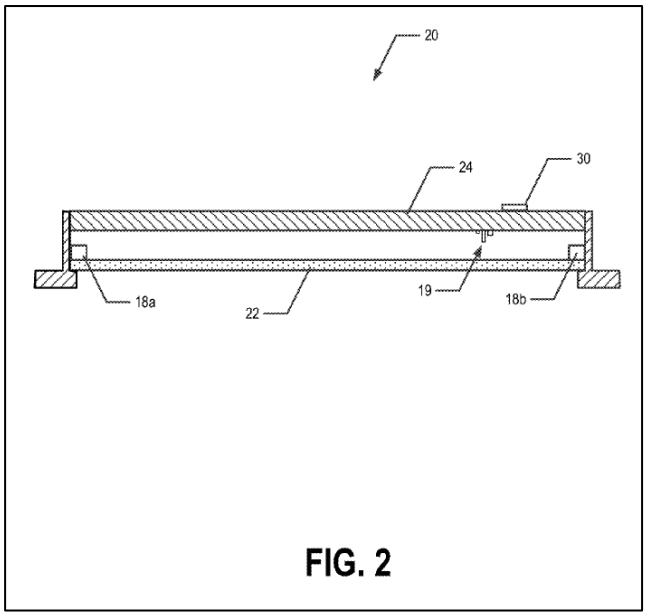
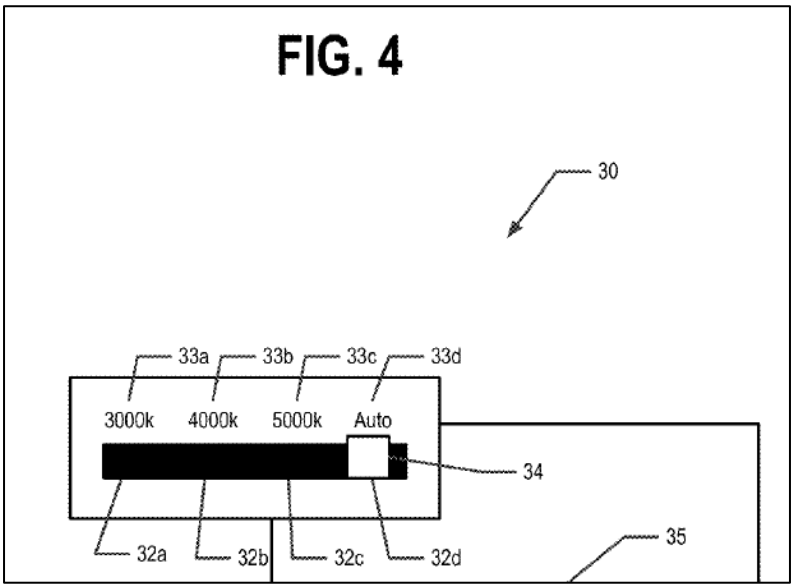


FIG. 2

Halliwell, Fig. 2.

259. However, Halliwell discloses that its LED lighting device could also employ a remote switch in addition to or in place of a housing-mounted switch. *Id.*, 1:60-67. The remote switch could be "a wall switch, remote control, mobile computing device, and/or the like," or even a "junction box mounted toggle switch." *Id.*, 1:60-67, 17:39-42. While Halliwell discloses a "junction box mounted" CCT switch, it does not describe the mechanisms of the switch in detail. However, Halliwell discloses that the remote switch 40 (similar to switch 30) may include "a slide … button" as an actuator and that the remote switch "may comprise additional user interface components as appropriate for the application." *Id.*, 18:31-41. A POSA would not have required more explanation beyond that supplied by Halliwell. For example, a POSA would have understood that any of the switches discussed by Halliwell, such as the slide switch of Fig. 4 of Halliwell, reproduced below, would have been "appropriate for the application" of a "junction box mounted" CCT switch:



Id., Fig. 4 (cropped).

260. Thus, Halliwell explicitly states that the "junction box mounted CCT switch" could be a switch like that disclosed in Fig. 4. To the extent that Halliwell does not disclose using the

switch of Fig. 4 as the "junction box mounted" CCT switch, a POSA would not have required that the patent explicitly make the statement because the electrical circuits and components required (switches and cable) are among the most basic in circuits. Instead, a POSA would recognize that switch 30, or a variety of other switches, would have been suitable as the "junction box mounted" CCT switch.

261. These simple switches were known in the art decades before the alleged invention of the '336 Patent. The particular switch illustrated in Fig. 4, a slide switch, has been discussed at length in this report and is one of the first switches developed, and one of the most extensively developed, by electrical engineers. Any POSA would have understood that such a switch would function as the "junction box mounted" CCT switch in Halliwell. This is further confirmed by Halliwell's disclosure that the "remote switch" (*e.g.*, the "junction box mounted" CCT switch) includes a "remote selector 44 [that] may be a slide … button," like that shown in Fig. 4. *Id.*, 18:31-31.

2. Claim 1

(a) Preamble: "A luminaire comprising"

262. The preamble of claim 1 recites: "[a] luminaire comprising". '336 Patent, 14:31.

263. To the extent the preamble of claim 1 is limiting, Halliwell discloses a luminaire. For example, Halliwell discloses a number of LED lighting devices or lamps in a common enclosure. *See* Halliwell, Abstract. In particular, Halliwell discloses that its "LED lighting device 20 may be a lighting fixture, a luminaire, … and/or the like." *Id.*, 6:36-42. Accordingly, a POSA would have understood that LED lighting devices disclosed in Halliwell are luminaires.

264. Thus, to the extent the preamble of claim 1 is limiting, Halliwell discloses luminaires.

(b) Element 1a: "a housing comprising at least one outer surface that forms a first cavity;"

265. Element 1a recites: "a housing comprising at least one outer surface that forms a first cavity." '336 Patent, 14:32-33.

266. Halliwell's LED lighting device includes a "device housing 24" that "may be configured to house the driver circuitry 19 … one or more LED packages 18…" Halliwell, 6:51-56. The device housing 24 is highlighted in yellow in the reproduction of Fig. 2 below. Note that the device housing 24 forms a cavity housing one or more LEDs 18, the driver circuitry 19, and the device lens 22. *Id.*

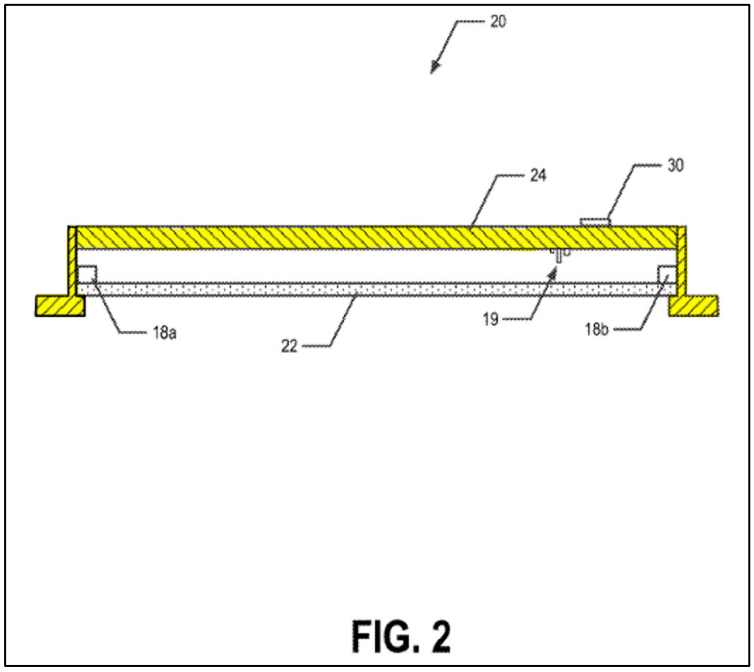
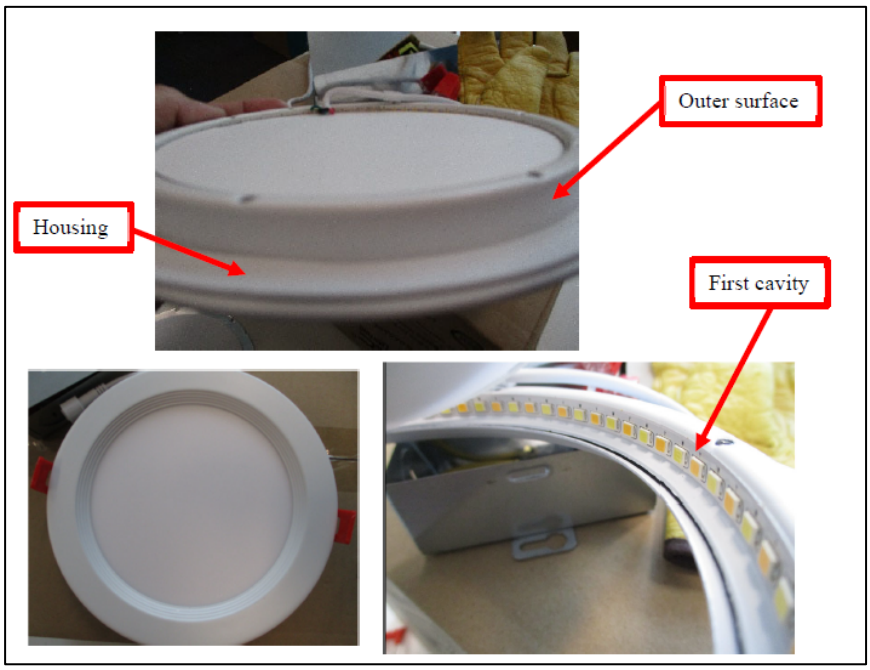


FIG. 2

Id., Fig. 2 (colors added).

267. Thus, Halliwell's device housing 24 is "a housing comprising at least one outer surface that forms a first cavity."

268. In addition, it is my understanding that, in its infringement contentions, Signify has interpreted the "housing" of claim 1 as encompassing a structure nearly indistinguishable from the housing of Halliwell:



Appx. G-1 to Signify's Infringement Contentions, 5.

269. Finally, '336 Patent concedes that this claim element was known in the prior art. For example, Fig. 8 (labeled "prior art") depicts a housing 805 with an outer surface that forms a cavity. *See, e.g.*, '336 Patent, Fig. 8.

(c) Element 1b: "at least one electrical component disposed, at least in part, within the first cavity;"

270. Element 1b recites: "at least one electrical component disposed, at least in part, within the first cavity." '336 Patent, 14:34-35.

271. As discussed above with respect to element 1a, Halliwell's device housing 24 "may be configured to house the driver circuitry 19 … one or more LED packages 18…" Halliwell, 6:51-56. For example, the "one or more LED packages 18" and driver circuitry 19 are electrical

components located within the "first cavity" of the device housing 24. In Fig. 2 reproduced below, the LED packages 18a and 18b are highlighted in blue, the driver circuitry 19 in green, and the housing 24 in yellow. As shown below, the LED packages 18a and 18b and driver circuitry 19 are located within the cavity formed by the device housing 24.

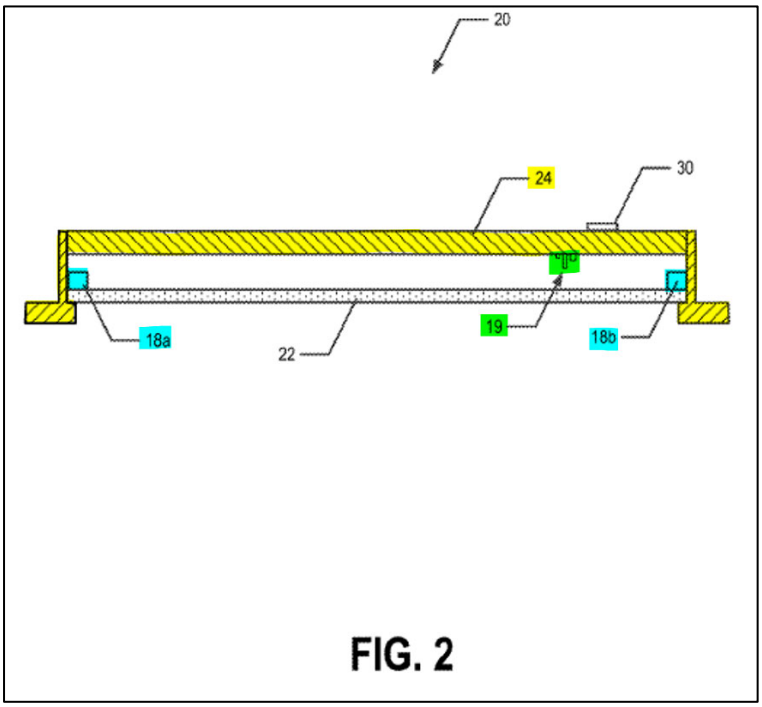
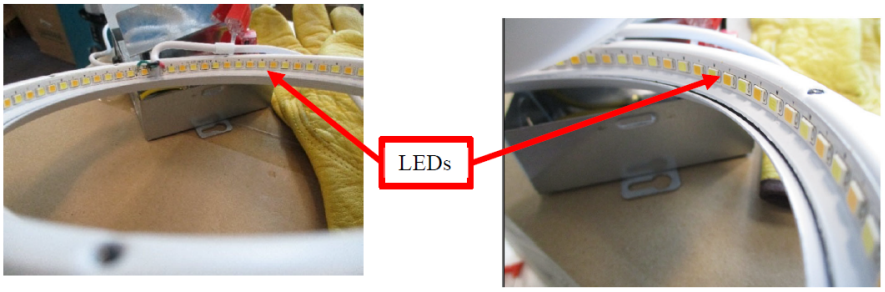


FIG. 2

Id., Fig. 2 (colors added).

272. Thus, Halliwell's LED lighting device includes "at least one electrical component disposed, at least in part, within the first cavity."

273. It is also my understanding that, in its infringement contentions, Signify has interpreted the "at least one electrical component" of claim 1 as encompassing LEDs such as those disclosed in Halliwell. A portion of the Claim chart prepared by Signify is given below:

[1.b] at least one electrical component disposed, at least in part, within the first cavity;	The 349-1292 product includes at least one electrical component disposed, at least in part, within the first cavity. For example, the 349-1292 product includes LEDs disposed within the first cavity. 

Appx. G-1 to Signify's Infringement Contentions, 6.

274. Finally, the '336 Patent itself also concedes that this claim element was known in the prior art. Indeed, Fig. 8 (labeled "prior art") is described as a luminaire including "one or more [electrical components (*e.g.,* light sources)] disposed on and/or within the housing 805." *See, e.g.*, '336 Patent, Fig. 8; 11:5-12.

(d) Element 1c: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component; and"

275. Element 1c recites: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component." *Id.*, 14:36-38.

276. Halliwell states that the "electrical components of the LED lighting device 20 (*e.g.*, the driver circuitry 19, switch control unit 35, and/or the like) may be configured to be directly wired to line voltage (*e.g.* through a junction box)..." Halliwell, 7:8-19. Halliwell further discloses that "the remote switch 40 may be a … junction box mounted toggle switch …in wired communication with the switch control unit 35." *Id.*, 17:39-42.

277. A POSA would have understood that since the "electrical components" are "directly wired to line voltage" as described by Halliwell, the LED luminaire would necessarily

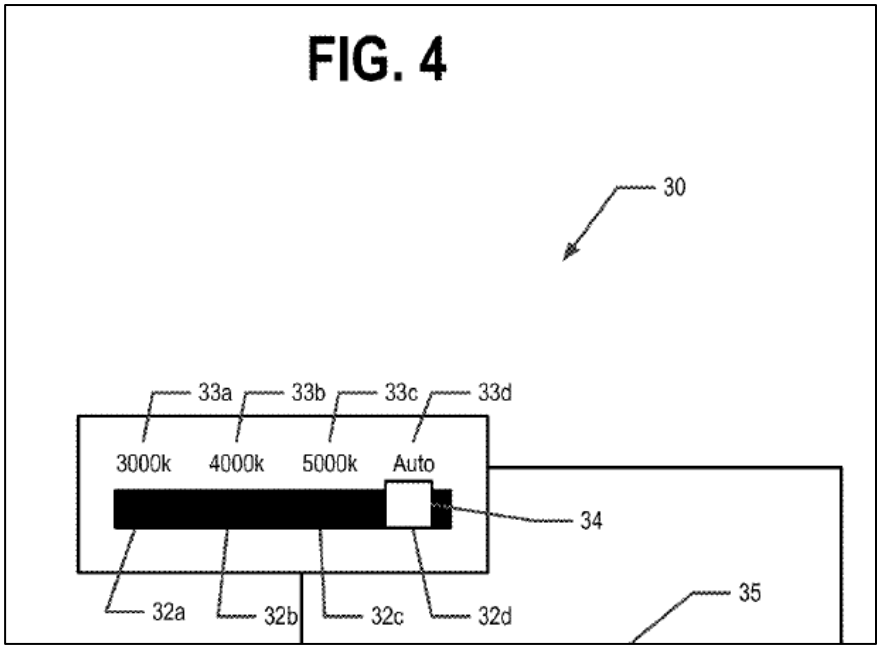
include an electrical cable that is electrically connected ("coupled") to the electrical components, *e.g.*, the driver circuitry or LED packages 18. Moreover, a POSA would have understood that the cable's conductors (*i.e.*, wires within the cable) would have been coupled to the electrical components (*e.g.*, the driver circuitry 19) located within the housing.

278. Consequently, Halliwell discloses "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component." Moreover, the '336 Patent concedes that this claim element was also known in the prior art. Indeed, Fig. 8 (labeled "prior art") depicts an electrical cable 827 that is "connected to the one or more [electrical] components (*e.g.*, light sources) disposed … within the housing 805." *See, e.g.*, '336 Patent, Fig. 8, 11:5-12.

(e) Element 1d: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing,"

279. Element 1d states: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing." '336 Patent, 14:39-40.

280. As discussed above, Halliwell discloses that its LED lighting device includes a CCT switch for adjusting the CCT value of the light generated by the LED lighting device. *See* Halliwell, 12:60-13:14. As one example, Fig. 4 of Halliwell is a "block diagram of at least some of the electrical components of [Halliwell's] LED lighting device," including a switch for adjusting the CCT output. *Id.*, 3:26-29, Fig. 4. As shown below in the cropped version of Fig. 4, the exemplary switch 30 includes four positions corresponding to four "color temperature mode[s]," including 3000 K, 4000 K, and 5000 K. *Id.*, 12:60-13:14, Fig. 4.



Halliwell, Fig. 4 (cropped).

281. Further, Halliwell discloses that its CCT switch can be located remotely from the housing, including as a "junction box mounted toggle switch." Halliwell, 17:39-42. As discussed above in Section VIII.D.1, a POSA would have understood that the slide switch of Fig. 4 is a perfectly good candidate as the "junction box mounted" CCT switch.

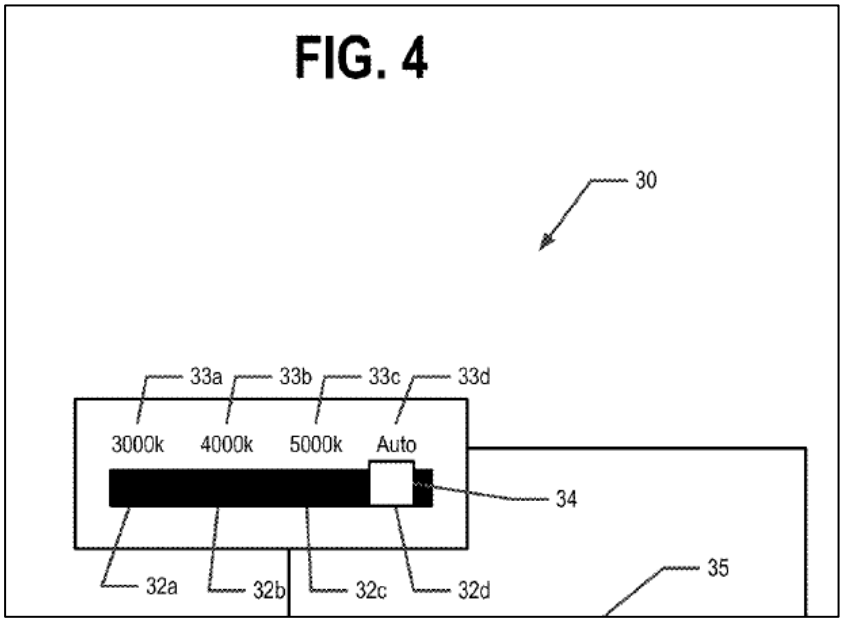
282. If the CCT switch is mounted in the junction box as described in Halliwell, and the "electrical components" are "directly wired to line voltage" as disclosed in Halliwell and discussed above with respect to element 1c, the "junction box mounted" CCT switch would necessarily be coupled to the electrical cable and disposed remotely from the housing 24.

283. Thus, Halliwell's "junction box mounted" CCT switch is "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing."

(f) Element 1e: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire."

284. Element 1e states: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire." '336 Patent, 14:40-45.

285. As discussed above, Halliwell discloses that its LED lighting device includes a CCT switch for adjusting the CCT output of the LED lighting device. *See* Halliwell, 12:60-13:14. As shown below, "the switch 30 may comprise a plurality of switch positions," including "two, three, four, five, six, seven, eight or more switch positions." *Id.*, 11:55-67. The exemplary slide switch shown in Fig. 4 includes four positions that "correspond to set operating color temperature modes with each position corresponding to a particular set operating color temperature," where 3000 K, 4000 K, and 5000 K are indicated specifically on the switch. *Id.* 12:10-15, 13:4-15, Fig. 4. The CCT values (3000 K, 4000 K, and 5000 K) shown in Fig. 4 are discrete. Also, as discussed above, a person skilled in the art of LED lighting design would have understood that Halliwell's LED light fixture could use the switch disclosed in Fig. 4 as the "junction box mounted" CCT switch.



Halliwell, Fig. 4 (cropped).

286. To the extent that the "auto" position in the switch 30 of Fig. 4 overlaps with the three other CCTs, as discussed above and below, Halliwell discloses that the switch could be modified with a number of CCTs, "as appropriate for the application." *Id.*, 7:61-67.

287. Thus, Halliwell's "junction box mounted" CCT switch is a switch "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire."

(g) Conclusion For Claim 1

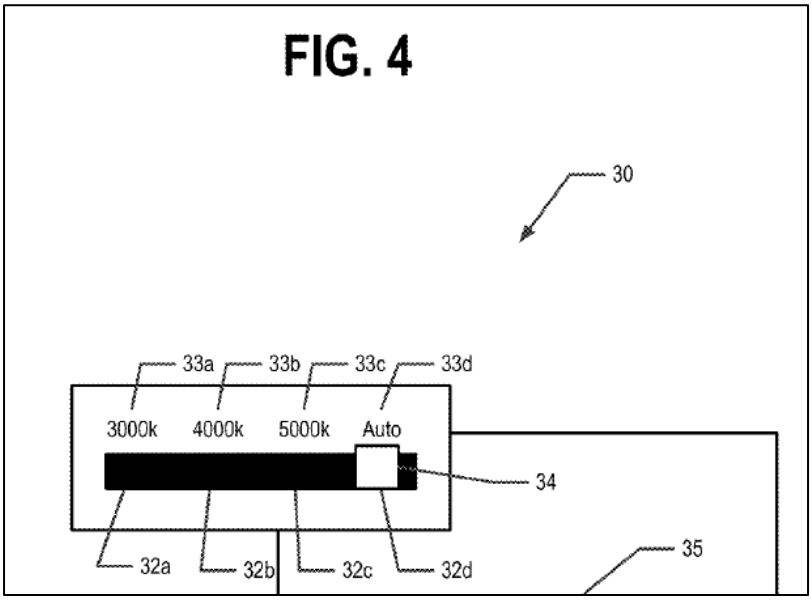
288. As explained in the section above, Halliwell discloses all elements of claim 1 of the '336 Patent. Accordingly, Halliwell anticipates and/or renders obvious claim 1.

3. Claim 3: "The luminaire of claim 1, wherein each position of the plurality of positions is discrete."

289. Claim 3 recites: "[t]he luminaire of claim 1, wherein each position of the plurality of positions is discrete." '336 Patent, 14:47-48.

290. As discussed above, Halliwell's switch "may comprise a plurality of switch positions," including "two, three, four, five, six, seven, eight or more switch positions." Halliwell, 11:55-67. Halliwell discloses a CCT slide switch (shown in Fig. 4) that includes four positions which "correspond to set operating color temperature modes with each position corresponding to a particular set operating color temperature," including 3000 K, 4000 K, and 5000 K. *Id.* 12:10-15, 13:4-15, Fig. 4. These positions are discrete and the switch can be set to only one position at a time. Moreover, Halliwell discloses that its CCT switch can be a "junction box mounted" switch as discussed with respect to claim 1 above. *Id.*, 17:39-42. As discussed above, a POSA would

also have understood that Halliwell's LED light fixture could employ the switch illustrated in Fig. 4 as the "junction box mounted" CCT switch.



Halliwell, Fig. 4 (cropped).

291. Accordingly, Halliwell's "junction box mounted" CCT switch is a switch "wherein each position of the plurality of positions is discrete."

(a) Conclusion For Claim 3

292. As explained in Section VIII.D.2, Halliwell anticipates and/or renders obvious claim 1 of the '336 Patent. This section has shown that Halliwell discloses the additional elements of claim 3. Accordingly, Halliwell anticipates and/or renders obvious claim 3 of the '336 Patent.

4. Claim 4: "The luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position."

293. Claim 4 recites: "[t]he luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position." '336 Patent, 14:49-52.

294. Halliwell discloses that its LED luminaire includes a CCT switch for adjusting the CCT output of the LED lighting device, and that the switch can be a "junction box mounted" CCT switch. *See* Halliwell, 12:60-13:14, 17:39-42. The exemplary slide switch of Fig. 4 (which can be used as the junction box mounted CCT switch) includes just four positions that "correspond to set operating color temperature modes with each position corresponding to a particular set operating color temperature," including 3000 K, 4000 K, and 5000 K. *Id.*, 12:10-15, 13:4-15, Fig. 4. However, Halliwell discloses that the "switch 30 may comprise a plurality of switch positions," including "two, three, four, five, six, seven, eight or more switch positions." *Id.*, 11:55-67. Accordingly, a POSA would have understood that Halliwell's switch is able to include five or more positions.

295. Thus, Halliwell discloses a CCT switch "wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position."

(a) Conclusion For Claim 4

296. As explained in Section VIII.D.3, Halliwell anticipates and/or renders obvious claim 3 of the '336 Patent. This section has also shown that Halliwell discloses the additional elements of claim 4. Accordingly, Halliwell anticipates and/or renders obvious claim 4 of the '336 Patent.

5. Claim 5: "The luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources."

297. Claim 5 recites: "[t]he luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources." '336 Patent, 14:53-62.

298. As discussed above with respect to claim 4, Halliwell discloses that its "junction box mounted" CCT switch is not limited to four positions. Indeed, Halliwell states that its CCT switch "may comprise a plurality of switch positions," including "two, three, four, five, six, seven, eight or more switch positions." *Id.*, 11:55-67. Moreover, Halliwell discloses that its LEDs "may be configured to emit light of at least one of 2700K, 3000K, 3500K, 4000K, 5000K, 5700K, 6000K, 7000K, 7500K and/or other color temperatures, as appropriate for the application." Halliwell, 7:61-67. Accordingly, a POSA would have understood that Halliwell's LED light fixture could be configured to emit light having five or more values of the CCT, including the first five values listed in Halliwell: 2700 K, 3000 K, 3500 K, 4000 K, and 5000 K. *Id.*

299. A POSA would have understood that if Halliwell's LED light fixture was configured with these five CCT outputs, the CCT switch label of Fig. 4 would have been modified with five positions (as noted in Halliwell), one for each value of the CCT. Therefore, Halliwell discloses that its CCT switch could include five discrete positions corresponding to the following values of the correlated color temperature (CCT): 2700 K, 3000 K, 3500 K, 4000 K, and 5000 K.

300. Thus, Halliwell discloses and/or renders obvious a LED luminaire with a CCT switch "wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one

or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources."

(a) Conclusion For Claim 5

301. As explained in Section VIII.D.4VIII.D.4 , Halliwell anticipates and/or renders obvious claim 4 of the '336 Patent. This section has also shown that Halliwell discloses the additional elements of claim 5. Accordingly, Halliwell anticipates and/or renders obvious claim 5 of the '336 Patent.

6. Claim 7: "The luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch."

302. Claim 7 recites: "[t]he luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch." '336 Patent, 14:65-15:2.

303. As discussed above, Halliwell discloses that the "electrical components of the LED lighting device 20 (*e.g.*, the driver circuitry 19, switch control unit 35, and/or the like) may be configured to be directly wired to line voltage (*e.g.* through a junction box) or may be configured to be connected to line voltage through a power cord comprising a two- or three prong polarized plug." Halliwell, 7:8-19. Thus, Halliwell discloses that its LED luminaire can include a junction box, and a POSA would have understood that a junction box includes an open space containing wires and other electrical components, *i.e.* a second cavity.

304. Further, as discussed above, Halliwell discloses that "the remote switch 40 may be a … junction box mounted toggle switch …in wired communication with the switch control unit 35." *Id.*, 17:39-42. A POSA would have therefore understood that Halliwell discloses that its CCT switch (including the exemplary switch 30) could be mounted in the junction box, *i.e.* disposed within the cavity of the junction box. This situation is quite common in electrical circuits and those supplying power to electrical systems such as lighting. Further, as discussed above with respect to Chaimberg, a POSA would have recognized additional benefits to placing the CCT switch within the junction box. For example, placing the switch within the junction box could protect the switch from elements like dust, debris, insects, and rodents. Further, in certain applications, a POSA would have been motivated to make the switch less accessible to users or customers.

305. Finally, as discussed in Section VIII.D.1 above, since Halliwell's switch is mounted in the junction box (as disclosed in Halliwell) and the "electrical components" are "directly wired to line voltage" as disclosed in Halliwell and discussed above in Section VIII.D.1, the "junction box mounted" CCT switch would necessarily be coupled to the electrical cable and disposed remotely from the housing 24. When the electrical cable ends in the junction box, and the switch is located in the junction box, a POSA would have understood that the switch would be coupled to the "second end" of the electrical cable.

306. Accordingly, Halliwell renders obvious an LED luminaire "further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch."

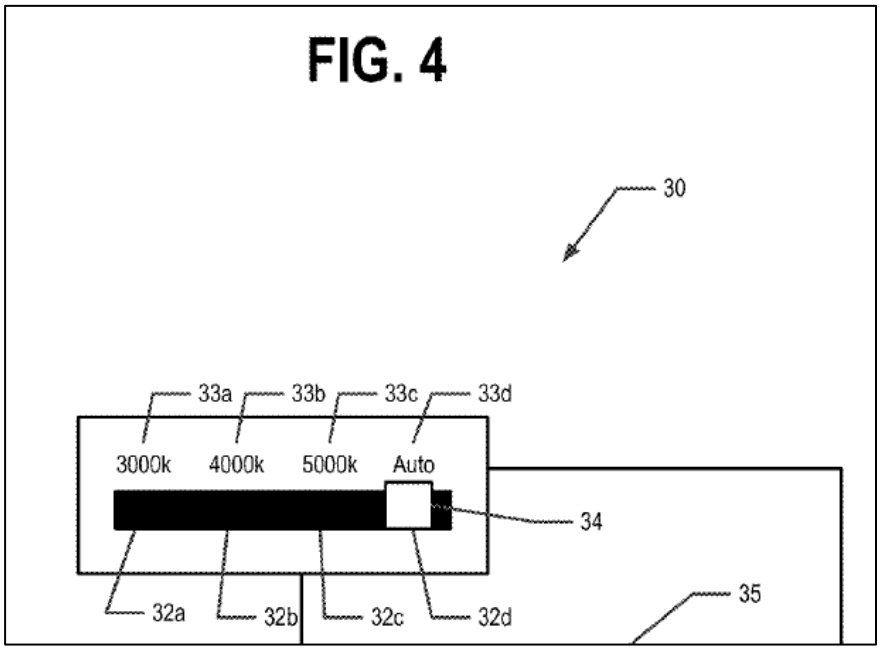
(a) Conclusion For Claim 7

307. As explained in Section VIII.D.2, Halliwell anticipates and/or renders obvious claim 1. This section has also shown that Halliwell discloses the additional elements of claim 7. Accordingly, Halliwell anticipates and/or renders obvious claim 7.

7. Claim 9: "The luminaire of claim 1, wherein the switch is a slide switch."

308. Claim 9 recites: "[t]he luminaire of claim 1, wherein the switch is a slide switch." '336 Patent, 15:13-14.

309. As discussed above, while Halliwell discloses a remotely located CCT switch that is a "junction box mounted toggle switch," a POSA would have understood that Halliwell could include a "junction box mounted" slide switch, like the switch shown in Fig. 4. Halliwell, 17:39-42. Furthermore, the switch of Fig. 4 is, indeed, a slide switch ("[t]he switch 30 has been illustrated herein as a slider switch.") *Id.*, 13:43-45. In addition, Halliwell states that when the CCT switch is remotely located (*e.g.*, in the junction box), the "remote selector … may be a slide … button." *Id.*, 18:31-32.



Id., Fig. 4 (cropped).

310. Thus, Halliwell discloses and/or renders obvious an LED luminaire "wherein the switch is a slide switch."

(a) Conclusion For Claim 9

311. As explained in Section VIII.D.2, Halliwell anticipates and/or renders obvious claim 1. This section has also shown that Halliwell discloses the additional elements of claim 9. Accordingly, Halliwell anticipates and/or renders obvious claim 9.

8. Claim 11: "The luminaire of claim 1, wherein the switch is inaccessible when the housing is installed."

312. Claim 11 recites: "[t]he luminaire of claim 1, wherein the switch is inaccessible when the housing is installed." '336 Patent, 15:17-18.

313. As discussed above, Halliwell discloses a remotely located CCT switch that is a "junction box mounted toggle switch" which a POSA would have understood could include a "junction box mounted" slide switch, like the switch shown in Fig. 4. Halliwell, 17:39-42. A POSA would also have understood that because the CCT switch is mounted in the junction box (which would have been mounted in the ceiling), it would have been inaccessible to the user because junction boxes are generally installed in ceilings or on walls behind drywall. Moreover, Halliwell discloses that "a user may select a desired operating light aspects or qualities (e.g., color temperature…) for the … LED lighting device before the … LED lighting device is installed" in a ceiling, confirming that the switch will be inaccessible after the LED lighting device is installed. *Id.*, 4:31-35.

314. Thus, Halliwell discloses a luminaire "wherein the switch is inaccessible when the housing is installed."

(a) Conclusion For Claim 11

315. As explained in Section VIII.D.2, Halliwell anticipates and/or renders obvious claim 1. This section has also shown that Halliwell discloses the additional elements of claim 11. Accordingly, Halliwell anticipates and/or renders obvious claim 11.

9. Claim 12: "The luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location."

316. Claim 12 recites: "[t]he luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location." '336 Patent, 15:19-21.

317. As discussed above, since Halliwell discloses a remotely located CCT switch that is a "junction box mounted toggle switch," a POSA would have understood such a switch to include a "junction box mounted" slide switch, like the switch of Fig. 4. Halliwell, 17:39-42. A POSA would have understood that when the junction box and LED light fixture are both installed in a ceiling, the junction box mounted CCT switch would have been inaccessible when the LED light fixture is installed. However, removing the LED light fixture from its installation location would typically render the junction box accessible to the user. This statement assumes that the junction box is in proximity to the luminaire in the ceiling which is usually the case.

318. Accordingly, Halliwell renders obvious an LED luminaire, "wherein the switch is accessible to a user when the housing is removed from its installed location."

(a) Conclusion For Claim 12

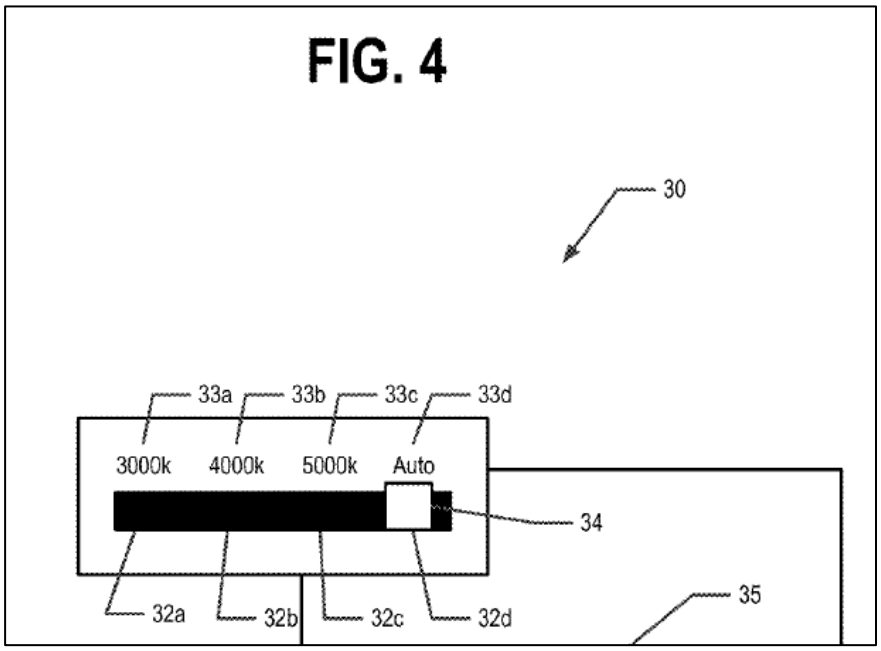
319. As explained in Section VIII.D.2, Halliwell anticipates and/or renders obvious claim 1. This section also shows that Halliwell discloses the additional elements of claim 12. Accordingly, Halliwell anticipates and/or renders obvious claim 12.

10. Claim 13:

(a) Preamble: "A switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising:"

320. The preamble of claim 13 recites: "[a] switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising." '336 Patent, 15:22-24.

321. For example, as discussed above with respect to claim 1, Halliwell discloses that its LED luminaire includes a CCT switch for adjusting the CCT value that describes the spectrum of the light emitted by the LED lighting device. *See* Halliwell, 12:60-13:14. As shown below in the cropped version of Fig. 4, the exemplary CCT switch 30 includes four positions corresponding to four "color temperature mode[s]," including 3000 K, 4000 K, and 5000 K. *Id*. 12:60-13:14, Fig. 4.



Id., Fig. 4 (cropped).

322. As discussed above with respect to claim 1, Halliwell states that the CCT switch can be located remotely from the housing, including as a "junction box mounted toggle switch." *Id.*, 17:39-42. Thus, a POSA would have understood that Halliwell's LED light fixture could

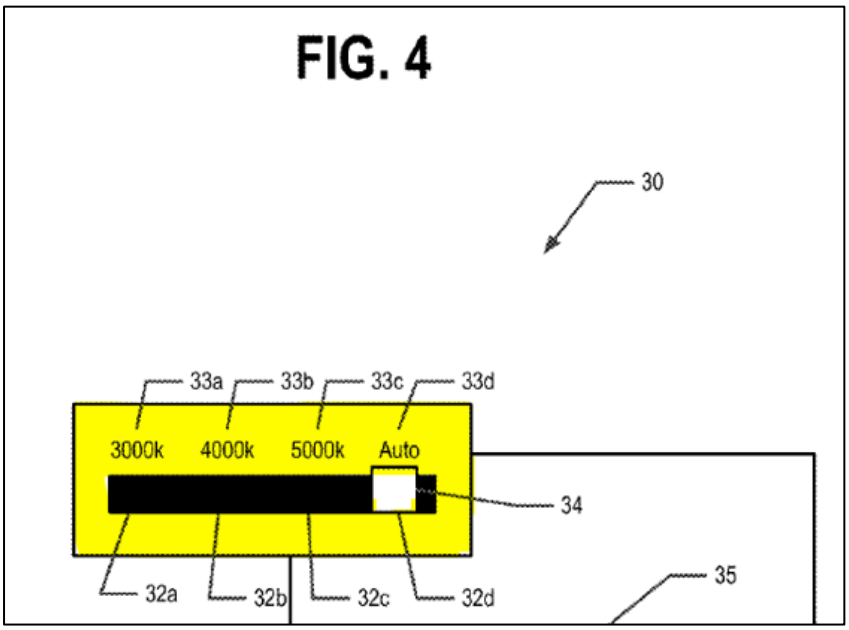
employ the switch disclosed in Fig. 4 as the "junction box mounted" CCT switch for the reasons discussed above.

323. Accordingly, to the extent the preamble of claim 13 is limiting, Halliwell discloses the required switch.

(b) Element 13a: "a body;"

324. Element 13a recites: "a body." '336 Patent, 15:25.

325. The exemplary CCT switch 30 shown in Fig. 4 includes four positions corresponding to four "color temperature mode[s]," including 3000 K, 4000 K, and 5000 K. *Id.* 12:60-13:14, Fig. 4. The switch includes a body which is highlighted in yellow in Fig. 4 below.



Id., Fig. 4 (color added).

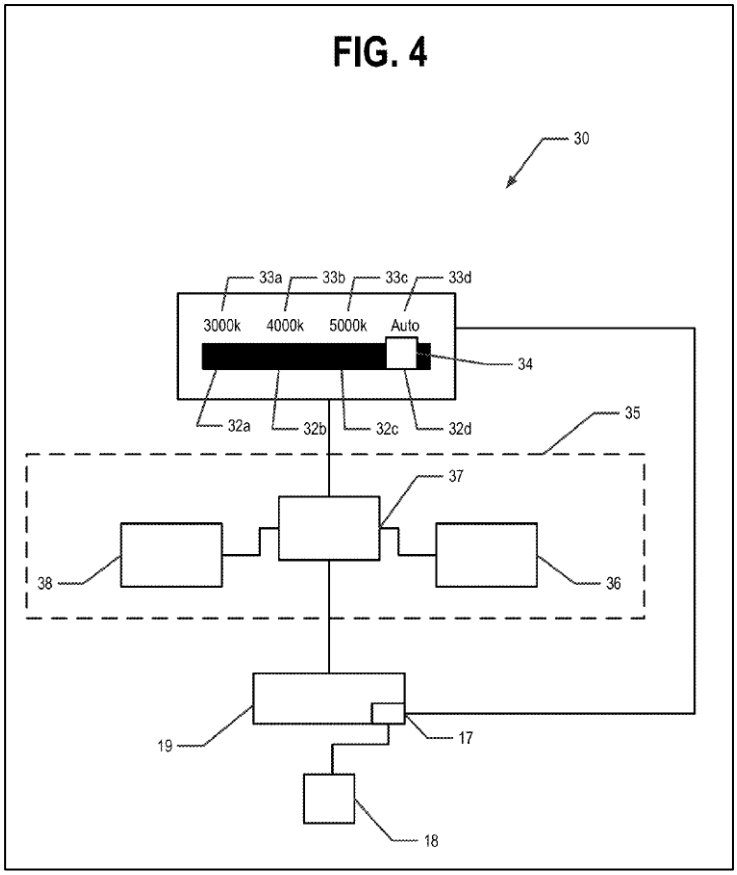
326. Accordingly, Halliwell discloses a CCT switch with "a body."

(c) Element 13b: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and"

327. Element 13b states: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire." '336 Patent, 15:26-15:29.

328. As discussed above with respect to claim 1, Halliwell discloses that its CCT switch can be located remotely from the housing, including as a "junction box mounted" CCT switch. Halliwell, 17:39-42. Consequently, as described in previous sections, a POSA would have understood that Halliwell's LED luminaire could use the switch disclosed in Fig. 4 as the "junction box mounted" CCT switch.

329. As discussed above with respect to claim 1, Halliwell also discloses that the "electrical components of the LED lighting device 20 (*e.g.*, the driver circuitry 19, switch control unit 35, and/or the like) may be configured to be directly wired to line voltage (*e.g.* through a junction box) or may be configured to be connected to line voltage through a power cord comprising a two- or three prong polarized plug." Halliwell, 7:8-19. A POSA would have understood well that when the "electrical components" are "directly wired to line voltage" as disclosed in Halliwell, the LED luminaire would necessarily include an electrical cable that electrically connects ("couples") the luminaire and junction box. If the CCT switch is mounted in the junction box as described by Halliwell, and the "electrical components" are "directly wired to line voltage" as disclosed in Halliwell, the "junction box mounted" CCT switch would necessarily be electrically connected to the electrical cable. Moreover, Halliwell Figure 4 includes a diagram of "at least some of the electrical components" of Halliwell's LED lighting device, and further demonstrates that the switch would necessarily include one or more coupling features to electrically couple the switch to the wire.



Id., Fig. 4.

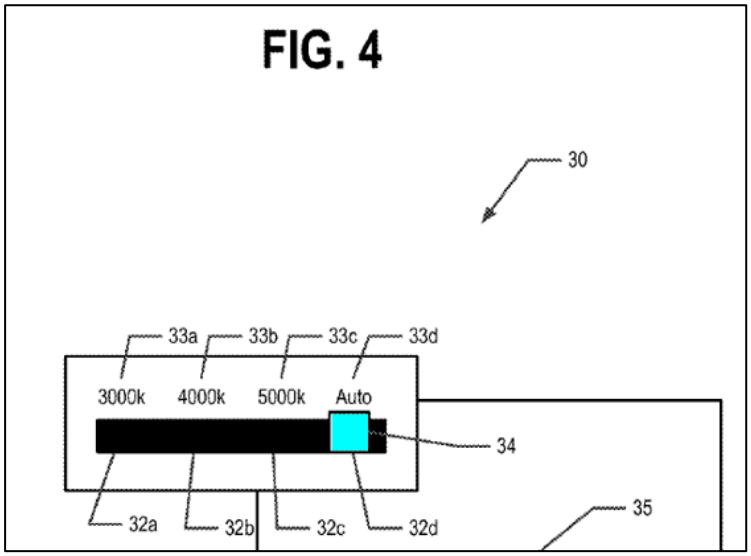
330. Accordingly, Halliwell's "junction box mounted" CCT switch includes "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire."

(d) Element 13c: "an actuator disposed on the body, wherein the actuator has a range of positions"

331. Element 13c recites: "an actuator disposed on the body, wherein the actuator has a range of positions." '336 Patent, 16:1-2.

332. The exemplary CCT switch 30 includes four positions corresponding to four "color temperature mode[s]," including 3000 K, 4000 K, and 5000 K as shown below. *Id.* 12:60-13:14, Fig. 4. The switch includes an actuator which is highlighted in blue in Fig. 4 below. As shown,

the actuator is the component of the switch that can be moved by one's thumb or other finger to the desired position of the switch.



Halliwell, Fig. 4 (cropped and color added).

333. Accordingly, Halliwell discloses a CCT switch with "an actuator disposed on the body, wherein the actuator has a range of positions" as recited in element 13c of claim 13 of the '336 Patent.

334. It should also be mentioned that the '336 Patent also depicts an actuator (673) as a button that the user can slide "along the length" of a slot within the body of a switch (631) ('336 Patent, 10:17-20) like the slide button disclosed in Halliwell:

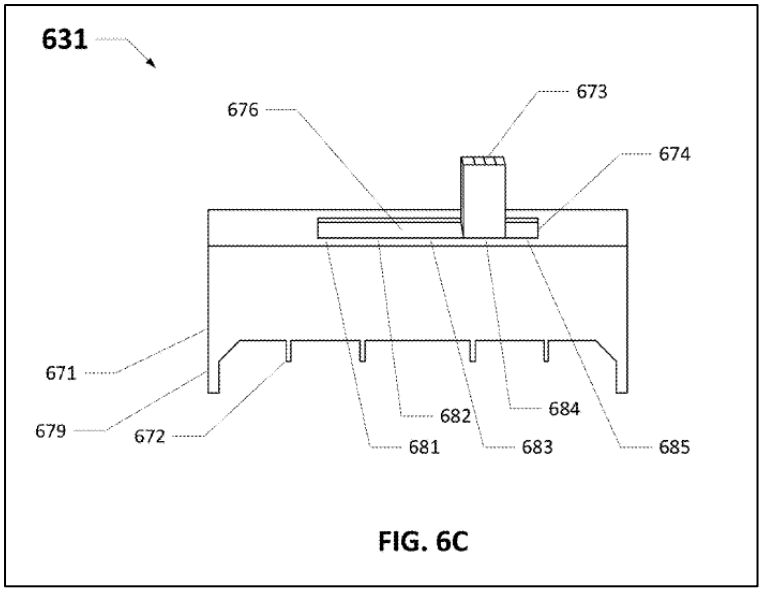
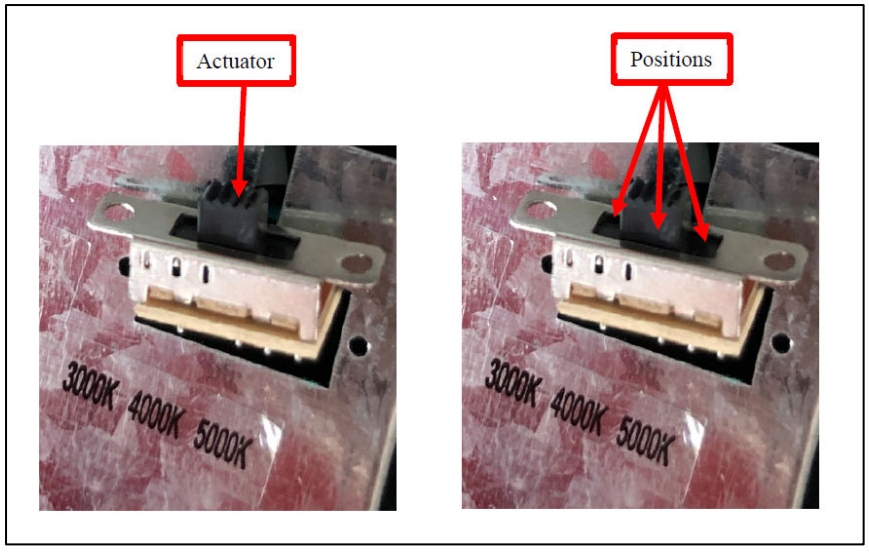


FIG. 6C

Id., Fig. 6C.

335. The diagram of the slide switch shown in Fig. 6C of the '336 Patent is virtually identical to many other slide switches that have been mass-produced for several decades.

336. I understand that, in its infringement contentions, Signify has interpreted the "actuator" of claim 13 as encompassing slide "buttons" such as those disclosed in Halliwell:



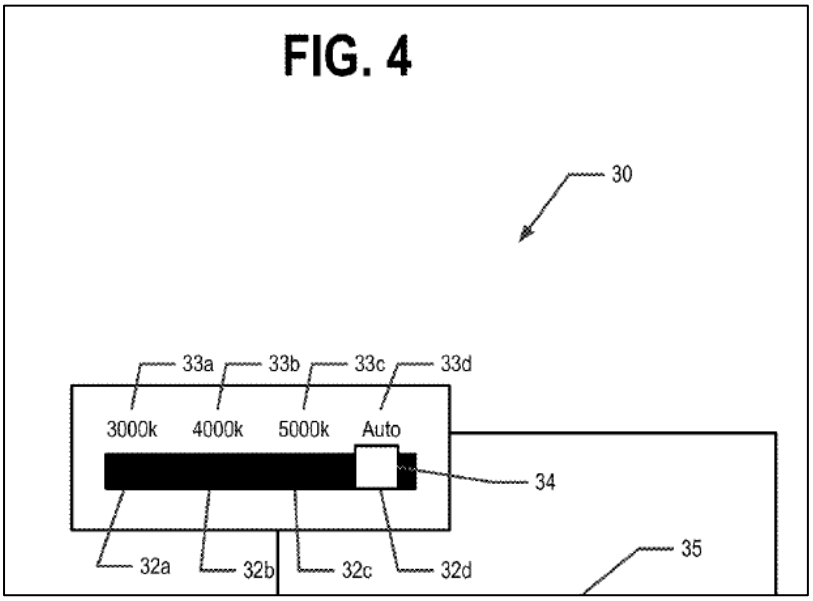
Appx. G-1 to Signify's Infringement Contentions, 27.

337. Electrical switches are a type of "actuator" that is manually or electrically switched. A slide switch is generally switched manually, as shown by the black plastic slide that has a corrugated surface, as pictured above. A wide range of types of actuators were well known in the art decades before the alleged invention of the '336 Patent. An example of electrically-activated switches in the high-current contact switches that "open" or "close" when the current flowing through a motor reaches a preset value.

(e) Element 13d: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

338. Element 13d recites: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire." '336 Patent, 16:3-5.

339. As discussed above and shown below in the cropped version of Fig. 4, the exemplary slide switch 30 shows four positions corresponding to four different "color temperature mode[s]": 3000 K, 4000 K, and 5000 K. *Id*. 12:60-13:14, Fig. 4. Each position of the switch corresponds to a specific value of the CCT for the light emitted by Halliwell's luminaire.



Halliwell, Fig. 4 (cropped).

340. Therefore, Halliwell discloses a CCT switch "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

(f) Conclusion For Claim 13

341. As I have explained in the section above, Halliwell discloses all elements of claim 13 of the '336 Patent. Accordingly, Halliwell anticipates and/or renders obvious claim 13.

11. Claim 15: "The switch of claim 13, wherein each position is discrete within the range of positions."

342. Claim 15 recites: "[t]he switch of claim 13, wherein each position is discrete within the range of positions." '336 Patent, 16:8-9.

343. As discussed above in Section VIII.D.3 with respect to claim 3, Halliwell discloses a CCT switch having a range of positions, and "each position of the plurality of positions is discrete." Accordingly, for the same reasons discussed above with respect to claim 3, Halliwell discloses a CCT switch "wherein each position is discrete within the range of positions."

(a) Conclusion For Claim 15

344. As explained in Section VIII.D.10, Halliwell anticipates and/or renders obvious claim 13. This section has also shown that Halliwell discloses the additional elements of claim 15. Accordingly, Halliwell anticipates and/or renders obvious claim 15.

12. Claim 16: "The switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position."

345. Claim 16 recites: "[t]he switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position." '336 Patent, 16:11-13.

346. As discussed above in Section VIII.D.3 with respect to claim 4 of the '336 Patent, Halliwell discloses a CCT switch "wherein the range of positions comprises a first position, a

second position, a third position, a fourth position, and a fifth position." Accordingly, Halliwell discloses a CCT switch "wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position."

(a) Conclusion For Claim 16

347. As explained in Section VIII.D.11, Halliwell anticipates and/or renders obvious claim 15. This section has also shown that Halliwell discloses the additional elements of claim 16. Accordingly, Halliwell anticipates and/or renders obvious claim 16.

13. Claim 19: "The switch of claim 13, wherein the body is configured to be disposed within a junction box."

348. Claim 19 reads: "[t]he switch of claim 13, wherein the body is configured to be disposed within a junction box." '336 Patent, 16:23-24.

349. As discussed above in Section VIII.D.6 with respect to claim 7, Halliwell discloses a CCT switch "wherein the switch is disposed within" a junction box. Accordingly, for the same reasons discussed above with respect to claim 7, Halliwell discloses a CCT switch "wherein the body is configured to be disposed within a junction box."

(a) Conclusion For Claim 19

350. As explained in Section VIII.D.10, Halliwell anticipates and/or renders obvious claim 13. This section has also shown that Halliwell discloses the additional elements of claim 19. Accordingly, Halliwell anticipates and/or renders obvious claim 19.

E. Ground [3a] – Claims 1, 3, 9, 13, and 15 Are Anticipated And/Or Rendered Obvious by By Reiff

1. Claim 1

(a) Preamble: "A luminaire comprising"

351. The preamble of claim 1 recites: "[a] luminaire comprising". '336 Patent, 14:31.

352. To the extent the preamble of claim 1 is limiting, Reiff discloses a luminaire. For example, Reiff a number of lighting devices that "include[] fluorescent and/or LED light sources," "wherein the color of the emitted light can easily be switched." Reiff, Abstract. Accordingly, a POSA would have understood that the LED lighting devices disclosed in Reiff are luminaires.

353. Thus, to the extent the preamble of claim 1 is limiting, Reiff discloses luminaires.

(b) Element 1a: "a housing comprising at least one outer surface that forms a first cavity;"

354. Element 1a states: "a housing comprising at least one outer surface that forms a first cavity." '336 Patent, 14:32-33.

355. Reiff's lighting devices include "a transparent housing 26." *See* Reiff, 3:20-24, Fig. 2. Further, as shown below, the exemplary lighting device shown in Fig. 2 of Reiff "is a perspective view of an [] embodiment of a light in accordance with the invention," that shows the cylindrical transparent housing 26. *Id.*, 2:45-46. Reiff further discloses that "mounted within the housing is a plate to which the light source is mounted. The plate may be in the form of a circuit board for mounting LEDs." Reiff, 1:63-2:1.

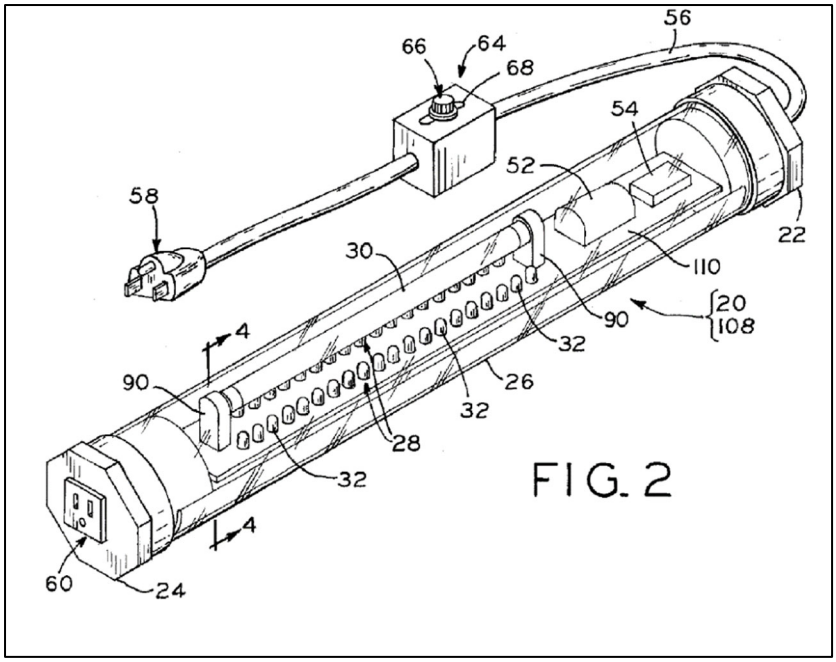


FIG. 2

Id., Fig. 2

356. Thus, Reiff's device housing 26, and other external components shown in Fig. 2, form "a housing comprising at least one outer surface that forms a first cavity."

(c) Element 1b: "at least one electrical component disposed, at least in part, within the first cavity;"

357. Element 1b recites: "at least one electrical component disposed, at least in part, within the first cavity." '336 Patent, 14:34-35.

358. Reiff discloses that "mounted within the housing is a plate to which the light source is mounted. The plate may be in the form of a circuit board for mounting LEDs." Reiff, 1:63-2:1. Reiff further discloses that its lights "are provided with the appropriate electrical components, [in Fig. 2], the electrical components include a conventional fluorescent ballast 52 and LED driver 54 which transform input current from a power source into regulated operational current required by the fluorescent lamp 30 and LEDs 32, respectively." *Id.*, 4:6-15. Under Signify's apparent construction, a POSA would have understood that the LEDs 32, lamp 30, fluorescent ballast 52,

and LED driver 54 are likewise "electrical components" as recited in element 1b and that the LED driver 54, fluorescent ballast 52, LEDs 32, and fluorescent lamp 30 are all mounted within the housing 26. *See id.*, Fig. 2.

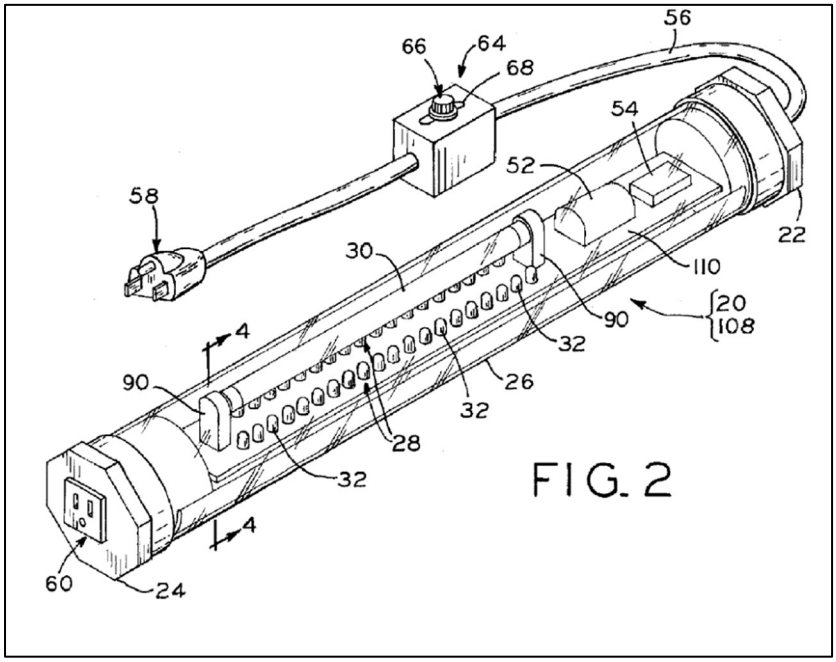
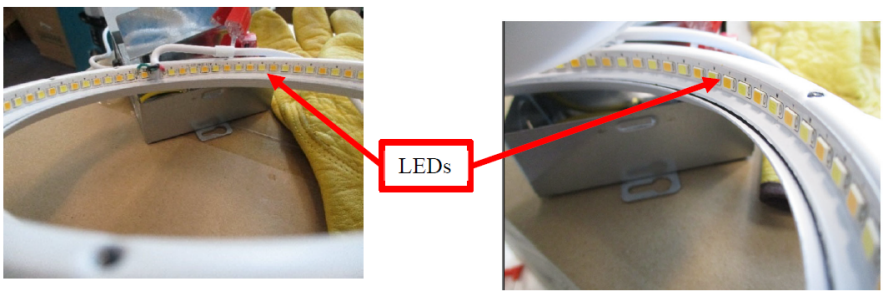


FIG. 2

Id., Fig. 2.

359. It is also my understanding that, in its infringement contentions, Signify has interpreted the phrase "at least one electrical component" of claim 1 as encompassing LEDs such as those disclosed in Reiff. A portion of the Claim chart prepared by Signify is given below:

[1.b] at least one electrical component disposed, at least in part, within the first cavity;	The 349-1292 product includes at least one electrical component disposed, at least in part, within the first cavity. For example, the 349-1292 product includes LEDs disposed within the first cavity. 

Appx. G-1 to Signify's Infringement Contentions, 6.

360. Finally, the '336 Patent itself also concedes that this claim element was known in the prior art. Indeed, Fig. 8 (labeled "prior art") is described as a luminaire including "one or more [electrical components (*e.g.,* light sources)] disposed on and/or within the housing 805." *See, e.g.*, '336 Patent, Fig. 8; 11:5-12.

(d) Element 1c: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component; and"

361. Element 1c recites: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component." '336 Patent, 14:36-38.

362. Reiff's light fixtures include an "electrical cord 56 [that] extends from one end 22 of the light" and has a plug 58 at the other end. *See* Reiff, 4:16-19, 6:18-20. As shown in Fig. 2 below, end 22 is connected to the housing 26 which, as discussed above, houses multiple electrical components. *See*, *id.*, Fig. 2. Because the electrical cord 56 is connected to the housing 26 and provides power to the light, a POSA would understand that Reiff's electrical cable 56 is coupled to the LEDs 32, LED driver 54, fluorescent light 30, and fluorescent ballast 52—i.e., the electrical components.

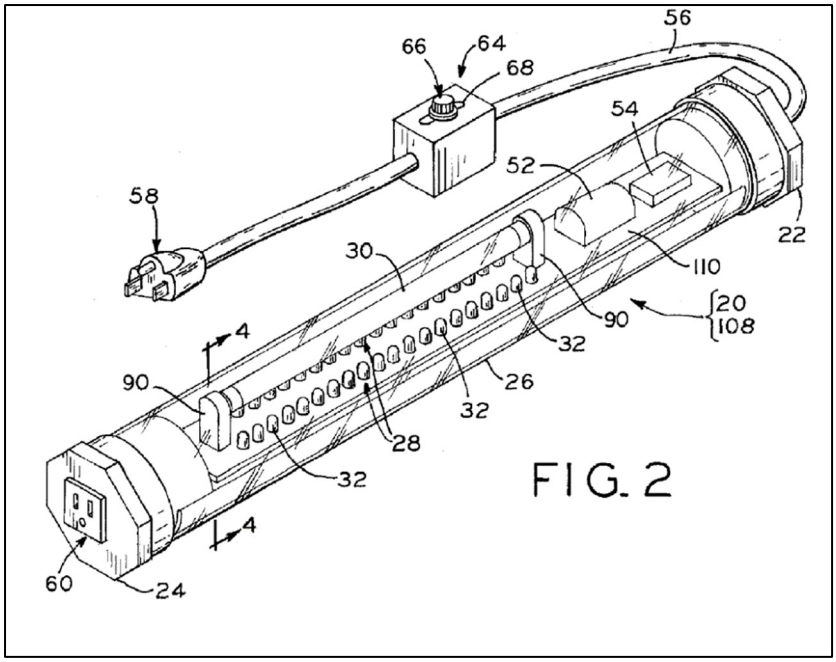


FIG. 2

Id., Fig. 2.

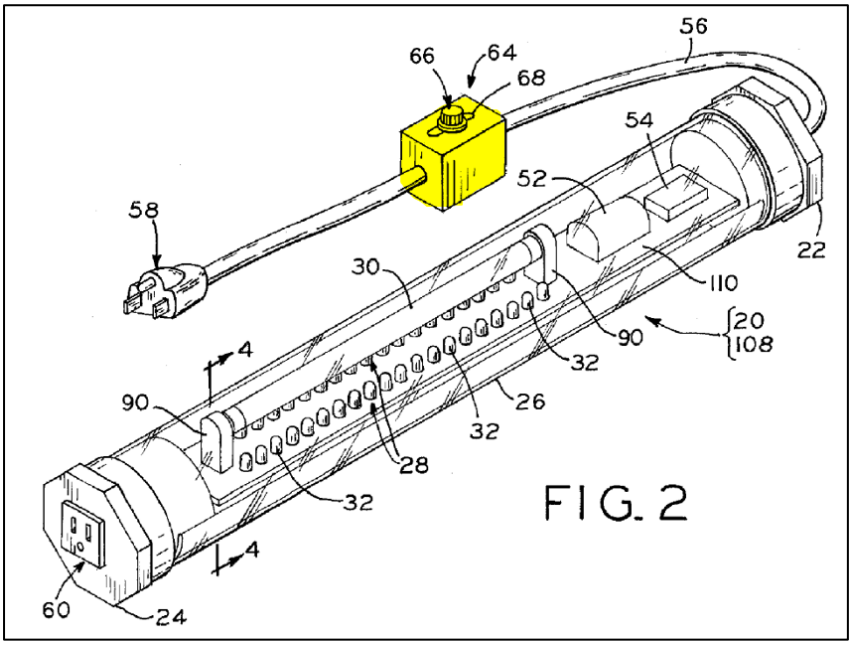
363. Moreover, the '336 Patent even concedes that this claim element was known in the prior art. Indeed, Fig. 8 (labeled "Prior Art") depicts an electrical cable 827 that is "connected to the one or more [electrical] components (*e.g.*, light sources) disposed … within the housing 805." *See, e.g.*, '336 Patent, Fig. 8, 11:5-12.

(e) Element 1d: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing,"

364. Element 1d recites: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing." '336 Patent, 14:39-40.

365. Reiff's lights include a "control box 64 which includes a switch … for … selecting between the different light sources … [E]ither a regular white light fluorescent light source can be selected, or a 'colored' LED light source can be selected." *Id.*, 4:28-36. The control box 64 is "[l]ocated along electrical cord 56" away (i.e., remotely) from the housing. *Id.*, 6:18-20. The

"switch 66 which is a stepped dimmer switch linearly slidable in slot 68 to select light source 28." *Id.*, 4:28-36. The control box, including the switch, has been highlighted in yellow in Fig. 2 below.



Id., Fig. 2 (color added).

366. A POSA would have understood that Reiff's control box switch is "a switch coupled to the electrical cable [*i.e.*, cable 56], wherein the switch is disposed remotely from the housing."

(f) Element 1e: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire."

367. Element 1e states: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire." '336 Patent, 14:40-45.

368. Reiff's control box switch includes "three positions, one position being the off position as shown in Fig. 2, one position operating the fluorescent lamp and one position operating

the LEDs. Switch 66 slides into one of the three positions…" Reiff, 6:20-24. Moreover, "[e]ach of the light sources emits a different color of light," so, each light source emits light having a different CCT value. *Id.*, 2:19-22. A POSA would have understood that all white LEDs, such as those in Reiff (*see* Reiff, 6:31-45), emit light that is associated with a specific CCT value that is occasionally referred to as an "apparent CCT". Accordingly, the two "on" positions correspond to emitted light having a different CCT value: the off position corresponds to no light emitted by the luminaire because both light sources are off, the LED operating position(s) corresponds to the CCT value or values emitted by the LEDs, and the fluorescent lamp operating position corresponds to yet another CCT value characteristic of the light emitted by the fluorescent lamp. A POSA would have understood that the two "on" positions are a "plurality of positions" as recited in element 1e.

369. Thus, Reiff's control box switch is a switch with "a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire."

(g) Conclusion For Claim 1

370. As explained in the section above, Reiff discloses all elements of claim 1 of the '336 Patent. Accordingly, Reiff anticipates and/or renders obvious claim 1.

2. Claim 3: "The luminaire of claim 1, wherein each position of the plurality of positions is discrete."

371. Claim 3 recites: "[t]he luminaire of claim 1, wherein each position of the plurality of positions is discrete." '336 Patent, 14:47-48.

372. As discussed above, Reiff's control box switch includes "three positions…" Reiff, 6:20-24. These three positions are a "plurality of positions" and the switch can only be set to one position at a time. Therefore, each position (and associated CCT value) is discrete.

(a) Conclusion For Claim 3

373. As explained in Section VIII.E.1, Reiff anticipates and/or renders obvious claim 1 of the '336 Patent. This section has shown that Reiff discloses the additional elements of claim 3. Accordingly, Reiff anticipates and/or renders obvious claim 3 of the '336 Patent.

3. Claim 9: "The luminaire of claim 1, wherein the switch is a slide switch."

374. Claim 9 states: "[t]he luminaire of claim 1, wherein the switch is a slide switch." '336 Patent, 15:13-14.

375. As discussed above, Reiff's control box "switch 66 which is a stepped dimmer switch linearly slidable in slot 68 to select light source 28." *Id.*, 4:28-36. Reiff further discloses that its control box switch includes "three positions, one position being the off position as shown in Fig. 2, one position operating the fluorescent lamp and one position operating the LEDs. Switch 66 slides into one of the three positions…" Reiff, 6:20-24. A POSA would have understood that a switch which "slides into one of the three positions" would function as a "slide switch" as recited in claim 9.

(a) Conclusion For Claim 9

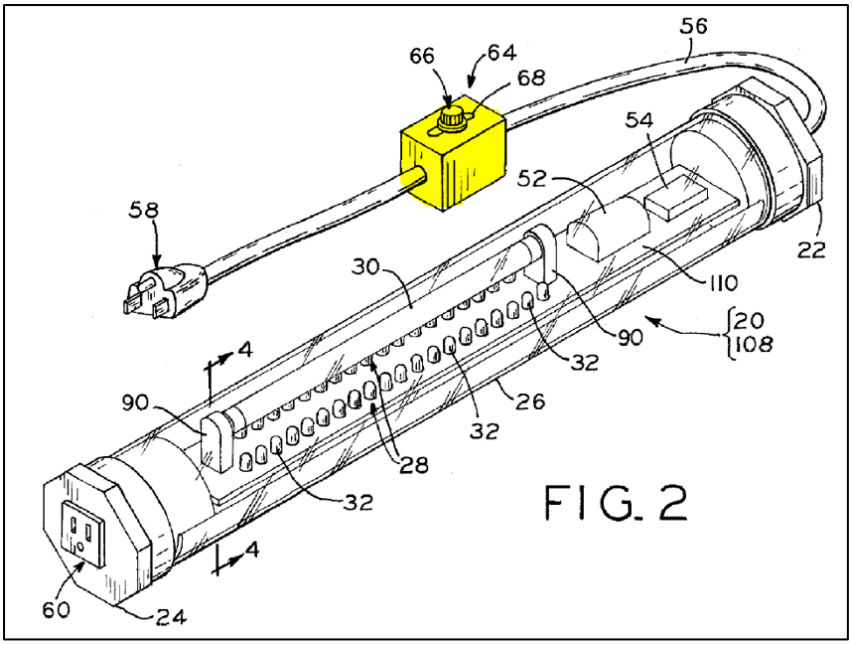
376. As explained in Section VIII.E.1, Reiff anticipates and/or renders obvious claim 1. This section has also shown that Reiff discloses the additional elements of claim 9. Accordingly, Reiff anticipates and/or renders obvious claim 9.

4. Claim 13

(a) Preamble: "A switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising:"

377. The preamble of claim 13 recites: "[a] switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising." '336 Patent, 15:22-24.

378. Reiff discloses a number of lighting devices that "include[] fluorescent and/or LED light sources," "wherein the color of the emitted light can easily be switched." Reiff, Abstract. The exemplary light device shown in Fig. 2 below "is a perspective view of an [] embodiment of a light in accordance with [Reiff's] invention," that includes both LED light sources and a fluorescent light source. Reiff, 2:45-46. The light includes a "control box 64 which includes a switch … for … selecting between the different light sources … [E]ither a regular white light fluorescent light source can be selected, or a 'colored' LED light source can be selected." *Id.*, 4:28-36. The "switch 66 which is a stepped dimmer switch linearly slidable in slot 68 to select light source 28." *Id.* "Each of the light sources emits a different color of light," thus, each light source within the luminaire (fluorescent lamp or LED) emits light having a different value of CCT. *Id.*, 2:19-22. Indeed, since the phosphor that coats the inside of the glass tube in a fluorescent lamp determines the CCT of the emitted light and many different phosphors are available for fluorescent lamps, the number of CCT values available with both one or more fluorescent lamps and the LEDs is considerable. The control box, including the switch, has been highlighted in yellow in Fig. 2 below.



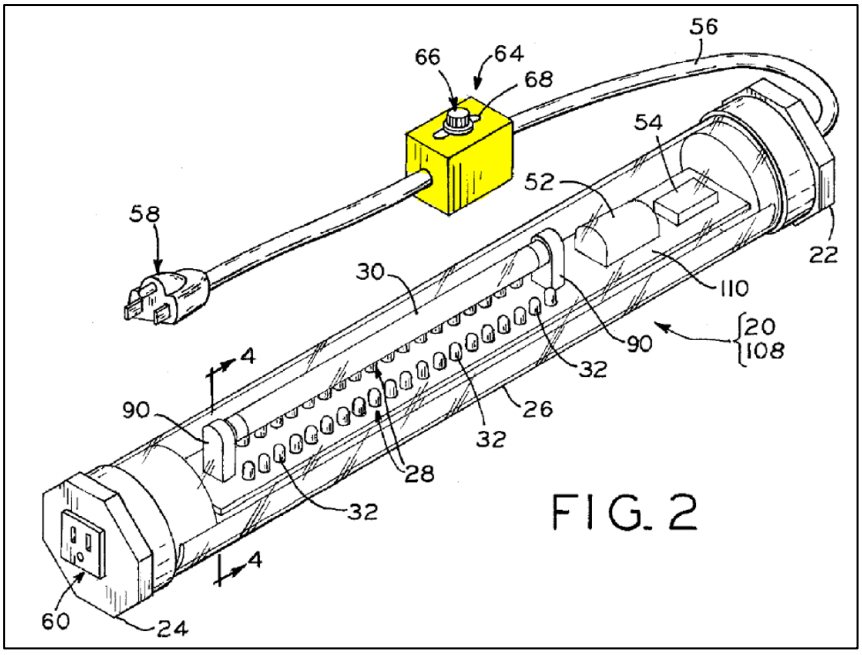
Id., Fig. 2 (color added).

379. Thus, to the extent the preamble is limiting, Reiff discloses it.

(b) Element 13a: "a body;"

380. Element 13a recites: "a body." '336 Patent, 15:25.

381. As discussed above, the "control box 64 [includes a] switch 66 which is … linearly slidable in slot 68." Reiff, 4:28-36. As shown in Fig. 2 below, the control box 64 necessarily includes a body portion for the switch. The portion of the control box 64 that forms a body for the switch has been highlighted in yellow in Fig. 2 below.



Id., Fig. 2 (color added).

382. Thus, Reiff's switch includes a body as recited in element 13a of claim 13.

(c) Element 13b: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and"

383. Element 13b recites: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and." '336 Patent, 15:26-15:29.

384. As shown in Fig. 2 (reproduced below), Reiff's light "is powered by conventional 120-volt power, electrical cord 56 [that] extends from one end 22 of the light" and has a "plug 58 at a distal end of the cord for insertion into a conventional electrical outlet." Reiff, 4:16-19. As illustrated in Fig. 2, Reiff's control box 64 is "[l]ocated along electrical cord 56 [which] extend[s] from end cap 22" and is connected to the light device. *Id.*, 6:18-20. The control box 64 (with switch 66) is highlighted in yellow, and the electrical cord 56 highlighted in blue, in Fig. 2 below.

Because the control box 64 is located on the electrical cable 56, it is necessarily electrically connected ("coupled") to electrical cable 56 and, therefore, must include at least "one coupling feature". In other words, both the input and output terminals of the control box (and switch) *must* be electrically connected to the cable 56 by soldering, screw terminals, spade lugs, pins, or a myriad of other connectors or connections that have been developed over the past century. If the control box (and switch) and cable are not electrically connected, current will not flow and the luminaire will not function. Having all portions of a circuit electrically connected is referred to by electricians and electrical circuit designers as "electrical continuity"—a condition that a POSA would have assumed to be met when the luminaire is actually constructed and tested.

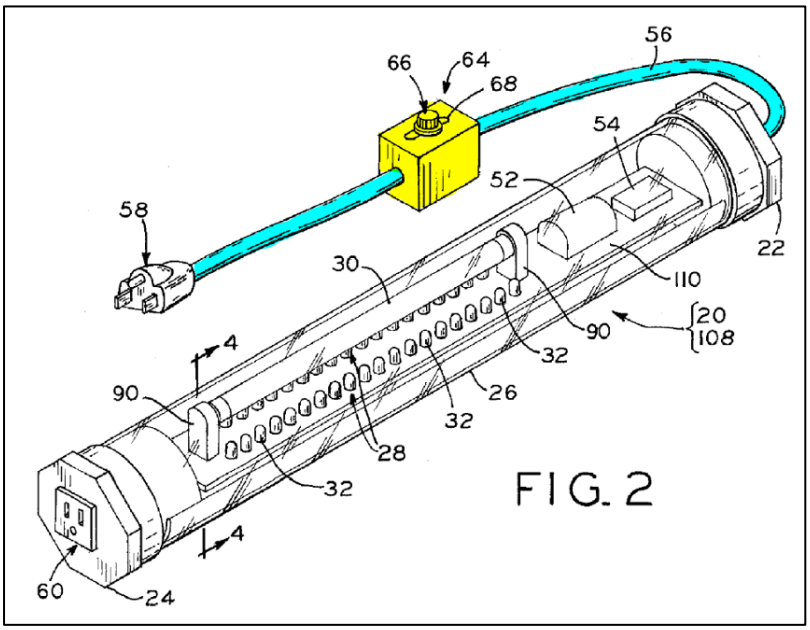


FIG. 2

Id., Fig. 2 (colors added).

385. Thus, Reiff's control box switch includes "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire" as recited in element 13b of claim 13.

(d) Element 13c: "an actuator disposed on the body, wherein the actuator has a range of positions,"

386. Element 13c recites: "an actuator disposed on the body, wherein the actuator has a range of positions." '336 Patent, 16:1-2.

387. Reiff's control box switch includes an actuator (as recited in the '336 Patent), identified as switch 66. The actuator is highlighted in green in Fig. 2 below. The actuator (*i.e.*, switch 66) is located on the body of the control box 64 (highlighted in yellow) as shown in Fig. 2 below. Reiff, Fig. 2. "Switch 66 has three positions, one position being the off position as shown in Fig. 2, one position operating the fluorescent lamp and one position operating the LEDS. Switch 66 slides into one of the three positions…" *Id.*, 6:20-24.

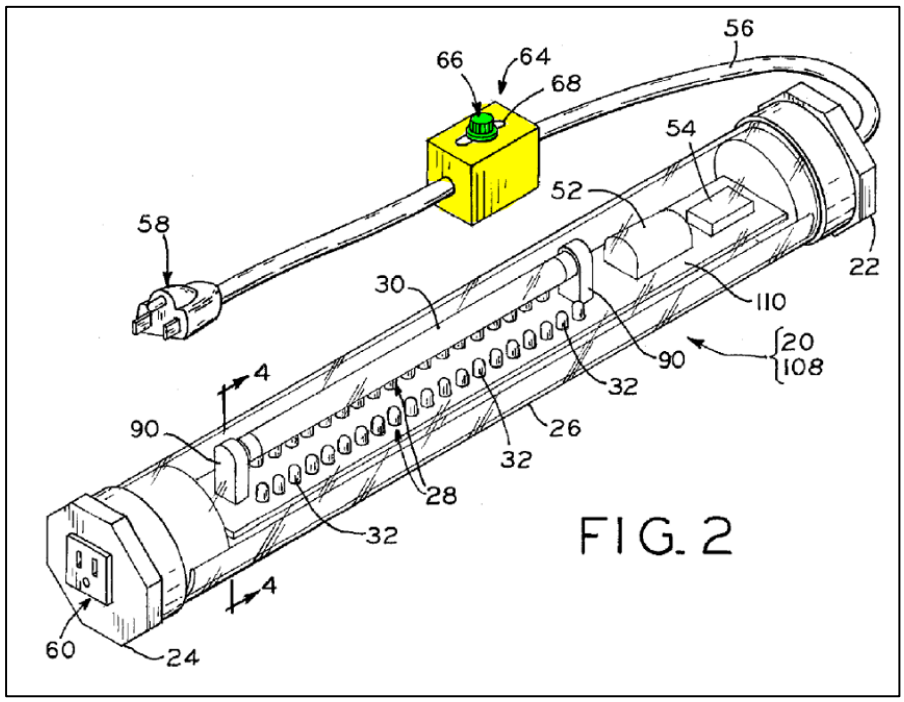


FIG. 2

Id., Fig. 2 (colors added).

388. Thus, Reiff's control box switch includes "an actuator disposed on the body, wherein the actuator has a range of positions" as recited in element 13c of claim 13 of the '336 Patent.

(e) Element 13d: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

389. Element 13d reads: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire." '336 Patent, 16:3-5.

390. As discussed above, Reiff's control box switch includes "three positions, one position being the off position as shown in Fig. 2, one position operating the fluorescent lamp and one position operating the LEDs. Switch 66 slides into one of the three positions…" Reiff, 6:20-24. Moreover, "[e]ach of the light sources emits a different color of light," so, each light source emits light having a different CCT value. *Id.*, 2:19-22. Accordingly, the two "on" positions correspond to emitted light having a different CCT value: the off position corresponds to no light emitted by the luminaire because both light sources are off, the LED operating position(s) corresponds to the CCT value or values emitted by the LEDs, and the fluorescent lamp operating position corresponds to yet another CCT value characteristic of the light emitted by the fluorescent lamp. A POSA would have understood that the two "on" positions are a "range of positions" as recited in element 13d.

391. Thus, Reiff's control box switch is a switch "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

(f) Conclusion For Claim 13

392. As explained in the section above, Reiff discloses all elements of claim 13 of the '336 Patent. Accordingly, Reiff anticipates and/or renders obvious claim 13.

5. Claim 15

393. Claim 15 recites: "[t]he switch of claim 13, wherein each position is discrete within the range of positions." '336 Patent, 16:8-9.

394. As discussed above, Reiff's control box switch includes "three positions…" Reiff, 6:20-24. These three positions are a "range of positions" and the switch actuator can only be set to one position at a time. Therefore, the CCT value associated with each position of the switch is discrete.

(a) Conclusion For Claim 15

395. As explained in Section VIII.E.1, Reiff anticipates and/or renders obvious claim 13. This section has also shown that Reiff discloses the additional elements of claim 15. Accordingly, Reiff anticipates and/or renders obvious claim 15.

F. Ground [3b] – Reiff Alone And/Or In View Of Chaimberg And/Or Roberge Renders Obvious Claims 4, 5, 7, 11, 12, 16, and 19 of the '336 Patent

1. Motivation To Combine Reiff, Chaimberg, And Roberge

396. As discussed above in Section VII.A.4, Reiff, Chaimberg, and Roberge disclose LED lighting systems capable of producing white light for which the CCT is adjustable.

397. Reiff discloses a number of lighting devices that "include[] fluorescent and/or LED light sources," "wherein the color of the emitted light can easily be switched." Reiff, Abstract. The exemplary lighting device shown in Fig. 2 of Reiff "is a perspective view of an [] embodiment of a light in accordance with the invention," that includes both LED light sources (32) and a fluorescent light source (30). *Id.*, 2:45-46. As shown below and discussed above, the CCT output of Reiff's light fixture is managed by the control box 64, which "includes a switch [66] for … selecting between the different light sources [28]." *Id.*, 4:28-36. Like Chaimberg and Roberge, Reiff locates the switch remotely from the housing - along the cord 56 as shown below.

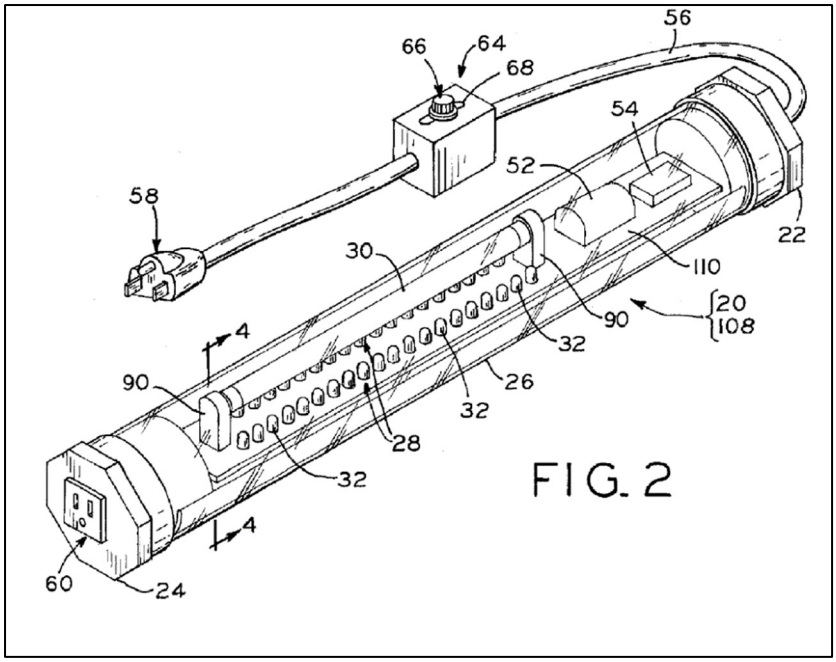


FIG. 2

Id., Fig. 2.

398. In an effort to expand the applications and improve the efficiency of Reiff's light, a POSA would have looked to other LED lighting fixtures. Those described by Chaimberg and Roberge would be particularly attractive because of the LED sets providing additional CCT outputs they offer.

399. First, as discussed above in Section VII.A.1, Chaimberg discloses "[a] ceiling mountable LED light fixture … wherein at least two sets of LED's of different correlated color temperatures (CCT) are mounted in its housing." Chaimberg, Abstract. Chaimberg's light fixture includes a CCT "switch 18 [which] is a toggle switch provided with a slide button 31 having two conducting arms 32 and 33 and displaceable to three switch positions." *Id.*, 4:34-37. The three positions on Chaimberg's slide switch 18 correspond to the three white light CCT values of 3000 K, 4000 K, and 5000 K. *Id.*, 4:30-5:10.

400. Likewise, Roberge discloses LED "[l]ighting methods and systems [having] a plurality of LEDs." Roberge, 1:28-31. Roberge states that its LED lights "can be located in a

conventional lighting fixture, such as a lamp or a cylindrical fixture," similar to the luminaires described by Chaimberg and Reiff. *Id.*, 17:23-26. Roberge also discloses that the LEDs can include "two white sources of varying characteristics, three white sources of varying characteristics, or four or more white sources of varying characteristics." *Id.*, 7:33-36. Not surprisingly, Roberge discloses a number of switches so as to generate "white light having a variety of color temperatures." *Id.*, 7:45-46. For example, Fig. 34i of Roberge presents "a dial [that] allows a user to select one or more color temperatures from a scale 3414 [, which can] include different color temperatures of white light." *Id.*, 42:51-54. While Fig. 34i shows a "dial" (rotary) switch, Roberge also discusses a slide switch as follows: "[a] slide mechanism [*i.e.*, switch] can be used like the dial to set a particular color temperature of white light." *Id.*, 42:57-59. A POSA would have understood that the additional CCT values available with Roberge's rotary switch and Chaimberg's slide switch would expand the capability of Reiff's light.

401. Accordingly, when expanding the light output options of Reiff, a POSA would have looked to Chaimberg and Roberge for additional switch configurations and LED lighting outputs. Likewise, when looking to install the lighting fixture of Reiff in "a multitude of industrial and military applications" a POSA would have looked to other references, including Chaimberg and Roberge, to determine additional switch locations and layouts.

2. Claim 4: "The luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position."

402. Claim 4 recites: "[t]he luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position." '336 Patent, 14:49-52.

403. As discussed above, with respect to claims 1 and 13, the two "on" positions of Reiff's switch correspond to emitted light having a different CCT value: the off position corresponds to no light emitted by the luminaire because both light sources are off, the LED operating position(s) corresponds to the CCT value or values emitted by the LEDs, and the fluorescent lamp operating position corresponds to yet another CCT value characteristic of the light emitted by the fluorescent lamp. Reiff discloses that its light fixtures are "exempl[ary] … and not intended to be exhaustive or construed as limiting the scope of the invention." Reiff, 2:65-3:3. Accordingly, a POSA would have understood that Reiff's light fixture could have been modified with additional LED light sources of different CCTs, including a third, fourth, and fifth LED light source. If modified with additional light sources as suggested in Reiff, a POSA would have understood that the switch necessarily would have needed to accommodate the third, fourth, and fifth light sources, with additional positions.

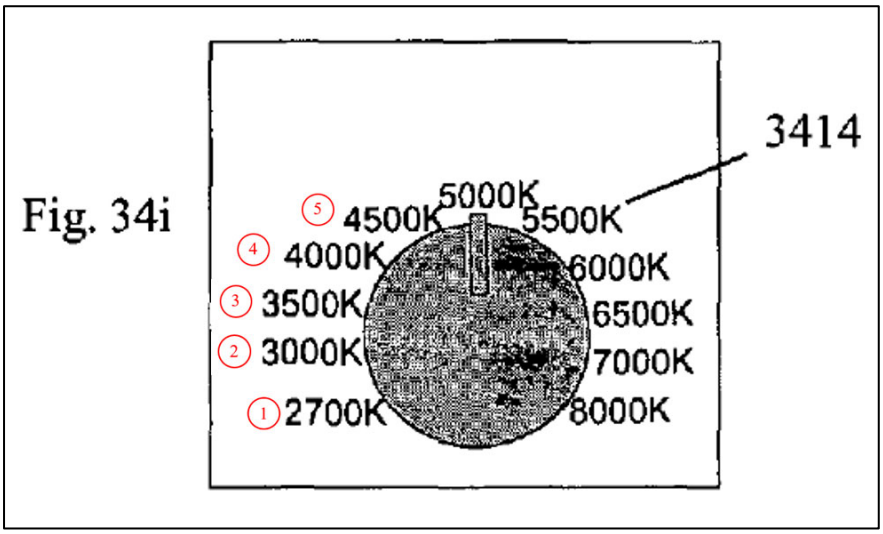
404. Accordingly, Reiff anticipates and/or renders obvious a switch "wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position."

405. To the extent that modifying the control box switch with third, fourth, and fifth positions is not disclosed by Reiff, Section VIII.F.1 above explains why it would have been obvious for a POSA to modify Reiff's switch with one of the switches of Roberge.

406. As discussed above, Reiff discloses an LED-based luminaire that can generate multiple light having selectable color temperature values (CCTs). Roberge likewise discloses LED light fixtures capable of generating light having selectable CCT values. Roberge, 1:28-31, 7:33-36. Embodiments provided by Roberge can, for example, include "two white sources of varying characteristics, three white sources of varying characteristics, or four or more white sources of

varying characteristics." *Id.*, 7:33-36. Thus, as discussed above, a POSA would have been motivated to adopt one of the switches described in Roberge, such as the rotary ("dial") switch of Fig. 34i, in Reiff's light.

407. As discussed above, Fig. 34i of Roberge shows "a dial [that] allows a user to select one or more color temperatures from a scale 3414[, which can] include different color temperatures of white light." *Id.*, 42:51-54. Roberge states that "[t]he lighting designer can specify use of a particular color temperature of light, which the installer can select by setting the right position on the scale 3414 with the dial." *Id.*, 42:54-57. Roberge's rotary switch of Fig. 34i (reproduced below) allows the user to select from the following white light CCT values: 2700 K, 3000 K, 3500 K, 4000 K, 4500 K, 5000 K, 5500 K, 6000 K, 6500 K, 7000 K, and 8000 K. Thus, this CCT switch includes 11 positions, including a first, second, third, fourth, and fifth position. For convenience, these first five positions are numbered in the annotated version of Roberge's Fig. 34i below.



Id., Fig. 34i (annotated).

408. While Fig. 34i shows a "dial" (rotary) switch, Roberge also notes correctly that "[a] slide mechanism [*i.e.*, switch] can be used like the dial to set a particular color temperature of

white light." *Id.*, 42:57-59. This additional alternative presented by Roberge provides another incentive for a POSA to incorporate Roberge's switch into Reiff's light.

409. Accordingly, Roberge's CCT switch "comprises a first position, a second position, a third position, a fourth position, and a fifth position."

(a) Conclusion For Claim 4

410. As explained in Section VIII.E.2, Reiff anticipates and/or renders obvious claim 3 of the '336 Patent. This section has also shown that Reiff and/or Roberge discloses the additional elements of claim 4. Accordingly, Reiff alone and/or in view of Chaimberg and/or Roberge renders obvious claim 4 of the '336 Patent.

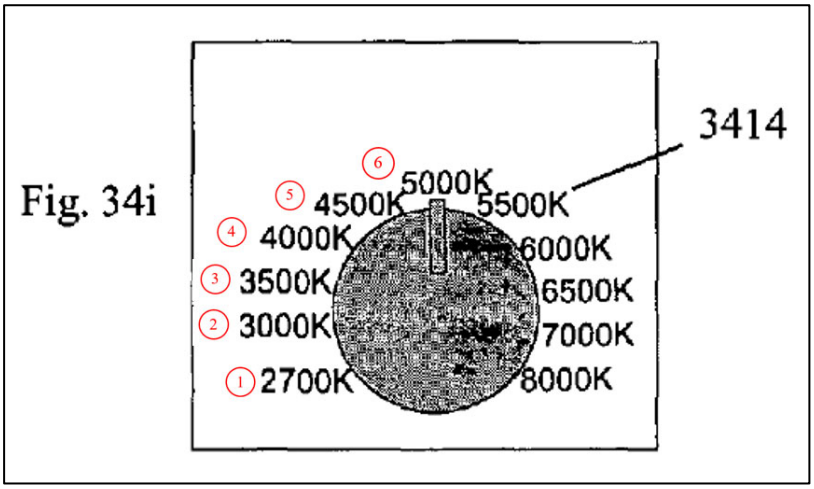
3. Claim 5: "The luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources."

411. Claim 5 recites: "[t]he luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources." '336 Patent, 14:53-62.

412. To the extent that modifying Reiff's switch with third, fourth, and fifth positions is not disclosed by Reiff, Section VIII.F.1 above explains why it would have been obvious to modify

Reiff's switch with one of the switches of Roberge. Moreover, as discussed above in Section VIII.F.2 with respect to claim 4, Reiff alone and/or in view of Roberge, renders obvious a LED light system having a CCT switch that "comprises a first position, a second position, a third position, a fourth position, and a fifth position."

413. As discussed earlier, the switch of Roberge Fig. 34i includes 11 positions, including a first (2700 K), second (3000 K), third (3500 K), fourth (4000 K), fifth (4500 K), and sixth (5000 K) position. For convenience, FIG. 34i of Roberge is reproduced below:



Roberge, Fig. 34i (annotated).

414. While Roberge's fifth position corresponds to the generation of light having a CCT value of 4500 K, and the sixth position corresponds to 5000 K, it would have been obvious for a POSA include any other CCT values required by the application at hand. Indeed, as discussed above, Roberge discloses that the eleven temperatures are exemplary and the "designer can specify a particular setting." *Id.*, 42:51-65.

415. Consequently, Roberge's switch, illustrated in Fig. 34i, is a switch wherein the "first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or

more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources."

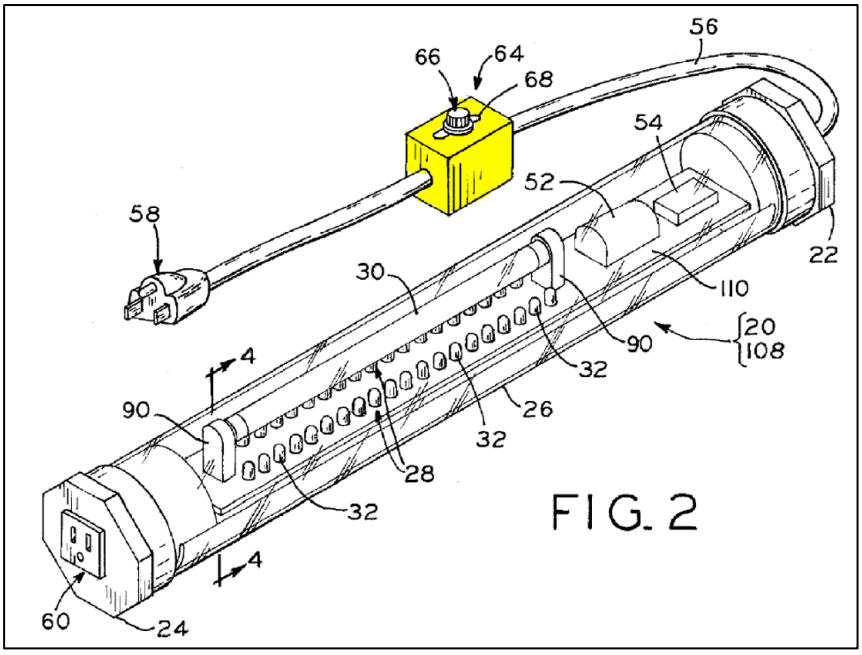
(a) Conclusion For Claim 5

416. As explained in Section VIII.F.2, Reiff alone and/or in view of Roberge renders obvious claim 4 of the '336 Patent. This section has also shown that Roberge discloses the additional elements of claim 5. Accordingly, Reiff alone and/or in view of Chaimberg and/or Roberge renders obvious claim 5 of the '336 Patent.

4. Claim 7: "The luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch."

417. Claim 7 states: "[t]he luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch." '336 Patent, 14:65-15:2.

418. As discussed above, Reiff's control box 64 includes a switch for adjusting the CCT output of the light. The control box 64, highlighted in yellow below includes outer walls. A POSA would have understood that the outer-walls of Reiff's control box formed an internal opening, and that the control box could function as a junction box. Moreover, the control box necessarily includes certain components of the switch 66. Finally, because the control box 64 is mounted on the electrical cable 56, and the switch controls the power distributed to the light, a POSA would have understood that the electrical cable is necessarily "coupled" to the switch.



Id., Fig. 2 (color added).

419. Accordingly, Reiff renders obvious a light fixture including "a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch."

420. To the extent that Reiff's control box does not anticipate and/or render obvious a junction box mounted switch, Section VIII.F.1 above explains that it would have been obvious to modify Reiff with Chaimberg's switch.

421. I explained above (Section VIII.B.3) that Chaimberg discloses and/or would have rendered a luminaire with a "a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch" as recited in claim 7. I incorporate my analysis from Section VIII.B.3 as if repeated herein in its entirety.

(a) Conclusion For Claim 7

422. As explained in Section VIII.E.1, Reiff anticipates and/or renders obvious claim 1. This section has also shown that Chaimberg discloses the additional elements of claim 7. Accordingly, Reiff alone and/or in view of Chaimberg and/or Roberge renders obvious claim 7 of the '336 Patent.

5. Claim 11: "The luminaire of claim 1, wherein the switch is inaccessible when the housing is installed."

423. Claim 11 recites: "[t]he luminaire of claim 1, wherein the switch is inaccessible when the housing is installed." '336 Patent, 15:17-18.

424. As discussed above, Reiff's light is designed to be used in "industrial or military applications" in small or large areas, including "rooms or tents." Reiff, 3:7-13. A POSA thus would have understood that Reiff's light could be installed in a location "wherein the switch is inaccessible when the" light fixture is installed.

425. To the extent that Reiff's control box does not anticipate and/or render obvious a switch that is inaccessible when the light is installed, Section VIII.F.1 above explains why it would have been obvious to modify Reiff's switch with one of the switches of Chaimberg or Roberge.

426. I explained above, in Section VIII.B.5, that Chaimberg's switch 18 "is inaccessible when the housing is installed", as recited in claim 11. I incorporate my analysis from Section VIII.B.5 as if repeated herein in its entirety.

(a) Conclusion For Claim 11

427. As explained in Section VIII.E.1, Reiff anticipates and/or renders obvious claim 1. This section has also shown that Chaimberg discloses the additional elements of claim 11. Accordingly, Reiff alone and/or in view of Chaimberg and/or Roberge renders obvious claim 11 of the '336 Patent.

6. Claim 12: "The luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location."

428. Claim 12 recites: "[t]he luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location." '336 Patent, 15:19-21.

429. As discussed above, Reiff's light is designed to be used in "industrial or military applications" in small or large areas, including "rooms or tents." Reiff, 3:7-13. A POSA thus would have understood that Reiff's light could be installed in a location "wherein the switch is accessible to a user when the housing is removed from its installed location."

430. To the extent that Reiff's control box does not anticipate and/or render obvious a switch that is accessible when the light is removed from its installed location, Section VIII.F.1 above explains why it would have been obvious to modify Reiff's switch with one of the switches of Chaimberg.

431. I explained above in Section VIII.B.6 that Chaimberg's switch 18 "is accessible to a user when the housing is removed from its installed location" as recited in claim 12. I incorporate my analysis from Section VIII.B.6 as if repeated herein in its entirety.

(a) Conclusion For Claim 12

432. As explained in Section VIII.E.1, Reiff anticipates and/or renders obvious claim 1. This section has also shown that Chaimberg discloses the additional elements of claim 12. Accordingly, Reiff alone and/or in view of Chaimberg and/or Roberge renders obvious claim 12 of the '336 Patent.

7. Claim 16: "The switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position."

433. Claim 16 recites: "[t]he switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position." '336 Patent, 16:11-13.

434. As discussed above in Section VIII.F.2 with respect to claim 4 of the '336 Patent, Roberge's switch is a switch with a range of positions that "comprises a first position, a second position, a third position, a fourth position, and a fifth position."

(a) Conclusion For Claim 16

435. As explained in Section VIII.E.5, Reiff anticipates and/or renders obvious claim 15. This section has also shown that Roberge discloses the additional elements of claim 16. Accordingly, Reiff in view of Chaimberg and/or Roberge renders obvious claim 16.

8. Claim 19: "The switch of claim 13, wherein the body is configured to be disposed within a junction box."

436. Claim 19 recites: "[t]he switch of claim 13, wherein the body is configured to be disposed within a junction box." '336 Patent, 16:23-24.

437. I explain above in Section VIII.B.9 that Chaimberg anticipates and or renders obvious a CCT switch "wherein the body is configured to be disposed within a junction box" as recited in claim 19. I incorporate my analysis from Section VIII.B.9 as if repeated herein in its entirety.

(a) Conclusion For Claim 19

438. As explained in Section VIII.E.4, Reiff anticipates and/or renders obvious claim 13. This section has also shown that Chaimberg discloses the additional elements of claim 19. Accordingly, Reiff in view of Chaimberg and/or Roberge renders obvious claim 19.

G. Ground [4a] – Roberge Anticipates And/Or Renders Obvious Claims 1, 3-5, 9, 13, 15, 16, and 19 of the '336 Patent

1. Claim 1

(a) Preamble: "A luminaire comprising"

439. The preamble of claim 1 recites: "[a] luminaire comprising". '336 Patent, 14:31.

440. To the extent the preamble of claim 1 is limiting, Roberge discloses a luminaire. In particular, Roberge discloses a number of LED "[l]ighting methods and systems… [with] … a plurality of LEDs." Roberge, 1:28-31. Roberge discloses a number of embodiments and styles of LED lighting systems, such as the linear light system depicted in Fig. 71 that is shaped with a housing 800. Roberge, 65:19-23, 66:43-50, Fig. 71. Roberge discloses that the housing 800 "may be a housing for an architectural, theatrical, or entertainment lighting fixture, ***luminaire***, lamp, system or other product." *Id.*, 17:54-56 (emphasis added).

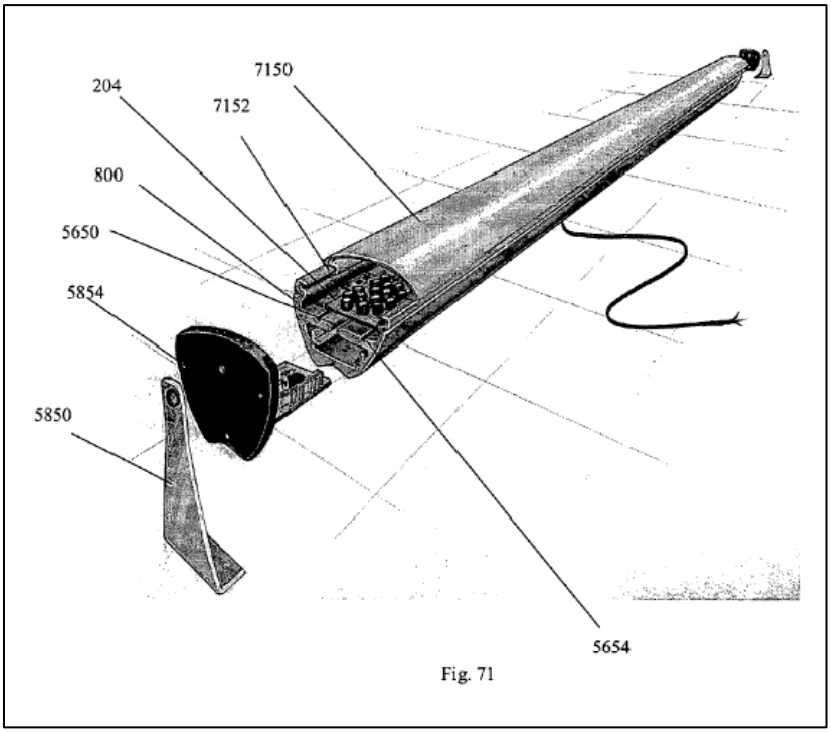


Fig. 71

Id., Fig. 71.

441. Therefore, to the extent the preamble is limiting, Roberge discloses "[a] luminaire."

(b) Element 1a: "a housing comprising at least one outer surface that forms a first cavity;"

442. Element 1a recites: "a housing comprising at least one outer surface that forms a first cavity." '336 Patent, 14:32-33.

443. Roberge discloses that its lighting fixtures include a housing 800. Roberge, 66:43-50, Fig. 71. For example, Roberge Fig. 71 shows a "linear lighting system 100, including the [circuit] boards 204, [and] the housing 800…" *Id.* As shown below, the housing 800 forms a cavity in which the board 204 is located. *Id.*.

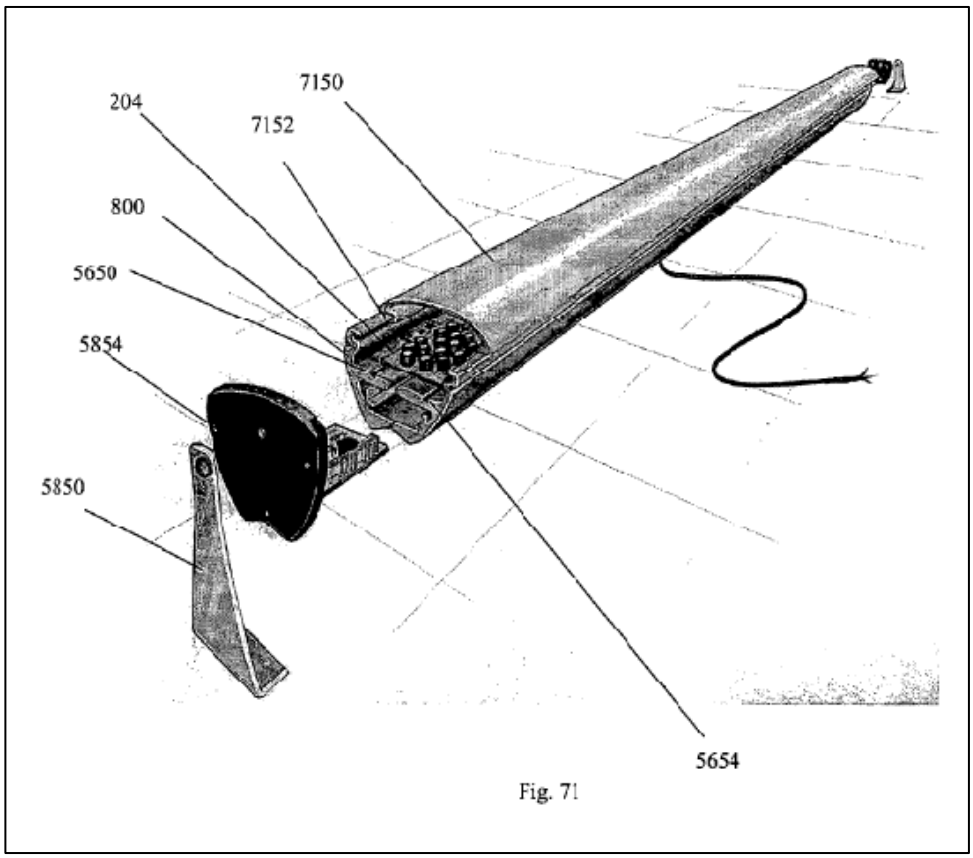


Fig. 71

Id., Fig. 71.

444. Thus, Roberge's housing 800 is "a housing comprising at least one outer surface that forms a first cavity."

445. Finally, let me mention that the '336 Patent concedes this claim element to have been known in the prior art. Indeed, Fig. 8 (labeled "prior art") depicts a housing 805 with an outer surface that forms a cavity. *See, e.g.*, '336 Patent, Fig. 8.

(c) Element 1b: "at least one electrical component disposed, at least in part, within the first cavity;"

446. Element 1b recites: "at least one electrical component disposed, at least in part, within the first cavity." '336 Patent, 14:34-35.

447. The lighting fixture of Fig. 71 shows a housing 800 that forms a cavity in which the board 204 is located. *Id.*, 66:43-50, Fig. 71. Roberge further states that the board 204 shown in Fig. 71 is a circuit board "supporting a plurality of LEDs," which have been highlighted in yellow in Fig. 71 below. *Id.*, 1:30-31, 19:46-51, Fig. 71. As shown below, the LEDs (highlighted in yellow below) are located at least in part, within the cavity created by the housing 800.

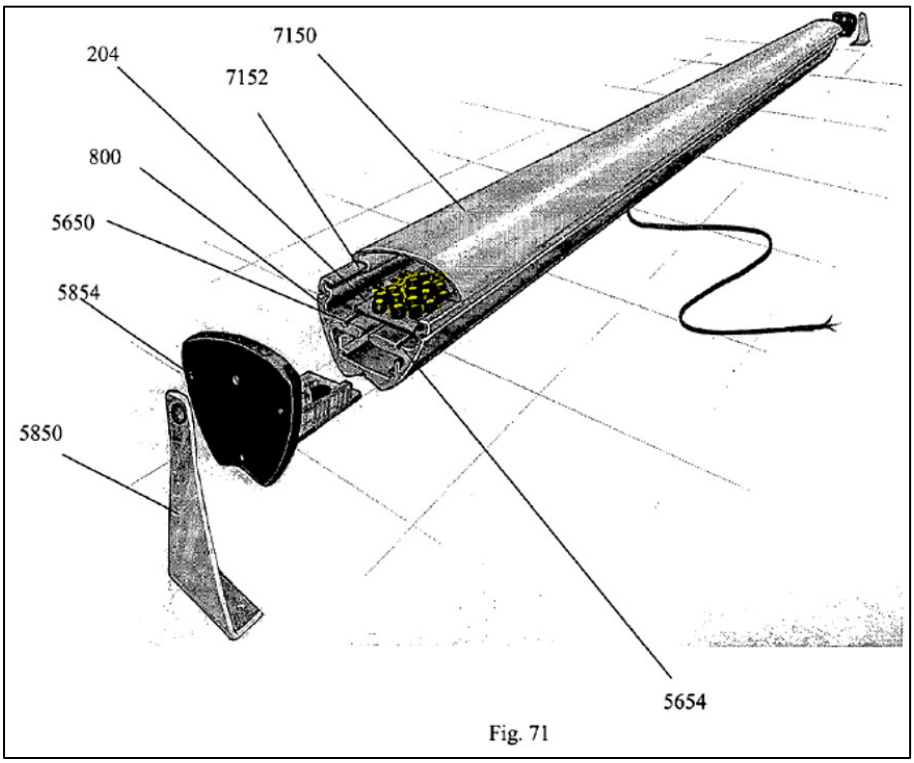
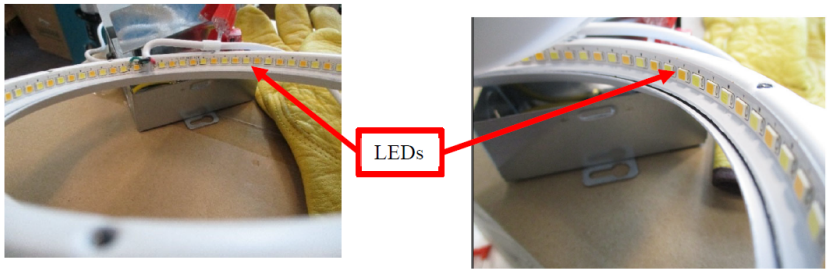


Fig. 71

Id., Fig. 71 (color added).

448. Thus, Roberge's LEDs located on board 204 are "at least one electrical component disposed, at least in part, within the first cavity." "Further, I understand that in its infringement contentions, Signify has interpreted the phrase "at least one electrical component" of claim 1 as encompassing LEDs such as those disclosed in Roberge:

[1.b] at least one electrical component disposed, at least in part, within the first cavity;	The 349-1292 product includes at least one electrical component disposed, at least in part, within the first cavity. For example, the 349-1292 product includes LEDs disposed within the first cavity. 

Appx. G-1 to Signify's Infringement Contentions, 6.

449. Finally, the '336 Patent also concedes that this claim element was known in the prior art. Specifically, Fig. 8 of the '336 Patent, labeled "Prior Art" is described as follows: "Fig. 8 shows another luminaire currently known in the art", and the specification states, in reference to Fig. 8: "One end of the electrical cable 827 is connected to one or more components (*e.g.*, light sources) disposed on and/or within the housing 805 of the luminaire 800." '336 Patent, 3:24-25, 11:5-12; Fig. 8.

(d) Element 1c: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component; and"

450. Element 1c recites: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component." '336 Patent, 14:36-38.

451. Roberge's lighting fixtures, including the exemplary fixture shown in Fig. 71, include an electrical cable. The electrical cable is highlighted in blue in Fig. 71 below. A POSA

would have understood that the electrical cable, which powers the LEDs on the board 204, is necessarily coupled to the board. The board (and LEDs) could not function otherwise.

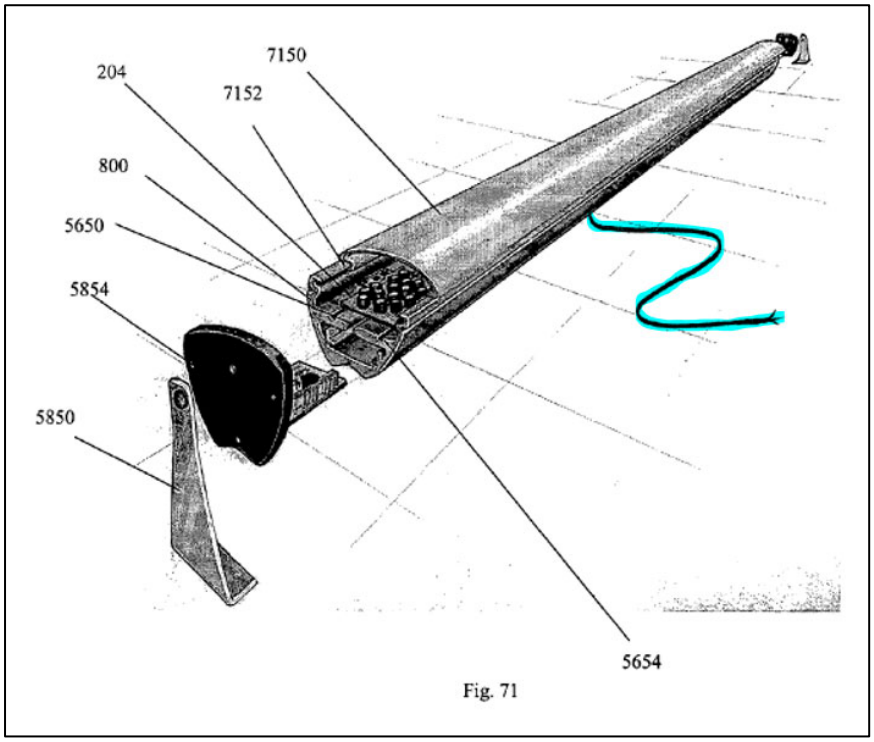


Fig. 71

Id., Fig. 71 (color added).

452. Accordingly, Roberge's lighting fixtures disclose "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component."

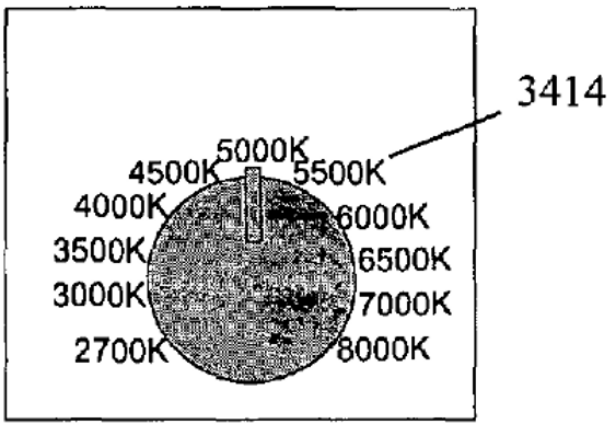
453. Moreover, the '336 Patent even concedes that this claim element was known in the prior art. Indeed, Fig. 8 (labeled "Prior Art") depicts an electrical cable 827 that is "connected to the one or more [electrical] components (*e.g.*, light sources) disposed … within the housing 805." *See, e.g.*, '336 Patent, Fig. 8, 11:5-12.

(e) Element 1d: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing,"

454. Element 1d recites: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing." '336 Patent, 14:39-40.

455. Roberge discloses controls and switches for specifying the CCT of the light produced by the lighting fixture. For example, Fig. 34 depicts a number of user interfaces 4908 that can be used to control Roberge's lighting systems/fixtures. Roberge, 41:62-42:65, Figs. 34a-34i. In particular, Fig. 34i (reproduced below) shows "a dial [that] allows a user to select one or more color temperatures from a scale 3414[, which can] include different color temperatures of white light." Roberge, 42:51-54. "The lighting designer can specify use of a particular color temperature of light, which the installer can select by setting the right position on the scale 3414 with the dial." *Id.*, 42:54-57. As shown below, the rotary switch of Fig. 34i allows the user to select the following white light LED outputs: 2700 K, 3000 K, 3500 K, 4000 K, 4500 K, 5000 K, 5500 K, 6000 K, 6500 K, 7000 K, and 8000 K. While Fig. 34i shows a rotary switch, Roberge discloses that "[a] slide mechanism [*i.e.*, switch] can be used like the dial to set a particular color temperature of white light." *Id.*, 42:57-59.

Fig. 34i



Id., Fig. 34i.

456. Roberge further discloses that "communication between the user interface 4908 [e.g., the dial in Fig. 34i] and the lighting unit may be accomplished through wire or cable, or

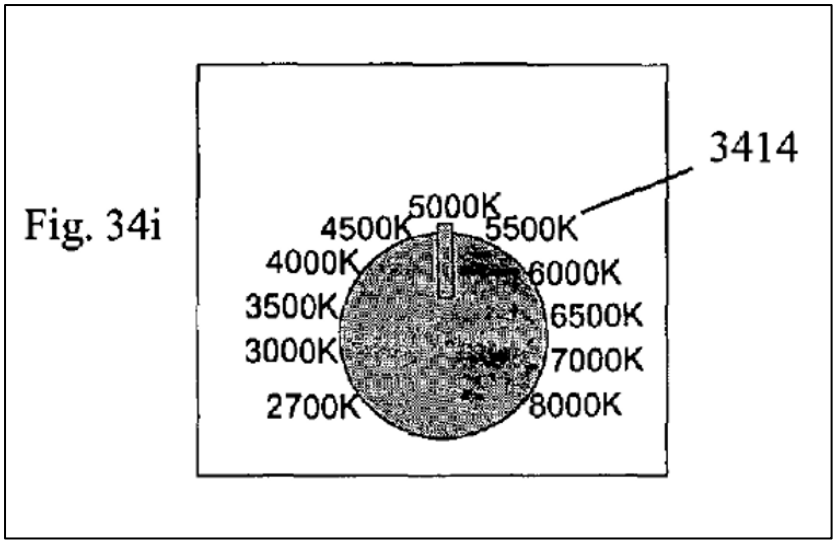
wireless transmission." *Id.*, 41:45-48. Roberge also discloses that the "[p]ower supplies may take line voltage or may take power input that is interrupted or modified by other devices, such as user interfaces 4908, such as switches, dials, sliders, dimmers, and the like." *Id.*, 20:49-52. This further confirms that the switch would have been coupled to the electrical cable as recited in element 1d.

457. Therefore, a POSA would have understood that Roberge's switch shown in Fig. 34i would have functioned as "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing."

(f) Element 1e: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire."

458. Element 1e recites: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire." '336 Patent, 14:40-45.

459. As discussed above, Fig. 34i of Roberge shows "a dial [switch that] allows a user to select one or more color temperatures from a scale 3414[, which can] include different color temperatures of white light." *Id.*, 42:51-54. Roberge states that "[t]he lighting designer can specify use of a particular color temperature of light, which the installer can select by setting the right position on the scale 3414 with the dial." *Id.*, 42:54-57. Roberge's rotary switch of Fig. 34i (reproduced below) allows the user to select from the following white light CCT values: 2700 K, 3000 K, 3500 K, 4000 K, 4500 K, 5000 K, 5500 K, 6000 K, 6500 K, 7000 K, and 8000 K. Thus, this CCT switch includes 11 discrete positions corresponding to different CCT outputs.



Id., Fig. 34i.

460. Thus, the switch of Fig. 34i is a switch "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire."

(g) Conclusion For Claim 1

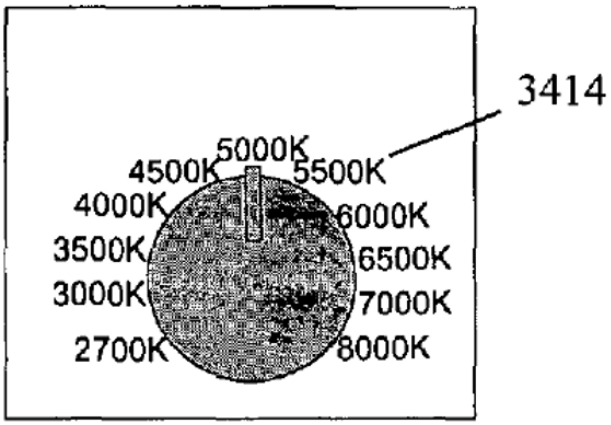
461. As explained in the section above, Roberge discloses all elements of claim 1 of the '336 Patent. Accordingly, Roberge anticipates and/or renders obvious claim 1.

2. Claim 3: "The luminaire of claim 1, wherein each position of the plurality of positions is discrete."

462. Claim 3 recites: "[t]he luminaire of claim 1, wherein each position of the plurality of positions is discrete." '336 Patent, 14:47-48.

463. As discussed above, Roberge's rotary switch of Fig. 34i (reproduced below) allows the user to select from the following white light CCT values: 2700 K, 3000 K, 3500 K, 4000 K, 4500 K, 5000 K, 5500 K, 6000 K, 6500 K, 7000 K, and 8000 K. Thus, Roberge's CCT switch includes 11 discrete positions corresponding to different CCT outputs.

Fig. 34i



Id., Fig. 34i.

464. Thus, Roberge's CCT switch shown in Fig. 34i is a switch "wherein each position of the plurality of positions is discrete."

(a) Conclusion For Claim 3

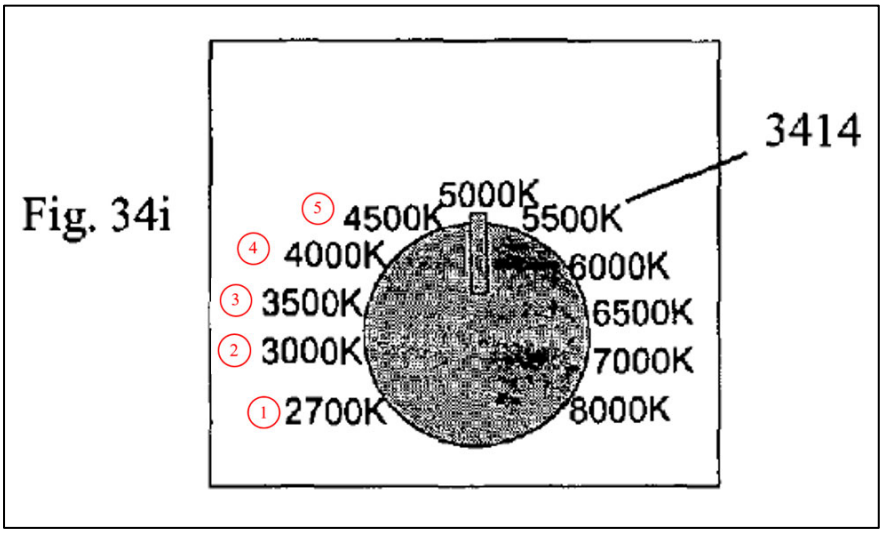
465. As explained in Section VIII.G.1, Roberge anticipates and/or renders obvious claim 1 of the '336 Patent. This section has shown that Roberge discloses the additional elements of claim 3. Accordingly, Roberge anticipates and/or renders obvious claim 3 of the '336 Patent.

3. Claim 4: "The luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position."

466. Claim 4 states: "[t]he luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position." '336 Patent, 14:49-52.

467. Fig. 34i of Roberge shows "a dial [that] allows a user to select one or more color temperatures from a scale 3414[, which can] include different color temperatures of white light." *Id.*, 42:51-54. Roberge states that "[t]he lighting designer can specify use of a particular color

temperature of light, which the installer can select by setting the right position on the scale 3414 with the dial." *Id.*, 42:54-57. Roberge's rotary switch of Fig. 34i (reproduced below) allows the user to select from the following white light CCT values: 2700 K, 3000 K, 3500 K, 4000 K, 4500 K, 5000 K, 5500 K, 6000 K, 6500 K, 7000 K, and 8000 K. Thus, this CCT switch includes 11 positions, including a first, second, third, fourth, and fifth position. For convenience, these first five positions are numbered in the annotated version of Roberge's Fig. 34i below.



Id., Fig. 34i (annotated).

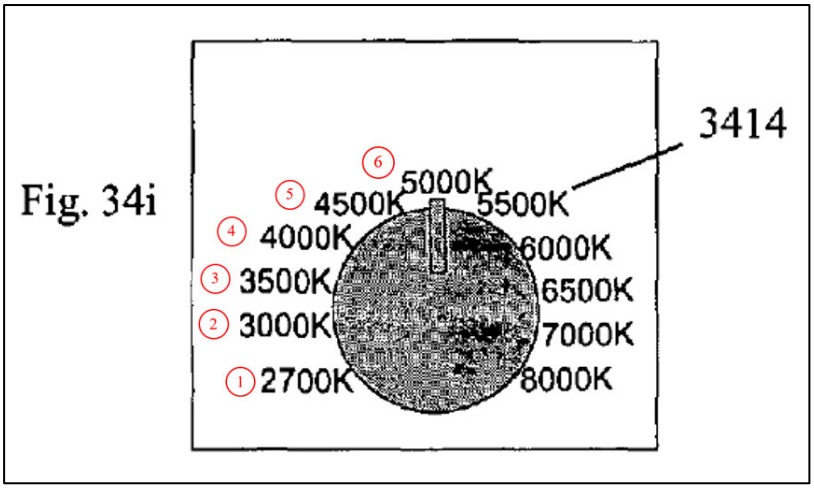
(a) Conclusion For Claim 4

468. As explained in Section VIII.G.2, Roberge anticipates and/or renders obvious claim 3 of the '336 Patent. This section has also shown that Roberge discloses the additional elements of claim 4. Accordingly, Roberge anticipates and/or renders obvious claim 4 of the '336 Patent.

4. Claim 5: "The luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources."

469. Claim 5 states: "[t]he luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources." '336 Patent, 14:53-62.

470. As discussed earlier, the switch of Roberge Fig. 34i includes 11 positions, including a first (2700 K), second (3000 K), third (3500 K), fourth (4000 K), fifth (4500 K), and sixth (5000 K) position. For convenience, FIG. 34i of Roberge is reproduced below:



Roberge, Fig. 34i (annotated).

471. While Roberge's fifth position corresponds to the generation of light having a CCT value of 4500 K, and the sixth position corresponds to 5000 K, it would have been obvious for a POSA to include any other CCT values required by the application at hand. Indeed, as discussed above, Roberge discloses that the eleven temperatures are exemplary and the "designer can specify a particular setting." *Id.*, 42:51-65.

472. Consequently, Roberge's switch, illustrated in Fig. 34i discloses a switch wherein the "first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources."

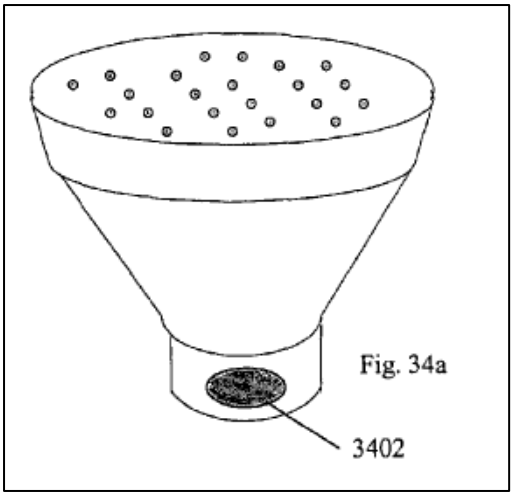
(a) Conclusion For Claim 5

473. As explained in Section VIII.G.3, Roberge anticipates and/or renders obvious claim 4 of the '336 Patent. This section has also shown that Roberge discloses the additional elements of claim 5. Accordingly, Roberge anticipates and/or renders obvious claim 5 of the '336 Patent.

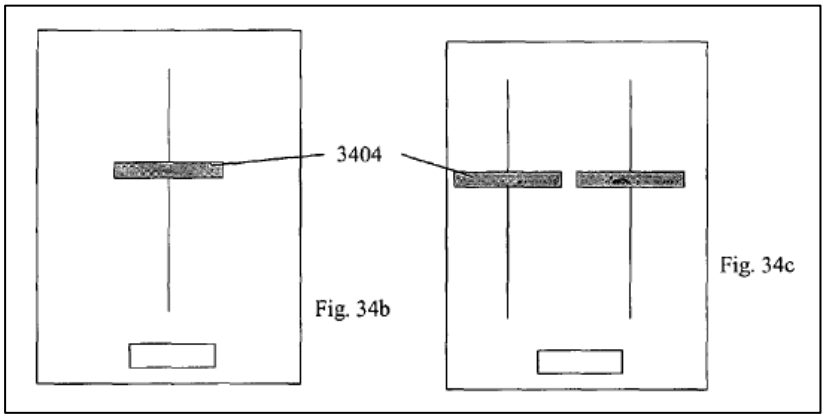
5. Claim 9: "The luminaire of claim 1, wherein the switch is a slide switch."

474. Claim 9 recites: "[t]he luminaire of claim 1, wherein the switch is a slide switch." '336 Patent, 15:13-14.

475. As discussed above, Roberge discloses a number of configurations for its CCT switch. *See* Roberge, 42:11-65. While I focused on the dial switch of Fig. 34i above, Roberge discloses that "[a] slide mechanism [*i.e.*, switch] can be used like the dial to set a particular color temperature of white light." *Id.*, 42:57-59. Further, Fig. 34a, discloses a switch with a "slide" that "allow[s] the user to switch between modes of operation, such as by selecting … a specific color temperature." *Id.*, 42:30-34. Likewise, Figs. 34b and 34c show a slide switch where the "slide[3404] can change the intensity or color"—i.e., the CCT—of the light. *Id.*, 42:15-17.



Id., Fig. 34a.



Id., Figs. 34b & 34c.

476. Accordingly, Roberge discloses a CCT switch "wherein the switch is a slide switch."

(a) Conclusion For Claim 9

477. As explained in Section VIII.G.1, Roberge anticipates and/or renders obvious claim 1. This section has also shown that Roberge discloses the additional elements of claim 9. Accordingly, Roberge anticipates and/or renders obvious claim 9.

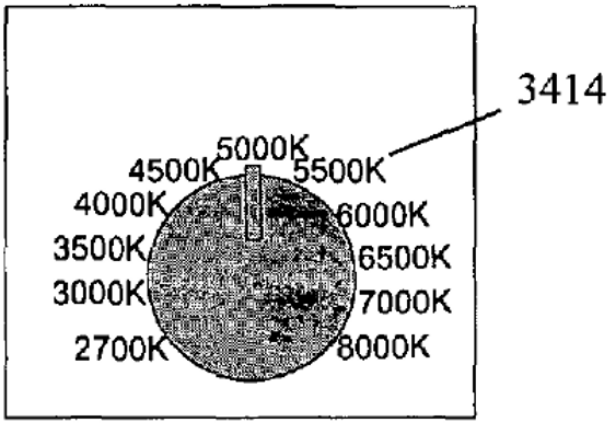
6. Claim 13:

(a) Preamble: "A switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising:"

478. The preamble of claim 13 reads as follows: "[a] switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising." '336 Patent, 15:22-24.

479. As discussed above with respect to claim 1, Roberge discloses controls and switches for specifying the CCT of the light produced by the luminaire. For example, Fig. 34a-i depicts a number of user interfaces 4908 that can be used to control Roberge's lighting systems/fixtures. Roberge, 41:62-42:65, Figs. 34a-34i. In particular, Fig. 34i (reproduced below) shows "a dial [that] allows a user to select one or more color temperatures from a scale 3414[, which can] include different color temperatures of white light." Roberge, 42:51-54. As shown below, the rotary switch of Fig. 34i allows the user to select the following white light LED outputs: 2700 K, 3000 K, 3500 K, 4000 K, 4500 K, 5000 K, 5500 K, 6000 K, 6500 K, 7000 K, and 8000 K. While Fig. 34i shows a rotary switch, Roberge discloses that "[a] slide mechanism [*i.e.*, switch] can be used like the dial to set a particular color temperature of white light." *Id.*, 42:57-59.

Fig. 34i



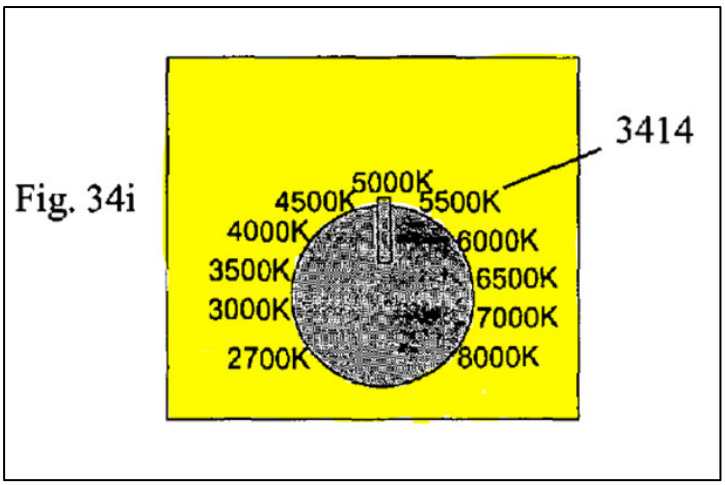
Id., Fig. 34i.

480. Accordingly, to the extent the preamble of claim 13 is limiting, Roberge discloses the required switch.

(b) Element 13a: "a body;"

481. Element 13a recites: "a body." '336 Patent, 15:25.

482. The exemplary CCT switch in Fig. 34i includes 11 positions corresponding to 11 CCT outputs. Roberge, 42:51-54, Fig. 34i. The switch includes a body portion as highlighted in yellow below.



Id., Fig. 34i (color added).

483. Accordingly, Roberge discloses a CCT switch with "a body."

(c) Element 13b: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and"

484. Element 13b states: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire." '336 Patent, 15:26-15:29.

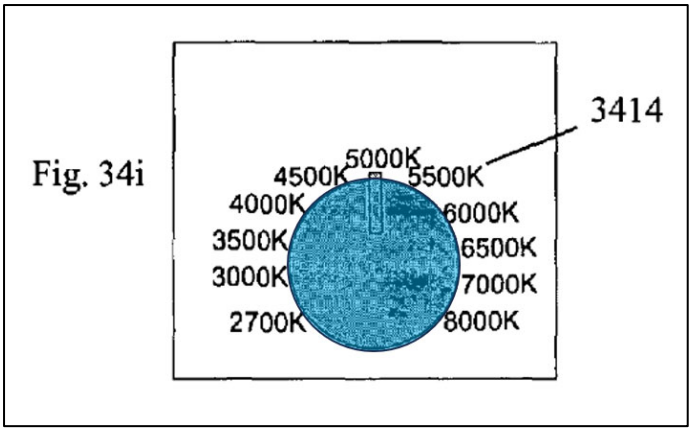
485. As discussed above with respect to claim 1, Roberge discloses that "communication between the user interface 4908 [e.g., the dial in Fig. 34i] and the lighting unit may be accomplished through wire or cable, or wireless transmission." *Id.*, 41:45-48. Roberge also states that the "[p]ower supplies may take line voltage or may take power input that is interrupted or modified by other devices, such as user interfaces 4908, such as switches, dials, sliders, dimmers, and the like." *Id.*, 20:49-52. Thus, a POSA would have understood that the switch necessarily would have included at least one coupling feature that electrically couples an electrical cable from Roberge's light apparatus to the switch disclosed in Fig. 34i.

486. Accordingly, Roberge discloses a switch with "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire."

(d) Element 13c: "an actuator disposed on the body, wherein the actuator has a range of positions"

487. Element 13c reads: "an actuator disposed on the body, wherein the actuator has a range of positions." '336 Patent, 16:1-2.

488. As discussed above, the switch of Fig. 34i includes "a dial [that] allows a user to select one or more … color temperatures from a scale 3414." Roberge, 42:51-57. The user can select "a particular color temperature of light … by setting the right position on the scale 3414 with the dial." *Id.* The dial, highlighted in blue below, functions as an "actuator." Further, while Fig. 34i shows a dial actuator, Roberge discloses that other actuators, such as "[a] slide mechanism can be used like the dial to set a particular color temperature of white light." *Id.*, 42:57-60.



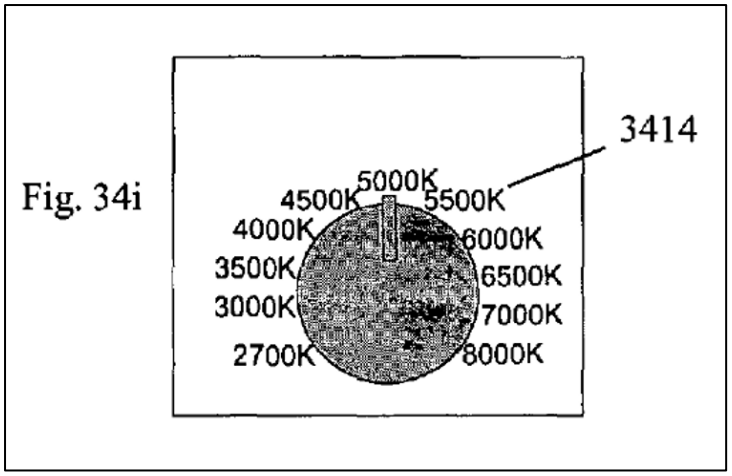
Id., Fig. 34i (color added).

489. Therefore, Roberge discloses a CCT switch "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

(e) Element 13d: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

490. Element 13d reads: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire." '336 Patent, 16:3-5.

491. As discussed above and shown below, the rotary switch of Fig. 34i allows the user to select the following white light LED outputs: 2700 K, 3000 K, 3500 K, 4000 K, 4500 K, 5000 K, 5500 K, 6000 K, 6500 K, 7000 K, and 8000 K. While Fig. 34i shows a rotary switch, Roberge discloses that "[a] slide mechanism [*i.e.*, switch] can be used like the dial to set a particular color temperature of white light." *Id.*, 42:57-59. Each of the 11 switch positions correspond to a different CCT of light emitted by Roberge's light fixture.



Id., Fig. 34i.

492. Therefore, Roberge discloses a CCT switch "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

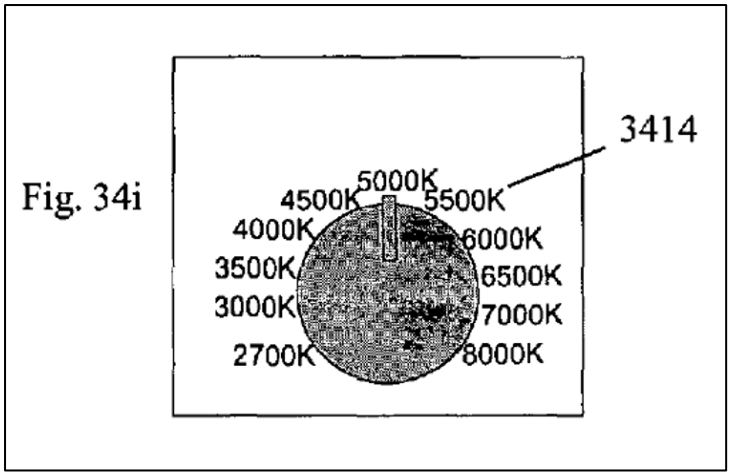
(f) Conclusion For Claim 13

493. As I have explained in the section above, Roberge discloses all elements of claim 13 of the '336 Patent. Accordingly, Roberge anticipates and/or renders obvious claim 13.

7. Claim 15: "The switch of claim 13, wherein each position is discrete within the range of positions."

494. Claim 15 states: "[t]he switch of claim 13, wherein each position is discrete within the range of positions." '336 Patent, 16:8-9.

495. As discussed above and shown below, the rotary switch of Fig. 34i allows the user to select the following white light LED outputs: 2700 K, 3000 K, 3500 K, 4000 K, 4500 K, 5000 K, 5500 K, 6000 K, 6500 K, 7000 K, and 8000 K. Each of the 11 switch positions correspond to a different CCT of light emitted by Roberge's light fixture. Thus, each of the positions are discrete.



Id., Fig. 34i.

496. Therefore, Roberge discloses a CCT switch "wherein each position is discrete within the range of positions."

(a) Conclusion For Claim 15

497. As explained in Section VIII.G.6, Roberge anticipates and/or renders obvious claim 13. This section has also shown that Roberge discloses the additional elements of claim 15. Accordingly, Roberge anticipates and/or renders obvious claim 15.

8. Claim 16: "The switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position."

498. Claim 16 recites: "[t]he switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position." '336 Patent, 16:11-13.

499. As discussed above in Section VIII.F.2 with respect to claim 4 of the '336 Patent, Roberge discloses a CCT switch "wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position." Accordingly, Roberge

discloses a CCT switch "wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position."

(a) Conclusion For Claim 16

500. As explained in Section VIII.G.7, Roberge anticipates and/or renders obvious claim 15. This section has also shown that Roberge discloses the additional elements of claim 16. Accordingly, Roberge anticipates and/or renders obvious claim 16.

H. Ground [4b] – Roberge Alone And/Or In View Of Chaimberg Or Halliwell Renders Obvious Claims 7, 11, and 12 Of The '336 Patent

1. Motivation to Combine Roberge With Chaimberg Or Halliwell

501. As I previously discussed, Chaimberg and Roberge both describe LED lighting systems capable of producing white light for which the CCT is adjustable ("tunable"). In particular, both references disclose applying LEDs of multiple, separate color temperatures to the generation of white light having a variety of color temperatures (CCTs), and both references employ any of a wide range of switches to perform the change in CCT.

502. I explain in Section VIII.C.1 above why a POSA would have been motivated to modify Chaimberg's light fixture with Roberge's CCT switches. For those same reasons, a POSA reviewing Roberge would have been motivated to modify Roberge with the Chaimberg's light fixture. I incorporate my entire discussion in Section VIII.C.1 by reference as if fully set forth herein.

503. Further, a POSA in possession of Roberge's light would have looked to other lighting fixtures, including that disclosed in Chaimberg for additional applications and layouts. In particular, a POSA would have been motivated to incorporate the layout, junction box, and housing disclosed in Chaimberg with the CCT switches disclosed in Roberge.

504. Like Roberge and Chaimberg, Halliwell also describes a number of LED lighting devices and lamps. *See* Halliwell, Abstract. For example, Halliwell states that its "LED lighting device 20 may be a lighting fixture, a luminaire, … and/or the like." *Id.*, 6:36-42. In particular, Halliwell's LED lighting device includes a "device housing 24" that "may be configured to house … one or more LED packages 18…" as shown in Fig. 2 below. *Id.*, 6:51-56. For example, Halliwell discloses a CCT switch 30 that can be mounted on, or within, the housing of the LED lighting device, as illustrated in Fig. 2 below.

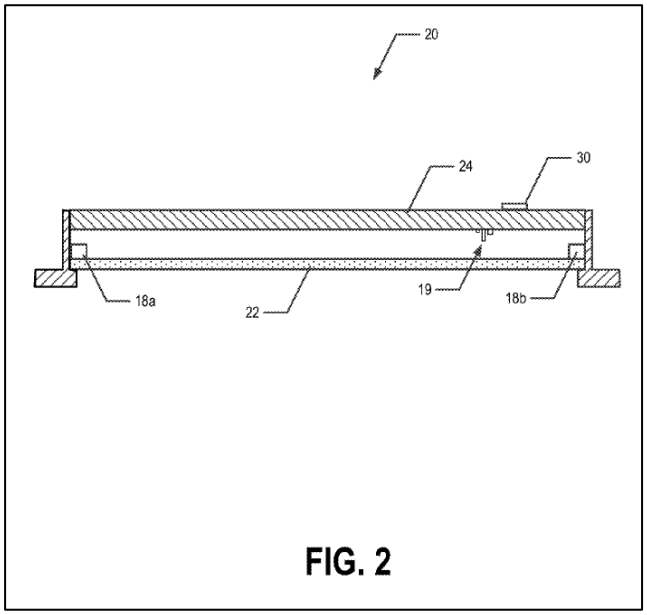


FIG. 2

Halliwell, Fig. 2.

505. However, Halliwell discloses that its LED lighting device could also employ a remote switch in addition to or in place of a housing-mounted switch. *Id.*, 1:60-67. The remote switch could be "a wall switch, remote control, mobile computing device, and/or the like," or even a "junction box mounted toggle switch." *Id.*, 1:60-67, 17:39-42. While Halliwell discloses a "junction box mounted" CCT switch, it does not describe the mechanisms of the switch in detail. However, Halliwell discloses that the remote switch 40 (similar to switch 30) may include "a slide

… button" as an actuator and that the remote switch "may comprise additional user interface components as appropriate for the application." *Id.*, 18:31-41.

506. A POSA in possession of Roberge's light fixture and CCT switches would have looked to other lighting structures and switch locations, such as those in Halliwell to identify additional lighting applications and locations. For example, a POSA would have been motivated to incorporate the junction box switch location and the housing structure disclosed in Halliwell.

507. Accordingly, a POSA would have been motivated to modify Roberge with Halliwell's light fixture and junction box switch location.

2. Claim 7: "The luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch."

508. Claim 7 states: "[t]he luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch." '336 Patent, 14:65-15:2.

509. As discussed above, a POSA would have been motivated to combine Roberge with Chaimberg or Halliwell. As discussed in Section VIII.B.3 above, Chaimberg discloses a luminaire that includes "a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch." Likewise, Section VIII.D.6 above explains why Halliwell discloses a luminaire that includes "a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch."

(a) Conclusion For Claim 7

510. As explained in Section VIII.G.1, Roberge anticipates and/or renders obvious claim 1. This section has also shown that Chaimberg and Halliwell disclose the additional elements of claim 7. Accordingly, Roberge in view of Chaimberg or Halliwell renders obvious claim 7.

3. Claim 11: "The luminaire of claim 1, wherein the switch is inaccessible when the housing is installed."

511. Claim 11 reads as follows: "[t]he luminaire of claim 1, wherein the switch is inaccessible when the housing is installed." '336 Patent, 15:17-18.

512. As discussed above, a POSA would have been motivated to combine Roberge with Chaimberg or Halliwell. As discussed in Section VIII.B.5 above, Chaimberg discloses a luminaire "wherein the switch is inaccessible when the housing is installed." Likewise, Section VIII.D.8 above explains why Halliwell discloses a luminaire "wherein the switch is inaccessible when the housing is installed."

(a) Conclusion For Claim 11

513. As explained in Section VIII.G.1, Roberge anticipates and/or renders obvious claim 1. This section has also shown that Chaimberg and Halliwell disclose the additional elements of claim 11. Accordingly, Roberge in view of Chaimberg or Halliwell renders obvious claim 11.

4. Claim 12: "The luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location."

514. Claim 12 recites: "[t]he luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location." '336 Patent, 15:19-21.

515. As discussed above, a POSA would have been motivated to combine Roberge with Chaimberg or Halliwell. As discussed in Section VIII.B.6 above, Chaimberg discloses a luminaire "wherein the switch is accessible to a user when the housing is removed from its installed location." Likewise, Section VIII.D.9 above explains why Halliwell discloses a luminaire

"wherein the switch is accessible to a user when the housing is removed from its installed location."

(a) Conclusion For Claim 12

516. As explained in Section VIII.G.1, Roberge anticipates and/or renders obvious claim 1. This section also shows that Chaimberg and Halliwell disclose the additional elements of claim 12. Accordingly, Roberge in view of Chaimberg or Halliwell renders obvious claim 12.

5. Claim 19: "The switch of claim 13, wherein the body is configured to be disposed within a junction box."

517. Claim 19 states: "[t]he switch of claim 13, wherein the body is configured to be disposed within a junction box." '336 Patent, 16:23-24.

518. As discussed above in Section VIII.H.2 with respect to claim 7, Chaimberg and Halliwell both disclose a CCT switch located in a junction box. Further, Section VIII.B.9 above explains why Chaimberg discloses a CCT switch "wherein the body is configured to be disposed within a junction box." Likewise, Section VIII.D.13 above explains why Halliwell discloses a CCT switch "wherein the body is configured to be disposed within a junction box."

(a) Conclusion For Claim 19

519. As explained in Section VIII.G.6, Roberge anticipates and/or renders obvious claim 13. This section has also shown that Chaimberg and Halliwell disclose the additional elements of claim 19. Accordingly, Roberge in view of Chaimberg or Halliwell renders obvious claim 19.

I. Ground [5a] – Chen Anticipates And/Or Renders Obvious Claims 1 and 3-5 of the '336 Patent

1. Claim 1

(a) Preamble: "A luminaire comprising"

520. The preamble of claim 1 reads as follows: "[a] luminaire comprising". '336 Patent, 14:31.

521. To the extent the preamble of claim 1 is limiting, Chen discloses a luminaire. For example, Chen relates to a number lighting fixtures, including lighting fixtures "comprising a first lighting load, a second lighting load, a diffuser and a microcontroller based electronic switch." *Id.*, 3:15-18. Chen discloses a number of lighting fixture applications for its microcontroller based switch, including those shown in Figs. 9A, 9B, 10C, and 10D. As shown below, Figs. 9A and 9B are "exemplary embodiment[s] of [Chen's] disclosure for a lighting apparatus." *Id.*, 5:16-21. Fig. 10C shows "an exemplary embodiment of the present disclosure for a wall switch construction electrically connected to a ceiling light for the performance of three working modes." *Id.*, 5:29-32. Likewise, Fig. 10E shows another "exemplary embodiment of the present disclosure for a lighting apparatus with a diffuser of hollow body accommodating the lighting loads and the microcontroller based electronic switch." *Id.*, 5:38-42.

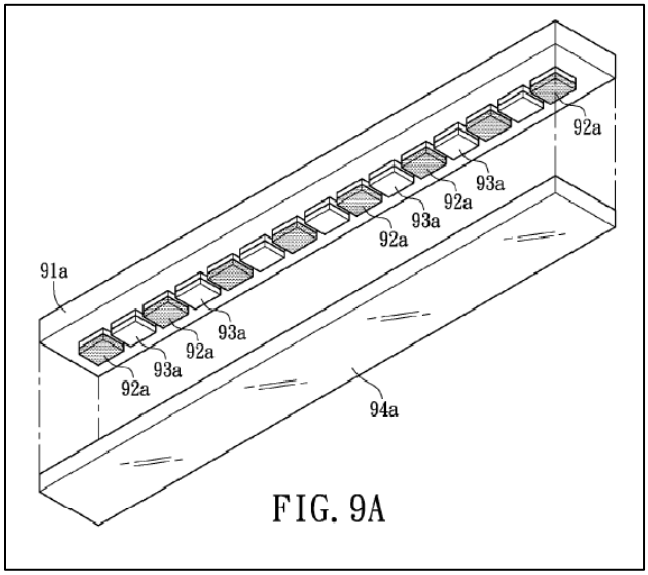


FIG. 9A

Id., Fig. 9A.

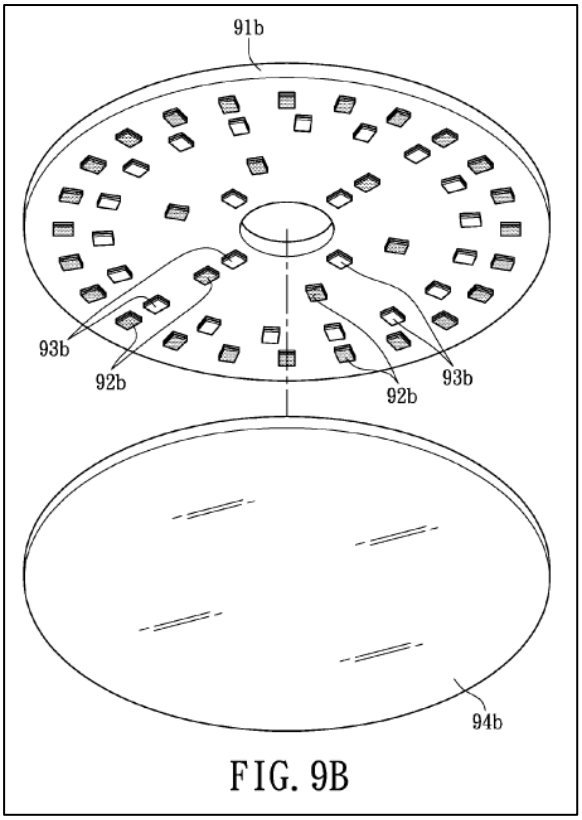


FIG. 9B

Id., Fig. 9B.

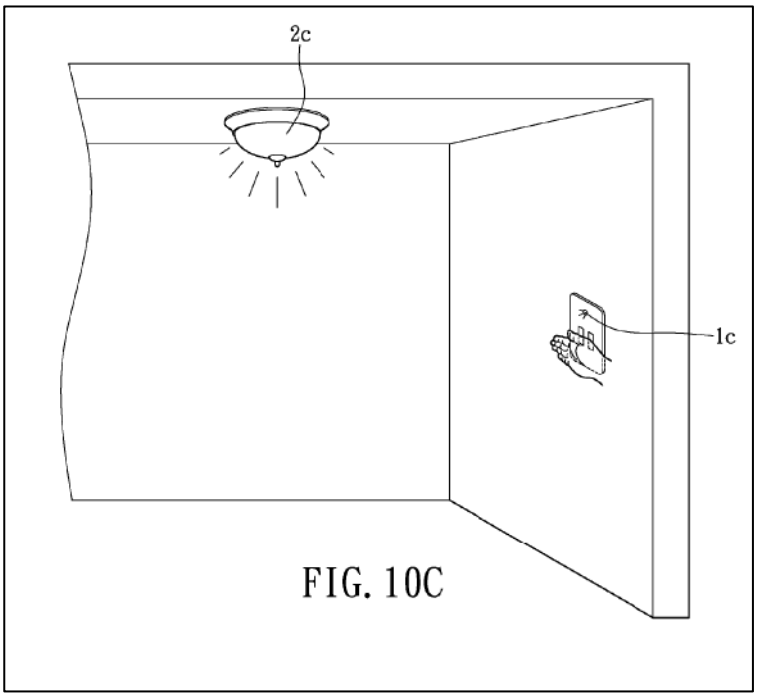


FIG. 10C

Id., Fig. 10C.

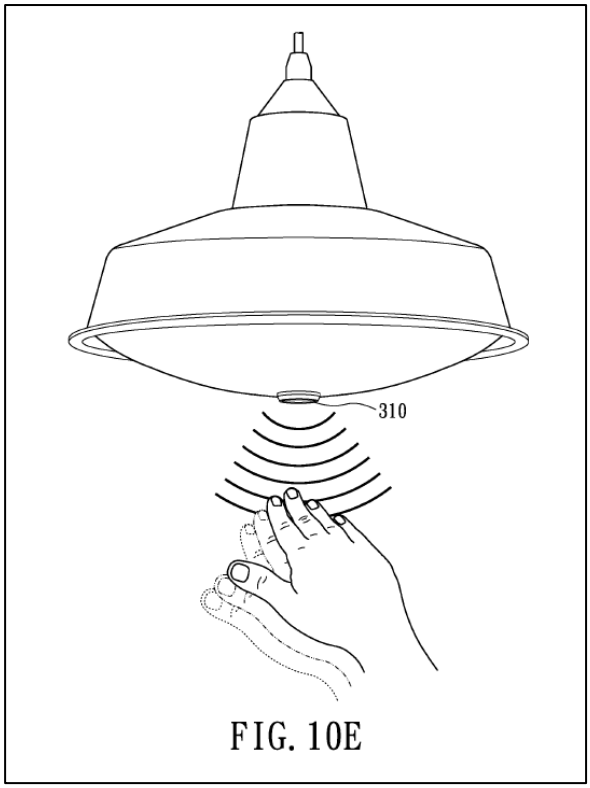


FIG. 10E

Id., Fig. 10E.

522. A POSA would have understood that the lighting fixtures disclosed in Chen, including those shown above, are "luminaires" as recited in the preamble of claim 1 of the '336 Patent.

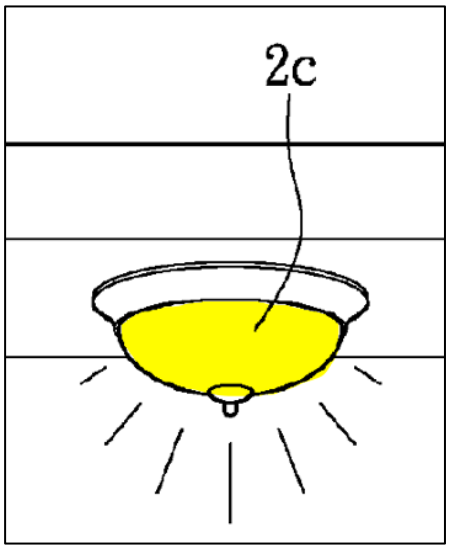
523. Therefore, to the extent the preamble is limiting, Chen discloses it.

(b) Element 1a: "a housing comprising at least one outer surface that forms a first cavity;"

524. Element 1a recites: "a housing comprising at least one outer surface that forms a first cavity." '336 Patent, 14:32-33.

525. While Chen's disclosures focus on the microcontroller based switch, Chen also discloses features of the lighting fixture, including housings. For example, the ceiling light 2c in Fig. 10C includes an outer housing, highlighted in yellow below. Because the LEDs are located inside the ceiling light, a POSA would have understood that the outer housing of the light 2c

includes an open space for the LEDs, i.e., a first cavity. Likewise, Chen explicitly discloses that the light fixture in Fig. 10E is a "lighting apparatus with a diffuser of hollow body [i.e., a body with a cavity] accommodating the lighting loads and the microcontroller based electronic switch." *Id.*, 5:38-42.



Id., Fig. 10C (cropped and color added).

526. Further, Chen Figs. 9A and 9B show additional embodiments of Chen's invention with more internal details of the exemplary light fixtures. In Figs. 9A and 9B, the LEDs 92a/93a and 92b/93a are located on a base and surround by a diffuser 94a/94b. *Id.*, 20:19-21:3. A POSA would have understood that this diffuser 94a/94b and base 91a/91b act as a housing with an outer surface and forms an opening where the LEDs are located (i.e., forms a first cavity).

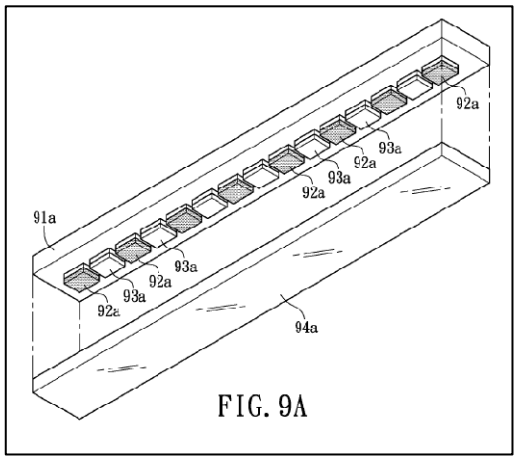


FIG. 9A

Id., Fig. 9A.

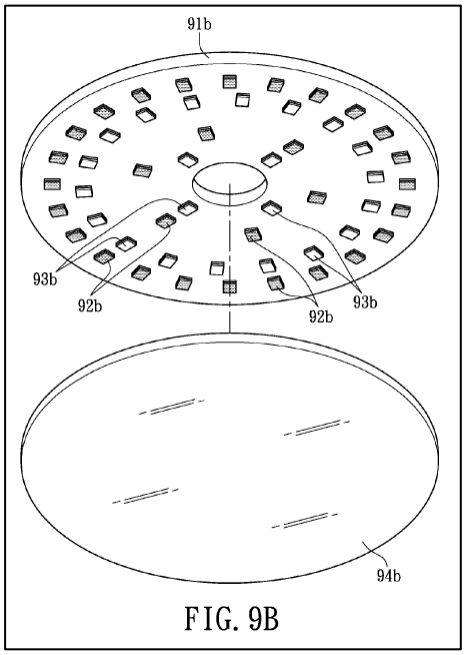


FIG. 9B

Id., Fig. 9B.

527. Thus, Chen's lighting apparatus includes "a housing comprising at least one outer surface that forms a first cavity."

528. Moreover, the '336 Patent concedes that this claim element was known in the prior art. For example, Fig. 8 (labeled "prior art") depicts a housing 805 with an outer surface that forms a cavity. *See, e.g.*, '336 Patent, Fig. 8.

(c) Element 1b: "at least one electrical component disposed, at least in part, within the first cavity;"

529. Element 1b recites: "at least one electrical component disposed, at least in part, within the first cavity." '336 Patent, 14:34-35.

530. For example, as discussed above with respect to element 1a, Chen's lighting apparatuses shown in Figs. 9A, 9B, 10C, and 10E all include LEDs within the first cavity. Figs. 9A and 9B include additional structural detail of the lighting fixture as noted above. For example, Figs. 9A and 9B show LEDs 92a/93a and 92b/93b located on the base 91a/91b and encased by the diffuser (housing) 94a/94b. *Id.*, 20:19-21:3. As discussed above, the LEDs located within the space (cavity) created by the "housing" (diffuser 94a/94b and base 91a/91b). Exemplary LEDs have been highlighted in Figs. 9A and 9AB below.

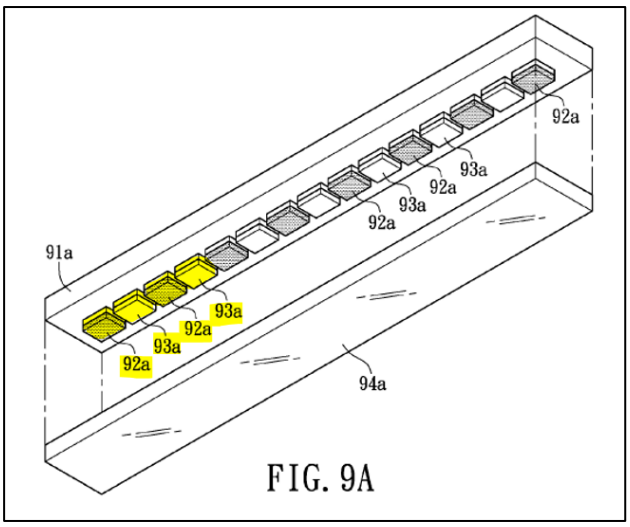


FIG. 9A

Id., Fig. 9A (color added).

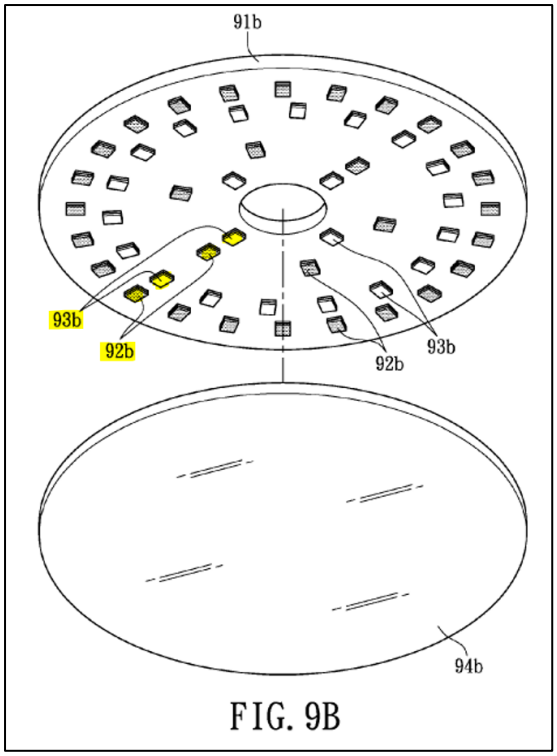
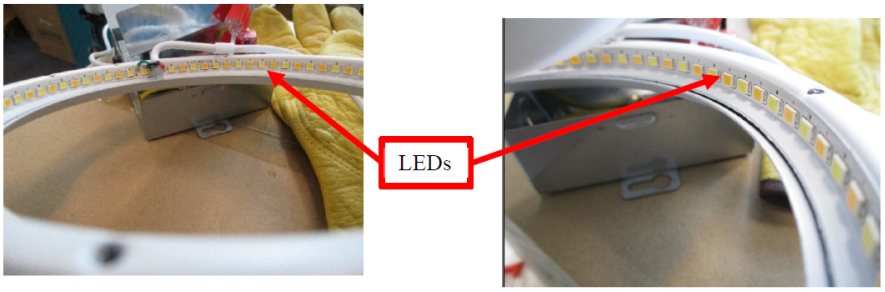


FIG. 9B

Id., Fig. 9B (color added).

531. Thus, Chen's LED lighting apparatus includes "at least one electrical component disposed, at least in part, within the first cavity."

532. It is also my understanding that, in its infringement contentions, Signify has interpreted the phrase "at least one electrical component" of claim 1 as encompassing LEDs such as those disclosed in Chen. A portion of the claim chart prepared by Signify is given below:

[1.b] at least one electrical component disposed, at least in part, within the first cavity;	The 349-1292 product includes at least one electrical component disposed, at least in part, within the first cavity. For example, the 349-1292 product includes LEDs disposed within the first cavity. 

Appx. G-1 to Signify's Infringement Contentions, 6.

533. Finally, the '336 Patent itself also concedes that this claim element was known in the prior art. Indeed, Fig. 8 (labeled "prior art") is described as a luminaire including "one or more [electrical components (*e.g.,* light sources)] disposed on and/or within the housing 805." *See, e.g.*, '336 Patent, Fig. 8; 11:5-12.

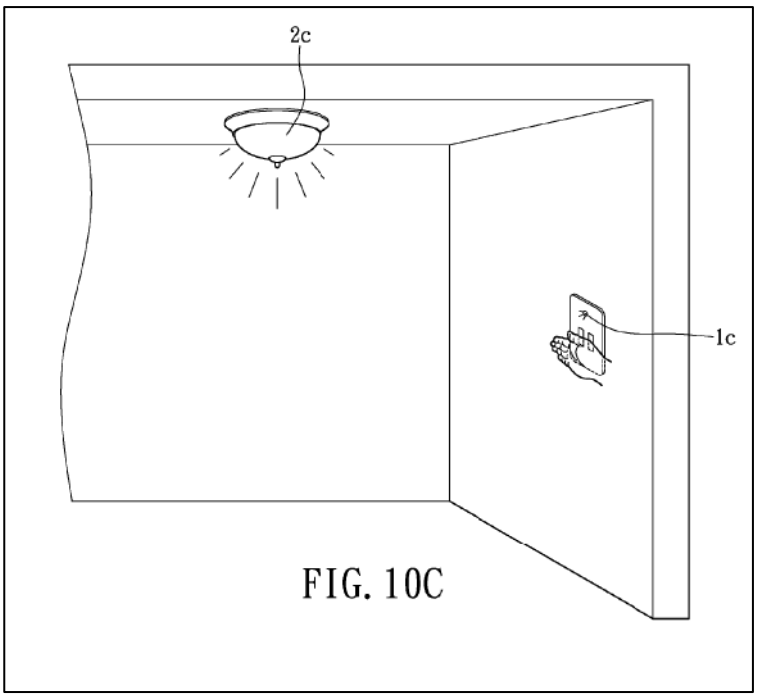
(d) Element 1c: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component; and"

534. Element 1c recites: "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component." '336 Patent, 14:36-38.

535. As discussed above, Fig. 10C shows an application of Chen's invention wherein the microcontroller based switch is "a wall switch [1c] that is electrically connected to a ceiling light [2c]." *See id.*, 22:61-23:15. The user waves their hand in front of the switch 1c to adjust the color temperature of the light output by the ceiling light 2c. *Id.*

536. A POSA would have understood that, "electrically connected" means that Chen's switch 1c and ceiling light 2c are connected by an electrical cable in the wall, just like standard wall switches/ceiling lights. A POSA thus would have understood that, in order to control the light

output by the LEDs in ceiling light 2C, the electrical cable would necessarily be connected to the LEDs, i.e., the one or more electrical components.



Id., Fig. 10C.

537. Consequently, Chen describes "an electrical cable comprising a first end and a second end, wherein the first end is coupled to the at least one electrical component." Moreover, the '336 Patent concedes that this claim element was also known in the prior art. Indeed, Fig. 8 (labeled "prior art") depicts an electrical cable 827 that is "connected to the one or more [electrical] components (*e.g.*, light sources) disposed … within the housing 805." *See, e.g.*, '336 Patent, Fig. 8, 11:5-12.

(e) Element 1d: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing,"

538. Element 1d recites: "a switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing." '336 Patent, 14:39-40.

539. As discussed above, Fig. 10C shows an application of Chen's invention wherein the microcontroller-based switch is "a wall switch [1c] that is electrically connected to a ceiling light [2c]." Chen, 22:61-23:15. The user waves their hand in front of the switch 1c to adjust the color temperature of the light output by the ceiling light 2c. *Id.*, In addition, a POSA would have understood that "electrically connected" would mean that Chen's switch 1c, including the microcontroller-based switch, and ceiling light 2c would necessarily be connected by an electrical cable in the wall as are conventional wall switches and ceiling lights. A POSA would, therefore, have understood that, in order to control the light output by the LEDs in ceiling light 2C, the electrical cable would necessarily be connected to the LEDs—i.e., the one or more electrical components on one end—and the switch 1c on the other. It should also be mentioned that, as shown below, the switch 1c is located remotely from the housing portion of the light 2c.

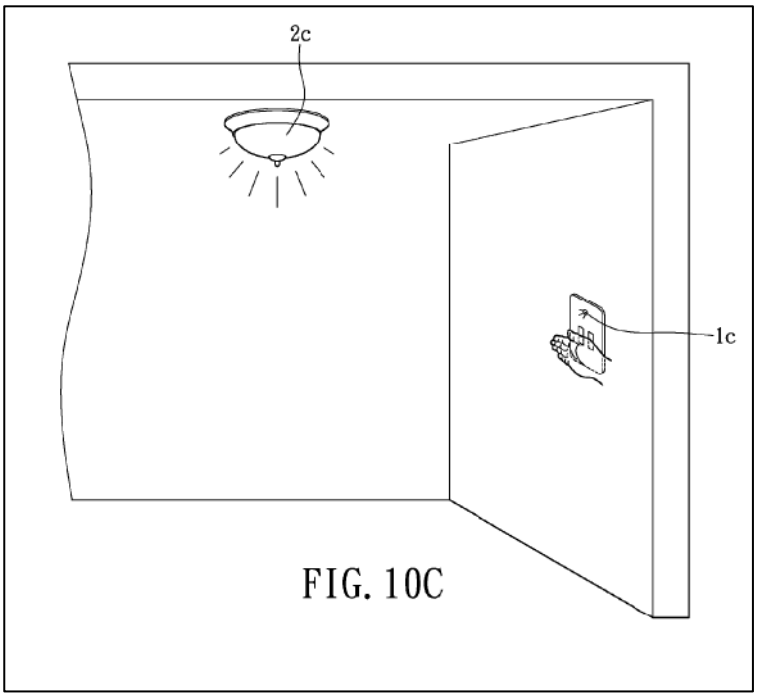


FIG. 10C

Id., Fig. 10C.

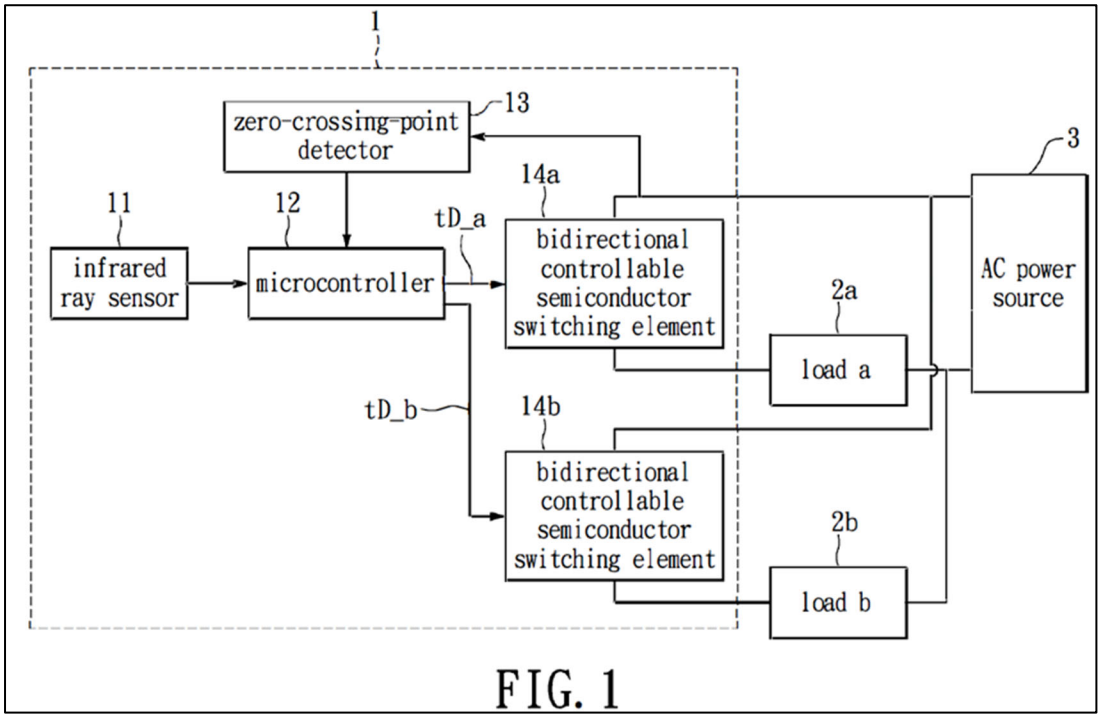
540. Thus, Chen discloses a "switch coupled to the electrical cable, wherein the switch is disposed remotely from the housing."

(f) Element 1e: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire."

541. Element 1e reads as follows: "wherein the switch has a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire." '336 Patent, 14:40-45.

542. As discussed above, Chen discloses a "microcontroller based electronic switch [which] comprises a first controllable switching element, a second controllable switching element, a detection device and a microcontroller. The first controllable switching element is electrically connected between a power source and a first lighting load for emitting light with a first color temperature. The second controllable switching element is electrically connected between the power source and a second lighting load for emitting light with a second color temperature." Chen, 2:19-28. Chen further states that its "microcontroller based electronic switch" serves to "control the lighting power levels, ***the color temperature*** of the diffused light (also called the blended or mingled light) of the first lighting load and the second lighting load can be controlled." *Id.*, 3:49-53 (emphasis added). Further, the exemplary switch shown in Chen Fig. 10C discussed above provides "a convenient way [for the user] to select a desired illumination color temperature." *Id.*, 23:4-9. The sensing portion of the switch in Fig. 10C will detect "a motion of double swings across the detecting zone … and activate the performance of the color temperature management mode" which enables the user to adjust the color temperature output of the lighting apparatus. *Id.*

543. Chen includes addition details regarding its microcontroller based electronic switch. For example, Chen states that Fig. 1 "is a block diagram of a microcontroller based electronic switch using an infrared ray sensor as a detection device applied for two AC lighting loads with different color temperatures powered by an AC power source according to an exemplary embodiment of the present disclosure." *Id.*, 4:43-47. As shown below, Chen's exemplary switch includes two unidirectional/bidirectional, controllable semiconductor switching elements (14a and 14b), one for each set of LEDs (2a and 2b). *Id.*, 6:2-20; *see also* Fig. 8A.



Chen at Fig. 1.

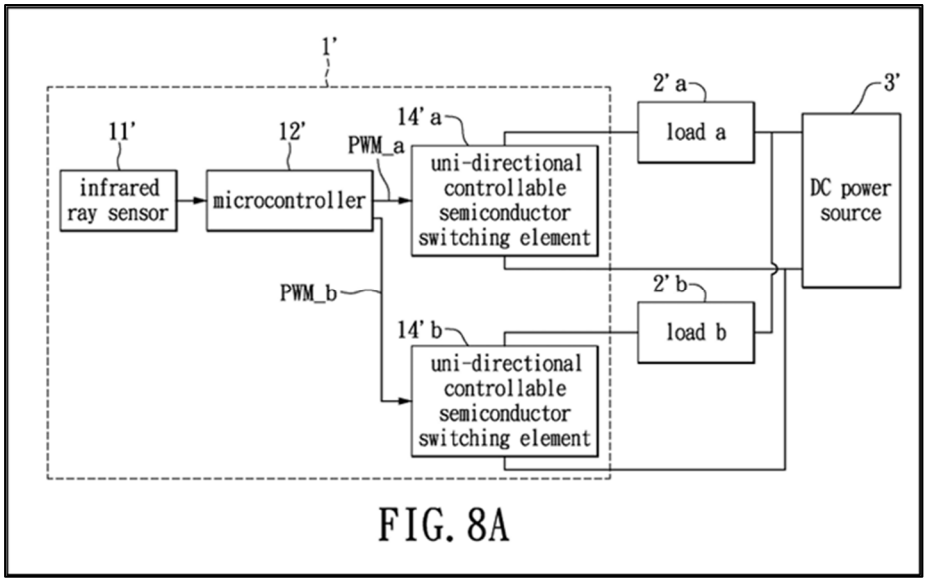


FIG. 8A

Id., Fig. 8A.

544. Based on the desired setting, the two switching elements (14a and 14b) will adjust the power to the LEDs (2a and 2b) to emit the desire CCT output. A POSA would have readily understood that each CCT output setting in these switching elements constitutes a different, distinct position of the microcontroller based switch. Chen specifically describes a range of CCT values, ranging from 3000 K to 5700 K, that can be selected with the microcontroller based switch. *Id.*, 7:14-33. In particular, Chen included the following details—years before any application related to the '336 Patent was filed:

> In another example, X-watt can be zero watts and Y-watt can be twelve watts, such that the power of the first lighting load 2 *a* ranges from zero watts to twelve watts, and the power of the second lighting load 2 *b* ranges from twelve watts to zero watts, wherein X+Y watt can be fixed to twelve watts. When the color temperatures of the first lighting load 2 *a* and the second lighting load 2 *b* are respectively 3000K and 5700K, the apparent color temperature of the diffused light of the first lighting load 2 *a* and the second lighting load 2 *b* can range from 3000K (twelve watts of the first lighting load 2 *a* and no power of the second lighting load 2 *b*) to 5700K (twelve watts of the second lighting load 2 *b* and no power of the first lighting load 2 *a*) depending on the electric power transmission levels fed to the first lighting load 2 *a* and the second

> lighting load 2 *b*. Thus, a desired color temperature may be generated by controlling the power levels of the first lighting load 2 *a* and the second lighting load 2 *b* to create proper color blending effect under a fixed total lighting power level with this type of microcontroller based electronic switch.

Id.

545. Chen discloses the following formula for calculating the apparent CCT output discussed above: CTapp = CT1 · X/(X+Y) + CT2 · Y/(X+Y). *Id.*, 6:37-63. A POSA would have understood, based on Chen's microcontroller based switch using the color temperature turning formula is a CCT switch with "a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire."

546. Accordingly, Chen's microcontroller based electronic switch has "a plurality of positions, wherein each position of the plurality of positions of the switch corresponds to a discrete correlated color temperature (CCT) output emitted by one or more light sources of the luminaire."

(g) Conclusion For Claim 1

547. As explained in the section above, Chen discloses all elements of claim 1 of the '336 Patent. Accordingly, Chen anticipates and/or renders obvious claim 1.

2. Claim 3: "The luminaire of claim 1, wherein each position of the plurality of positions is discrete."

548. Claim 3 states: "[t]he luminaire of claim 1, wherein each position of the plurality of positions is discrete." '336 Patent, 14:47-48.

549. As discussed above, Chen's microcontroller based electronic switch serves to "control the lighting power levels, ***the color temperature*** of the diffused light (also called the blended or mingled light) of the first lighting load and the second lighting load can be controlled." *Id.*, 3:49-53 (emphasis added). As shown below, Chen's exemplary switch includes two

bidirectional (or uni-directional) controllable semiconductor switching elements (14a and 14b), one for each set of LEDs (2a and 2b). *Id.*

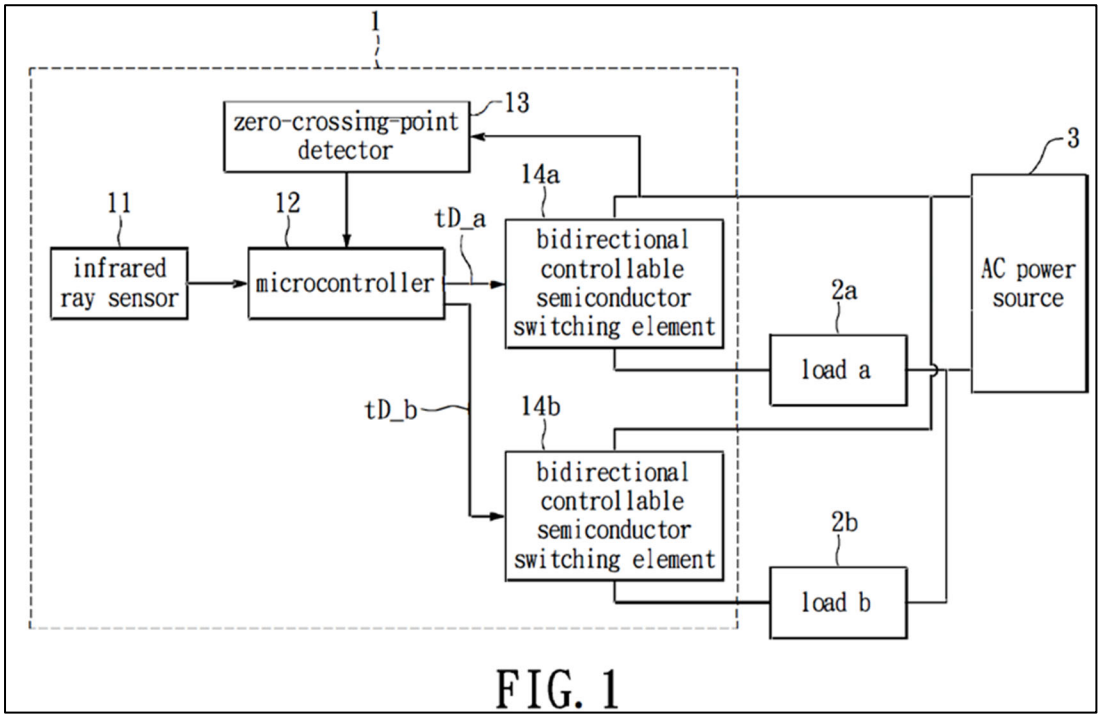


FIG. 1

Chen at Fig. 1.

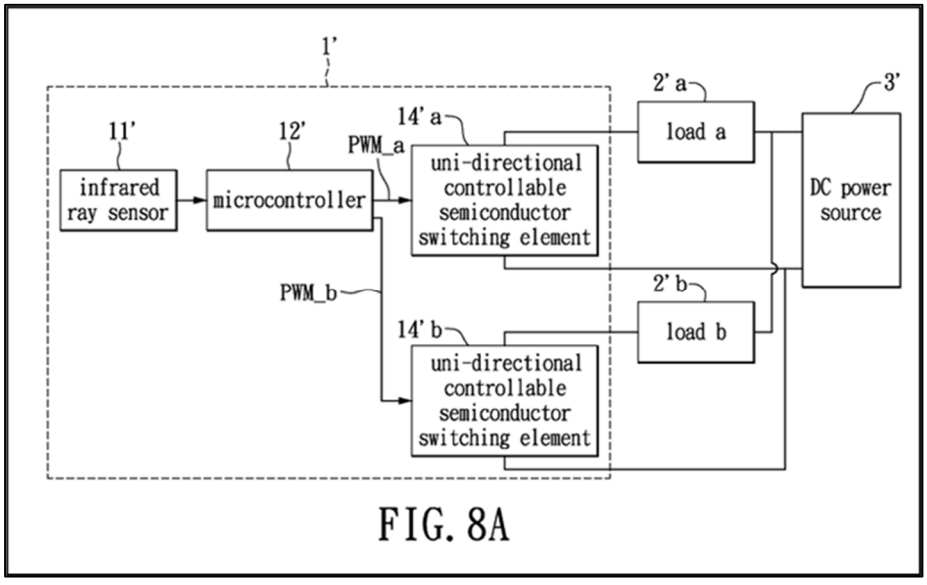


FIG. 8A

Id., Fig. 8A.

550. Based on the desired setting, the two switching elements (14a and 14b) adjust the power delivered to the LEDs (2a and 2b) so as to emit light having the desired CCT value(s). A POSA would have understood that each CCT value provided by these switching elements constitutes a distinct switch "position."

551. Thus, Chen's microcontroller based electronic switch is a switch "wherein each position of the plurality of positions is discrete."

(a) Conclusion For Claim 3

552. As explained in Section VIII.I.1, Chen anticipates and/or renders obvious claim 1 of the '336 Patent. This section has shown that Chen discloses the additional elements of claim 3. Accordingly, Chen anticipates and/or renders obvious claim 3 of the '336 Patent.

3. Claim 4: "The luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position."

553. Claim 4 reads: "[t]he luminaire of claim 3, wherein the plurality of positions of the switch comprises a first position, a second position, a third position, a fourth position, and a fifth position." '336 Patent, 14:49-52.

554. As discussed above with respect to claim 1, Chen discloses a "microcontroller based electronic switch [which] comprises a first controllable switching element, a second controllable switching element, a detection device and a microcontroller. The first controllable switching element is electrically connected between a power source and a first lighting load for emitting light with a first color temperature. The second controllable switching element is electrically connected between the power source and a second lighting load for emitting light with a second color temperature." Chen, 2:19-28. Chen further discloses that its "microcontroller based electronic switch" is used to "control the lighting power levels, ***the color temperature*** of the

diffused light (also called the blended or mingled light) of the first lighting load and the second lighting load can be controlled." *Id.*, 3:49-53. Further, Chen Fig. 1 "is a block diagram of a microcontroller based electronic switch using an infrared ray sensor as a detection device applied for two AC lighting loads with different color temperatures powered by an AC power source according to an exemplary embodiment of the present disclosure." *Id.*, 4:43-47. As shown below, Chen's exemplary switch includes two bidirectional (or unidirectional), controllable semiconductor switching elements (14a and 14b), one for each set of LEDs (2a and 2b). *Id.*

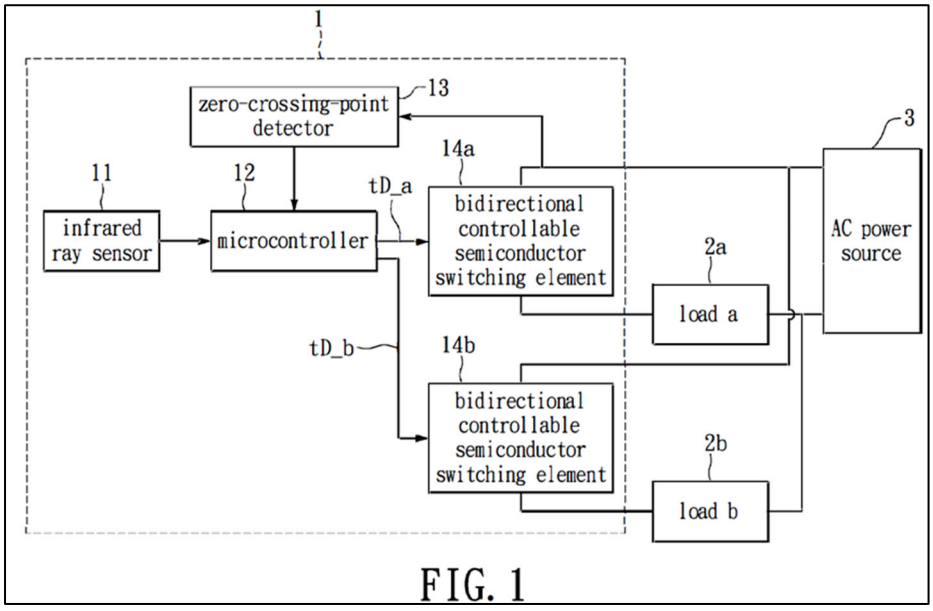


FIG. 1

Chen at Fig. 1.

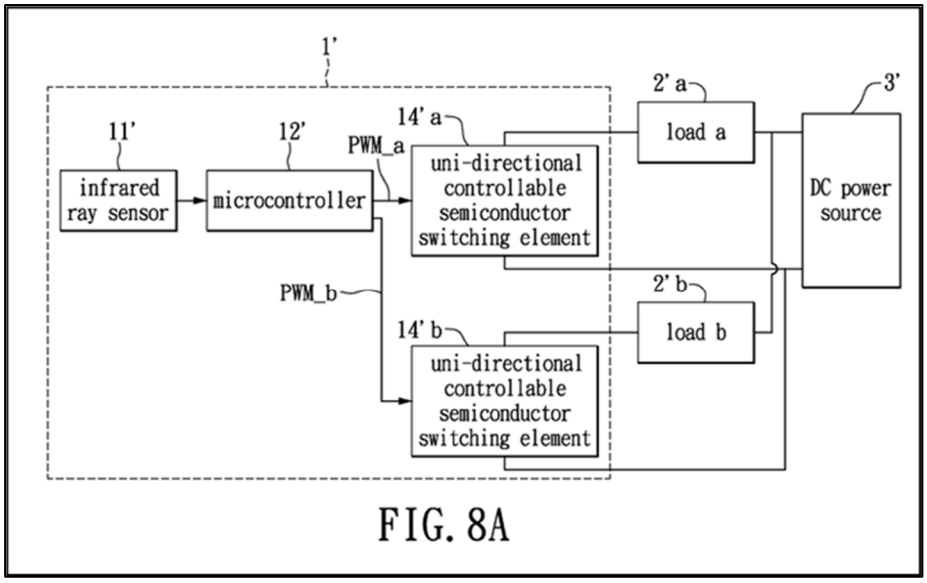


FIG. 8A

Id., Fig. 8A.

555. Based on the desired setting, the two switching elements (14a and 14b) will adjust the power to the LEDs (2a and 2b) to emit the desire CCT output. As discussed above, a POSA would have understood that each CCT value provided by these switching elements constitutes a distinct switch "position". Chen's exemplary light includes two sets of LEDs, a first (2a) emitting light having a 3000 K CCT, and a second (2b) emitting light with a 5700 K CCT. First, Chen discloses two settings (positions) for powering only one set of LEDs (2a or 2b). Consequently, two positions of Chen's switch are 3000 K and 5700 K.

556. Secondly, Chen explains in detail the equation used to control and create the "apparent" CCT output (CTapp) which results from blending the light from LEDs 2a and 2b. *See id.*, 6:2-7:33. By controlling the power to each of the LEDs 2a and 2b, Chen's microcontroller-based switch can emit light having CCT values over a wide range.. Chen explains that "a desired color temperature may be generated by controlling the power levels of the first lighting load 2a and the second lighting load 2b to create proper color blending effect under a fixed total lighting power level." *Id.*, 7:28-32. In particular, Chen notes that the exemplary blended apparent CCT

"can range from nearly 3700K … to 5000K." *Id.*, 7:3-13. Therefore, Chen describes the generation of light having one of numerous CCT outputs, including for example, 3700 K and 5000K, and other values in between, such as 4500 K.

557. Thus, a POSA would have understood that Chen discloses a CCT switch with at least five positions, including positions corresponding to the following CCT outputs: 3000K (LEDs 2a) 3700 K; 4500 K; 5000 K; and 5700K (LEDs 2b).

(a) Conclusion For Claim 4

558. As explained in Section VIII.I.2, Chen anticipates and/or renders obvious claim 3 of the '336 Patent. This section has also shown that Chen discloses the additional elements of claim 4. Accordingly, Chen anticipates and/or renders obvious claim 4 of the '336 Patent.

4. Claim 5: "The luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources."

559. Claim 5 states: "[t]he luminaire of claim 4, wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources." '336 Patent, 14:53-62.

560. As discussed above with respect to claim 4, a POSA would have understood that Chen disclosed five or more positions, two of which correspond to powering only LEDs 2a and LEDs 2b. Other positions generate "blended" light which correspond to combining light from both LEDs 2a and 2b so as to obtain other CCT values. While Chen's exemplary CCT outputs range from 3000 K to 5700 K, a POSA would have understood that these values are simply examples and Chen's light could be readily modified by, for example, replacing the 3000 K at "2a" with 2700 K LEDs.

561. 562. Consequently, Chen inherently discloses an LED light source capable of generating a range of apparent CCT values. Therefore, a POSA would have thus understood that Chen's luminaire could have included a CCT switch "wherein the first position of the switch corresponds to 2700 Kelvin (K) output by the one or more light sources, wherein the second position of the switch corresponds to 3000 K output by the one or more light sources, wherein the third position of the switch corresponds to 3500 K output by the one or more light sources, wherein the fourth position of the switch corresponds to 4000 K output by the one or more light sources, and wherein the fifth position of the switch corresponds to 5000 K output by the one or more light sources." Modifying Chen's microcontroller-based switch to incorporate such positions would simply be a matter of routine design choice.

(a) Conclusion For Claim 5

562. As explained in Section VIII.I.3, Chen anticipates and/or renders obvious claim 4 of the '336 Patent. This section has also shown that Chen discloses the additional elements of claim 5. Accordingly, Chen anticipates and/or renders obvious claim 5 of the '336 Patent.

J. Ground 5[b] – Chen Alone And/Or In View Of Chaimberg Renders Obvious Claims 4, 5, 7, 9, 11-13, 15, 16, and 19 of the '336 Patent

1. Motivation to Combine Chen and Chaimberg

563. As discussed above in Sections VII.A.1 and VII.A.5, Chen and Chaimberg disclose LED lighting systems capable of producing white light for which the CCT is adjustable. As discussed above, Chen's disclosures focus on a microcontroller-based CCT switch that "tunes" the CCT value of emitted light as desired. On the other hand, Chaimberg focuses on the structure of the LED light fixture and external switch features, without providing the extensive, microcontroller-based CCT tuning capability of Chen.

564. In particular, Chen's invention enables the blending of the light produced by two sets of LEDs having different CCT values in order to create a third CCT value that is determined by: (1) the CCTs of the two sets of LEDs, and (2) the ratios of power level respectively delivered to each of the two sets of LEDs. This method is known as CCT "tuning" or, as described earlier, "white light" tuning. Chen performs "color temperature tuning [by] controlling different levels of electric power transmission to the two lighting loads [reversely and complementary] 2a [LEDs of a first temperature] and 2b [LEDs of a second temperature] by controlling" the power delivered to the LEDs as shown in Fig. 8A below. Chen, 8:24-59, Fig. 8A.

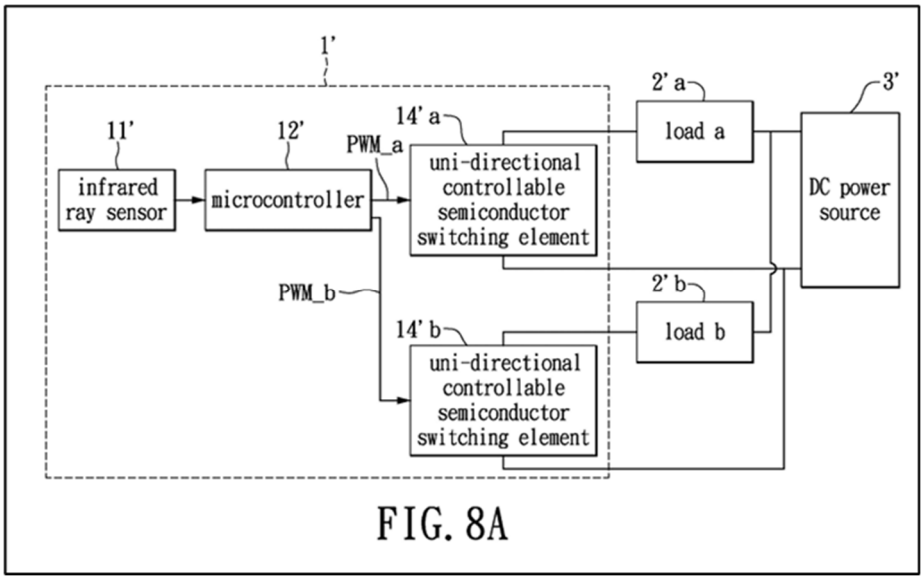
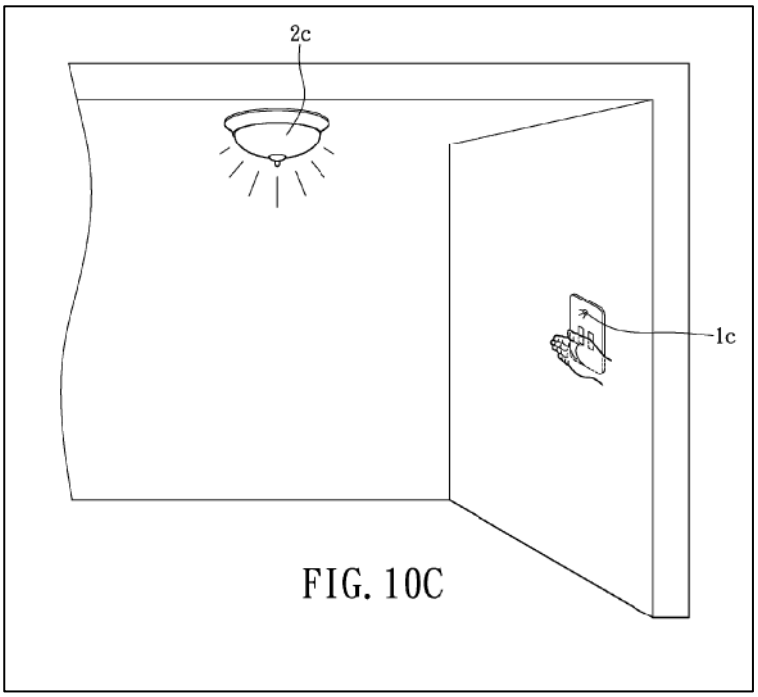


FIG. 8A

Id., Fig. 8A.

565. Chen focuses on an infrared ray sensor based switch, but other switch configurations are also described in Chen, including a button switch. Regardless of the switch chosen, it serves to generate a sensing signal that results in controlling "the color temperature of the blended light" output of Chen's LED light fixture. Chen, 10:65-11:7.

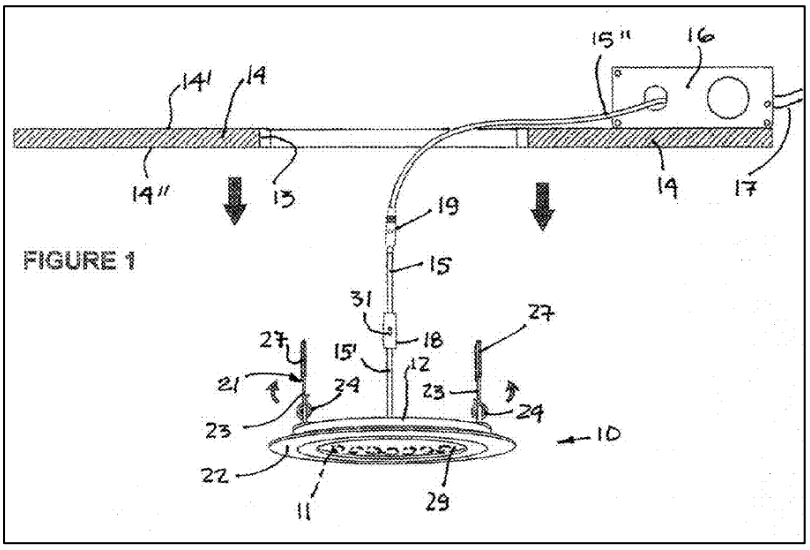
566. Chen discloses a range of CCT values, ranging from 3000 K to 5700 K, that can be selected with the microcontroller-based switch. *Id.*, 7:14-33. But a POSA would have understood that Chen could have been modified so as to offer a larger, or different, range of CCT values. Chen also discloses a number of lighting fixture applications for its microcontroller-based switch. For example, Fig. 10C shows "an exemplary embodiment of the present disclosure for a wall switch construction electrically connected to a ceiling light for the performance of three working modes." *Id.*, 5:29-32.



Id., Fig. 10C.

567. A POSA in possession of Chen's invention would have considered incorporating Chen's microcontroller-based CCT switch to other light fixtures and lighting applications. Chaimberg discloses such a light fixture. As discussed in detail above, Chaimberg discloses "[a] ceiling mountable LED light fixture … wherein at least two sets of LED's of different correlated color temperatures (CCT) are mounted in its housing." Chaimberg, Abstract, 1:7-10, 2:24-44. Chaimberg's LED light fixture is "adapted to be removably secured" in a ceiling. *Id*., Abstract. "A cable [15] is secured to [Chaimberg's] light fixture to supply drive current to the LED sets." *Id.*, Abstract, 3:61-4:3.

568. Chaimberg's LED light fixture is typically installed into a ceiling. In "Fig. 1, the LED light fixture 10 is shown retracted from its fixture mounting hole" in a ceiling. *Id.*, 3:13-15. Figure 2 is an illustration of Chaimberg's LED light fixture "mounted in the fixture mounting hole" in the ceiling. *Id.*, 2:58-61, Fig. 2.



Id., Fig. 1.

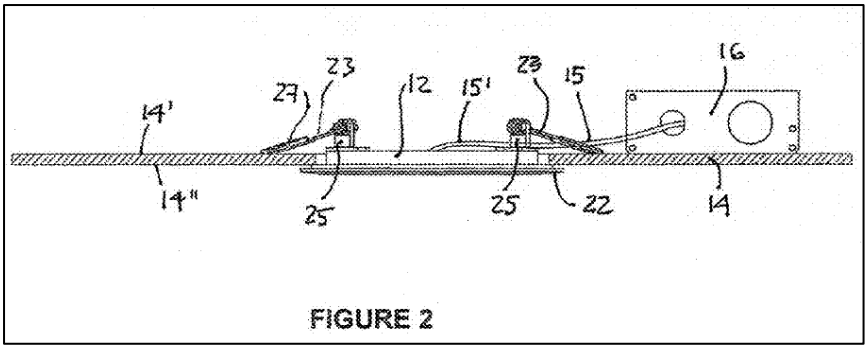


FIGURE 2

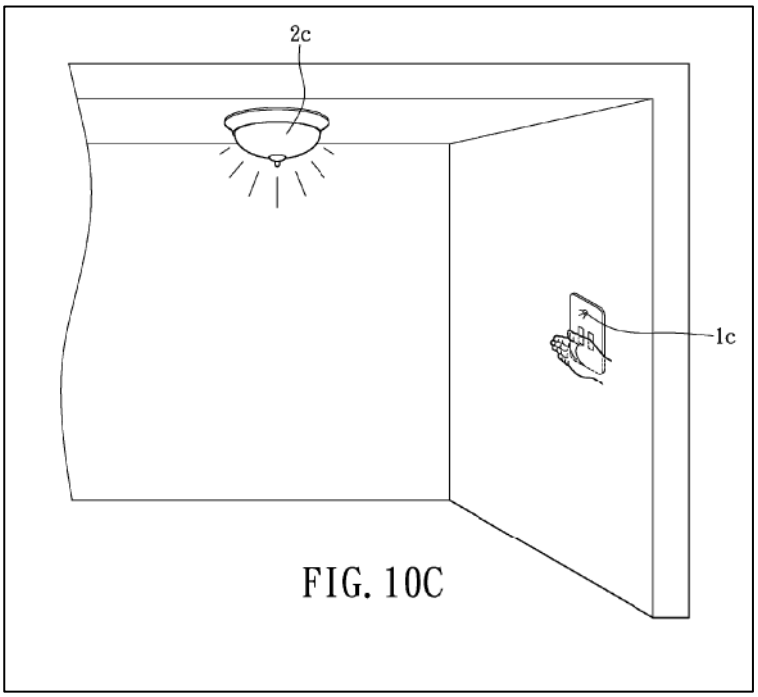
Id., Fig. 2

569. In addition, while the example LED light fixture in Chaimberg's luminaire includes LEDs emitting light having *two* distinct correlated color temperatures (CCTs) so as to make possible the generation of light having one of *three* CCT outputs, it also mentions that the light fixture could include more than two sets of LEDs. Chen discloses a LED light fixture and corresponding microcontroller-based switch capable of producing more than three CCT outputs. A POSA would have understood that Chen's switch would function well in Chaimberg's LED light fixture and that Chaimberg's light fixture would open additional applications for the use of Chen's switch. Such applications would include hotels, airports, and other public settings in which the versatility of Chen's switch in varying the CCT of the light source would be of considerable value.

2. Claim 7: "The luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch."

570. Claim 7 recites: "[t]he luminaire of claim 1, further comprising: a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch." '336 Patent, 14:65-15:2.

571. As discussed above, Fig. 10C shows an application of Chen's invention wherein the microcontroller-based switch is "a wall switch [1c] that is electrically connected to a ceiling light [2c]." *See id.*, 22:61-23:15. In this application, the motion of a hand waved in front of the switch 1c is sufficient to vary the color temperature (CCT) of the light output from the ceiling light 2c. *Id.* A POSA would have understood that the housing (wall box) for switch 1c would necessarily form a cavity in which the switching functionality components were located. A POSA would also have understood that this housing could qualify as a "junction box" as recited in claim 7.



Id., Fig. 10C.

572. Therefore, a POSA would have understood that Chen discloses a luminaire which includes "a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch."

573. To the extent that Chen does not inherently disclose the additional limitations of claim 7, as explained in Section VIII.J.1 above, a POSA would have been motivated to combine Chen with Chaimberg. Further, Section VIII.B.3 above explains that Chaimberg presents a luminaire with "a junction box comprising at least one wall that forms a second cavity, wherein the switch is disposed within the second cavity, wherein the second end of the electrical cable is coupled to the switch."

(a) Conclusion For Claim 7

574. As explained in Section VIII.I.1, Chen anticipates and/or renders obvious claim 1. This section has also shown that Chen and Chaimberg disclose the additional elements of claim 7. Accordingly, Chen alone and/or in view of Chaimberg renders obvious claim 7 of the '336 Patent.

3. Claim 9: "The luminaire of claim 1, wherein the switch is a slide switch."

575. Claim 9 states: "[t]he luminaire of claim 1, wherein the switch is a slide switch." '336 Patent, 15:13-14.

576. As noted above, Chen discloses that its switch could be implemented as a "direct touch switch (such as a push button or a touch sensor)." *Id.*, 4:8-10. As discussed at length earlier, physical switches, including slide switches, were well known in the art for decades before the alleged invention of the '336 Patent. Thus, a POSA would have understood that a slide switch could have been used as the "touch or push button" disclosed in Chen.

577. Moreover, as discussed in Section VIII.J.1 above, a POSA would have been motivated to combine Chen with Chaimberg. In addition, Section VIII.B.4 above explains that Chaimberg discloses a luminaire with a CCT switch "wherein the switch is a slide switch."

(a) Conclusion For Claim 9

578. As explained in Section VIII.I.1, Chen anticipates and/or renders obvious claim 1. This section has also shown that Chen and Chaimberg describe the additional elements of claim 9. Accordingly, Chen alone and/or in view of Chaimberg renders obvious claim 9 of the '336 Patent.

4. Claim 11: "The luminaire of claim 1, wherein the switch is inaccessible when the housing is installed."

579. Claim 11 states: "[t]he luminaire of claim 1, wherein the switch is inaccessible when the housing is installed." '336 Patent, 15:17-18.

580. As discussed in Section VIII.J.1 above, a POSA would have been motivated to combine Chen with Chaimberg. Furthermore, Section VIII.B.5 above explains that Chaimberg discloses a luminaire "wherein the switch is inaccessible when the housing is installed."

(a) Conclusion For Claim 11

581. As explained in Section VIII.I.1, Chen anticipates and/or renders obvious claim 1. This section has also shown that Chen and Chaimberg disclose the additional elements of claim 11. Accordingly, Chen alone and/or in view of Chaimberg renders obvious claim 11 of the '336 Patent.

5. Claim 12: "The luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location."

582. Claim 12 recites: "[t]he luminaire of claim 1, wherein the switch is accessible to a user when the housing is removed from its installed location." '336 Patent, 15:19-21.

583. As discussed in Section VIII.J.1 above, a POSA would have been motivated to combine Chen with Chaimberg. In addition, Section VIII.B.6 above explains that Chaimberg discloses a luminaire "wherein the switch is accessible to a user when the housing is removed from its installed location."

(a) Conclusion For Claim 12

584. As explained in Section VIII.I.1, Chen anticipates and/or renders obvious claim 1. This section has also shown that Chen and Chaimberg disclose the additional elements of claim 12. Accordingly, Chen alone and/or in view of Chaimberg renders obvious claim 12 of the '336 Patent.

6. Claim 13:

(a) Preamble: "A switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising:"

585. The preamble of claim 13 reads as follows: "[a] switch for controlling a correlated color temperature (CCT) of light emitted by a luminaire, the switch comprising." '336 Patent, 15:22-24.

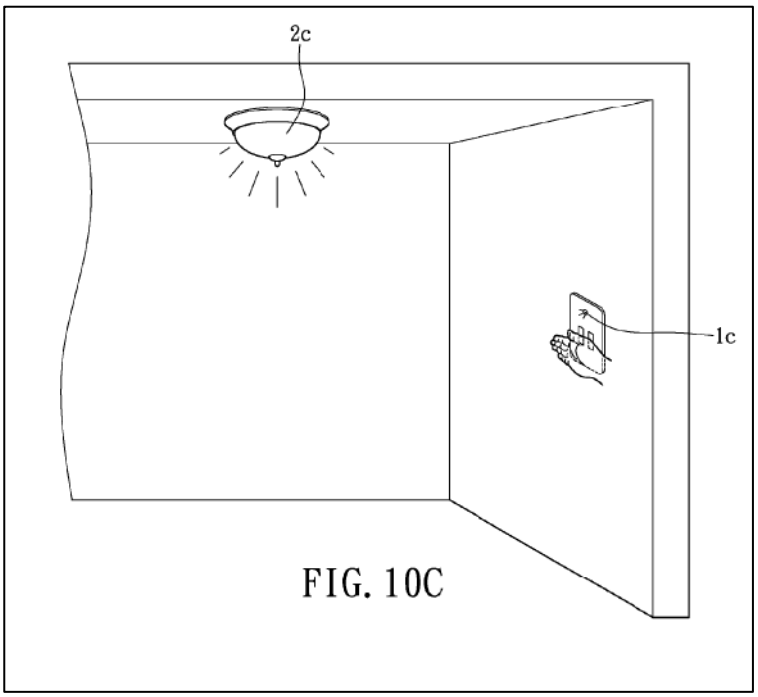
586. As discussed above with respect to claim 1, Chen discloses a "microcontroller based electronic switch [which] comprises a first controllable switching element, a second controllable switching element, a detection device and a microcontroller. The first controllable switching element is electrically connected between a power source and a first lighting load for emitting light with a first color temperature. The second controllable switching element is electrically connected between the power source and a second lighting load for emitting light with a second color temperature." Chen, 2:19-28. Chen further discloses that its "microcontroller based electronic switch" serves to "control the lighting power levels, ***the color temperature*** of the diffused light (also called the blended or mingled light) of the first lighting load and the second lighting load can be controlled." *Id.*, 3:49-53. Further, the exemplary switch shown in Fig. 10C of Chen (discussed earlier) provides "a convenient way [for the user] to select a desired illumination color temperature." *Id.*, 23:4-9.

587. Thus, to the extent the preamble of claim 13 is limiting, Chen disclose it.

(b) Element 13a: "a body;"

588. Element 13a recites: "a body." '336 Patent, 15:25.

589. As discussed above, Fig. 10C shows an application of Chen's invention wherein the microcontroller based switch is "a wall switch [1c] that is electrically connected to a ceiling light [2c]." *See* Chen, 22:61-23:15. The user waves his/her hand in front of the switch 1c to adjust the color temperature of the light output generated by the ceiling light 2c. *Id.* A POSA would have understood that the housing for the microcontroller-based switch 1c would necessarily include a body that holds the switch components, including those shown in Fig. 1 and 8A.



Id., Fig. 10C.

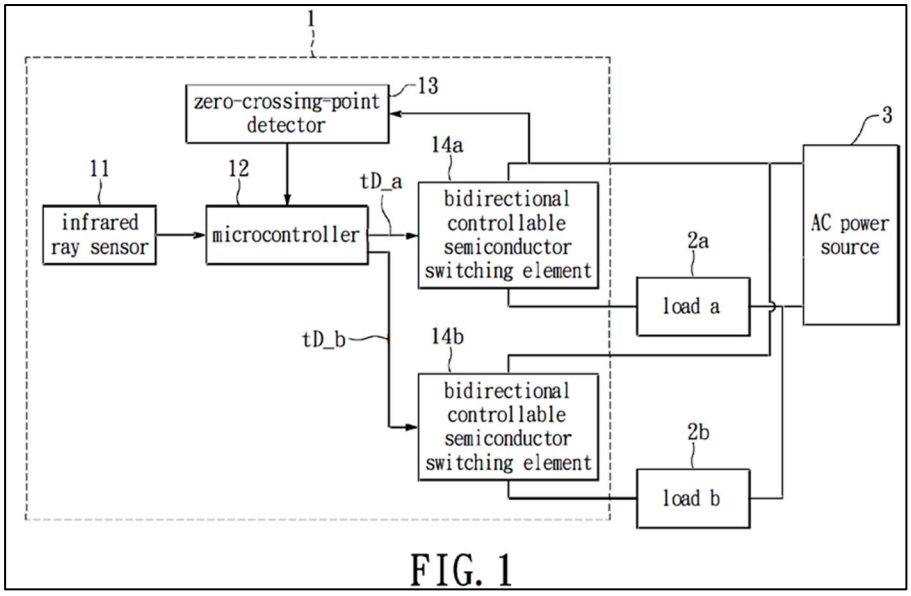


FIG. 1

Id., Fig. 1.

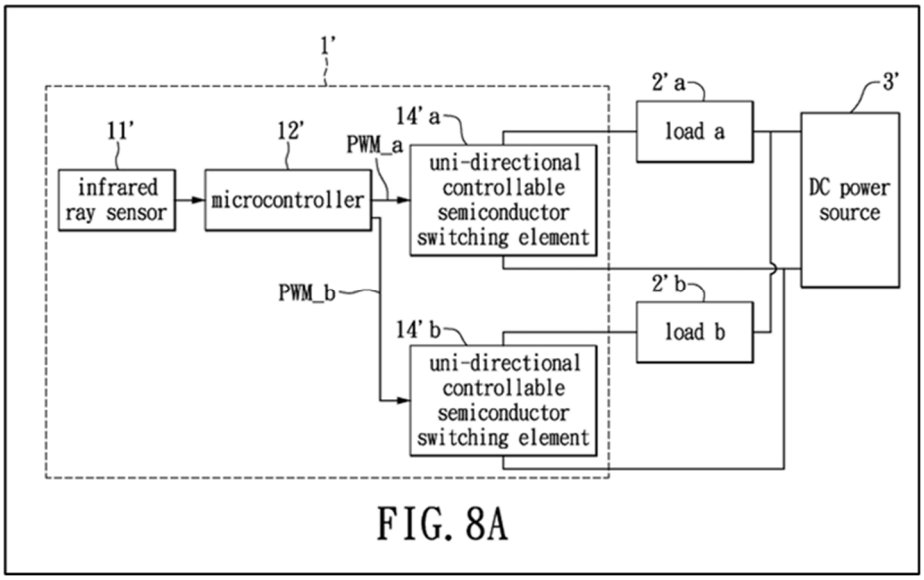


FIG. 8A

Id., Fig. 8A.

590. Thus, Chen discloses "a body."

591. To the extent that Chen does not disclose "a body," Section VIII.J.1 above explains why a POSA would have been motivated to combine Chen with Chaimberg. Further, Section VIII.B.7(b) above explains that Chaimberg discloses a CCT switch with "a body."

(c) Element 13b: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire; and"

592. Element 13b states: "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire." '336 Patent, 15:26-15:29.

593. As discussed above, Fig. 10C shows an application of Chen's invention wherein the microcontroller based switch is "a wall switch [1c] that is electrically connected to a ceiling light [2c]." *See id.*, 22:61-23:15. The user waves his/her hand in front of the switch 1c to adjust the color temperature of the light output generated by the ceiling light 2c. *Id.*

594. A POSA would have understood that "electrically connected" means that Chen's switch 1c and ceiling light 2c are connected by an electrical cable in the wall, just like any standard wall switches/ceiling lights would have been. Therefore, a POSA would have understood that, in order to control the light output by the LEDs in ceiling light 2C, the electrical cable would necessarily be coupled to the switch, using at least one coupling feature.

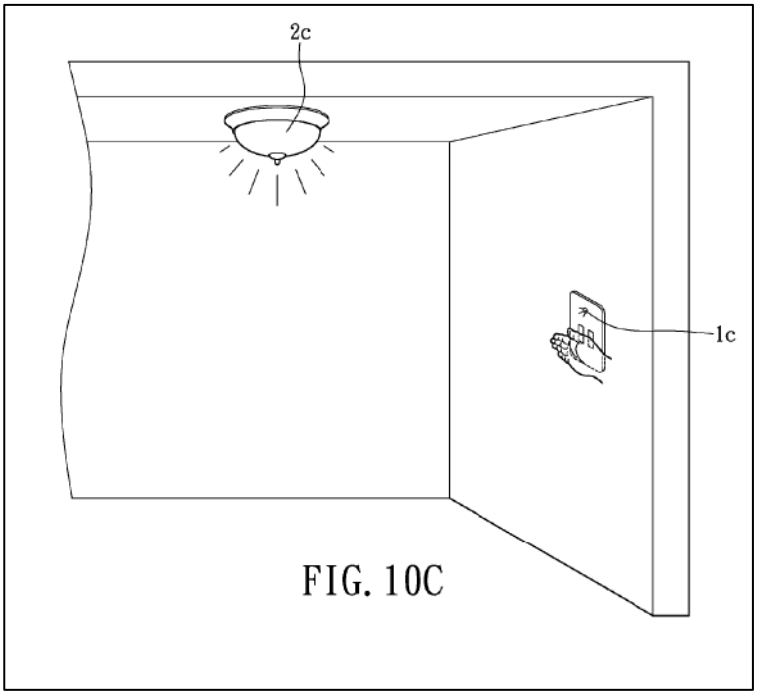


FIG. 10C

Id., Fig. 10C.

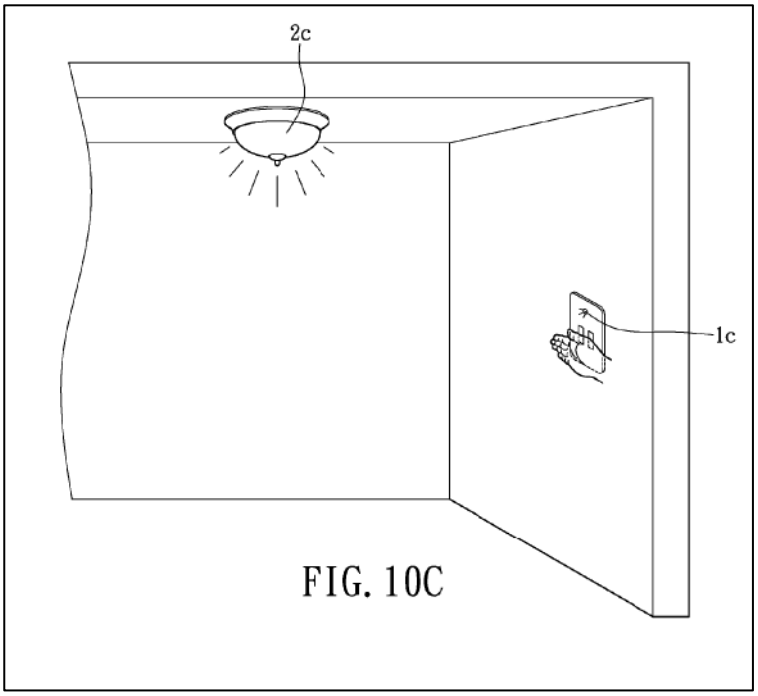
595. Thus, Chen discloses "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire."

596. To the extent that Chen does not disclose this element, Section VIII.J.1 above explains why a POSA would have been motivated to combine Chen with Chaimberg. Further, Section VIII.B.7(c) above explains that Chaimberg discloses a switch with "at least one first coupling feature disposed on the body, wherein the at least one first coupling feature is configured to electrically couple to an electrical cable of the luminaire."

(d) Element 13c: "an actuator disposed on the body, wherein the actuator has a range of positions"

597. Element 13c recites: "an actuator disposed on the body, wherein the actuator has a range of positions." '336 Patent, 16:1-2.

598. As discussed above, the Fig. 10C shows an application of Chen's invention wherein the microcontroller based switch is "a wall switch [1c that is] electrically connected to a ceiling light [2c]." *See* Chen, 22:61-23:15. The user waves his/her hand in front of the switch 1c to adjust the color temperature of the light output generated by the ceiling light 2c. *Id.* A POSA would have understood that the housing for the microcontroller-based switch 1c would necessarily include a body that holds the switch components, including those shown in Fig. 1 and 8A.



Id., Fig. 10C.

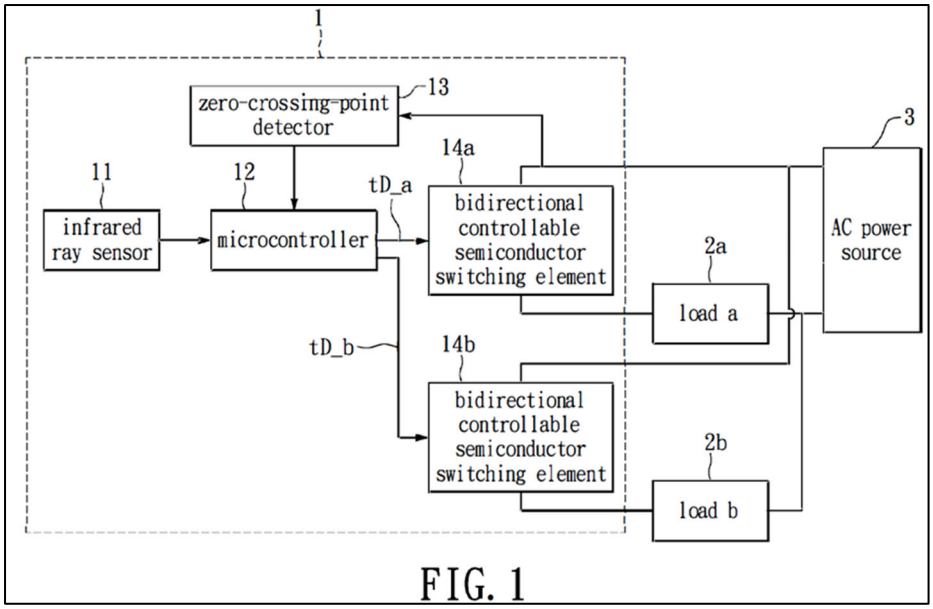


FIG. 1

Id., Fig. 1.

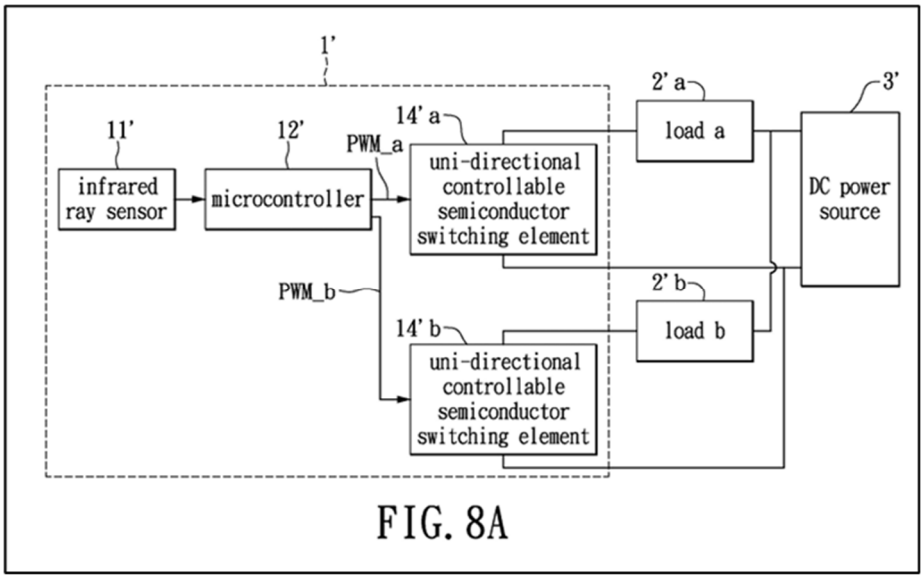


FIG. 8A

Id., Fig. 8A.

599. A POSA would have understood that the sensing portion of Chen's switch would function as an actuator. Moreover, Chen discloses that its switch could be implemented as a "direct touch switch (such as a push button or a touch sensor)." *Id.*, 4:8-10. A POSA would have understood that a "push button" would necessarily include an actuator as well.

600. To the extent that Chen does not explicitly disclose this element, Section VIII.J.1 above explains why a POSA would have been motivated to combine Chen with Chaimberg. Further, Section VIII.B.7(d) above explains that Chaimberg discloses a switch with "an actuator disposed on the body, wherein the actuator has a range of positions."

(e) Element 13d: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

601. Element 13d reads as follows: "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire." '336 Patent, 16:3-5.

602. As discussed above, Chen discloses a "microcontroller based electronic switch [which] comprises a first controllable switching element, a second controllable switching element, a detection device and a microcontroller. The first controllable switching element is electrically connected between a power source and a first lighting load for emitting light with a first color temperature. The second controllable switching element is electrically connected between the power source and a second lighting load for emitting light with a second color temperature." Chen, 2:19-28. Chen further discloses that its "microcontroller based electronic switch" is used to "control the lighting power levels, ***the color temperature*** of the diffused light (also called the blended or mingled light) of the first lighting load and the second lighting load can be controlled." *Id.*, 3:49-53. Further, the exemplary switch shown in Chen Fig. 10C discussed above provides "a convenient way [for the user] to select a desired illumination color temperature." *Id.*, 23:4-9. The sensing portion of the switch in Fig. 10C will detect "a motion of double swings across the detecting zone … and activate the performance of the color temperature management mode" which enables the user to adjust the color temperature output of the lighting apparatus. *Id.*

603. Chen includes additional details regarding its microcontroller-based electronic switch. For example, Chen Fig. 1 "is a block diagram of a microcontroller based electronic switch using an infrared ray sensor as a detection device applied for two AC lighting loads with different color temperatures powered by an AC power source according to an exemplary embodiment of the present disclosure." *Id.*, 4:43-47. As shown below, Chen's exemplary switches include two bidirectional (or unidirectional) controllable semiconductor switching elements (14a and 14b), one for each set of LEDs (2a and 2b). *Id.*

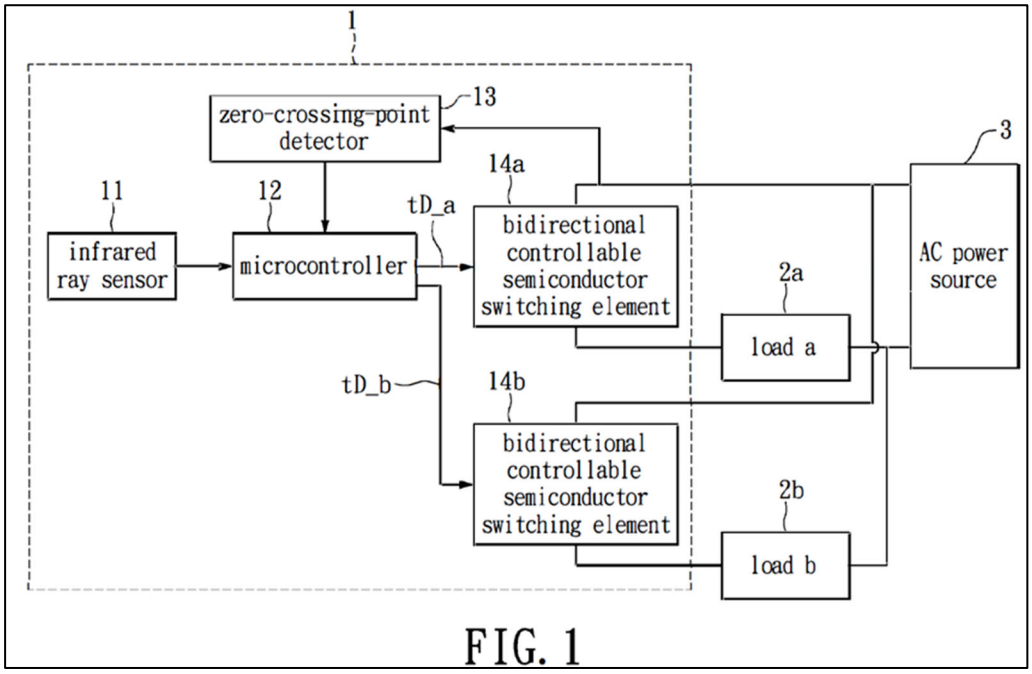


FIG. 1

Chen, Fig. 1.

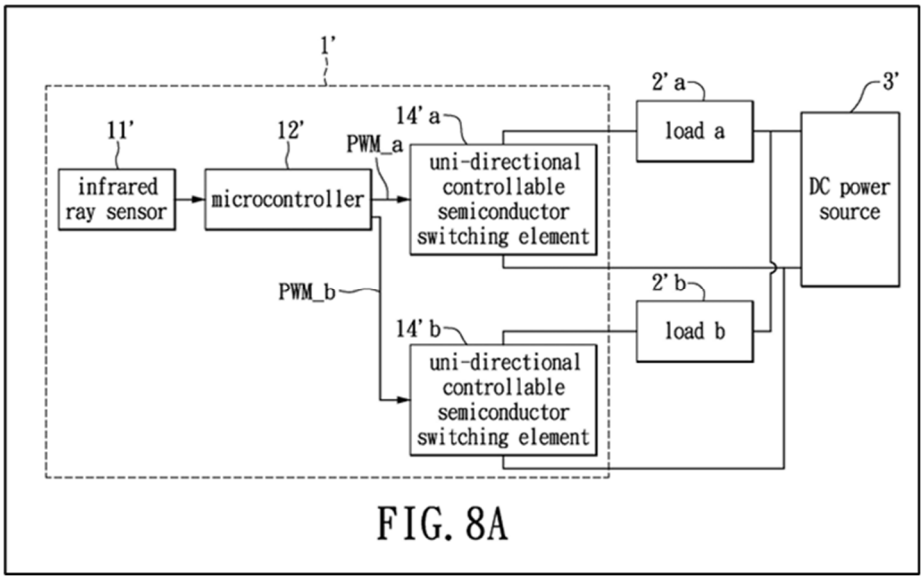


FIG. 8A

Id., Fig. 8A.

604. Based on the desired setting, the two switching elements (14a and 14b) will adjust the power to the LEDs (2a and 2b) to emit the desired CCT output. A POSA would have understood that the various CCT outputs constitute a range of positions "wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

605. To the extent that Chen does not disclose this element, Section VIII.J.1 above explains why a POSA would have been motivated to combine Chen with Chaimberg. Furthermore, Section VIII.B.7(e) above explains that Chaimberg discloses "a switch wherein each position of the range of positions of the actuator corresponds to a CCT of the light emitted by the luminaire."

(f) Conclusion For Claim 13

606. As I have explained in the section above, Chen and Chaimberg disclose all elements of claim 13 of the '336 Patent. Accordingly, Chen alone and/or in view of Chaimberg renders obvious claim 13 of the '336 Patent.

7. Claim 15: "The switch of claim 13, wherein each position is discrete within the range of positions."

607. Claim 15 states: "[t]he switch of claim 13, wherein each position is discrete within the range of positions." '336 Patent, 16:8-9.

608. As explained with respect to claim 3 in Section VIII.I.2, Chen discloses a CCT switch "wherein each position is discrete." For the same reasons discussed above with respect to claim 3, Chen discloses a CCT switch "wherein each position is discrete within the range of positions."

(a) Conclusion For Claim 15

609. As explained in Section VIII.J.6, Chen alone and/or in view of Chaimberg renders obvious claim 13. This section has also shown that Chen discloses the additional elements of claim 15. Accordingly, Chen alone and/or in view of Chaimberg renders obvious claim 15 of the '336 Patent.

8. Claim 16: "The switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position."

610. Claim 16 recites: "[t]he switch of claim 15, wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position." '336 Patent, 16:11-13.

611. As discussed above in Section VIII.I.3 with respect to claim 4 of the '336 Patent, Chen discloses a CCT switch "wherein the range of positions comprises a first position, a second position, a third position, a fourth position, and a fifth position."

(a) Conclusion For Claim 16

612. As explained in Section VIII.J.7, Chen alone and/or in view of Chaimberg renders obvious claim 15. This section has also shown that Chen discloses the additional elements of claim

16. Accordingly, Chen alone and/or in view of Chaimberg renders obvious claim 16 of the '336 Patent.

9. Claim 19: "The switch of claim 13, wherein the body is configured to be disposed within a junction box."

613. Claim 19 states: "[t]he switch of claim 13, wherein the body is configured to be disposed within a junction box." '336 Patent, 16:23-24.

614. As discussed in Section VIII.J.1 above, a POSA would have been motivated to combine Chen with Chaimberg. Further, Section VIII.B.9 above explains that Chaimberg discloses a CCT switch "wherein the body is configured to be disposed within a junction box."

(a) Conclusion For Claim 19

615. As explained in Section VIII.J.6, Chen alone and/or in view of Chaimberg renders obvious claim 13. This section has also shown that Chen and Chaimberg disclose the additional elements of claim 19. Accordingly, Chen alone and/or in view of Chaimberg renders obvious claim 19 of the '336 Patent.

K. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

616. I am aware that Signify alleges there are secondary indicia of nonobviousness for the claimed inventions of the '336 Patent. Signify 2/26/2024 Resp. to Interrogatory No. 7. Specifically, I understand Signify alleges the claimed inventions have obtained "industry praise", have obtained commercial success, and met a "long-felt but previously unmet need in the industry". *Id.* I further understand that these are the only secondary indicia of nonobviousness that Signify has offered (Signify has, for example, not alleged, *e.g.*, copying by others or unexpected results). I understand that Signify has not identified any particular products that purportedly practice the '336 Patent, but rather refers only to "Signify's patented technology" and the "patented inventions." *Id.*

617. been presented with any evidence offered by Signify that provides any basis to support these alleged secondary indicia of nonobviousness. Signify has merely rested its allegations on attorney argument, website links that offer no context or explanation, and documents produced in accordance with the Federal Rule of Civil Procedure 33(d). (Signify 2/26/2024 Resp. to Interrogatory No. 7.)

618. I have reviewed the documents and information provided by Signify and am not aware of the grounds on which Signify maintains that its claimed inventions demonstrate any secondary indicia of nonobviousness. Signify has not articulated any reasoning as to how these particular documents and information satisfy any of the three indicia of nonobviousness identified in its interrogatory response (industry praise, commercial success, or satisfying a long-felt but unmet need in the industry). Having reviewed these documents and information, I do not see any support for Signify's assertion that these documents constitute indicia of nonobviousness.

619. I further understand there must be an association or "nexus" demonstrated between the claimed elements and the secondary indicia of nonobviousness. No such nexus exists in any of the identified documents or information. The documents are either authored by Signify and merely discuss the various features of Signify products, or generically discuss Signify's presence in the field of LED lighting products. None of these documents or information show how the patented features contributed to any commercial success of Signify products, as opposed to other unpatented features, nor do they discuss how the patent features solved any long-felt but previously unmet need in the industry.

620. For any sales-related documents, there is no indication that any of the sales figures are attributable to the relevant technology at issue here, which is the specific subject matter claimed in the '336 Patent. In fact, I understand that Signify does not contend that the '336 Patent covers

all of Signify's commercial products. Consequently, mentioning the sales of unpatented products appears to me to bear no relevance to this matter.

Finally, the press releases provided by Signify mentions no praise from industry regarding technology claimed in the '336 Patent. In fact, these press releases simply refer to statements or quotes provided by Signify personnel related to generic information regarding Signify or the launch of Signify products. In summary, it is my opinion that none of the documents or information cited by Signify in its response to Interrogatory No. 7 evidence "a long-felt but unmet need for", or commercial success as a result of, or industry praise for, the subject matter claimed in the '336 Patent. My opinions expressed in this Expert Report that the asserted claims of the '336 Patent are either anticipated or obvious are, therefore, unaffected by these unsubstantiated allegations. Should Signify provide a basis for its alleged secondary indicia of nonobviousness, I reserve the right to supplement my opinions in response thereto.

621. I understand that Signify served additional arguments concerning secondary considerations shortly before my report was due. I explicitly reserve the right to supplement my responses as I continue to review Signify's recent disclosures. In its supplement, Signify alleged that Eaton sold products that allegedly embody various claims of the '336 Patent. For example, Signify alleges that "Halo Commercial PR8 family of products with SelecCCTableTM technology" were introduced around January 2017 and embody claim 13 of the '336 Patent. Signify has not presented any evidence beyond showing a screenshot of a PR8 advertisement on top of figures 1I, 1J, 1K, and 3 of the '336 Patent on top of each other. Most notably, Signify omits Fig. 2 from its comparison. If the PR8 product actually blends the two CCTs as Signify alleged, then the product is using a different circuitry than that shown in Fig. 2 of '336, as I explain below in Section IX. Further, as I explained above, the earliest priority date that claim 13 of the

'336 Patent is entitled to is June 21, 2018, thus, to the extent Signify argues that the PR8 embodies claim 13, it also anticipates it. Signify also alleges, without any citation or support, that "the PR8 was the first product to provide a luminaire or lighting device with CCT selectability via a switch." As I discussed above, this technology was known in the art for decades.

622. Signify points to an award for the SeleCCTtableTM products, but this too is irrelevant in view of the fact that the technology was known for decades as I have discussed earlier in this report. Finally, Signify cites to other products, and likewise simply shows advertising screenshots next to figures from the patent, but the patent does not disclose such luminaires.

IX. THE ASSERTED CLAIMS OF THE '336 PATENT ARE INVALID UNDER 35 U.S.C. § 112 ARE INVALID BECAUSE THE SPECIFICATION DOES TEACH A SWITCH THAT IS CAPABLE OF CCT TUNING

623. In my opinion, the Asserted Claims of the '336 Patent are invalid under 35 U.S.C. § 112. Specifically, it is my understanding that Signify contends the Asserted Claims cover luminaires capable of "tuning" the CCT of the light source by blending the output of multiple LED light sources having different CCT values. However, my review of the '336 Patent specification finds it to be silent with regard to the optical or electronic methods, devices, and systems required for CCT tuning. Furthermore, portions of the specification make incorrect statements in, for example, the claimed production of light, having a CCT value of 3500 K, from LEDs emitting 3000 K and 4000 K light simply using the technology, circuitry and components disclosed in the specification. Therefore, it is my opinion that the Asserted Claims of the '336 Patent are invalid because they fail to satisfy one or more of the written description-, enablement-, and definiteness-requirements of 35 U.S.C. § 112.

624. Although I am not a lawyer, I understand from counsel for the Joint Defense Group that 35 U.S.C. § 112 includes several requirements regarding specification support for a challenged

claim. The first of these is that the written description requirement is intended to ensure that the inventors "were in possession of the claimed invention as of the effective filing date" of the '336 Patent. Second, my understanding is that the enablement requirement is intended to ensure that the description in the patent is sufficiently detailed so as to allow persons of ordinary skill in the field of technology of the patent to make and use the invention without "undue experimentation", as of the effective filing date of the '336 Patent. Finally, it is also my understanding that a patent claim, when read in light of the patent's specification and prosecution history, must inform, with "reasonable certainty," those skilled in the art about the scope of the invention claimed in the '336 Patent to satisfy the definiteness requirement.

625. Independent claim 1, and its dependent claims (including Asserted Claims 3-5, 7, 9, 11, and 12), relate to a luminaire with a CCT switch located remotely from the housing of the light source. '336 Patent, 14:30-15:20. The claimed CCT switch includes "a plurality of positions, wherein each position … corresponds to a discrete" CCT output. *Id.* Independent claim 13, and its dependent claims (including Asserted Claims 15, 16, and 19) relate to a switch for a luminaire that is electrically coupled to an electrical cable of the luminaire. *Id.*, 15:21-16:26. Like the switch recited in independent claim 1, the CCT switch recited in claim 13 includes a "range of positions" that correspond to different CCT values for the light provided by the light source. *Id.* As I have discussed earlier in this report, the '336 Patent was apparently intended to fulfill a need for LED lights "that can adapt to various applications, for example, by delivering multiple color temperatures," but such LED lights were well known in the art more than a decade before the alleged invention. *Id.*, 1:50-53.

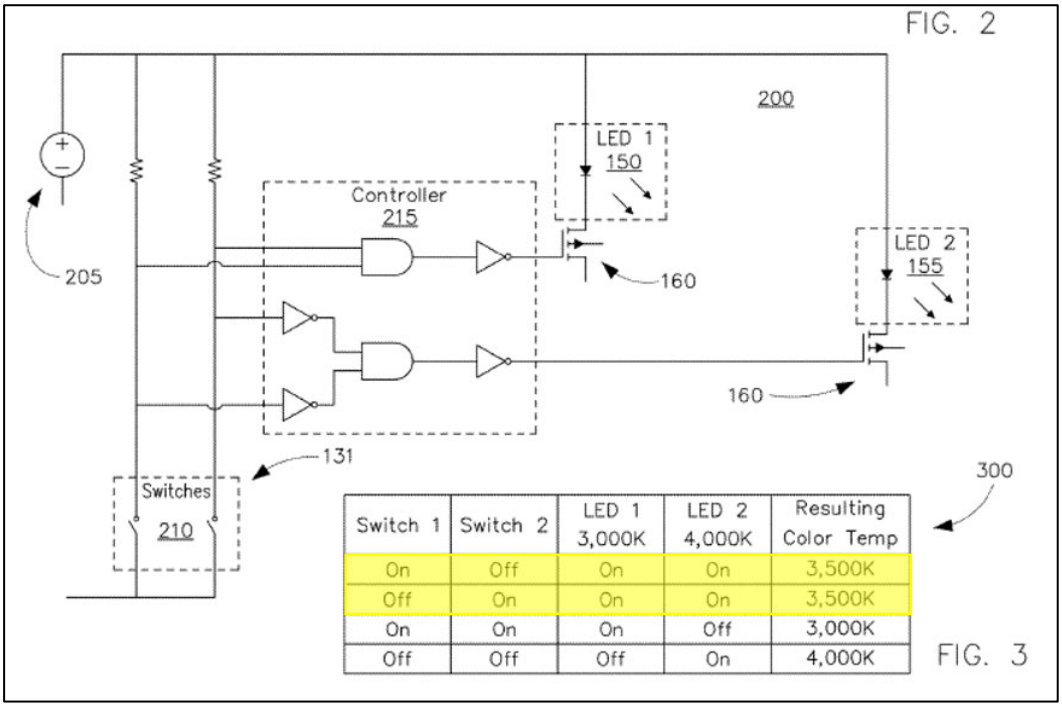
626. The specification of the '336 Patent discusses employing multiple sets of LEDs with the intention of providing multiple discrete CCT outputs. For example, the '336 Patent offers

the example of a luminaire having two sets of LEDs, the first emitting light having a CCT of 3000 K and the second emitting light having a CCT of 4000 K. *See id.*, 6:64-7:21; Figs. 2 & 3. For the sake of simplicity, I will discuss just these two CCT values. However, my analysis and comments apply to any other examples discussed in the specification of the '336 Patent. The '336 Patent states that this luminaire would "emit[] illumination having a color temperature of 3500 Kelvin" when both the 3000 K and 4000 K LEDs are powered. *Id.* In other words, the '336 Patent proposes simply combining (superimposing or "adding") the light output of the two sets of LEDs to produce an apparent third CCT output. The '336 Patent specification claims that, in so doing, the CCT of the resulting light will be the average value of the CCTs of the two light sources (3500 K). The '336 Patent specification describes the adoption of a DIP switch and related circuitry to select which LEDs are illuminated.

627. In short, the process of "blending" light from different sets of LEDs so as to yield a tunable CCT value requires: 1) the ability, at a minimum, to be able to control the electrical current (and, concomitantly, the electrical power) delivered to the LEDs, and 2) extensive testing with an optical instrument known as an integrating sphere. With this standard optical measurement tool, the characteristics of the blended light are studied as the power delivered to the LEDs, and the mode of delivery of the electrical power delivery, is varied. All illumination engineers are familiar with this process which is governed by international standards.

628. Figure 2 of the '336 Patent (reproduced below) presents a simple circuit that allows one to switch between the two sets of LEDs—e.g., allowing the user to switch from powering only the 3000 K LEDs to powering only the 4000 K LEDs. However, the switches of Fig. 2 also allow both sets of LEDs to be operated simultaneously, as shown by the circuitry of FIG. 2 and the Table of FIG. 3. The '336 specification and FIG. 3 state clearly that, by simply opening or closing

switches 210, the CCT value of the light generated by the light source can be changed between 3000 K, 4000 K, and 3500 K. Basic principles of electric circuit analysis (taught to Electrical Engineering undergraduates) and illumination engineering are firm in saying that this assertion of the Patent cannot be correct. Consequently, it is impossible for the "Resulting Color Temperature" of FIG. 3 to be 3500 K when both LED 1 and LED 2 are on, *unless* additional, unspecified circuitry or optical components are installed in this light source. Unfortunately, the Specification is silent on this issue.



Switch 1	Switch 2	LED 1 3,000K	LED 2 4,000K	Resulting Color Temp
On	Off	On	On	3,500K
Off	On	On	On	3,500K
On	On	On	Off	3,000K
Off	Off	Off	On	4,000K

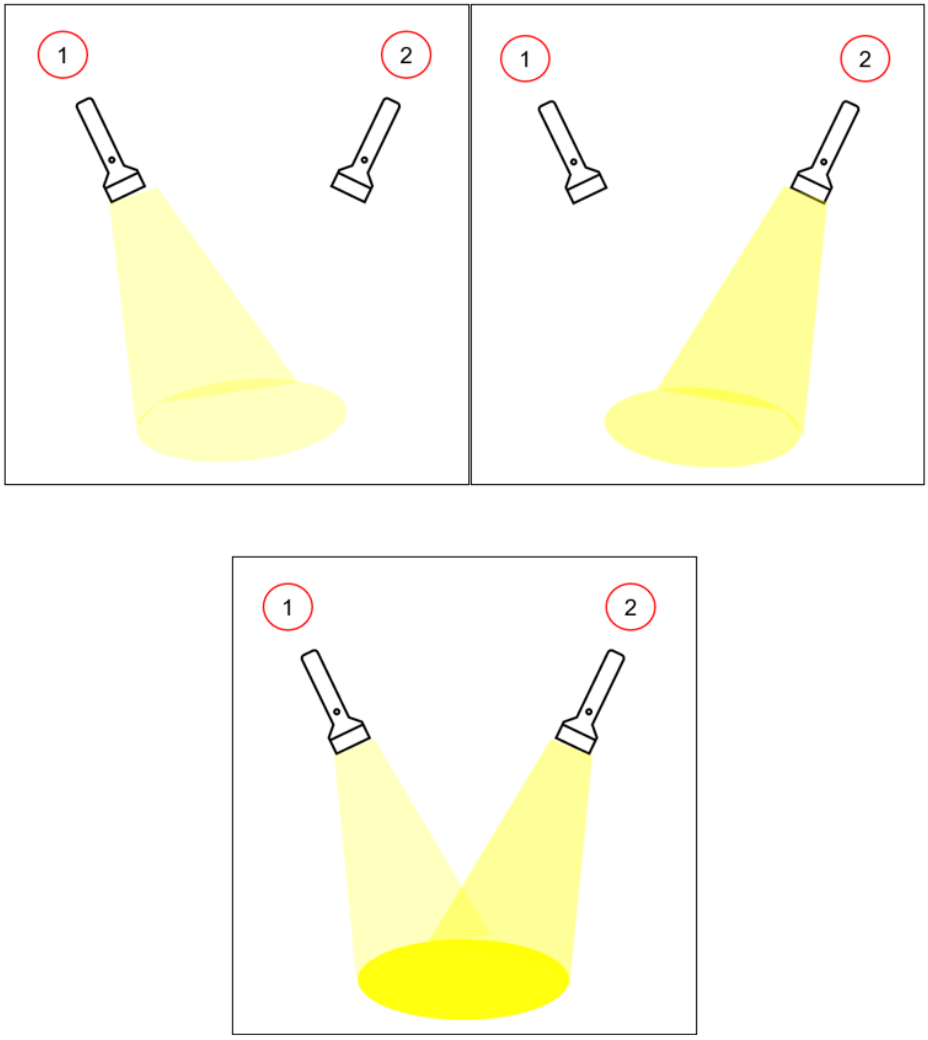
'336 Patent, Figs. 2 & 3 (color added).

629. Because the '336 Patent does not disclose CCT tuning technology—but rather simply combines the light from a 3000 K light source with that from a 4000 K light source—the assertions made in this regard by the '336 Patent are incorrect. This basic fact would have been, and will be today, recognized by a POSA as a failure by the '336 Patent specification to satisfy the enablement requirement of Sect. 112. In fact, an inspection of Figures. 2 and 3 would prompt a

POSA to look elsewhere for direction as to how one might build a luminaire capable of "tuning" the CCT of an LED light source. A POSA would have understood that the inventor was not in possession of the claimed luminaire and CCT switch, and likewise, said POSA would not have been able to construct the claimed luminaire that creates a third apparent CCT output by blending two sets of LEDs with different CCTs. Further, in view of Signify's own apparent claim constructions, the specification of the '336 Patent fails to inform with reasonable certainty the scope of the claimed CCT switch.

630. As discussed earlier, prior art references disclosed functioning CCT "tuning" methods years before the alleged invention of the '336 Patent. For example, Chen discloses a microcontroller-based CCT tuning method, and explains in detail the equation with which the CCT or "apparent CCT" of blended light from sets of LEDs, each emitting light having a different CCT, is varied. *See* Chen, 6:2-7:33. By controlling the power to each of the LEDs 2a and 2b, Chen is able to emit light characterized by a CCT that can be varied at will. Chen explains that "a desired color temperature may be generated by controlling the power levels of the first lighting load 2a and the second lighting load 2b to create proper color blending effect under a fixed total lighting power level." *Id.*, 7:28-32.

631. To think of this another way, imagine that two flashlights pointed towards a wall, one in each hand. The two light patterns pointed at the wall have different CCT values, e.g. 3000 K (flashlight 1) and 4000 K (flashlight 2). Therefore, if both flashlights are "on" at the same time, the light reflected from the wall will appear to be a temperature different from 3000 K or 4000K; however because both flashlights are on, the resulting light reflected from the wall will be brighter than flashlight 2 (or flashlight 1) alone.



632. It is my understanding from counsel that Signify cannot rely upon other prior art references to fill-in the vital information (discussed above) that the '336 Patent specification does not provide. Therefore, to the extent Signify argues that a POSA would have looked to switches and/or technology known in the art to control the power supplied to each set of LEDs—such as those described in Chen—Signify is admitting that the switch claimed in the '336 Patent was disclosed in the prior art, including the references discussed in Section VIII above.

633. In summary, the specification of the '336 Patent is silent with respect to the critical issue of varying the CCT of the light emitted by groups of LEDs. In my opinion, therefore, the

'336 specification is incorrect and misleading on this subject. Furthermore, because the '336 Patent neither discusses, nor provides, a method (electronic or optical) for tuning the CCT of light generated by groups of LEDs, a POSA would understand that the specification does not support the claimed invention as of the effective filing date. That is, a POSA reviewing the specification of the '336 Patent: (A) would understand that the inventors did not possess a luminaire with a switch with multiple positions that correspond to the CCT output of the luminaire; (B) would not have been able to make a luminaire with the claimed CCT switch without undue experimentation; and (C) not be informed with "reasonable certainty" of the scope of the CCT switch. As noted earlier, a POSA interested in electronic or optical approaches to controlling the CCT associated with the light emitted from groups of LEDs would, after examining the '336 specification, be compelled to look elsewhere.

634. I explained above in Section VIII.A that in my opinion, the earliest effective filing date of the Asserted Claims of the '336 Patent is June 21, 2018. However, my opinion would not change if the Court finds that the '336 Patent was entitled to an earlier priority date, including the filing date of any of the applications related to the '336 Patent.

X. THE ASSERTED CLAIMS OF THE '506 PATENT ARE INVALID UNDER 35 U.S.C. §§ 102 and/or 103

635. It is my understanding that Signify asserts claims 1-5, 7, 14, and 15 of the '506 Patent, which state:

> 1. [p] A cove lighting apparatus for an architectural surface, comprising:
>
> [a] a cove member configured to fit within a gap defined by the architectural surface comprising an interior surface that is recessed from the architectural surface; and

[b] at least one LED-based light source associated with the cove member for irradiating at least a portion of the interior surface with visible light perceivable by a viewer via the gap defined in the architectural surface,

[c] wherein the cove lighting apparatus is configured such that the at least one LED-based light source is concealed from the viewer.

2. The apparatus of claim 1, wherein the cove member includes a channel portion, and wherein: the at least one LED-based light source is coupled to the channel portion and positioned so as to irradiate at least the portion of the interior surface of the cove member with the visible light.

3. The apparatus of claim 2, further comprising a blocking member for concealing the at least one light LED-based source from the viewer.

4. The apparatus of claim 1, wherein the at least a portion the interior surface of the cove member comprises an essentially white matte surface configured to reflect and diffuse light.

5. The apparatus of claim 4, wherein the at least one LED-based light source is positioned with respect to the cove member such that the visible light is perceivable as a light surface that is essentially flush with the architectural surface.

7. The apparatus of claim 1, wherein the visible light includes essentially white light.

14. The apparatus of claim 1, wherein the visible light is perceived by the viewer as substantially uniform filing the gap in the architectural surface.

15. [p] A method for providing architectural illumination, comprising:

[a] forming a gap in an architectural surface;

[b] disposing a cove member in the gap defined by the architectural surface, the cove member comprising an interior surface that is recessed from the architectural surface;

[c] generating visible light by at least one light LED-based source;

[d] irradiating at least a portion of the interior surface with visible light such that the visible light is perceivable by a viewer via the gap as a light surface that is essentially flush with the architectural surface.

636. I have been asked to consider whether claims 1-5, 7, 14, and 15 of the '506 Patent are valid. It is my opinion that claims 1-5, 7, 14, and 15 of the '506 Patent are invalid for the following reasons:

- Van De Ven anticipates claims 1-5, 7, 14, and 15 of the '506 Patent under 35 U.S.C. § 102;
- Alternatively, Van De Ven alone and/or in view of Lester renders obvious claims 1-5, 7, 14, and 15 of the '506 Patent under 35 U.S.C. § 103;
- Alternatively, Lester anticipates claims 1-5, 7, 14, 15 of the '506 Patent under 35 U.S.C. 102;
- Alternatively, Lester alone and/or in view of Piepgras renders obvious claims 1-5, 7, 14, and 15 of the '506 Patent under 35 U.S.C. § 103;
- Alternatively, Yoshimi alone and/or in view of Van De Ven and Lester renders obvious claims 1-5, 7, 14, and 15 of the '506 Patent under 35 U.S.C. § 103.

637. In the following sections, I will provide my opinions with respect to the invalidity of the asserted claims of the '506 Patent and describe in detail the reasons for arriving at these opinions and conclusions.

A. VAN DE VEN ANTICIPATES CLAIMS 1-5, 7, 14, AND 15 OF THE '506 PATENT

1. Van De Ven Anticipates Claim 1

638. Van De Ven discloses to a POSA every limitation of claim 1 of the '506 Patent. Specifically, Van De Ven describes all three elements of claim 1 ([a]-[ac]) as discussed in the paragraphs to follow.

639. **Elements 1[p]-1[a].** Van De Ven discloses both the preamble and element 1[a] of the '506 Patent: "[p] A cove lighting apparatus for an architectural surface, comprising: [a] a cove member configured to fit within a gap defined by the architectural surface and comprising an interior surface that is recessed from the architectural surface; and".

640. With regard to the preamble, Van De Ven discloses "a lighting device in particular, a device which includes one or more solid state light emitters. In a specific aspect, the present invention relates to a 'recessed can' lighting device." Van De Ven, 1:12-15. In column 4, Van De Ven describes the invention in greater detail: "In one preferred aspect of the present invention, there is provided a light fixture which employs solid state light emitters (e.g., LEDs) and which can be mounted in a room (e.g., in a ceiling) where heat from the solid state light emitters is effectively transferred to the room environment, direct view of the solid state emitters is obscured (to reduce glare), and/or collimation and/or mixing and/or filtering of the light is provided before and/or as it is exiting the fixture into the room." Van De Ven, 4:47-56. Van De Ven states that "[t]he lighting devices of the present invention can be installed in a construction surface, e.g., in a ceiling, a wall, or a floor." Van De Ven, 12:64-65.

641. A POSA immediately notes that Van De Ven is describing "lighting devices" similar to those presented in the '506 Patent: "The present invention is generally directed to cove lighting apparatus for architectural surfaces, and more particularly, to recessed cove lighting apparatus employing LED-based light sources and methods of their manufacture and installation." '506 Patent, 1:13-16.

642. The '506 Patent further states: "In view of the foregoing, various embodiments of the present invention are directed to methods and apparatus for creating a light cove that is integrated with an architectural surface. In particular, Applicant has recognized and appreciated that light sources such as LEDs can be arranged within a wall as part of a cove, without the need for a special bezel or frame, so as to create intriguing "light surface effects." In various embodiments of the present invention, a formed cove is installed into a gap in a wall surface (e.g., an internal wall made from drywall.) The formed cove may include at least one lighting unit that can be used to light the cove." '506 Patent, 2:22-32.

643. The '506 Patent thus defines an "architectural surface" as being equivalent to a wall or a ceiling, and that a "cove" contains "light sources such as LEDs" and "is installed into a gap in a wall surface." Therefore, a "cove" is simply a compartment of a desired shape that is installed through a "gap" (*i.e.*, hole of a desired shape) in a wall or ceiling, and the term "recessed cove" in column 1 of the '506 Patent is redundant. In short, Van De Ven's "construction surface" is identical to the "architectural" surface of the '506 Patent. As will be discussed below, the shape of Van De Ven's "reflective element" defines the "cove" described in the '506 Patent.

644. Figure 2 of Ven De Ven (reproduced below) illustrates "a lighting device 10 according to the present invention—the lighting device depicted in FIG. 2 is shown having been attached to a construction surface (in this case, a ceiling 14) …. The lighting device 10 has been

attached to a contact region of a ceiling 14 adjacent to a substantially circular construction surface opening 15 which has been cut in the ceiling." Van De Ven, 19:19-29.

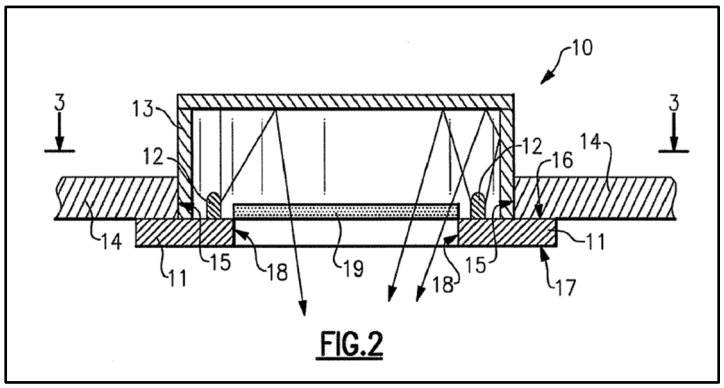


FIG.2

Van De Ven, Fig. 2.

645. From this disclosure, a POSA would recognize from Figure 2 above that a "light cove" is "configured to fit within a gap defined by the architectural surface" and that this "cove" comprises "an interior surface [13] that is recessed from the architectural surface [14]."

646. It must also be emphasized that the "Background" section of the '506 Patent itself notes the prevalence of recessed lighting in the prior art: "Recessed lighting is a popular illumination option for both new dwellings and remodeling or renovation of existing dwellings. With recessed lighting, the majority of a lighting fixture is disposed substantially behind or recessed into an architectural surface or feature, such as a ceiling, wall, or soffit." '506 Patent, 1:42-47.

647. In summary, Van De Ven discloses both the preamble and claim element 1[a] of the '506 Patent.

648. **Element 1[b].** Van De Ven discloses element [b] of claim 1 of the '506 Patent: "at least one LED-based light source associated with the cove member for irradiating at least a portion

of the interior surface with visible light perceivable by a viewer via the gap defined in the architectural surface."

649. Van De Ven describes a light source in which "at least one of the solid state light emitters is an LED." Van De Ven, 7:50-51. It is also stated that: "In another preferred aspect of the present invention, there is provided a light fixture using solid state light emitters (e.g., LEDs) that is aesthetically attractive and which can be recessed into a ceiling (or other construction surface, e.g., a wall or a floor." Van De Ven, 4:57-62.

650. With regard to "irradiating at least a portion of the interior surface" and the viewer perceiving visible light "via the gap," Van De Ven informs the reader that: "In some embodiments, the reflector comprises a highly reflective flat surface (>90%) such that the light incident on the reflector is reflected and directed towards the aperture. In other embodiments, the reflector comprises a curved surface(s)." Van De Ven, 12:37-41. And Van De Ven further discloses that "[i]n some embodiments of the present invention, light from the emitters is projected onto the reflective element such that a significant portion of the light is reflected towards and through the conductive element opening." Van De Ven, 14:22-25.

651. Therefore, Van De Ven discloses a light source, recessed into a ceiling or other construction ("architectural") surface, in which light from LEDs is reflected from a flat or curved reflective surface and through an aperture ("gap" as used in the '506 Patent). The light emerging from this aperture or gap is observed by a "viewer."

652. Van De Ven thus discloses a light source having all aspects recited in claim 1[b] of the '506 Patent.

653. **Element 1[c].** Van De Ven also discloses element [c] of claim 1 of the '506 Patent which reads: "wherein the cove lighting apparatus is configured such that the at least one LED-based light source is concealed from the viewer."

654. In several sections, Van De Ven mentions that at least one LED must be obscured from the observer's view. In column 2, for example, Van De Ven states that the "position (height) of the bulb can be set such that the bulb is not directly visible to the people standing in the room and the light from the fixture is directed so that it principally illuminates an area below the fixture." Van De Ven, 2:52-55.

655. With respect to Figure 5, Van De Ven states: "FIG. 5 is a sectional view of another embodiment of a lighting device 30 according to the present invention. The lighting device 30 is similar to the lighting device 10 depicted in FIG. 2, except that the lighting device 30 further comprises a shield member 21 which extends from the first side 16 of the thermal conduction element 11 away from the second side 17 of the thermal conduction element 11." (Van De Ven at 20:11-17.) As shown in Figure 5 of Van Den Ven (reproduced below), shield 21, in combination with the positioning of the LEDs ("set back" from the perimeter of the aperture or "conduction element opening" 18), serves to block the view of at least one LED form an observer.

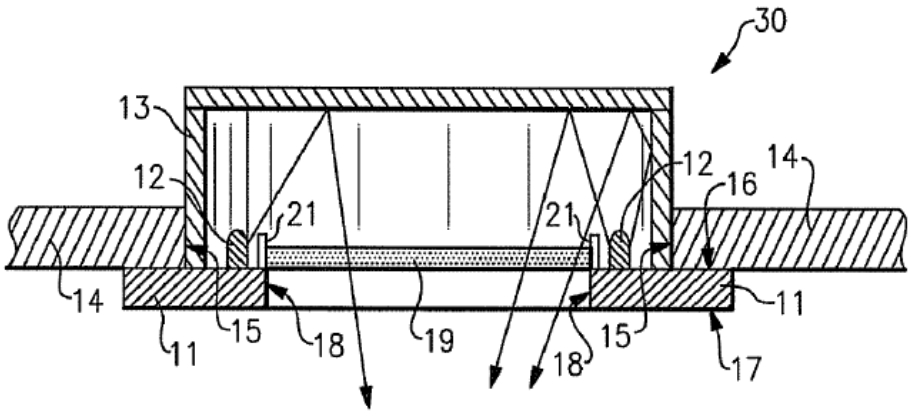


FIG.5

Van De Ven, Fig. 5.

656. For the reasons discussed above, a POSA would have understood that Van De Ven discloses every limitation of claim 1 of the '506 Patent, and therefore Van De Ven anticipates claim 1.

2. Van De Ven Anticipates Claim 2

657. Claim 2 of the '506 Patent recites: "The apparatus of claim 1, wherein the cove member includes a channel portion, and wherein: the at least one LED-based light source is coupled to the channel portion and positioned so as to irradiate at least the portion of the interior surface of the cove member with the visible light." Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 2.

658. The '506 Patent specification describes the "channel portion" as follows: "With continued reference to FIG. 2A, in various embodiments, the cove lighting apparatus includes a channel portion 255 having an interior channel surface generally facing the interior cove surface 242. In many embodiments, the cove member 240 is coupled generally perpendicularly to the channel portion 255. In some versions of these embodiments, both the interior cove surface and

the interior channel surface are surfaces of the cove member, i.e., the cove member includes the channel portion generally parallel to the flange 250. In another version, the channel portion is formed by a portion of the flange, and the interior channel surface constitutes an interior surface of the flange 250. Generally, the channel portion 255 may be arranged so that the wall appears to extend into a portion of the gap 230." '506 Patent, 8:20-33.

659. From this description and Figure 2A of the '506 Patent, a POSA would conclude that the "channel portion 255" is the section of the "lighting apparatus" that lies between the cove member 240 (*i.e.*, the light reflector) and the "gap" or aperture 230. It is also the portion in which at least one LED resides, an LED that directs light generally upwards so as to illuminate the reflector 240.

660. Van De Ven discloses precisely the same structure as that described above in the '506 Patent. In Figure 5 of Van De Ven, the region between the reflective element 13 and the conduction element 18 (i.e., the aperture or "gap" of the lighting apparatus) contains at least one LED that emits light generally upwards, as shown in Figure 5 of Van De Ven. As illustrated in Figure 5 of Van De Ven (reproduced below), light emitted by the LED is reflected by the reflective element 13, thus illuminating ("irradiating") "at least the portion of the interior surface of the cove member with the visible light."

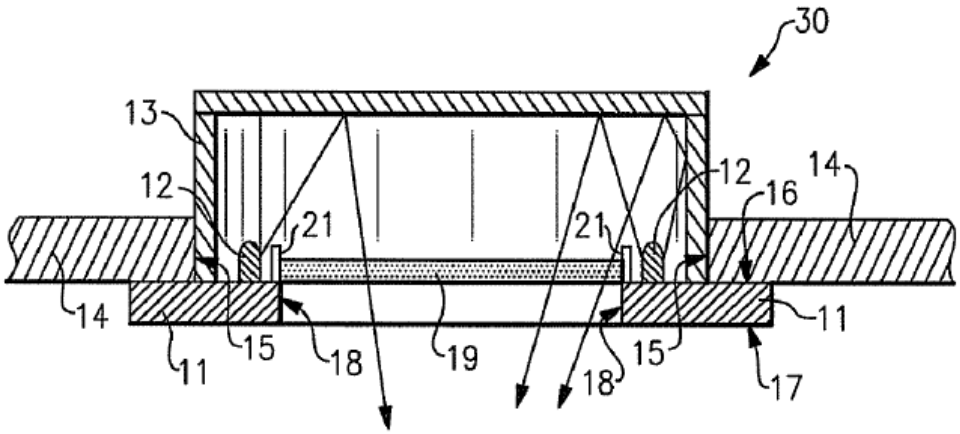


FIG.5

Van De Ven, Fig. 5.

661. For the reasons discussed above, a POSA would understand (and have understood at the earliest claimed priority date of the '506 Patent) that Van De Ven discloses every limitation of claim 2 of the '506 Patent, and therefore Van De Ven anticipates claim 2.

3. Van De Ven Anticipates Claim 3

662. Claim 3 of the '506 Patent recites: "The apparatus of claim 2, further comprising a blocking member for concealing the at least one light LED-based source from the viewer." Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 3.

663. Van De Ven discloses that "some embodiments of the lighting devices according to the present invention can, if desired, also include a shield member which extends from the first side of the thermal conduction element away from the second side of the thermal conduction element, in order to obstruct the solid state light emitters from view. Such a shield member, if provided, can be formed of any suitable material, e.g., any of the materials which are suitable for forming the reflective element." Van De Ven, 13:59-67.

664. Consequently, the "shield member" of Van De Ven is the same as the "blocking member 260" described in the '506 Patent: "In some embodiments of the invention, the cove lighting apparatus includes at least one blocking member 260 coupled to the channel portion 255 at an acute angle thereto." '506 Patent, 8:42-44. Both the "blocking member" of the '506 Patent and the "shield member" of Van De Ven serve the same purpose—namely, to "obstruct the solid state light emitters from view." Van De Ven, 13:59-67.

665. For the reasons discussed above, a POSA would have understood that Van De Ven discloses every limitation of claim 3 of the '506 Patent and, therefore, Van De Ven anticipates claim 3.

4. Van De Ven Anticipates Claim 4

666. Claim 4 of the '506 Patent recites: "The apparatus of claim 1, wherein the at least a portion the interior surface of the cove member comprises an essentially white matte surface configured to reflect and diffuse light." Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 4.

667. Van De Ven discloses "an optional light transmitting plate can be included, if desired. In some embodiments according to the present invention, the light from the individual light emitters can be mixed either by using a reflector with a slight diffuse reflectance and directing the light from multiple emitters to the same point on the reflector, or, alternatively, where the light is directed to a common point within the aperture, the light transmitting plate that is covering the aperture can have a mixing or diffusing function." Van De Ven, 13:32-40.

668. The '506 Patent states that the white matte surface serves to "reflect and diffuse light." '506 Patent, 7:51-62. Similarly, Van De Ven notes that a reflector "with a slight diffuse reflectance" is of value for "mixing" the light from individual emitters. Consequently, the

description of the '506 Patent and Van De Ven are nearly identical with respect to this function of the reflector or "reflecting element." It should also be mentioned that the "white matte surface" of claim 4 of the '506 Patent was well known decades before the earliest claimed priority date of the '506 Patent. White optical surfaces intended to diffuse and reflect light have, for example, been incorporated into optical integrating spheres since at least early in the 20th century.

669. For the reasons discussed above, a POSA would have understood that Van De Ven discloses every limitation of claim 4 of the '506 Patent, and therefore Van De Ven anticipates claim 4.

5. Van De Ven Anticipates Claim 5

670. Claim 5 of the '506 Patent recites: "The apparatus of claim 4, wherein the at least one LED-based light source is positioned with respect to the cove member such that the visible light is perceivable as a light surface that is essentially flush with the architectural surface." Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 5.

671. Van De Ven discloses that the "conduction element opening 18 is covered by a light transmitting plate 19, so that light which is emitted by any of the LEDs 12 and which passes through the conduction element opening 18 must pass through the light transmitting plate 19. The LEDs 12 are generally pointing up and not into the opening 18. The reflective element 13 mixes and/or reflects the light emitted by the LEDs downward and through the opening 18." Figure 2 illustrates this configuration.

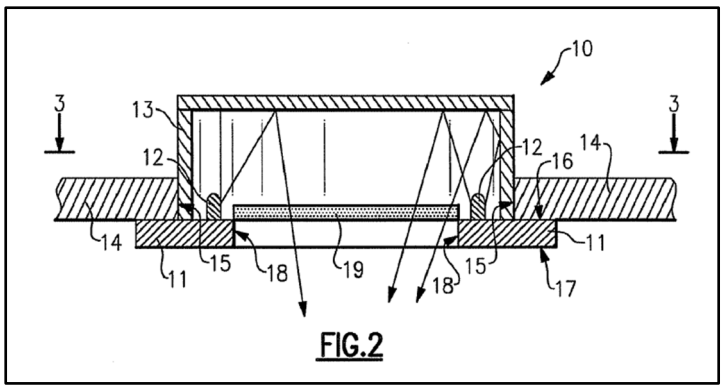


FIG.2

(Van De Ven at Fig. 2.)

672. Furthermore, Van De Ven discloses a version of the "LED-based light source" of Figure 2 that has no transmission plate. Instead, "FIG. 4 is a bottom perspective view of an embodiment of a lighting device similar to the one shown in FIGs. 2 and 3, except that the lighting device in FIG. 4 does not have a light transmitting plate 19, and the lighting device depicted in FIG. 4 has lenses or reflectors 20 which collimate the light prior to the reflection of the light by the reflective surface 13." Van De Ven, 20:4-10. Consequently, the LED-based light sources of both Figures 2 and 4 of Van De Ven will produce light by reflecting light off of a reflective surface, thereby giving to an observer (or "viewer") the impression that light is emanating from "a light surface that is essentially flush with the architectural surface."

673. For the reasons discussed above, a POSA would have understood that Van De Ven discloses every limitation of claim 5 of the '506 Patent and, therefore, Van De Ven anticipates claim 5.

6. Van De Ven Anticipates Claim 7

674. Claim 7 of the '506 Patent recites: "The apparatus of claim 1, wherein the visible light includes essentially white light." Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 7.

675. According to Van De Ven, "[b]ecause light that is perceived as white is necessarily a blend of light of two or more colors (or wavelengths), no single light emitting diode junction has been developed that can produce white light. 'White' LED lamps have been produced which have a light emitting diode pixel formed of respective red, green and blue light emitting diodes. Another 'white' LED which has been produced includes (1) a light emitting diode which generates blue light and (2) a luminescent material (e.g., a phosphor) that emits yellow light in response to excitation by light emitted by the light emitting diode, whereby the blue light and the yellow light, when mixed, produce light that is perceived as white light." Van De Ven, 8:61-9:5.

676. Van De Ven further discloses that "[l]ight emitting diodes can thus be used individually or in any combinations, optionally together with one or more luminescent material (e.g., phosphors or scintillators) and/or filters, to generate light of any desired perceived color (including white)." Van De Ven, 9:36-40. And according to Van De Ven, "in another type of LED lamp, a light emitting diode chip that emits an ultraviolet ray is combined with phosphor materials that produce red (R), green (G) and blue (B) light rays. In such an LED lamp, the ultraviolet ray that has been radiated from the light emitting diode chip excites the phosphor, causing the phosphor to emit red, green and blue light rays which, when mixed, are perceived by the human eye as white light. Consequently, white light can also be obtained as a mixture of these light rays." Van De Ven, 10:62-65.

677. For the reasons discussed above, a POSA would have understood that Van De Ven discloses every limitation of claim 7 of the '506 Patent and, therefore, Van De Ven anticipates claim 7.

7. Van De Ven Anticipates Claim 14

678. Claim 14 of the '506 Patent recites: "The apparatus of claim 1, wherein the visible light is perceived by the viewer as substantially uniform filing the gap in the architectural surface." Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 14.

679. Van De Ven discloses that, for the embodiment of Figure 2, "[t]he conduction element opening 18 is covered by a light transmitting plate 19, so that light which is emitted by any of the LEDs 12 and which passes through the conduction element opening 18 must pass through the light transmitting plate 19. The LEDs 12 are generally pointing up and not into the opening 18. The reflective element 13 mixes and/or reflects the light emitted by the LEDs downward and through the opening 18." Van De Ven, 19:45-53.

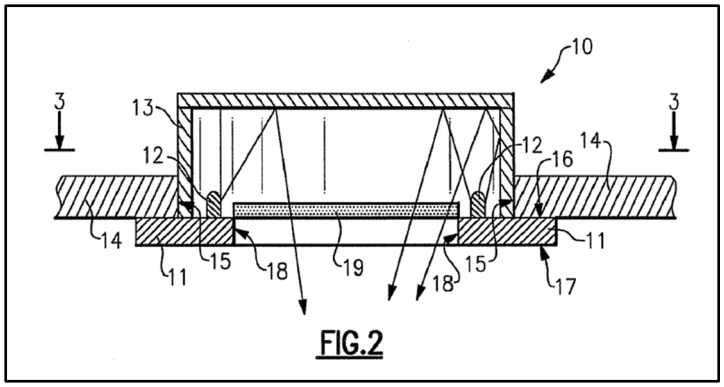


FIG.2

Van De Ven, Fig. 2.

680. For the reasons discussed above, a POSA would have understood that Van De Ven discloses every limitation of claim 14 of the '506 Patent and, therefore, Van De Ven anticipates claim 14.

8. Van De Ven Anticipates Claim 15

681. Van De Ven disclosed to a POSA, as of the earliest claim priority date of the '506 Patent, every limitation of claim 15 of the '506 Patent and, therefore, anticipates it. Specifically,

Van De Ven discloses all four elements of claim 15 as identified by Signify, elements [a]-[d], as detailed further below.

682. **Elements 15[p]-15[a].** Van De Ven discloses the preamble and element [a] of claim 15 of the '506 Patent: "[p] A method for providing architectural illumination, comprising: [a] forming a gap in an architectural surface;".

683. For example, Van De Ven discloses that "lighting devices of the present invention [that] can be installed in a construction surface, e.g., in a ceiling, a wall or a floor." Van De Ven, 12:64-65. And according to one particular embodiment disclosed in Van De Ven, "a construction surface opening is formed in the construction surface, and the lighting device is positioned such that the contact region of the thermal conduction element (i.e., the first portion of the first side of the thermal conduction element) surrounds the construction surface opening (for example, the first portion of the first side can be in contact with the construction surface at least at locations adjacent to the construction surface opening), and then the lighting device is attached to the construction surface in any suitable manner (persons skilled in the art are familiar with a wide variety of ways of attaching a lighting device, such as the lighting devices according to the present invention, to different construction surfaces)." Van De Ven, 12:66-13:12.

684. As discussed previously with regards to claim 1, the "gap" mentioned repeatedly in the '506 Patent is simply a hole of the desired shape that is cut into an "architectural surface" such as a wall or ceiling. Recessed lighting has long required that a hole of the desired shape be cut into a wall or ceiling that is typically constructed form drywall (also known as "sheet rock").

685. **Elements 15[b].** Van De Ven discloses element [b] of claim 15 of the '506 Patent: "disposing a cove member in the gap defined by the architectural surface, the cove member comprising an interior surface that is recessed from the architectural surface;".

686. As discussed previously with respect to claim 1 of the '506 Patent, a POSA immediately notes that Van De Ven is describing "lighting devices" similar to those presented in the '506 Patent: "The present invention is generally directed to cove lighting apparatus for architectural surfaces, and more particularly, to recessed cove lighting apparatus employing LED-based light sources and methods of their manufacture and installation." '506 Patent, 1:13-16.

687. The '506 Patent further states: "In view of the foregoing, various embodiments of the present invention are directed to methods and apparatus for creating a light cove that is integrated with an architectural surface. In particular, Applicant has recognized and appreciated that light sources such as LEDs can be arranged within a wall as part of a cove, without the need for a special bezel or frame, so as to create intriguing "light surface effects." In various embodiments of the present invention, a formed cove is installed into a gap in a wall surface (e.g., an internal wall made from drywall.) The formed cove may include at least one lighting unit that can be used to light the cove." '506 Patent, 2:22-32.

688. The '506 Patent thus defines an "architectural surface" as being equivalent to a wall or a ceiling, and that a "cove" contains "light sources such as LEDs" and "is installed into a gap in a wall surface." Therefore, a "cove" is simply a compartment of a desired shape that is installed through a "gap" (*i.e.*, hole of a desired shape) in a wall or ceiling, and the term "recessed cove" in column 1 of the '506 Patent is redundant. In short, Van De Ven's "construction surface" is identical to the "architectural" surface of the '506 Patent. As will be discussed below, the shape of Van De Ven's "reflective element" defines the "cove" described in the '506 Patent.

689. Figure 2 of Ven De Ven (reproduced below) illustrates "a lighting device 10 according to the present invention—the lighting device depicted in FIG. 2 is shown having been attached to a construction surface (in this case, a ceiling 14) …. The lighting device 10 has been

attached to a contact region of a ceiling 14 adjacent to a substantially circular construction surface opening 15 which has been cut in the ceiling." Van De Ven, 19:19-29.

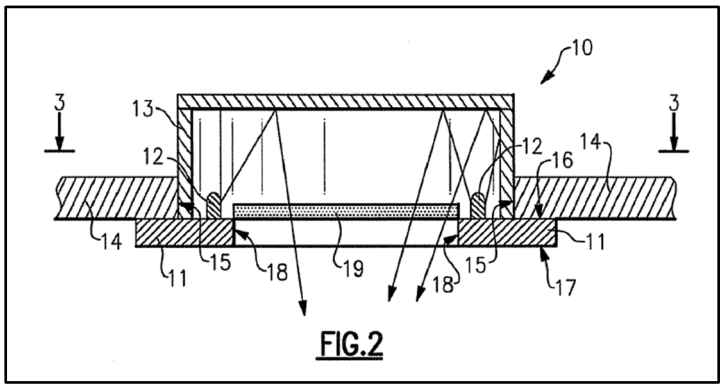


FIG.2

Van De Ven, Fig. 2.

690. From this disclosure, a POSA would recognize from Figure 2 above that a "light cove" is "configured to fit within a gap defined by the architectural surface" and that this "cove" comprises "an interior surface [13] that is recessed from the architectural surface [14]."

691. It must also be emphasized that the "Background" section of the '506 Patent itself notes the prevalence of recessed lighting in the prior art: "Recessed lighting is a popular illumination option for both new dwellings and remodeling or renovation of existing dwellings. With recessed lighting, the majority of a lighting fixture is disposed substantially behind or recessed into an architectural surface or feature, such as a ceiling, wall, or soffit." '506 Patent, 1:42-47.

692. In summary, Van De Ven discloses the elements of claim 15[b] of the '506 Patent.

693. **Element 15[c].** Van De Ven discloses element [c] of claim 15 of the '506 Patent: "generating visible light by at least one light LED-based source."

694. Van De Ven discusses a light source in which "at least one of the solid state light emitters is an LED," and "the reflective element can comprise numerous concave surfaces, and

one or more light emitting diodes can be mounted on any or all of such concave surfaces." Van De Ven, 7:50-51, 12-33-36. Van De Ven then further discloses installing the lighting device such that "a construction surface opening is formed in the construction surface, and the lighting device is positioned such that the contact region of the thermal conduction element (i.e., the first portion of the first side of the thermal conduction element) surrounds the construction surface opening." Van De Ven, 12:66-13:12.

695. **Element 15[d].** Van De Ven discloses element [d] of claim 15 of the '506 Patent: "irradiating at least a portion of the interior surface with visible light such that the visible light is perceivable by a viewer via the gap as a light surface that is essentially flush with the architectural surface."

696. Van De Ven discloses a version of the "LED-based light source" of Figure 2 that has no transmission plate. Instead, "FIG. 4 is a bottom perspective view of an embodiment of a lighting device similar to the one shown in FIGs. 2 and 3, except that the lighting device in FIG. 4 does not have a light transmitting plate 19, and the lighting device depicted in FIG. 4 has lenses or reflectors 20 which collimate the light prior to the reflection of the light by the reflective surface 13." Van De Ven, 20:4-10. Consequently, the LED-based light sources of both Figures 2 and 4 of Van De Ven will produce light by reflecting light off of a reflective surface, thereby giving to an observer (or "viewer") the impression that light is emanating from "a light surface that is essentially flush with the architectural surface."

697. For the reasons discussed above, a POSA would have understood that Van De Ven discloses every limitation of claim 15 of the '506 Patent and, therefore, Van De Ven anticipates claim 15.

B. VAN DE VEN ALONE AND/OR IN VIEW OF LESTER RENDERS CLAIMS 1-5, 7, 14, AND 15 OF THE '506 PATENT OBVIOUS

1. Claim 1 is Obvious Over Van De Ven

698. For the reasons set forth above, Van De Ven embodied all elements of claims 1-5, 7, 14, and 15 of the '506 Patent and, thus, Van De Ven anticipates those claims. If it is found that Van De Ven fails to disclose any limitations of the Asserted Claims of the '506 Patent, then it is my opinion that Van De Ven in view of Lester would have rendered those claims obvious.

699. **Elements 1[p]-1[a].** Van De Ven discloses both the preamble and element 1[a] of the '506 Patent: "[p] A cove lighting apparatus for an architectural surface, comprising: [a] a cove member configured to fit within a gap defined by the architectural surface and comprising an interior surface that is recessed from the architectural surface; and".

700. With regard to the preamble, Van De Ven discloses "a lighting device in particular, a device which includes one or more solid state light emitters. In a specific aspect, the present invention relates to a 'recessed can' lighting device." Van De Ven, 1:12-15. In column 4, Van De Ven describes the invention in greater detail: "In one preferred aspect of the present invention, there is provided a light fixture which employs solid state light emitters (e.g., LEDs) and which can be mounted in a room (e.g., in a ceiling) where heat from the solid state light emitters is effectively transferred to the room environment, direct view of the solid state emitters is obscured (to reduce glare), and/or collimation and/or mixing and/or filtering of the light is provided before and/or as it is exiting the fixture into the room." Van De Ven, 4:47-56. Van De Ven states that "[t]he lighting devices of the present invention can be installed in a construction surface, e.g., in a ceiling, a wall, or a floor." Van De Ven, 12:64-65.

701. A POSA immediately notes that Van De Ven is describing "lighting devices" similar to those presented in the '506 Patent: "The present invention is generally directed to cove

lighting apparatus for architectural surfaces, and more particularly, to recessed cove lighting apparatus employing LED-based light sources and methods of their manufacture and installation." '506 Patent, 1:13-16.

702. The '506 Patent further states: "In view of the foregoing, various embodiments of the present invention are directed to methods and apparatus for creating a light cove that is integrated with an architectural surface. In particular, Applicant has recognized and appreciated that light sources such as LEDs can be arranged within a wall as part of a cove, without the need for a special bezel or frame, so as to create intriguing "light surface effects." In various embodiments of the present invention, a formed cove is installed into a gap in a wall surface (e.g., an internal wall made from drywall.) The formed cove may include at least one lighting unit that can be used to light the cove." '506 Patent, 2:22-32.

703. The '506 Patent thus defines an "architectural surface" as being equivalent to a wall or a ceiling, and that a "cove" contains "light sources such as LEDs" and "is installed into a gap in a wall surface." Therefore, a "cove" is simply a compartment of a desired shape that is installed through a "gap" (*i.e.*, hole of a desired shape) in a wall or ceiling, and the term "recessed cove" in column 1 of the '506 Patent is redundant. In short, Van De Ven's "construction surface" is identical to the "architectural" surface of the '506 Patent. As will be discussed below, the shape of Van De Ven's "reflective element" defines the "cove" described in the '506 Patent.

704. Figure 2 of Ven De Ven (reproduced below) illustrates "a lighting device 10 according to the present invention—the lighting device depicted in FIG. 2 is shown having been attached to a construction surface (in this case, a ceiling 14) …. The lighting device 10 has been attached to a contact region of a ceiling 14 adjacent to a substantially circular construction surface opening 15 which has been cut in the ceiling." Van De Ven, 19:19-29.

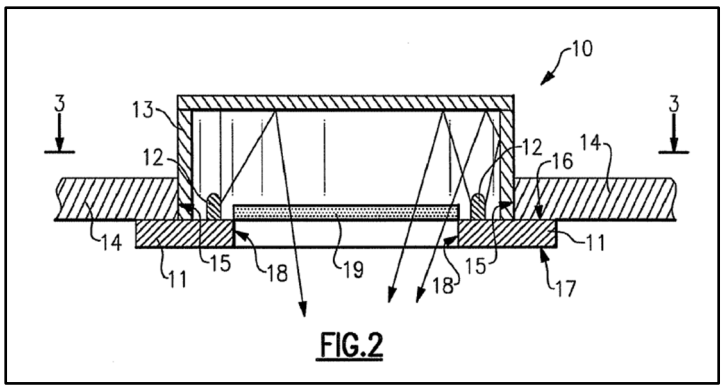


FIG.2

Van De Ven, Fig. 2.

705. From this disclosure, a POSA would recognize from Figure 2 above that a "light cove" is "configured to fit within a gap defined by the architectural surface" and that this "cove" comprises "an interior surface [13] that is recessed from the architectural surface [14]."

706. It must also be emphasized that the "Background" section of the '506 Patent itself notes the prevalence of recessed lighting in the prior art: "Recessed lighting is a popular illumination option for both new dwellings and remodeling or renovation of existing dwellings. With recessed lighting, the majority of a lighting fixture is disposed substantially behind or recessed into an architectural surface or feature, such as a ceiling, wall, or soffit." '506 Patent, 1:42-47.

707. **Element 1[b].** Van De Ven discloses element [b] of claim 1 of the '506 Patent: "at least one LED-based light source associated with the cove member for irradiating at least a portion of the interior surface with visible light perceivable by a viewer via the gap defined in the architectural surface,".

708. Van De Ven describes a light source in which "at least one of the solid state light emitters is an LED." Van De Ven, 7:50-51. It is also stated that: "In another preferred aspect of the present invention, there is provided a light fixture using solid state light emitters (e.g., LEDs)

that is aesthetically attractive and which can be recessed into a ceiling (or other construction surface, e.g., a wall or a floor." Van De Ven, 4:57-62.

709. With regard to "irradiating at least a portion of the interior surface" and the viewer perceiving visible light "via the gap," Van De Ven informs the reader that: "In some embodiments, the reflector comprises a highly reflective flat surface (>90%) such that the light incident on the reflector is reflected and directed towards the aperture. In other embodiments, the reflector comprises a curved surface(s)." Van De Ven, 12:37-41. And Van De Ven further discloses that "[i]n some embodiments of the present invention, light from the emitters is projected onto the reflective element such that a significant portion of the light is reflected towards and through the conductive element opening." Van De Ven, 14:22-25.

710. Therefore, Van De Ven discloses a light source, recessed into a ceiling or other construction ("architectural") surface, in which light from LEDs is reflected from a flat or curved reflective surface and through an aperture ("gap" as used in the '506 Patent). The light emerging from this aperture or gap is observed by a "viewer."

711. Consequently, Van De Ven discloses a light source having all aspects recited in claim 1[b] of the '506 Patent.

712. **Element 1[c].** Van De Ven discloses element [c] of claim 1 of the '506 Patent: "wherein the cove lighting apparatus is configured such that the at least one LED-based light source is concealed from the viewer."

713. In several sections, Van De Ven mentions that at least one LED must be obscured from the observer's view. In column 2, for example, Van De Ven states that the "position (height) of the bulb can be set such that the bulb is not directly visible to the people standing in the room

and the light from the fixture is directed so that it principally illuminates an area below the fixture." Van De Ven, 2:52-55.

714. With respect to Figure 5, Van De Ven states: "FIG. 5 is a sectional view of another embodiment of a lighting device 30 according to the present invention. The lighting device 30 is similar to the lighting device 10 depicted in FIG. 2, except that the lighting device 30 further comprises a shield member 21 which extends from the first side 16 of the thermal conduction element 11 away from the second side 17 of the thermal conduction element 11." Van De Ven, 20:11-17. As shown in Figure 5 of Van Den Ven (reproduced below), shield 21, in combination with the positioning of the LEDs ("set back" from the perimeter of the aperture or "conduction element opening" 18), serves to block the view of at least one LED form an observer.

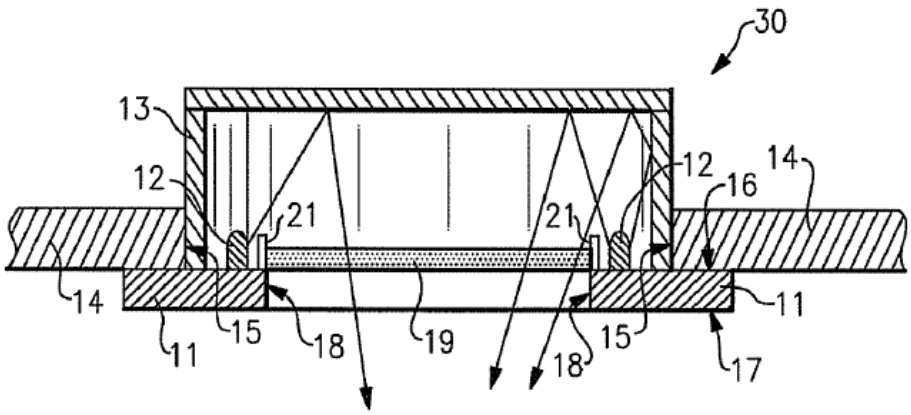


FIG.5

Van De Ven, Fig. 5.

715. For the reasons discussed above, a POSA would have understood that Van De Ven discloses every limitation of claim 1 of the '506 Patent and, therefore, Van De Ven anticipates claim 1.

2. Claim 2 is Obvious Over Van De Ven in View of Lester

716. Claim 2 of the ’506 Patent recites: “The apparatus of claim 1, wherein the cove member includes a channel portion, and wherein: the at least one LED-based light source is coupled to the channel portion and positioned so as to irradiate at least the portion of the interior surface of the cove member with the visible light.” Van De Ven alone, or in combination with Lester, disclosed to a POSA, as of the earliest claimed priority date of the ’506 Patent, the limitations of claim 2.

717. The ’506 Patent specification describes the “channel portion” as follows: “With continued reference to FIG. 2A, in various embodiments, the cove lighting apparatus includes a channel portion 255 having an interior channel surface generally facing the interior cove surface 242. In many embodiments, the cove member 240 is coupled generally perpendicularly to the channel portion 255. In some versions of these embodiments, both the interior cove surface and the interior channel surface are surfaces of the cove member, i.e., the cove member includes the channel portion generally parallel to the flange 250. In another version, the channel portion is formed by a portion of the flange, and the interior channel surface constitutes an interior surface of the flange 250. Generally, the channel portion 255 may be arranged so that the wall appears to extend into a portion of the gap 230.” ’506 Patent, 8:20-33.

718. From this description and Figure 2A of the ’506 Patent, a POSA would conclude that the “channel portion 255” is the section of the “lighting apparatus” that lies between the cove member 240 (i.e., the light reflector) and the “gap” or aperture 230. It is also the portion in which at least one LED resides, an LED that directs light generally upwards so as to illuminate the reflector 240.

719. Van De Ven discloses precisely the same structure as that described above in the ’506 Patent. In Figure 5 of Van De Ven, the region between the reflective element 13 and the

conduction element 18 (i.e., the aperture or "gap" of the lighting apparatus) contains at least one LED that emits light generally upwards, as shown in Figure 5 of Van De Ven. As illustrated in Figure 5 of Van De Ven (reproduced below), light emitted by the LED is reflected by the reflective element 13, thus illuminating ("irradiating") "at least the portion of the interior surface of the cove member with the visible light."

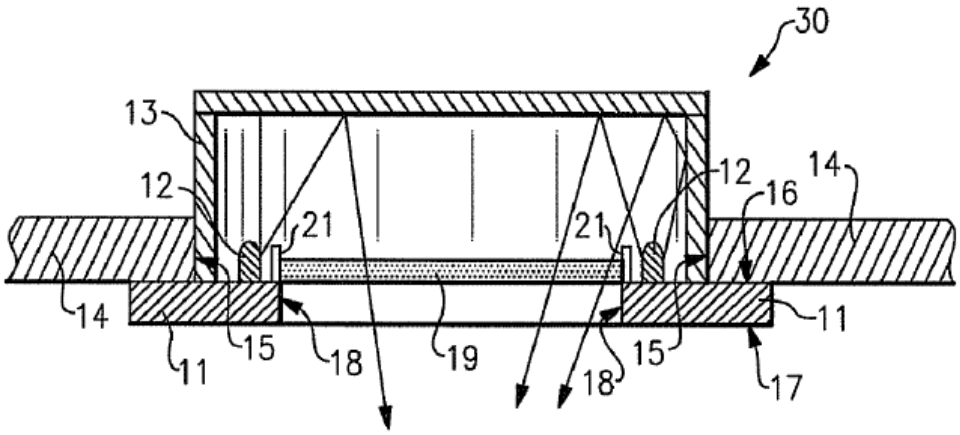


FIG.5

Van De Ven, Fig. 5.

720. To the extent this limitation is not expressly disclosed in Van De Ven, such a limitation would have been obvious to a POSA when combined with the teachings of Lester. Lester discloses the channel portion of claim 2, as well coupling the indirect lighting fixture to the channel portion and irradiating at least a portion of the interior surface of the cove member with visible light. According to Lester, the dome of the indirect lighting fixture "has an arcuate cross section and is adapted for recessed mounting in the ceiling of a room. Two longitudinally extending u-shaped channel-like coves are mounted, one on each side of the dome, for holding the fluorescent bulbs." Lester, 2:1-8. Such a configuration allows for the upper portion of the cove

to "allow the light from the bulbs inserted therein to escape and be evenly reflected off the inner face of the dome and down into the room." Lester, 2:37-39.

721. A POSA would have understood that the cove lighting apparatus of Van De Ven could be combined with the U-shaped channel-like coves of Lester, simply because the U-shaped channels/coves provide a means for combining the light from two or more sources so as to provide a spatially-uniform light output from the entire lighting apparatus. In fact, the embodiment that Van De Ven shows in Figure 9 includes "U-shaped coves" 64 that are similar to the designs that a POSA would envision from the combination of Van De Ven and Lester.

722. For the reasons discussed above, a POSA would have understood that Van De Ven, either alone or in combination with the general knowledge and understanding of a POSA and/or Lester, discloses every limitation of claim 2 of the '506 Patent and thus renders claim 2 obvious.

3. Claim 3 is Obvious Over Van De Ven

723. Claim 3 of the '506 Patent recites: "The apparatus of claim 2, further comprising a blocking member for concealing the at least one light LED-based source from the viewer." Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 3.

724. Van De Ven discloses that "some embodiments of the lighting devices according to the present invention can, if desired, also include a shield member which extends from the first side of the thermal conduction element away from the second side of the thermal conduction element, in order to obstruct the solid state light emitters from view. Such a shield member, if provided, can be formed of any suitable material, e.g., any of the materials which are suitable for forming the reflective element." Van De Ven, 13:59-67.

725. Consequently, the "shield member" of Van De Ven is the same as the "blocking member 260" described in the '506 Patent: "In some embodiments of the invention, the cove lighting apparatus includes at least one blocking member 260 coupled to the channel portion 255 at an acute angle thereto." '506 Patent, 8:42-44. Both the "blocking member" of the '506 Patent and the "shield member" of Van De Ven serve the same purpose—namely, to "obstruct the solid state light emitters from view." Van De Ven, 13:59-67.

726. For the reasons discussed above, a POSA would have understood that Van De Ven discloses every limitation of claim 3 of the '506 Patent and, therefore, Van De Ven anticipates claim 3.

4. Claim 4 is Obvious Over Van De Ven in View of Lester

727. Claim 4 of the '506 Patent recites: "The apparatus of claim 1, wherein the at least a portion the interior surface of the cove member comprises an essentially white matte surface configured to reflect and diffuse light." Van De Ven alone, or in combination with Lester, disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 4.

728. Van De Ven discloses "an optional light transmitting plate can be included, if desired. In some embodiments according to the present invention, the light from the individual light emitters can be mixed either by using a reflector with a slight diffuse reflectance and directing the light from multiple emitters to the same point on the reflector, or, alternatively, where the light is directed to a common point within the aperture, the light transmitting plate that is covering the aperture can have a mixing or diffusing function." Van De Ven, 13:32-40.

729. To the extent this limitation is not expressly disclosed in Van De Ven, such a limitation would have been obvious to a POSA when combined with the teachings of Lester.

Lester discloses the use of a white matte surface for reflecting and diffusing light on the interior surface of the cove member. According to Lester, the "inner face of the dome is preferably coated with a non-glare coating or paint such as semi-matte white enamel for reflecting the light emanating from the light bulbs in the coves down into the room in an aesthetically pleasing manner without harsh glare." Lester, 2:17-23.

730. A POSA would have recognized that the LED/"reflective element" combination of Van De Ven, in combination with the semi-matte white enamel non-glare coating supplied by Lester, would provide the spatially uniform, diffuse light output intensity pattern supplied by the lighting apparatus of Van De Ven, but without the transmitting plate that is required in Figure 2 of Van De Ven.

731. For the reasons discussed above, a POSA would have understood that Van De Ven, either alone or in combination with the general knowledge and understanding of a POSA and/or Lester, discloses every limitation of claim 4 of the '506 Patent and thus renders claim 4 obvious.

5. Claim 5 is Obvious Over Van De Ven in View of Lester

732. Claim 5 of the '506 Patent recites: "The apparatus of claim 4, wherein the at least one LED-based light source is positioned with respect to the cove member such that the visible light is perceivable as a light surface that is essentially flush with the architectural surface." Van De Ven alone, or in combination with Lester, disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 5.

733. Van De Ven discloses that the "conduction element opening 18 is covered by a light transmitting plate 19, so that light which is emitted by any of the LEDs 12 and which passes through the conduction element opening 18 must pass through the light transmitting plate 19. The LEDs 12 are generally pointing up and not into the opening 18. The reflective element 13 mixes

and/or reflects the light emitted by the LEDs downward and through the opening 18." Figure 2 is illustrative of this configuration.

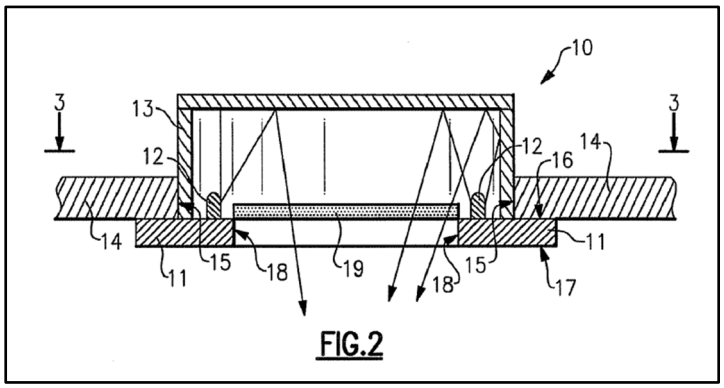


FIG.2

Van De Ven, Fig. 2.

734. Furthermore, Van De Ven discloses a version of the "LED-based light source" of Figure 2 that has no transmission plate. Instead, "FIG. 4 is a bottom perspective view of an embodiment of a lighting device similar to the one shown in FIGs. 2 and 3, except that the lighting device in FIG. 4 does not have a light transmitting plate 19, and the lighting device depicted in FIG. 4 has lenses or reflectors 20 which collimate the light prior to the reflection of the light by the reflective surface 13." Van De Ven, 20:4-10. Consequently, the LED-based light sources of both Figures 2 and 4 of Van De Ven will produce light by reflecting light off of a reflective surface, thereby giving to an observer (or "viewer") the impression that light is emanating from "a light surface that is essentially flush with the architectural surface."

735. To the extent this limitation is not expressly disclosed in Van De Ven, such a limitation would have been obvious to a POSA when combined with the teachings of Lester. Lester discloses positioning the light bulb such that the light visible to an observer appears essentially flush with the architectural surface. According to Lester, the indirect lighting fixture is "mounted in place of ceiling panels in a grid-type ceiling, so that the coves and the edges of the

dome are hidden behind the ceiling panels on either side of the fixture, and more of the internal surface of the dome is visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:8-13.

736. As discussed above, a POSA would have recognized that the LED/"reflective element" combination of Van De Ven, in combination with the semi-matte, white enamel non-glare coating supplied by Lester, would provide the spatially uniform, diffuse light output intensity pattern supplied by the lighting apparatus of Van De Ven, but without the transmitting plate that is shown in Figure 2 of Van De Ven.

737. For the reasons discussed above, a POSA would have understood that Van De Ven, either alone or in combination with the general knowledge and understanding of a POSA and/or Lester, discloses every limitation of claim 5 of the '506 Patent and thus renders claim 5 obvious.

6. Claim 7 is Obvious Over Van De Ven

738. Claim 7 of the '506 Patent recites: "The apparatus of claim 1, wherein the visible light includes essentially white light." Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 7.

739. According to Van De Ven, "[b]ecause light that is perceived as white is necessarily a blend of light of two or more colors (or wavelengths), no single light emitting diode junction has been developed that can produce white light. 'White' LED lamps have been produced which have a light emitting diode pixel formed of respective red, green and blue light emitting diodes. Another 'white' LED which has been produced includes (1) a light emitting diode which generates blue light and (2) a luminescent material (e.g., a phosphor) that emits yellow light in response to excitation by light emitted by the light emitting diode, whereby the blue light and the yellow light, when mixed, produce light that is perceived as white light." Van De Ven, 8:61-9:5.

740. Van De Ven further discloses that "[l]ight emitting diodes can thus be used individually or in any combinations, optionally together with one or more luminescent material (e.g., phosphors or scintillators) and/or filters, to generate light of any desired perceived color (including white)." Van De Ven, 9:36-40. And according to Van De Ven, "in another type of LED lamp, a light emitting diode chip that emits an ultraviolet ray is combined with phosphor materials that produce red (R), green (G) and blue (B) light rays. In such an LED lamp, the ultraviolet ray that has been radiated from the light emitting diode chip excites the phosphor, causing the phosphor to emit red, green and blue light rays which, when mixed, are perceived by the human eye as white light. Consequently, white light can also be obtained as a mixture of these light rays." Van De Ven, 10:62-65.

7. Claim 14 is Obvious Over Van De Ven in View of Lester

741. Claim 14 of the '506 Patent recites: "The apparatus of claim 1, wherein the visible light is perceived by the viewer as substantially uniform filing the gap in the architectural surface." Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 14.

742. Van De Ven discloses that, for the embodiment of Figure 2, "[t]he conduction element opening 18 is covered by a light transmitting plate 19, so that light which is emitted by any of the LEDs 12 and which passes through the conduction element opening 18 must pass through the light transmitting plate 19. The LEDs 12 are generally pointing up and not into the opening 18. The reflective element 13 mixes and/or reflects the light emitted by the LEDs

downward and through the opening 18." Van De Ven, 19:45-53.

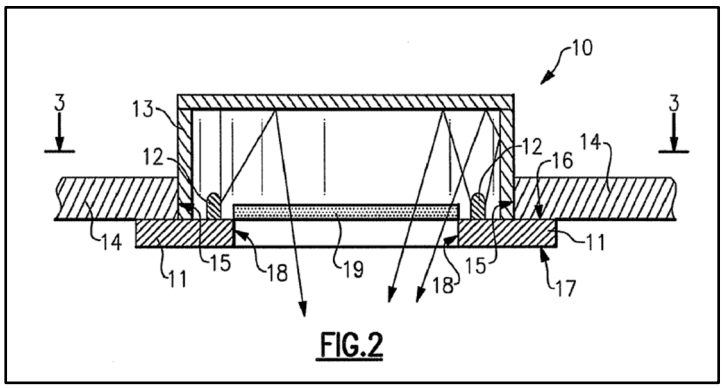


FIG.2

Van De Ven, Fig. 2.

743. To the extent this limitation is not expressly disclosed in Van De Ven, such a limitation would have been obvious to a POSA when combined with the teachings of Lester. Lester discloses positioning the light bulb such that the light visible to an observer appears essentially flush with the architectural surface. According to Lester, the indirect lighting fixture is "mounted in place of ceiling panels in a grid-type ceiling, so that the coves and the edges of the dome are hidden behind the ceiling panels on either side of the fixture, and more of the internal surface of the dome is visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:8-13.

8. Claim 15 is Obvious Over Van De Ven in View of Lester

744. Van De Ven disclosed to a POSA, either alone or in combination with the general knowledge and understanding of a POSA, as of the earliest claim priority date of the '506 Patent every limitation of claim 15 of the '506 Patent and, therefore, renders it obvious. Specifically, Van De Ven, either alone or in combination with Lester, discloses all four elements of claim 15 as identified by Signify, elements [a]-[d], as detailed further below.

745. **Elements 15[p]-15[a].** Van De Ven discloses the preamble and element [a] of claim 15 of the '506 Patent: "[p] A method for providing architectural illumination, comprising: [a] forming a gap in an architectural surface;".

746. For example, Van De Ven discloses that "lighting devices of the present invention [that] can be installed in a construction surface, e.g., in a ceiling, a wall or a floor." Van De Ven, 12:64-65. And according to one particular embodiment disclosed in Van De Ven, "a construction surface opening is formed in the construction surface, and the lighting device is positioned such that the contact region of the thermal conduction element (i.e., the first portion of the first side of the thermal conduction element) surrounds the construction surface opening (for example, the first portion of the first side can be in contact with the construction surface at least at locations adjacent to the construction surface opening), and then the lighting device is attached to the construction surface in any suitable manner (persons skilled in the art are familiar with a wide variety of ways of attaching a lighting device, such as the lighting devices according to the present invention, to different construction surfaces)." Van De Ven, 12:66-13:12.

747. As discussed previously with regards to claim 1, the "gap" mentioned repeatedly in the '506 Patent is simply a hole of the desired shape that is cut into an "architectural surface" such as a wall or ceiling. Recessed lighting has long required that a hole of the desired shape be cut into a wall or ceiling that is typically constructed from drywall (also known as "sheet rock").

748. **Element 15[b].** Van De Ven discloses element [b] of claim 15 of the '506 Patent: "disposing a cove member in the gap defined by the architectural surface, the cove member comprising an interior surface that is recessed from the architectural surface."

749. As discussed previously with respect to claim 1 of the '506 Patent, a POSA immediately notes that Van De Ven is describing "lighting devices" similar to those presented in

the ’506 Patent: “The present invention is generally directed to cove lighting apparatus for architectural surfaces, and more particularly, to recessed cove lighting apparatus employing LED-based light sources and methods of their manufacture and installation.” ’506 Patent, 1:13-16.

750. The ’506 Patent further states: “In view of the [ciforegoing, various embodiments of the present invention are directed to methods and apparatus for creating a light cove that is integrated with an architectural surface. In particular, Applicant has recognized and appreciated that light sources such as LEDs can be arranged within a wall as part of a cove, without the need for a special bezel or frame, so as to create intriguing “light surface effects.” In various embodiments of the present invention, a formed cove is installed into a gap in a wall surface (e.g., an internal wall made from drywall.) The formed cove may include at least one lighting unit that can be used to light the cove.” ’506 Patent, 2:22-32.

751. The ’506 Patent thus defines an “architectural surface” as being equivalent to a wall or a ceiling, and that a “cove” contains “light sources such as LEDs” and “is installed into a gap in a wall surface.” Therefore, a “cove” is simply a compartment of a desired shape that is installed through a “gap” (*i.e.*, hole of a desired shape) in a wall or ceiling, and the term “recessed cove” in column 1 of the ’506 Patent is redundant. In short, Van De Ven’s “construction surface” is identical to the “architectural” surface of the ’506 Patent. As will be discussed below, the shape of Van De Ven’s “reflective element” defines the “cove” described in the ’506 Patent.

752. Figure 2 of Ven De Ven (reproduced below) illustrates “a lighting device 10 according to the present invention—the lighting device depicted in FIG. 2 is shown having been attached to a construction surface (in this case, a ceiling 14) …. The lighting device 10 has been attached to a contact region of a ceiling 14 adjacent to a substantially circular construction surface opening 15 which has been cut in the ceiling.” Van De Ven, 19:19-29.

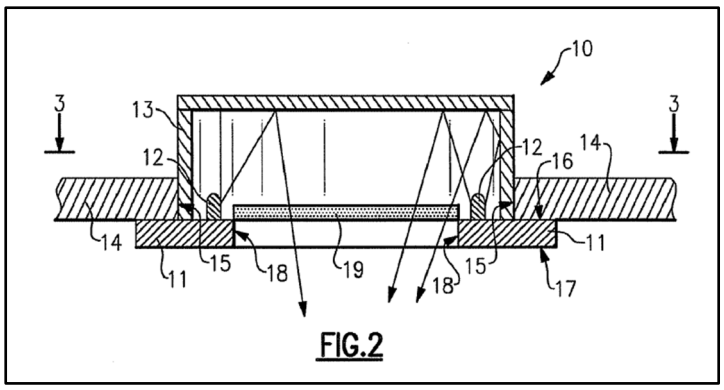


FIG.2

Van De Ven, Fig. 2.

753. From this disclosure, a POSA would recognize from Figure 2 above that a "light cove" is "configured to fit within a gap defined by the architectural surface" and that this "cove" comprises "an interior surface [13] that is recessed from the architectural surface [14]."

754. It must also be emphasized that the "Background" section of the '506 Patent itself notes the prevalence of recessed lighting in the prior art: "Recessed lighting is a popular illumination option for both new dwellings and remodeling or renovation of existing dwellings. With recessed lighting, the majority of a lighting fixture is disposed substantially behind or recessed into an architectural surface or feature, such as a ceiling, wall, or soffit." '506 Patent, 1:42-47.

755. In summary, Van De Ven discloses the elements of claim 15[b] of the '506 Patent.

756. **Element 15[c].** Van De Ven discloses element [c] of claim 15 of the '506 Patent: "generating visible light by at least one light LED-based source;".

757. 57. Van De Ven discusses a light source in which "at least one of the solid state light emitters is an LED," and "the reflective element can comprise numerous concave surfaces, and one or more light emitting diodes can be mounted on any or all of such concave surfaces." Van De Ven, 7:50-51, 12-33-36. Van De Ven then further discloses installing the lighting device

such that "a construction surface opening is formed in the construction surface, and the lighting device is positioned such that the contact region of the thermal conduction element (i.e., the first portion of the first side of the thermal conduction element) surrounds the construction surface opening." Van De Ven, 12:66-13:12.

758. **Element 15[d].** Van De Ven discloses, either alone or in combination with Lester, element [d] of claim 15 of the '506 Patent: "irradiating at least a portion of the interior surface with visible light such that the visible light is perceivable by a viewer via the gap as a light surface that is essentially flush with the architectural surface."

759. 59. Van De Ven discloses a version of the "LED-based light source" of Figure 2 that has no transmission plate. Instead, "FIG. 4 is a bottom perspective view of an embodiment of a lighting device similar to the one shown in FIGs. 2 and 3, except that the lighting device in FIG. 4 does not have a light transmitting plate 19, and the lighting device depicted in FIG. 4 has lenses or reflectors 20 which collimate the light prior to the reflection of the light by the reflective surface 13." Van De Ven, 20:4-10. Consequently, the LED-based light sources of both Figures 2 and 4 of Van De Ven will produce light by reflecting light off of a reflective surface, thereby giving to an observer (or "viewer") the impression that light is emanating from "a light surface that is essentially flush with the architectural surface."

760. To the extent this limitation is not expressly disclosed in Van De Ven, such a limitation would have been obvious to a POSA when combined with the teachings of Lester. Lester discloses positioning the light bulb such that the light visible to an observer appears essentially flush with the architectural surface. According to Lester, the indirect lighting fixture is "mounted in place of ceiling panels in a grid-type ceiling, so that the coves and the edges of the dome are hidden behind the ceiling panels on either side of the fixture, and more of the internal

surface of the dome is visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:8-13.

761. As discussed above, a POSA would have recognized that the LED/"reflective element" combination of Van De Ven, in combination with the semi-matte, white enamel non-glare coating supplied by Lester, would provide the spatially uniform, diffuse light output intensity pattern supplied by the lighting apparatus of Van De Ven, but without the transmitting plate that is shown in Figure 2 of Van De Ven.

762. For the reasons discussed above, a POSA would have understood that Van De Ven, either alone or in combination with Lester, discloses every limitation of claim 15[d] of the '506 Patent and, thus, renders claim 15[d] obvious.

763. For the reasons discussed above, a POSA would have understood that Van De Ven, either alone or in combination with the general knowledge and understanding of a POSA and/or Lester, discloses every limitation of claim 15 of the '506 Patent and, therefore, renders it obvious.

C. LESTER ANTICIPATES CLAIMS 1-5, 7, 14, AND 15 OF THE '506 PATENT

1. Lester Anticipates Claim 1

764. Lester disclosed to a POSA, as of the earliest claim priority date of the '506 Patent, every limitation of claim 1 of the '506 Patent and, therefore, anticipates it. Specifically, Lester discloses all three elements of claim 1 as identified by Signify, elements [a]-[c], as detailed further below.

765. **Elements 1[p]-1[a].** Lester discloses the preamble and element [a] of claim 1 of the '506 Patent: "[p] A cove lighting apparatus for an architectural surface, comprising: [a] a cove member configured to fit within a gap defined by the architectural surface and comprising an interior surface that is recessed from the architectural surface."

766. Lester discloses an "indirect fluorescent lighting fixture for recessed mounting in a grid-type ceiling, comprising an elongated dome having an arcuate cross section and two elongated coves, each capable of holding at least one fluorescent light bulb…. The inner face of the dome points in the downward direction and is capable of reflecting light." Lester, Abstract. Lester further discloses that the lighting fixture provides for hiding the light bulbs from a viewer "in a cove on either side of the fixture, and light from each bulb radiates upward and is reflected off of a domed upper portion of the fixture." Lester, 1:6-11.

767. According to Lester, Figure 1 (reproduced below) discloses a cross section of a lighting fixture "comprising a dome 1 and coves 2 funning along each longitudinal edge of dome 1," as shown below.



Fig. 1

Lester, Fig. 1.

768. Lester describes the configuration of Figure 1 in which the dome 1 is at approximately 45 degrees, and cove 2 comprises an outer wall 3, a base 4, and an inner wall 5, wherein the base 4 is angled at approximately 25 degrees below horizontal relative to a ground surface. As a result, Lester discloses that the "angle of the cove maximizes the amount of light that is reflected off of the inner face of dome 1 and into the room." Lester, 3:29-38.

769. To the extent Signify or its expert contend this element is novel in the field of art, even the '506 Patent's "Background" section admits that recessed cove lighting apparatuses in an architectural surface were known in the art prior to the '506 Patent. '506 Patent, 1:42-55, 2:3-6.

770. **Element 1[b].** Lester discloses element [b] of claim 1 of the '506 Patent: "at least one LED-based light source associated with the cove member for irradiating at least a portion of the interior surface with visible light perceivable by a viewer via the gap defined in the architectural surface,".

771. Lester specifically states that the lighting fixture is designed to provide a viewer with an indirect source of lighting. Lester, 2:1-13 ("These and other objects of the present invention are accomplished by an ***indirect lighting fixture*** comprising…). Lester then goes on to state that the indirect lighting fixture "is mounted in place of ceiling panels in a grid-type ceiling, so that the cove and the edges of the dome are hidden behind the ceiling panels on either side of the fixture." Lester, 2:1-13. Such a configuration, according to Lester, results in "more of the internal surface of the dome [being] visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:1-13. Lester then states that a configuration such as that shown in Figure 1 allows for the visible light to travel to the viewer via a gap in the architectural surface. According to Lester, the "upper portion of the coves allows the light from the bulbs inserted therein to escape and be evenly reflected off the inner face of the dome and down into the room." Lester, 2:37-39.

772. **Element 1[c].** Lester discloses element [c] of claim 1 of the '506 Patent: "wherein the cove lighting apparatus is configured such that the at least one LED-based light source is concealed from the viewer."

773. Lester discloses configuring the indirect lighting fixture such that it is concealed from view of an observer. According to Lester, light from the indirect lighting fixture is "directed upward to the inner face of the dome where it is reflected down into the room." Lester, Abstract. Such a configuration, when mounted recessed into a surface such as a ceiling, results in "the light bulbs in the coves and the ends of the dome [being] invisible to occupants of the room." Lester, Abstract. Lester then proceeds to disclose such a configuration in more detail when discussing Figure 2. According to Figure 2 of Lester (reproduced below), the "[i]nner wall 5 of cove 2 is integrally formed with a bracket 6, which prevents the light bulbs 11 from being seen, and attaches to a section of a ceiling grid 9 to mount the fixture." Lester, 3:42-44.

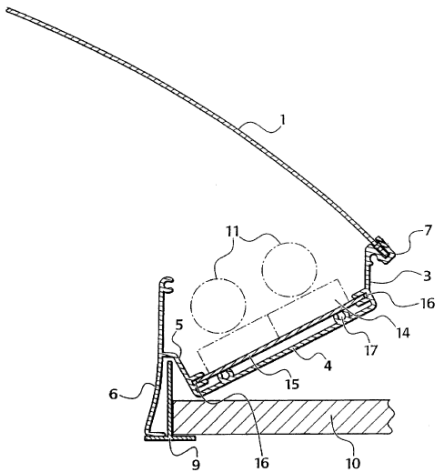


Fig. 2

Lester, Fig. 2.

774. Lester further discloses that "[d]uring use, the coves are configured so as to keep the light bulbs out of the line of sight of all occupants of the room, but are open enough to allow the maximum amount of light to emanate from the bulbs and be reflected off the inner face of the dome." Lester, 2:60-64.

775. For the reasons discussed above, a POSA would have understood that Lester discloses every limitation of claim 1 of the '506 Patent and, therefore, Lester anticipates claim 1.

2. Lester Anticipates Claim 2

776. Claim 2 of the '506 Patent recites: "The apparatus of claim 1, wherein the cove member includes a channel portion, and wherein: the at least one LED-based light source is coupled to the channel portion and positioned so as to irradiate at least the portion of the interior surface of the cove member with the visible light." Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 2.

777. Lester discloses the channel portion of claim 2, as well as coupling the indirect lighting fixture to the channel portion and irradiating at least a portion of the interior surface of the cove member with visible light. According to Lester, the dome of the indirect lighting fixture "has an arcuate cross section and is adapted for recessed mounting in the ceiling of a room. Two longitudinally extending u-shaped channel-like coves are mounted, one on each side of the dome, for holding the fluorescent bulbs." Lester, 2:1-8. Such a configuration allows for the upper portion of the cove to "allow the light from the bulbs inserted therein to escape and be evenly reflected off the inner face of the dome and down into the room." Lester, 2:37-39.

778. For the reasons discussed above, a POSA would have understood that Lester discloses every limitation of claim 2 of the '506 Patent and, therefore, Lester anticipates claim 2.

3. Lester Anticipates Claim 3

779. Claim 3 of the '506 Patent recites: "The apparatus of claim 2, further comprising a blocking member for concealing the at least one light LED-based source from the viewer." Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 3.

780. Lester discloses the blocking member of claim 3 in the form of a bracket which blocks the indirect lighting fixture from the view of an observer: "Inner wall 5 of the cove 2 is integrally formed with a bracket 6, which prevents the light bulbs 11 from being seen, and attaches to a section of a ceiling grid 9 to mount the fixture." Lester, 3:42-44. According to Lester, the "dome overlaps the opening in the ceiling in which the fixture is mounted, so that the coves 2 and the ends of the dome 1 are hidden behind ceiling panels." Lester, 3:46-48.

781. For the reasons discussed above, a POSA would have understood that Lester discloses every limitation of claim 3 of the '506 Patent and, therefore, Lester anticipates claim 3.

4. Lester Anticipates Claim 4

782. Claim 4 of the '506 Patent recites: "The apparatus of claim 1, wherein the at least a portion of the interior surface of the cove member comprises an essentially white matte surface configured to reflect and diffuse light." Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 4.

783. Lester discloses the use of a white matte surface for reflecting and diffusing light on the interior surface of the cove member. According to Lester, the "inner face of the dome is preferably coated with a non-glare coating or paint such as semi-matte white enamel for reflecting the light emanating from the light bulbs in the coves down into the room in an aesthetically pleasing manner without harsh glare." Lester, 2:17-23.

784. For the reasons discussed above, a POSA would have understood that Lester discloses every limitation of claim 4 of the '506 Patent and, therefore, Lester anticipates claim 4.

5. Lester Anticipates Claim 5

785. Claim 5 of the '506 Patent recites: "The apparatus of claim 4, wherein the at least one LED-based light source is positioned with respect to the cove member such that the visible

light is perceivable as a light surface that is essentially flush with the architectural surface." Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 5.

786. Lester discloses positioning the light bulb such that the light visible to an observer appears essentially flush with the architectural surface. According to Lester, the indirect lighting fixture is "mounted in place of ceiling panels in a grid-type ceiling, so that the coves and the edges of the dome are hidden behind the ceiling panels on either side of the fixture, and more of the internal surface of the dome is visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:8-13.

787. For the reasons discussed above, a POSA would have understood that Lester discloses every limitation of claim 5 of the '506 Patent and, therefore, Lester anticipates claim 5.

6. Lester Anticipates Claim 7

788. Claim 7 of the '506 Patent recites: "The apparatus of claim 1, wherein the visible light includes essentially white light." Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 7.

789. Lester discloses the indirect lighting fixture capable of emitting essentially white light from the light bulb. According to Lester, the disclosed invention "relates to an indirect fluorescent lighting fixture." Lester, 1:7-8. Lester further discloses "an indirect lighting fixture comprising an elongated dome for holding a plurality of fluorescent light bulbs," as well as a mounting structure within the cove "for mounting of a fluorescent light bulb[]." Lester, 2:1-4, 3:49-50. Fluorescent light bulbs emit visible light that is essentially white.

790. For the reasons discussed above, a POSA would have understood that Lester discloses every limitation of claim 7 of the '506 Patent and, therefore, Lester anticipates claim 7.

7. Lester Anticipates Claim 14

791. Claim 14 of the '506 Patent recites: "The apparatus of claim 1, wherein the visible light is perceived by the viewer as substantially uniform filing the gap in the architectural surface." Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 14.

792. Lester discloses positioning the light bulb such that the light visible to an observer appears substantially uniform and, therefore, thus appears to fill the gap in the architectural surface. According to Lester, the indirect lighting fixture is "mounted in place of ceiling panels in a grid-type ceiling, so that the coves and the edges of the dome are hidden behind the ceiling panels on either side of the fixture, and more of the internal surface of the dome is visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:8-13.

793. For the reasons discussed above, a POSA would have understood that Lester discloses every limitation of claim 14 of the '506 Patent and, therefore, Lester anticipates claim 14.

8. Lester Anticipates Claim 15

794. Lester disclosed to a POSA, as of the earliest claim priority date of the '506 Patent, every limitation of claim 15 of the '506 Patent and, therefore, anticipates it. Specifically, Lester discloses all four elements of claim 15 as identified by Signify, elements [a]-[d], as detailed further below.

795. **Elements 15[p]-15[a].** Lester discloses the preamble and element [a] of claim 15 of the '506 Patent: "[p] A method for providing architectural illumination, comprising: [a] forming a gap in an architectural surface;".

796. Lester discloses an "indirect fluorescent lighting fixture for recessed mounting in a grid-type ceiling, comprising an elongated dome having an arcuate cross section and two elongated coves, each capable of holding at least one fluorescent light bulb…. The inner face of the dome points in the downward direction and is capable of reflecting light." Lester, Abstract. Lester further discloses that the lighting fixture provides for hiding the light bulbs from a viewer "in a cove on either side of the fixture, and light from each bulb radiates upward and is reflected off of a domed upper portion of the fixture." Lester, 1:6-11.

797. According to Lester, Figure 1 (reproduced below) discloses a cross section of a lighting fixture "comprising a dome 1 and coves 2 funning along each longitudinal edge of dome 1," as shown below.



Fig. 1

Lester, Fig. 1. Lester describes the configuration of Figure 1 in which the dome 1 is at approximately 45 degrees, and cove 2 comprises an outer wall 3, a base 4, and an inner wall 5, wherein the base 4 is angled at approximately 25 degrees below horizontal relative to a ground surface.

798. To the extent Signify or its expert contend this element is novel in the field of art, even the '506 Patent's "Background" section admits that recessed cove lighting apparatuses in an architectural surface (wall, ceiling, etc.) were known in the art prior to the '506 Patent. '506 Patent, 1:42-55, 2:3-6.

799. **Element 15[b].** Lester discloses element [b] of claim 15 of the '506 Patent: "disposing a cove member in the gap defined by the architectural surface, the cove member comprising an interior surface that is recessed from the architectural surface;".

800. Lester discloses an "indirect fluorescent lighting fixture for recessed mounting in a grid-type ceiling, comprising an elongated dome having an arcuate cross section and two elongated coves, each capable of holding at least one fluorescent light bulb…. The inner face of the dome points in the downward direction and is capable of reflecting light." Lester, Abstract. Lester further discloses that the lighting fixture provides for hiding the light bulbs from a viewer "in a cove on either side of the fixture, and light from each bulb radiates upward and is reflected off of a domed upper portion of the fixture." Lester, 1:6-11.

801. To the extent Signify or its expert contend this element is novel in the field of art, even the '506 Patent's "Background" section admits that recessed cove lighting apparatuses in an architectural surface were known in the art prior to the '506 Patent. '506 Patent, 1:42-55, 2:3-6.

802. **Element 15[c].** Lester discloses element [c] of claim 15 of the '506 Patent: "generating visible light by at least one light LED-based source;".

803. Lester discloses an "indirect fluorescent lighting fixture for recessed mounting in a grid-type ceiling, comprising an elongated dome having an arcuate cross section and two elongated coves, each capable of holding at least one fluorescent light bulb." Lester, Abstract. Lester further discloses that "[l]ight bulbs 11 may be wired to an electrical outlet with any conventional wiring means," and that the "upper portion of the coves allows the light from the bulbs inserted therein to escape and be evenly reflected off the inner face of the dome and down into the room." Lester, 3:52-54, 2:37-39.

804. **Element 15[d].** Lester discloses element [d] of claim 15 of the '506 Patent: "irradiating at least a portion of the interior surface with visible light such that the visible light is perceivable by a viewer via the gap as a light surface that is essentially flush with the architectural surface."

805. Lester specifically discloses that the lighting fixture is designed to provide a viewer with an indirect source of lighting. Lester, 2:1-13 ("These and other objects of the present invention are accomplished by an ***indirect lighting fixture*** comprising…). Lester then informs the reader that the indirect lighting fixture "is mounted in place of ceiling panels in a grid-type ceiling, so that the cove and the edges of the dome are hidden behind the ceiling panels on either side of the fixture." Lester, 2:1-13. Such a configuration, according to Lester, results in "more of the internal surface of the dome [being] visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:1-13. Lester then discloses that a configuration such as that shown in Figure 1 allows for the visible light to travel to the viewer via a gap in the architectural surface. According to Lester, the "upper portion of the coves allows the light from the bulbs inserted therein to escape and be evenly reflected off the inner face of the dome and down into the room." Lester, 2:37-39.

806. For the reasons discussed above, a POSA would have understood that Lester discloses every limitation of claim 15 of the '506 Patent and, therefore, Lester anticipates claim 1.

D. LESTER ALONE AND/OR IN VIEW OF PIEPGRAS RENDERS CLAIMS 1-5, 7, 14, AND 15 OF THE '506 PATENT OBVIOUS

1. Claim 1 is Obvious Over Lester in View of Piepgras

807. For the reasons set forth above, Lester embodied all elements of claims 1-5, 7, 14, and 15 of the '506 Patent and, therefore, Lester anticipates those claims. If it is found that Lester

fails to disclose any limitations of the Asserted Claims of the '506 Patent, then it is my opinion that Lester in view of Piepgras would have rendered those claims obvious.

808. **Elements 1[p]-1[a].** Lester discloses the preamble and element [a] of claim 1 of the '506 Patent: "[p] A cove lighting apparatus for an architectural surface, comprising: [a] a cove member configured to fit within a gap defined by the architectural surface and comprising an interior surface that is recessed from the architectural surface; and".

809. Lester discloses an "indirect fluorescent lighting fixture for recessed mounting in a grid-type ceiling, comprising an elongated dome having an arcuate cross section and two elongated coves, each capable of holding at least one fluorescent light bulb…. The inner face of the dome points in the downward direction and is capable of reflecting light." Lester, Abstract. Lester further discloses that the lighting fixture provides for hiding the light bulbs from a viewer "in a cove on either side of the fixture, and light from each bulb radiates upward and is reflected off of a domed upper portion of the fixture." Lester, 1:6-11.

810. According to Lester, Figure 1 (reproduced below) discloses a cross section of a lighting fixture "comprising a dome 1 and coves 2 running along each longitudinal edge of dome 1," as shown below.

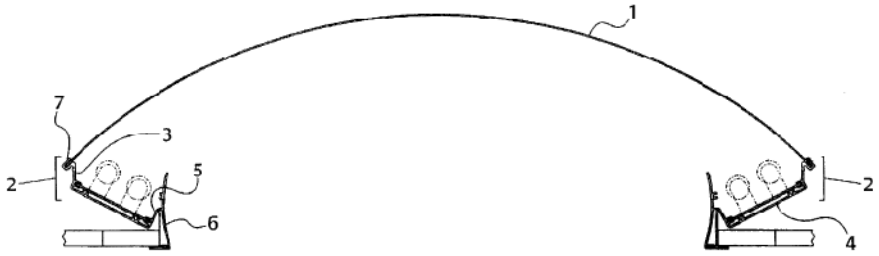


Fig. 1

Lester, Fig. 1. Lester describes the configuration of Figure 1 in which the dome 1 is at approximately 45 degrees, and cove 2 consists of an outer wall 3, a base 4, and an inner wall 5,

where the base 4 is angled at approximately 25 degrees below horizontal relative to a ground surface. As a result, Lester discloses that the "angle of the cove maximizes the amount of light that is reflected off of the inner face of dome 1 and into the room." Lester, 3:29-38.

811. To the extent Signify or its expert contend this element is novel in the field of art, even the '506 Patent's "Background" section admits that recessed cove lighting apparatuses in an architectural surface were known in the art prior to the '506 Patent. '506 Patent, 1:42-55, 2:3-6.

812. To the extent this limitation is not expressly disclosed in Lester, such a limitation would have been obvious to a POSA when combined with his/her general knowledge and understanding of cove lighting apparatuses.

813. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 1[a] of the '506 Patent and, thus, renders claim 1[a] obvious.

814. **Element 1[b].** Lester discloses element [b] of claim 1 of the '506 Patent: "at least one LED-based light source associated with the cove member for irradiating at least a portion of the interior surface with visible light perceivable by a viewer via the gap defined in the architectural surface,".

815. Lester specifically discloses that the lighting fixture is designed to provide a viewer with an indirect source of lighting. Lester, 2:1-13 ("These and other objects of the present invention are accomplished by an ***indirect lighting fixture*** comprising…). Lester then describes that the indirect lighting fixture "is mounted in place of ceiling panels in a grid-type ceiling, so that the cove and the edges of the dome are hidden behind the ceiling panels on either side of the fixture." Lester, 2:1-13. Such a configuration, according to Lester, results in "more of the internal surface of the dome [being] visible, and the dome has the effect of appearing endless from any

direction of view." Lester, 2:1-13. Lester discloses that a configuration such as that shown in Figure 1 allows for the visible light to travel to the viewer via a gap in the architectural surface. According to Lester, the "upper portion of the coves allows the light from the bulbs inserted therein to escape and be evenly reflected off the inner face of the dome and down into the room." Lester, 2:37-39.

816. To the extent this limitation is not expressly disclosed in Lester, such a limitation would have been obvious to a POSA when combined with Piepgras. Piepgras discloses, in connection with Figure 18 (reproduced below): "[v]arious implementations of light emitting diode (LED) based illumination products and methods, including a "contoured reflective surface may be placed apart from a plurality of LEDs, such that radiation from the LEDs is directed toward the reflective surface, as indicated by arrows 1806. In this configuration, radiation from the LEDs is redirected out in a circle about the reflective surface." Piepgras, 5:13-21, 17:36-44.

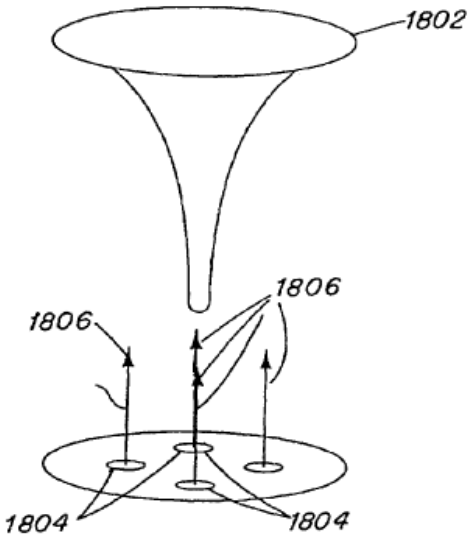


FIG. 18

Piepgras, Fig. 18.

817. A POSA would have understood that the indirect lighting fixture of Lester could be combined with the LEDs of Piepgras because Piepgras provides a reflective surface having a novel geometry that, in some illumination applications, is effective in dispersing light throughout a large space.

818. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 1[b] of the '506 Patent and, thus, renders claim 1[b] obvious.

819. **Element 1[c].** Lester discloses element [c] of claim 1 of the '506 Patent: "wherein the cove lighting apparatus is configured such that the at least one LED-based light source is concealed from the viewer."

820. Lester discloses configuring the indirect lighting fixture such that it is concealed from view of an observer. According to Lester, light from the indirect lighting fixture is "directed upward to the inner face of the dome where it is reflected down into the room." (Lester at Abstract.) Such a configuration, when mounted recessed into a surface such as a ceiling, results in "the light bulbs in the coves and the ends of the dome [being] invisible to occupants of the room." Lester, Abstract. Lester then goes on to disclose such a configuration in more detail in reference to Figure 2. According to Figure 2 of Lester (reproduced below), the "[i]nner wall 5 of cove 2 is integrally formed with a bracket 6, which prevents the light bulbs 11 from being seen, and attaches to a section of a ceiling grid 9 to mount the fixture." Lester, 3:42-44.

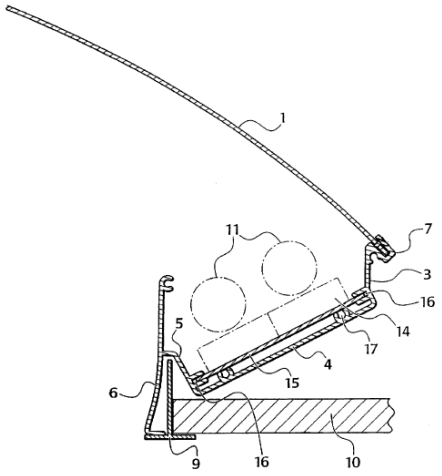


Fig. 2

Lester, Fig. 2.

821. Lester further discloses that "[d]uring use, the coves are configured so as to keep the light bulbs out of the line of sight of all occupants of the room, but are open enough to allow the maximum amount of light to emanate from the bulbs and be reflected off the inner face of the dome." Lester, 2:60-64.

822. To the extent this limitation is not expressly disclosed in Lester, such a limitation would have been obvious to a POSA when combined with the teachings of Piepgras. Piepgras discloses "[v]arious implementations of light emitting diode (LED) based illumination products and methods, including a "contoured reflective surface may be placed apart from a plurality of LEDs, such that radiation from the LEDs is directed toward the reflective surface, as indicated by arrows 1806. In this configuration, radiation from the LEDs is redirected out in a circle about the reflective surface." Piepgras, 5:13-21, 17:36-44.

823. A POSA would have understood that the indirect lighting fixture of Lester could be combined with the LEDs of Piepgras because, as discussed earlier, the shape of the reflective surface suggested by Piepgras is, in some applications, preferable to a simple concave reflector.

824. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 1 of the '506 Patent and is, therefore, rendered obvious.

2. Claim 2 is Obvious Over Lester in View of Piepgras

825. Claim 2 of the '506 Patent recites: "The apparatus of claim 1, wherein the cove member includes a channel portion, and wherein: the at least one LED-based light source is coupled to the channel portion and positioned so as to irradiate at least the portion of the interior surface of the cove member with the visible light." Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 2.

826. Lester discloses the channel portion of claim 2, as well coupling the indirect lighting fixture to the channel portion and irradiating at least a portion of the interior surface of the cove member with visible light. According to Lester, the dome of the indirect lighting fixture "has an arcuate cross section and is adapted for recessed mounting in the ceiling of a room. Two longitudinally extending u-shaped channel-like coves are mounted, one on each side of the dome, for holding the fluorescent bulbs." Lester, 2:1-8. Such a configuration allows for the upper portion of the cove to "allow the light from the bulbs inserted therein to escape and be evenly reflected off the inner face of the dome and down into the room." Lester, 2:37-39.

827. To the extent this limitation is not expressly disclosed in Lester, such a limitation would have been obvious to a POSA when combined with the teachings of Piepgras. Piepgras discloses "[v]arious implementations of light emitting diode (LED) based illumination products and methods, including a "contoured reflective surface may be placed apart from a plurality of LEDs, such that radiation from the LEDs is directed toward the reflective surface, as indicated by

arrows 1806. In this configuration, radiation from the LEDs is redirected out in a circle about the reflective surface." Piepgras, 5:13-21, 17:36-44.

828. A POSA would have understood that the indirect lighting fixture of Lester could be combined with the LEDs of Piepgras because of the electrical efficiency and comparative brightness of LEDs.

829. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 2 of the '506 Patent and thus renders claim 2 obvious.

3. Claim 3 is Obvious Over Lester in View of Piepgras

830. Claim 3 of the '506 Patent recites: "The apparatus of claim 2, further comprising a blocking member for concealing the at least one light LED-based source from the viewer." Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 3.

831. Lester discloses the blocking member of claim 3 in the form of a bracket which blocks the indirect lighting fixture from the view of an observer: "Inner wall 5 of the cove 2 is integrally formed with a bracket 6, which prevents the light bulbs 11 from being seen, and attaches to a section of a ceiling grid 9 to mount the fixture." Lester, 3:42-44. According to Lester, the "dome overlaps the opening in the ceiling in which the fixture is mounted, so that the coves 2 and the ends of the dome 1 are hidden behind ceiling panels." Lester, 3:46-48.

832. To the extent this limitation is not expressly disclosed in Lester, such a limitation would have been obvious to a POSA when combined with their general knowledge and understanding of cove lighting apparatuses. Specifically, blocking the line-of-sight of an observer

to the light source(s) (such as LEDs) prevents glare and gives the light emanating from the fixture or luminaire a diffuse appearance.

833. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 3 of the '506 Patent and is, therefore, rendered obvious.

4. Claim 4 is Obvious Over Lester in View of Piepgras

834. Claim 4 of the '506 Patent recites: "The apparatus of claim 1, wherein the at least a portion the interior surface of the cove member comprises an essentially white matte surface configured to reflect and diffuse light." Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 4.

835. Lester discloses the use of an essentially white matte surface for reflecting and diffusing light on the interior surface of the cove member. According to Lester, the "inner face of the dome is preferably coated with a non-glare coating or paint such as semi-matte white enamel for reflecting the light emanating from the light bulbs in the coves down into the room in an aesthetically pleasing manner without harsh glare." Lester, 2:17-23.

836. To the extent this limitation is not expressly disclosed in Lester, such a limitation would have been obvious to a POSA when combined with their general knowledge and understanding of cove lighting apparatuses. As discussed above, diffuse light is pleasing to the human eye and a white matte surface has the effect of homogenizing and diffusing light.

837. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 4 of the '506 Patent and is, therefore, rendered obvious.

5. Claim 5 is Obvious Over Lester in View of Piepgras

838. Claim 5 of the '506 Patent recites: "The apparatus of claim 4, wherein the at least one LED-based light source is positioned with respect to the cove member such that the visible light is perceivable as a light surface that is essentially flush with the architectural surface." Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 5.

839. Lester discloses positioning the light bulb such that the light visible to an observer appears essentially flush with the architectural surface. According to Lester, the indirect lighting fixture is "mounted in place of ceiling panels in a grid-type ceiling, so that the coves and the edges of the dome are hidden behind the ceiling panels on either side of the fixture, and more of the internal surface of the dome is visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:8-13.

840. To the extent this limitation is not expressly disclosed in Lester, such a limitation would have been obvious to a POSA when combined with the teachings of Piepgras. Piepgras discloses "an essentially planar member that serves as either a portion of a wall itself, or that is adapted to be essentially flush-mounted on a wall." Piepgras, 23:46-59.

841. A POSA would have understood that the indirect lighting fixture of Lester could be combined with the LEDs of Piepgras for the reasons stated previously.

842. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 5 of the '506 Patent and is, therefore, rendered obvious.

6. Claim 7 is Obvious Over Lester in View of Piepgras

843. Claim 7 of the '506 Patent recites: "The apparatus of claim 1, wherein the visible light includes essentially white light." Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 7.

844. Lester discloses the indirect lighting fixture capable of emitting essentially white light from the light bulb. According to Lester, the disclosed invention "relates to an indirect fluorescent lighting fixture." Lester, 1:7-8. Lester further discloses "an indirect lighting fixture comprising an elongated dome for holding a plurality of fluorescent light bulbs," as well as a mounting structure within the cove "for mounting of a fluorescent light bulb[]." Lester, 2:1-4, 3:49-50. Fluorescent light bulbs emit visible light that is essentially white.

845. To the extent this limitation is not expressly disclosed in Lester, such a limitation would have been obvious to a POSA when combined with the teachings of Piepgras. Piepgras discloses "the term LED" should be understood to include light emitting diodes of all types, including white LEDs, infrared LEDs, …." Piepgras, 5:47-49. Piepgras further discloses an apparatus "wherein the at least one controller is configured to selectively control the first plurality of the first white LEDs and the second plurality of the second LEDs such that the visible radiation is perceived as essentially white light." Piepgras, 39:18-22.

846. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 7 of the '506 Patent and is, therefore, rendered obvious.

7. Claim 14 is Obvious Over Lester in View of Piepgras

847. Claim 14 of the '506 Patent recites: "The apparatus of claim 1, wherein the visible light is perceived by the viewer as substantially uniform filing the gap in the architectural surface."

Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 14.

848. Lester discloses positioning the light bulb such that the light visible to an observer appears substantially uniform and thus appears to fill the gap in the architectural surface. According to Lester, the indirect lighting fixture is "mounted in place of ceiling panels in a grid-type ceiling, so that the coves and the edges of the dome are hidden behind the ceiling panels on either side of the fixture, and more of the internal surface of the dome is visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:8-13.

849. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 4 of the '506 Patent and is, therefore, rendered obvious.

8. Claim 15 is Obvious Over Lester in View of Piepgras

850. Lester disclosed to a POSA, either alone or in combination with the general knowledge and understanding of a POSA, as of the earliest claim priority date of the '506 Patent every limitation of claim 15 of the '506 Patent and, therefore, renders it obvious. Specifically, Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses all four elements of claim 15 as identified by Signify, elements [a]-[d], as detailed further below.

851. **Elements 15[p]-15[a].** Lester discloses the preamble and element [a] of claim 15 of the '506 Patent: "[p] A method for providing architectural illumination, comprising: [a] forming a gap in an architectural surface;".

852. Lester discloses an "indirect fluorescent lighting fixture for recessed mounting in a grid-type ceiling, comprising an elongated dome having an arcuate cross section and two elongated

coves, each capable of holding at least one fluorescent light bulb…. The inner face of the dome points in the downward direction and is capable of reflecting light." Lester, Abstract. Lester further discloses that the lighting fixture provides for hiding the light bulbs from a viewer "in a cove on either side of the fixture, and light from each bulb radiates upward and is reflected off of a domed upper portion of the fixture." Lester, 1:6-11.

853. According to Lester, Figure 1 discloses a cross section of a lighting fixture "comprising a dome 1 and coves 2 funning along each longitudinal edge of dome 1," as shown below.



Fig. 1

Lester, Fig. 1.

854. Lester describes the configuration of Figure 1 where the dome 1 is at approximately 45 degrees, and cove 2 comprises an outer wall 3, a base 4, and an inner wall 5, wherein the base 4 is angled at approximately 25 degrees below horizontal relative to a ground surface.

855. For the reasons discussed above, a POSA would have understood that Lester discloses every limitation of claims 15[p] and 15[a] of the '506 Patent and is, therefore, rendered obvious.

856. **Element 15[b].** Lester discloses element [b] of claim 15 of the '506 Patent: "disposing a cove member in the gap defined by the architectural surface, the cove member comprising an interior surface that is recessed from the architectural surface;".

857. Lester discloses an "indirect fluorescent lighting fixture for recessed mounting in a grid-type ceiling, comprising an elongated dome having an arcuate cross section and two elongated coves, each capable of holding at least one fluorescent light bulb…. The inner face of the dome points in the downward direction and is capable of reflecting light." Lester, Abstract. Lester further discloses that the lighting fixture provides for hiding the light bulbs from a viewer "in a cove on either side of the fixture, and light from each bulb radiates upward and is reflected off of a domed upper portion of the fixture." Lester, 1:6-11.

858. To the extent this limitation is not expressly disclosed in Lester, such a limitation would have been obvious to a POSA simply because of the definition of recessed lighting.

859. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 15[b] of the '506 Patent and is, therefore, rendered obvious.

860. **Element 15[c].** Lester discloses element [c] of claim 15 of the '506 Patent: "generating visible light by at least one light LED-based source;".

861. Lester discloses an "indirect fluorescent lighting fixture for recessed mounting in a grid-type ceiling, comprising an elongated dome having an arcuate cross section and two elongated coves, each capable of holding at least one fluorescent light bulb." Lester, Abstract. Lester further discloses that "[l]ight bulbs 11 may be wired to an electrical outlet with any conventional wiring means," and that the "upper portion of the coves allows the light from the bulbs inserted therein to escape and be evenly reflected off the inner face of the dome and down into the room." Lester, 3:52-54, 2:37-39.

862. To the extent this limitation is not expressly disclosed in Lester, such a limitation would have been obvious to a POSA when combined with the teachings of Piepgras. Piepgras

discloses "[v]arious implementations of light emitting diode (LED) based illumination products and methods, including a "contoured reflective surface may be placed apart from a plurality of LEDs, such that radiation from the LEDs is directed toward the reflective surface, as indicated by arrows 1806. In this configuration, radiation from the LEDs is redirected out in a circle about the reflective surface." Piepgras, 5:13-21, 17:36-44.

863. A POSA would have understood that the indirect lighting fixture of Lester could be combined with the LEDs of Piepgras because of the superior efficiencies of LEDs in generating visible light.

864. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 15[c] of the '506 Patent and, thus, renders it obvious.

865. **Element 15[d].** Lester discloses element [d] of claim 15 of the '506 Patent: "irradiating at least a portion of the interior surface with visible light such that the visible light is perceivable by a viewer via the gap as a light surface that is essentially flush with the architectural surface."

866. Lester specifically discloses that the lighting fixture is designed to provide a viewer with an indirect source of lighting. Lester, 2:1-13 ("These and other objects of the present invention are accomplished by an ***indirect lighting fixture*** comprising…). Lester then goes on to describe that the indirect lighting fixture "is mounted in place of ceiling panels in a grid-type ceiling, so that the cove and the edges of the dome are hidden behind the ceiling panels on either side of the fixture." Lester, 2:1-13. Such a configuration, according to Lester, results in "more of the internal surface of the dome [being] visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:1-13. Lester then goes on to disclose that configuration

such as that shown in Figure 1 allows for the visible light to travel to the viewer via a gap in the architectural surface. According to Lester, the "upper portion of the coves allows the light from the bulbs inserted therein to escape and be evenly reflected off the inner face of the dome and down into the room." Lester, 2:37-39.

867. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with the general knowledge and understanding of a POSA and/or Piepgras, discloses every limitation of claim 15[d] of the '506 Patent and is, therefore, rendered obvious.

868. For the reasons discussed above, a POSA would have understood that Lester, either alone or in combination with Piepgras, discloses every limitation of claim 15 of the '506 Patent and, therefore, renders it obvious.

E. YOSHIMI ALONE AND/OR IN VIEW OF VAN DE VEN AND LESTER RENDERS CLAIMS 1-5, 7, 14, AND 15 OF THE '506 PATENT OBVIOUS

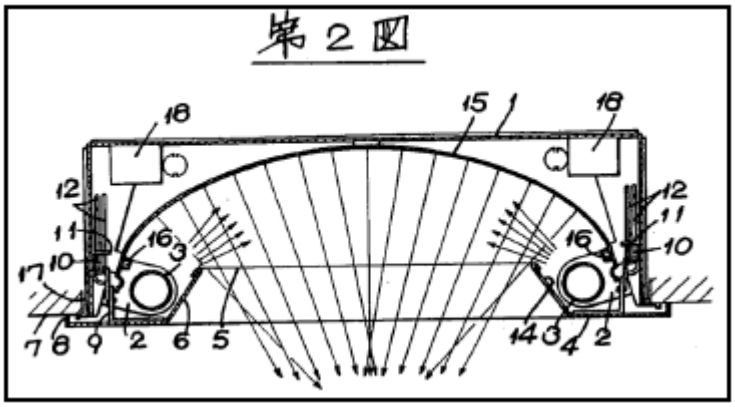
1. Claim 1 is Obvious Over Yoshimi in View of Van De Ven

869. It is my opinion that Yoshimi in view of Van De Ven and/or Lester would have rendered the asserted claims of the '506 Patent obvious.

870. **Elements 1[p]-1[a].** Yoshimi discloses the preamble and element [a] of claim 1 of the '506 Patent: "[p] A cove lighting apparatus for an architectural surface, comprising: [a] a cove member configured to fit within a gap defined by the architectural surface and comprising an interior surface that is recessed from the architectural surface; and".

871. Yoshimi discloses a "lighting fixture, and more particularly … a lighting fixture which is mounted on a ceiling, such as a ceiling-embedded type, and emits only reflected light to the outside of the lighting fixture." Yoshimi (translation), p. 5, col. 2. According to Yoshimi, the lighting fixture is recessed from the architectural surface, as a reflector has its "central part curved upward in a dome shape and is arranged within the main body" such that the "sides of this reflector

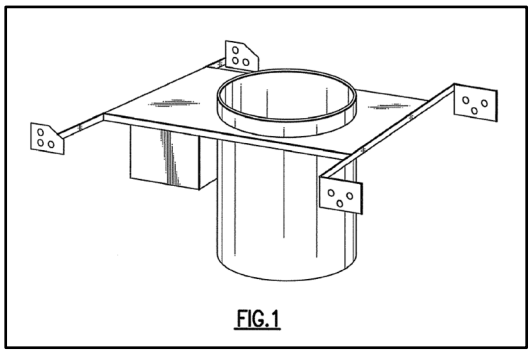
are detachably attached to the inner surfaces on both sides of the main body with screws." Yoshimi (translation), p. 6, col. 4. Yoshimi further discloses that by "surrounding the outside of the lamp with the sides of the reflector, the lamp is surrounded on the lower and both sides by the reflector and the light-blocking frame" such that the "opening of the light-blocking frame faces the reflector, and the sides of the reflector and the edges of the light-blocking frame mutually reflect the light of the lamp towards the central part of the reflector." Yoshimi (translation), p.6, col. 4. Figure 2 below illustrates the configuration of Yoshimi:



Yoshimi, Fig. 2.

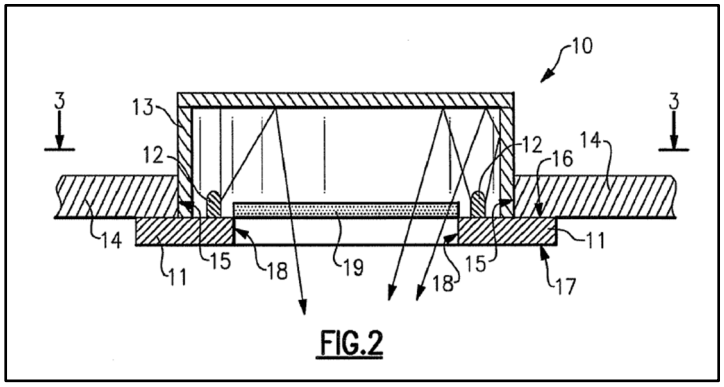
872. To the extent this limitation is not expressly disclosed in Yoshimi, such a limitation would have been obvious to a POSA when combined with the teachings of Van De Ven. Van De Ven discloses "a lighting device in particular, a device which includes one or more solid state light emitters. In a specific aspect, the present invention relates to a 'recessed can' lighting device." Van De Ven, 1:12-15. According to Van De Ven, "Traditional recessed light fixtures comprise a metal cylinder ('can') mounted into the ceiling using horizontal metal struts attached to the ceiling joints. Within the cylinder, mounted on an adjustable sliding plate, is light bulb socket into which a light bulb is inserted. Typically a 60 W incandescent light bulb or a 15 W compact fluorescent bulb is used. For example, a conventional recessed light fixture is depicted." Van De Ven, 2:38-

45. Figure 1, reproduced below, is illustrative of the cove lighting apparatus disclosed in Van De Ven.



Van De Ven, Fig. 1.

873. According to Van De Ven, "[t]raditional recessed light fixtures comprise a metal cylinder ('can') mounted into the ceiling using horizontal metal struts attached to the ceiling joints." Van De Ven, 2:38-40. With reference to Figure 2, a "lighting device 10 have been attached to a contract region of a ceiling 14 adjacent to a substantially circular construction surface opening which has been cut in the ceiling 14." Van De Ven, 19:19-29.



Van De Ven, Fig. 2.

874. Van De Ven further discloses that "[t]he lighting devices of the present invention can be installed in a construction surface, e.g., in a ceiling, a wall or a floor." Van De Ven, 12:64-65. And according to one particular embodiment disclosed in Van De Ven, "a construction surface

opening is formed in the construction surface, and the lighting device is positioned such that the contact region of the thermal conduction element (i.e., the first portion of the first side of the thermal conduction element) surrounds the construction surface opening (for example, the first portion of the first side can be in contact with the construction surface at least at locations adjacent to the construction surface opening), and then the lighting device is attached to the construction surface in any suitable manner (persons skilled in the art are familiar with a wide variety of ways of attaching a lighting device, such as the lighting devices according to the present invention, to different construction surfaces)." Van De Ven, 12:66-13:12.

875. To the extent Signify or its expert contend this element is novel in the field of art, even the '506 Patent's "Background" section admits that recessed cove lighting apparatuses in an architectural surface were known in the art prior to the '506 Patent. '506 Patent, 1:42-55, 2:3-6.

876. A POSA would have recognized the multiple similarities between the lighting fixtures of Yoshimi and Van De Van. Furthermore, a POSA would be motivated to combine the two designs because of the improved "shield" of Yoshimi, but also because of the introduction of LEDs by Van de Ven.

877. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven, discloses every limitation of claims 1[p] and 1[a] of the '506 Patent and, thus, renders them obvious.

878. **Element 1[b].** Yoshimi in view of Van De Ven discloses element [b] of claim 1 of the '506 Patent: "at least one LED-based light source associated with the cove member for irradiating at least a portion of the interior surface with visible light perceivable by a viewer via the gap defined in the architectural surface,".

879. While Yoshimi does not directly disclose the use of LEDs, such a limitation would have been obvious to a POSA when combined with the teachings of Van De Ven. Van De Ven discloses a light source in the form of "at least one of the solid state light emitters is an LED," and that "the reflective element can comprise numerous concave surfaces, and one or more light emitting diodes can be mounted on any or all of such concave surfaces." Van De Ven, 7:50-51, 12-33-36. Van De Ven then further discloses installing the lighting device such that "a construction surface opening is formed in the construction surface, and the lighting device is positioned such that the contact region of the thermal conduction element (i.e., the first portion of the first side of the thermal conduction element) surrounds the construction surface opening." Van De Ven, 12:66-13:12.

880. A POSA would have recognized the multiple similarities between the lighting fixtures of Yoshimi and Van De Van. Furthermore, a POSA would be motivated to combine the two designs because of the improved "shield" of Yoshimi, but also because of the introduction of LEDs by Van de Ven.

881. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven, discloses every limitation of claim 1[b] of the '506 Patent and, thus, renders it obvious.

882. **Element 1[c].** Yoshimi in view of Van De Ven discloses element [c] of claim 1 of the '506 Patent: "wherein the cove lighting apparatus is configured such that the at least one LED-based light source is concealed from the viewer."

883. Yoshimi discloses concealing the light source from a viewer. According to Yoshimi, a "straight tube type fluorescent lamp mounted on the main body is arranged along the

peripheral edge part of both side openings in the main body. The inner peripheral edge of the opening is provided with a light-shielding edge which is inclined with a width-decreasing direction toward the inner ceiling, and the outer peripheral edge of the light-shielding frame is provided with an edge frame portion which is brought into contact with the ceiling surface." Yoshimi (translation), p. 6, col. 3. According to Yoshimi, therefore the "[m]ounting pieces are fixed to both sides of the inner surface of the light shielding frame, and a V-shaped spring rod whose central part is wound is engaged with the mounting pieces" such that when the "light shielding frame is pushed up in this state, the rod part of the spring rod slides on the engaging part while being expanded by elasticity." Yoshimi (translation), p. 6, col. 3. This configuration is also described by Yoshimi as follows: "[as] the light shielding frame is pulled up, the edge frame part of the light shielding frame is abutted on the ceiling surface, and the light shielding edge goes in and out of the main body to a position opposed to the inside of the lamp and surrounds the lower part and inside of the lamp to conceal the lamp." Yoshimi (translation), p. 6, col. 3. And Yoshimi further discloses that the "lamp is concealed by fitting and fixing the luminaire main body … in the recessed hole of the ceiling surface." Yoshimi (translation), p. 7, col. 1.

884. Although Yoshimi does not employ LEDs as the light source, such a limitation would have been obvious to a POSA when combined with the teachings of Van De Ven for the reasons discussed above.

885. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven, discloses every limitation of claim 1[c] of the '506 Patent and, thus, renders it obvious.

2. Claim 2 is Obvious Over Yoshimi in View of Van De Ven and Lester

886. Claim 2 of the '506 Patent recites: "The apparatus of claim 1, wherein the cove member includes a channel portion, and wherein: the at least one LED-based light source is coupled to the channel portion and positioned so as to irradiate at least the portion of the interior surface of the cove member with the visible light." Yoshimi in view of Van De Ven and/or Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 2.

887. Yoshimi discloses the channel portion of claim 2, wherein the light source is coupled to the channel portion so as to irradiate at least part of the interior surface of the cove member with visible light. According to Yoshimi, a "straight tube type fluorescent lamp mounted on the main body is arranged along the peripheral edge part of both side openings in the main body. The inner peripheral edge of the opening is provided with a light-shielding edge which is inclined with a width-decreasing direction toward the inner ceiling, and the outer peripheral edge of the light-shielding frame is provided with an edge frame portion which is brought into contact with the ceiling surface." Yoshimi (translation), p. 6, col. 3. Thus according to Yoshimi, the "[m]ounting pieces are fixed to both sides of the inner surface of the light shielding frame, and a V-shaped spring rod whose central part is wound is engaged with the mounting pieces" such that when the "light shielding frame is pushed up in this state, the rod part of the spring rod slides on the engaging part while being expanded by elasticity." Yoshimi (translation), p. 6, col. 3. This configuration as disclosed in Yoshimi thus provides that as the "light shielding frame is pulled up, the edge frame part of the light shielding frame is abutted on the ceiling surface, and the light shielding edge goes in and out of the main body to a position opposed to the inside of the lamp and surrounds the lower part and inside of the lamp to conceal the lamp." Yoshimi (translation), p. 6, col. 3.

888. To the extent this limitation is not expressly disclosed in Yoshimi, such a limitation would have been obvious to a POSA when combined with the teachings of Lester. Lester discloses the channel portion of claim 2, as well coupling the indirect lighting fixture to the channel portion and irradiating at least a portion of the interior surface of the cove member with visible light. According to Lester, the dome of the indirect lighting fixture "has an arcuate cross section and is adapted for recessed mounting in the ceiling of a room. Two longitudinally extending u-shaped channel-like coves are mounted, one on each side of the dome, for holding the fluorescent bulbs." Lester, 2:1-8. Such a configuration allows for the upper portion of the cove to "allow the light from the bulbs inserted therein to escape and be evenly reflected off the inner face of the dome and down into the room." Lester, 2:37-39.

889. A POSA would have understood that the lighting fixture of Yoshimi could be combined with the indirect dome lighting fixture of Lester for the same reasons as discussed above with regards to combining the lighting fixture of Yoshimi with that of Van De Ven.

890. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven and/or Lester, discloses every limitation of claim 2 of the '506 Patent and thus renders it obvious.

3. Claim 3 is Obvious Over Yoshimi in View of Van De Ven

891. Claim 3 of the '506 Patent recites: "The apparatus of claim 2, further comprising a blocking member for concealing the at least one light LED-based source from the viewer." Yoshimi in view of Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 3.

892. Yoshimi discloses the blocking member of claim 3. According to Yoshimi, a "straight tube type fluorescent lamp mounted on the main body is arranged along the peripheral edge part of both side openings in the main body. The inner peripheral edge of the opening is provided with a light-shielding edge which is inclined with a width-decreasing direction toward the inner ceiling, and the outer peripheral edge of the light-shielding frame is provided with an edge frame portion which is brought into contact with the ceiling surface." Yoshimi (translation), p. 6, col. 3. Thus according to Yoshimi, the "[m]ounting pieces are fixed to both sides of the inner surface of the light shielding frame, and a V-shaped spring rod whose central part is wound is engaged with the mounting pieces" such that when the "light shielding frame is pushed up in this state, the rod part of the spring rod slides on the engaging part while being expanded by elasticity." Yoshimi (translation), p. 6, col. 3. This configuration as disclosed in Yoshimi thus provides that as the "light shielding frame is pulled up, the edge frame part of the light shielding frame is abutted on the ceiling surface, and the light shielding edge goes in and out of the main body to a position opposed to the inside of the lamp and surrounds the lower part and inside of the lamp to conceal the lamp." Yoshimi (translation), p. 6, col. 3.

893. Yoshimi further discloses that the "lamp is concealed by fitting and fixing the luminaire main body … in the recessed hole of the ceiling surface, attaching the light shielding frame, and bringing the edge frame part into close contact with the ceiling surface, and only the central part in the reflecting plate is exposed from the opening part of the light shielding frame." Yoshimi (translation), p. 7, col. 1.

894. To the extent this limitation is not expressly disclosed in Yoshimi, such a limitation would have been obvious to a POSA when combined with the teachings of Van De Ven. Van De Ven discloses that "some embodiments of the lighting devices according to the present invention

can, if desired, also include a shield member which extends from the first side of the thermal conduction element away from the second side of the thermal conduction element, in order to obstruct the solid state light emitters from view. Such a shield member, if provided, can be formed of any suitable material, e.g., any of the materials which are suitable for forming the reflective element." Van De Ven, 13:59-67.

895. A POSA would have understood that the lighting fixture of Yoshimi could be combined with the recessed lighting fixture of Van De Ven for the reasons discussed above.

896. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven, discloses every limitation of claim 3 of the '506 Patent and thus renders it obvious.

4. Claim 4 is Obvious Over Yoshimi and Van De Ven

897. Claim 4 of the '506 Patent recites: "The apparatus of claim 1, wherein the at least a portion the interior surface of the cove member comprises an essentially white matte surface configured to reflect and diffuse light." Yoshimi in view of Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 4.

898. Yoshimi in view of Van De Ven discloses the essentially white matte surface for reflecting and diffusing light of claim 4. According to Yoshimi, the "curved surface of the reflecting plate is formed into a smooth curved surface so that all normal lines at arbitrary points thereof pass through the opening of the light shielding frame. A white matte coating is applied to the surface of the reflector plate so as to form a white diffuse reflection face." Yoshimi (translation), p. 6, col. 4.

899. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or

Van De Ven, discloses every limitation of claim 4 of the '506 Patent, and is therefore rendered obvious by Yoshimi.

5. Claim 5 is Obvious Over Yoshimi in View of Van De Ven and Lester

900. Claim 5 of the '506 Patent recites: "The apparatus of claim 4, wherein the at least one LED-based light source is positioned with respect to the cove member such that the visible light is perceivable as a light surface that is essentially flush with the architectural surface." Yoshimi in view of Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 5.

901. Yoshimi in view of Van De Ven and/or Lester discloses positioning the LED-based light source relative to the cove member such that the resulting visible light is perceived by an observer as being essentially flush with the architectural surface. Yoshimi posits that the disclosed configuration "prevent[s] glare from being felt at all, [improves] luminance of a central part of a reflecting plate which can be seen from the opening part of the light shielding frame, to uniformly shine, and [obtains] a beautiful illumination effect." Yoshimi (translation), at 4.

902. To the extent this limitation is not expressly disclosed in Yoshimi, such a limitation would have been obvious to a POSA when combined with the teachings of Lester. Lester discloses positioning the light bulb such that the light visible to an observer appears essentially flush with the architectural surface. According to Lester, the indirect lighting fixture is "mounted in place of ceiling panels in a grid-type ceiling, so that the coves and the edges of the dome are hidden behind the ceiling panels on either side of the fixture, and more of the internal surface of the dome is visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:8-13.

903. A POSA would have understood that the lighting fixture of Yoshimi could be combined with the indirect dome lighting fixture of Lester for the reasons discussed above.

904. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven and/or Lester, discloses every limitation of claim 5 of the '506 Patent and thus renders it obvious.

6. Claim 7 is Obvious Over Yoshimi in View of Van De Ven

905. Claim 7 of the '506 Patent recites: "The apparatus of claim 1, wherein the visible light includes essentially white light." Yoshimi in view of Van De Ven disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 7.

906. Yoshimi discloses the indirect lighting fixture capable of emitting essentially white light from the light bulb. According to Yoshimi, a "straight tube type fluorescent lamp mounted on the main body is arranged along the peripheral edge part of both side openings in the main body." Yoshimi (translation), p. 6, col. 3. Fluorescent light bulbs emit visible light that is essentially white.

907. To the extent this limitation is not expressly disclosed in Yoshimi, such a limitation would have been obvious to a POSA when combined with the teachings of Van De Ven. According to Van De Ven, "[b]ecause light that is perceived as white is necessarily a blend of light of two or more colors (or wavelengths), no single light emitting diode junction has been developed that can produce white light. 'White' LED lamps have been produced which have a light emitting diode pixel formed of respective red, green and blue light emitting diodes. Another 'white' LED which has been produced includes (1) a light emitting diode which generates blue light and (2) a luminescent material (e.g., a phosphor) that emits yellow light in response to excitation by light

emitted by the light emitting diode, whereby the blue light and the yellow light, when mixed, produce light that is perceived as white light." Van De Ven, 8:61-9:5.

908. A POSA would have understood that the lighting fixture of Yoshimi could be combined with the recessed lighting fixture of Van De Ven for the reasons discussed above.

909. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven, discloses every limitation of claim 7 of the '506 Patent and thus renders it obvious.

7. Claim 14 is Obvious Over Yoshimi in View of Van De Ven and Lester

910. Claim 14 of the '506 Patent recites: "The apparatus of claim 1, wherein the visible light is perceived by the viewer as substantially uniform filing the gap in the architectural surface." Yoshimi in view of Van De Ven and/or Lester disclosed to a POSA, as of the earliest claimed priority date of the '506 Patent, the limitations of claim 14.

911. Yoshimi discloses the visible light being perceived by an observer such that it appears substantially uniform to the architectural surface. According to Yoshimi, when "the lamp is turned on in this state, a part of light emitted from the lamp is directed to the vicinity of the central part of the reflecting plate, and light directed to the end edge of the reflecting plate and both side edges of the light shielding frame is alternately reflected by the reflecting plate and the inner surface of the light shielding frame and directed to the vicinity of the central part of the reflecting plate. Yoshimi (translation), p. 7, col. 1. Yoshimi further discloses that the "brightness in the vicinity of the central part of the reflecting plate is increased, and the light made incident on the vicinity of the central part of the reflecting plate is reflected by the reflecting plate and is made incident on the opening part of the light shielding frame." Yoshimi (translation), p. 7, col. 1. Such a configuration, according to Yoshimi, allows for the light "emitted toward the outside of the lower

part and the central part of the reflecting plate exposed from the opening part [to be] uniformly brightened." Yoshimi (translation), p. 7, col. 1.

912. To the extent this limitation is not expressly disclosed in Yoshimi, such a limitation would have been obvious to a POSA when combined with the teachings of Lester. Lester discloses wherein the visible light is perceived by the viewer as substantially uniform filing the gap in the architectural surface. According to Lester, the indirect lighting fixture is "mounted in place of ceiling panels in a grid-type ceiling, so that the coves and the edges of the dome are hidden behind the ceiling panels on either side of the fixture, and more of the internal surface of the dome is visible, and the dome has the effect of appearing endless from any direction of view." (Lester at 2:8-13.)

913. A POSA would have understood that the lighting fixture of Yoshimi could be combined with the indirect dome lighting fixture of Lester for the reasons discussed above.

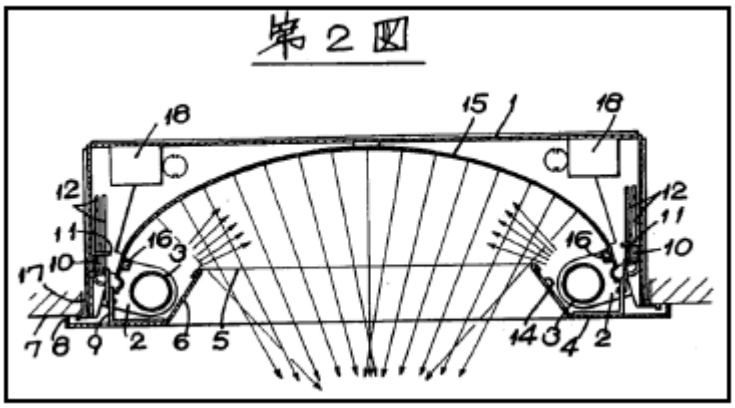
914. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven and/or Lester, discloses every limitation of claim 14 of the '506 Patent and thus renders it obvious.

8. Claim 15 is Obvious Over Yoshimi in View of Van De Ven and Lester

915. Yoshimi disclosed to a POSA, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven and/or Lester, as of the earliest claim priority date of the '506 Patent every limitation of claim 15 of the '506 Patent and therefore renders it obvious. Specifically, Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven and/or Lester, discloses all four elements of claim 15 as identified by Signify, elements [a]-[d], as detailed further below.

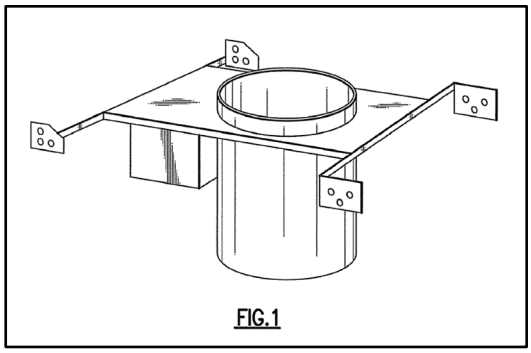
916. **Elements 15[p]-15[a].** Yoshimi in view of Van De Ven discloses the preamble and element [a] of claim 15 of the '506 Patent: "[p] A method for providing architectural illumination, comprising: [a] forming a gap in an architectural surface;".

917. Yoshimi discloses a "lighting fixture, and more particularly … a lighting fixture which is mounted on a ceiling, such as a ceiling-embedded type, and emits only reflected light to the outside of the lighting fixture." Yoshimi (translation), p. 5, col. 2. According to Yoshimi, the lighting fixture is recessed from the architectural surface, as a reflector has its "central part curved upward in a dome shape and is arranged within the main body" such that the "sides of this reflector are detachably attached to the inner surfaces on both sides of the main body with screws." Yoshimi (translation), p. 6, col. 4. Yoshimi further discloses that by "surrounding the outside of the lamp with the sides of the reflector, the lamp is surrounded on the lower and both sides by the reflector and the light-blocking frame" such that the "opening of the light-blocking frame faces the reflector, and the sides of the reflector and the edges of the light-blocking frame mutually reflect the light of the lamp towards the central part of the reflector." Yoshimi (translation), p.6, col. 4. Figure 2 below illustrates the configuration of Yoshimi:



Yoshimi, Fig. 2.

918. To the extent this limitation is not expressly disclosed in Yoshimi, such a limitation would have been obvious to a POSA when combined with the teachings of Van De Ven. Van De Ven discloses a lighting device in particular, a device which includes one or more solid state light emitters. In a specific aspect, the present invention relates to a 'recessed can' lighting device." Van De Ven, 1:12-15. According to Van De Ven, "Traditional recessed light fixtures comprise a metal cylinder ('can') mounted into the ceiling using horizontal metal struts attached to the ceiling joints. Within the cylinder, mounted on an adjustable sliding plate, is light bulb socket into which a light bulb is inserted. Typically a 60 W incandescent light bulb or a 15 W compact fluorescent bulb is used. For example, a conventional recessed light fixture is depicted." Van De Ven, 2:38-45. Figure 1, reproduced below, is illustrative of the cove lighting apparatus disclosed in Van De Ven.



Van De Ven, Fig. 1.

919. According to Van De Ven, "[t]raditional recessed light fixtures comprise a metal cylinder ('can') mounted into the ceiling using horizontal metal struts attached to the ceiling joints." Van De Ven, 2:38-40. With reference to Figure 2, a "lighting device 10 have been attached to a contract region of a ceiling 14 adjacent to a substantially circular construction surface opening which has been cut in the ceiling 14." Van De Ven, 19:19-29.

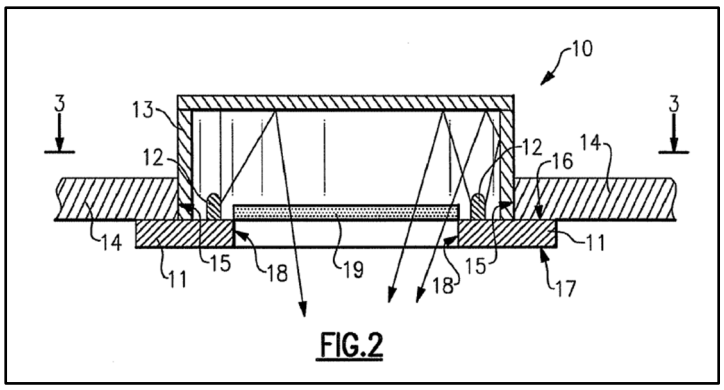


FIG.2

Van De Ven, Fig. 2.

920. Van De Ven further discloses that "[t]he lighting devices of the present invention can be installed in a construction surface, e.g., in a ceiling, a wall or a floor." Van De Ven, 12:64-65. And according to one particular embodiment disclosed in Van De Ven, "a construction surface opening is formed in the construction surface, and the lighting device is positioned such that the contact region of the thermal conduction element (i.e., the first portion of the first side of the thermal conduction element) surrounds the construction surface opening (for example, the first portion of the first side can be in contact with the construction surface at least at locations adjacent to the construction surface opening), and then the lighting device is attached to the construction surface in any suitable manner (persons skilled in the art are familiar with a wide variety of ways of attaching a lighting device, such as the lighting devices according to the present invention, to different construction surfaces)." Van De Ven, 12:66-13:12.

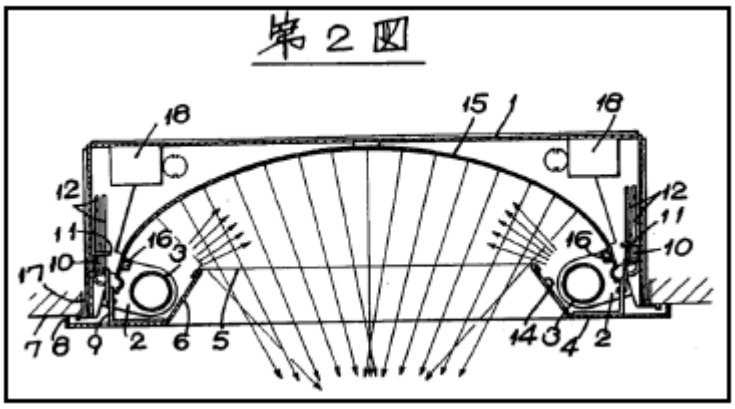
921. A POSA would have understood that the lighting fixture of Yoshimi could be combined with the recessed lighting fixture of Van De Ven for the reasons discussed above.

922. To the extent Signify or its expert contend this element is novel in the field of art, even the '506 Patent's "Background" section admits that recessed cove lighting apparatuses in an architectural surface were known in the art prior to the '506 Patent. '506 Patent, 1:42-55, 2:3-6.

923. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven, discloses every limitation of claims 15[p] and 15[a] of the '506 Patent and thus renders it obvious.

924. **Elements 15[b].** Yoshimi in view of Van De Ven discloses element [b] of claim 15 of the '506 Patent: "disposing a cove member in the gap defined by the architectural surface, the cove member comprising an interior surface that is recessed from the architectural surface;".

925. Yoshimi discloses a "lighting fixture, and more particularly … a lighting fixture which is mounted on a ceiling, such as a ceiling-embedded type, and emits only reflected light to the outside of the lighting fixture." Yoshimi (translation), p. 5, col. 2. According to Yoshimi, the lighting fixture is recessed from the architectural surface, as a reflector has its "central part curved upward in a dome shape and is arranged within the main body" such that the "sides of this reflector are detachably attached to the inner surfaces on both sides of the main body with screws." Yoshimi (translation), p. 6, col. 4. Yoshimi further discloses that by "surrounding the outside of the lamp with the sides of the reflector, the lamp is surrounded on the lower and both sides by the reflector and the light-blocking frame" such that the "opening of the light-blocking frame faces the reflector, and the sides of the reflector and the edges of the light-blocking frame mutually reflect the light of the lamp towards the central part of the reflector." Yoshimi (translation), p.6, col. 4. Figure 2 below illustrates the configuration of Yoshimi:



Yoshimi, Fig. 2.

926. To the extent this limitation is not expressly disclosed in Yoshimi, such a limitation would have been obvious to a POSA when combined with the teachings of Van De Ven. Van De Ven discloses that "[t]he lighting devices of the present invention can be installed in a construction surface, e.g., in a ceiling, a wall or a floor." Van De Ven, 12:64-65. And according to one particular embodiment disclosed in Van De Ven, "a construction surface opening is formed in the construction surface, and the lighting device is positioned such that the contact region of the thermal conduction element (i.e., the first portion of the first side of the thermal conduction element) surrounds the construction surface opening (for example, the first portion of the first side can be in contact with the construction surface at least at locations adjacent to the construction surface opening), and then the lighting device is attached to the construction surface in any suitable manner (persons skilled in the art are familiar with a wide variety of ways of attaching a lighting device, such as the lighting devices according to the present invention, to different construction surfaces)." Van De Ven, 12:66-13:12.

927. A POSA would have understood that the lighting fixture of Yoshimi could be combined with the recessed lighting fixture of Van De Ven for the reasons discussed above.

928. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven, discloses every limitation of claim 15[b] of the '506 Patent and thus renders it obvious.

929. **Elements 15[c].** Yoshimi in view of Van De Ven discloses element [c] of claim 15 of the '506 Patent: "generating visible light by at least one light LED-based source."

930. Yoshimi discloses a light source that provides visible light to a viewer via the gap defined in the architectural surface. According to Yoshimi, when "the lamp is turned on in this state, a part of light emitted from the lamp is directed to the vicinity of the central part of the reflecting plate, and light directed to the end edge of the reflecting plate and both side edges of the light shielding frame is alternately reflected by the reflecting plate and the inner surface of the light shielding frame and directed to the vicinity of the central part of the reflecting plate. Yoshimi (translation), p. 7, col. 1.

931. To the extent this limitation is not expressly disclosed in Yoshimi, such a limitation would have been obvious to a POSA when combined with the teachings of Van De Ven. Van De Ven discloses a light source in the form of "at least one of the solid state light emitters is an LED," and that "the reflective element can comprise numerous concave surfaces, and one or more light emitting diodes can be mounted on any or all of such concave surfaces." Van De Ven, 7:50-51, 12-33-36. Van De Ven then further discloses installing the lighting device such that "a construction surface opening is formed in the construction surface, and the lighting device is positioned such that the contact region of the thermal conduction element (i.e., the first portion of the first side of the thermal conduction element) surrounds the construction surface opening." Van De Ven, 12:66-13:12.

932. A POSA would have understood that the lighting fixture of Yoshimi could be combined with the recessed lighting fixture of Van De Ven for the reasons discussed above.

933. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven, discloses every limitation of claim 15[c] of the '506 Patent and thus renders it obvious.

934. **Elements 15[d].** Yoshimi in view of Van De Ven and/or Lester discloses element [d] of claim 15 of the '506 Patent: "irradiating at least a portion of the interior surface with visible light such that the visible light is perceivable by a viewer via the gap as a light surface that is essentially flush with the architectural surface."

935. Yoshimi discloses that the "brightness in the vicinity of the central part of the reflecting plate is increased, and the light made incident on the vicinity of the central part of the reflecting plate is reflected by the reflecting plate and is made incident on the opening part of the light shielding frame." Yoshimi (translation), p. 7, col. 1. Such a configuration, according to Yoshimi, allows for the light "emitted toward the outside of the lower part and the central part of the reflecting plate exposed from the opening part [to be] uniformly brightened." Yoshimi (translation), p. 7, col. 1.

936. Yoshimi further discloses positioning the light source relative to the cove member such that the resulting visible light is perceived by an observer as being essentially flush with the architectural surface. Yoshimi posits that the disclosed configuration "prevent[s] glare from being felt at all, [improves] luminance of a central part of a reflecting plate which can be seen from the opening part of the light shielding frame, to uniformly shine, and [obtains] a beautiful illumination effect." Yoshimi (translation), at 4.

937. To the extent this limitation is not expressly disclosed in Yoshimi, such a limitation would have been obvious to a POSA when combined with the teachings of Van De Ven. Van De Ven discloses a light source in the form of "at least one of the solid state light emitters is an LED," and that "the reflective element can comprise numerous concave surfaces, and one or more light emitting diodes can be mounted on any or all of such concave surfaces." Van De Ven, 7:50-51, 12-33-36. Van De Ven then further discloses installing the lighting device such that "a construction surface opening is formed in the construction surface, and the lighting device is positioned such that the contact region of the thermal conduction element (i.e., the first portion of the first side of the thermal conduction element) surrounds the construction surface opening." Van De Ven, 12:66-13:12. Van De Ven goes on to state that the "conduction element opening 18 is covered by a light transmitting plate 19, so that light which is emitted by any of the LEDs 12 and which passes through the conduction element opening 18 must pass through the light transmitting plate 19. The LEDs 12 are generally pointing up and not into the opening 18. The reflective element 13 mixes and/or reflects the light emitted by the LEDs downward and through the opening 18." Figure 2 is illustrative of this configuration.

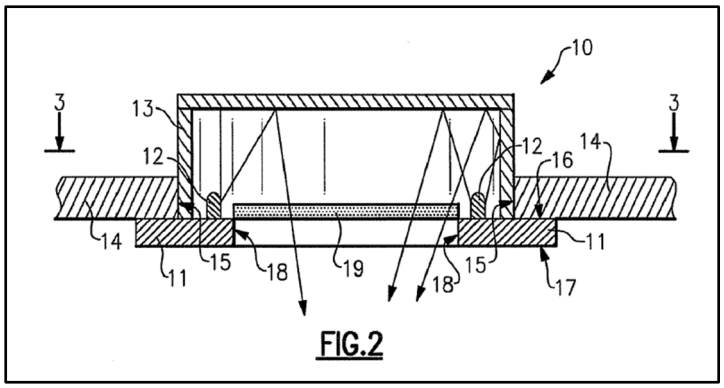


FIG.2

(Van De Ven at Fig. 2.)

938. To the extent this limitation is not expressly disclosed in Yoshimi or Van De Ven, such a limitation would have been obvious to a POSA when combined with the teachings of Lester. Lester discloses positioning the light bulb such that the light visible to an observer appears essentially flush with the architectural surface. According to Lester, the indirect lighting fixture is "mounted in place of ceiling panels in a grid-type ceiling, so that the coves and the edges of the dome are hidden behind the ceiling panels on either side of the fixture, and more of the internal surface of the dome is visible, and the dome has the effect of appearing endless from any direction of view." Lester, 2:8-13.

939. A POSA would have understood that the lighting fixture of Yoshimi could be combined with the recessed lighting fixture of Van De Ven and/or the indirect dome lighting fixture of Lester for the reasons discussed above.

940. For the reasons discussed above, a POSA would have understood that Yoshimi, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven and/or Lester discloses every limitation of claim 15[d] of the '506 Patent and thus renders it obvious.

941. For the reasons discussed above, a POSA would have understood that Van De Ven, either alone or in combination with the general knowledge and understanding of a POSA and/or Van De Ven and/or Lester, discloses every limitation of claim 15 of the '506 Patent and therefore renders it obvious.

F. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

942. I am aware that Signify alleges there are secondary indicia of nonobviousness for the claimed inventions of the '506 Patent. Signify 2/26/2024 Resp. to Interrogatory No. 7. Specifically, I understand Signify alleges the claimed inventions have obtained industry praised,

have obtained commercial success, and met a long-felt but previously unmet need in the industry. *Id.* I further understand that these are the only secondary indicia of nonobviousness that Signify has alleged (Signify has not alleged, *e.g.*, copying by others or unexpected results). I understand that Signify has not identified any particular products that purportedly practice the '506 Patent, but rather refers only to "Signify's patented technology" and the "patented inventions." *Id.*

943. Despite Signify's naked allegations, I have not seen any evidence presented by Signify that articulates any basis to support these alleged secondary indicia of nonobviousness. Signify has merely rested its allegations on attorney argument, website links absent any context or explanation, and documents produced in accordance with Federal Rule of Civil Procedure 33(d). Signify 2/26/2024 Resp. to Interrogatory No. 7.

944. I have reviewed these documents and information identify by Signify and, accordingly, I am not aware on what grounds Signify alleges its claimed inventions demonstrate any secondary indicia of nonobviousness. Signify has not articulated any reasoning as to how these particular documents and information satisfy any of the three indicia of nonobviousness identified in its interrogatory response (industry praise, commercial success, or satisfying a long-felt but unmet need in the industry). And having reviewed these documents and information, I do not see any support for said indicia of nonobviousness.

945. I further understand there must be an association or "nexus" demonstrated between the claimed elements and the secondary indicia of nonobviousness. No such nexus exists in any of the identified documents or information. The documents are either authored by Signify and merely discuss the various features of Signify products, or generically discuss Signify's presence in the field of LED lighting products. None of these documents or information show how the patented features contributed to any commercial success of Signify products, as opposed to other

unpatented features, nor do they discuss how the patent features solved any long-felt but previously unmet need in the industry.

946. For any sales-related documents, there is no indication that any of the sales figures are attributable to the relevant technology at issue here, which is the specific subject matter claimed in the '506 Patent. In fact, I understand that Signify does not contend that the '506 Patent cover all of Signify's commercial products, so I see no relevance to sales of unpatented products.

947. And for the online press releases authored by third parties that Signify references, there is nothing attributing praise in the industry to the relevant technology claimed in the '506 Patent. In fact, these press releases simply refer to statements or quotes provided by Signify personnel related to generic information regarding Signify or the launch of Signify products.

In my opinion, none of the documents or information cited by Signify in its response to Interrogatory No. 7 evidence a long-felt but unmet need for, or commercial success as a result of, or industry praise for, the subject matter claimed in the '506 Patent. My opinions expressed in this Expert Report that the asserted claims of the '506 Patent are either anticipated or obvious therefore are unaffected by these unsubstantiated allegations. Should Signify articulate a basis for its alleged secondary indicia of nonobviousness, I reserve the right to supplement my opinions in response thereto.

XI. CONCLUSION

948. For the reasons discussed above, it is my opinion that the asserted claims of the '336 Patent and '506 Patent are invalid.