

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION**

LUMENCO, LLC,

Plaintiff,

v.

GIESECKE+DEVRIENT GMBH,  
GIESECKE+DEVRIENT CURRENCY  
TECHNOLOGY GMBH, AND  
PAPIERFABRIK LOUISENTHAL GMBH,  
Defendants.

Civil Action No. 2:23-cv-00100-JRG

**JURY TRIAL DEMANDED**

**FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT**

Plaintiff Lumenco, LLC (“Lumenco” or “Plaintiff”) files this First Amended Complaint against Defendants Giesecke+Devrient GmbH (“G+D”), Giesecke+Devrient Currency Technology GmbH (“G+D Currency”), and Papierfabrik Louisenthal GmbH (“PL”) (collectively, “Defendants”) alleging, based on its own knowledge as to itself and its own actions, and based on information and belief as to all other matters, as follows:

**NATURE OF THE ACTION**

1. This is a patent infringement action regarding Defendants’ infringement of the following United States Patents (the “Asserted Patents”) issued by the United States Patent and Trademark Office (“USPTO”):

	U.S. Patent No.	Title	Available At
A.	10,317,691 (“the ‘691 patent”)	Arrays Of Individually Oriented Micro Mirrors Providing Infinite Axis Activation Imaging For Imaging Security Devices	<a href="https://patentcenter.uspto.gov/applications/15588831">https://patentcenter.uspto.gov/applications/15588831</a> <a href="https://patents.google.com/patent/US10317691B2/en?q=10%2c317%2c691">https://patents.google.com/patent/US10317691B2/en?q=10%2c317%2c691</a>

	U.S. Patent No.	Title	Available At
B.	10,189,294 (“the ‘294 patent”)	Arrays Of Individually Oriented Micro Mirrors For Use In Imaging Security Devices For Currency And Brand Authentication	<a href="https://patentcenter.uspto.gov/applications/15162113">https://patentcenter.uspto.gov/applications/15162113</a> <a href="https://patents.google.com/patent/US10189294B2/en?q=10%2c189%2c294">https://patents.google.com/patent/US10189294B2/en?q=10%2c189%2c294</a>
C.	10,901,191 (“the ‘191 patent”)	Method Of Fabricating Arrays Of Individually Oriented Micro Mirrors For Use In Imaging Security Devices	<a href="https://patentcenter.uspto.gov/applications/16203128">https://patentcenter.uspto.gov/applications/16203128</a> <a href="https://patents.google.com/patent/US10901191B2/en?q=10%2c901%2c191">https://patents.google.com/patent/US10901191B2/en?q=10%2c901%2c191</a>
D.	11,448,863 (“the ‘863 patent”)	Method Of Fabricating Arrays Of Individually Oriented Micro Mirrors For Use In Imaging Security Devices	<a href="https://patentcenter.uspto.gov/applications/17152623">https://patentcenter.uspto.gov/applications/17152623</a> <a href="https://patents.google.com/patent/US11448863B2/en?q=11%2c448%2c863">https://patents.google.com/patent/US11448863B2/en?q=11%2c448%2c863</a>

2. Lumenco seeks injunctive relief and monetary damages.

### PARTIES

3. Plaintiff Lumenco, LLC is a limited liability company organized under the laws of Colorado with its principal place of business located in Englewood, Colorado.

4. Defendant Giesecke+Devrient GmbH (“G+D”) is a private limited company organized under the laws of the Federal Republic of Germany with its principal place of business located at Prinzregentenstraße 161, 81677 Munich, Germany.

5. Based upon publicly available information, G+D owns 100% of the shares in G+D Currency, among others.

6. Defendant Giesecke+Devrient Currency Technology GmbH (“G+D Currency”) is a private limited company organized under the laws of the Federal Republic of Germany with its

principal place of business located at Prinzregentenstraße 161, 81677 Munich, Germany.

7. Defendant Papierfabrik Louisenenthal GmbH (“PL”) is a private limited company organized under the laws of the Federal Republic of Germany with its principal place of business located at Louisenenthal 1, 83703 Gmund am Tegernsee, Germany.

8. Based upon publicly available information, PL is a subsidiary of the G+D Group.

9. Based upon publicly available information, PL stated in its 2021 annual financial statements that G+D Currency is its sole shareholder.

### **JURISDICTION AND VENUE**

10. Lumenco repeats and re-alleges the allegations in the Paragraphs above as though fully set forth in their entirety.

11. This action arises under the Patent Laws of the United States, 35 U.S.C. § 1 et seq., including 35 U.S.C. §§ 271, 281, 283, 284, and 285. This Court has subject matter jurisdiction over this case for patent infringement under 28 U.S.C. §§ 1331 and 1338(a).

12. The Court has personal jurisdiction over each Defendant under due process and/or the Texas Long Arm Statute due at least to Defendants’ substantial business in this judicial district, including: (i) At least a portion of the infringement alleged herein; and (ii) regularly doing or soliciting business, engaging in other persistent courses of conduct, or deriving substantial revenue from goods and services provided to individuals in Texas and in this District.

13. Venue is proper pursuant to 28 U.S.C. §§ 1400(b) and 1391(c), which provides that “a Defendant not resident in the United States may be sued in any judicial district.”

### **LUMENCO AND THE ASSERTED PATENTS**

14. Lumenco repeats and re-alleges the allegations in the Paragraphs above as though fully set forth in their entirety.

15. Lumenco is a research and development company founded in 2012 by Mark

Raymond and Hector Porras. Lumenco has expertise in micro-optic, micro mirror, lighting, and screen technologies.

16. Messrs. Raymond and Porras and their company Lumenco are recognized innovators in the micro-optics technology development and commercialization space.

17. Messrs. Raymond and Porras have fifteen issued United States patents and additional pending applications.

18. Lumenco's cutting-edge micro mirror technology has a wide array of applications across diverse markets and industries including banknote security, brand protection, lighting and screen technologies, and solar technologies, among others.

19. Lumenco has enjoyed commercial success with many of its products and technologies.

20. Lumenco founded a joint banknote security venture together with KBA NotaSys in 2014. KBA NotaSys has since changed its name to Koenig and Bauer Banknote Solutions. The German Leonhard Kurz Group, which is active in the field of coatings for counterfeit prevention, among other things, is the main licensee of this joint venture.

21. In 2015, Lumenco entered into a development agreement with the U.S. Bureau of Engraving and Printing. The collaboration lasted five years and involved micro-optical technologies for use on banknotes, which allowed the United States to test in its currency one of the most advanced micro-optic arrays available.

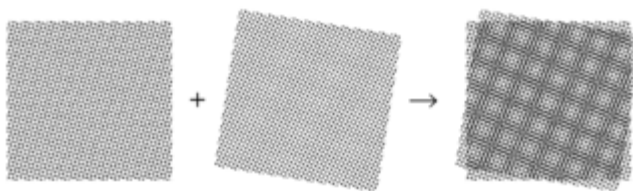
22. Among other technologies, Lumenco recently introduced its patented refraction facet-based lighting technologies to the market.

23. The Asserted Patents generally relate to anti-counterfeiting devices for authenticating currency and other brand authentication and protection uses.

24. In particular, the Asserted Patents relate to optical security features that can produce multiplanar images (i.e., the images appear to have optical depth) that are visible without the use of special glasses or aids. These security features are extremely difficult, if not impossible, to replicate and copy.

25. In the currency and brand protection space there has always been a need for technology to prevent counterfeiting. The companies involved in developing such technologies must continually develop new technology to combat the capabilities of counterfeiters. Over the years, various processes have been used to develop security elements employed in order to protect against the counterfeiting of, *e.g.*, banknotes and elements.

26. One technology that has been used for years is moiré effects. This technology enables the creation of a periodic pattern by superimposing regular grids that are not present in any of the individual patterns. This effect can look something like the following:



The disadvantage of moiré effects is that only a small number of effects can be displayed and reverse engineering such features are also relatively easy.

27. Holograms are another technology used in the optical currency security space. Holograms can be found on Euro banknotes from the years 2013 to 2019 in the form as follows:



As an example, the hologram strip (framed in yellow in the picture above) shows, among other things, the amount of the banknote and the portrait of Europa. However, holograms are also becoming increasingly susceptible to forgery due to improvements in the technological capabilities of counterfeiters.

28. The Asserted Patents provide sophisticated and robust security features using complex pixel-mapped interlaced voxels and micro mirrors that generate multiplanar images without specialized glasses or lighting and without the use of holographic imagery. This results in security features for banknotes and brand authentication that are practically, if not literally, impossible to replicate and that are substantially better than any prior existing technologies.

29. The Asserted Patents describe a special technique that enables images to be “written” into one or more spatial planes using a micro mirror array. The images appear above and below the plane of the security element on which the micro mirrors are located.

30. The generated images consist of several pixels. A pixel is created by several micro mirrors directing the light to a specific point. The micro mirrors that generate a pixel are referred to as a “set.”

31. A method of generating pixels by means of multiple micro mirrors is graphically illustrated in Figure 4 of the '691 patent.

32. In the example of Figure 4, the micro mirrors are located at the bottom of the security element. As shown below, the light reflected by the mirrors is represented approximately by the arrows (423). At their intersections, the reflected light creates the pixels (422) above the plane (420) of the security element. Figure 4 also shows another plane (430) on which reflected light represented by the arrows (433) generates pixels (432).

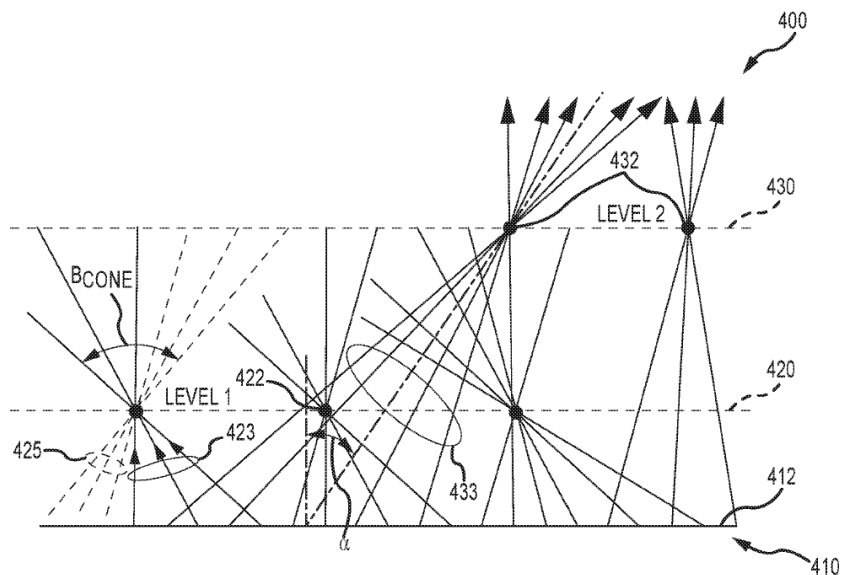


FIG.4

33. Figure 2 of the '691 patent (reproduced below) shows an example of images generated by means of these pixels from a different perspective:

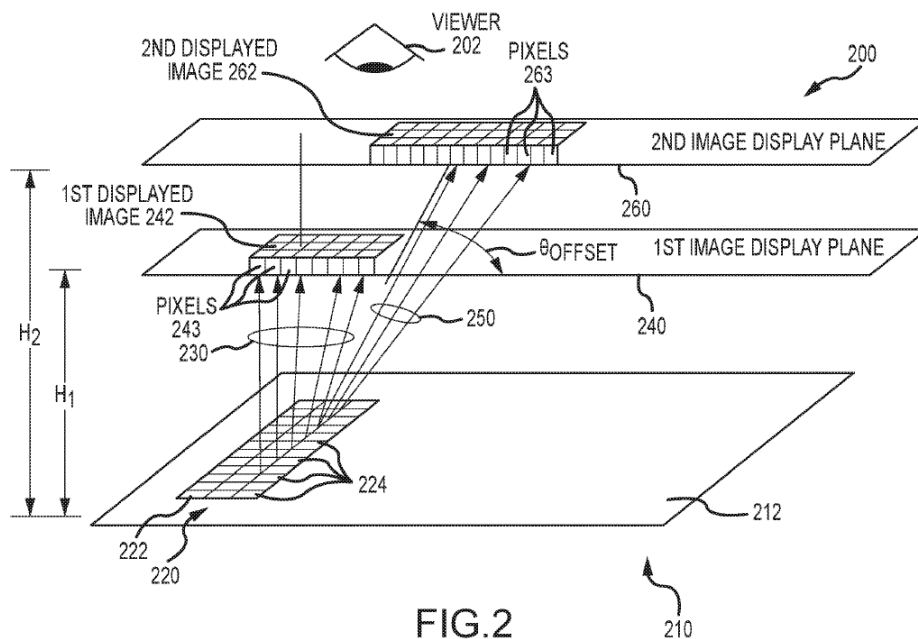


FIG.2

34. Figure 2 of the '691 patent shows an example of multiple micro mirrors (224) and two images, first displayed image 242 on plane (240) and second displayed image 262 on plane (260) above the plane of the substrate (212) on which the micro mirrors are mounted. The images

consist of several pixels (243 and 263).

### **LUMENCO MEETS WITH G+D AND PL**

35. In early 2017, Lumenco introduced its proprietary Dycyfer™ banknote security technology and its micro mirror patent portfolio to G+D.

36. Messrs. Raymond and Porras discussed Lumenco's imminent launch of the Dycyfer™ technology with G+D and were promptly invited to meet with PL and G+D executives in Germany.

37. In May 2017, Messrs. Raymond and Porras flew to Gmund, Germany to meet with Alfred Kraxenberger, Manfred Heim, Michael Rahm, and Christian Fuhse of PL.

38. During that meeting, Messrs. Raymond and Porras presented Lumenco's Dycyfer™ technology and the patent application that eventually issued as the '294 patent.

39. Messrs. Raymond and Porras traded several emails with representatives of PL and G+D before and after that meeting regarding Lumenco's technology and inventions.

### **THE ACCUSED PRODUCTS**

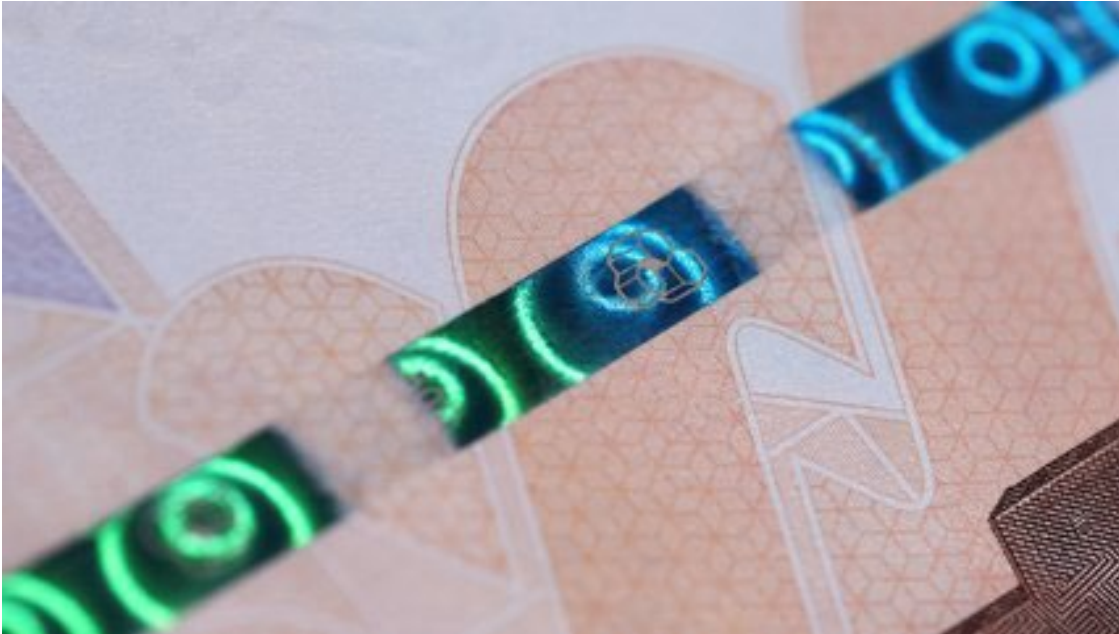
40. Lumenco repeats and re-alleges the allegations in the Paragraphs above as though fully set forth in their entirety.

41. Based upon public information, Defendants own, operate, advertise, and/or control the websites [www.gi-de.com](http://www.gi-de.com) and [www.louisenthal.com](http://www.louisenthal.com) through which they advertise, sell, offer to sell, provide, and/or educate customers about their security threads and security patch technology used in banknotes for anti-counterfeiting purposes.

42. Defendants have infringed one or more claims of the Asserted Patents by making, importing, using, selling, and offering to sell in and into the United States, *e.g.*, their Galaxy®-branded security threads, similar micro mirror security threads marketed and sold under names or brands other than Galaxy®, similar micro mirror arrays that are provided on a patch or adhered or



affixed to a substrate in any other way, and banknotes that include such threads or patches in the United States (hereinafter, the “Accused Products”). **Exhibit A; Exhibit B; Exhibit C.** An image of an exemplary Galaxy®-branded security thread is below:



Source: **Ex. C.**

43. Defendants also have and continue to import the Accused Products into the United States and sell and offer for sale the Accused Products into the United States.

44. Defendants market and advertise their Accused Products as anti-counterfeiting measures that can be “embedded in the paper on a registered basis” utilizing “millions of micro-mirrors arranged on nanoscale dimensions.” **Ex. A.**

45. In February 2018, the Armenian 500-dram collector’s note, featuring the Galaxy®-branded security thread, was selected as Regional Banknote of the Year for the EMEA region (Europe, the Middle East, and Africa) at the 2018 High Security Printing (HSP) Conference in Warsaw, Poland.

46. Versions of the Accused Products have been incorporated into various other banknotes across the world including: (1) The Honduras 200 lempiras banknote; (2) the United

Arab Emirates 100-dirham banknote; (3) the Thai 1000 Baht banknote; (4) Hong Kong series banknotes; and (5) the Guatemalan 20 quetzales banknote. Below is an example of one of these banknotes with the Galaxy®-branded security thread:



Source: **Ex. C.**



Source: **Ex. C.**

#### **PRE-LITIGATION COMMUNICATIONS WITH DEFENDANTS**

47. Prior to filing this litigation, Plaintiff met and communicated with Defendants

numerous times to discuss Lumenco's micro mirror technologies and intellectual property.

48. G+D and PL requested information and a demonstration of those technologies. At the May 2017 meeting, Lumenco presented its micro mirror technology to G+D and PL. G+D and PL informed Lumenco that they were not interested in pursuing a license or partnership at that time.

49. Shortly thereafter, Defendants released the first examples of the Accused Products and offered to sell the Accused Products around the world.

50. Further communication between the parties took place in January of 2021. More specifically, on January 21, 2021, Lumenco sent a letter to G+D and PL. **Exhibit D**. The letter brought several patents to the attention of G+D and PL, including the '294 patent, '691 patent, and the '191 patent, including a German patent application based on PCT/US2016/061845, one of the two priority documents of the Asserted Patents. *Id.* The letter invited G+D and PL to further discuss the Asserted Patents. *Id.*

51. Defendants responded by email on March 8, 2021 stating, without explanation or evidence, that the Asserted Patents were not relevant to their product portfolio. Defendants also alleged that they held comparable patents with earlier priority dates. **Exhibit E**. Defendants nevertheless offered to purchase Lumenco's patents, including the Asserted Patents. *Id.* These communications did not lead to an agreement between the parties.

52. Lumenco issued Defendants a formal warning letter in February of 2023. The warning letter demanded that Defendants issue a declaration stating that they would desist from using Lumenco's technologies. Defendants did not issue any such declaration.

53. Defendants continue to offer for sale, sell, and attempt to monetize the technology, including by at least offering to sell the technology for incorporation into U.S. currency.

54. Defendants' executives conducted, participated in, and instructed others to participate in these offers to sell both in in-person meetings conducted within the United States and from communications targeted to the United States from their offices in Germany and elsewhere.

55. On February 28, 2023, Lumenco filed an action against G+D and PL in Germany for their infringement of the German National Phase of European Patent EP 3 913 410 B1/DE 60 2016 072 642.4.

### **COUNT I: INFRINGEMENT OF U.S. PATENT NO. 10,317,691**

56. Lumenco repeats and re-alleges the allegations in the Paragraphs above as though fully set forth in their entirety.

57. The USPTO duly issued the '691 patent on June 11, 2019, after full and fair examination of Application No. 15/588,831, which was filed on May 8, 2017. *See* '691 patent at p. 1.

58. Lumenco owns all substantial rights, interest, and title in and to the '691 patent, including the sole and exclusive right to prosecute this action and enforce the '691 patent against infringers and to collect damages for all relevant times.

59. The claims of the '691 patent are not directed to an abstract idea. Taken as a whole, the claimed inventions of the '691 patent are not limited to well-understood, routine, or conventional activity. Rather, the claimed inventions include inventive components that improve on the design and fabrication of micro mirror arrays and assemblies that display imagery useful for anti-counterfeiting and/or product/document authentication.

60. The written description of the '691 patent describes in technical detail each limitation of the claims, allowing a skilled artisan to understand the scope of the claims and how the non-conventional and non-generic combination of claim limitations is patently distinct from

and improved upon what may have been considered conventional or generic in the art at the time of the invention.

61. Plaintiff or its predecessors-in-interest have satisfied all statutory obligations required to collect pre-filing damages for the full period allowed by law for infringement of the '691 patent.

62. Defendants have directly infringed the '691 patent by making, having made, using, importing, providing, supplying, distributing, selling, or offering for sale the Accused Products to customers.

63. Defendants have directly infringed, either literally or under the doctrine of equivalents, at least claim 1 of the '691 patent.

64. For example, Defendants' Accused Products include a visual display assembly useful as a security element on paper and coin currency and on product labels, comprising: a substrate; and on a surface of the substrate, an array of micro mirrors receiving ambient light and, in response, displaying a plurality of images in a plane spaced a distance apart from the surface of the substrate, wherein each of the images comprises a plurality of pixels, wherein the array of micro mirrors includes, for each of the pixels of each of the images, a set of the micro mirrors each having a reflective surface oriented to reflect the ambient light toward a point on the plane corresponding to one of the pixels, wherein each of the sets of the micro mirrors providing the pixels for each of the differing ones of the images has a differing cone angle offset, wherein the cone angle offset is defined based upon a relative position of a cone axis for a cone of rays projected by the sets of the micro mirrors through each of the pixels, wherein the cone has a cone angle in the range of 10 to 45 degrees, wherein the cone angle offsets are selected whereby the cones do not overlap at a predefined height above the substrate, whereby only one of the images is

observable at a time by a viewer, wherein each of the sets of the micro mirrors includes at least two of the micro mirrors, wherein the reflected ambient light from the at least two of the micro mirrors intersects at the point corresponding to the one of the pixels, wherein the point on the plane corresponds to an apex of a cone and the at least two of the micro mirrors are located within a base of the cone coplanar with the surface of the substrate, and wherein each of the micro mirrors in each of the sets for the micro mirrors is selected randomly from available micro mirrors in the base of the cone coplanar with the surface of the substrate, whereby each of the sets of the micro mirrors is arranged in a random pattern. Defendants' infringement in this regard is ongoing.

65. Since its issuance, and in no event later than January 21, 2021, Defendants have also indirectly infringed the '691 patent by inducing others to directly infringe the '691 patent. Defendants have induced end-users, including Defendants' customers, employees, partners, or contractors, to directly infringe, either literally or under the doctrine of equivalents, the '691 patent by providing or requiring use of the Accused Products. Defendants took active steps, directly or through contractual relationships with others, with the specific intent to cause them to use the Accused Products in a manner that infringes one or more claims of the '691 patent, including, for example, claim 1 of the '691 patent. Such steps by Defendants included, among other things, advising or directing personnel, contractors, or end-users to make or use the Accused Products in an infringing manner; advertising and promoting the use of the Accused Products in an infringing manner; or distributing instructions that guide users to use the Accused Products in an infringing manner. Defendants are performing these steps, which constitutes induced infringement with the knowledge of the '691 patent and with the knowledge that the induced acts constitute infringement. Defendants are aware that the normal and customary use of the Accused Products by others would infringe the '691 patent. Defendants' inducement is ongoing.

66. Defendants have also indirectly infringed by contributing to the infringement of the '691 patent. Defendants have contributed to the direct infringement of the '691 patent by its personnel, contractors, and customers. The Accused Products have special features that are specially designed to be used in an infringing way and that have no substantial uses other than ones that infringe one or more claims of the '691 patent, including, for example, claim 1 of the '691 patent. The special features constitute a material part of the invention of one or more of the claims of the '691 patent and are not staple articles of commerce suitable for substantial non-infringing use. Defendants' contributory infringement is ongoing.

67. G+D and PL have had knowledge of the '691 patent (or the applications from which it issued) as of its issuance, and in no event later than January 21, 2021. Defendants were expressly notified of the relevance of the '691 patent to the Accused Products by at least the time of receiving the January 21, 2021 letter.

68. Furthermore, on information and belief, Defendants have a policy or practice of not reviewing the patents of others (including instructing their employees to not review the patents of others), and thus have been willfully blind of Plaintiff's patent rights.

69. Defendants' actions are at least objectively reckless as to the risk of infringing a valid patent and this objective risk was either known or should have been known by Defendants.

70. Defendants' direct and indirect infringement of the '691 patent is, has been, and continues to be willful, intentional, deliberate, or in conscious disregard of Plaintiff's rights under the patent.

71. Plaintiff has been damaged as a result of the infringing conduct by Defendants alleged above. Thus, Defendants are liable to Lumenco in an amount that compensates it for such infringements, which should be equal to Lumenco's lost profits but by law cannot be less than a



reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

72. Lumenco has suffered irreparable harm, through its loss of market share and goodwill, for which there is no adequate remedy at law. Lumenco has and will continue to suffer this harm by virtue of each Defendant's infringement of the '691 patent. Defendants' actions have interfered with and will interfere with Lumenco's ability to license technology. The balance of hardships favors Lumenco's ability to commercialize its own ideas and technology. The public interest in allowing Lumenco to enforce its right to exclude outweighs other public interests, which supports injunctive relief in this case.

## **COUNT II: INFRINGEMENT OF U.S. PATENT NO. 10,189,294**

73. Lumenco repeats and re-alleges the allegations in the Paragraphs above as though fully set forth in their entirety.

74. The USPTO duly issued the '294 patent on January 29, 2019, after full and fair examination of Application No. 15/162,113, which was filed on May 23, 2016. *See* '294 patent at p. 1.

75. Lumenco owns all substantial rights, interest, and title in and to the '294 patent, including the sole and exclusive right to prosecute this action and enforce the '294 patent against infringers and to collect damages for all relevant times.

76. The claims of the '294 patent are not directed to an abstract idea. Taken as a whole, the claimed inventions of the '294 patent are not limited to well-understood, routine, or conventional activity. Rather, the claimed inventions include inventive components that improve on the design and fabrication of micro mirror arrays and assemblies that display imagery useful for anti-counterfeiting and/or product/document authentication.

77. The written description of the '294 patent describes in technical detail each limitation of the claims, allowing a skilled artisan to understand the scope of the claims and how



the non-conventional and non-generic combination of claim limitations is patently distinct from and improved upon what may have been considered conventional or generic in the art at the time of the invention.

78. Plaintiff or its predecessors-in-interest have satisfied all statutory obligations required to collect pre-filing damages for the full period allowed by law for infringement of the '294 patent.

79. Defendants have directly infringed the '294 patent by making, having made, using, importing, providing, supplying, distributing, selling, or offering for sale the Accused Products to customers.

80. Defendants have directly infringed, either literally or under the doctrine of equivalents, at least claim 1 of the '294 patent.

81. For example, Defendants' Accused Products include a visual display assembly useful as a security element on paper and coin currency, and product labels, comprising: a substrate; and on a surface of the substrate, an array of micro mirrors receiving ambient light and, in response, displaying an image in a plane spaced a distance apart from the surface of the substrate, wherein the image comprises a plurality of pixels and wherein the array of micro mirrors includes for each of the pixels a different set of the micro mirrors each having a reflective surface oriented, in a fixed manner with a body of each of the micro mirrors rotated about at least one of first and second rotation axes extending through the body, to reflect the ambient light toward a point on the plane corresponding to one of the pixels, wherein each of the different sets concurrently reflect the ambient light to concurrently generate the plurality of pixels, and wherein a voxel is created at each of the points on the plane via intersection of two or more beams of the reflected ambient light and wherein each of the created voxels produces an effect of a point source

of light floating above the surface of the substrate in the plane. Defendants' infringement in this regard is ongoing.

82. Since its issuance, and in no event later than January 21, 2021, Defendants have also indirectly infringed the '294 patent by inducing others to directly infringe the '294 patent. Defendants have induced end-users, including Defendants' customers, employees, partners, or contractors, to directly infringe, either literally or under the doctrine of equivalents, the '294 patent by providing or requiring use of the Accused Products. Defendants took active steps, directly or through contractual relationships with others, with the specific intent to cause them to use the Accused Products in a manner that infringes one or more claims of the '294 patent, including, for example, claim 1 of the '294 patent. Such steps by Defendants included, among other things, advising or directing personnel, contractors, or end-users to make or use the Accused Products in an infringing manner; advertising and promoting the use of the Accused Products in an infringing manner; or distributing instructions that guide users to use the Accused Products in an infringing manner. Defendants are performing these steps, which constitute induced infringement with knowledge of the '294 patent and with knowledge that the induced acts constitute infringement. Defendants are aware that the normal and customary use of the Accused Products by others would infringe the '294 patent. Defendants' inducement is ongoing.

83. Defendants have also indirectly infringed by contributing to the infringement of the '294 patent. Defendants have contributed to the direct infringement of the '294 patent by their personnel, contractors, and customers. The Accused Products have special features that are specially designed to be used in an infringing way and that have no substantial uses other than ones that infringe one or more claims of the '294 patent, including, for example, claim 1 of the '294 patent. The special features constitute a material part of the invention of one or more of the

claims of the '294 patent and are not staple articles of commerce suitable for substantial non-infringing use. Defendants' contributory infringement is ongoing.

84. G+D and PL have had knowledge of the '294 patent (or the applications from which it issued) of its issuance, and in no event later than January 21, 2021. Defendants were expressly notified of the relevance of the '294 patent to the Accused Products by at least the time of receiving the January 21, 2021 letter.

85. Furthermore, on information and belief, Defendants have a policy or practice of not reviewing the patents of others (including instructing its employees to not review the patents of others), and thus have been willfully blind of Plaintiff's patent rights.

86. Defendants' actions are at least objectively reckless as to the risk of infringing a valid patent and this objective risk was either known or should have been known by Defendants.

87. Defendants' direct and indirect infringement of the '294 patent is, has been, and continues to be willful, intentional, deliberate, or in conscious disregard of Plaintiff's rights under the patent.

88. Plaintiff has been damaged as a result of the infringing conduct by Defendants alleged above. Thus, Defendants are liable to Lumenco in an amount that compensates it for such infringements, which should be equal to Lumenco's lost profits but by law cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

89. Lumenco has suffered irreparable harm, through its loss of market share and goodwill, for which there is no adequate remedy at law. Lumenco has and will continue to suffer this harm by virtue of each Defendant's infringement of the '294 patent. Defendants' actions have interfered with and will interfere with Lumenco's ability to license technology. The balance of hardships favors Lumenco's ability to commercialize its own ideas and technology. The public

interest in allowing Lumenco to enforce its right to exclude outweighs other public interests, which supports injunctive relief in this case.

### **COUNT III: INFRINGEMENT OF U.S. PATENT NO. 10,901,191**

90. Lumenco repeats and re-alleges the allegations in the Paragraphs above as though fully set forth in their entirety.

91. The USPTO duly issued the '191 patent on January 26, 2021, after full and fair examination of Application No. 16/203,128, which was filed on November 28, 2018. *See* '191 patent at p. 1.

92. Lumenco owns all substantial rights, interest, and title in and to the '191 patent, including the sole and exclusive right to prosecute this action and enforce the '191 patent against infringers and to collect damages for all relevant times.

93. The claims of the '191 patent are not directed to an abstract idea. Taken as a whole, the claimed inventions of the '191 patent are not limited to well-understood, routine, or conventional activity. Rather, the claimed inventions include inventive components that improve on the design and fabrication of micro mirror arrays and assemblies that display imagery useful for anti-counterfeiting and/or product/document authentication.

94. The written description of the '191 patent describes in technical detail each limitation of the claims, allowing a skilled artisan to understand the scope of the claims and how the non-conventional and non-generic combination of claim limitations is patently distinct from and improved upon what may have been considered conventional or generic in the art at the time of the invention.

95. Plaintiff or its predecessors-in-interest have satisfied all statutory obligations required to collect pre-filing damages for the full period allowed by law for infringement of the '191 patent.

96. Defendants have directly infringed the '191 patent by making, having made, using, importing, providing, supplying, distributing, selling, or offering for sale the Accused Products to customers.

97. Defendants have directly infringed, either literally or under the doctrine of equivalents, at least claim 1 of the '191 patent.

98. For example, Defendants, in the making of the Accused Products, perform steps of A method of fabricating a security element useful on paper and coin currency and product labels, comprising: providing a substrate; and forming an array of micro mirrors on a surface of the substrate, wherein the array of micro mirrors is configured for receiving ambient light and, in response, displaying an image in a plane spaced a distance apart from the surface of the substrate, wherein the image comprises a plurality of pixels, wherein the array of micro mirrors includes for each of the pixels a different set of the micro mirrors each having a reflective surface oriented, in a fixed manner, with a body of each of the micro mirrors rotated about at least one of first and second rotation axes extending through the body, to reflect the ambient light toward a point on the plane corresponding to one of the pixels, wherein each of the different sets concurrently reflect the ambient light to concurrently generate the plurality of pixels, wherein a voxel is created at each of the point on the plane via intersection of two or more beams of the reflected ambient light, and wherein each of the created voxels produces an effect of a point source of light floating above the surface of the substrate in the plane. Defendants' infringement in this regard is ongoing.

99. Since its issuance, and in no event later than January 21, 2021, Defendants have also indirectly infringed the '191 patent by inducing others to directly infringe the '191 patent. Defendants have induced end-users, including Defendants' customers, employees, partners, or contractors, to directly infringe, either literally or under the doctrine of equivalents, the '191 patent

by providing or requiring use of the Accused Products. Defendants took active steps, directly or through contractual relationships with others, with the specific intent to cause them to use the Accused Products in a manner that infringes one or more claims of the '191 patent, including, for example, claim 1 of the '191 patent. Such steps by Defendants included, among other things, advising or directing personnel, contractors, or end-users to make or use the Accused Products in an infringing manner; advertising and promoting the use of the Accused Products in an infringing manner; or distributing instructions that guide users to use the Accused Products in an infringing manner. Defendants are performing these steps, which constitutes induced infringement with the knowledge of the '191 patent and with the knowledge that the induced acts constitute infringement. Defendants are aware that the normal and customary use of the Accused Products by others would infringe the '191 patent. Defendants' inducement is ongoing.

100. Defendants have also indirectly infringed by contributing to the infringement of the '191 patent. Defendants have contributed to the direct infringement of the '191 patent by its personnel, contractors, and customers. The Accused Products have special features that are specially designed to be used in an infringing way and that have no substantial uses other than ones that infringe one or more claims of the '191 patent, including, for example, claim 1 of the '191 patent. The special features constitute a material part of the invention of one or more of the claims of the '191 patent and are not staple articles of commerce suitable for substantial non-infringing use. Defendants' contributory infringement is ongoing.

101. G+D and PL have had knowledge of the '191 patent (or the applications from which it issued) of its issuance, and in no event later than January 21, 2021. Defendants were expressly notified of the relevance of the '191 patent to the Accused Products by at least the time of receiving the January 21, 2021 letter.

102. Furthermore, on information and belief, Defendants have a policy or practice of not reviewing the patents of others (including instructing its employees to not review the patents of others), and thus has been willfully blind of Plaintiff's patent rights.

103. Defendants' actions are at least objectively reckless as to the risk of infringing a valid patent and this objective risk was either known or should have been known by Defendants.

104. Defendants' direct and indirect infringement of the '191 patent is, has been, and continues to be willful, intentional, deliberate, or in conscious disregard of Plaintiff's rights under the patent.

105. Plaintiff has been damaged as a result of the infringing conduct by Defendants alleged above. Thus, Defendants are liable to Lumenco in an amount that compensates it for such infringements, which should be equal to Lumenco's lost profits but by law cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

106. Lumenco has suffered irreparable harm, through its loss of market share and goodwill, for which there is no adequate remedy at law. Lumenco has and will continue to suffer this harm by virtue of each Defendant's infringement of the '191 patent. Defendants' actions have interfered with and will interfere with Lumenco's ability to license technology. The balance of hardships favors Lumenco's ability to commercialize its own ideas and technology. The public interest in allowing Lumenco to enforce its right to exclude outweighs other public interests, which supports injunctive relief in this case.

#### **COUNT IV: INFRINGEMENT OF U.S. PATENT NO. 11,448,863**

107. Lumenco repeats and re-alleges the allegations in the Paragraphs above as though fully set forth in their entirety.

108. The USPTO duly issued the '863 patent on September 20, 2022, after full and fair examination of Application No. 17/152,623, which was filed on January 19, 2021. *See* '863 patent

at p. 1.

109. Lumenco owns all substantial rights, interest, and title in and to the '863 patent, including the sole and exclusive right to prosecute this action and enforce the '863 patent against infringers and to collect damages for all relevant times.

110. The claims of the '863 patent are not directed to an abstract idea. Taken as a whole, the claimed inventions of the '863 patent are not limited to well-understood, routine, or conventional activity. Rather, the claimed inventions include inventive components that improve on the design and fabrication of micro mirror arrays and assemblies that display imagery useful for anti-counterfeiting and/or product/document authentication.

111. The written description of the '863 patent describes in technical detail each limitation of the claims, allowing a skilled artisan to understand the scope of the claims and how the non-conventional and non-generic combination of claim limitations is patently distinct from and improved upon what may have been considered conventional or generic in the art at the time of the invention.

112. Plaintiff or its predecessors-in-interest have satisfied all statutory obligations required to collect pre-filing damages for the full period allowed by law for infringement of the '863 patent.

113. Defendants have directly infringed the '863 patent by making, having made, using, importing, providing, supplying, distributing, selling, or offering for sale the Accused Products to customers.

114. Defendants have directly infringed, either literally or under the doctrine of equivalents, at least claim 1 of the '863 patent.

115. For example, Defendants, in the making of the Accused Products, perform the steps



of a method of fabricating a security element, comprising: assigning a first object in a starting digital image to a first image display plane and a second object in the starting digital image to a second image display plane; with a processor of a computing device, executing code to provide an array design module that operates to select a set of micro mirrors in an array of the micro mirrors to display each of the pixels of the first object in the first image display plane and to display each of the pixels of the second object in the second image display plane; for each of the pixels, determining with the array design module an angular orientation of each of the micro mirrors in the selected sets of the micro mirrors; generating a design output file including the angular orientation and location coordinates in the array for each of the micro mirrors in the selected sets of the micro mirrors; and forming the array of the micro mirrors according to the design output file. Defendants' infringement in this regard is ongoing.

116. Since at least the time of its issuance, Defendants have also indirectly infringed the '863 patent by inducing others to directly infringe the '863 patent. Defendants have induced end-users, including Defendants' customers, employees, partners, or contractors, to directly infringe, either literally or under the doctrine of equivalents, the '863 patent by providing or requiring use of the Accused Products. Defendants took active steps, directly or through contractual relationships with others, with the specific intent to cause them to use the Accused Products in a manner that infringes one or more claims of the '863 patent, including, for example, claim 1 of the '863 patent. Such steps by Defendants included, among other things, advising or directing personnel, contractors, or end-users to make or use the Accused Products in an infringing manner; advertising and promoting the use of the Accused Products in an infringing manner; or distributing instructions that guide users to use the Accused Products in an infringing manner. Defendants are performing these steps, which constitutes induced infringement with the knowledge of the '863

patent and with the knowledge that the induced acts constitute infringement. Defendants are aware that the normal and customary use of the Accused Products by others would infringe the '863 patent. Defendants' inducement is ongoing.

117. Defendants have also indirectly infringed by contributing to the infringement of the '863 patent. Defendants have contributed to the direct infringement of the '863 patent by its personnel, contractors, and customers. The Accused Products have special features that are specially designed to be used in an infringing way and that have no substantial uses other than ones that infringe one or more claims of the '863 patent, including, for example, claim 1 of the '863 patent. The special features constitute a material part of the invention of one or more of the claims of the '863 patent and are not staple articles of commerce suitable for substantial non-infringing use. Defendants' contributory infringement is ongoing.

118. G+D and PL have had knowledge of the '863 patent (or the applications from which it issued) since its issuance.

119. Furthermore, on information and belief, Defendants have a policy or practice of not reviewing the patents of others (including instructing its employees to not review the patents of others), and thus has been willfully blind of Plaintiff's patent rights.

120. Defendants' actions are at least objectively reckless as to the risk of infringing a valid patent and this objective risk was either known or should have been known by Defendants.

121. Defendants' direct and indirect infringement of the '863 patent is, has been, and continues to be willful, intentional, deliberate, or in conscious disregard of Plaintiff's rights under the patent.

122. Plaintiff has been damaged as a result of the infringing conduct by Defendants alleged above. Thus, Defendants are liable to Lumenco in an amount that compensates it for such

infringements, which should be equal to Lumenco's lost profits but by law cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

123. Lumenco has suffered irreparable harm, through its loss of market share and goodwill, for which there is no adequate remedy at law. Lumenco has and will continue to suffer this harm by virtue of each Defendant's infringement of the '863 patent. Defendants' actions have interfered with and will interfere with Lumenco's ability to license technology. The balance of hardships favors Lumenco's ability to commercialize its own ideas and technology. The public interest in allowing Lumenco to enforce its right to exclude outweighs other public interests, which supports injunctive relief in this case.

#### **JURY DEMAND**

Lumenco hereby requests a trial by jury on all issues so triable by right.

#### **PRAYER FOR RELIEF**

Lumenco requests that the Court find in its favor and against Defendants, and that the Court grant Lumenco the following relief:

- a. Judgment that one or more claims of the Asserted Patents have been infringed, either literally or under the doctrine of equivalents, by Defendants or all others acting in concert therewith;
- b. A permanent injunction enjoining Defendants and its officers, directors, agents, servants, affiliates, employees, divisions, branches, subsidiaries, parents, and all others acting in concert therewith from infringement of the Asserted Patents; or, in the alternative, an award of a reasonable ongoing royalty or Lumenco's lost profits for future infringement of the Asserted Patents by such entities.
- c. Judgment that Defendants account for and pay to Lumenco all damages to and costs incurred by Lumenco because of Defendants' infringing activities and other conduct

complained of herein;

- d. Judgment that Defendants' infringements be found willful, and that the Court award treble damages for the period of such willful infringement pursuant to 35 U.S.C. § 284;
- e. Pre-judgment and post-judgment interest on the damages caused by Defendants' infringing activities and other conduct complained of herein;
- f. That this Court declare this an exceptional case and award Lumenco its reasonable attorneys' fees and costs in accordance with 35 U.S.C. § 285; and
- g. All other and further relief as the Court may deem just and proper under the circumstances.

Dated: March 22, 2023

Respectfully submitted,

By: /s/ C. Matthew Rozier

Jonathan L. Hardt (TX 24039906)\*  
**ROZIER HARDT MCDONOUGH PLLC**  
712 W. 14th Street, Suite C  
Austin, Texas 78701  
Telephone: (210) 289-7541  
Email: hardt@rhmttrial.com

C. Matthew Rozier (CO 46854)\*  
**ROZIER HARDT MCDONOUGH PLLC**  
2590 Walnut Street, Suite 10  
Denver, Colorado 80205  
Telephone: (720) 820-3006  
Email: matt@rhmttrial.com

James F. McDonough, III (GA 117088)\*  
Jonathan R. Miller (GA 507179)\*  
Travis E. Lynch (GA 162373)\*  
**ROZIER HARDT MCDONOUGH PLLC**  
3621 Vinings Slope, Suite 4300  
Atlanta, Georgia 30339  
Telephone: (470) 840-9505, -9517, -9514  
Email: jim@rhmttrial.com  
Email: miller@rhmttrial.com  
Email: lynch@rhmttrial.com

*Attorneys for Plaintiff LUMENCO, LLC*

\*Admitted to the Eastern District of Texas

**List Of Exhibits**

- A. Galaxy Security Threads – 360 Authentication
- B. Louisenthal – Galaxy Security Threads
- C. Louisenthal – Case Study
- D. January 2021 Letter to G+D
- E. March 2021 Reply From G+D

**CERTIFICATE OF SERVICE**

I HEREBY CERTIFY on this 22d day of March, 2023, I caused to be electronically-filed the foregoing document with the Clerk of Court using the Court's CM/ECF system. As such, this document was served on all counsel who are deemed to have consented to electronic service.

By: /s/ C. Matthew Rozier

C. Matthew Rozier