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7 *For Plaintiff AR DESIGN INNOVATIONS LLC*

8 **UNITED STATES DISTRICT COURT**  
9 **FOR THE CENTRAL DISTRICT OF CALIFORNIA**

10 AR DESIGN INNOVATIONS LLC,

11 Plaintiff,

12 v.

13 ROOM & BOARD, INC.,

14 Defendant.

15 Case No. 2:24-cv-05868

16 **COMPLAINT FOR PATENT**  
17 **INFRINGEMENT**

18 **JURY TRIAL DEMANDED**  
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1 Plaintiff AR Design Innovations LLC (“AR Design” or “Plaintiff”) files this  
2 Complaint against Room & Board, Inc. (“Room & Board” or “Defendant”) alleging,  
3 based on its own knowledge as to itself and its own actions, and on information and  
4 belief based on public information as to all other matters, as follows:

5 **NATURE OF THE ACTION**

6 1. This is a patent infringement action to stop Defendant’s infringement of the  
7 following United States Patent (the “Asserted Patent”) issued by the United States  
8 Patent and Trademark Office (“USPTO”), a copy of which is attached hereto as

9 **Exhibit A:**

U.S. Patent No.	Title
7,277,572	Three-Dimensional Interior Design System

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12  
13 2. Plaintiff seeks monetary damages and monetary damages.

14 **PARTIES**

15 3. AR Design is a limited liability company organized under the laws of the  
16 State of Texas, with a place of business at 815 Brazos Street, Suite 500, Austin, Texas  
17 78701-2509 (Travis County).

18 4. Based upon public information, Room & Board is a corporation organized  
19 under the laws of the State of Minnesota with its principal place of business located at  
20 4600 Olson Memorial Hwy., Golden Valley, Minnesota, 55422–4822 (Hennepin  
21 County).

22 5. Based upon public information, Room & Board may be served through its  
23 registered agent for service, CT Corporation System, located at 330 N. Brand Blvd.,  
24 Suite 700, Glendale, California, 91203.

25 **JURISDICTION AND VENUE**

26 6. AR Design repeats and re-alleges the allegations in the Paragraphs above as  
27 though fully set forth in their entirety.

28 7. This is an action for infringement of a United States patent arising under 35

1 U.S.C. §§ 271, 281, and 284–85, among others. This Court has subject matter  
2 jurisdiction of the action under 28 U.S.C. § 1331 and § 1338(a).

3 8. Venue is proper against Defendant in this District pursuant to 28 U.S.C. §  
4 1400(b) and 1391(c) because it has maintained established and regular places of  
5 business in this District and has committed acts of patent infringement in the District.  
6 *See In re: Cray Inc.*, 871 F.3d 1355, 1362-1363 (Fed. Cir. 2017).

7 9. Defendant is subject to this Court’s specific and general personal  
8 jurisdiction under due process and/or the California Long Arm Statute due at least to  
9 Defendant’s substantial business in this judicial district, including: (i) at least a portion  
10 of the infringements alleged herein; and (ii) regularly doing or soliciting business,  
11 engaging in other persistent courses of conduct, or deriving substantial revenue from  
12 goods and services provided to individuals in California and in this district.

13 10. Specifically, Defendant intends to do and does business in, and has  
14 committed acts of infringement in this District directly and through intermediaries,  
15 and offered its products or services, including those accused of infringement here, to  
16 customers and potential customers located in California, including in this District.

17 11. Defendant maintains regular and established places of business in this  
18 District.

19 12. For example, Defendant owns, operates, manages, conduct businesses, and  
20 directs and controls the operations and employees of facilities at several locations in  
21 this District including retail facilities at the following locations:<sup>1</sup>

- 22 • 3309 Hyland Avenue #A, Costa Mesa, California 92626;
- 23 • Helms Bakery Building, 3231 Helms Avenue, Los Angeles, California  
24 90034;
- 25 • 830 N. Palm Canyon Drive, Suite 1, Palm Springs, California 92262; and
- 26 • 42 S. De Lacey Avenue, Pasadena, California 91105.

27 13. In addition, Defendant owns, operates, manages, conduct businesses, and  
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<sup>1</sup> See <https://www.roomandboard.com/careers/teams-locations/retail> (last visited July 8, 2024)

1 directs and controls the operations and employees of a distribution facility located in  
2 this District at 1390 Storm Parkway, Torrance, California 90501.<sup>2</sup>

3 14. Defendant has committed acts of infringement from this district, including,  
4 but not limited to, use of the Accused Products.

## 5 THE TECHNOLOGY

### 6 The Invention

7 15. AR Design repeats and re-alleges the allegations in the Paragraphs above as  
8 though fully set forth in their entirety.

9 16. Cathryn MacInnes and Gerald Pearlstein are the inventors of U.S. Patent  
10 No. 7,277,572 (the ‘572 patent”). See Exhibit A at p.A-1.

11 17. The ‘572 patent resulted from the pioneering efforts of Ms. MacInnes and  
12 Mr. Pearlstein (hereinafter “the Inventors”) in the area of interactive, three-  
13 dimensional (3D) interior design systems. These efforts resulted in the development  
14 of a method and apparatus for generating and rendering a photorealistic 3D perspective  
15 view of a 3D object (*e.g.*, a piece of furniture) that can be selectively positioned and  
16 manipulated within a 3D scene, such as a living room in a person’s house, in the early  
17 2000s. At the time of these pioneering efforts, the most widely implemented  
18 technology used to try to address the need for a real-time, network-based interactive  
19 system for use in visualizing furniture in a room prior to placing an order for that  
20 furniture was either limited by its capability of using only two-dimensional (2D)  
21 images of the furniture or, if it had such 3D capability, the 3D furniture could not be  
22 rendered for manipulation within a 3D representation of the room into which the  
23 furniture was to be placed.

24 18. Other systems at that time allowed users to import photographs of actual  
25 rooms into the program, and then place 3D furniture objects into the room, which  
26 could be rotated to fit the scene. However, the room images for such systems were  
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28 <sup>2</sup> See <https://www.roomandboard.com/careers/teams-locations/delivery-distribution> (last visited July 7, 2024)

1 not associated with a 3D model of the room and lacked the capability of rendering  
2 furniture objects placed onto floor plans in photographically derived scenes, and/or  
3 did not provide for the manipulation of 3D furniture objects at the client computer.

4 19. The Inventors conceived of the inventions claimed in the '572 patent as a  
5 way to provide an improved 3D design and visualization system that includes an easy  
6 to use Graphical User Interface ("GUI"), which is capable of enabling a user to quickly  
7 and conveniently generate or import 3D scenes from a server, import and manipulate  
8 3D objects (like furniture) in the scenes in real-time, and render them in photorealistic  
9 detail on a client computer.

10 20. For example, the Inventors developed a method in a client-server computing  
11 environment for generating and rendering a photorealistic 3D perspective view of a  
12 3D object selectively positioned within a 3D scene. The method includes operating a  
13 client application with a GUI and displaying a 3D scene with the GUI. It also includes  
14 configuring the 3D scene for being selectively displayed in a plurality of views;  
15 retrieving at least one 3D object (e.g., furniture) from a server; importing the 3D object  
16 into the 3D scene to generate a composite; and manipulating the 3D object within the  
17 composite for placement and orientation. A 3D image of the composite may be  
18 rendered at the client and selectively reconfigured in real-time. Luminosity  
19 characteristics may be applied to the 3D image and a photorealistic 3D view of the  
20 composite image may be rendered with the client application, including the luminosity  
21 characteristics.

## 22 **Advantage Over the Prior Art**

23 21. The invention disclosed in the '572 patent provides many advantages over  
24 the prior art, and in particular improved systems for depicting a realistic 3D rendering  
25 of a space with architectural and design elements therein capable of real-time, user-  
26 friendly manipulation by a client. The system may be used by interior designers and  
27 architects (or by their clients) to easily design interior spaces with the help of an  
28 intuitive and easy to use custom interface. The resulting design may then be displayed

1 on any number of suitable displays, such as phones, tablets, or computers, to improve  
2 customer visualization of proposed designs. See '572 patent at 6:53-67.3 One  
3 advantage of the patented invention is the easy-to-use GUI that is capable of enabling  
4 a user to quickly and conveniently generate or import 3D scenes, import and  
5 manipulate at the client computer 3D objects in the scenes in real-time, and which is  
6 capable of rendering them in photorealistic detail on the client computer. See Exhibit  
7 A at 4:18-25.

8 22. Another advantage of the patented invention is that it provides the ability to  
9 represent changes in both natural and artificial light, which may be precise enough to  
10 depict lighting and shadowing associated with a particular exposure during a particular  
11 season at a predetermined hour of the day at a particular geographic location  
12 worldwide. Advantageously, this ability enables the aesthetics of the conceptualized  
13 design to be accurately communicated prior to build-out of the actual room(s). See  
14 Exhibit A at 7:12-17.

15 23. Because of these significant advantages that can be achieved by the patented  
16 invention, the '572 patent presents significant commercial value for companies like  
17 Defendant. Indeed, use of the patented technology has become widespread among  
18 members of the public interested in buying furniture products, including customers of  
19 Defendant. It has become quite popular and advantageous as part of the furniture  
20 buying process for a customer to first utilize the technology offered by Defendant and  
21 other furniture sellers, to import 3D objects (like furniture) from the seller's server and  
22 render them in photorealistic detail, including with luminosity effects, within a room  
23 setting on the client computer.

#### 24 **Technological Innovation**

25 24. The disclosures and claims of the '572 patent resolve technical problems  
26 related to computerized three-dimensional modeling systems, particularly problems  
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28 <sup>3</sup> As used herein, a citation in the form such as "6:53-67" refers to column 6, lines 53-67 of the patent-in-suit.

1 related to the utilization of technology for rendering and manipulating in real-time 3D  
2 furniture objects on a client computer with a user-selected or user-generated interior  
3 design scene, as well as editing of those objects to apply lighting and shadow effects  
4 called luminosity effects. As the '572 patent explains, one of the limitations of the  
5 prior art as regards such prior art modeling systems was that many of them generated  
6 furniture images in 2D as opposed to 3D, which did not enable them to be shown in  
7 context of a background scene, e.g., a particular room, and did not enable them to be  
8 manipulated, e.g., for scaling, rotation and particular placement within the background  
9 scenes. Some prior art systems did include 3D furniture models, which can be rotated  
10 and scaled to fit the scene. However, for example, the room images for such systems  
11 were not associated with a 3D model of the room and lacked the capability of rendering  
12 furniture objects placed onto floor plans in photographically derived scenes, and/or  
13 did not provide for the manipulation of 3D furniture objects at the client computer.  
14 See Exhibit A at 2:6-64, 3:12-29 and 3:58-4:17.

15 25. Moreover, the disclosures and claims of the '572 patent recite inventive  
16 concepts that are not merely routine or conventional use of computerized 3D modeling  
17 systems and, more particularly, to a software application configured to reside on a  
18 client computer that is capable of manipulating 3D object representations in-situ with  
19 a user-selected or user-generated interior design scene and rendering quality  
20 perspective images of the composite scene. Instead, the claims of the '572 patent are  
21 directed to a new and novel solution to specific problems related to improving a  
22 software application configured to reside on a client computer, which is capable of  
23 manipulated 3D object representations at the client computer with a user-selected or  
24 user-generated interior design scene, including selectively reconfiguring a given 3D  
25 object in real time and applying luminosity characteristics to the 3D image, thereby  
26 rendering quality perspective images of the composite scene.

27 26. The claims of the '572 patent does not preempt all the ways that a method  
28 in a client-server computing environment for generating and rendering a photorealistic

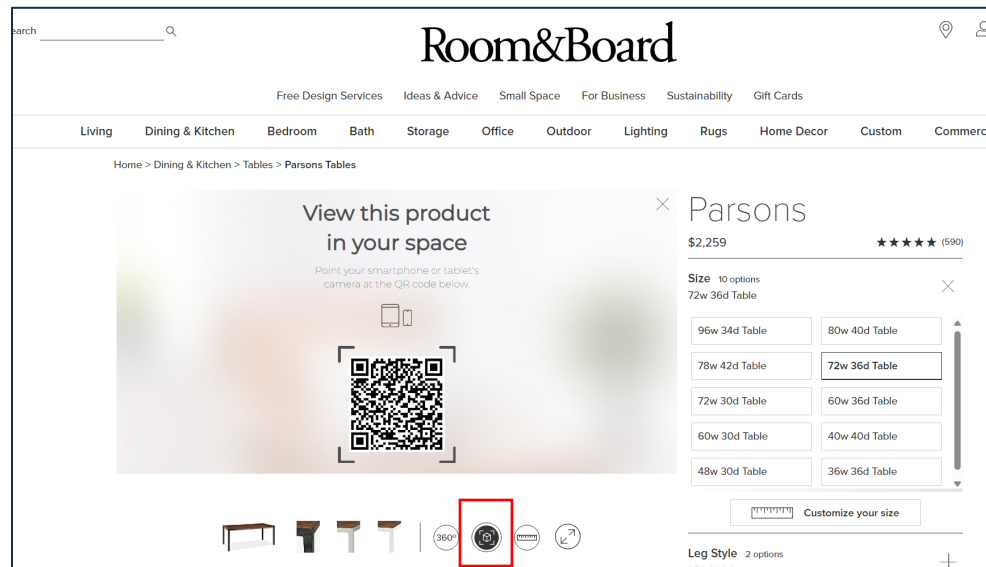
1 3D perspective view of a 3D object selectively positioned within a 3D scene may be  
2 used to improve computerized 3D modeling systems, nor does the '572 patent preempt  
3 any other well-known or prior art technology.

4 27. Accordingly, the claims in the '572 patent recite a combination of elements  
5 sufficient to ensure that the claims in substance and in practice amount to significantly  
6 more than a patent-ineligible abstract idea.

### 7 THE ACCUSED PRODUCTS

8 28. Based upon public information, Defendant owns, operates, advertises,  
9 and/or controls the website [www.roomandboard.com](http://www.roomandboard.com) through which it advertises,  
10 sells, offers to sell, provides and/or educates customers about its products and services.

11 29. Defendant manufactures, uses, causes to be used, sells, offers for sale,  
12 provides, supplies, or distributes augmented reality products and tools including, but  
13 not limited to, website functionality that provides photorealistic 3D perspective view  
14 of a 3D object chosen from its list of products that can be selectively positioned within  
15 a 3D scene chosen by the viewer. *See* Figure 1; Exhibit B.<sup>4</sup>



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26 **Figure 1:** Screenshot from Defendant's website (captured July 9, 2024); 3D tool highlighted in red.

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28 <sup>4</sup> Source: [https://www.roomandboard.com/catalog/dining-and-kitchen/tables/parsons-tables/650586?CHAR\\_650586\\_PRATT\\_COLL\\_BASE=NS&CHAR\\_650586\\_PRATT\\_COLL\\_TOP=WA](https://www.roomandboard.com/catalog/dining-and-kitchen/tables/parsons-tables/650586?CHAR_650586_PRATT_COLL_BASE=NS&CHAR_650586_PRATT_COLL_TOP=WA)



**COUNT I: INFRINGEMENT OF U.S. PATENT NO. 7,277,572**

30. AR Design repeats and re-alleges the allegations in the Paragraphs above as though fully set forth in their entirety.

31. The USPTO duly issued the '572 patent on October 2, 2007 after full and fair examination of application 10/683,825 which was filed on October 10, 2003. *See Exhibit A*, at A-1. A Certificate of Correction was issued on May 18, 2010. *See id.* at A-51.

32. AR Design owns all substantial rights, interest, and title in and to the '572 patent, including the sole and exclusive right to prosecute this action and enforce the said patent against infringers and to collect damages for all relevant times.

33. 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 '572 patent.

34. The claims of the '572 patent are not directed to an abstract idea. For example, claim 1 of the '572 patent recites a specific and multi-step method to generate and render a photorealistic 3D perspective view of a 3D object selectively positioned within a 3D scene. The method enables a user to connect to a server, interact with a graphical user interface (“GUI”), and retrieve and manipulate a 3D image – including applying different luminosity characterizations – that result in a photorealistic 3D view of the composite image, including any luminosity characteristics. Taken as a whole, the claimed inventions of the '572 patent are not limited to well-understood, routine, or conventional activity. Rather, the claimed inventions include inventive components that improve upon the experience of furnishing an interior space. (*See also* description above in the Section entitled “Technological Innovation” under the heading “The Technology.”)

35. The written description of the '572 patent describes in technical detail each of the limitations 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

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

3 36. Defendant has infringed one or more claims of the '572 patent by making,  
4 having made, using, importing, providing, supplying, distributing, selling, or offering  
5 the Accused Products to customers.

6 37. The Accused Products include websites that perform a method in a client-  
7 server computing environment for generating and rendering a photorealistic 3D  
8 perspective view of a 3D object selectively positioned within a 3D scene.

9 38. The Accused Products perform and supply a method in a client-server  
10 computing environment for generating and rendering a photorealistic 3D perspective  
11 view of a 3D object selectively positioned within a 3D scene.

12 39. Defendant has directly infringed, either literally or under the doctrine of  
13 equivalents, at least claim 1 of the '572 patent as shown in **Exhibit B**.

14 40. The method performed and supplied by the Accused Products includes the  
15 steps of communicably accessing a server with a client; operating with the client, a  
16 client application configured for scene editing and rendering, including a GUI;  
17 displaying a 3D scene with the GUI; configuring the 3D scene for being selectively  
18 displayed in a plurality of views; retrieving at least one 3D object from the server;  
19 importing the 3D object into the 3D scene to generate a composite; manipulating the  
20 3D object within the composite for placement and orientation; rendering a 3D image  
21 of the composite at the client; selectively reconfiguring the 3D image in real time;  
22 applying luminosity characteristics to the 3D image; and rendering, with the client  
23 application, a photorealistic 3D view of the composite image, including the luminosity  
24 characteristics. Defendant's infringement in this regard is ongoing.

25 41. Plaintiff has been damaged as a result of the infringing conduct by  
26 Defendant alleged above. Defendant is liable to Plaintiff in an amount that  
27 compensates it for such infringements, which by law cannot be less than a reasonable  
28 royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

1 42. Since at least the time of receiving this Complaint, Defendant has also  
2 indirectly infringed the '572 patent by inducing others to directly infringe said patent.  
3 Defendant has induced end-users, including Defendant's customers, to directly  
4 infringe, either literally or under the doctrine of equivalents, the '572 patent by  
5 downloading and using the Accused Products. Defendant took active steps, directly  
6 or through contractual relationships with others, with the specific intent to cause them  
7 to use the Accused Products in a manner that infringes one or more claims of the '572  
8 patent, including, for example, claim 1 of the '572 patent. Such steps by Defendant  
9 included, among other things, advising or directing personnel, contractors, or end-  
10 users to make or use the Accused Products in an infringing manner; advertising and  
11 promoting the use of the Accused Products in an infringing manner; or distributing  
12 instructions that guide users to use the Accused Products in an infringing manner.  
13 Defendant is performing these steps, which constitutes induced infringement with the  
14 knowledge of the '572 patent and with the knowledge that the induced acts constitute  
15 infringement. Defendant is aware that the normal and customary use of the Accused  
16 Products by others would infringe the '572 patent. Defendant's inducement is  
17 ongoing.

18 43. Defendant has also indirectly infringed by contributing to the infringement  
19 of the '572 patent. Defendant has contributed to the direct infringement of the '572  
20 patent by its personnel, contractors, and customers. The Accused Products have  
21 special features that are specially designed to be used in an infringing way and that  
22 have no substantial uses other than ones that infringe one or more claims of the '572  
23 patent, including, for example, claim 1 of the '572 patent. The special features include,  
24 for example, the method recited in claim 1, including all the intermediary steps, that  
25 allow the claimed method to generate and render a photorealistic 3D perspective view  
26 of a 3D object selectively positioned within a 3D scene. The special features constitute  
27 a material part of the invention of one or more of the claims of the '572 patent and are  
28 not staple articles of commerce suitable for substantial non-infringing use.

1 Defendant's contributory infringement is ongoing.

2 44. Defendant has had knowledge of the '572 patent at least as of the date when  
3 it was notified of the filing of this action.

4 45. Furthermore, on information and belief, Defendant has a policy or practice  
5 of not reviewing the patents of others (including instructing its employees to not  
6 review the patents of others), and thus has been willfully blind of Plaintiff's patent  
7 rights.

8 46. Defendant's actions are at least objectively reckless as to the risk of  
9 infringing a valid patent and this objective risk was either known or should have been  
10 known by Defendant.

11 47. Defendant's direct and indirect infringement of the '572 patent is, has been,  
12 and continues to be willful, intentional, deliberate, or in conscious disregard of  
13 Plaintiff's rights in the '572 patent.

14 48. Plaintiff has been damaged as a result of the infringing conduct by  
15 Defendant alleged above. Thus, Defendant is liable to AR Design in an amount that  
16 compensates it for such infringements, which by law cannot be less than a reasonable  
17 royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

18 49. AR Design has suffered irreparable harm, through its loss of market share  
19 and goodwill, for which there is no adequate remedy at law. AR Design has and will  
20 continue to suffer this harm by virtue of each Defendant's infringement of the '572  
21 patent. Defendant's actions have interfered with and will interfere with AR Design's  
22 ability to license technology. The balance of hardships favors AR Design's ability to  
23 commercialize its own ideas and technology. The public interest in allowing AR  
24 Design to enforce its right to exclude outweighs other public interests, which supports  
25 injunctive relief in this case.

26 **JURY DEMAND**

27 50. AR Design hereby requests a trial by jury on all issues so triable by right.  
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**PRAYER FOR RELIEF**

1  
2 51. AR Design requests that the Court find in its favor and against Defendant,  
3 and that the Court grant AR Design the following relief:

- 4 a. Judgment that one or more claims of the Asserted Patent has been infringed,  
5 either literally or under the doctrine of equivalents, by Defendant or others  
6 acting in concert therewith;
- 7 b. An award of a reasonable royalty for infringement Asserted Patent;
- 8 c. A permanent injunction enjoining Defendant and its officers, directors, agents,  
9 servants, affiliates, employees, divisions, branches, subsidiaries, parents, and all  
10 others acting in concert therewith from infringement of the Asserted Patent or,  
11 in the alternative, an award of a reasonable ongoing royalty for future  
12 infringement of the Asserted Patent by such entities;
- 13 d. Judgment that Defendant accounts for and pays to AR Design all damages to  
14 and costs incurred by AR Design because of Defendant’s infringing activities  
15 and other conduct complained of herein;
- 16 e. Judgment that Defendant’s infringements be found willful as to the Asserted  
17 Patent and that the Court award treble damages for the period of such willful  
18 infringement pursuant to 35 U.S.C. § 284;
- 19 f. Pre-judgment and post-judgment interest on the damages caused by Defendant’s  
20 infringing activities and other conduct complained of herein;
- 21 g. That this Court declare this an exceptional case and award AR Design its  
22 reasonable attorneys’ fees and costs in accordance with 35 U.S.C. § 285; and
- 23 h. All other and further relief as the Court may deem just and proper under the  
24 circumstances.

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DATED: July 11, 2024

Respectfully submitted,

/s/ Travis E. Lynch

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Attorneys for ***AR DESIGN INNOVATIONS LLC***

**List of Exhibits**

- A. U.S. Patent No. 7,277,572
- B. Evidence of Use Chart for U.S. Patent No. 7,277,572