

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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AMERICAN NATIONAL MANUFACTURING INC.,  
Petitioner,

v.

SLEEP NUMBER CORPORATION  
f/k/a SELECT COMFORT CORPORATION,  
Patent Owner.

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Case No. IPR2019-00514  
Patent No. 5,904,172

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**DECLARATION OF DR. JOHN ABRAHAM  
IN SUPPORT OF PATENT OWNER'S RESPONSE**

I, John Abraham, declare as follows:

1. I am over the age of 21 years and am fully competent to make this Declaration. I make the following statements based on personal knowledge and, if called to testify to them, could and would do so.

2. I have been retained on behalf of Sleep Number Corporation (“Sleep Number”). My fee is not contingent on the outcome of any matter or on any of the positions I have or will take in any matter. I have no financial interest in Sleep Number.

3. My qualifications as an expert in the field of mechanical engineering are set forth in the paragraphs below and in my curriculum vitae, attached hereto as Appendix A.

4. I earned a Bachelor of Science degree in Mechanical Engineering with a minor in Mathematics from the University of Minnesota – Twin Cities in 1997. In 1999, I earned a Master of Science degree from the University of Minnesota – Twin Cities. In 2002, I earned a Ph.D. degree in Mechanical Engineering in the area of Thermal Sciences also from the University of Minnesota – Twin Cities, with my thesis on “A comprehensive experimental, analytical, and numerical investigation of the modes of heat transfer in an electrically heated oven.”

5. In 2002, I joined the faculty of University of St. Thomas in St. Paul, Minnesota, as an Assistant Professor in the Engineering Department. In 2008, I became an Associate Professor at the University of St. Thomas in the Engineering Department. In 2013, I was promoted to a full professorship at the University of St. Thomas in the Engineering Department, where I currently teach in the area of thermodynamics, heat transfer, and fluid mechanics.

6. I am an inventor on several issued U.S. Patents, including: U.S. Patent No. 8,484,974 “Dual-phase thermal electricity generator”; U.S. Patent No. 7,559,485 “Variable orifice valve”; and U.S. Patent No. 8,118,225 “Vehicle Energy Absorption.”

### **Background**

7. I am familiar with U.S. Patent No. 5,904,172 (“the ‘172 Patent”), U.S. Patent No. 9,737,154 (“the ‘154 Patent”), and U.S. Patent No. 8,769,747 (“the ‘747 Patent”) (collectively, “Patents-at-Issue”).

8. I am also familiar with the products of Petitioner American National Manufacturing, Inc. (“ANM”), Real-Party-in-Interest Sizewise Rentals, LLC (“Sizewise”), and Real-Party-in-Interest Dires, LLC (“Dires”). For example, I was retained by Sleep Number and served as an expert in the prior International Trade Commission (“ITC”) proceeding against ANM and Sizewise and involving the ‘172 Patent: *In the Matter of Certain Air Mattress Systems, Components Thereof, and*

*Methods of Using the Same*, Inv. No. 337-TA-971 (“ITC Proceeding”). During the ITC Proceeding, I conducted inspections and analyses of ANM’s/Dires’ (ANM for short herein) and Sizewise’s physical products, as well as Versions 1.8 and 1.9 of ANM’s source code used in ANM’s products and one version of the source code used in the Platinum 5000/6000 products.

9. I submitted an expert report and testified to the ITC as to my opinion that ANM’s and Sizewise’s air bed products infringed claims 2, 6, 9, 12, 16, 20, 22, 23, and 24 of the ‘172 Patent. It is my understanding that the ITC ultimately found claims 12 and 16 of the ‘172 Patent to be both valid and infringed by ANM (specifically, the Gen 3 V1 and Gen 3 V2 products identified below) and Sizewise (specifically, the Platinum 5000/6000 products identified below).

10. Additionally, I was retained by Sleep Number to conduct inspections and analyses of products in Sleep Number’s possession and inspections and analyses of products in ANM’s and Sizewise’s possession (specifically, at ANM’s counsel’s office in Dallas in December 2018 and Kansas City in February 2019) in the underlying district court cases: *Sleep Number Corporation v. American National Manufacturing, Inc.*, No. 5:18-cv-00357AB(SP<sub>x</sub>) (C.D. Cal. 2018) and *Sleep Number Corporation v. Sizewise Rentals, LLC*, No. 5:18-cv-00356AB(SP<sub>x</sub>) (C.D. Cal.) (“District Court Cases”).

11. My inspection of ANM's air controllers included an analysis of the mechanical structure of these air controllers in comparison to the claims of the Patents-at-Issue and to Sleep Number's products. I understand that while ANM refers to its air controllers using different identifiers, Sleep Number referred to them in its Contentions as the Gen 3 Arco, Gen 3 Koge, and Gen X air controllers. I use Sleep Number's identifiers herein for ease of reference. However, my analysis herein focuses on the Gen 3 Arco and Gen 3 Koge which, as explained below, I believe are similar to, and copies of, Sleep Number's air controllers sold leading up to and during the same time period.

12. My inspection of Sizewise's air controllers included an analysis of the mechanical structure of these air controllers in comparison to the claims of the Patents-at-Issue and to Sleep Number's products. I understand Sizewise claims to only sell a Platinum 6000 air controller, but I also understand from the ITC Proceeding that ANM imports the Platinum 5000 air controller and sells it to a company called Direct Supply. I understand based upon prior inspection that the Platinum 5000 and Platinum 6000 are substantially similar, and I understand Sleep Number thus accused the Platinum 5000 and Platinum 6000 air controller together in its Contentions. I use Sleep Number's identifier of Platinum 5000/6000 herein for ease of reference.

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