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.

SELECT COMFORT CORPORATION,
Patent Owner.

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Case No. IPR2019-00500
Patent No. 9,737,154 B2

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# DECLARATION OF PAUL MAHONEY IN SUPPORT OF PATENT OWNER'S RESPONSE

I, Paul James Mahoney, 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 received my Bachelor's of Science in Electrical Engineering from the University of Dayton in Dayton, Ohio in 1966. I also received a Masters in Biomedical Engineering from Southern Methodist University in Dallas, Texas in 1972.

3. I was employed at Select Comfort Corporation, which is now known as Sleep Number Corporation (referred to herein as "Sleep Number"), as an engineer and later as Senior Product Design Engineer from June 1995 to July 2011. Prior to joining Sleep Number, I was the Director of Research and Development at Aequitron Medical. I also worked as the Manager of Corporate Research Laboratories at 3M.

4. A copy of my current CV is attached as Appendix A.

5. While at Sleep Number, I was heavily involved in the product research, development, and design of air control systems sold as part of the company's adjustable air mattress systems. Sleep Number refers to those systems as their proprietary Sleep Number® beds. As part of my job, we did extensive testing on different designs. We regularly used test subjects to try out new concepts or designs.

We also regularly received relevant customer feedback, which would inform our design choices and strategies.

6. I was an inventor in the field of adjustable mattresses. I am the named inventor of several United States patents, including 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"). Each of these patents is in the field of adjustable air beds.

7. The '172 Patent teaches a novel system for adjustable air beds that allows for continuous monitoring and adjusting of the pressure in an air bladder within a mattress in order to adjust the firmness for a desired user. Specifically, pressure is monitored from a valve enclosure assembly, which is remotely located from the air bladder. The pressure is monitored before and during inflation/deflation, allowing the system to inflate/deflate the air bladder until the pressure sensed within an air chamber in the valve enclosure assembly is substantially equal to the desired pressure, at which point inflation/deflation stops.

8. The purpose behind adjustable air beds, and the reason Sleep Number believed consumers would purchase its adjustable air beds, is that users can individualize or customize the mattress, as they desire, to his/her preferred firmness—*i.e.*, they can change the firmness at any time. As such, each user may

make a selection of his/her desired pressure, which I refer to as the desired pressure setpoint.

9. The degree or magnitude of pressure adjustments in an adjustable air bed are very small. As an initial matter, the air bladders in the adjustable beds usually have a fully deflated pressure of 0.0 or 0.05 PSI and a fully inflated pressure of around 0.6 PSI. While other ranges are possible, those skilled in the art of adjustable air mattresses would appreciate that each pressure adjustment would be a fraction of a fraction of a PSI. For example, Sleep Number beds have sleep settings or desired pressure setpoints that range from 0 to 100 in increments of 5 (*i.e.* 0, 5, 10, 15, etc.). Accordingly, a sleep setting of 0 is indicative of a fully deflated air bladder, *i.e.* 0.0 or 0.05 PSI, and a sleep setting of 100 is indicative of a fully inflated air bladder, *i.e.,* 0.6 PSI.

10. We did several experiments at Sleep Number and we found that users can generally appreciate the difference in firmness between pressure changes of as little as 0.01 to 0.03 PSI. For example, we found that users could generally appreciate the difference in firmness between a sleep setting of 30 (approx. 0.18 PSI) and 35 (approx. 0.21 PSI). In fact, most users could tell a huge difference between each sleep setting when in the 20-40 (approx. 0.12 to 0.24 PSI) sleep setting range. However, due to the pressure transducers available to us it was difficult to consistently achieve a sleep setting with increments smaller than 0.03 PSI. In

addition, as the pressure increased, *e.g.*, when approaching sleep settings of 80 (approx. 0.48 PSI), users could not always appreciate the difference between pressure adjustments smaller than 0.03 PSI. Accordingly, while different increments may be used, we consistently used pressure adjustments in increments of 0.03 PSI.

11. Through my experience in the bed industry, I understood that most individuals had a predisposition to a certain firmness, *e.g.*, soft, medium, or firm. Indeed, in my experience most users or test subjects preferred a firmness within the 20-40 sleep setting range, or 0.12 to 0.24 PSI. It is my opinion, through my work and experiences, that users often toggle between desired pressures that are very close to one another. In other words, a user preferring a soft to medium firmness may change from a Sleep Number setting of 30 to 35 (or vice versa), which as discussed above represents a very small change of .03 PSI but would be a noticeable change in firmness for the user. While a user could drastically change the firmness of his/her mattress by switching between a sleep setting of 20 (approx. 0.12 PSI) and 80 (approx. 0.48 PSI), this magnitude of change was considered to be more the exception than the rule. That is, the understanding of those working in the field was that users who were predisposed to a generally firm mattress would not often switch to a very soft setting (or vice versa). Additionally, even if a user changed from a setting of 0 to 100 (or vice versa), it would only represent an approximate change of 0.6 PSI.

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