United States Court of Appeals for the Federal Circuit

AMERICAN NATIONAL MANUFACTURING INC.,
Appellant

v.

SLEEP NUMBER CORPORATION, FKA SELECT COMFORT CORPORATION,
Cross-Appellant

KATHERINE K. VIDAL, UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE,
Intervenor

2021-1321, 2021-1323, 2021-1379, 2021-1382

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2019-00497, IPR2019-00500.

Decided: November 14, 2022

KYLE L. ELLIOTT, Spencer Fane, LLP, Kansas City, MO, argued for appellant. Also represented by BRIAN T. BEAR, KEVIN S. TUTTLE; ANDY LESTER, Oklahoma City, OK.

RUFFIN B. CORDELL, Fish & Richardson PC,

Washington, DC, argued for cross-appellant. Also represented by ROBERT COURTNEY, MATHIAS WETZSTEIN SAMUEL, Minneapolis, MN; ANDREW S. HANSEN, ELIZABETH A. PATTON, LUKAS D. TOFT, Fox Rothschild LLP, Minneapolis, MN; STEVEN A. MOORE, Moore IP Law PC, San Diego, CA; KECIA JANNELL REYNOLDS, Paul Hastings LLP, Washington, DC.

SARAH E. CRAVEN, Office of the Solicitor, United States Patent and Trademark Office, Alexandria, VA, argued for intervenor. Also represented by THOMAS W. KRAUSE, FARHEENA YASMEEN RASHEED; MEREDITH HOPE SCHOENFELD.

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Before STOLL, SCHALL, and CUNNINGHAM, *Circuit Judges.*

STOLL, *Circuit Judge.*

American National Manufacturing Inc. and Sleep Number Corp. each appeals the Patent Trial and Appeal Board's final written decisions in two inter partes reviews. The Board issued mixed decisions in those proceedings, determining that some, but not all, of the challenged claims were not unpatentable. These appeals and cross-appeals involve two patents and numerous issues, including two on which the U.S. Patent and Trademark Office has intervened.

Our opinion focuses on four of these issues: (1) whether the Board erred in permitting the patent owner to present proposed amended claims that both responded to a ground of unpatentability and made other wording changes unrelated to the IPR proceedings; (2) whether those proposed amended claims were not enabled because of an alleged error in the specification; (3) whether those proposed amended claims should have been rejected for allegedly raising an inventorship issue; and (4) whether the Board inappropriately considered the

petitioner's sales data in its secondary considerations analysis. For the below reasons, we affirm. Although we have thoroughly considered the other issues raised by both parties, we affirm the Board's determinations regarding those issues without significant discussion.

BACKGROUND

I

Sleep Number owns U.S. Patent Nos. 8,769,747 and 9,737,154. Both patents describe systems and methods that purport to adjust the pressure in an air mattress "in less time and with greater accuracy" than previously known. '747 patent col. 1 ll. 6–10.[1] Conventional air bed systems have a control panel that allows a user to select a desired inflation setting for each air chamber in the air bed for optimal comfort and to change the inflation setting at any time, allowing for changes in the firmness of the bed. *Id.* at col. 1 ll. 13–25. The air chambers are in fluid communication with an air pump manifold. *Id.* at col. 3 ll. 10–19, 46–51. The patents disclose adjusting pressure in an air bed "in less time and with greater accuracy" by measuring the air pressure inside the valve enclosure assembly instead of in the air chambers themselves, thus "eliminating the need to turn off the pump in order to obtain a substantially accurate approximation of the chamber pressure." *Id.* at col. 1 ll. 6–10, col. 4 ll. 53–59.

As the patents' shared specification explains, the pressure control system computes and iteratively refines what the patents call "pressure adjustment factors" or "offsets"— the difference between the pressure in the valve enclosure assembly and the pressure in the bed's air chambers. *Id.* at

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[1]   The '154 patent is a continuation of the application that matured into the '747 patent. Because the patents share a common specification, we refer only to the '747 patent specification unless otherwise specified.

col. 2 ll. 26–31, col. 5 l. 9–col. 6 l. 7. The system then uses the pressure adjustment factor to determine what the "target pressure" in the valve enclosure assembly must be for the air chamber to reach the user's desired pressure setpoint. *Id.* at col. 7 l. 51–col. 8 l. 59. The system adjusts the valve enclosure assembly pressure until it meets the target pressure, then re-tests the pressure in the air chamber. *Id.* at col. 8 l. 63–col. 9 l. 43. If the air chamber has still not reached the desired pressure setpoint, the system revises its pressure adjustment factor, using what the patents call an "adjustment factor error," and tries again. *Id.* at col. 2 ll. 28–31, col. 9 l. 44–col. 10 l. 51; *see also id.* Fig. 6 (describing the process in flow diagram form). This process repeats until the air chamber reaches the desired pressure.

The specification further explains that the process for determining the pressure adjustment factor varies depending on whether the system is inflating or deflating the air chamber. To differentiate between the two processes, the patents describe using an additive offset (i.e., an offset that is added to the measured valve enclosure pressure) for inflation and a multiplicative offset (i.e., an offset by which the measured valve enclosure pressure is multiplied) for deflation. *Id.* at col. 8 ll. 14–59, col. 9 ll. 51–61.

Claim 1 of the '747 patent recites:

1. A method for adjusting pressure within an air bed comprising:

providing or receiving an air bed, the air bed including an air chamber and a pump having a pump housing;

selecting a desired pressure setpoint for the air chamber;

determining an initial pressure within the pump housing;

> calculating a pressure target based upon the de-
> sired pressure setpoint and a pressure adjustment
> factor, wherein an inflate pressure adjustment fac-
> tor is used to calculate the pressure target when
> the initial pressure within the pump housing is less
> than the desired pressure setpoint, and wherein a
> deflate pressure adjustment factor is used to calcu-
> late the pressure target when the initial pressure
> within the pump housing is greater than the de-
> sired pressure setpoint;
>
> adjusting pressure within the air chamber until a
> sensed pressure within the pump housing is sub-
> stantially equal to the calculated pressure target;
>
> determining an actual chamber pressure within
> the air chamber;
>
> comparing the actual chamber pressure to the de-
> sired pressure setpoint to determine the adjust-
> ment factor error; and
>
> modifying the pressure adjustment factor based
> upon the adjustment factor error.

Id. at col. 12 ll. 43–67. Claim 1 of the '154 patent is similar. *See* '154 patent col. 13 ll. 11–29. Certain dependent claims of both patents require that the pressure adjustment factor be a multiplicative pressure adjustment factor. *See* '747 patent col. 13 ll. 8–13, col. 14 ll. 1–3 (claims 5, 6, and 13); '154 patent col. 13 ll. 39–44, col. 14 ll. 46–49 (claims 5, 6, and 15). Both patents also contain an inde-pendent claim requiring, among other things, a "pressure adjustment system for an air bed comprising . . . a pressure sensing means adapted to monitor pressure within the pump manifold." '747 patent col. 14 ll. 9–43 (claim 16); '154 patent col. 15 l. 16–col. 16 l. 18 (claim 20).

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