

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC

Petitioner

v.

ECOFACOR, INC.

(record) Patent Owner

IPR2022-00538

Patent No. 9,194,597

REPLY DECLARATION OF RAJENDRA SHAH

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I. ENGAGEMENT AND INTRODUCTION

1. I am that same Rajendra Shah who previously submitted a declaration in the present Inter Partes Review in which I set forth certain opinions regarding the unpatentability of U.S. Pat. No. 9,194,597 (“the ’597 patent”) (“the First Shah Declaration”). My qualifications are set forth in the First Shah Declaration and my curriculum vitae is attached as Exhibit 1003 thereto.

2. I understand that the Patent Trial and Appeal Board (“Board”) has issued an Order granting Google, LLC’s (“Google”) Petition for Inter Partes Review. I further understand that Dr. John A. Palmer has submitted a declaration on behalf of Patent Owner EcoFactor Inc. in this proceeding (“the Palmer Declaration”) in which he has offered certain opinions in response to the opinions set forth in the First Shah Declaration. I have reviewed the Palmer Declaration and the Exhibits cited therein. I have been asked by Google to provide additional opinions regarding the unpatentability of the ’597 patent in response to the opinions offered by Dr. Palmer. These additional opinions are set forth herein.

II. ADDITIONAL OPINIONS REGARDING THE UNPATENTABILITY OF THE ’597 PATENT

A. Ehlers’ 330’s “Thermal Gain Rates” Are Rates of Change In Inside Temperature Over Time

3. As I explained in detail in the First Shah Declaration, Ehlers’ 330 teaches calculating the rate at which temperature inside a structure changes over time

at any given outside temperature (*i.e.*, the “thermal gain rate”). Ehlers ’330 illustrates this in Figure 3D, reproduced below.

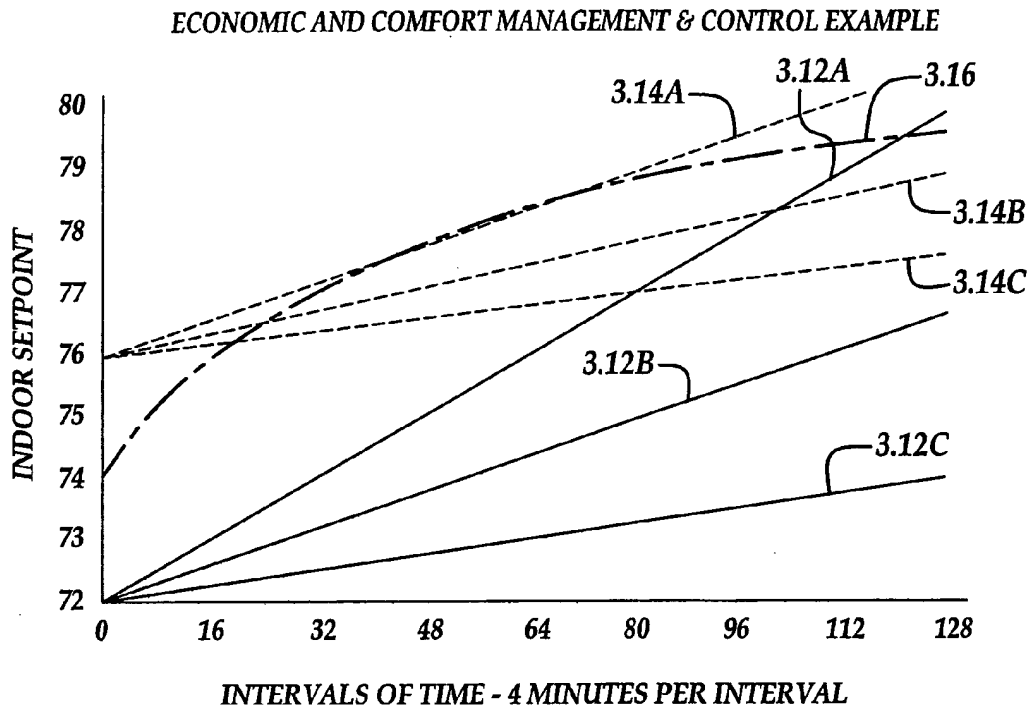


Figure 3D

(Ex. 1004, Fig. 3D). As I further explained in detail in the First Shah Declaration, a POSITA would understand that in Figure 3D of Ehlers ’330, the HVAC system is “OFF” and the inside temperature is permitted to change or ‘drift’ in response to the outside temperature.¹

¹ It appears that Dr. Palmer agrees with me and recognizes that that “information presented in Fig. 3D of Ehlers ’330 only relates to changes in temperature when the HVAC system is OFF” and that “the ‘thermal gain rates’ qualitatively illustrated in Fig. 3D are only for a building with an HVAC system turned OFF.” (See Ex. 2008, ¶54)(See also *id.* ¶56)(“Ehlers ’330 determines *the thermal gain* of

4. Ehlers '330 specifically describes Figure 3D as depicting what Ehlers '330 refers to as the “thermal gain rate” of the home. Ehlers '330 states: “the system 3.08 tracks the **thermal gain rate** of the home 2.18 for each set point selected over time by the customer.” (Ex. 1004, ¶0253). Ehlers '330 goes on to state that “lines 3.12A, 3.12B, and 3.12C **plot the thermal rate of gain** in the site 1.04 for different outside temperatures.” (Ex. 1004, ¶0253)(*see also id.*) (“The three trends shown as lines 3.14A, 3.14B, and 3.14C illustrate the **thermal rate of gain** in the home 2.18.”)(emphases added). Ehlers '330 further states that “these graphs are drawn to illustrate the **rate of thermal gain.**” (Ex. 1004, ¶0253).

5. Ehlers '330 also explains:

“[w]hile these graphs are drawn to illustrate the rate of thermal gain, they do not depict the rapid initial gain when the differential is large and the slower rate of thermal gain, which occurs as the indoor temperature reaches the outside temperature. This rate [of] thermal gain change is illustrated in FIG. 3D as plot line 3.16 which shows the

the building under only certain conditions. Ex. 1004, ¶253, Fig. 3D. This involves, as Mr. Shah admits, turning the HVAC off and then measuring how much the inside temperature increases over time when at a certain outside temperature.”)(*id.* ¶59)(“At best, the data in Fig 3D discloses the changes in inside temperature from a specific starting temperature and for a single, specific outside temperature when the HVAC system is OFF.”)(*id.*, ¶38)(recognizing that “the slope of the line” in Figure 3D is the “rate of change of temperature”).

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