

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TOYOTA MOTOR NORTH AMERICA, INC., SUBARU OF AMERICA, INC.,
FORD MOTOR COMPANY, JAGUAR LAND ROVER NORTH
AMERICA, LLC, and VOLVO CARS OF NORTH AMERICA, LLC,
Petitioner,

v.

CRUISE CONTROL TECHNOLOGIES LLC,
Patent Owner.

Case IPR2014-00280
Patent 6,324,463 B1

Before JOSIAH C. COCKS, HYUN J. JUNG, and GEORGE R. HOSKINS,
Administrative Patent Judges.

HOSKINS, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Toyota Motor North America, Inc. et al. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–5, 12–16, 18, 19, 21, 25–28, and 34–36 of U.S. Patent No. 6,324,463 B1 (Ex. 1001, “the ’463 patent”). Petitioner submitted the Declaration of Dr. Paul Green (Ex. 1011) in support of the Petition. Cruise Control Technologies LLC (“Patent Owner”) filed a Preliminary Response (Paper 13, “Prelim. Resp.”). On July 2, 2014, we instituted an *inter partes* review of claims 1–5, 12–16, 18, 19, 21, 25–28, and 34–36 based on all five unpatentability grounds alleged in the Petition. Paper 17 (“Inst. Dec.”).

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 26, “PO Resp.”). Petitioner filed a Reply (Paper 33, “Pet. Reply”). An oral hearing was held March 24, 2015. Paper 46 (“Tr.”). The Board has jurisdiction under 35 U.S.C. § 6.

For the reasons provided below, Petitioner has shown, by a preponderance of the evidence, that claims 1–5, 12–16, 18, 19, 21, 25–28, and 34–36 of the ’463 patent are unpatentable.

A. *Related Proceedings*

Petitioner and Patent Owner have identified several district court proceedings that would affect, or be affected by, a decision in this proceeding. Pet. 1–2; Paper 12, 2–4. The ’463 patent is also the subject of four other *inter partes* review proceedings (IPR2014-00279, IPR2014-00281, IPR2014-00289, and IPR2014-00291). Final decisions in those proceedings are being entered concurrently with this final decision.

B. The '463 Patent

The '463 patent discloses cruise control systems for use in a human operated vehicle. Ex. 1001, Abst. Figures 1 and 2 of the '463 patent are shown below:

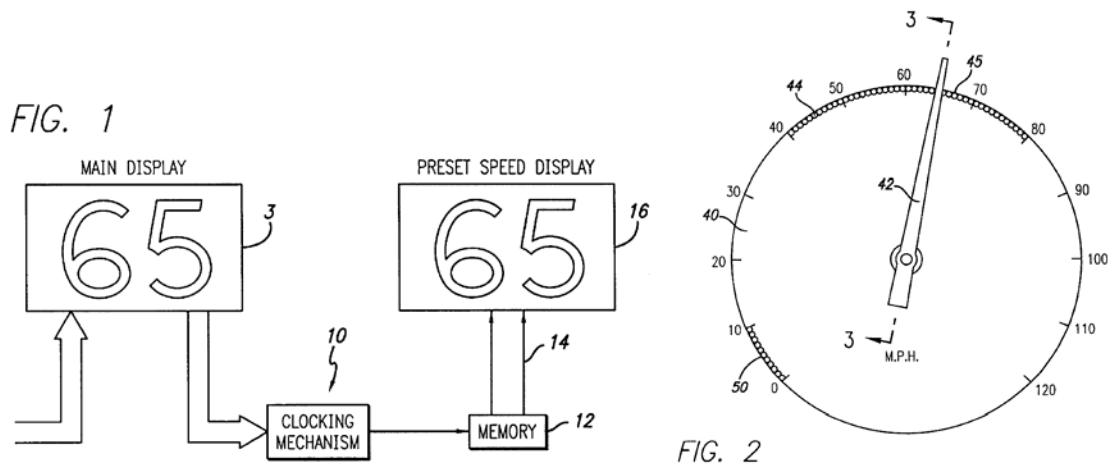


Figure 1 illustrates a digital speed display, while Figure 2 illustrates an analog speedometer. *Id.* at 3:8–13. In Figure 1, main speed display 3 shows the current speed at which the vehicle is operating. *Id.* at 3:49–53. When a cruise control set button (not shown in Figure 1) is pressed, the vehicle speed is stored in digital memory 12 as a preset speed. *Id.* at 3:53–60. Second speed display 16 shows that preset speed. *Id.*

Figure 2's analog speedometer 40 incorporates several LED assemblies 45. *Id.* at 4:19–26. Each LED assembly 45 has an LED and a detector. *Id.* at 4:29–30. When a cruise control set button (not shown in Figure 2) is pressed, all of the detectors are activated, and all of the LEDs momentarily light up. *Id.* at 4:48–51. The back of needle 42 reflects the light of the lit LEDs behind the needle, and that reflected light is detected by the detector of the LED assembly disposed at the location of needle 42. *Id.*

at 4:51–57. The LED of that assembly is then activated to indicate the speed at which cruise control was engaged. *Id.* at 4:57–64.

C. Illustrative Claim

Claim 1 of the '463 patent is illustrative:

1. A cruise control system for [a] vehicle having a human operator, comprising:
 - a speed controller that automatically maintains the vehicle speed at a preset speed;
 - an enable switch associated with said controller for enabling the system;
 - a set speed input in communication with said controller for manually setting the speed of the vehicle at said preset speed, thereby engaging the system;
 - a memory which stores information indicative of said preset speed; and
 - a feedback system for communicating said information in said memory to the operator of the vehicle.

Ex. 1001, 6:7–20.

D. Prior Art Supporting Instituted Unpatentability Grounds

Mitsubishi Diamante Owner's Manual ("Diamante," translation Ex. 1004) ¹	May 1995	Ex. 1003
Mitsubishi Diamante Preview Distance Control Manual ("Diamante PDC," translation Ex. 1006)	May 1995	Ex. 1005
Watanabe (translation Ex. 1008)	JP 8-192663 July 1996	Ex. 1007
Toyota Celsior Owner's Manual ("Celsior," translation Ex. 1010)	July 1997	Ex. 1009

¹ Our opinion cites to the translations of the prior art, including the page or paragraph numbering of the original documents reflected in the translations.

E. Instituted Unpatentability Grounds

We instituted an *inter partes* review of the '463 patent based on the following five unpatentability grounds alleged in the Petition. Inst. Dec. 5, 38.

Basis	Reference(s)	Claim(s) Challenged
§ 102(b)	Diamante	1–3, 5, 12–16, 21, 25, 26, and 28
§ 103(a)	Diamante and Diamante PDC	15, 16, and 21
§ 103(a)	Diamante and Watanabe	12
§ 102(b)	Watanabe	18 and 19
§ 102(a)	Celsior	2–5, 26–28, and 34–36

II. ANALYSIS

A. Claim Construction

As a step in our analysis, we determine the meaning of the claims for purposes of this decision. In an *inter partes* review, a claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears. 37 C.F.R. § 42.100(b) (2014); *In re Cuozzo Speed Techs., LLC*, 778 F.3d 1271, 1279–83 (Fed. Cir. 2015). Under that construction, claim terms are given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). We construe the terms below in accordance with that standard.

1. *“engaging the system” (claim 1) and
“engaging the cruise control system” (claim 21)*

In the Institution Decision, we construed “engaging the system” in claim 1, and “engaging the cruise control system” in claim 21, to mean “operating the cruise control system to automatically control the vehicle at the preset speed.” Inst. Dec. 8–9. Neither party has disputed these constructions during trial, and we do not find any reason to deviate from them.

2. *“enabling” (claims 1 and 2) and “enabled” (claims 2 and 4)*

In the Institution Decision, we construed “enabling the system” in claim 1, and “enabling . . . the controller” in claim 2, to mean a “system on” state for the cruise control system, which we also applied to the descriptor “enabled” in claims 2 and 4. Inst. Dec. 9–10. Neither party has disputed these constructions during trial, and we do not find any reason to deviate from them.

3. *“indicating to the operator the unset status of the preset speed” (claim 15) and “displaying a symbol indicative of an unset state of the preset speed” (claim 21)*

In the Institution Decision, we construed “unset status” and “unset state” in these two claim limitations to mean “a state or status in which there is no preset speed for the cruise control system.” Inst. Dec. 10–11. Neither party has disputed these constructions during trial, and we do not find any reason to deviate from them.

4. *“activating the cruise control system” (claims 12 and 15) and
“deactivated” (claims 12, 13, and 21)*

In the Institution Decision, we construed “activating” in these claims to mean “turning on,” and “deactivated” as “turned off.” Inst. Dec. 11–12.

Neither party has disputed these constructions during trial, and we do not find any reason to deviate from them.

5. *Remaining Claim Terms*

All other terms of the claims are given their plain and ordinary meaning that is consistent with the specification. For purposes of this decision, we need not construe those terms expressly.

B. *Anticipation by Diamante*

Petitioner contends claims 1–3, 5, 12–16, 21, 25, 26, and 28 of the '463 patent are unpatentable as anticipated by Diamante. Pet. 15–35.

1. *Independent Claim 1*

Claim 1 recites a cruise control system for a vehicle, including a speed controller. We are persuaded Diamante discloses a cruise control speed controller. Pet. 18; Ex. 1011, 22–23.² For example, Diamante states: “Cruise control is a system that allows the vehicle to cruise at a constant speed (from approximately 40–100 km/h) without depressing the accelerator pedal.” Ex. 1004, 86.

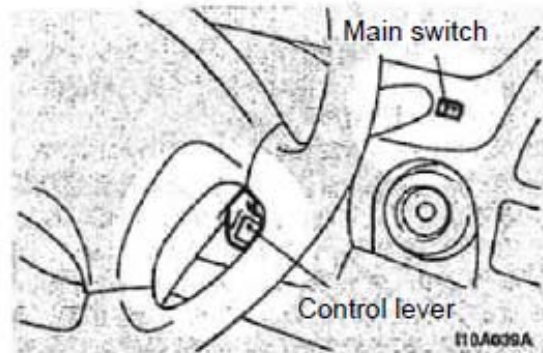
Patent Owner contends the quoted statement from Diamante expressly refers only to a cruise control “system” as recited in the preamble of claim 1, and fails to disclose the “speed controller” structural component later recited in claim 1. PO Resp. 5–6. Further, according to Patent Owner, neither Petitioner nor Dr. Green asserts the claimed “speed controller” is inherent in Diamante. *Id.* at 5.

² Although the Green Declaration (Exhibit 1011) contains numbered paragraphs, this opinion cites to page numbers.

Patent Owner's contentions are not persuasive. Claim 1 requires "a speed controller that automatically maintains the vehicle speed at a preset speed." We agree with Petitioner that, by indicating the Diamante cruise control system "allows the vehicle to cruise at a constant speed," Diamante expressly discloses that its system includes a component corresponding to the claimed speed controller. Pet. Reply 2–3; Ex. 1004, 86. Patent Owner's argument fails to specify any structural feature of the claimed speed controller that is missing from the Diamante cruise control system.³ See Pet. Reply 3–4. Moreover, even if Patent Owner is correct that Diamante at page 86 fails to disclose the claimed speed controller expressly, we find such a controller is necessary to the Diamante disclosure at page 86, and, therefore, find that such a controller is inherent to Diamante's system. See Pet. Reply 5.

Claim 1 also recites an enable switch and a set speed input. The following illustration appears in Diamante:

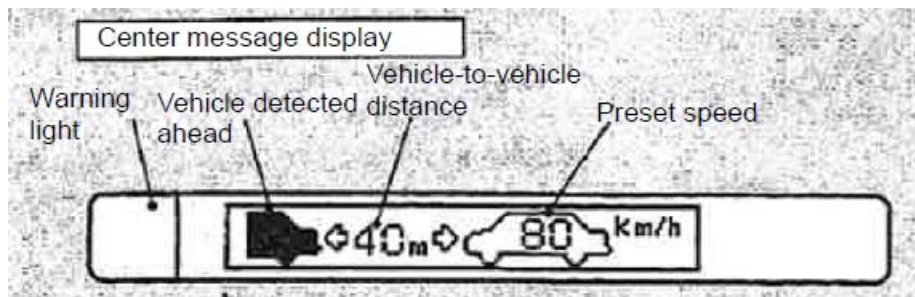
³ The present case is distinguishable from *In re Ruskin*, 347 F.2d 843 (CCPA 1965), upon which Patent Owner relies. PO Resp. 5–6. In that case, the claim specified a series of separate central magnets defining an annular fluid passageway with a fluid supply line outer wall, which was not met structurally by a single central magnetically permeable part surrounded by a series of annular magnets. *Ruskin*, 347 F.2d at 845–46. In this case, the claimed structure is merely a "speed controller," which is found in Diamante.



Ex. 1004, 86. This illustration shows a main switch and a control lever used to operate the cruise control system. *Id.* We are persuaded the main switch is an enable switch as required by claim 1. Pet. 18–19; Ex. 1011, 23. In particular, Diamante instructs the vehicle operator to “[p]ush the main switch to turn cruise control on.” Ex. 1004, 86. We also are persuaded the control lever corresponds to the set speed input required by claim 1. Pet. 19; Ex. 1011, 23. In particular, Diamante instructs the vehicle operator to “push the control lever downward and release it” to “set [the cruise control system] to automatic fixed-speed cruise mode” at a desired speed. Ex. 1004, 86.

Claim 1 further recites a memory which stores the cruise control’s preset speed. We are persuaded a person of ordinary skill in the art, upon reading Diamante, would understand that the cruise control system described therein necessarily includes a memory to perform the functions described in Diamante. Pet. 16, 19–20; Ex. 1011, 20–21, 24.

Claim 1 finally recites a “feedback system” for communicating the cruise control’s preset speed to the vehicle operator. Diamante’s disclosure in this regard is exemplified by the following excerpted illustration:

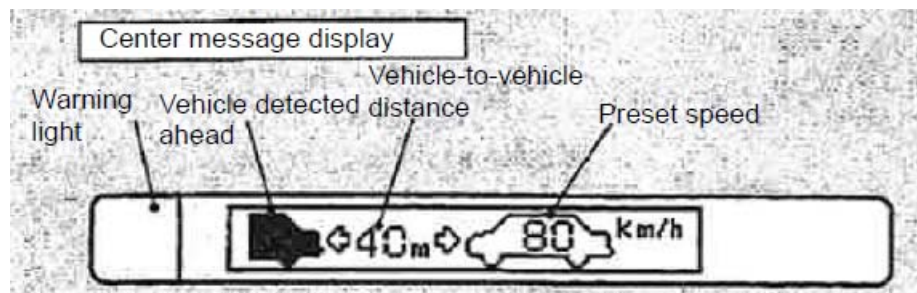


Ex. 1004, 88. This illustration reflects a “Center message display” shown when the cruise control and preview distance control systems are enabled. *Id.* at 52, 88. The display includes an outline of a vehicle, representing the vehicle being driven by the operator, surrounding a digital display of the cruise control’s “Preset speed” (e.g., 80 km/h). *Id.* at 90. We are persuaded this display corresponds to the feedback system recited in claim 1. Pet. 20; Ex. 1011, 24–25.

Patent Owner contends Diamante discloses “two different systems,” a “cruise control” system at pages 86–87, and a “preview distance control” system at pages 88–93. PO Resp. 3. Patent Owner further contends Diamante indicates no vehicle includes both systems, because: (1) Diamante calls out features that are available only in vehicles with the preview distance control system; (2) the preview distance control system uses the center message display, but the cruise control system does not; (3) different warnings are provided for the two systems; and (4) pushing the control lever changes speed by 1.5 km/h in the cruise control system, but by 1.0 km/h in the preview distance control system. *Id.* at 3–4. Patent Owner faults Petitioner for relying on the cruise control system for some limitations in claim 1, and the preview distance control system for other limitations in claim 1, on the basis that such an analysis improperly combines different

embodiments of Diamante. PO Resp. 4–5 (citing *Net MoneyIN, Inc., v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008)).

Patent Owner’s argument is not persuasive.⁴ We find Diamante discloses the cruise control features described at pages 86–87 and the preview distance control features described at pages 88–93 work together as one integrated system in one vehicle, if that vehicle is equipped with preview distance control. Pet. Reply 1–2. For example, Diamante states: “Preview distance control is a system that controls the distance between your vehicle and the vehicle ahead . . . *after the desired vehicle speed (preset speed) has been set*” and “[w]hen no vehicle is detected ahead, *the system cruises the vehicle at the preset speed.*” Ex. 1004, 88 (emphases added). In addition, the center message display available with preview distance control includes, at the same time, the “Preset speed” maintained by the cruise control system as well as the “Vehicle-to-vehicle distance” and other information provided by the preview distance control system, as shown in the following illustration excerpt:



⁴ Patent Owner’s argument in this regard carries through to all claims in relation to Diamante. Our consideration of the argument here in connection with claim 1 is representative of all challenged claims.

Id. at 88. That illustration excerpt reflects the center message display shown when the cruise control and preview distance control systems are enabled.

Id. at 52, 88. Moreover, the instructions for “Setting preview distance control” recite pushing the main switch of the cruise control “to turn it on” (Ex. 1004, 89 (step 2)), and then setting the cruise control at the “desired speed” (*id.* (steps 3–4)).

During the oral hearing, Patent Owner’s counsel suggested the cruise control system described at Diamante pages 86–87 is not the same cruise control system used in conjunction with the preview distance control system described at Diamante pages 88–93. Tr. 23:4–27:2. However, that the preview distance control feature adds functionality not present in the cruise control system of pages 86–87, adds a new display element in the center message display, and comes with its own set of warnings which are different from the cruise control warnings, indicates only that the preview distance control system provides additional functionality to the cruise control system, not that the two systems cannot or do not work together. The different preset speed changes implemented by toggling the cruise control lever, i.e., 1.5 versus 1.0 km/h, indicate only that the cruise control system is calibrated differently when the preview distance control system is operated. The cruise control system still has the speed controller, enable switch, set speed input, memory, and feedback system required by claim 1. *See* Ex. 1004, 89 (steps 2–4, describing use of main switch to turn on cruise control, and control lever to store a preset speed, in order to set preview distance control).

For the foregoing reasons, a preponderance of the evidence establishes claim 1 is unpatentable as anticipated by Diamante.

2. *Claims 2, 3, and 5*

Claim 2, similarly to claim 1, recites a cruise control system for a vehicle including a speed controller, a cruise control enable switch, a set speed input, a memory, and a feedback system. We are persuaded these claim limitations are disclosed in Diamante, for the reasons provided above. *See supra* Part II.B.1; Ex. 1011, 25–27. For those same reasons, Patent Owner’s assertion that Diamante has not been shown to disclose a speed controller is not persuasive. PO Resp. 6.

Claim 2 further specifies the feedback system “substantially continuously communicates the selected cruising speed . . . until either the operator selects a subsequent cruising speed or the controller is disabled.” We are persuaded Diamante discloses this claim requirement. Pet. 21–23; Ex. 1011, 27–29. In particular, as to a subsequent cruising speed, Diamante indicates the vehicle operator may change the preset speed by “operat[ing] the control lever until the preset speed displayed on the center message display reaches the desired speed and then releas[ing] it.” Ex. 1004, 91. As to disabling the controller, Diamante indicates “the [preset] vehicle speed displayed on the center message display disappears” if the driver turns off the cruise control main switch. *Id.* at 92.

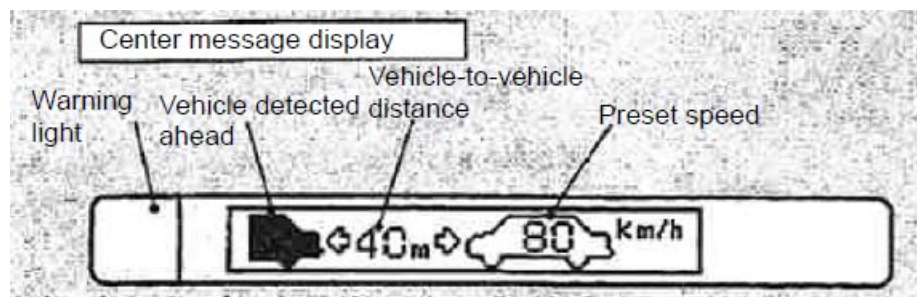
Claims 3 and 5 depend from claim 2, and specify, respectively, “the feedback system includes a digital display,” which “displays information indicative of the selected cruising speed of the vehicle.” We are persuaded these requirements are met by Diamante’s display of the preset cruising speed as a digital readout. Pet. 23–25; Ex. 1011, 29–31; Ex. 1004, 88.

For the foregoing reasons, a preponderance of the evidence establishes claims 2, 3, and 5 are unpatentable as anticipated by Diamante.

3. *Claim 12*

Claim 12 recites a method for visually communicating, to a vehicle operator, a cruising speed at which a cruise control system is set. The first two steps of the method are “determining the speed at which the vehicle is traveling” and “activating the cruise control system at a desired cruising speed.” We are persuaded Diamante discloses these two steps. Pet. 25–26; Ex. 1011, 31–32. For example, Diamante’s cruise control “allows the vehicle to cruise at a constant speed (from approximately 40–100 km/h) without depressing the accelerator pedal.” Ex. 1004, 86. Diamante further instructs the operator to depress the accelerator pedal until a desired speed is reached, and then set the system to automatic fixed-speed cruise mode. *Id.*

Claim 12 additionally recites “displaying a symbol indicative of the speed at which the cruise control system is activated.” Diamante’s disclosure in this regard is exemplified by the following excerpted illustration:



Ex. 1004, 88. This illustration reflects a “Center message display” shown when the cruise control and preview distance control systems are enabled. *Id.* at 52, 88. The display includes an outline of a vehicle, representing the vehicle being driven by the operator, surrounding a digital display of the cruise control’s “Preset speed” (e.g., 80 km/h). *Id.* at 90. We are persuaded

this display corresponds to displaying a speed-indicative symbol as recited in claim 12. Pet. 26; Ex. 1011, 32.

Claim 12 further recites “maintaining the activated cruise control speed symbol upon temporary acceleration or deceleration of the vehicle.” We are persuaded Diamante discloses the “acceleration” portion of this limitation in the following passage:

While vehicle-to-vehicle distance control is on or *while accelerating to the preset speed*, the speed of your vehicle (displayed on the speedometer) differs from *the preset speed (displayed on the center message display)*. When changing the preset speed, check the preset speed setting displayed on the center message display.

Ex. 1004, 91 (emphases added); Pet. 26; Ex. 1011, 32–33.

We further are persuaded that the “deceleration” claim requirement is met by the same quoted passage, in combination with other passages in Diamante, reading the reference as a whole.⁵ Pet. Reply 6; Pet. 26–27; Ex. 1011, 32–34. In particular, the quoted passage indicates that “[w]hile vehicle-to-vehicle distance control is on”—which would include instances when the vehicle temporarily decelerates due to a braking operation, or due to detection of a slower vehicle ahead—the actual speed display “differs from” the preset speed display. Ex. 1004, 91; *see id.* at 87 (temporary

⁵ In the Institution Decision, we found this limitation was met in Diamante when the operator uses the control lever to reduce the preset speed. Inst. Dec. 18–19. Patent Owner’s Response challenges that finding. PO Resp. 6–8. During the oral hearing, Petitioner’s counsel stated Petitioner agrees with Patent Owner in this regard. Tr. 9:5–16. We, therefore, do not rely, in the present decision, on the control lever deceleration display as maintaining a symbol upon deceleration.

deceleration due to braking operation), 90 (temporary deceleration due to detection of slower vehicle ahead).

Claim 12 finally recites “removing said symbol when the cruise control system is deactivated or a new cruising speed is selected.” We are persuaded Diamante discloses this claim requirement. Pet. 27–28; Ex. 1011, 34. As to the deactivating component, Diamante indicates “the [preset] vehicle speed displayed on the center message display disappears” if the driver turns off the cruise control main switch. Ex. 1004, 92. As to selecting a new cruising speed, Diamante indicates the vehicle operator may change the preset speed by “operat[ing] the control lever until the preset speed displayed on the center message display reaches the desired speed and then releas[ing] it.” *Id.* at 91.

For the foregoing reasons, a preponderance of the evidence establishes claim 12 is unpatentable as anticipated by Diamante.

4. *Claims 13–16*

Claim 13, similarly to claim 12, recites a method for indicating, to a vehicle operator, a preset speed for which a cruise control system is set, including setting the preset speed, displaying a symbol indicative of the preset speed, maintaining the display, and discontinuing the display when the cruise control system is deactivated or a new preset speed is selected. We are persuaded these claim limitations are disclosed in Diamante, for the reasons provided above. *See supra* Part II.B.3; Ex. 1011, 34–35.

Claim 14 depends from claim 13, and specifies “displaying a second symbol upon the selection of a new preset speed, said second symbol indicative of the new preset speed.” We are persuaded Diamante discloses this claim limitation when instructing the vehicle operator to “operate the

control lever until the preset speed displayed on the center message display reaches the desired speed and then release it.” Ex. 1004, 91; Pet. 29; Ex. 1011, 35–36.

Claim 15 depends from claim 13, and specifies “before setting the preset speed, activating the cruise control system.” We are persuaded Diamante correspondingly discloses activating the cruise control system by pressing the main switch, before setting the preset speed with the control lever. Pet. 29; Ex. 1011, 36; Ex. 1004, 86–87. Claim 15 also specifies “after activating the cruise control system, but before setting the preset speed, indicating to the operator the unset status of the preset speed.” We are persuaded Diamante correspondingly shows an empty vehicle outline in the center message display to indicate the unset status of the preset speed. Pet. 17, 29–30; Ex. 1011, 36; Ex. 1004, 52.

Patent Owner contends Petitioner fails to establish that the empty vehicle outline is ever shown to the operator. PO Resp. 8–9. The only time the empty vehicle outline is illustrated in Diamante is on page 52. *Id.* According to Patent Owner, when Diamante discusses “[s]etting preview distance control” on page 89, in step 4 the cruise control indicator light on the meter turns on simultaneously with the center message display switching to preview distance control mode, showing a numerical value within the vehicle outline. PO Resp. 8–9.

We are not persuaded by Patent Owner’s argument that Diamante fails to disclose that the empty vehicle outline is ever shown to the operator. The illustration on page 52 of Diamante includes an empty vehicle outline in the “preview distance control information” item display. The accompanying text, just above the illustration, indicates that item is “*displayed*” when the

MODE switch is pressed the correct number of times, and also states “[o]nly vehicles with preview distance control *display* this item,” with an asterisk indicating the displayed item, including an empty vehicle outline. Ex. 1004, 52⁶ (emphases added); see Pet. Reply 7. The discussion of step 4 on page 89 of Diamante does not demonstrate otherwise. Rather, the illustration in step 4 relates to the display after a cruise control preset speed is set in steps 2 and 3, not to what is displayed prior to steps 2 and 3, which is the pertinent time frame to claim 15.

Claim 16 depends from claim 15, and specifies “wherein indicating the unset status of the preset speed includes displaying a visual symbol to the operator.” We are persuaded the empty vehicle outline in the center message display is a visual symbol as claimed here. Pet. 30; Ex. 1011, 37; Ex. 1004, 52.

For the foregoing reasons, a preponderance of the evidence establishes claims 13–16 are unpatentable as anticipated by Diamante.

5. *Claim 21*

Claim 21, similarly to claim 12, recites a method for indicating, to a vehicle operator, a preset speed for which a cruise control system is set, including engaging the system and setting the preset speed, displaying a symbol indicative of the preset speed, maintaining the display, and discontinuing the display after the system is deactivated or a new preset

⁶ The translation of Diamante (Exhibit 1004, 52) has boxes surrounding the text and the associated preview distance control display, which are not found in the original (Exhibit 1003, 52). The original, however, has asterisks to tie the two together.

speed is selected. We are persuaded Diamante discloses these claim limitations for the reasons provided above. *See supra* Part II.B.3; Ex. 1011, 37–39.

Claim 21 additionally recites “after the cruise control system is deactivated, displaying a symbol indicative of an unset state of the preset speed.” We are persuaded Diamante correspondingly discloses: “If . . . you turn the main switch off, the vehicle speed displayed on the center message display disappears.” Ex. 1004, 92 (emphasis added); Pet. 32; Ex. 1011, 39.

Patent Owner contends the quoted statement from Diamante fails to disclose the display of a symbol indicating there is no preset speed after the cruise control system is turned off. PO Resp. 9–10. Patent Owner asserts the lack of a display of any information on the center message display cannot simultaneously correspond to “discontinuing display” and “displaying” in claim 21. *Id.* at 10. Patent Owner also contends Diamante fails to disclose that information related to the preview distance control system is displayed when the main switch is turned off, but the ignition is on. *Id.* at 10.

Patent Owner’s arguments are not persuasive. As Petitioner points out in the Reply Brief, and as discussed above in connection with claim 15, Diamante displays an empty vehicle outline to indicate an unset status of the preset speed. Pet. Reply 8–9; *supra* Part II.B.4. We find Diamante shows such an empty vehicle outline, as illustrated on page 52, even when the cruise control system is “deactivated” in claim 21 (i.e., turned off). Ex. 1004, 52 (preview distance control display is shown whenever the MODE switch is pressed an appropriate number of times).

For the foregoing reasons, a preponderance of the evidence establishes claim 21 is unpatentable as anticipated by Diamante.

6. *Claim 25*

Claim 25, similarly to claim 12, recites a method for indicating, to a vehicle operator, a preset speed for which a cruise control system is set, including setting the preset speed, and displaying a symbol indicative of the preset speed. We are persuaded Diamante discloses these claim limitations, for the reasons provided above. *See supra* Part II.B.3; Ex. 1011, 39–40.

Claim 25 additionally recites “accelerating the vehicle to a speed above the preset speed” and “maintaining the display of the symbol indicative of the preset speed while the vehicle is at the speed above the preset speed.” We are persuaded Diamante discloses these requirements. Pet. 33; Ex. 1011, 40–41; Ex. 1004, 91. In particular, Diamante indicates the operator may depress the accelerator pedal to accelerate the vehicle above the preset speed, and the system will resume the preset speed when the pedal is released. Ex. 1004, 91 (“Advice”, first paragraph). Diamante further indicates “[w]hile vehicle-to-vehicle distance control is on”—i.e., during the time the accelerator pedal is depressed—“the speed of your vehicle (displayed on the speedometer) differs from the preset speed (displayed on the center message display).” *Id.* (“Advice”, third paragraph).

Patent Owner contends the Diamante disclosure on page 91, in the first paragraph of the “Advice” box, does not establish that the acceleration is “above” the preset speed as required by claim 25. PO Resp. 11. We are not persuaded. That disclosure states the system will “*resume* the preset speed *prior to* the acceleration” when the accelerator pedal is released. Ex. 1004, 91 (emphases added). Because depressing the accelerator pedal

increases the vehicle speed, the only way the vehicle can resume the preset speed prior to the acceleration, once the pedal is released, is if the preset speed is less than the accelerated speed. *See* Pet. Reply 10.

Patent Owner also contends the Diamante disclosure on page 91, in the third paragraph of the “Advice” box, does not establish that the acceleration is “above” the preset speed. PO Resp. 11–12. However, as just discussed, the first “Advice” paragraph does disclose such an acceleration. The third paragraph discloses that “[w]hile vehicle-to-vehicle distance control is on”—such as during the temporary acceleration disclosed in the first “Advice” paragraph—the preset speed continues to be displayed. Thus, the first and third “Advice” paragraphs in combination disclose the “accelerating” and “maintaining” steps of claim 25. *See, e.g.*, Pet. Reply 10; Tr. 14:12–16:9.

For the foregoing reasons, a preponderance of the evidence establishes claim 25 is unpatentable as anticipated by Diamante.

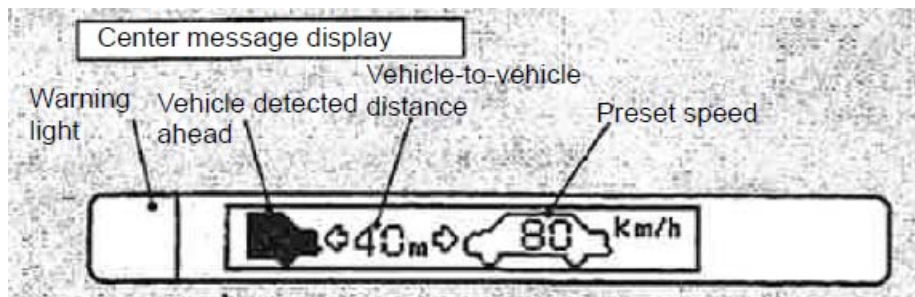
7. *Claims 26 and 28*

Claim 26, similarly to claim 1, recites a cruise control system for a vehicle, including a speed controller, a set speed input, and a memory. We are persuaded Diamante discloses these claim limitations, for the reasons provided above. *See supra* Part II.B.1; Ex. 1011, 41–42. For those same reasons, Patent Owner’s assertion that Diamante has not been shown to disclose a speed controller is not persuasive. PO Resp. 12.

Claim 26 also recites a “first visual display apparatus operable to display the indicative of the actual speed of the vehicle.” Diamante states: “the speed of your vehicle (*displayed on the speedometer*) differs from the preset speed (*displayed on the center message display*).” Ex. 1004, 91

(emphases added). We are persuaded the speedometer display corresponds to claim 26's first visual display apparatus. Pet. 34; Ex. 1011, 42.

Claim 26 further recites a second visual display apparatus operable to display visual information indicative of an operation status of the speed controller, including the preset speed. Diamante's disclosure in this regard is exemplified by the following excerpted illustration:



Ex. 1004, 88. This illustration reflects a “Center message display” shown when the cruise control and preview distance control systems are enabled. *Id.* at 52, 88. The display includes an outline of a vehicle, representing the vehicle being driven by the operator, surrounding a digital display of the cruise control's “Preset speed” (e.g., 80 km/h). *Id.* at 90. We are persuaded this display corresponds to claim 26's second visual display apparatus. Pet. 34–35; Ex. 1011, 42.

Claim 28 depends from claim 26, and specifies “the second visual display apparatus comprises a digital numerical indicator.” We are persuaded this requirement is met by Diamante's display of the preset cruising speed as a digital readout. Pet. 23–24, 35; Ex. 1011, 43; Ex. 1004, 88.

For the foregoing reasons, a preponderance of the evidence establishes claims 26 and 28 are unpatentable as anticipated by Diamante.

C. Obviousness Based on Diamante and Diamante PDC

Petitioner contends claims 15, 16, and 21 of the '463 patent are unpatentable as obvious over Diamante and Diamante PDC. Pet. 37–38. We have reviewed Petitioner's argument and Dr. Green's testimony that Diamante PDC discloses "indicating to the operator the unset status of the preset speed" as recited in claims 15 and 16, and "displaying a symbol indicative of an unset state of the preset speed" as recited in claim 21. *Id.*; Pet. Reply 7, 9; Ex. 1011, 18–19, 46–47; Ex. 1006, p. 0-11 ("When the [preset] speed is not set, the speed (three digits) and 'km/h' are not displayed; only the symbol is displayed."). We have further reviewed Petitioner's argument and Dr. Green's testimony that a person of ordinary skill in the art would have had reason to combine Diamante and Diamante PDC to achieve the methods recited in claims 15, 16, and 21. Pet. 38; Pet. Reply 14–15; Ex. 1011, 47.

In opposition to this unpatentability ground, Patent Owner relies on its argument and evidence alleging Petitioner improperly combines two different embodiments in Diamante as disclosing the claimed subject matter, apart from indicating an unset status or state of the preset speed. PO Resp. 18–19. For reasons provided above, that argument is unpersuasive. *See supra* Part II.B.1. The Scheduling Order cautioned Patent Owner that any arguments not raised in the Response would be deemed waived. Paper 18, 3. Accordingly, after due consideration of the argument and evidence advanced by both parties, we find a preponderance of the evidence establishes claims 15, 16, and 21 are unpatentable as obvious over Diamante and Diamante PDC.

D. Obviousness Based on Diamante and Watanabe

Petitioner contends claim 12 of the '463 patent is unpatentable as obvious over Diamante and Watanabe. Pet. 39–40. We have reviewed Petitioner's argument and Dr. Green's testimony that Watanabe discloses "maintaining the activated cruise control speed symbol upon temporary . . . deceleration of the vehicle" as recited in claim 12. *Id.*; Ex. 1011, 48–49; Ex. 1008, Fig. 5, ¶ 36. We have further reviewed Petitioner's argument and Dr. Green's testimony that a person of ordinary skill in the art would have had reason to combine Diamante and Watanabe to achieve the method recited in claim 12. Pet. 40; Ex. 1011, 49.

In opposition to this unpatentability ground, Patent Owner relies on its argument and evidence alleging Petitioner improperly combines two different embodiments in Diamante as disclosing the claimed subject matter, apart from maintaining the activated speed symbol upon temporary deceleration. PO Resp. 19. For reasons provided above, that argument is unpersuasive. *See supra* Part II.B.1. Accordingly, after due consideration of the argument and evidence advanced by both parties, we find a preponderance of the evidence establishes claim 12 is unpatentable as obvious over Diamante and Watanabe.

E. Anticipation by Watanabe

Petitioner contends claims 18 and 19 of the '463 patent are unpatentable as anticipated by Watanabe. Pet. 41–43.

Claim 18 recites a method for indicating, to a vehicle operator, a preset speed for which a cruise control system is set, including setting the preset speed, displaying a symbol indicative of the preset speed while maintaining the vehicle speed at substantially the preset speed, and

maintaining the display. We are persuaded Watanabe discloses these steps. Pet. 41–42; Ex. 1011, 50–51. That is, Watanabe discloses center message display 41 having set vehicle speed display part 42, for displaying the set vehicle speed V_m , in a line image schematically showing the contour of a vehicle. Ex. 1008 ¶ 15, Figs. 2, 5.

Claim 18 also recites “upon braking the vehicle, discontinuing maintaining the vehicle speed at substantially the preset speed while keeping data corresponding to the preset speed in a memory device,” as well as “at a time after braking and during which time the vehicle is not being maintained at substantially the preset speed, displaying to the operator a symbol indicative of the preset speed.” We are persuaded Watanabe discloses these limitations. Pet. 42; Ex. 1011, 51. In particular, Watanabe’s disclosure in this regard is exemplified by its Figure 5, reproduced below:

[Figure 5]

	1. センターメッセージディスプレイ 表示ランプ	3. メッセージ部	4. コンビ メータ	
(1)		◇--m◇ 100 Km/h	車間 CRUISE	5.
(2)		◇80m◇ 100 Km/h	車間 CRUISE	5.
(3)		◇70m◇ 100 Km/h	車間 CRUISE	5.
(4)	5. 車間 △	◇35m◇ 100 Km/h	車間 CRUISE	5.
(5)		◇30m◇ 100 Km/h	車間	5.

Ex. 1008, Fig. 5. The middle portion (column 3) of Figure 5 shows a series of display contents in center message display 41 when cruise control is carried out. *Id.* ¶¶ 32–33.

Row (5) of Figure 5 illustrates display 41 when the brake pedal is operated. *Id.* ¶ 36. As can be seen therein, display 41 includes the preset speed (e.g., 100 km/h) when the brakes are being applied, which also cancels the cruise control system. *Id.* Because of that cancellation, when the operator releases the brakes, the vehicle will no longer be maintained at substantially the preset speed. However, the display of the preset speed continues until the vehicle speed drops below a prescribed value, when the set vehicle speed display disappears. *Id.* In that way, if the operator resumes cruise control before the vehicle speed drops below the prescribed value, the operator “can detect the set vehicle speed V_m as an arrival target, thus being able to reliably continue traveling without feeling unintended acceleration.” *Id.* ¶ 40.

Patent Owner contends neither the Petition nor Dr. Green addresses the “memory device” limitation of claim 18. PO Resp. 13 (citing Pet. 41–43 and Ex. 1011, 50–52). This argument is not persuasive. Petitioner and Dr. Green cite Watanabe paragraph 25 in support of finding that Watanabe’s operation switch 18 sets the preset speed. Pet. 42; Ex. 1011, 51. Watanabe therein states, if cruise control is started by operation switch 18, “the present vehicle speed V_S is stored as the set vehicle speed V_m in the ECU 2 ($V_m = V_S$).” Ex. 1008 ¶ 25 (emphasis added); *see also id.* at Fig. 1, ¶¶ 10–12 (illustrating and describing main control device (ECU) 2). That disclosure indicates Watanabe has the memory of claim 18.

Petitioner and Dr. Green further discuss how Watanabe Figure 5 illustrates that the preset speed remains displayed even after cruise control is disengaged by pressing the brakes. Pet. Reply 12; Pet. 42; Ex. 1011, 51.

That disclosure indicates, again, that Watanabe has the memory of claim 18, so that the display may be maintained. Pet. Reply 12.

Claim 19 depends from claim 18, and specifies:

the symbol indicative of the preset speed displayed at the time after braking and during which time the vehicle is not being maintained at substantially the preset speed, is distinguishable by the operator from the symbol indicative of the preset speed while the vehicle is being maintained at substantially the preset speed.

We are persuaded Watanabe discloses that limitation. Pet. 42–43; Ex. 1011, 51–52. In particular, cruise control display lamp 62 of Watanabe is lit while cruise control is working to maintain the preset speed, but becomes unlit when the brakes are applied to cancel cruise control. Ex. 1008 ¶ 36, Fig. 5.

Patent Owner contends the Petition does not meet the requirements of 37 C.F.R. § 42.104 because it fails to specify where each element of claims 18 and 19 is found in Watanabe. PO Resp. 13. We have reviewed the Petition at pages 41–43, and find that the requirements of Rule 42.104(b)(4)–(5) are met therein.

Patent Owner specifically contends the Petition, in stating that “[t]he cruise control device of Watanabe includes an operation switch 18 to set the preset speed (claims 18 and 19),” is unclear as to which of the claim limitations Petitioner alleges is met by operation switch 18. PO Resp. 13 (quoting Pet. 42). We, however, agree with Petitioner that the quoted statement refers to the limitation in claim 18 reciting “setting the preset speed.” Pet. Reply 11–12.

For the foregoing reasons, a preponderance of the evidence establishes claims 18 and 19 are unpatentable as anticipated by Watanabe.

F. Anticipation by Celsior

Petitioner contends claims 2–5, 26–28, and 34–36 of the ’463 patent are unpatentable as anticipated by Celsior. Pet. 43–59.

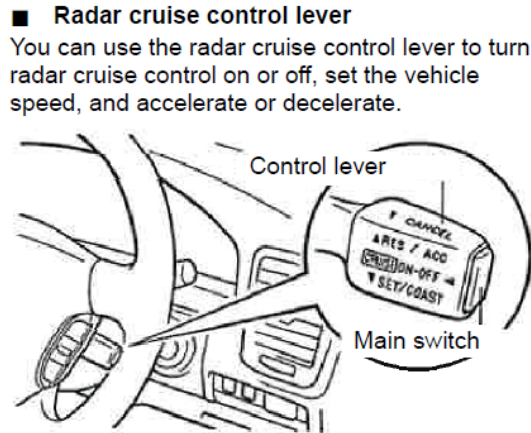
1. Claims 2–5

Claim 2 recites a cruise control system for a vehicle, including a speed controller. We are persuaded Celsior discloses a cruise control speed controller. Pet. 47; Ex. 1011, 56. For example, Celsior directs the vehicle operator to “use the radar control system to drive your vehicle without depressing the accelerator pedal” such that “[y]our cruising speed is maintained at the preset speed (from about 50–100 km/h).” Ex. 1010, 130.

Patent Owner contends the quoted statement from Celsior expressly refers only to a cruise control “system” as recited in the preamble of claim 2, and fails to disclose the “speed controller” structural system component later recited in claim 2. PO Resp. 14–15. Further, according to Patent Owner, neither Petitioner nor Dr. Green asserts that the claimed “speed controller” is inherent in Celsior. *Id.* at 15.

These arguments are not persuasive. Claim 2 requires “a speed controller for automatically maintaining the vehicle at a substantially constant cruising speed selected by the operator.” By indicating the Celsior cruise control system maintains a preset speed without the operator depressing the accelerator pedal, we find Celsior expressly discloses that its system includes a component corresponding to the claimed speed controller. Ex. 1010, 130. Patent Owner’s argument fails to specify any structural feature of the claimed speed controller that is missing from the Celsior cruise control system. See Pet. Reply 3–4, 12–13.

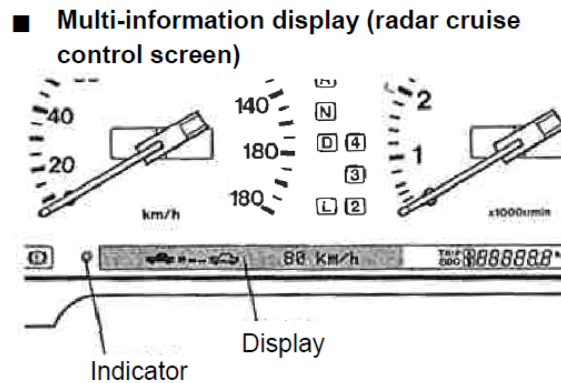
Claim 2 also recites an enable switch and a set speed input. The following illustration appears in Celsior:



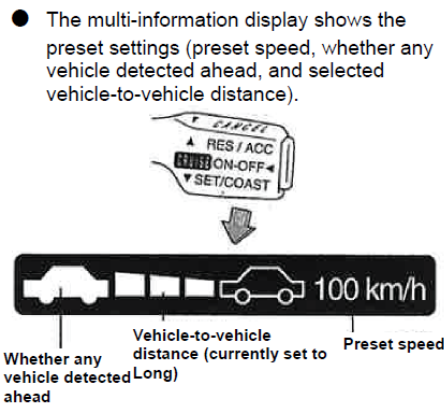
Ex. 1010, 132. This illustration shows a main switch and a control lever used to operate the cruise control system. *Id.* We are persuaded the main switch is an enable switch as required by claim 2. Pet. 47–48; Ex. 1011, 56–57. In particular, Celsior instructs the vehicle operator to “[p]ress the main switch to turn the radar cruise control on.” Ex. 1010, 133. We also are persuaded the control lever corresponds to the set speed input required by claim 2. Pet. 48–49; Ex. 1011, 57–58. In particular, Celsior instructs the vehicle operator to “[a]ccelerate or decelerate to the desired speed” and then “[p]ush the control lever downward” to select the preset speed. Ex. 1010, 133.

Claim 2 further recites a memory that stores the selected cruising speed. We are persuaded a person of ordinary skill in the art, upon reading Celsior, would understand the cruise control system described therein necessarily includes a memory to perform the functions described in Celsior. Pet. 45, 49–50; Ex. 1011, 54, 58–59.

Claim 2 finally recites “a feedback system that substantially continuously communicates the selected cruising speed information to the operator of the vehicle until either the operator selects a subsequent cruising speed or the controller is disabled.” Celsior’s disclosure in this regard is exemplified by two illustrations in Celsior. The first is shown below:



Ex. 1010, 132. This first illustration reflects a multi-information display shown to the vehicle operator. The second illustration is shown below:



Id. at 133. This second illustration includes a close-up view of the multi-information display, shown in the first illustration underneath the analog speedometer. The multi-information display includes an outline of a vehicle, representing the vehicle being driven, next to a digital display of the “Preset speed” (e.g., 100 km/h). *Id.*

We are persuaded the multi-information display corresponds to the feedback system recited in claim 2. Pet. 50–52; Ex. 1011, 59–61. In particular, as to a subsequent cruising speed, Celsior indicates the operator may toggle the control lever to change the preset speed, and “[w]hen the preset speed displayed on the multi-information display reaches the desired speed, release the control lever.” Ex. 1010, 135. As to disabling the controller, Celsior indicates that when the main switch is used to cancel cruise control, “the cruise control indicator light on the meter turns off and the multi-information display screen switches to another screen.” *Id.* at 137.

Claims 3 and 5 depend from claim 2, and specify respectively “the feedback system includes a digital display,” which “displays information indicative of the selected cruising speed of the vehicle.” We are persuaded Celsior correspondingly displays the preset cruising speed as a digital display, next to an outline of a vehicle representing the vehicle being driven. Pet. 52–53; Ex. 1011, 61–62; Ex. 1010, 133.

Claim 4 depends from claim 3, and specifies “the digital display displays a predetermined signal when the controller is initially enabled to indicate the state of the controller.” We are persuaded Celsior discloses this claim limitation. Pet. 52–53; Ex. 1011, 53–55, 61–62. In particular, when the main switch is pressed to turn the radar control system on, the phrase “CRUISE READY” appears in the multi-information display. Ex. 1010, 133.

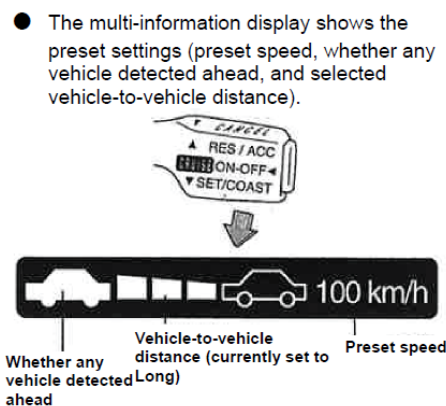
For the foregoing reasons, a preponderance of the evidence establishes claims 2–5 are unpatentable as anticipated by Celsior.

2. Claims 26–28

Claim 26, similarly to claim 2, recites a cruise control system for a vehicle including a speed controller, a set speed input, and a memory. We are persuaded Celsior discloses these claim limitations, for the reasons provided above. *See supra* Part II.F.1; Ex. 1011, 62–63. For those same reasons, Patent Owner’s assertion that Celsior has not been shown to disclose a speed controller is not persuasive. PO Resp. 16.

Claim 26 also recites a “first visual display apparatus operable to display the indicative of the actual speed of the vehicle.” We are persuaded Celsior discloses such a display apparatus as an analog speedometer. Pet. 54; Ex. 1011, 64; Ex. 1010, 132.

Claim 26 further recites a second visual display apparatus operable to display visual information indicative of an operation status of the speed controller, including the preset speed. Celsior’s disclosure in this regard is exemplified by the following illustration:



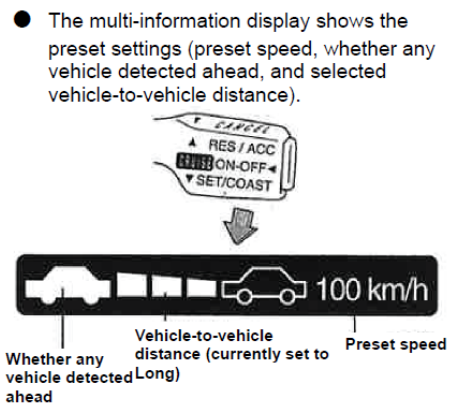
Ex. 1010, 133. This illustration reflects a close-up view of a multi-information display. The display includes an outline of a vehicle, representing the vehicle being driven, next to a digital display of the “Preset speed” (e.g., 100 km/h). *Id.* We are persuaded this display corresponds to

the second visual display apparatus recited in claim 26. Pet. 50, 54; Ex. 1011, 64–65.

Claim 27 depends from claim 26, and specifies “the second visual display apparatus includes information reflecting whether the speed controller is operating to maintain the vehicle at the cruising speed at the time the display is made.” We are persuaded Celsior discloses this claim limitation. Pet. 55; Ex. 1011, 53, 65. In particular, after the cruise control system is enabled but before a cruising speed is selected, the multi-information display shows the phrase “CRUISE READY.” Ex. 1010, 133. Then, once a cruising speed is selected, the multi-information display changes to show the selected cruising speed, and other information. *Id.*

Patent Owner contends the display of the selected cruising speed in Celsior does not satisfy claim 27’s requirement to reflect that the vehicle is being maintained “at the cruising speed at the time the display is made.” PO Resp. 16–17. Specifically, Patent Owner points out that Celsior continues displaying the selected cruising speed even when the vehicle is not being maintained at that speed, when the vehicle-to-vehicle distance control slows down the vehicle in response to detecting a slower vehicle ahead. *Id.* at 17 (citing Ex. 1010, 130).

Patent Owner’s argument is not persuasive. We agree with Petitioner that Celsior’s second visual display, as a whole, includes information reflecting whether the vehicle is being maintained at the displayed cruising speed at the time the display is made. Pet. Reply 14. In particular, Celsior’s second visual display is shown below:



Ex. 1010, 133. As shown there, the display reflects when a vehicle is detected ahead by showing a symbol of a vehicle, which is colored white at the far left edge of the display. *Id.* at 133–134. If no slower vehicle is detected ahead, and, therefore, the driven vehicle is maintained at the indicated 100 km/h, the white vehicle is removed. *Id.* at 134. By using the white vehicle to display whether the driven vehicle has slowed down from the 100 km/h cruising speed due to a slower vehicle being detected ahead, Celsior meets claim 27’s requirement for displaying information reflecting whether the vehicle is being maintained at the cruising speed at the time the display is made.

Claim 28 depends from claim 26, and specifies “the second visual display apparatus comprises a digital numerical indicator.” We are persuaded this requirement is met by Celsior’s display of the preset cruising speed as a digital readout. Pet. 55; Ex. 1011, 65; Ex. 1010, 133.

For the foregoing reasons, a preponderance of the evidence establishes claims 26–28 are unpatentable as anticipated by Celsior.

3. Claims 34–36

Claim 34 recites a method for providing a vehicle operator with information reflecting the operating status of a cruise control device,

comprising providing a cruise control device with various components. Similarly to claim 26, the cruise control system components of claim 34 include a speed controller, a set speed input, a memory, a first visual display apparatus, and a second visual display apparatus. We are persuaded Celsior discloses these claim limitations, for the reasons provided above. *See supra* Part II.F.1–2; Ex. 1011, 65–68. For those same reasons, Patent Owner’s assertion that Celsior has not been shown to disclose a speed controller is not persuasive. PO Resp. 17–18.

The method of claim 34 additionally includes “activating the cruise control device” and “operating the second visual display apparatus to indicate the active status of the cruise control device.” We are persuaded Celsior discloses activating the cruise control device by pressing the main switch. Pet. 57; Ex. 1011, 68; Ex. 1010, 133. We also are persuaded that Celsior’s multi-information display is operated to indicate the active status of the cruise control device when the phrase “CRUISE READY” appears therein. Pet. 57–58; Ex. 1011, 53, 69; Ex. 1010, 133.

Claim 35 depends from claim 34, and specifies “operating the second visual display apparatus to display visual information indicative of the preset speed.” We are persuaded these requirements are met by Celsior’s display of the preset speed as a digital readout next to an outline of a vehicle. Pet. 58⁷; Ex. 1011, 69.

⁷ In this regard, the Petition (Pet. 58) refers back to “disclosures cited in response to claim [34(b)],” which in turn (Pet. 56) refers back to “disclosures cited in response to claim [2(c)],” which discusses (Pet. 48–49) displaying the preset speed in the multi-information display.

Claim 36 depends from claim 35, and specifies changing the preset speed from a first preset speed to a second preset speed, and operating the second visual display apparatus to display visual information indicative of the second preset speed. We are persuaded Celsior discloses this claim requirement. Pet. 58–59; Ex. 1011, 70. In particular, Celsior indicates the operator may toggle the control lever to change the preset speed, and “[w]hen the preset speed displayed on the multi-information display reaches the desired speed, release the control lever.” Ex. 1010, 135.

For the foregoing reasons, a preponderance of the evidence establishes claims 34–36 are unpatentable as anticipated by Celsior.

III. CONCLUSION

Based on the complete record before us, we determine that Petitioner has shown, by a preponderance of the evidence, that:

A. Claims 1–3, 5, 12–16, 21, 25, 26, and 28 are unpatentable under 35 U.S.C. § 102(b) as anticipated by Diamante;

B. Claims 15, 16, and 21 are unpatentable under 35 U.S.C. § 103(a) as obvious over Diamante and Diamante PDC;

C. Claim 12 is unpatentable under 35 U.S.C. § 103(a) as obvious over Diamante and Watanabe;

D. Claims 18 and 19 are unpatentable under 35 U.S.C. § 102(b) as anticipated by Watanabe; and

E. Claims 2–5, 26–28, and 34–36 are unpatentable under 35 U.S.C. § 102(a) as anticipated by Celsior.

IV. ORDER

For the foregoing reasons, it is:

ORDERED that claims 1–5, 12–16, 18, 19, 21, 25–28, and 34–36 of the '463 patent are unpatentable; and

FURTHER ORDERED that, because this is a final decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2 (2014).

IPR2014-00280
Patent 6,324,463 B1

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