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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* KIM STEPHEN JONES, CLIVE JOHN BARTON, and  
LUDWIG FEIN

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Appeal 2019-003186  
Application 14/085,148  
Technology Center 3600

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Before LINDA E. HORNER, JILL D. HILL, and LISA M. GUIJT,  
*Administrative Patent Judges.*

HORNER, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>1</sup> appeals from the Examiner's decision to reject claims 1–11 and 13–18. We have jurisdiction under 35 U.S.C. § 6(b).

The Examiner rejected the claims on appeal as anticipated by, and obvious over, the prior art. Appellant argues that the Examiner erred in

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<sup>1</sup> We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Ford Global Technologies, LLC. Appeal Br. 1.

finding that the prior art discloses the claimed subject matter and the Examiner failed to articulate an adequate reason to combine the prior art in the manner claimed. For the reasons explained below, we do not find error in the Examiner's anticipation rejection. We agree, however, with Appellant's arguments that the Examiner's reason to combine the teachings of the prior art in the obviousness rejection of some of the claims is inadequate. Thus, we affirm in part.

### CLAIMED SUBJECT MATTER

The claims are directed to a method for bleeding a hydraulic brake system of a vehicle. Spec. ¶ 3. Claims 1, 14, and 17 are independent. Claim 1 is illustrative of the subject matter on appeal and is reproduced below.

1. A method for bleeding a vehicle brake system including a brake circuit having a brake line containing a hydraulic fluid, a bleed valve in the brake circuit, and a pump comprising the step of using the pump to increase hydraulic fluid pressure in the brake line and on the bleed valve for a specified period of time without opening the bleed valve during bleeding of said brake system.

Appeal Br. 19 (Claims Appendix).

### REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Schmidt	US 2004/0251740 A1	Dec. 16, 2004
Koons	US 2013/0032438 A1	Feb. 7, 2013

## REJECTIONS

The following rejections are on appeal:

1. Claims 1, 2, 9, 10, 13, 17, and 18 are rejected under 35 U.S.C. § 102(a)(1) as anticipated by Schmidt.
2. Claims 3–8, 11, and 14–16 are rejected under 35 U.S.C. § 103 as unpatentable over Schmidt and Koons.

## OPINION

*Rejection of claims 1, 2, 9, 10, 13, 17, and 18 as anticipated by Schmidt  
Independent claim 1*

The Examiner found that Schmidt discloses a method for bleeding a vehicle brake system that includes the step of using a pump to increase hydraulic fluid pressure in the brake circuit and on the bleed valve for a specified period of time without opening the bleed valve during bleeding of the brake system, as recited in claim 1. Final Act. 2 (citing Schmidt ¶¶ 26–27, Fig. 1). In making this finding, the Examiner applied Appellant’s definition of “bleeding,” as set forth in paragraph 15 of the Specification, to mean a procedure that “eliminates or reduces the presence of a compressible gas.” *Id.* at 2–3. The Examiner noted that Appellant’s definition of “bleeding” “does not align with the understood meaning by those skilled in the art” because it “apparently may include merely dissolving the gas into the fluid.” *Id.* (citing Examiner Interview Summary, dated March 21, 2018).

The Examiner explained that “bleeding” occurs prior to Schmidt’s degassing phase, “when the system and valve(s) are closed and gas is potentially dissolved in the brake fluid.” Ans. 8. The Examiner found that “[t]he eventual possibility of the dissolved gas reappearing as air bubbles

due to a pressure drop and an eventual need to degas the system does not negate the fact that Schmidt discusses the initial procedure that constitutes Appellants' construction of 'bleeding.'" *Id.* at 9.

Appellant argues that the Examiner erred in finding that Schmidt discloses the method of claim 1 because "Schmidt expressly discloses opening the valve 28 to remove the gas bubbles from the brake fluids or 'in other words to degas the brake fluid.'" Appeal Br. 5 (quoting Schmidt ¶ 26). Appellant argues that "Schmidt explains that gas may be dissolved in the brake fluid; however, it still requires degassing of the brake fluid" because "[d]issolving the gas in the brake fluid does not eliminate or reduce the presence of the compressible gas." *Id.* at 6. Appellant argues that "[u]sing the pump 40 of Schmidt to increase hydraulic fluid pressure for a specified period of time does not eliminate or reduce the presence of compressible gas as required in claim 1 because the dissolved gas will reappear as air bubbles when the pressure is reduced, a pressure change." Reply Br. 2–3.

As we understand the Examiner's position, during operation of Schmidt's system prior to opening the valve during the degassing phase, Schmidt discloses that the pressure in the system reaches high enough to cause some of the gas to be dissolved in the brake fluid, thereby reducing, at least temporarily, the presence of the compressible gas in the fluid while the valve remains closed. Appellant's position is that, in Schmidt, the gas reappears when the pressure is reduced, and, thus, the presence of gas is not permanently eliminated or reduced while the valve is closed. Thus, the issue before us turns on the scope of the term "bleeding" as defined in Appellant's Specification, and, specifically, whether "bleeding" requires the air to be permanently eliminated from the brake fluid, or whether the temporary

reduction of air in the brake fluid due to the air dissolving in the fluid suffices.

Appellant's Specification describes generally that "[b]leeding as applied to hydraulic brake systems is a process used to purge or evacuate air or gas bubbles from the brake system." Spec. ¶ 5. The Specification provides, however, a slightly different definition of "bleeding" as used in the written description to refer to "a procedure performed on a brake system that eliminates or reduces the presence of a compressible gas, for example air bubbles, in an incompressible liquid, for example brake fluid, located in the brake system." *Id.* ¶ 15. This definition does not make clear whether the reduction of the presence of air bubbles in the brake fluid encompasses temporary dissolution of the gas bubbles in the brake fluid under sufficient pressure to cause the dissolution. We look to the remainder of the Specification for further clarification and context.

The Specification describes that "[a]pplying relatively high pressures in the brake system without opening bleed valves ultimately leads to permanent removal of air from the brake system even after the pressure increase has ended." *Id.* ¶ 16. The Specification describes that "[t]he residual air or trapped air in the brake system dissolves in the brake fluid at the applied high pressures and essentially remains dissolved or chemically bound therein because of chemical or physical processes."<sup>2</sup> *Id.* ¶ 17. This disclosure would lead one to believe that the claimed bleeding method

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<sup>2</sup> The Specification does not provide any further details as to the chemical or physical processes that allow for the air to remain dissolved or chemically bound in the brake fluid, and thus, permanently removed from the brake fluid without escaping to atmosphere.

requires the air to be permanently eliminated or reduced from the brake fluid even after the pressure is reduced in the brake fluid without opening the bleed valve.

The Specification further describes, however, that “[i]n addition, the residual air dissolves in the brake fluid and then with low pressures at other locations of the brake system, especially in the vicinity of the normally present master cylinder, precipitates out during communication with the expansion tank or master cylinder and ultimately escapes to the atmosphere.” *Id.* ¶ 18. The Specification’s description that the air precipitates out of the brake fluid at low pressures leads one to believe that the claimed bleeding method allows for air to be only temporarily eliminated or reduced from the brake fluid while the brake fluid remains under sufficient pressure to prevent the air from precipitating back out of the fluid.

In light of these disparate descriptions of the effect of high pressure on the air within the brake fluid, we understand the definition of “bleeding”, when read in the context of Appellant’s Specification, to mean a procedure that causes the air to dissolve in the brake fluid, and either remain dissolved or chemically bound therein so that the air is permanently removed from the brake system even after the pressure increase has ended, or remain dissolved therein temporarily until the brake fluid reaches an area of relative lower pressure where the air precipitates back out of the brake fluid.

Schmidt discloses a hydraulic vehicle brake system 10 having two hydraulic pumps 14, driven by motor 16, and high-pressure hydraulic reservoir 18 connected to a pressure side of pumps 14. Schmidt ¶ 18, Fig. 1. An intake side of pumps 14 is connected to brake fluid reservoir 24. *Id.* Wheel brake cylinders 30 are connected to high-pressure hydraulic reservoir

18 via brake pressure buildup valves 28. *Id.* ¶ 19. Schmidt describes that “[b]y means of the hydraulic pumps 40 and/or the hydraulic reservoir 18 . . . , air and/or compressed gas from the hydraulic reservoir 18 can get into the brake fluid.” *Id.* ¶ 26. Schmidt discloses that the gas “may either be dissolved in the brake fluid or contained in it in the form of gas bubbles” and that “[g]as dissolved in the brake fluid can also form gas bubbles as a result of a pressure change or enrichment.” *Id.* Schmidt describes that a drawback of the presence of gas in the brake fluid is that the brake fluid becomes compressible, which diminishes the function of the auxiliary brake system. *Id.* Thus, Schmidt provides a method to “avoid gas bubbles in the brake fluid or to remove them from the brake fluid or in other words to degas the brake fluid.” *Id.*

In Schmidt’s degassing method, brake pressure buildup valves 28 are opened. *Id.* ¶ 27. Schmidt describes that “[b]rake pressure that is under pressure flows out of the hydraulic reservoir 18 of the external energy source 12 through the brake pressure buildup valves 28, the open disconnection valves 52, and the master cylinder 50, into the brake fluid reservoir 24, where gas bubbles can escape from the brake fluid.” *Id.*

We agree with the Examiner’s finding that, in the operation of Schmidt’s system, pressure within the system causes some of the gas to be dissolved in the brake fluid prior to opening valve 28. Schmidt ¶ 26. Schmidt discloses that through operation of pumps 14 air is caused to be dissolved in the brake fluid, and remain dissolved therein temporarily until the brake fluid reaches an area of relative lower pressure where the air precipitates back out of the brake fluid. This disclosure meets Appellant’s broad definition of “bleeding” because the temporary dissolution of air in the

brake fluid leads to a reduction of the presence of air in the brake fluid. Thus, we find adequate support in Schmidt for the method of claim 1 wherein “bleeding” occurs by using the pump to increase hydraulic fluid pressure in the brake line and on the bleed valve for a specified period of time without opening the bleed valve during “bleeding” of the brake system.

As noted by the Examiner, these events all transpire prior to the opening of any valves. Ans. 7, 9 (citing Schmidt ¶ 26). The fact that Schmidt subsequently opens valve 28 during the degassing process does not negate the fact that Schmidt discusses the claimed method in which pressure applied by pumps 14 causes a reduction of the air bubbles in the brake fluid. *Id.* at 9.

For these reasons, Appellant has not identified error in the Examiner’s rejection of claim 1 as anticipated by Schmidt. Appellant does not present separate arguments for the patentability of claim 9, which depends from claim 1. Thus, we sustain the rejection of claims 1 and 9 as anticipated by Schmidt.

*Claim 2*

Claim 2 depends from claim 1 and recites “wherein the pump provides for pressure build-up in the brake circuit during operation of an electronic dynamic driving control system.” Appeal Br. 19 (Claims Appendix). The Examiner relied on the same disclosure in paragraph 26 of Schmidt to find the subject matter of claim 2 anticipated by Schmidt. Final Act. 3. Appellant argues that the cited paragraph of Schmidt does not disclose an electronic dynamic driving control system. Appeal Br. 7. The Examiner responded that “this limitation is clearly met because that is how these brake systems operate – it provides electronic dynamic control and the

pumps increase pressure in the brake line.” Ans. 9 (citing Schmidt ¶¶ 21, 26). We find adequate disclosure in Schmidt to support the Examiner’s finding.

Schmidt describes that vehicle brake system 10 has an electronic control unit 38, which receives signals from sensors and controls electric motor 16 of hydraulic pumps 14 and valves 28, 32, 36 of vehicle brake system 10. Schmidt ¶ 21. Because Schmidt discloses using an electronic control unit 38 to control the motor and pumps, Schmidt’s pumps 14 provide for pressure build-up in the brake circuit during operation of an electronic dynamic driving control system, as recited in claim 2. Thus, Schmidt anticipates the subject matter of claim 2, and we sustain the rejection of claim 2 as anticipated by Schmidt.

*Claim 10*

Claim 10 depends from claim 1 and further recites “the step of carrying out the bleeding process after the brake system is first filled with hydraulic fluid during the production process of a vehicle including the brake system.” Appeal Br. 20 (Claims Appendix). The Examiner relied on the same disclosure in paragraph 26 and Figure 1 of Schmidt to find the subject matter of claim 10 anticipated by Schmidt. Final Act. 3. Appellant argues that Schmidt does not disclose this claimed step because “Schmidt explains to degas the brake fluid, the brake pressure buildup valves are opened.” Appeal Br. 7. This argument is the same argument we found unavailing above in our discussion of claim 1. For the same reasons discussed above, we sustain the rejection of claim 10 as anticipated by Schmidt.

*Claim 13*

Claim 13 depends from claim 1 and recites “wherein the increased pressure causes any air to dissolve in the hydraulic fluid and essentially remain dissolved therein when the pressure is reduced.” Appeal Br. 21 (Claims Appendix). The Examiner noted that because claim 13 does not specify the amount by which the pressure is reduced, Schmidt anticipates the claimed subject matter because it encompasses increasing the pressure beyond the pressure required to dissolve the gas in the brake fluid, so that even if the pressure is thereafter reduced slightly, the pressure would remain above the level required to maintain the gas as dissolved. Final Act. 3. In other words, the pressure could be reduced somewhat as long as it is not reduced to a level that would allow the gas to precipitate out of the brake fluid.

Appellant argues that “[n]othing in Schmidt discloses that the air dissolved in the hydraulic fluid remains dissolved therein when the pressure is reduced.” Appeal Br. 8 (arguing that Schmidt acknowledges the need to degas by opening the brake pressure buildup valves).

Appellant’s argument fails to address the breadth of the claim language as interpreted by the Examiner. We agree with the Examiner’s reading of the claim language. In other words, the scope of the claim language encompasses an instance in which the pressure is reduced only slightly so that it remains above the pressure level that allows for the gas to precipitate out of the brake fluid. Due to the breadth of the claim language, we do not find error in the Examiner’s rejection. Further, the language is not commensurate with Appellant’s Specification, which also allows for gas to

precipitate out of the brake fluid during communication with the expansion tank or master cylinder at low pressures. Spec. ¶ 18.

For these reasons, Appellant has not identified error in the Examiner's rejection of claim 13 as anticipated by Schmidt. Thus, we sustain this rejection of claim 13.

*Independent Claim 17*

Claim 17 recites a method for bleeding a vehicle brake system that includes the step of “during bleeding of said vehicle brake system using the controller to activate the pump for a specified period of time and thereby increasing hydraulic fluid pressure in the brake line of the brake system, and correspondingly at the bleed valve, without opening the bleed valve.”

Appeal Br. 22 (Claims Appendix). The Examiner relied on the same interpretation of “bleeding” and findings as to Schmidt as relied on in the rejection of claim 1 to find the subject matter of claim 17 anticipated by Schmidt. Final Act. 3–4. Appellant presents the same arguments discussed above in our analysis of the rejection of claim 1. Appeal Br. 8–9. For the same reasons discussed above, we find no error in the Examiner's findings as to Schmidt's disclosure of the claimed method step. Thus, we sustain the rejection of claim 17 as anticipated by Schmidt.

*Claim 18*

Claim 18 depends from claim 17 and recites “wherein the step of increasing the pressure in the brake line of the brake system causes any air in the brake line of the brake system to dissolve in the brake fluid and essentially remain dissolved therein when the pressure is reduced.” Appeal Br. 22 (Claims Appendix). Appellant presents the same argument as discussed above in our analysis of the rejection of claim 13. Appeal Br. 9–

10. For the same reasons discussed above, we sustain the rejection of claim 18 as anticipated by Schmidt.

*Rejection of claims 3–8, 11, and 14–16 over Schmidt and Koons*

*Claims 3–5*

Claims 3–5 each depend from claim 1 and recite increasing the pressure: to more than 50 bar, to more than 100 bar, and between 180 to 200 bar, respectively. Appeal Br. 19 (Claims Appendix). The Examiner found that Koons discloses increasing the pressure to the recited levels. Final Act. 4 (citing Koons ¶ 41); Ans. 10 (stating that Koons teaches that “pumps in hydraulic brake systems may be operated at pressure at least as high as 180 bar and may be operated for durations at least as long as 15 seconds”). The Examiner determined that it would have been obvious to a person having ordinary skill in the art to combine these references because “Koons discusses increasing accumulator pressure to 180 bar in 15 seconds ‘during the ignition event’” and “this particular pressure and time range is typical for operation of pumps in vehicle brake systems.” Final Act. 4–5.

The Examiner explained that “[t]he Schmidt brake system is not being modified by Koons” and that “Koons is merely a teaching reference for the specific values at which hydraulic brake pumps operate.” Ans. 10. The Examiner further explained that, because “Koons discusses *increasing* pump operating pressures for certain durations during ignition, this must concern the Schmidt phase of operation prior to degassing – the pressure clearly cannot increase when there is degassing and the system is open.” Ans. 11.

Appellant argues that the Examiner’s determination of obviousness is in error because the Examiner fails to provide a reason why one having ordinary skill in the art would have used the increased pressure and duration

of Koons in the method of Schmidt. Appeal Br. 11–12; Reply Br. 3–4. Appellant asserts that “Koons explains using the pump 242 to pressure the hydraulic accumulator to 44 until hydraulic pressure reaches a predetermined threshold or until a predetermined amount of time has elapsed.” Reply Br. 3 (citing Koons ¶ 41).

We agree with Appellant that the Examiner’s articulation in the rejection lacks an adequate reason use the pressure of Koons in the system of Schmidt. As noted by Appellant, Koons describes a process for calibrating a braking system and describes that when an ignition of the vehicle is turned on, the system runs a pump to provide hydraulic pressure for an accumulator until the pressure reaches a predetermined threshold or until a predetermined amount of time has elapsed. Koons ¶ 41. The Examiner has not explained adequately a reason that would have led one having ordinary skill in the art to use this predetermined pressure threshold, as disclosed in Koons, in the system of Schmidt. In other words, simply because Koons discloses a system in which a pump is used to achieve a pressure within the claimed range for purposes of calibration is not adequate to explain why one would have used Schmidt’s pumps in this manner at the claimed pressure. For this reason, we do not sustain the rejection of claims 3–5 under 35 U.S.C. § 103 as unpatentable over Schmidt and Koons.

*Claims 6–8*

Claims 6–8 each depend from claim 1 and recite applying the increased pressure with the vehicle stationary for a period of time of: at least 5 seconds and less than 2 minutes, at least 10 seconds and less than 1 minute, and between 10 seconds and 20 seconds, respectively. Appeal Br. 19–20 (Claims Appendix). The Examiner found that Koons discloses

applying the increased pressure for a period of time that falls within the claimed ranges. Final Act. 4 (citing Koons ¶ 41). For the same reasons discussed above in our analysis of the rejection of claims 3–5, the rejection of claims 6–8 likewise suffer from the deficiency of an inadequate explanation of a reason to modify Schmidt to apply increased pressure with the vehicle stationary for the claimed duration. Thus, we do not sustain the rejection of claims 6–8 under 35 U.S.C. § 103 as unpatentable over Schmidt and Koons.

*Claim 11*

Claim 11 depends from claim 1 and provides further details of an electronic brake controller. Appeal Br. 19 (Claims Appendix). The Examiner found that Koons discloses the subject matter of claim 11. Final Act. 5. Appellant does not contest this finding. Appeal Br. 13 (“Claim 11 stands with claim 1.”). For the reasons discussed above in our analysis of claim 1, we likewise sustain the rejection of claim 11 as unpatentable over Schmidt and Koons.

*Claims 14–16*

Independent claim 14 recites a method for bleeding a vehicle brake system comprising the steps of using the pump to increase the pressure in the brake line to between 180 and 200 bar and applying the pressure for a period between 10 and 20 seconds. Appeal Br. 21 (Claims Appendix). For the same reasons discussed above in our analysis of the rejection of claims 3–5, the rejection of independent claim 14 and its dependent claims 15 and 16 likewise suffer from the deficiency of an inadequate explanation of a reason to modify Schmidt to apply increased pressure at the claimed pressure level

for the claimed duration. Thus, we do not sustain the rejection of claims 14–16 under 35 U.S.C. § 103 as unpatentable over Schmidt and Koons.

### CONCLUSION

We sustain the Examiner’s rejection under 35 U.S.C. § 102(a)(1) of claims 1, 2, 9, 10, 13, 17, and 18 and the Examiner’s rejection under 35 U.S.C. § 103 of claim 11. We do not sustain the Examiner’s rejection under 35 U.S.C. § 103 of claims 3–8 and 14–16. Thus, we affirm in part.

### DECISION SUMMARY

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 2, 9, 10, 13, 17, 18	102(a)(1)	Schmidt	1, 2, 9, 10, 13, 17, 18	
3–8, 11, 14–16	103	Schmidt, Koons	11	3–8, 14–16
<b>Overall Outcome</b>			1, 2, 9–11, 13, 17, 18	3–8, 14–16

AFFIRMED IN PART