UNITED STATES PATENT AND TRADEMARK OFFICE						
BEFORE THE PATENT TRIAL AND APPEAL BOARD						

v.

BAYERISCHE MOTOREN WERKE AKTIENGESELLSCHAFT and BMW OF NORTH AMERICA, LLC, Petitioners

PAICE LLC & THE ABELL FOUNDATION Patent Owner

Case IPR2020-00994 Patent 7,104,347

DECLARATION OF MAHDI SHAHBAKHTI PH.D. IN SUPPORT OF THE PATENT OWNER'S RESPONSE

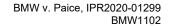




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VII.	ANALYSIS AND OPINIONS			34	
	A.	A. Grounds 1b and 2b: The proposed combination of Severinsky and Ma does not render obvious claim 33 and the proposed combination of Severinsky, Ehsani, and Ma does not render obvious claim 11			
		1.	Dr. Davis does not identify a valid reason to add a turbocharger to Severinsky's parallel hybrid	35	
		2.	The prior art does not disclose any reason to add a turbocharger to Severinsky's parallel hybrid	48	
		3.	The disadvantages of adding a turbocharger to Severinsky would deter a person of skill in the art from combining Severinsky and Ma	55	
		4.	No reasonable expectation of success	68	
	B.	Seve the p	unds 3a and 3b: The proposed combination of erinsky and Nii does not render obvious claim 24 and proposed combination of Severinsky, Ehsani, and Nii a not render obvious claim 2	69	
		1.	Neither Severinsky nor Nii vary a setpoint	69	

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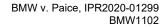


	2.	Severinsky's parallel hybrid architecture vs. Nii's series hybrid architecture		
	3.	Nii's use of vehicle patterns has no applicability to Severinsky's parallel hybrid control system and varying the alleged "setpoint"	94	
C.	Ref	ound 4b: The proposed combination of the Bumby ferences and Ma does not render obvious claims 11		
D.		unds 4c: The Bumby References in view of Ehsani do render obvious claim 38	117	
	1.	Overview of Bumby V's "free-wheel unit"	118	
	2.	Bumby V's disclosure of synchronizing output shafts to "within 45 rev/min" does not satisfy the "substantially equal" requirement	122	



DECLARATION EXHIBITS

Exhibit Number	Exhibit Name				
Ex. 2017	Curriculum Vitae of Mahdi Shahbakhti, Ph.D.				
Ex. 2018	Bosch Gasoline-engine Management				
Ex. 2019	Selected Pages From John Heywood, Internal				
EX. 2019	Combustion Engines Fundamentals				
Ex. 2020	Selected Pages From Merhdad Ehsani et al, Modern				
Ex. 2020	Electric, Hybrid Electric, and Fuel Cell Vehicles				
Ex. 2021	Matthew Cuddy et al., Analysis of the Fuel Economy				
EX. 2021	Benefit of Drivetrain Hybridization				
	Selected Pages From Draft Technical Assessment				
	Report: Midterm Evaluation of Light-Duty Vehicle				
Ex. 2022	Greenhouse Gas Emission Standards and Corporate				
	Average Fuel Economy Standards for Model Years				
	2022-2025				
Ex. 2023	Selected Pages From Assessment of Fuel Economy of				
LA. 2023	Fuel Economy Technologies for Light Duty Vehicles				
Ex. 2024	Selected Pages From Richard Stone, Introduction to				
Ex. 2024	Internal Combustion Engines				
Ex. 2025	Heinz Heisler, Advanced Vehicle Technology, SAE				
	Hitoshi Inoue et al., A Performance Improvement in				
Ex. 2026	Idle-Speed Control System with Feedforward				
	Compensation for the Alternator Load Current, SAE				
	Satoru Watanabe, Development of Model-Following				
Ex. 2027	Idle Speed Control System Incorporating Engine				
	Torque Models, SAE				
Ex. 2028	Guzzella et al., Introduction to Modeling Control of				
LA. 2020	Internal Combustion Engine Systems				





I, Mahdi Shahbakhti, hereby declare the following:

I. INTRODUCTION

- 1. I have been retained by counsel for Paice LLC and the Abell Foundation (collectively, "Paice" or "Patent Owner") to investigate and analyze certain issues relating to the validity of claims of U.S. Patent No. 7,104,347 ("the '347 patent").
- 2. For purposes of this declaration, I have been asked to analyze the arguments made by Bayerische Motoren Werke Aktiengesellschaft and BMW of North America, LLC ("BMW" or "Petitioners") related to Grounds 1b, 2b, 3a, 3b, 4b, and 4c (claim 38) in the matter of the *Inter Partes* Review of the '347 patent, Case No. IPR2020-00994, as shown in the table below.

Grounds 1b, 2b	Severinsky/Ma	Claims 33 and 11
Grounds 3a, 3b	Severinsky/Nii	Claims 24 and 2
Ground 4b	Bumby/Ma	Claims 33 and 11
Ground 4c	Bumby/Eshani	Claim 38

In addition to the grounds and noted claims above, I have also reviewed the petition as well as the declaration of BMW's expert, Dr. Davis (and the documents cited therein) pertaining to these grounds. I have also reviewed the Patent Trial and Appeal Board's ("the Board") decision to institute regarding these grounds, as well BMW v. Paice, IPR2020-01299



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