

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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FORD MOTOR COMPANY  
Petitioner

v.

INNOVATIVE DISPLAY TECHNOLOGIES LLC  
Patent Owner

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Case No. TBD  
U.S. Patent No. 6,886,956

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**DECLARATION OF A. BRENT YORK**

I, A. Brent York, hereby declare the following:

## **I. BACKGROUND AND EDUCATION**

1. I am an expert in the field of LED and optical systems including automotive lighting systems.

2. I am the CEO of Tangenesys Consulting Ltd., a firm focused on executive-level leadership related to strategic innovation and business development, and intellectual property strategy of LED devices, lighting equipment and optical systems. Although I discuss my expert qualifications in more detail below, I also attach as **[Appendix A]** a recent and complete curriculum vitae, which details my educational and professional background.

3. My formal, post-high school education includes a B.A.Sc in Engineering Physics in 1985 from the University of British Columbia where I focused on mechanical and electro-optical systems. My graduate education was an MBA from Simon Fraser University where I focused on International and Technology Business Strategy. My graduate thesis was the practical development of, what turned into a successful business plan, for an innovative machine vision illumination system that found significant application in the industrial machine vision field with such companies as Kodak, Bethlehem Steel, and Kimberley Clark.

4. My first professional career posting in 1985 was as a Photometrics Engineer (laboratory light measurement) with a Vancouver, B.C. company called TIR Systems Ltd., which was an optical and lighting systems company that had spun out of the graduate programs within the Physics Department of UBC. I held successively higher levels of engineering and technical responsibility during my 22 year career with TIR Systems – the last 10 years at the senior engineering and executive levels. I achieved my professional designation as a Professional Engineer in the province of British Columbia in 1988 and also served as the local President (BC) of the Illuminating Engineering Society in British Columbia in 90/91. I am a practicing lighting professional and have been a member of the IESNA for 29 years.

5. TIR Systems Ltd. was founded by Dr. Lorne Whitehead and Dr. Roy Nodwell both of UBC to exploit a new type of patented optical technology invented at the university (*see, e.g.*, original U.S. Patent No. 4,260,220) that could be used to guide light from remote sources to remote locations where it could be extracted, or in many cases, be extracted along the length of a light guide, and used for illumination or indication with very low loss rates. This unique technology could be exploited to create a variety of lighting systems in a wide range of unrelated fields, the most popular of which was trademarked “The Light Pipe.” It found extensive use in architectural lighting and specialty lighting systems in a

wide variety of lighting applications ranging from aerospace, military, nautical, signage, signaling, medical, architectural, entertainment, and automotive.

6. My professional experience in the automotive lighting industry started in the late 1980's when TIR Systems Ltd. was approached by Ford Motor Company, who was at the time trying to reduce the overall depth of the rear tail light assemblies in cars such as the Mustang. Automobile manufacturers such as Ford desired optical solutions to reduce the amount of internal volume in the trunk area that was required for conventional bulb and reflector assemblies. Essentially, a smaller and thinner light guide type cavity with remote light sources at the side instead of behind the usual reflector cavity would help to solve problems in automobile production and reduce the depth of penetration into the trunk while also creating a unique styling aesthetic. In summary, the engineering challenges were to apply optical system design to a mechanically constrained system in the shallower rear panels of an automobile.

7. Around that time, TIR Systems' technology was partnered with 3M, where the technology had been reduced to a thin film product called "Optical Lighting Film" or "OLF." This thin optical film could be used to guide light from remote light sources in thin, hollow, lightweight optical assemblies of virtually any cross section where the light could be emitted with high uniformity via internal or external light extraction features.

8. Still in the late 1980s, development of working proof of concept tail light assemblies was initiated at TIR Systems where I worked in the laboratory designing and building prototype rectangular hollow waveguides that were approximately 12 inches long by about 6 inches high. The thickness of the waveguide was about 1¼ inches. I experimented with a number of internal reflective surface materials in various locations, including specular reflective sheet, optical lighting film, diffuse high reflectance white surfaces, and various combinations thereof, to create a range of different light emission characteristics and physical appearances for the finished assembly.

9. While all of these designs relied upon a hollow light guide for propagation of light, I was encouraged to come up with a number of different finished light output aesthetic appearances for the styling team to evaluate that would still comply with the required rear tail light intensity requirements as established by SAE.

10. Solid light guides were well known in the art by this time of the late 1980's and had enjoyed many years of use in the automotive industry, for example, in instrument cluster backlighting applications. The mechanisms for light guidance are still based today on principles of these early solid light guides, namely Total Internal Reflection. The mechanisms for light extraction are also the same,

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