

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HUM INDUSTRIAL TECHNOLOGY, INC.

Petitioner

v.

AMSTED RAIL COMPANY, INC.

Patent Owner

Case IPR2023-00538

Patent No. 9,365,223

DECLARATION OF WILLIAM LEFEBVRE

1. I, William LeFebvre, declare as follows.

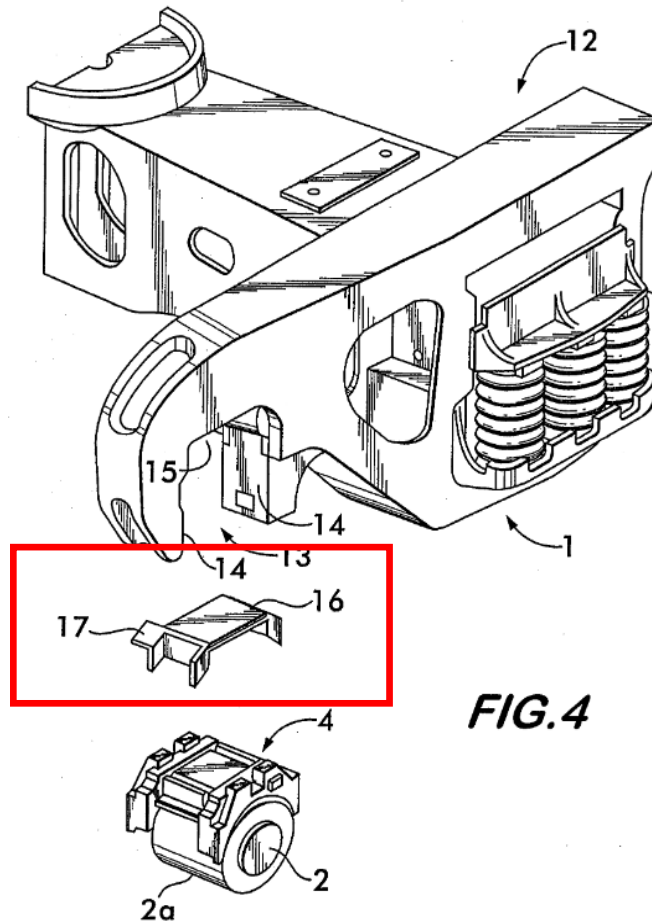
I. INTRODUCTION AND QUALIFICATIONS

2. I was an employee of Advanced Rail Technology who provided my contracted services to IONX LLC from about 2007 to 2017. My title was General Manager.

3. I am listed as an inventor on a number of Amsted Rail Company Inc. patents, including U.S. Pat. Nos. 7,688,218 (the '218 patent) and 9,365,223 (the '223 patent).

4. I am not being compensated by Amsted for providing this declaration.

5. The '218 patent relates to a monitoring system for railroad trains and the like, and more particularly to a system that uses an instrumented roller bearing adapter pad to detect the occurrence and cause of poor performance at a wheel set, truck, freight car, or train wide level. FIG. 4 of the '218 patent is illustrative of the adapter pad 16 (below).



6. I recognized a potential opportunity to equip these pads, with sensors that could monitor bearing temperature, pressure, shifting loads and truck hunting of the railcar. These ideas were disclosed in the '218 Patent. Because these pads were to be disposed in a load bearing position near the wheelset, I recognized that the inclusion of load sensors in the pad might be a good way to identify these operational characteristics. Specifically, I was concerned with monitoring vertical, lateral and longitudinal deflection by load sensors in the pad, but I was also interested in using temperature sensors to measure bearing condition. We were

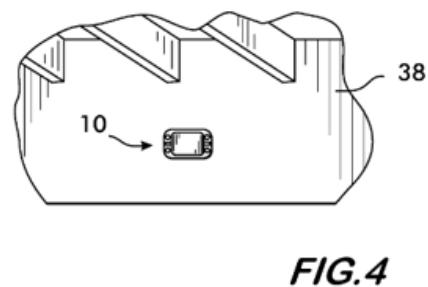
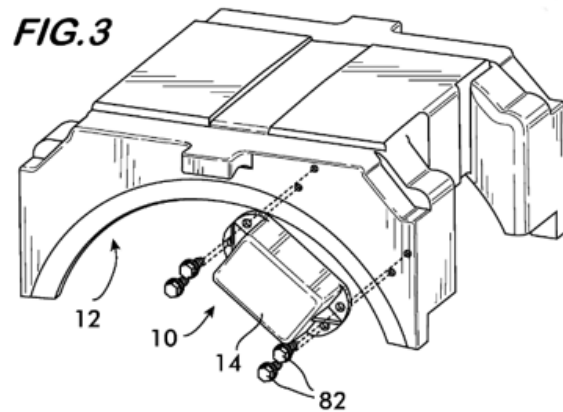
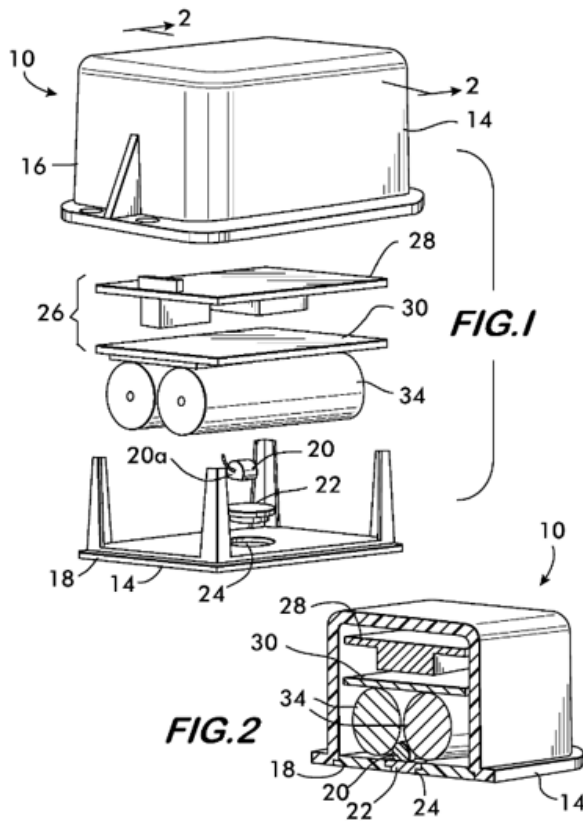
hopeful this invention would provide accurate and cost-effective monitoring solutions throughout long lifespans and in the harsh operating environment experienced by railcars. This turned out to not be the case.

7. In testing we learned that the pads suffered from two major problems. First, the extreme loads experienced by the pads were excessive enough that the sensors, wiring, and other electronic components associated with the pad were often damaged. This issue was exacerbated by the compliant nature of the elastomeric material. Second, each pad itself would take a permanent set over time leading to inaccurate sensor measurements. By this I mean that the pad would become deformed over time. As a result, the sensors, even if not damaged, would require periodic recalibration because of the changing dimensions of the pad. Ultimately, we explored alternative designs to the sensor pad invention covered by the '218 patent because it was not optimal for railway operators to have to continually recalibrate the sensors for each individual pad.

8. I began to work on an alternate invention that utilized a housing having various sensors and electronic components therein that could be mounted on a railcar in different non-load bearing positions. These efforts led to the development of the technologies disclosed in the '223 patent.

9. The '223 patent is directed to a system that gathers data regarding various operational characteristics from remote sensors disposed in a housing and

wirelessly reports back the sensor data to a central communication management unit. A primary goal of the design was for a self-contained sensor system that could be mounted on the railcar at different locations of interest. By this I mean the sensor system could be adapted for use in different locations of the railcar, particularly in non-load bearing positions. Another important aspect of the housing used in these sensor devices was to provide a robust weatherproof enclosure to put the electronics components in and then to surround those components with a potting material to help protect them. Examples from the '223 Patent are shown below.



10. The “pad” of the ’218 patent refers to a specific railcar component. It can only be placed in one specific location on the railcar, between the bearing adapter and the railcar frame. It has a function beyond that of being a sensor device to measure operational characteristics of the railcar accurately.

11. The “housing” that we disclosed in the ’223 patent refers to a different type of component that encloses and protects various electronics. It could be used in a variety of locations depending on the application the sensor device is used for. As such, the device could be placed virtually anywhere on the railcar.

12. I do not consider the pad of the ’218 patent to be a housing for several reasons. The pad was designed to be made from a specific elastomeric material providing it with the function as an adapter pad. The pad is not a portable enclosure like the housing described by the ’223 patent and can only be put in one location. Additionally, the housing embodiments would not be placed in a load bearing position like the pad. That is to say that the pad and the housing have some mutually exclusive characteristics. These differences should be apparent to a person reading the specifications of the ’218 patent and the ’223 patent.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and

the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed May 11, 2023 at West Chester, Pennsylvania.

A handwritten signature in blue ink, appearing to read 'W. Lefebvre', is positioned above a horizontal line.

William Lefebvre