WISSEN RESEARCH
EMPOWERING INNOVATION

VEHICLE CONNECTIVITY: MOBILE TO CAR COMMUNICATION

CASE STUDY

INTRODUCTION

The present invention relates to a vehicle communication system (Bluetooth) designed to enhance the interaction between a vehicle and external devices. This invention addresses that signals received by the vehicle communication system originate from within the vehicle, thereby enhancing user experience.

The method provides a systematic approach to receiving signals from devices, determining their origin, & facilitating seamless communication when appropriate. By automatically rejecting signals that do not originate from inside the vehicle, the system minimizes the risk of unauthorized access and potential security threats. The method includes assessing available resources and devices and sources and determining their load to make sure that user-requested applications run as efficiently as possible.

Our objective was to invalidate the patent by identifying prior art that either directly disclosed these features or suggested them through a combination of references, thereby challenging its novelty and non-obviousness.

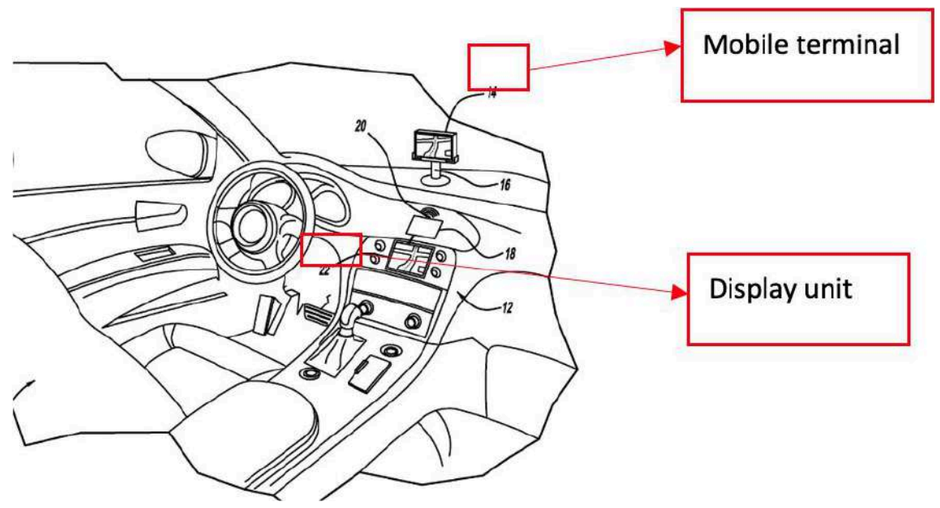
Phase 1

The search begins, but no output!

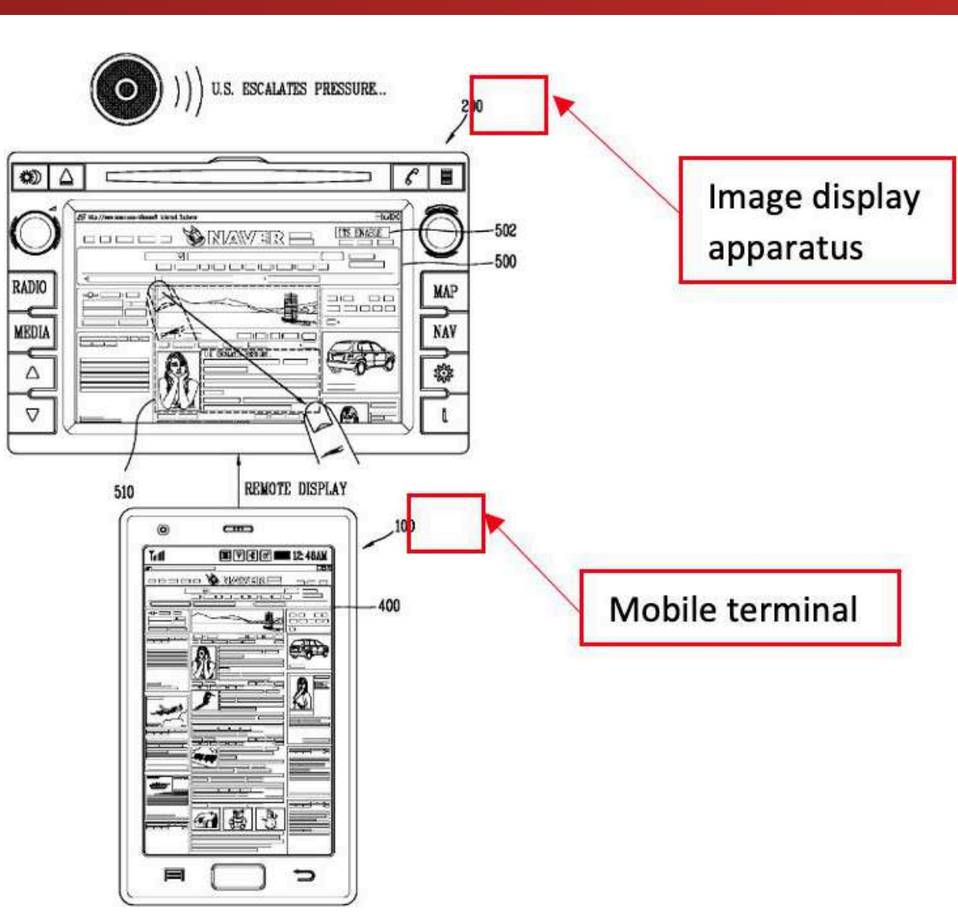
We only knew that we had to find the closest prior art within the given time. We geared up and started searching using keywords like “vehicle communication system,” “application,” “resources,” “load,” “device,” and “sensors,” yielding limited results. Most patents focused on communication systems but did not properly describe the novelty part. However, the search hinted at potential prior art in US patents and non-patent literature, which, when combined, could challenge novelty.

CHALLENGES FACED

Among the various references in the prior art, such as USXXXXX91B2, which discusses wireless and wired communication, there was no disclosure regarding the determination of load or the analysis of information transmitted to the vehicle communication system by the device.



Similarly, in USXXXXX384A, while wireless communication between a mobile device and a vehicle display unit was described, there was no clear disclosure regarding the determination of resources or the analysis of information transmitted to the vehicle unit.



Phase 2

The turning point – Leads, Logics, Classes

After being unable to get better results after our initial search, we decided to brainstorm with the team regarding our logics and ideologies so that we could get better results. We refined the search with the following steps:

- **IPC/CPC Code Integration**: Prioritized codes like H04W4/80 (short-range communication), G06F3/04883 (interaction techniques based on graphical user interfaces [GUI] using specific features provided by the input device), G06F3/04817 (interaction techniques based on graphical user interfaces [GUI] based on specific properties of the displayed interaction object or a metaphor-based environment), and B60K35/22 (display screens) to target technical specifics

- **Combining Keywords & Classes**: Used terms like “wireless communication,” “sensors,” “resources,” “compatibility,” and “load” alongside classification codes like G06F3/04883 (Interaction techniques based on graphical user interfaces [GUI] using specific features provided by the input device) and B60K35/10 (Input arrangements).

- **Global Prior Art**: Included patents and applications from Japan, South Korea, and China to uncover region-specific innovations.

- **Assignee Analysis**: Focused on patents filed by leading manufacturing companies (e.g., LG Electronics Inc., Toyota Motor Corp., Hyundai Motor Co., GM Global Technology Operations LLC, Denso Ten LTD) to identify advanced vehicular connectivity-related technologies.

- **Inventor Analysis** : Investigated prolific inventors in the domain of vehicle communication systems and wireless communication. Traced their patent portfolios and publications to uncover overlooked references, including prototypes or experimental designs.

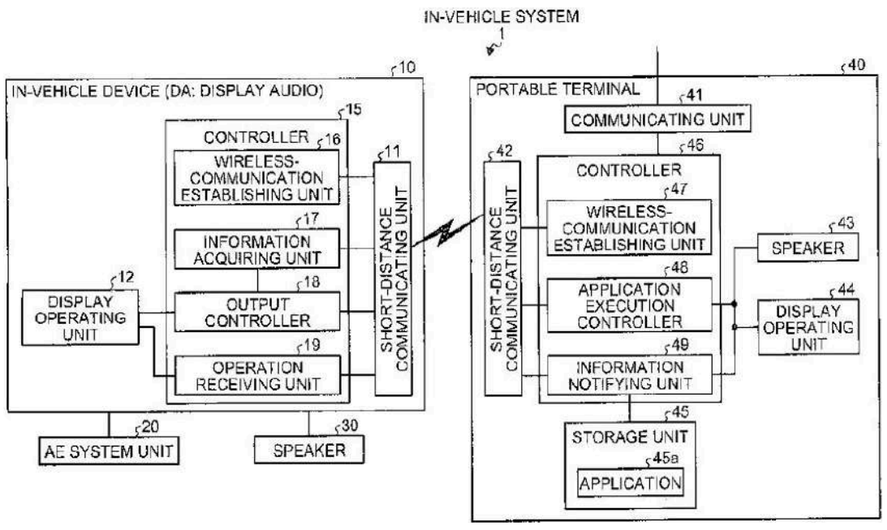
- **Combination Analysis** : Evaluated how disparate prior art references could collectively disclose the vehicle communication system, wireless communication in the vehicle, and sharing media between devices and the vehicle.

Phase 3

The results

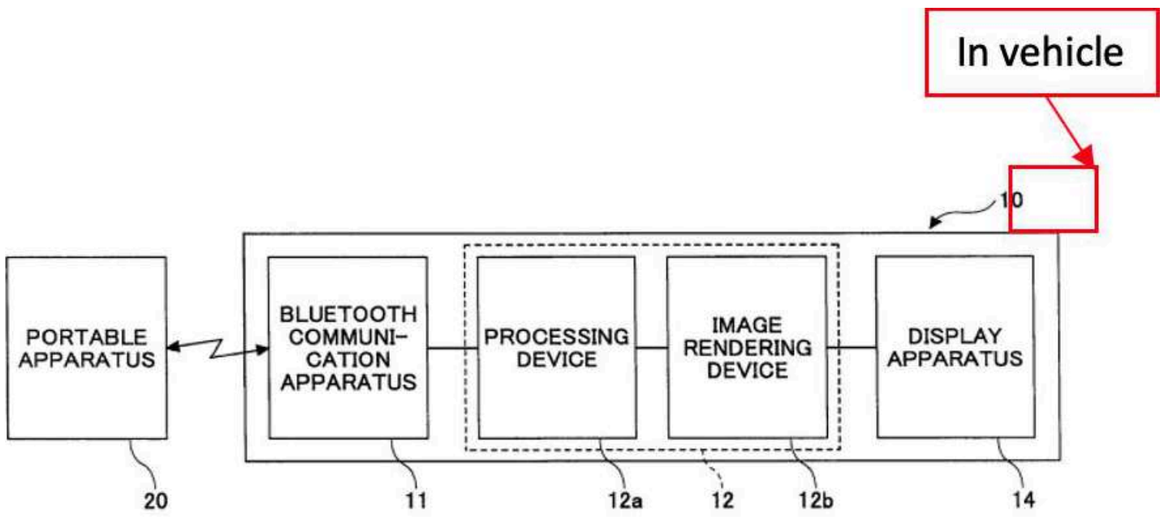
- We had gathered all our resources, and now we had one goal: find the best prior art. With time running out, we quickly dove into our leads and started our search with a clear path ahead.

After some deep analysis, we felt confident we were on the right track. The first promising result was a patent from Denso Ten Ltd., USXXXXX38149. It describes how the in-vehicle device interacts with portable terminals to execute applications based on user settings or execution history, displaying application outputs (e.g., music or images) on its display operating unit.



*[**Note**: The above snapshot shows short distance wireless communication between portable terminal(mobile etc.) and In-Vehicle device, Credit: Source]*

We found another relevant patent from Toyota Motor Corp, USXXXXX435, which discussed the concept of identifying the portable device's capabilities during initial registration and generating operation screens tailored to these functions. It was a solid find!



*[**Note**: The above snapshot shows wireless communication between portable apparatus (mobile etc.) and In-Vehicle device, Credit: Source]*

In the realm of non-patent literature, we came across a document titled 'Smartphone-Vehicle Integration: Making Sense of the Cacophony.' This document explores the concept of technology that enables media content from a smartphone to be seamlessly transmitted to a vehicle's speakers and screens using USB or Bluetooth connections.

*[**Note**: The above snapshot shows wireless communication between mobile device and In-Vehicle device, Credit: eetimes.com]*

OUTCOME AND IMPACT

Novelty Invalidated: References themselves and also the combination of references demonstrated that the vehicle communication system was not novel.

Inventor Credibility: The inventor's prior work established that vehicle communication was an obvious extension of existing solutions, weakening the patent's "non-obviousness" argument.