

CLAIMS

What is claimed is:

1. A system for value loading onto an in-vehicle device, the system comprising:
 - the in-vehicle device; and
 - a computing device comprising:
 - a near-field communication (NFC) reader;
 - a memory storing one or more instructions; and
 - one or more processors, coupled with the memory, operable to execute the one or more instructions, that when executed, cause the one or more processors to:
 - receive a unique identifier associated with the in-vehicle device;
 - receive information for accessing an account associated with the in-vehicle device; and
 - access the account associated with the in-vehicle device based on the received information and the unique identifier of the in-vehicle device; and
 - a contactless card comprising:
 - a memory storing one or more instructions;
 - at least one communication interface; and
 - one or more processors, coupled with the memory, operable to execute the one or more instructions, that when executed, cause the one or more processors to:
 - determine whether the at least one communication interface is in near-field communication (NFC) communication with the NFC reader of the computing device; and
 - load or reload the account associated with the in-vehicle device with funds of a predetermined value or amount.

2. The system of claim 1, wherein the in-vehicle device is a toll transponder, a device for drive-thru payment service, a garage access badge, or a parking pass.
3. The system of claim 1, wherein the computing device is a smartphone, a laptop, a tablet computer, or a wearable computer.
4. The system of claim 1, wherein the computing device is tapped to the in-vehicle device to receive the unique identifier and/or the information for accessing the account associated with the in-vehicle device.
5. The system of claim 4, wherein the contactless card is tapped to the mobile computing device to load or reload the account associated with the in-vehicle device.
6. The system of claim 2, wherein the unique identifier associated with the in-vehicle device is (i) a transponder identification number, (i) an account number corresponding to the drive-thru payment service, (iii) a badge number corresponding to the garage access badge, and/or (iv) pass number corresponding to the parking pass.
7. The system of claim 1, wherein the information for accessing the account includes a uniform resource locator (URL) corresponding to the account.
8. The system of claim 7, wherein the account is provided via a payment application and/or a website.
9. The system of claim 1, wherein the one or more processors of the computing device are further caused to:
 - receive encrypted data generated by the contactless card based at least in part on a private key for the contactless card stored in a memory of the contactless card;

transmit (i) a merchant identifier of a merchant, (ii) a transaction identifier, and (iii) the encrypted data to an authentication server, the authentication server to verify the encrypted data by decrypting the encrypted data based at least in part on the private key for the contactless card stored in a memory of the authentication server;

generate, by a virtual account number server based on the verification of the encrypted data, a virtual account number;

transmit, by the virtual account number server, the merchant identifier, the transaction identifier, the virtual account number, an expiration date associated with the virtual account number, and a card verification value (CVV) associated with the virtual account number to a merchant server associated with the merchant; and

process, by the merchant server, the transaction using the transaction identifier, the virtual account number, the expiration date, and the CVV.

10. The system of claim 1, wherein the in-vehicle device, the computing device, and the contactless card are all used or operated in a vehicle.

11. A system for value loading onto an in-vehicle device, comprising:

a contactless card comprising:

memory storing one or more instructions;

at least one communication interface; and

one or more processors, coupled with the memory, operable to execute the one or more instructions, that when executed, cause the one or more processors to:

determine (i) whether the at least one communication interface is in near-field communication (NFC) communication with an NFC reader of an in-vehicle device or (ii) whether the at least one communication interface is in operative communication with the in-vehicle device via an insert interface of the in-vehicle device; and

link a banking account associated with the contactless card to an account associated with the in-vehicle device or allow funds in the banking account to be accessed by the in-vehicle device for loading the account associated with the in-vehicle device.

12. The system of claim 11, wherein the in-vehicle device comprises:
 - memory storing one or more instructions;
 - the NFC reader and/or the insert interface; and
 - one or more processors, coupled with the memory, operable to execute the one or more instructions, that when executed, cause the one or more processors to:
 - determine that the contactless card has established communication with the in-vehicle device via the NFC reader or the insert interface;
 - determine whether the in-vehicle device establishes communication with an external reader of the in-vehicle device; and
 - load a payment value from the banking account to the account associated with the in-vehicle device and deduct the payment value from the account when the in-vehicle device communicates with the external reader.
13. The system of claim 12, wherein the account associated with the in-vehicle device is not a web-based account.
14. The system of claim 12, wherein at least the NFC reader of the in-vehicle device is configured to draw power from (i) a vehicle power socket and/or (ii) one or more energy storage components, the one or more energy storage components including a battery and/or a capacitor.
15. The system of claim 12, wherein the in-vehicle device further comprises an amplifier configured to amplify signals from the in-vehicle device to the external reader for the communication therebetween.

16. A system for value loading onto an in-vehicle device, the system comprising:
a contactless card comprising:
memory storing one or more instructions;
at least one communication interface; and
one or more processors, coupled with the memory, operable to execute the one or more instructions, that when executed, cause the one or more processors to:
determine whether the at least one communication interface is in near-field communication (NFC) communication with an NFC reader;
provide authentication information; and
a vehicle computing device comprising:
memory storing one or more instructions;
one or more processors, coupled with the memory, operable to execute the one or more instructions, that when executed, cause the one or more processors to:
receive authentication information from the contactless card; and
transmit the authentication information to an external reader via an in-vehicle device.
17. The system of claim 16, wherein the vehicle computing device and the NFC reader are integrated in a vehicle, wherein the vehicle computing device comprises a first short-range wireless communication interface, and wherein the in-vehicle device comprises a second short-range wireless communication interface, wherein the authentication information is transmitted to the vehicle computing device via the first and second short-range wireless communication interfaces.
18. The system of claim 17, further comprising a mobile computing device, wherein the mobile computing device includes a third short-range wireless communication

interface configured to communicate with the first and second short-range wireless communication interfaces.

19. The system of claim 18, wherein the mobile computing device communicates with the vehicle computing device and/or the in-vehicle device to manage or control value loading onto an account associated with the in-vehicle device such that funds can be transferred from the contactless card to the in-vehicle device via the first and second short-range communication interfaces.

20. The system of claim 19, wherein the short-range wireless communications via the first, second, third short-range wireless communication interfaces are authenticated and secure.