

WHAT IS CLAIMED IS:

1. A method for generating a virtual card number used to process transactions from a card account having a primary account number (PAN), comprising:

retrieving, by one or more processors, a trailing identifier that matches a trailing quantity of digits in the PAN such that the trailing quantity of digits are used by a consumer to identify the card account without revealing the PAN, wherein at least one of the trailing quantity of digits are a checksum value;

selecting, by the one or more processors, a bank identification number (BIN) from a plurality of available BINs;

selecting, by the one or more processors, an account identifier from a data structure of valid account identifiers built by: (1) traversing the plurality of available BINs; (2) traversing all trailing identifiers to determine a current trailing identifier; (3) traversing all account identifiers to determine a current account identifier; (4) running a checksum algorithm and when the combination of the current BIN, the current trailing identifier, and the current account identifier satisfies the checksum algorithm, adding the current account identifier to the data structure of valid account identifiers, wherein the data structure of valid account identifiers is keyed using the current BIN and the current trailing identifier;

concatenating the selected BIN, the account identifier, and the trailing identifier to generate the virtual card number, wherein the selecting the BIN and determining the account identifier occur such that, when concatenated, the virtual card number (i) is unique and (ii) satisfies the checksum value when a checksum algorithm is applied to the virtual card number; and

linking, by the one or more processors, a virtual card having the virtual card number with the card account.

2. The method of claim 1, the determining the account identifier further comprising:

selecting, by the one or more processors, the account identifier from a data structure of valid account identifiers that specifies valid account identifiers that satisfy the checksum algorithm when combined with the selected BIN and the trailing identifier.

3. The method of claim 1, wherein the virtual card number is a sixteen-digit number, wherein the bank identification number is a six-digit number, wherein the account identifier is a five-digit number, wherein the trailing identifier is a four-digit number, and wherein the checksum value is a single-digit number.

4. The method of claim 1, wherein the virtual card number is a sixteen-digit number, wherein the bank identification number is an eight-digit number, the account identifier is a three-digit number, wherein the trailing identifier is a four-digit number, and wherein the checksum value is a single-digit number.

5. The method of claim 1, wherein the virtual card number is a twenty-digit number, wherein the bank identification number is an eight-digit number, wherein the account identifier is a seven-digit number, wherein the trailing identifier is a four-digit number, and wherein the checksum value is a single-digit number.

6. The method of claim 1, wherein the virtual card number is a twenty-digit number, wherein the bank identification number is an eight-digit number, wherein the account identifier is a six-digit number, wherein the trailing identifier is a four-digit number, and wherein the checksum value is a two-digit number.

7. The method of claim 1, wherein the virtual card number is a twenty-digit number, wherein the bank identification number is an eight-digit number, wherein the account identifier is a six-digit number, wherein the trailing identifier is a five-digit number, and wherein the checksum value is a single-digit number.

8. The method of claim 1, wherein the virtual card number is a twenty-digit number, wherein the bank identification number is an eight-digit number, wherein the account identifier is a five-digit number, wherein the trailing identifier is a six-digit number, and wherein the checksum value is a single-digit number.

9. The method of claim 1, wherein the card account further comprises a PAN card verification value (CVV), further comprising:

generating, by the one or more processors, a virtual CVV based on the virtual card number; and

linking, by the one or more processors, the virtual CVV and the PAN CVV with the virtual card.

10. The method of claim 9, further comprising:

verifying, by the one or more processors, an authenticity of a subsequent transaction that uses the virtual card by performing a security verification algorithm against the virtual card number and matching the output of the security verification algorithm to either of the virtual CVV and the PAN CVV.

11. The method of claim 1, further comprising:

associating, by the one or more processors, the virtual card with a merchant.

12. The method of claim 11, further comprising:

receiving, by the one or more processors, a control from a user that specifies a limitation on transactions performed at the merchant using the virtual card; and

associating, by the one or more processors, the control with the virtual card.

13. The method of claim 1, the linking further comprising:

retrieving, by the one or more processors, a first expiration date associated with the card account; and

setting, by the one or more processors, a second expiration date associated with the virtual card to the retrieved first expiration date.

14. The method of claim 1, the linking further comprising:

setting, by the one or more processors, an expiration date associated with the virtual card to a distant date.

15. The method of claim 1, wherein the (i) retrieving, (ii) selecting, (iii) determining, (iv) concatenating, and (v) linking are performed in response to a request from an application that recognizes a credit card field in a checkout page.

16. A system for generating a virtual card number used to process transactions from a card account having a primary account number (PAN), comprising:

a memory; and

at least one processor coupled to the memory configured to:

retrieve a trailing identifier that matches a trailing quantity of digits in the PAN such that the trailing quantity of digits are used by a consumer to identify the card account without revealing the PAN, wherein at least one of the trailing quantity of digits are a checksum value;

select a bank identification number (BIN) from a plurality of available BINs;

select an account identifier from a data structure of valid account identifiers built by:
(1) traversing the plurality of available BINs; (2) traversing all trailing identifiers to determine a current trailing identifier; (3) traversing all account identifiers to determine a current account identifier; (4) running a checksum algorithm and when the combination of the current BIN, the current trailing identifier, and the current account identifier satisfies the checksum algorithm, adding the current account identifier to the data structure of valid account identifiers, wherein the data structure of valid account identifiers is keyed using the current BIN and the current trailing identifier;

concatenate the selected BIN, the account identifier, and the trailing identifier to generate the virtual card number, wherein the selecting the BIN and determining the account identifier occur such that, when concatenated, the virtual card number (i) is unique and (ii) satisfies the checksum value when a checksum algorithm is applied to the virtual card number; and

link a virtual card having the virtual card number with the card account.

17. The system of claim 16, wherein to determine the account identifier the at least one processor further configured to:

select the account identifier from a data structure of valid account identifiers that specifies valid account identifiers that satisfy the checksum algorithm when combined with the selected BIN and the trailing identifier.

18. A non-transitory computer-readable storage medium having computer-executable instructions stored thereon that, in response to being executed by a computing device, cause the computing device to perform operations for generating a virtual card number used to process transactions from a card account having a primary account number (PAN), the operations comprising:

retrieving a trailing identifier that matches a trailing quantity of digits in the PAN such that the trailing quantity of digits are used by a consumer to identify the card account without revealing the PAN, wherein at least one of the trailing quantity of digits are a checksum value;

selecting a bank identification number (BIN) from a plurality of available BINs;

selecting an account identifier from a data structure of valid account identifiers built by:
(1) traversing the plurality of available BINs; (2) traversing all trailing identifiers to determine a current trailing identifier; (3) traversing all account identifiers to determine a current account identifier; (4) running a checksum algorithm and when the combination of the current BIN, the current trailing identifier, and the current account identifier satisfies the checksum algorithm, adding the current account identifier to the data structure of valid account identifiers, wherein the data structure of valid account identifiers is keyed using the current BIN and the current trailing identifier;

concatenating the selected BIN, the account identifier, and the trailing identifier to generate the virtual card number, wherein the selecting the BIN and determining the account identifier occur such that, when concatenated, the virtual card number (i) is unique and (ii) satisfies the checksum value when a checksum algorithm is applied to the virtual card number; and

linking a virtual card having the virtual card number with the card account.

19. The method of claim 1, wherein the plurality of BINs are owned and stored in a BIN repository.

20. The system of claim 14, wherein the virtual card number can be used to process transactions against the card account until the expiration date.