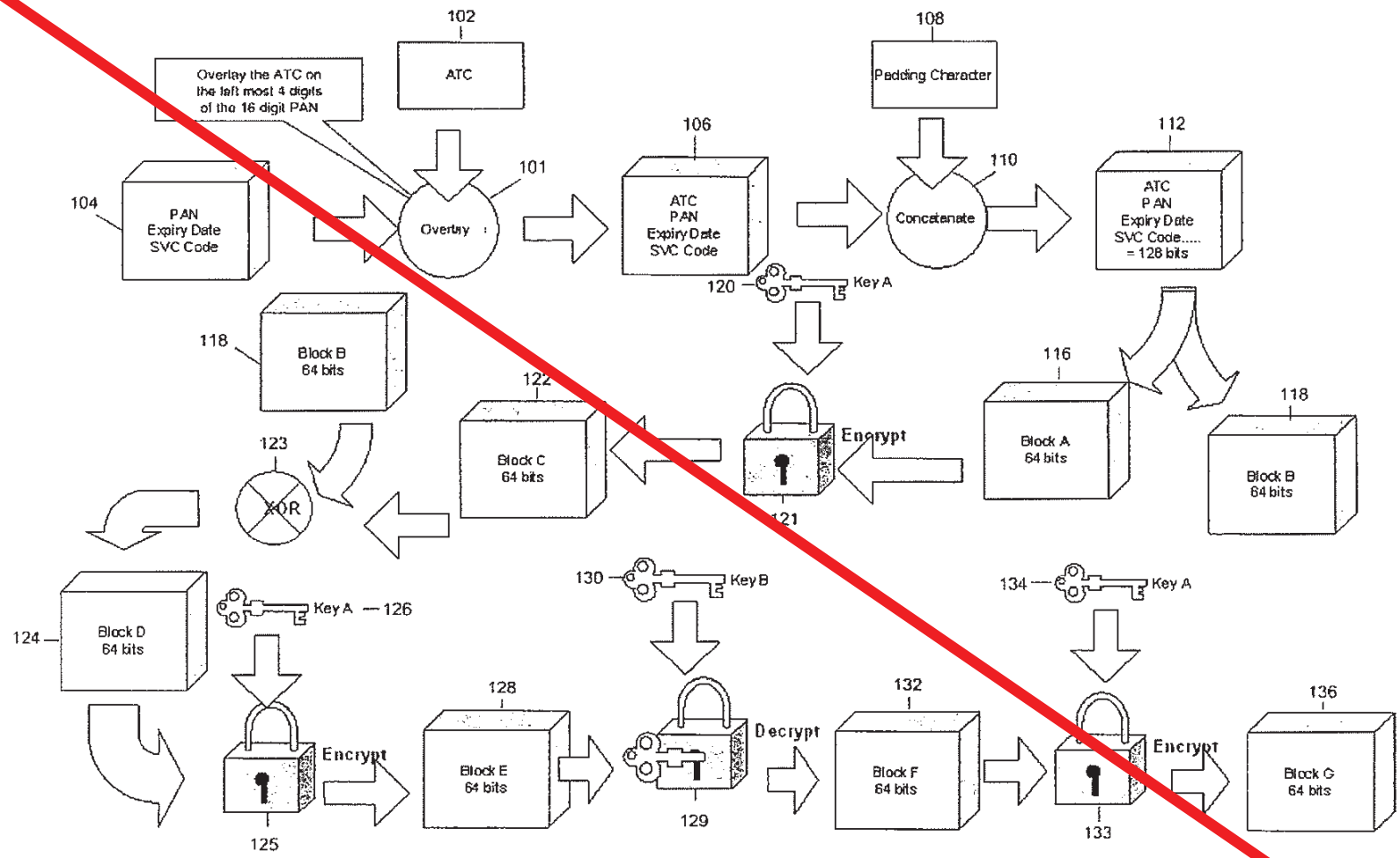

102
ATC
Overlay the ATC on the left most 4 digits of the 16 digit PAN
108
Padding Character
106
112
104
PAN
Expiry Date
SVC Code
101
Overlay
ATC
PAN
Expiry Date
SVC Code
110
Concatenate
ATC
PAN
Expiry Date
SVC Code.....
= 128 bits
120
Key A
118
Block B
64 bits
116
122
Block C
64 bits
Encrypt
Block A
64 bits
118
Block B
64 bits
123
XOR
121
130
Key B
134
Key A
124
Block D
64 bits
Key A
126
128
132
136
Encrypt
Block E
64 bits
Decrypt
Block F
64 bits
Encrypt
Block G
64 bits
125
129
133

FIG. 1

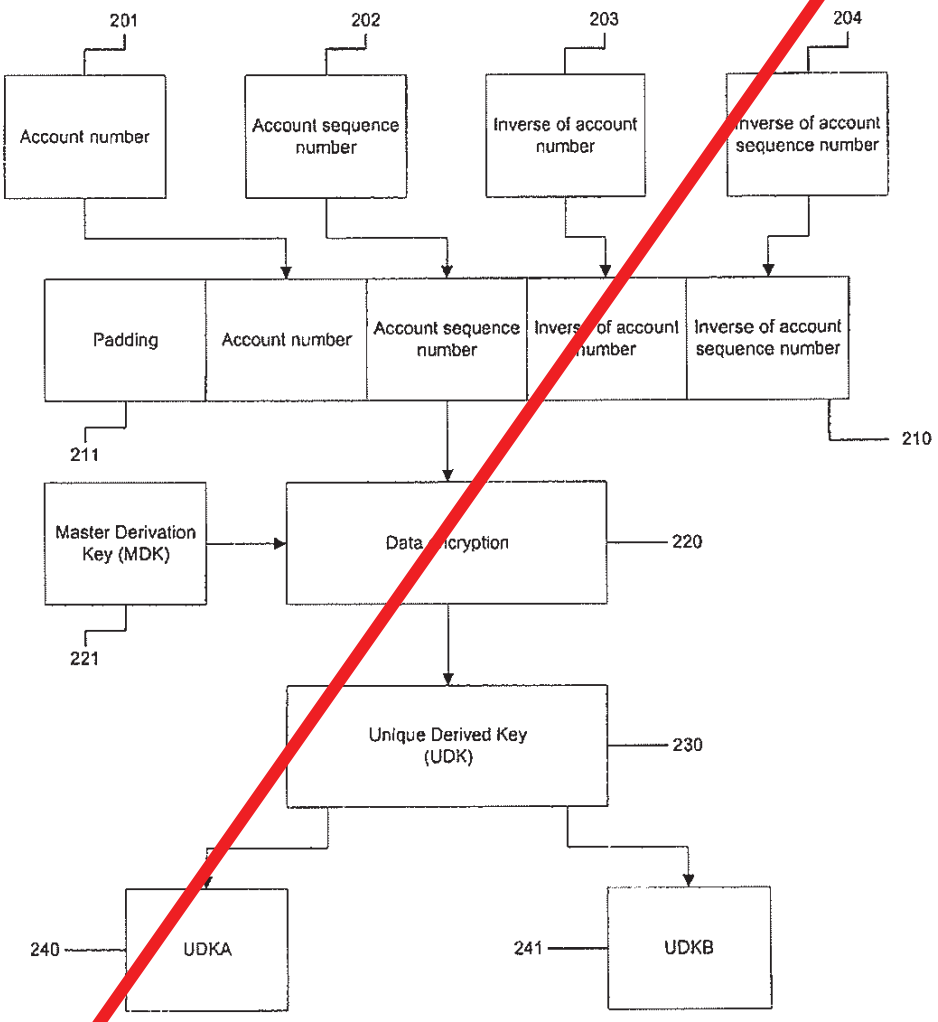

201
202
203
204
Account number
Account sequence number
Inverse of account number
Inverse of account sequence number
Padding
Account number
Account sequence number
Inverse of account number
Inverse of account sequence number
211
210
Master Derivation Key (MDK)
Data Encryption
220
221
Unique Derived Key (UDK)
230
240
UDKA
241
UDKB

FIG. 2

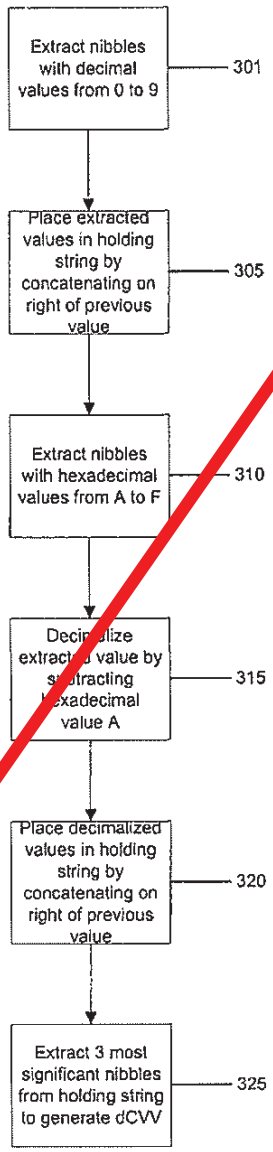

Extract nibbles with decimal values from 0 to 9
301
Place extracted values in holding string by concatenating on right of previous value
305
Extract nibbles with hexadecimal values from A to F
310
Decimalize extracted value by subtracting hexadecimal value A
315
Place decimalized values in holding string by concatenating on right of previous value
320
Extract 3 most significant nibbles from holding string to generate dCVV
325

FIG. 3



FIG. 4



FIG. 5

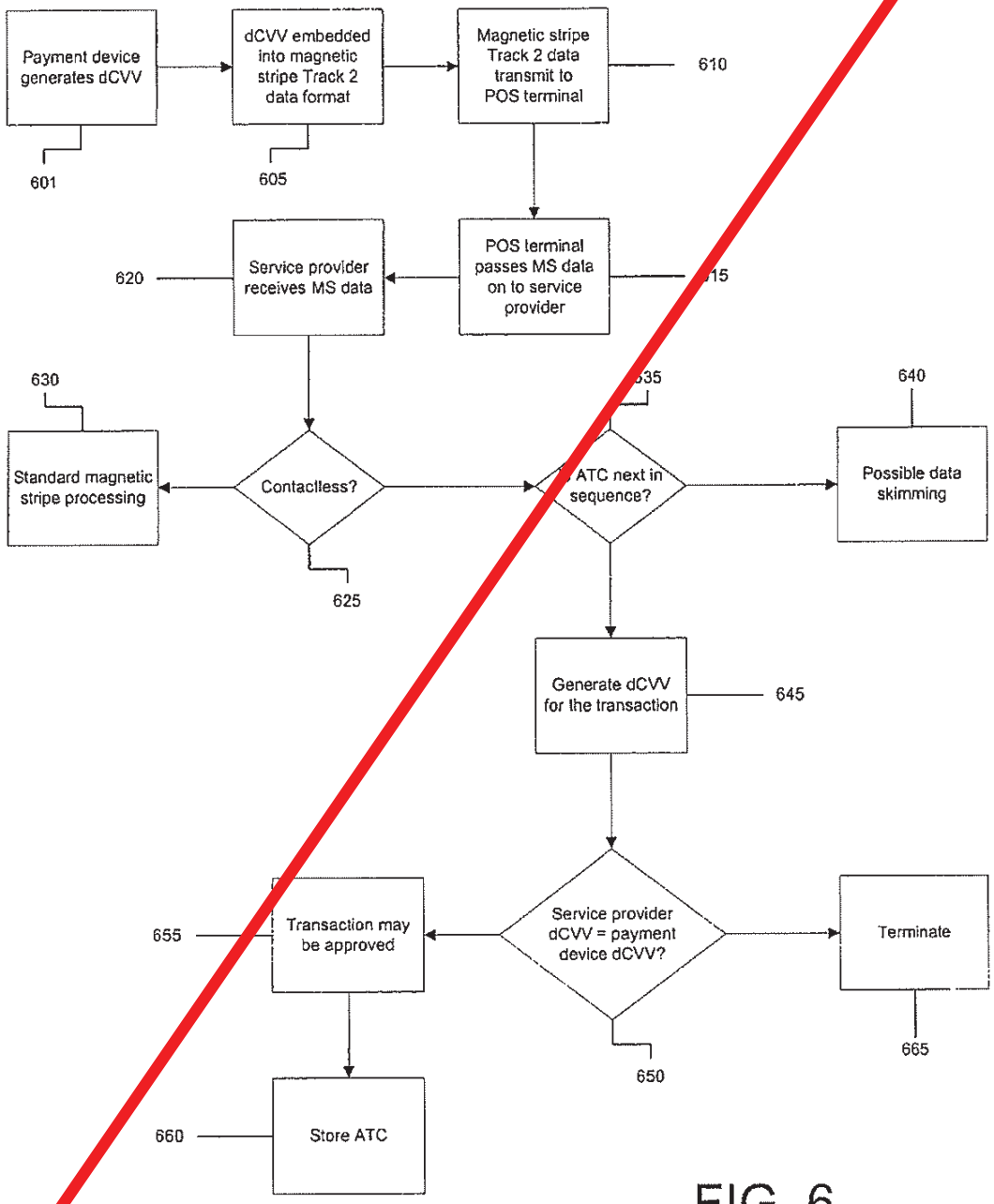

Payment device generates dCVV
601
dCVV embedded into magnetic stripe Track 2 data format
605
Magnetic stripe Track 2 data transmit to POS terminal
610
POS terminal passes MS data on to service provider
615
Service provider receives MS data
620
Contactless?
625
Standard magnetic stripe processing
630
ATC next in sequence?
635
Possible data skimming
640
Generate dCVV for the transaction
645
Service provider dCVV = payment device dCVV?
650
Terminate
665
Transaction may be approved
655
Store ATC
660

FIG. 6

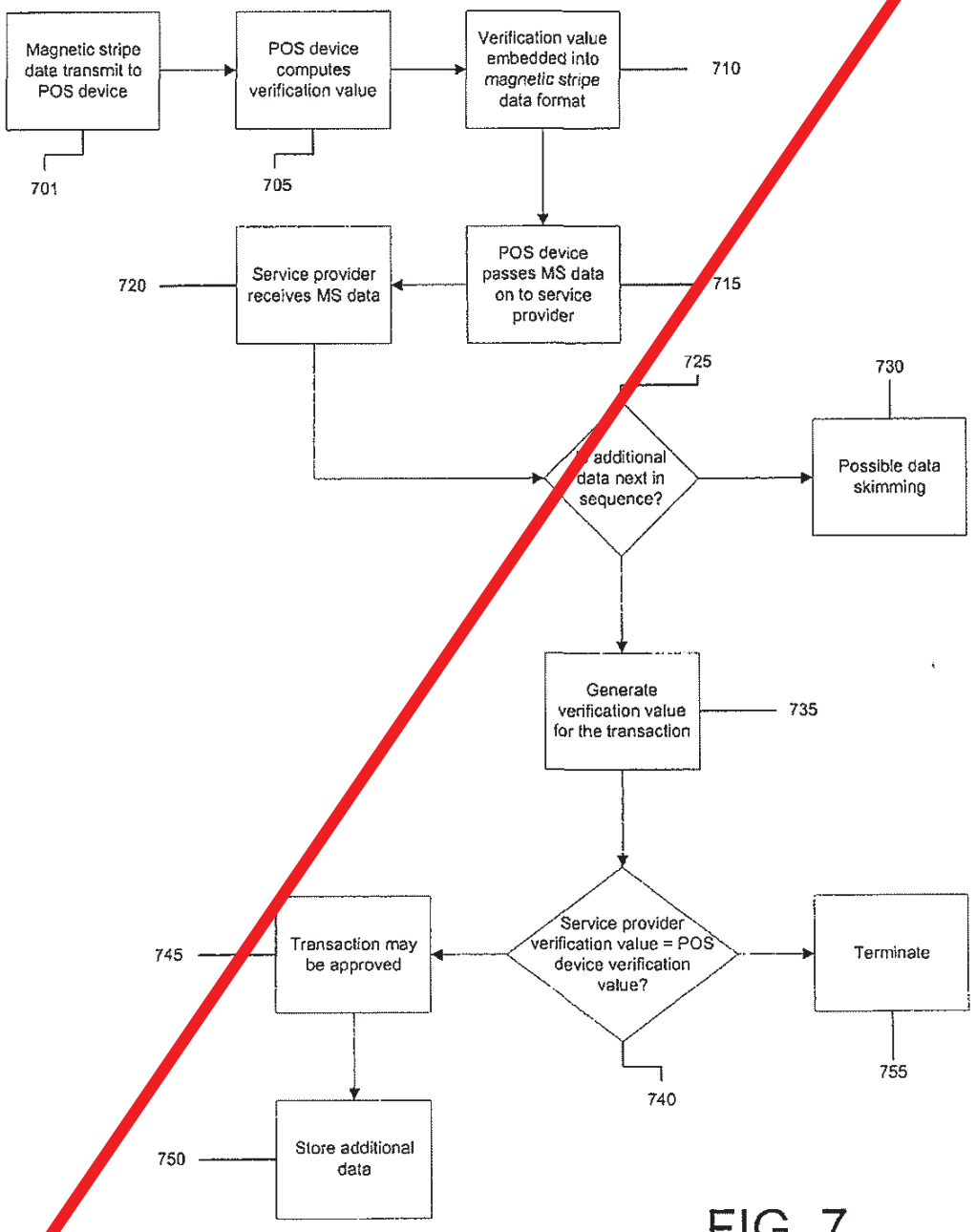

Magnetic stripe data transmit to POS device
701
POS device computes verification value
705
Verification value embedded into magnetic stripe data format
710
POS device passes MS data on to service provider
715
Service provider receives MS data
720
725
additional data next in sequence?
730
Possible data skimming
Generate verification value for the transaction
735
Service provider verification value = POS device verification value?
740
Terminate
755
Transaction may be approved
745
Store additional data
750

FIG. 7

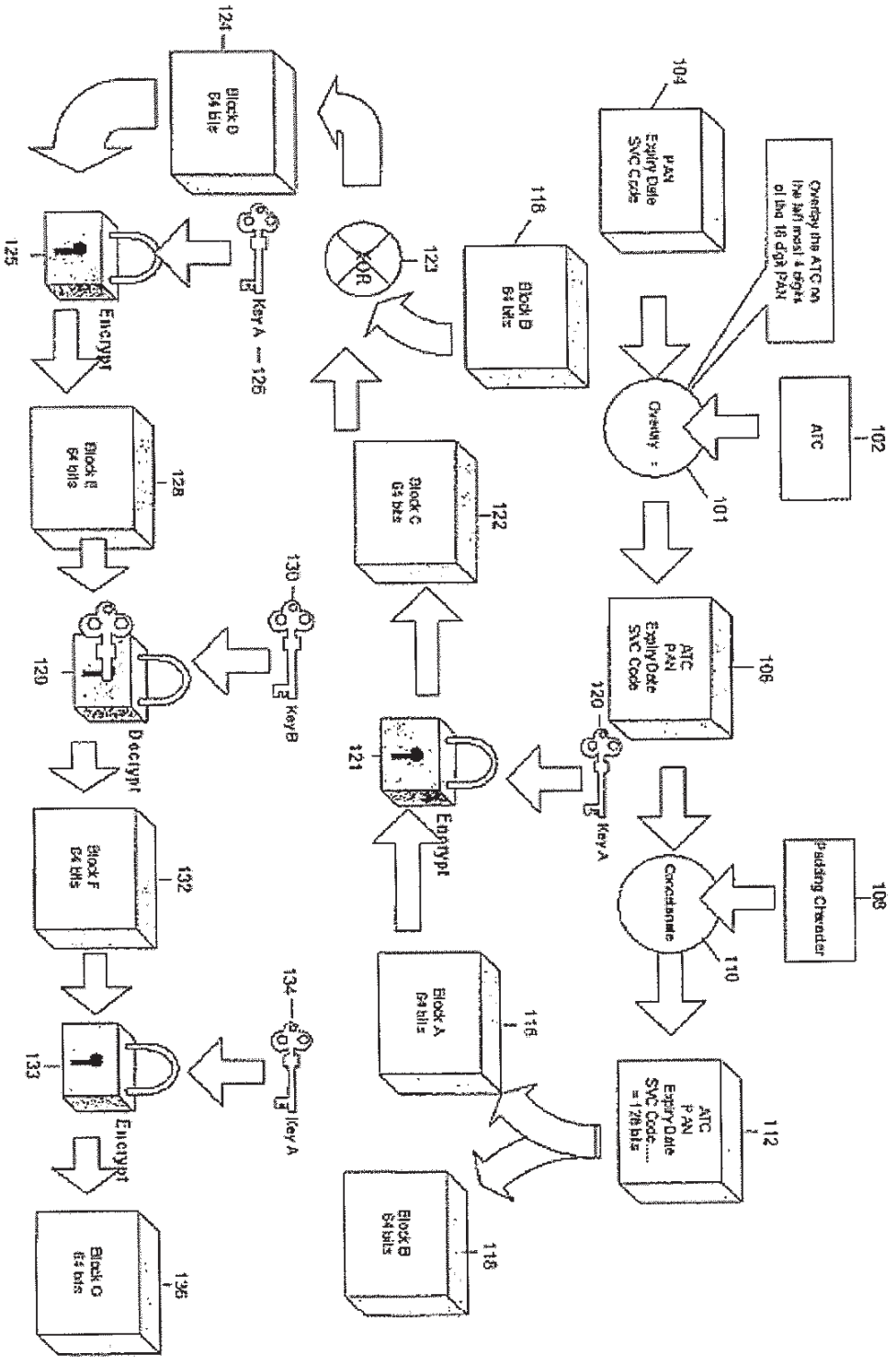

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64 bits
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XOR
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116
Block D
64 bits
124
Key A
125
Encrypt
Block E
64 bits
128
Key B
130
Decrypt
129
Block F
64 bits
132
Key A
134
Encrypt
133
Block G
64 bits
136

FIG. 1

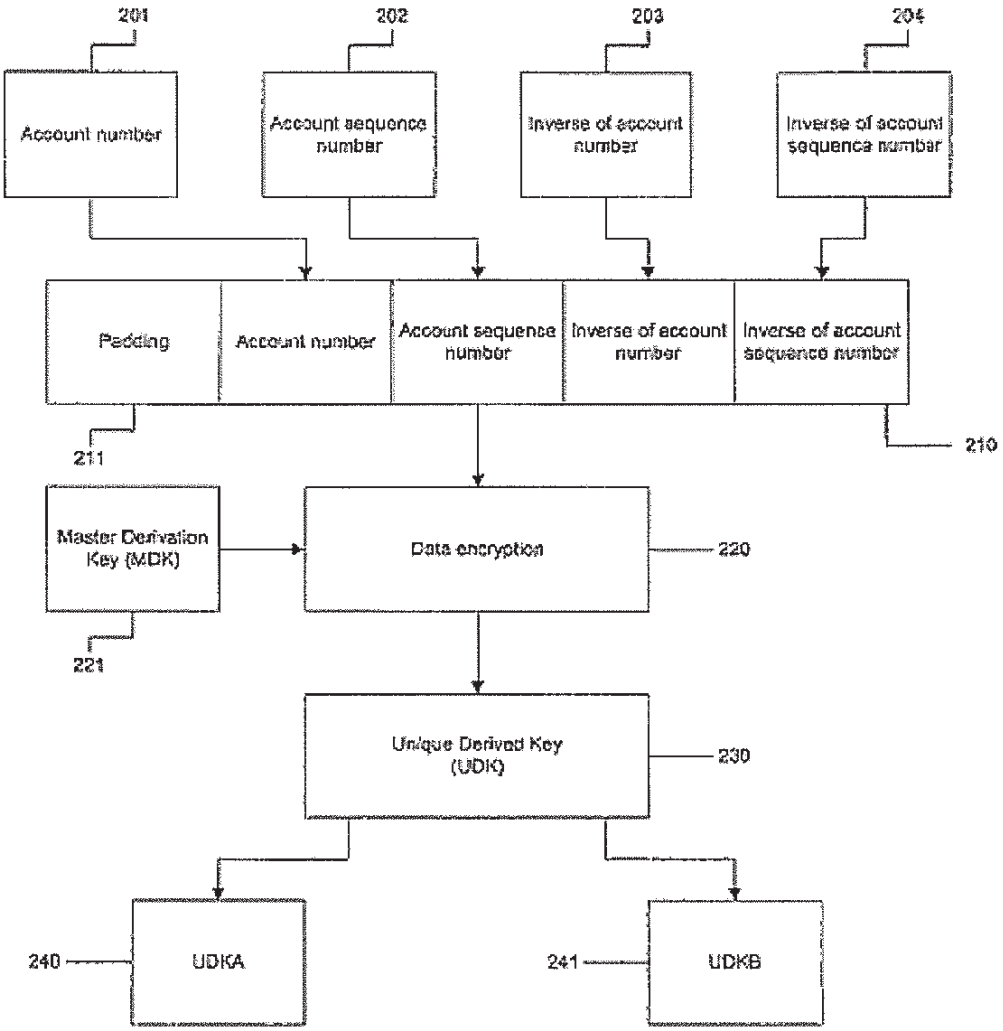

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Inverse of account number
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Padding
Account number
Account sequence number
Inverse of account number
Inverse of account sequence number
211
210
Master Derivation Key (MDK)
Data encryption
220
221
Unique Derived Key (UDK)
230
240
UDKA
241
UDKB

FIG. 2

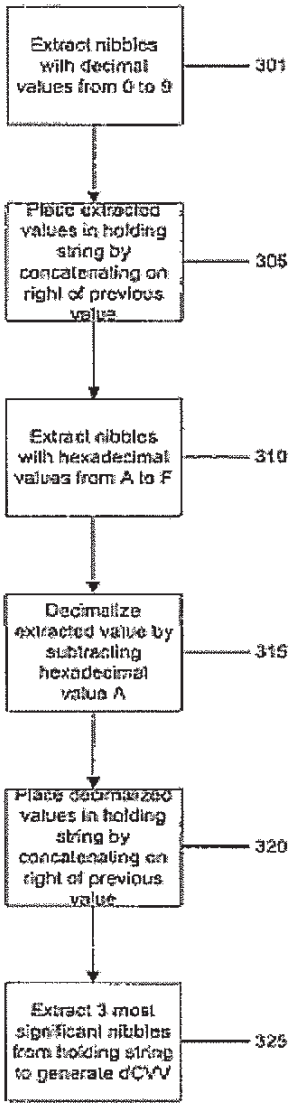

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FIG. 3



FIG. 4



FIG. 5

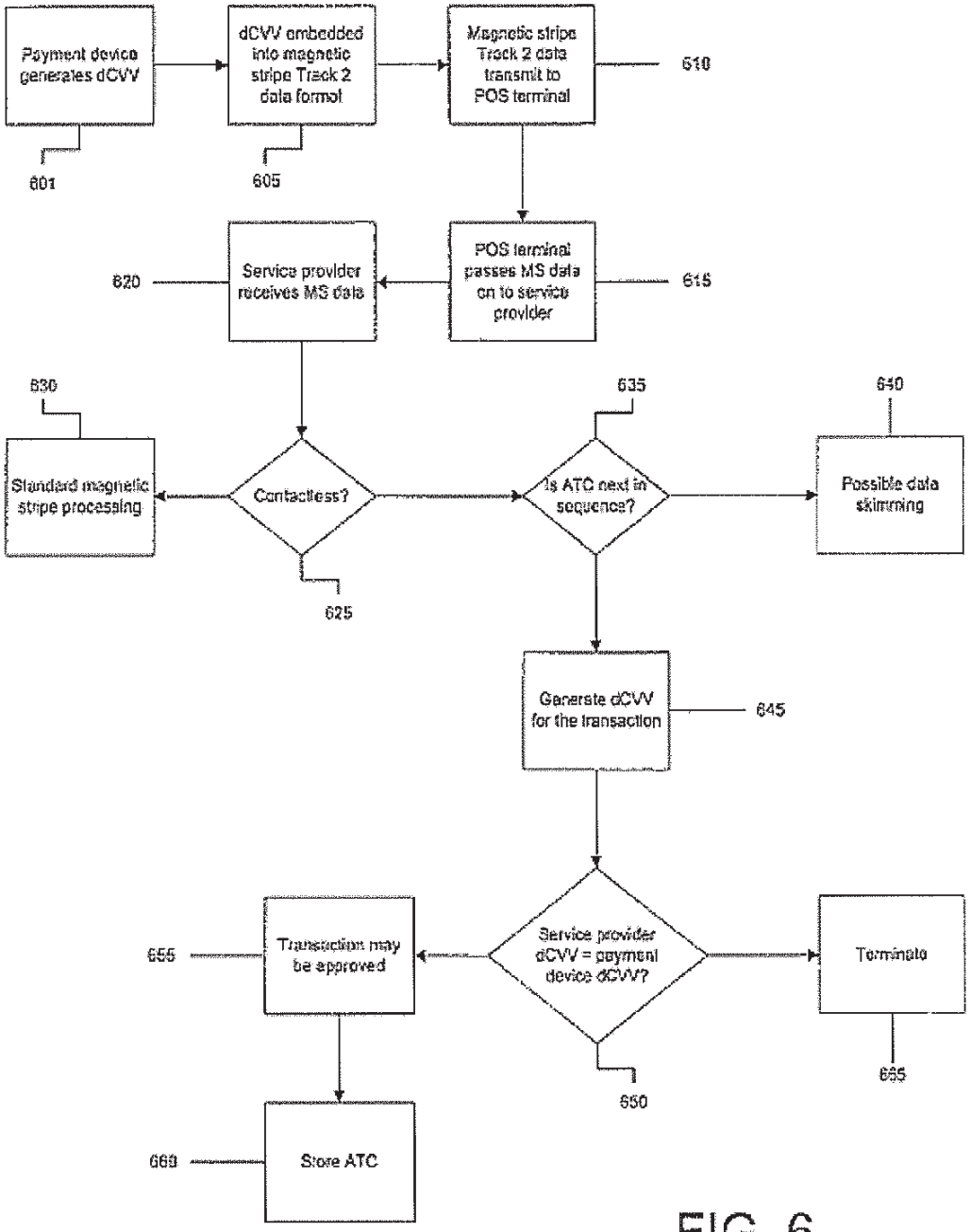

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665

FIG. 6

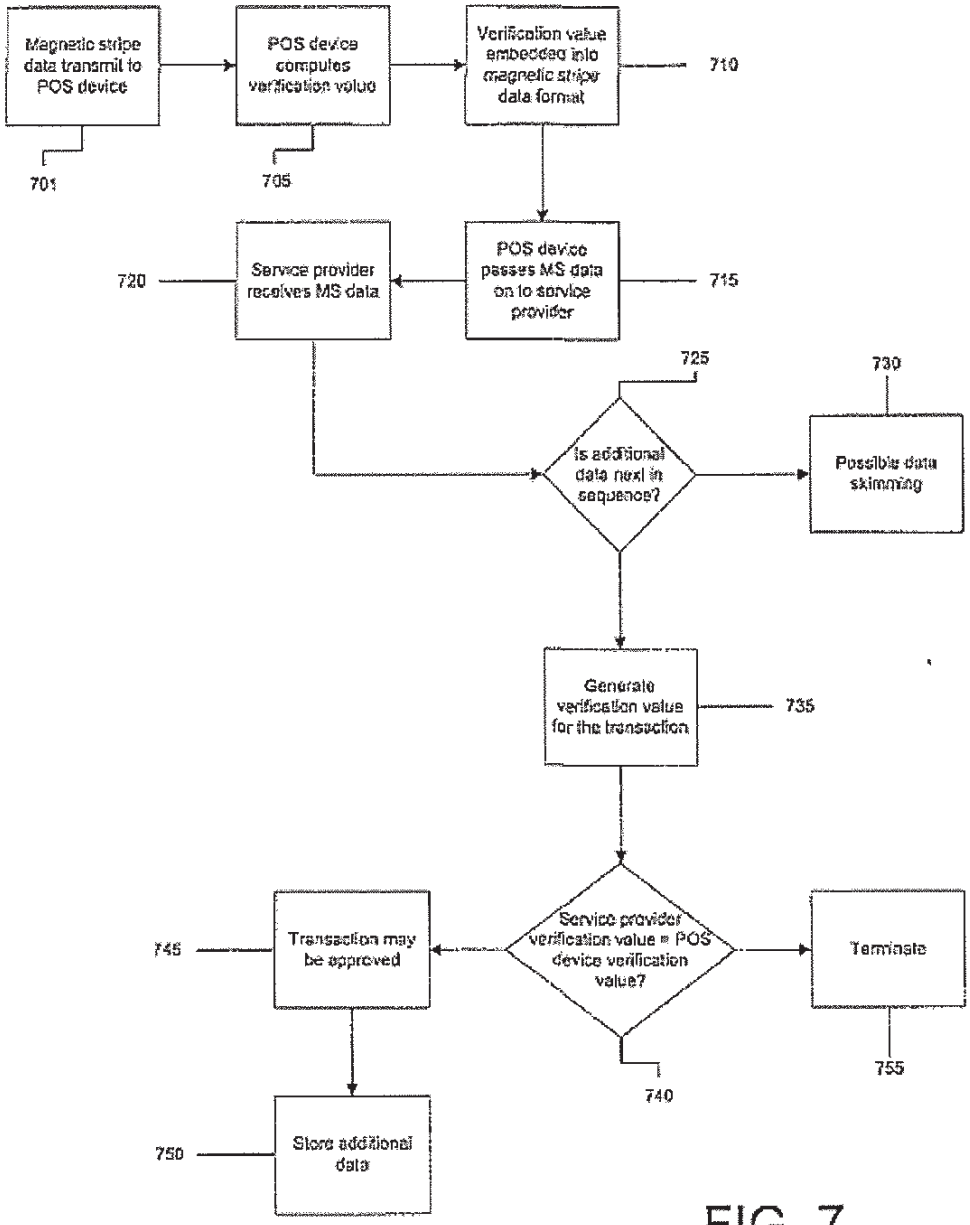

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740
Transaction may be approved
745
Terminate
755
Store additional data
750

FIG. 7