

REMITTANCE METHOD AND APPARATUS

TECHNICAL FIELD

[0001] One or more embodiments of this specification relate to the field of blockchain technologies, and in particular, to a remittance method and apparatus.

BACKGROUND

[0002] A blockchain technology (also referred to as a distributed ledger technology) is a decentralized distributed database technology, has a plurality of features such as decentralization, openness and transparency, tamper-resistance, and trustworthiness, and is applicable to various application scenarios in which there is a high requirement for data reliability.

SUMMARY

[0003] In view of this, one or more embodiments of this specification provide a remittance method and apparatus.

[0004] To achieve the above-mentioned objectives, one or more embodiments of this specification provide the following technical solutions.

[0005] According to a first aspect of one or more embodiments of this specification, a remittance method is provided, and is implemented by a blockchain system, including: receiving a remittance transaction, where the remittance transaction records a payment institution and a collection institution for a remittance operation, and a target payment currency and a target collection currency for the remittance operation; verifying the target payment currency based on payment currency support information of the payment institution which is maintained in the blockchain system, and verifying the target collection currency based on collection currency support information of the collection institution which is maintained in the blockchain system; and performing a remittance operation for the remittance transaction when a remittance condition is satisfied, where the remittance condition includes: the target payment currency is an available payment currency that is supported by the payment institution and that is recorded in the payment

currency support information, and the target collection currency is an available collection currency that is supported by the collection institution and that is recorded in the collection currency support information.

[0006] According to a second aspect of one or more embodiments of this specification, a remittance apparatus is provided, and is implemented by a blockchain system, including: a receiving unit, configured to receive a remittance transaction, where the remittance transaction records a payment institution and a collection institution for a remittance operation, and a target payment currency and a target collection currency for the remittance operation; a verification unit, configured to: verify the target payment currency based on payment currency support information of the payment institution which is maintained in the blockchain system, and verify the target collection currency based on collection currency support information of the collection institution which is maintained in the blockchain system; and an execution unit, configured to perform a remittance operation for the remittance transaction when a remittance condition is satisfied, where the remittance condition includes: the target payment currency is an available payment currency that is supported by the payment institution and that is recorded in the payment currency support information, and the target collection currency is an available collection currency that is supported by the collection institution and that is recorded in the collection currency support information.

[0007] According to a third aspect of one or more embodiments of this specification, an electronic device is provided, including: a processor; and a memory, configured to store processor-executable instructions, where the processor runs the executable instructions, to implement the method in the first aspect.

[0008] According to a fourth aspect of one or more embodiments of this specification, a computer-readable storage medium is provided. The computer-readable storage medium stores computer instructions, and when the instructions are executed by a processor, steps of the method in the first aspect are implemented.

BRIEF DESCRIPTION OF DRAWINGS

[0009] FIG. 1 is a flowchart illustrating a remittance method, according to an example embodiment;

[0010] FIG. 2 is a flowchart illustrating a cross-currency remittance method, according to an

example embodiment;

[0011] FIG. 3 is a diagram illustrating interaction of a remittance contract and a currency management contract, according to an example embodiment;

[0012] FIG. 4 is a schematic structural diagram illustrating a device, according to an example embodiment; and

[0013] FIG. 5 is a block diagram illustrating a remittance apparatus, according to an example embodiment.

DESCRIPTION OF EMBODIMENTS

[0014] Example embodiments are described in detail here, and examples of the example embodiments are presented in the accompanying drawings. When the following description relates to the accompanying drawings, unless specified otherwise, same numbers in different accompanying drawings represent same or similar elements. Implementations described in the following example embodiments do not represent all implementations consistent with one or more embodiments of this specification. On the contrary, the implementations are merely examples of apparatuses and methods that are described in the appended claims in detail and consistent with some aspects of one or more embodiments of this specification.

[0015] It should be noted that, in some other embodiments, the steps of the corresponding method are not necessarily performed in the order shown and described in this specification. In some other embodiments, the method can include more or fewer steps than those described in this specification. In addition, a single step described in this specification may be decomposed into a plurality of steps in some other embodiments for description; and a plurality of steps described in this specification may be combined into a single step for description in some other embodiments.

[0016] Remittance is also referred to as a money transfer, and is a common asset transfer method. A remittance operation relates to a payer and a payee, and the payer and the payee usually complete the remittance operation through a remittance institution such as a bank.

[0017] In an actual remittance process, the remittance institution limits a remittance currency used for the remittance operation. In other words, different remittance institutions support different remittance currencies. Usually, the same remittance institution may impose different limitations on a payment currency used by the payer and a collection currency used by the payee.

[0018] Therefore, when the remittance operation is performed through the remittance institution, a specified remittance institution needs to support a remittance currency specified for a current remittance operation. The current remittance operation can be successfully performed only when the payment institution can support a payment currency specified by the payer and a collection institution can support a collection currency specified by the payee.

[0019] In a related technology, each remittance institution independently maintains support information of the remittance institution for each currency, or records the support information in a centralized server. If each remittance institution independently maintains the support information, when a blockchain system receives a remittance transaction, the blockchain system first requires each remittance institution related to the remittance transaction to determine whether the corresponding remittance institution supports a specified currency in the remittance transaction, and then performs the remittance operation after determining is completed. If the support information is recorded in the centralized server, when the blockchain system receives the remittance transaction, the blockchain system needs to first interact with the centralized server, so that the centralized server parses, in an off-chain manner, whether a corresponding remittance institution supports a specified remittance currency in the remittance transaction.

[0020] It is easily learned that, in a remittance process in the related technology, because the support information of the remittance institution for the currency is recorded in an off-chain part, the remittance institution needs to interact with the off-chain part for a plurality of times in an actual remittance process, to perform currency verification. Consequently, the remittance operation is separately from the currency verification operation, and execution efficiency of the remittance operation is greatly reduced. In addition, because currency support information is recorded in an off-chain part, currency verification is inaccurate because the currency support information is tampered with. Especially, when the currency support information is recorded in the centralized server, it is difficult to avoid a case in which the centralized server is malicious and the currency support information is tampered with.

[0021] Therefore, this specification provides a remittance method, to avoid a problem that execution efficiency of the remittance operation is low because currency verification and the remittance operation are separated from each other and a problem that currency verification is inaccurate because the currency support information is tampered with.

[0022] FIG. 1 is a flowchart illustrating a remittance method, according to an example

embodiment of this specification. The method is implemented by a blockchain system. As shown in FIG. 1, the method can include the following steps.

[0023] Step 102: Receive a remittance transaction, where the remittance transaction records a payment institution and a collection institution for a remittance operation, and a target payment
5 currency and a target collection currency for the remittance operation.

[0024] It can be learned from the above-mentioned descriptions that, in a related technology, currency support information of a remittance institution is recorded in the remittance institution or a centralized server, so that when performing the remittance transaction, the blockchain system needs to frequently interact with an off-chain part to determine whether a remittance institution
10 specified in the remittance transaction supports a remittance currency specified in the transaction. Consequently, a currency verification operation and a remittance operation are separated, and execution efficiency of the remittance operation is greatly reduced. In addition, because the currency support information in the related technology is recorded in the off-chain part, the currency support information is easily tampered with, especially when the currency support
15 information is recorded in the centralized server.

[0025] In view of this, in this specification, the currency support information of the remittance institution is prestored in the blockchain system, so that the blockchain system maintains currency support information of each remittance institution. Based on this, when receiving the remittance transaction, the blockchain system can directly verify, based on the currency support information
20 maintained in the blockchain system, whether the remittance institution specified in the remittance transaction supports the remittance currency specified in the remittance transaction, and perform the remittance operation based on the remittance transaction if a verification result is "yes". It is easily learned that, in this specification, both currency verification and the remittance operation are performed by the blockchain system, to avoid a problem in a related technology that the
25 currency verification operation and the remittance operation are separated from each other and execution efficiency of the remittance transaction is low because an off-chain device needs to perform currency verification. In addition, because a blockchain technology has a tamper-proofing characteristic, the currency support information maintained in the blockchain system is not easily tampered with, to avoid a problem that the currency support information of the remittance
30 institution is tampered with in the related technology.

[0026] Step 104: Verify the target payment currency based on payment currency support

information of the payment institution which is maintained in the blockchain system, and verify the target collection currency based on collection currency support information of the collection institution which is maintained in the blockchain system.

5 [0027] It should be noted that the currency support information maintained in the blockchain system can include payment currency support information and collection currency support information of each remittance institution. Based on this, when the blockchain system receives the remittance transaction, the currency verification operation performed by the blockchain system can include payment currency verification and collection currency verification. For example, the blockchain system can read the payment institution and the collection institution that are related
10 to the current remittance operation and that are recorded in the remittance transaction, and the target payment currency and the target collection currency that are used for the current remittance operation; and further verify the target payment currency based on the payment currency support information that is of the payment institution and that is maintained in the blockchain system, and verify the target collection currency based on the collection currency support information that is
15 of the collection institution and that is maintained in the blockchain system. When the verification result indicates that the target payment currency is an available payment currency supported by the payment institution, and the target collection currency is an available collection currency supported by the collection institution, it is determined that currency verification succeeds.

[0028] In this specification, the blockchain system can record the currency support information
20 of the remittance institution in a plurality of manners.

[0029] In an embodiment, the blockchain system can record the currency support information of the remittance institution in a maintained blockchain structure in a transaction form. For example, each remittance institution can upload currency support information of the remittance institution to the blockchain system by sending a transaction to the blockchain system, and the
25 blockchain system can pack the transaction including the currency support information into a block, and add the block to an end of the blockchain structure. Based on this, when receiving the remittance transaction, the blockchain system can search the blockchain structure for a transaction that records the currency support information of the specified remittance institution, to perform currency verification.

30 [0030] In another embodiment, a currency management contract can be deployed in the blockchain system, to record the currency support information of the remittance institution in the

currency management contract. Based on this, when receiving the remittance transaction, the blockchain system can invoke and execute the currency management contract to verify, based on the currency support information that is of the remittance institution and that is recorded in the currency management contract, the remittance currency specified in the remittance transaction.

5 The target payment currency specified in the remittance transaction can be verified based on the payment currency support information that is of the payment institution and that is recorded in the currency management contract. In addition, the target collection currency specified in the remittance transaction can be verified based on the collection currency support information that is of the collection institution and that is recorded in the currency management contract.

10 **[0031]** In this embodiment, a contract address of the currency management contract can be added to a remittance contract. Based on this, when receiving the remittance transaction, the blockchain system can invoke the remittance contract to invoke and execute the currency management contract based on the contract address that is of the currency management contract and that is included in the remittance contract, so that the currency management contract performs
15 currency verification. When a verification result returned by the currency management contract indicates that verification succeeds, the remittance contract can be executed, to perform the remittance operation based on remittance logic recorded in the remittance contract. It should be understood that, because the currency management contract is invoked and executed by the remittance contract, and the remittance operation of the remittance contract is performed based on
20 the verification result of the currency management contract, the currency verification operation and the remittance operation are prevented from being separated, and execution efficiency of the remittance operation is improved.

[0032] In this specification, currency verification can be performed in a plurality of manners.

[0033] In an embodiment, the currency support information of each remittance institution can
25 be directly recorded in the blockchain system in a data form. Based on this, when receiving the remittance transaction, the blockchain system can directly perform currency verification on the remittance transaction based on the recorded currency support information. For example, as described above, the currency support information can be recorded in a smart contract such as the currency management contract or a contract account. For another example, the currency support
30 information can be recorded in the blockchain structure in a transaction form as described above.

[0034] In another embodiment, on-chain assets of each currency can be released in the

blockchain system based on support of each remittance institution for the currency, to determine, based on the released on-chain assets, whether the remittance institution supports a corresponding remittance currency. In this embodiment, it is equivalent to verifying the remittance currency by using the released on-chain assets as the currency support information. In an actual execution
5 process, each remittance institution can send, to the blockchain system based on support of the remittance institution for a currency, a manner of releasing on-chain assets for transaction, to release on-chain assets of a corresponding currency in the blockchain system.

[0035] In this embodiment, when receiving the remittance transaction, the blockchain system can verify whether the released on-chain assets maintained in the blockchain system include on-
10 chain assets that are of the target payment currency and that are released by the payment institution, and verify whether the released on-chain assets include on-chain assets that are of the target collection currency and that are released by the collection institution. When a verification result indicates that the on-chain assets that are of the target payment currency and that are released by the payment institution are maintained in the blockchain system, it is determined that the target
15 payment currency is the available payment currency that is supported by the payment institution and that is recorded in the payment currency support information; and when the verification result indicates that the on-chain assets that are of the target collection currency and that are released by the collection institution are maintained in the blockchain system, it is determined that the target collection currency is the available collection currency that is supported by the collection
20 institution and that is recorded in the collection currency support information.

[0036] In this embodiment, because the remittance institution releases, in the blockchain system, on-chain assets of a currency supported by the remittance institution, when a verification result indicates that the on-chain assets of the target payment currency and the on-chain assets of the target collection currency are released in the blockchain system, the remittance operation can
25 be directly performed based on the assets released in an on-chain manner. For example, the blockchain system can allocate the on-chain assets of the target payment currency to a payer account specified in the remittance transaction, allocate the on-chain assets of the target collection currency to a payee account specified in the remittance transaction, and based on a remittance amount included in the remittance transaction, deduct the on-chain assets of the target payment
30 currency from the payer account, and add the on-chain assets of the target collection currency to the payee account. Certainly, because the target payment currency and the target collection

currency are different in most cases, the blockchain system can further exchange the remittance amount from the target payment currency to the target collection currency, to complete an on-chain asset transfer of different currencies between the payer account and the payee account.

5 [0037] In this embodiment, it should be noted that, after the blockchain system releases on-chain assets of a corresponding currency to each remittance institution, the released on-chain assets can be directly recorded in an on-chain account of the corresponding remittance institution, to mark a party of the released on-chain assets of each currency, so that the on-chain assets of the remittance institution are allocated to the payer account and the payee account when remittance needs to be performed. Certainly, the example is merely an example. A specific manner of performing the remittance operation can be determined by a person skilled in the art based on an actual requirement. This is not limited in this specification.

[0038] Step 106: Perform the remittance operation for the remittance transaction when a remittance condition is satisfied, where the remittance condition includes: the target payment currency is the available payment currency that is supported by the payment institution and that is recorded in the payment currency support information, and the target collection currency is the available collection currency that is supported by the collection institution and that is recorded in the collection currency support information.

20 [0039] In this specification, the currency support information that is of the remittance institution and that is maintained in the blockchain system can include an available payment currency and an available collection currency that are supported by each remittance institution. Based on this, if the verification result indicates that the target payment currency specified in the remittance transaction is the available payment currency supported by the payment institution, and the target collection currency specified in the remittance transaction is the available collection currency supported by the collection institution, it is determined that currency verification succeeds.

25 [0040] In this specification, the remittance condition can be preset, to perform the remittance operation based on the remittance transaction when the remittance condition is satisfied. The remittance condition includes at least "the target payment currency is the available payment currency supported by the payment institution" and "the target collection currency is the available collection currency supported by the collection institution". Based on this, the remittance conditions in this specification can further include another condition.

[0041] In an embodiment, the currency support information of each remittance institution can further include a region in which the remittance institution supports each currency. Based on this, the remittance transaction can further include address information of a payer and address information of a payee. If the address information of the payer in the remittance transaction indicates that the payer is in a region in which the payment institution supports the target payment currency, and the address information of the payee in the remittance transaction indicates that the payee is in a region in which the collection institution supports the target collection currency, it is determined that region verification of the remittance currency succeeds. Region verification of the remittance currency can be used as one of the remittance condition.

[0042] In another embodiment, the currency support information of each remittance institution can further include information about support, for each account, of each currency supported by the remittance institution. Based on this, the remittance transaction can include a payer account and a payee account that are related to the current remittance operation. When the payer account related to the remittance transaction is a first preset account that supports the target payment currency and that is recorded in the payment currency support information, and the payee account related to the remittance transaction is a second preset account that supports the target collection currency and that is recorded in the collection currency support information, it is determined that account verification of the remittance currency succeeds. Account verification of the remittance transaction can also be used as one of the remittance condition.

[0043] In this embodiment, the information that is about support for each account and that is included in the currency support information can be recorded by specifying a specific account, or can be recorded by specifying a specific account type. For example, for any remittance institution, it can be recorded as follows: The any remittance institution supports an account A and an account B to perform payment by using a currency 1 and a currency 2 and perform collection by using a currency 3 and a currency 4. The any remittance institution supports an account C and an account D to perform payment by using the currency 3 and the currency 4 and perform collection by using the currency 1 and the currency 2. For another example, for any remittance institution, it can be recorded as follows: The any remittance institution supports an a-type account to perform payment by using a currency 1 and a currency 2 and perform collection by using a currency 3 and a currency 4. The any remittance institution supports a b-type account D to perform payment by using the currency 3 and the currency 4 and perform collection by using the currency 1 and the currency 2.

[0044] In still another embodiment, the currency support information can further record a remittance limit of a single remittance operation. Based on this, whether the remittance amount recorded in the remittance transaction exceeds the remittance limit can be further verified. Whether the remittance amount exceeds a maximum payment amount that is of the target payment currency, that is supported by the payment institution, and that is recorded in the payment currency support information can be verified, and whether the remittance amount exceeds a maximum collection amount that is of the target collection currency, that is supported by the collection institution, and that is recorded in the collection currency support information. When the remittance amount does not exceed the maximum payment amount and does not exceed the maximum collection amount, it is determined that verification of the remittance amount succeeds. That verification of the remittance amount succeeds can be used as one of the remittance condition.

[0045] In this embodiment, it should be noted that the remittance amount in the remittance transaction is usually limited by the target payment currency. Therefore, when whether the remittance amount exceeds the maximum collection amount of the target collection currency specified by the collection institution is verified, the remittance amount of the target payment currency can be exchanged for the remittance amount of the target collection currency. Certainly, the remittance transaction can also limit the remittance amount by using the target collection currency. Correspondingly, in this case, the remittance amount of the target collection currency can be exchanged for the remittance amount of the target payment currency in advance, to verify whether the remittance amount exceeds the maximum payment amount specified by the payment institution.

[0046] Certainly, the above-mentioned example is merely an example, and is used to indicate a specific condition included in the remittance condition for performing the remittance operation. The condition can be determined by a person skilled in the art based on an actual requirement. This is not limited in this specification.

[0047] In this specification, when the remittance operation is actually performed, the remittance operation can be performed in an on-chain asset transfer manner as described above, or the remittance information can be recorded only in the blockchain system, so that the remittance institution performs the remittance operation in an off-chain manner based on information recorded in an on-chain part. For example, remittance information of the current remittance operation can be recorded in a transaction receipt of the remittance transaction, and the remittance

information can include at least the payment institution, the collection institution, the target payment currency, the target collection currency, and the remittance amount of the current remittance operation. Based on this, the remittance information included in the transaction receipt can be obtained by the payment institution and the collection institution, to perform an operation of performing remittance by the payment institution to the collection institution.

[0048] It should be noted that the blockchain system in this specification can be deployed based on a conventional architecture of the blockchain technology. To be specific, all nodes in the blockchain system are formed by deploying blockchain code on corresponding physical devices. In most cases, each node corresponds to one physical device. The blockchain system in this specification can alternatively be deployed based on a blockchain as a service (BaaS) architecture in the blockchain technology. To be specific, all nodes in the blockchain network are formed by deploying blockchain code on a virtual machine implemented at a cloud end by using a cloud service, and the blockchain nodes do not need to be in a one-to-one correspondence with corresponding physical devices.

[0049] It can be learned from the above-mentioned technical solutions that, in this specification, the currency support information of the remittance institution is maintained in the blockchain system, so that when receiving the remittance transaction, the blockchain system can verify, based on the currency support information that is of the remittance institution and that is maintained in the blockchain system, whether the remittance institution specified in the remittance transaction supports the remittance currency specified in the remittance transaction. When a verification result indicates that the remittance institution specified in the remittance transaction supports the remittance currency specified in the remittance transaction, it is determined that currency verification succeeds. That currency verification succeeds is used as the remittance condition for performing the remittance operation.

[0050] It should be understood that, in this specification, currency verification can be completed based on the currency support information maintained in an on-chain manner, to avoid a problem in a related technology that, because the currency support information is recorded in an off-chain part, the currency verification operation needs to be performed by using an off-chain device, and consequently, the on-chain remittance operation and the currency verification operation are separated and execution efficiency of the remittance operation is low.

[0051] In addition, the currency support information is recorded in the blockchain system, to

avoid a problem in a related technology that the currency support information is easily tampered with because the currency support information is recorded in the remittance institution or the centralized server.

5 [0052] Further, in this specification, the currency verification operation can be performed by deploying the currency management contract. The contract address of the currency management contract can be recorded in the remittance contract, so that the remittance contract can implement currency verification by invoking the currency management contract. It should be understood that, in this manner, the currency management contract can be quickly invoked in a process of performing the remittance operation, to implement currency verification, thereby further
10 improving execution efficiency of the remittance operation.

[0053] The following describes the technical solutions in this specification by using an example "The remittance institution is a bank and performs the remittance operation by executing the smart contract".

[0054] FIG. 2 is a flowchart illustrating a cross-currency remittance method, according to an
15 example embodiment of this specification. The method is applied to a blockchain system. As shown in FIG. 2, the method can include the following steps.

[0055] Step 201: Receive a remittance transaction initiated by a payer.

[0056] In this embodiment, when a user needs to perform a remittance, the user can initiate a remittance transaction to the blockchain system by using a held terminal device, so that the
20 blockchain system performs a remittance operation based on remittance information included in the remittance transaction.

[0057] Step 202: Read the remittance information included in the remittance transaction.

[0058] In this embodiment, the remittance information recorded in the remittance transaction can include information such as a payer, a payment bank specified by the payer, a payee, a
25 collection bank specified by the payee, a remittance amount, a target payment currency used for current remittance, and a target collection currency. When receiving the remittance transaction, the blockchain system can read the remittance information included in the remittance transaction, to perform currency verification, and perform the remittance operation when currency verification succeeds.

30 [0059] Step 203: Determine, from maintained currency support information of each bank, currency support information of the payment bank and the collection bank that are specified in the

remittance information.

[0060] In this embodiment, after the remittance information is read, the currency support information of the payment bank and the collection bank that are specified in the remittance information can be first determined from the maintained currency support information of each bank, and then currency verification is performed based on the determined currency support information.

[0061] In this embodiment, a currency verification operation and the remittance operation can be performed by invoking a smart contract. In this case, the currency support information of each bank can be recorded in a corresponding smart contract in advance, so that the smart contract performs currency verification based on the currency support information maintained by the smart contract.

[0062] For example, a currency management contract and a remittance contract that are shown in FIG. 3 can be deployed in the blockchain system. The currency management contract records the currency support information of each bank, and is responsible for verifying, based on the recorded currency support information, the target payment currency and the target collection currency that are specified in the remittance information. The remittance contract records a contract address of the currency management contract, so that when the remittance transaction is received and the remittance information is read from the remittance transaction, the currency management contract is invoked to perform currency verification, and the remittance operation is performed based on the remittance information when currency verification succeeds.

[0063] For ease of understanding, it is assumed that the payer included in the read remittance information is a user 1, the payee is a user 2, the specified payment bank is a bank A, and the specified collection bank is a bank B. Based on this, the currency management contract can determine, in this step, currency support information shown in Table 1.

Remittance institution	Supported available payment currency	Supported available collection currency
Bank A	Currency m and currency n	Currency m and currency z
Bank B	Currency n and currency z	Currency n and currency x

Table 1

[0064] Step 204: Determine, based on the determined currency support information, an available payment currency supported by the payment bank and an available collection currency supported by the collection bank.

5 **[0065]** In the above-mentioned example, because the payment bank specified in the remittance transaction is the bank A and the collection bank is the bank B, it can be determined from the currency support information shown in Table 1 that the available payment currency of the bank A includes "currency m and currency n", and the available collection currency of the bank B includes "currency n and currency x".

10 **[0066]** Step 205: Determine whether the target payment currency specified in the remittance information is the determined available payment currency, and determine whether the target collection currency specified in the remittance information is the determined available collection currency; and jump to step 206 if both a determining result of determining whether the target payment currency specified in the remittance information is the determined available payment
15 currency, and a determining result of determining whether the target collection currency specified in the remittance information is the determined available collection currency are "yes"; or jump to step 207 if a determining result of at least one of determining whether the target payment currency specified in the remittance information is the determined available payment currency, and determining whether the target collection currency specified in the remittance information is the
20 determined available collection currency is "no".

[0067] In the above-mentioned example, assuming that the target payment currency specified in the remittance information is the currency m and the target collection currency is the currency n, because the currency m is exactly the available payment currency supported by the bank A and the currency n is exactly the available collection currency supported by the bank B, it is determined
25 that currency verification succeeds. In this case, the currency management contract can output a verification result indicating that currency verification succeeds. The remittance contract can use the verification result as an input parameter, and perform the remittance operation when it is determined, based on the input parameter, that currency verification succeeds.

[0068] It is alternatively assumed that if the target payment currency specified in the
30 remittance information is the currency z and the target collection currency is the currency x,

although the currency x is exactly the available collection currency supported by the bank B, currency verification fails because the currency z is not the available payment currency of the bank A. The currency management contract can still output the verification result, so that the remittance contract uses the verification result as an input parameter. However, when the remittance contract determines, based on the input parameter, that currency verification fails, step 207 can be performed, to end the remittance operation. Certainly, a case in which only verification of a collection currency fails and a case in which current verification of both a payment currency and a collection currency fails are similar. Details are omitted here for simplicity.

[0069] Step 206: Perform the remittance operation based on the remittance transaction.

[0070] In this embodiment, when currency verification succeeds, remittance information of a current remittance operation can be recorded in a transaction receipt of the remittance transaction. After the remittance information is recorded, it is considered as that an on-chain remittance operation is completed. The remittance institution can obtain, by monitoring the transaction receipt in the blockchain system, the remittance information whose currency verification succeeds, to perform, in an off-chain manner based on the remittance information, an operation of performing remittance by the payment bank to the collection bank. For example, after receiving off-chain assets of the target payment currency of the payer, the payment bank can exchange a corresponding amount of off-chain assets of the target payment currency for off-chain assets of the target collection currency based on an exchange rate between the target collection currency and the target payment currency, and provide the off-chain assets of the target collection currency to the collection bank. Certainly, this is merely an example here. Specifically, how to perform a remittance operation can be determined by a person skilled in the art based on an actual requirement. This is not limited in this embodiment.

[0071] Step 207: End the remittance operation.

[0072] In this embodiment, if the determining result of at least one of determining whether the target payment currency specified in the remittance information is the determined available payment currency, and determining whether the target collection currency specified in the remittance information is the determined available collection currency is "no", it can be determined that at least one of the payment bank and the collection bank does not support a currency specified in the remittance transaction, and the remittance operation cannot be performed based on the remittance transaction. Therefore, the remittance operation can be directly terminated.

[0073] It can be learned from the above-mentioned technical solutions that, in the technical solutions of this specification, currency support information of each remittance institution can be managed by deploying the smart contract, and currency verification is performed on the remittance transaction based on the managed currency support information, to avoid a problem that in a related technology, the currency verification operation and the remittance operation are separated from each other because an off-chain device needs to perform the currency verification operation, thereby leading to relatively low remittance efficiency.

[0074] FIG. 4 is a schematic structural diagram illustrating a device, according to an example embodiment. Referring to FIG. 4, in terms of hardware, the device includes a processor 402, an internal bus 404, a network interface 406, a memory 408, and a nonvolatile memory 410, and certainly, may further include other hardware needed by a service. One or more embodiments of this specification can be implemented based on software. For example, the processor 402 reads a corresponding computer program from the nonvolatile memory 410 to the memory 408 and then runs the computer program. Certainly, in addition to software implementations, one or more embodiments of this specification do not preclude other implementations, such as a logic device or a combination of software and hardware. In other words, an execution body of the following processing procedure is not limited to each logical unit, and may be hardware or a logic device.

[0075] Referring to FIG. 5, a remittance apparatus can be applied to the device shown in FIG. 4, to implement the technical solutions of this specification. The remittance apparatus can include:
a receiving unit 501, configured to receive a remittance transaction, where the remittance transaction records a payment institution and a collection institution for a remittance operation, and a target payment currency and a target collection currency for the remittance operation;

a verification unit 502, configured to: verify the target payment currency based on payment currency support information of the payment institution which is maintained in the blockchain system, and verify the target collection currency based on collection currency support information of the collection institution which is maintained in the blockchain system; and

an execution unit 503, configured to perform a remittance operation based on the remittance transaction when a remittance condition is satisfied, where the remittance condition includes: the target payment currency is an available payment currency that is supported by the payment institution and that is recorded in the payment currency support information, and the target collection currency is an available collection currency that is supported by the collection institution and that is recorded in the collection currency support information.

[0076] Optionally, the verification unit 502 is further configured to:

invoke and execute a currency management contract, to verify the target payment currency based on payment currency support information of the payment institution which is recorded in the currency management contract, and verifying the target collection currency based on collection currency support information of the collection institution which is recorded in the currency management contract.

[0077] Optionally, the verification unit 502 is further configured to: invoke a remittance contract in response to the remittance transaction, to invoke and execute the currency management contract based on a contract address of the currency management contract which is included in the remittance contract. The execution unit 503 is further configured to: execute the remittance contract, to perform the remittance operation based on remittance logic recorded in the remittance contract.

[0078] Optionally, the remittance condition further includes:

address information of a payer in the remittance transaction indicates that the payer is in a region in which the payment institution supports the target payment currency, and address information of a payee in the remittance transaction indicates that the payee is in a region in which the collection institution supports the target collection currency; and/or

a payer account in the remittance transaction is a first preset account that supports the target payment currency and that is recorded in the payment currency support information, and a payee account in the remittance transaction is a second preset account that supports the target collection currency and that is recorded in the collection currency support information; and/or

a remittance amount in the remittance transaction does not exceed a maximum payment amount that is of the target payment currency, that is supported by the payment institution, and that is recorded in the payment currency support information, and a remittance amount in the remittance transaction does not exceed a maximum collection amount that is of the target collection currency, that is supported by the collection institution, and that is recorded in the collection currency support information.

[0079] Optionally, the verification unit 502 is further configured to:

verify whether released on-chain assets maintained in the blockchain system include on-chain assets that are of the target payment currency and that are released by the payment institution, and whether the released on-chain assets maintained in the blockchain system include on-chain assets that are of the target collection currency and that are released by the collection institution; and

when the on-chain assets that are of the target payment currency and that are released

by the payment institution are maintained in the blockchain system, determine that the target payment currency is the available payment currency that is supported by the payment institution and that is recorded in the payment currency support information; and when the on-chain assets that are of the target collection currency and that are released by the collection institution are maintained in the blockchain system, determine that the target collection currency is the available collection currency that is supported by the collection institution and that is recorded in the collection currency support information.

[0080] Optionally, the method further includes: an allocation unit 504, configured to: allocate the on-chain assets of the target payment currency to a payer account specified in the remittance transaction, and allocate the on-chain assets of the target collection currency to a payee account specified in the remittance transaction. The execution unit 503 is further configured to: based on a remittance amount included in the remittance transaction, subtract the on-chain assets of the target payment currency from the payer account, and add the on-chain assets of the target collection currency to the payee account.

[0081] Optionally, the execution unit 503 is further configured to:
record remittance information of the current remittance operation in a transaction receipt of the remittance transaction, where the remittance information includes at least the payment institution, the collection institution, the target payment currency, the target collection currency, and a remittance amount, where

the remittance information recorded in the transaction receipt is used to perform an operation of performing remittance by the payment institution to the collection institution.

[0082] The system, apparatus, module, or unit illustrated in the above-mentioned embodiments can be implemented by using a computer chip or an entity, or can be implemented by using a product having a certain function. A typical implementation device is a computer, and a specific form of the computer can be a personal computer, a laptop computer, a cellular phone, a camera phone, a smartphone, a personal digital assistant, a media player, a navigation device, an e-mail transceiver device, a game console, a tablet computer, a wearable device, or any combination of several devices in these devices.

[0083] In a typical configuration, the computer includes one or more processors (CPU), one or more input/output interfaces, one or more network interfaces, and one or more memories.

[0084] The memory may include a non-persistent memory, a random access memory (RAM), a nonvolatile memory, and/or another form that are in a computer-readable medium, for example,

a read-only memory (ROM) or a flash memory (flash RAM). The memory is an example of the computer-readable medium.

[0085] The computer-readable medium includes a persistent and non-persistent, removable and non-removable medium, and can implement information storage by using any method or technology. Information can be a computer-readable instruction, a data structure, a program module, or other data. Examples of a storage medium of the computer include but are not limited to a phase change random access memory (PRAM), a static RAM (SRAM), a dynamic RAM (DRAM), a random access memory (RAM) of another type, a read-only memory (ROM), an electrically erasable programmable ROM (EEPROM), a flash memory or another memory technology, a compact disc read-only memory (CD-ROM), a digital versatile disc (DVD) or another optical storage, a cassette tape, a magnetic disk storage, a quantum memory, a storage medium based on graphene, another magnetic storage device, or any other non-transmission medium. The storage medium can be configured to store information that can be accessed by a computing device. Based on the definition in this specification, the computer-readable medium does not include transitory media such as a modulated data signal and carrier.

[0086] It is worthwhile to further note that, the terms "include", "comprise", or any other variant thereof are intended to cover a non-exclusive inclusion, so that a process, a method, a product or a device that includes a list of elements not only includes those elements but also includes other elements which are not expressly listed, or further includes elements inherent to such process, method, product or device. Without more constraints, an element preceded by "includes a ..." does not preclude the existence of additional identical elements in the process, method, product or device that includes the element.

[0087] Some specific embodiments of this specification are described above. Other embodiments fall within the scope of the appended claims. In some cases, the actions or steps described in the claims can be performed in an order different from that in the embodiments, and the desired results can still be achieved. In addition, processes described in the accompanying drawings do not necessarily need a specific order or a sequential order shown to achieve the desired results. In some implementations, multi-tasking and concurrent processing are feasible or may be advantageous.

[0088] Terms used in one or more embodiments of this specification are merely used to describe specific embodiments, and are not intended to limit the one or more embodiments of this

specification. The terms "a" and "the" of singular forms used in one or more embodiments of this specification and the appended claims are also intended to include plural forms, unless otherwise specified in the context clearly. It should be further understood that the term "and/or" used in this specification refers to and includes any or all possible combinations of one or more associated
5 listed items.

[0089] It should be understood that although terms "first", "second", "third", etc. may be used in one or more embodiments of this specification to describe various types of information, the information should not be limited to these terms. These terms are used merely to differentiate information of the same type. For example, without departing from the scope of one or more
10 embodiments of this specification, first information can also be referred to as second information, and similarly, the second information can also be referred to as the first information. Depending on the context, the word "if" used here can be interpreted as "when" or "while" or "in response to determining".

[0090] The above-mentioned descriptions are merely example embodiments of one or more
15 embodiments of this specification, but are not intended to limit the one or more embodiments of this specification. Any modification, equivalent replacement, improvement, etc. made without departing from the spirit and principle of the one or more embodiments of this specification shall fall within the protection scope of the one or more embodiments of this specification.

CLAIMS

What is claimed is:

1. A remittance method, implemented by a blockchain system, comprising:

receiving a remittance transaction, wherein the remittance transaction records a payment
5 institution and a collection institution for a remittance operation, and a target payment currency
and a target collection currency for the remittance operation;

verifying the target payment currency based on payment currency support information of the
payment institution which is maintained in the blockchain system, and verifying the target
collection currency based on collection currency support information of the collection institution
10 which is maintained in the blockchain system; and

performing the remittance operation for the remittance transaction when a remittance
condition is satisfied,

wherein the remittance condition comprises: the target payment currency is an available
payment currency that is supported by the payment institution and that is recorded in the payment
15 currency support information, and the target collection currency is an available collection currency
that is supported by the collection institution and that is recorded in the collection currency support
information.

2. The method according to claim 1, wherein the verifying the target payment currency based
on payment currency support information of the payment institution which is maintained in the
20 blockchain system, and verifying the target collection currency based on collection currency
support information of the collection institution which is maintained in the blockchain system
comprises:

invoking and executing a currency management contract, to verify the target payment
currency based on the payment currency support information of the payment institution which is
25 recorded in the currency management contract, and verifying the target collection currency based
on the collection currency support information of the collection institution which is recorded in
the currency management contract.

3. The method according to claim 2, wherein

the invoking and executing a currency management contract comprises: invoking a
30 remittance contract in response to the remittance transaction, to invoke and execute the currency

management contract based on a contract address of the currency management contract which is comprised in the remittance contract; and

the performing the remittance operation for the remittance transaction comprises: executing the remittance contract, to perform the remittance operation based on remittance logic recorded in

the remittance contract.

4. The method according to claim 1, wherein the remittance condition further comprises:

address information of a payer in the remittance transaction indicates that the payer is in a region in which the payment institution supports the target payment currency, and address information of a payee in the remittance transaction indicates that the payee is in a region in which the collection institution supports the target collection currency; and/or

a payer account in the remittance transaction is a first preset account that supports the target payment currency and that is recorded in the payment currency support information, and a payee account in the remittance transaction is a second preset account that supports the target collection currency and that is recorded in the collection currency support information; and/or

a remittance amount in the remittance transaction does not exceed a maximum payment amount that is of the target payment currency, that is supported by the payment institution, and that is recorded in the payment currency support information, and a remittance amount in the remittance transaction does not exceed a maximum collection amount that is of the target collection currency, that is supported by the collection institution, and that is recorded in the collection currency support information.

5. The method according to claim 1, wherein the verifying the target payment currency based on payment currency support information of the payment institution which is maintained in the blockchain system, and verifying the target collection currency based on collection currency support information of the collection institution which is maintained in the blockchain system comprises:

verifying whether released on-chain assets maintained in the blockchain system comprise on-chain assets that are of the target payment currency and that are released by the payment institution, and whether the released on-chain assets maintained in the blockchain system comprise on-chain assets that are of the target collection currency and that are released by the collection institution;

when the on-chain assets that are of the target payment currency and that are released by the payment institution are maintained in the blockchain system, determining that the target payment

currency is the available payment currency that is supported by the payment institution and that is recorded in the payment currency support information; and

when the on-chain assets that are of the target collection currency and that are released by the collection institution are maintained in the blockchain system, determining that the target
5 collection currency is the available collection currency that is supported by the collection institution and that is recorded in the collection currency support information.

6. The method according to claim 5, wherein

the method further comprises: allocating the on-chain assets of the target payment currency to a payer account in the remittance transaction, and allocating the on-chain assets of the target
10 collection currency to a payee account in the remittance transaction; and

the performing the remittance operation for the remittance transaction comprises: based on a remittance amount in the remittance transaction, subtracting the on-chain assets of the target payment currency from the payer account, and adding the on-chain assets of the target collection currency to the payee account.

15 7. The method according to claim 1, wherein the performing the remittance operation for the remittance transaction comprises:

recording remittance information of the remittance operation in a transaction receipt of the remittance transaction, wherein the remittance information comprises at least the payment institution, the collection institution, the target payment currency, the target collection currency,
20 and a remittance amount, wherein

the remittance information recorded in the transaction receipt is used to perform an operation of performing remittance by the payment institution to the collection institution.

8. A remittance apparatus, implemented by a blockchain system, comprising:

a receiving unit, configured to receive a remittance transaction, wherein the remittance
25 transaction records a payment institution and a collection institution for a remittance operation, and a target payment currency and a target collection currency for the remittance operation;

a verification unit, configured to: verify the target payment currency based on payment currency support information of the payment institution which is maintained in the blockchain system, and verify the target collection currency based on collection currency support information
30 of the collection institution which is maintained in the blockchain system; and

an execution unit, configured to perform the remittance operation for the remittance

transaction when a remittance condition is satisfied,

wherein the remittance condition comprises: the target payment currency is an available payment currency that is supported by the payment institution and that is recorded in the payment currency support information, and the target collection currency is an available collection currency that is supported by the collection institution and that is recorded in the collection currency support information.

9. An electronic device, comprising:

a processor; and

a memory, configured to store processor-executable instructions, wherein

the processor runs the executable instructions, to implement the method according to any one of claims 1 to 7.

10. A computer-readable storage medium, wherein the computer-readable storage medium stores computer instructions, and when the instructions are executed by a processor, steps of the method according to any one of claims 1 to 7 are implemented.