

## CLAIMS

What is claimed is:

1.- \_\_\_\_ A data sharing system, comprising:

members, wherein each member respectively ~~maintains~~is configured to maintain sharable private data, and ~~generates~~to generate corresponding ciphertext index information for the shareable private data, the corresponding ciphertext index information ~~comprises~~comprising a ciphertext index of the ~~corresponding~~shareable private data and information about a member that provides the shareable private data; and

a sharing platform, wherein the sharing platform is connected to each member and ~~records~~being configured to record ciphertext index information generated by each member in an index blockchain for sharing among all members; the sharing platform ~~forwards~~configured to forward a data acquisition request initiated by a data requester member to a data provider member; the data acquisition request ~~comprises~~comprising a ciphertext index of target data, and the sharing platform further ~~forwards~~configured to forward the target data corresponding to the data acquisition request returned by the data provider member to the data requester member, wherein the target data is encrypted by an identity public key of the data requester member;

characterised in that

the index blockchain is configured to receive a transaction of a complaint type for the target data, wherein the transaction comprises a complaint reason and related data, and wherein the transaction invokes a smart contract for processing the complaint,

and wherein the smart contract is used to verify the complaint reason based on the related data, and when the complaint reason is verified to be legitimate, an index information set corresponding to the target data shared in the index blockchain is added with an invalid identifier in the index blockchain, the index information set comprising a ciphertext index of the target data and member information of the data provider member.

2.- \_\_\_\_ The data sharing system according to claim 1, wherein the sharing platform is configured as a blockchain node of the index blockchain; and the sharing platform ~~obtains~~is configured to obtain ciphertext index information generated by each member, and ~~publishes~~configured to publish the ciphertext index information to the index blockchain; wherein

the sharing platform ~~queries~~is configured to query, based on an information query

request initiated by any member, corresponding ciphertext index information in an index blockchain ledger maintained by the sharing platform, and ~~return~~to return the ciphertext index information to the any member; and/or at least one member ~~download~~is configured to download the index blockchain ledger maintained by the sharing platform to query ciphertext index information.

5

3.-        The data sharing system according to claim 1, wherein the sharing platform and each member are configured as blockchain nodes of the index blockchain, respectively; and each member being configured to separately ~~publishes~~publish generated ciphertext index information to the index blockchain, and ~~queries~~to query ciphertext index information by using

10 an index blockchain ledger maintained by the member:

~~4. The system according to claim 1;~~ and/or wherein the sharing platform is configured as a blockchain node of a transaction blockchain; and the sharing platform further ~~records~~being configured to record a data sharing event between the data requester member and the data provider member into the transaction blockchain.

15 ~~5.4.~~        A data sharing method applied to a data requester member, the method comprising:

determining (102) an index information set corresponding to target data and recorded in an index blockchain, wherein the index information set comprises a ciphertext index of the target data and member information of a data provider of the target data, and the index information set is shared by the data provider to the index blockchain;

20 initiating (104) a data acquisition request to the data provider by using a sharing platform, wherein the data acquisition request comprises the ciphertext index of the target data; ~~and~~

receiving (106) response data returned by the sharing platform, wherein the response data corresponds to the data acquisition request and is encrypted by an identity public key of

25 the data requester: member;

characterised by

submitting a transaction of a complaint type for the response data to the index blockchain to invoke a smart contract for processing a complaint, wherein the transaction comprises a complaint reason and related data; and

30 the smart contract is used to verify the complaint reason based on the related data, and when the complaint reason is verified to be legitimate, the index information set is added with an invalid identifier in the index blockchain.

~~6.5.~~        The method according to claim ~~54~~, wherein the sharing platform is configured as a node of the index blockchain; and the determining an index information set corresponding to target

data and recorded in an index blockchain comprises:

generating a corresponding ciphertext index based on specific information of ~~the~~ known target data; and

initiating a query request to the sharing platform, wherein the query request comprises the ciphertext index to instruct the sharing platform to query, from the index blockchain, an index information set comprising the ciphertext index; or downloading ledger data of the index blockchain maintained by the sharing platform, so as to query the index information set that comprises the ciphertext index.

~~7-6.~~ The method according to claim ~~54~~, wherein the data requester member is configured as a node of the index blockchain; and the determining an index information set corresponding to target data and recorded in an index blockchain comprises:

generating a corresponding ciphertext index based on specific information of ~~the~~ known target data; and

querying, based on ledger data of the index blockchain maintained by the data requester member, an index information set that comprises the ciphertext index.

~~8-7.~~ The method according to claim ~~54~~, wherein the data acquisition request further comprises the identity public key of the data requester member and a signature of the data requester member generated by using an identity private key of the data requester member, to facilitate verification by the data provider; ~~and/ or~~

~~9. The method according to claim 5,~~ wherein the response data further comprises a signature of the data provider generated by using an identity private key of the data provider, to facilitate verification by the data requester member.

~~10-8.~~ The method according to claim ~~54~~, wherein the index information set comprises a hash value of the target data; and the method further comprises:

performing hash computation on decrypted data corresponding to the response data; and

when a computed hash value is consistent with the hash value in the index information set, determining that the decrypted data is the target data.

~~11-9.~~ The method according to claim ~~54~~, further comprising:

initiating a complaint request for the target data to the sharing platform, wherein the complaint request comprises a complaint reason and related data; wherein

when the complaint reason is verified to be legitimate based on the related data by the sharing platform or a smart contract invoked by the sharing platform from the index blockchain, the index information set is added with an invalid identifier in the index blockchain.

~~12-10.~~ The method according to claim 54, further comprising:

~~submitting a transaction of a complaint type to the index blockchain to invoke a smart contract for processing a complaint, wherein the transaction comprises a complaint reason and related data; and~~

~~the smart contract is used to verify the complaint reason based on the related data, and when the complaint reason is verified to be legitimate, the index information set is added with an invalid identifier in the index blockchain.~~

~~13.~~ The method according to claim 5, further comprising:

~~publishing a data sharing event between the data requester member and the data provider to a transaction blockchain, wherein the data requester member is configured as a node of the transaction blockchain; or~~

~~sending the data sharing event to the sharing platform, so the sharing platform publishes the data sharing event to the transaction blockchain, wherein the sharing platform is configured as a node of the transaction blockchain.~~

~~14-11.~~ A data sharing method applied to a ~~data provider member, sharing platform~~, the method comprising:

~~sharing an index information set corresponding to target data into an index blockchain, wherein the index information set comprises a ciphertext index of the target data and member information of the data provider;~~

~~receiving a data acquisition request initiated by a data requester by using a sharing platform, wherein the data acquisition request comprises the ciphertext index of the target data; and~~

~~returning response data to the data requester by using the sharing platform, wherein the response data is encrypted by an identity public key of the data requester.~~

~~15.~~ The method according to claim 14, wherein the data acquisition request further comprises the identity public key of the data requester and a signature of the data requester generated by using an identity private key of the data requester, to facilitate verification by the data provider.

~~16.~~ The method according to claim 14, wherein the response data further comprises a signature of the data provider generated by using an identity private key of the data provider, to facilitate verification by the data requester.

~~17.~~ The method according to claim 14, wherein the sharing an index information set corresponding to target data into an index blockchain comprises:

~~publishing the index information set to the index blockchain, wherein the data provider is configured as a node of the index blockchain; or~~

~~submitting the index information set to the sharing platform, so the sharing platform publishes the index information set to the index blockchain, wherein the sharing platform is configured as a node of the index blockchain.~~

~~18. The method according to claim 14, further comprising:~~

~~publishing a data sharing event between the data requester and the data provider to a transaction blockchain, wherein the data provider is configured as a node of the transaction blockchain; and~~

~~sending the data sharing event to the sharing platform, so the sharing platform publishes the data sharing event to the transaction blockchain, wherein the sharing platform is configured as a node of the transaction blockchain.~~

~~19. A data-sharing method applied to a sharing platform, the method comprising:~~

~~publishing publishing (302) an index information set corresponding to target data to an index blockchain, wherein the index information set comprises a ciphertext index of the target data and member information of a data provider of the target data, and the index information set is submitted by the data provider to the sharing platform;~~

~~forwarding (304) a data acquisition request initiated by a data requester to the data provider, wherein the data acquisition request comprises the ciphertext index of the target data;~~

~~and~~

~~returning (306) response data corresponding to the data acquisition request provided by the data provider to the data requester, wherein the response data is encrypted by an identity public key of the data requester; and~~

~~20. characterised by~~

~~receiving a transaction of a complaint type for the response data, wherein the transaction comprises a complaint reason and related data, and wherein the transaction invokes a smart contract for processing the complaint,~~

~~wherein the smart contract is used to verify the complaint reason based on the related data, and when the complaint reason is verified to be legitimate, the index information set is added with an invalid identifier in the index blockchain.~~

~~12. The method according to claim 11, further comprising:~~

~~receiving a query request initiated by the data requester, wherein the query request comprises a ciphertext index generated based on specific information of the known target data; and~~

querying an index information set comprising the ciphertext index from the index blockchain to inform the data requester.

~~21-13.~~ The method according to claim ~~19~~11, further comprising:

5 receiving a complaint request for the target data initiated by the data requester to the sharing platform, wherein the complaint request comprises a complaint reason and related data; and

when the complaint reason is verified to be legitimate based on the related data, adding an invalid identifier to the index information set in the index blockchain; and/ or

~~22. The method according to claim 19,~~ further comprising:

10 determining a data sharing event between the data requester and the data provider; and publishing the data sharing event to a transaction blockchain, wherein the sharing platform is configured as a node of the transaction blockchain.

~~23. A data sharing apparatus applied to a data requester member, the apparatus comprising:  
a determining unit, configured to determine an index information set corresponding to  
15 target data and recorded in an index blockchain, wherein the index information set comprises a ciphertext index of the target data and member information of a data provider of the target data, and the index information set is shared by the data provider to the index blockchain;~~

~~a requesting unit, configured to initiate a data acquisition request to the data provider by using a sharing platform, wherein the data acquisition request comprises the ciphertext index  
20 of the target data; and~~

~~a receiving unit, configured to receive response data returned by the sharing platform, wherein the response data is encrypted by an identity public key of the data requester.~~

~~24. The apparatus according to claim 23, wherein the sharing platform is configured as a node of the index blockchain; and the determining unit is specifically configured to:~~

25 ~~generate a corresponding ciphertext index based on specific information of the known target data; and~~

~~initiate a query request to the sharing platform, wherein the query request comprises the ciphertext index to instruct the sharing platform to query, from the index blockchain, an index information set comprising the ciphertext index; or downloading ledger data of the index  
30 blockchain maintained by the sharing platform, so as to query the index information set that comprises the ciphertext index.~~

~~25. The apparatus according to claim 23, wherein the data requester is configured as a node of the index blockchain; and the determining unit is specifically configured to:~~

~~generate a corresponding ciphertext index based on specific information of the known target data; and~~

~~query, based on ledger data of the index blockchain maintained by the data requester, an index information set that comprises the ciphertext index.~~

5       ~~26. The apparatus according to claim 23, wherein the data acquisition request further comprises the identity public key of the data requester and a signature of the data requester generated by using an identity private key of the data requester, to facilitate verification by the data provider.~~

10       ~~27. The apparatus according to claim 23, wherein the response data further comprises a signature of the data provider generated by using an identity private key of the data provider, to facilitate verification by the data requester.~~

~~28. The apparatus according to claim 23, wherein the index information set comprises a hash value of the target data; and the apparatus further comprises:~~

15       ~~a computation unit, configured to perform hash computation on decrypted data corresponding to the response data; and~~

~~a determining unit, configured to: when a computed hash value is consistent with the hash value in the index information set, determine that the decrypted data is the target data.~~

~~29. The apparatus according to claim 23, further comprising:~~

20       ~~a complaint unit, configured to initiate a complaint request for the target data to the sharing platform, wherein the complaint request comprises a complaint reason and related data; wherein~~

~~when the complaint reason is verified to be legitimate based on the related data by the sharing platform or a smart contract invoked by the sharing platform from the index blockchain, the index information set is added with an invalid identifier in the index blockchain.~~

25       ~~30. The apparatus according to claim 23, further comprising:~~

~~a submitting unit, configured to submit a transaction of a complaint type to the index blockchain to invoke a smart contract for processing a complaint, wherein the transaction comprises a complaint reason and related data; and~~

30       ~~the smart contract is used to verify the complaint reason based on the related data, and when the complaint reason is verified to be legitimate, the index information set is added with an invalid identifier in the index blockchain.~~

~~31. The apparatus according to claim 23, further comprising a publishing unit or a sending unit, wherein~~

the publishing unit is configured to publish a data sharing event between the data requester and the data provider to a transaction blockchain, wherein the data requester is configured as a node of the transaction blockchain; and

5 the sending unit is configured to send the data sharing event to the sharing platform, so the sharing platform publishes the data sharing event to the transaction blockchain, wherein the sharing platform is configured as a node of the transaction blockchain.

32. A data sharing apparatus applied to a data provider member, the apparatus comprising:  
a sharing unit, configured to share an index information set corresponding to target data into an index blockchain, wherein the index information set comprises a ciphertext index of  
10 the target data and member information of the data provider;

a receiving unit, configured to receive a data acquisition request initiated by a data requester by using a sharing platform, wherein the data acquisition request comprises the ciphertext index of the target data; and

a returning unit, configured to return response data to the data requester by using the  
15 sharing platform, wherein the response data is encrypted by an identity public key of the data requester.

33. The apparatus according to claim 32, wherein the data acquisition request further comprises the identity public key of the data requester and a signature of the data requester generated by using an identity private key of the data requester, to facilitate verification by the  
20 data provider.

34. The apparatus according to claim 32, wherein the response data further comprises a signature of the data provider generated by using an identity private key of the data provider, to facilitate verification by the data requester.

35. The apparatus according to claim 32, wherein the sharing unit is specifically  
25 configured to:

publish the index information set to the index blockchain, wherein the data provider is configured as a node of the index blockchain; or

submit the index information set to the sharing platform, so the sharing platform publishes the index information set to the index blockchain, wherein the sharing platform is configured  
30 as a node of the index blockchain.

36. The apparatus according to claim 32, further comprising a publishing unit or a sending unit, wherein

the publishing unit is configured to publish a data sharing event between the data requester and the data provider to a transaction blockchain, wherein the data provider is configured as a node of the transaction blockchain; and

5 the sending unit is configured to send the data sharing event to the sharing platform, so the sharing platform publishes the data sharing event to the transaction blockchain, wherein the sharing platform is configured as a node of the transaction blockchain.

37. A data sharing apparatus applied to a sharing platform, the apparatus comprising:

10 a first publishing unit, configured to publish an index information set corresponding to target data to an index blockchain, wherein the index information set comprises a ciphertext index of the target data and member information of a data provider of the target data, and the index information set is submitted by the data provider to the sharing platform;

a forwarding unit, configured to forward a data acquisition request initiated by a data requester to the data provider, wherein the data acquisition request comprises the ciphertext index of the target data; and

15 a returning unit, configured to return response data provided by the data provider to the data requester, wherein the response data is encrypted by an identity public key of the data requester.

38. The apparatus according to claim 37, further comprising:

20 a first receiving unit, configured to receive a query request initiated by the data requester, wherein the query request comprises a ciphertext index generated based on specific information of the known target data; and

a query unit, configured to query an index information set comprising the ciphertext index from the index blockchain to inform the data requester.

39. The apparatus according to claim 37, further comprising:

25 a second receiving unit, configured to receive a complaint request for the target data initiated by the data requester to the sharing platform, wherein the complaint request comprises a complaint reason and related data; and

an adding unit, configured to: when the complaint reason is verified to be legitimate based on the related data, add an invalid identifier to the index information set in the index blockchain.

30 40. The apparatus according to claim 37, further comprising:

a determining unit, configured to determine a data sharing event between the data requester and the data provider; and

a second publishing unit, configured to publish the data sharing event to a transaction blockchain, wherein the sharing platform is configured as a node of the transaction blockchain.

~~41.~~ 14. An electronic device, comprising:

a processor; and

a memory, configured to store instructions executable by the processor; wherein

the processor runs the executable instructions to implement the method according to any

5 one of claims ~~5~~4 to 13.

~~42. An electronic device, comprising:~~

~~a processor; and~~

~~a memory, configured to store instructions executable by the processor; wherein~~

~~the processor runs the executable instructions to implement the method according to any~~

10 ~~one of claims 14 to 18.~~

~~43. An electronic device, comprising:~~

~~a processor; and~~

~~a memory, configured to store instructions executable by the processor; wherein~~

~~the processor runs the executable instructions to implement the method according to any~~

15 ~~one of claims 19 to 22.~~