

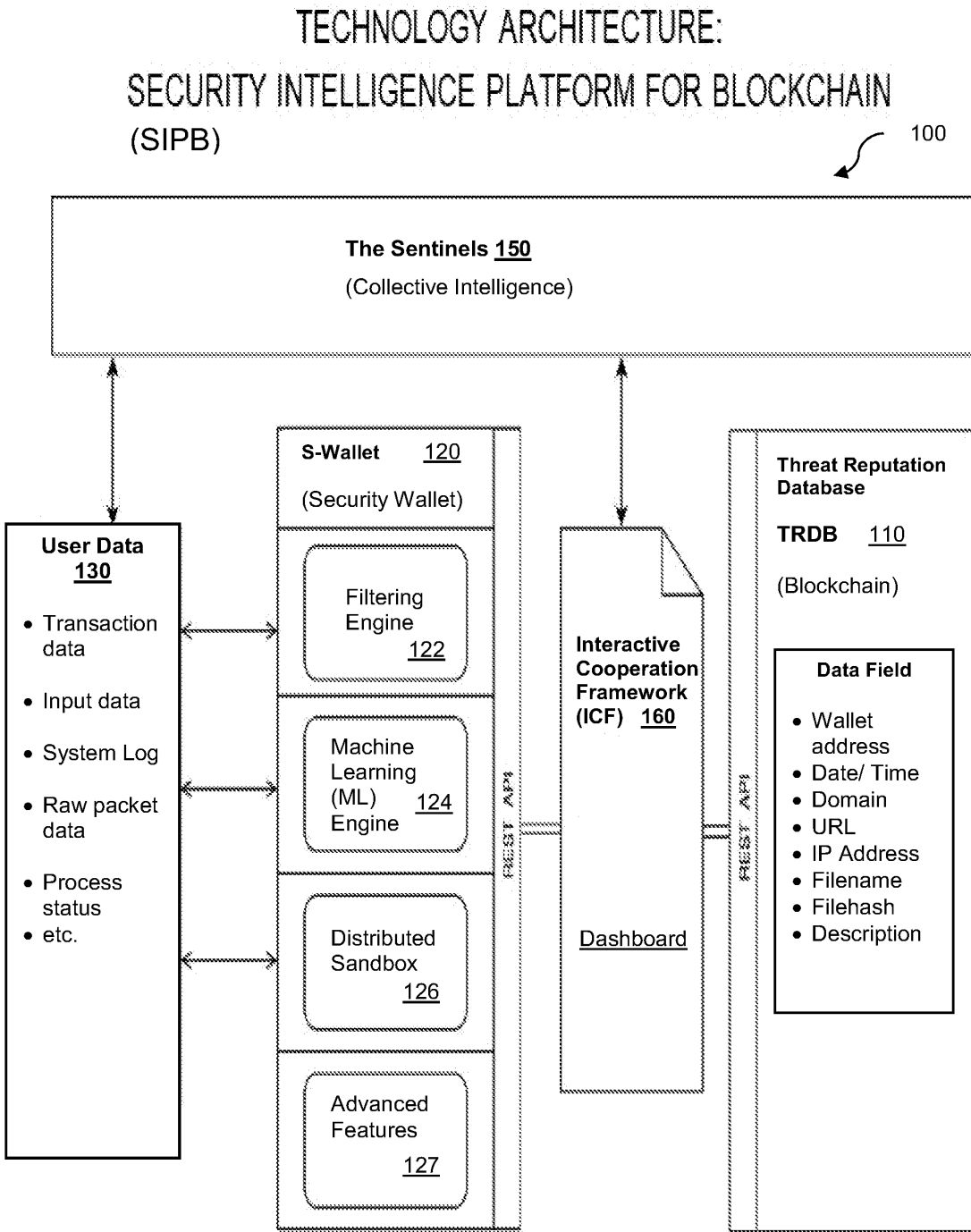


Figure 1

2/58

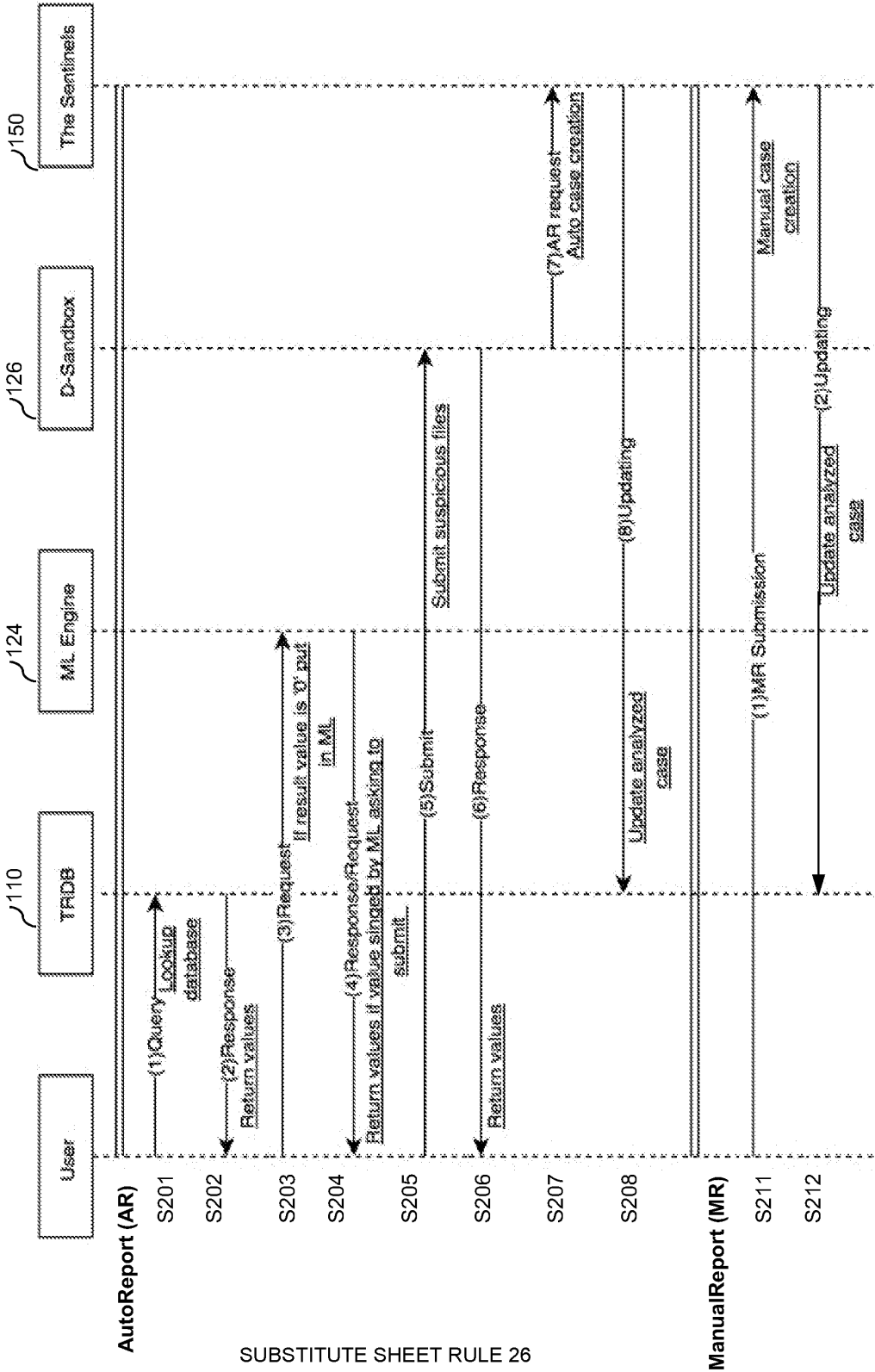


Figure 2: Security Intelligence Platform for Blockchain (SIPB) Process Flow

HIGH LEVEL CONSENSUS DIAGRAM

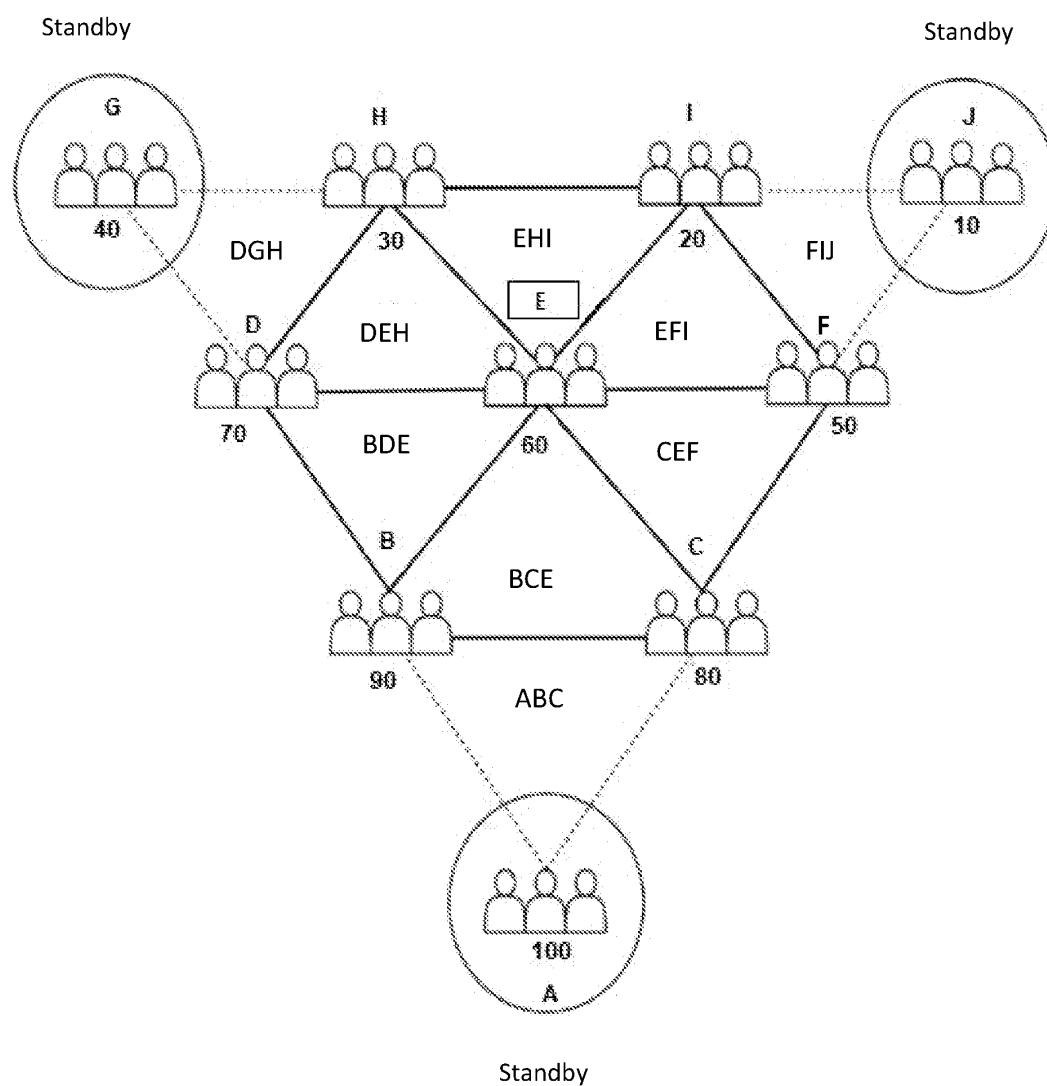


Figure 3

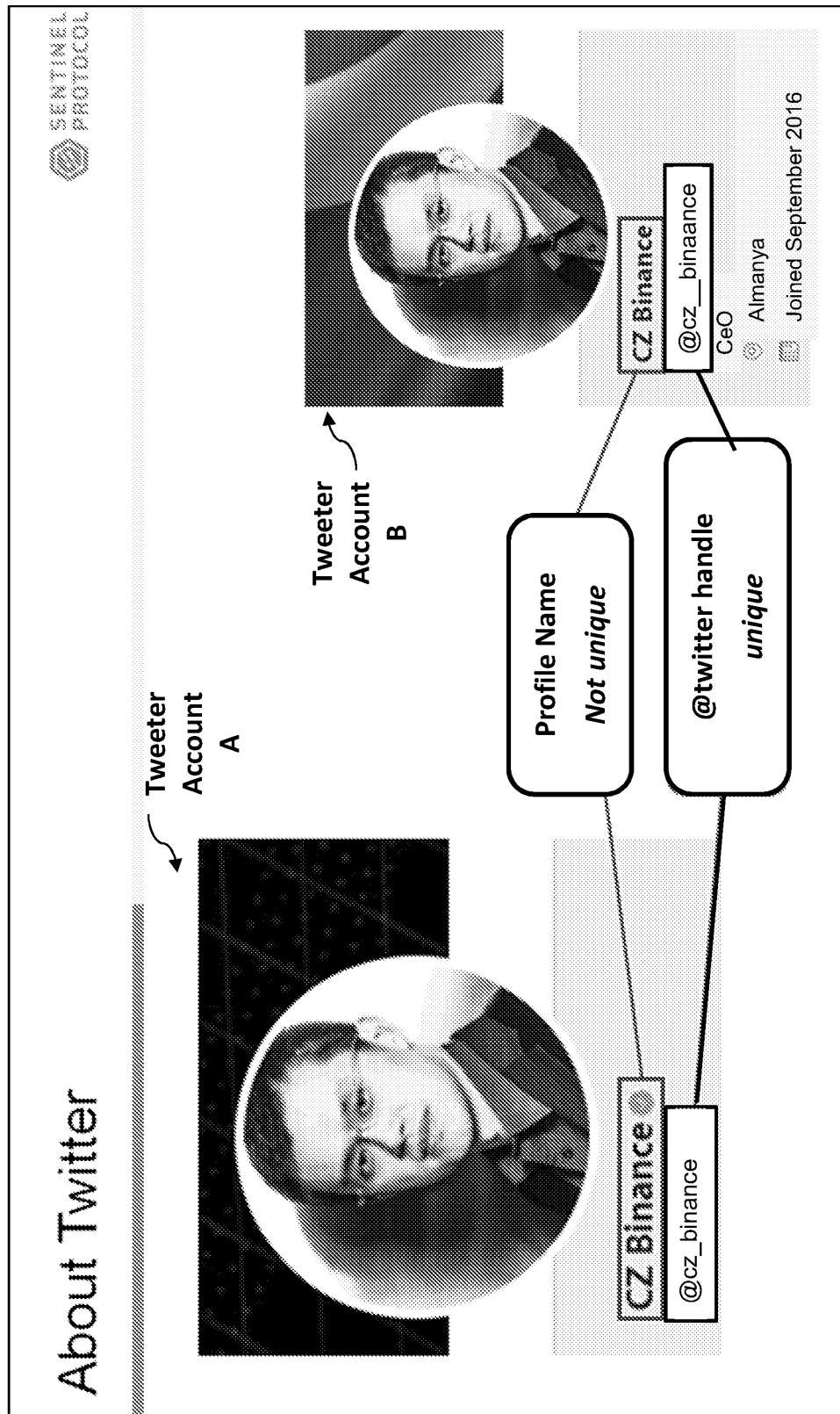


Figure 4

Issue: Twitter filled with malicious actors carrying out phishing

Figure 5A

Issue: Twitter filled with malicious actors carrying out phishing

Figure 5B



Figure 6A



Figure 6B

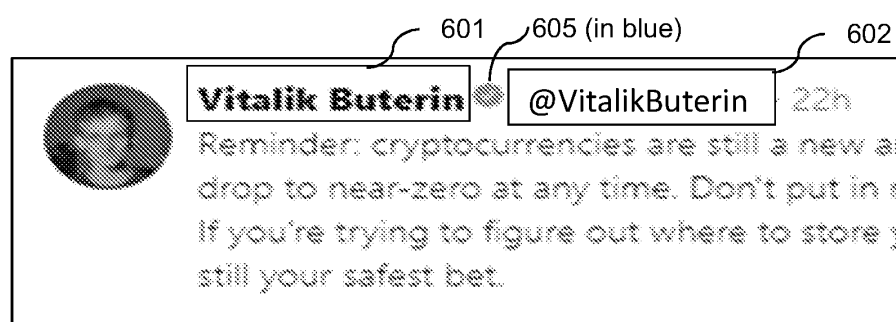


Figure 6C



- ① Omission of Characters
- ② Visually similar letters (e.g. *n* VS *m*)

Figure 7

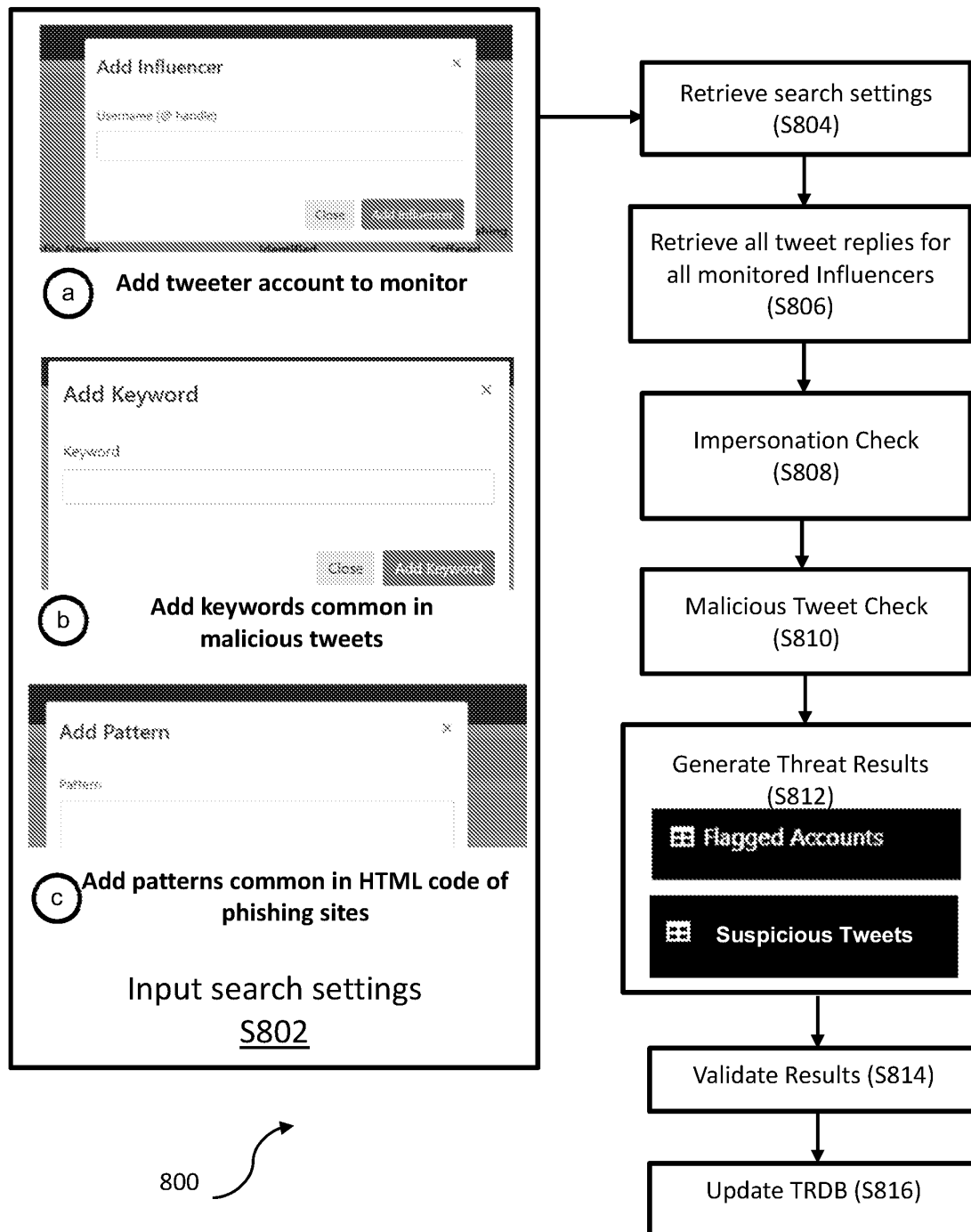
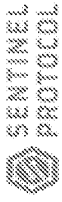


Figure 8A

Phishing & Impersonation Detection System

Backend: How ensure all new tweets available through Search API are retrieved?

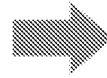


Influencer Object

Each influencer object has “lastRetrievedID” (Tweet ID of the latest retrieved tweet)

```
mentions = api.GetSearch(term="@ " + username, result_type="recent", include_entities=True,
count=100, since_id=last(sinceValue))
```

- Use twitter-python API's "GetSearch" method with "since_id"* parameter.
- Assign lastRetrievedID= tweet ID of latest retrieved tweet (i.e. largest tweet id out of all tweets returned)



Recursion used till GetSearch returns 0 mentions.

*since `id` Returns results with an ID greater than (that is, more recent than) the specified ID.

Figure 8B

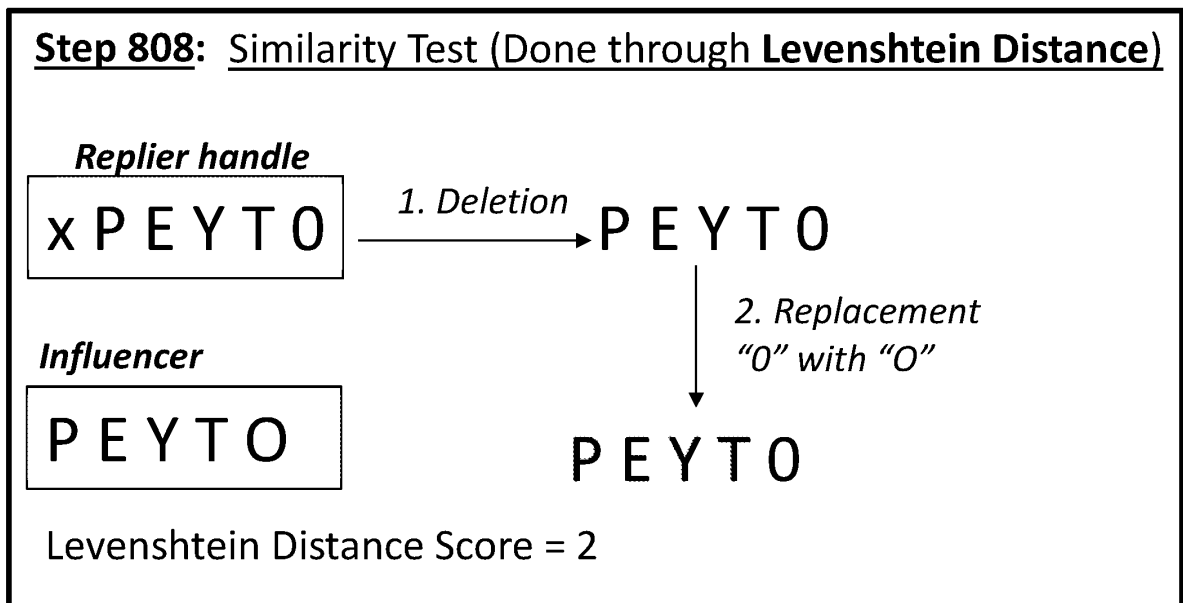


Figure 8C

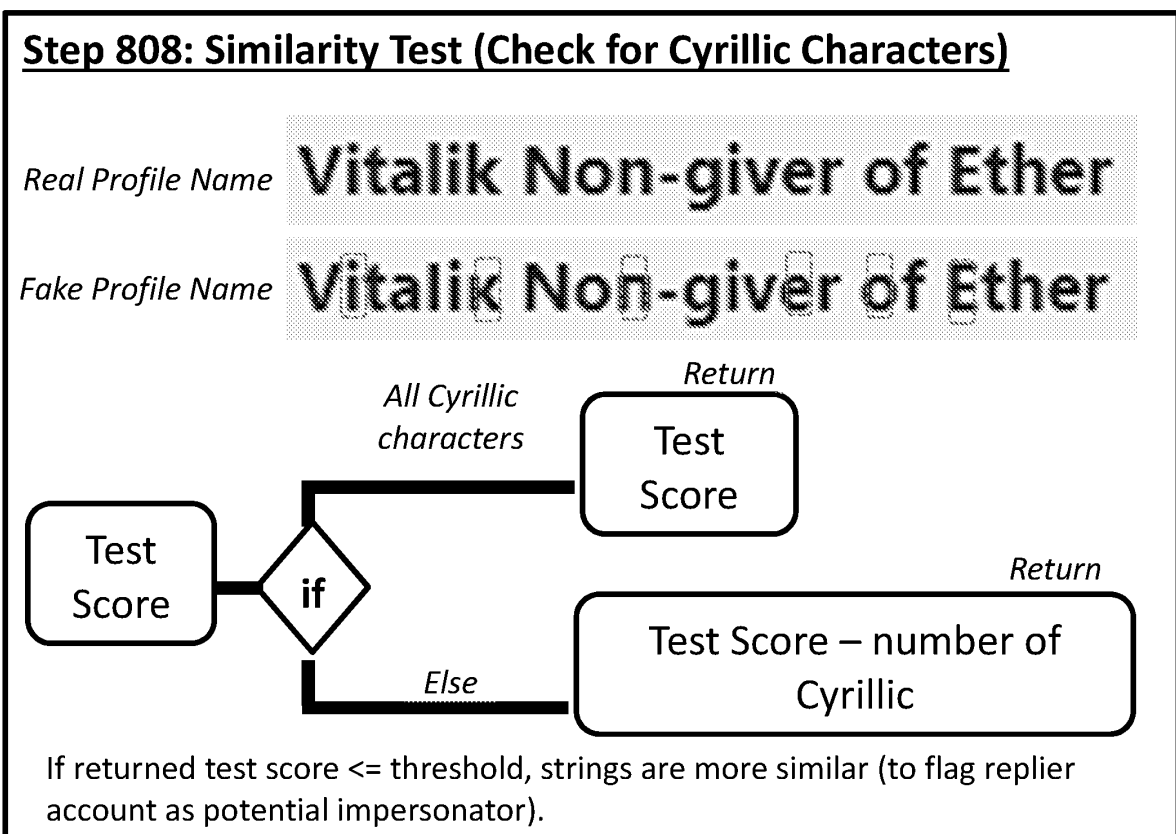


Figure 8D

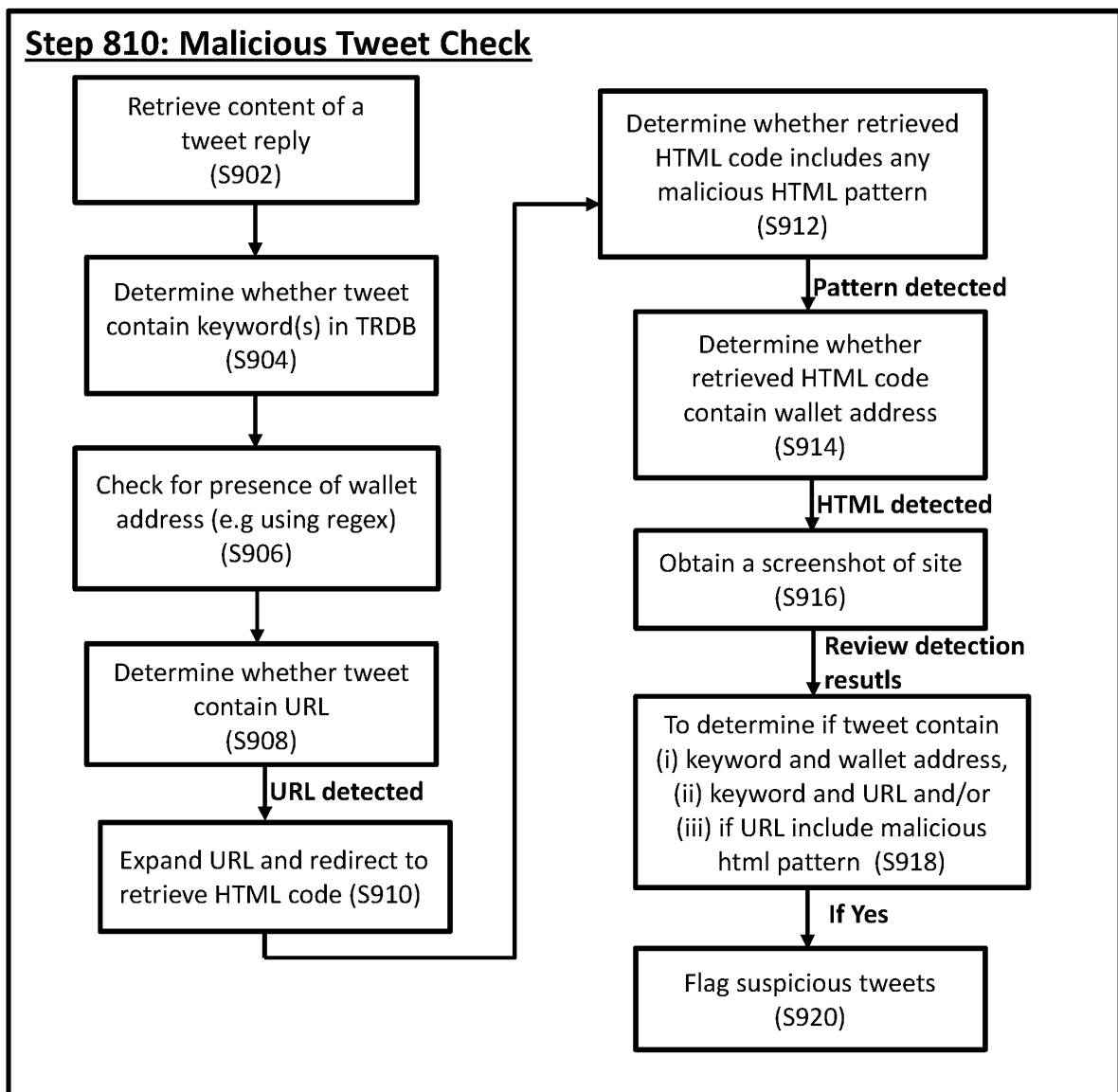
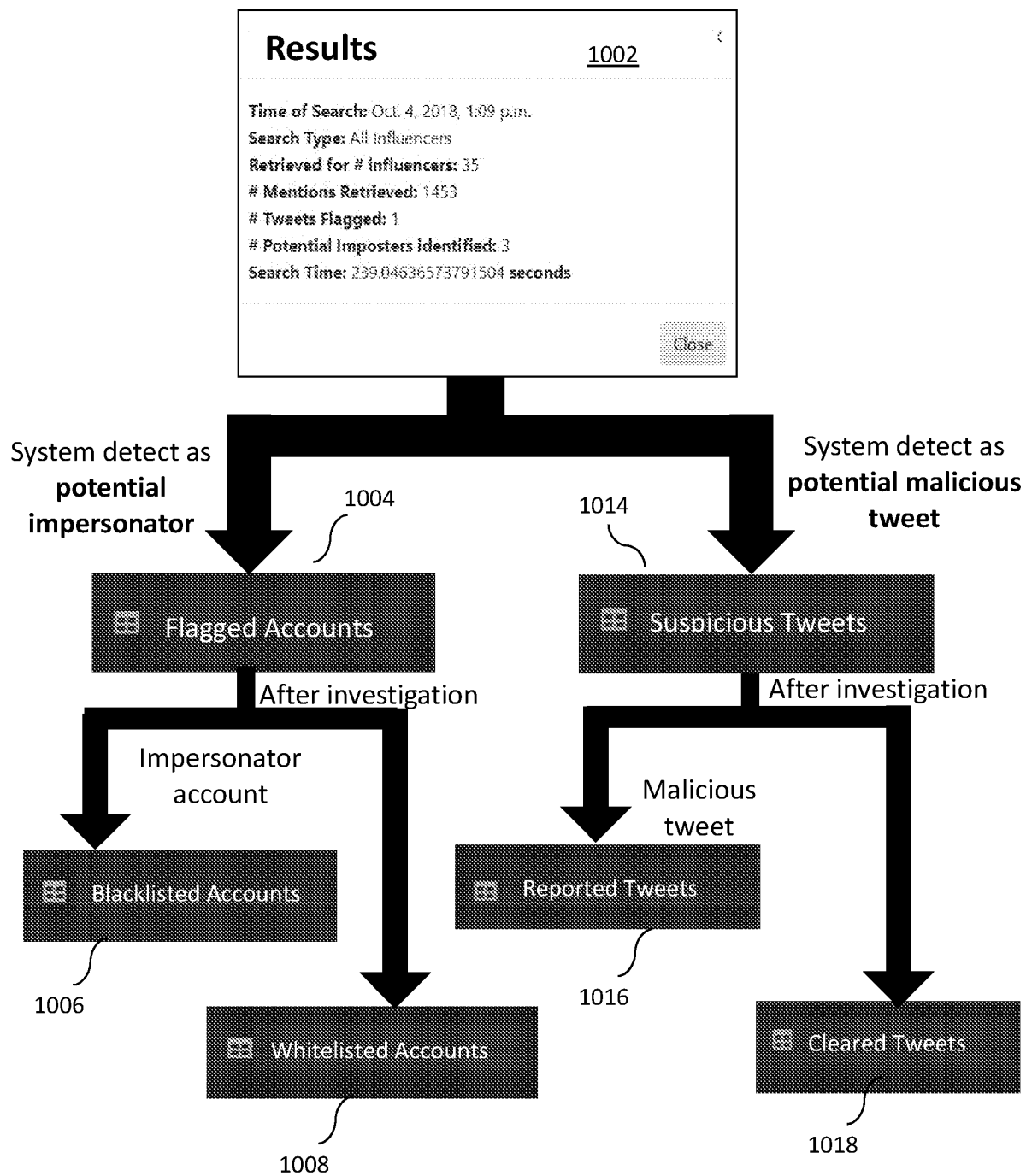


Figure 9



SUBSTITUTE SHEET RULE 26

Figure 10A

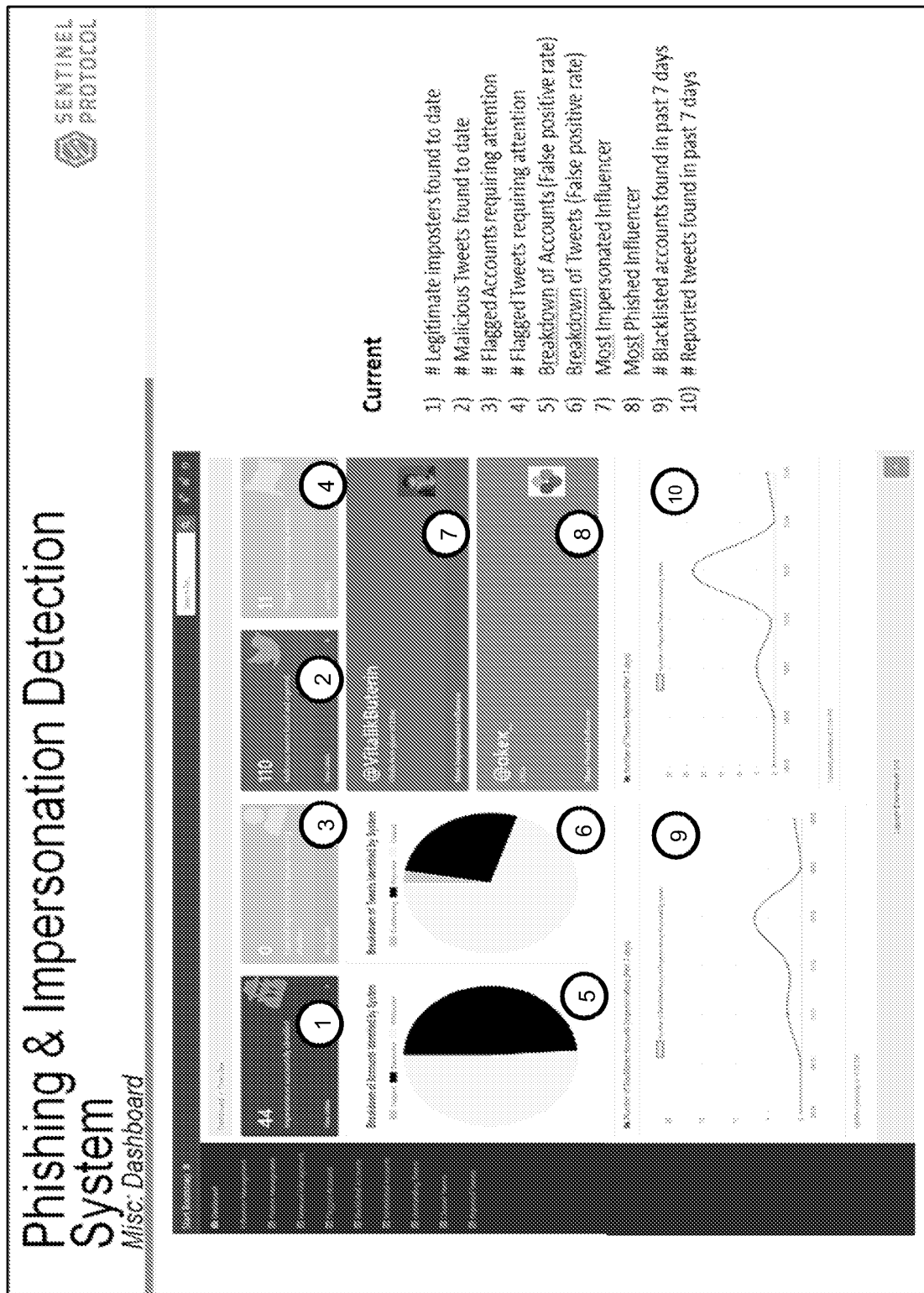


Figure 10B

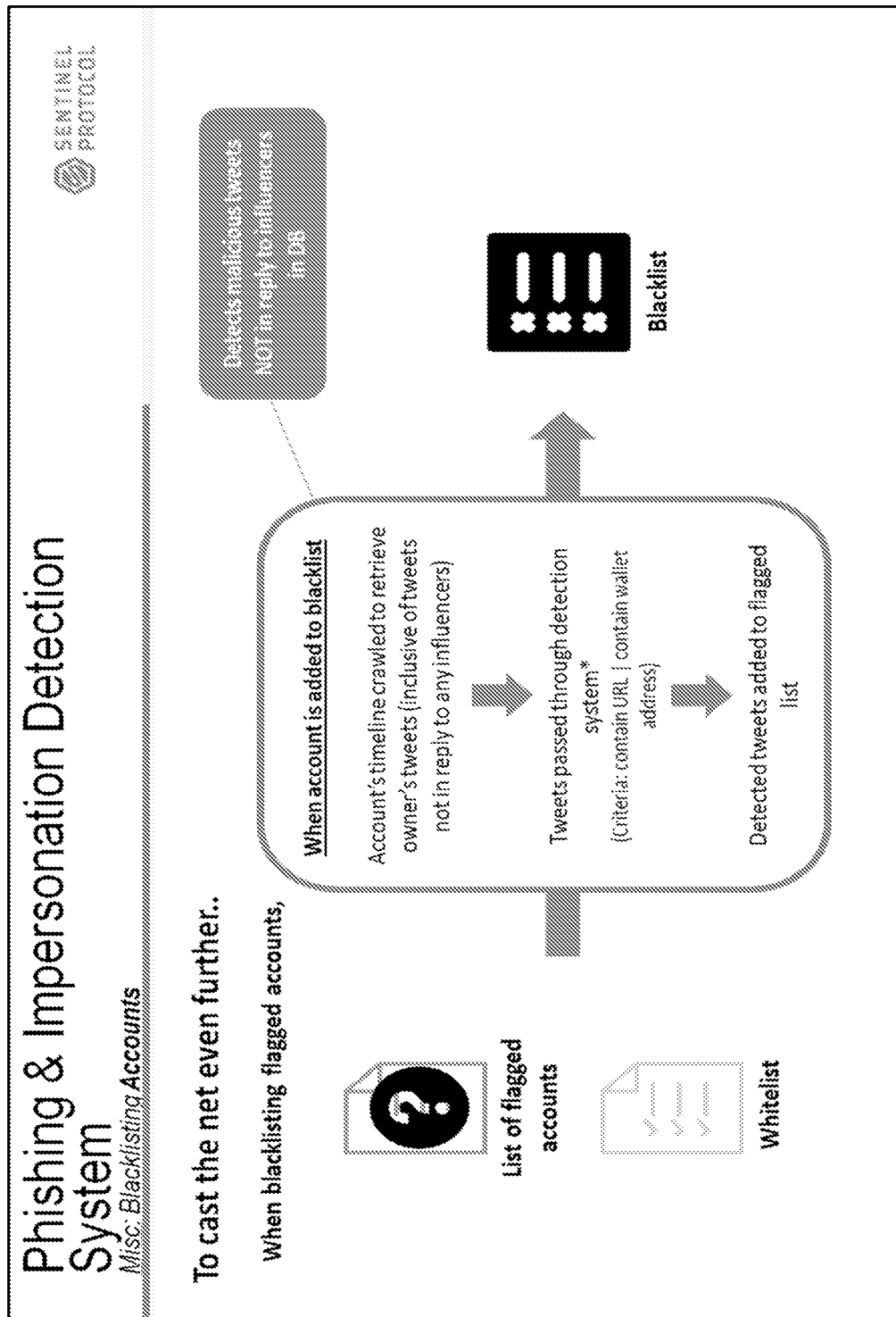


Figure 10C

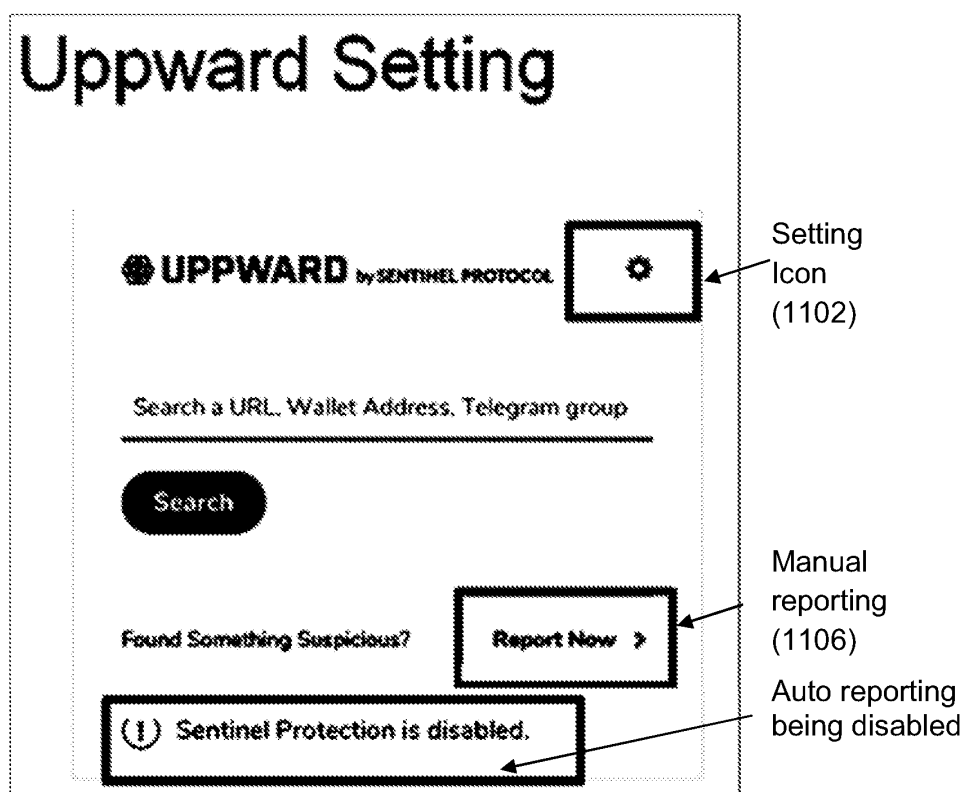


Figure 11

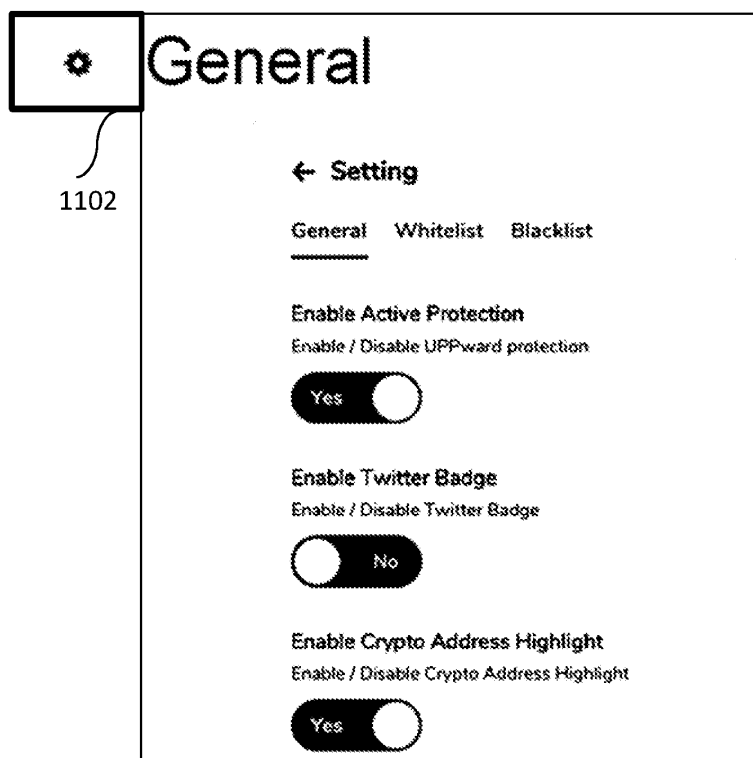


Figure 12

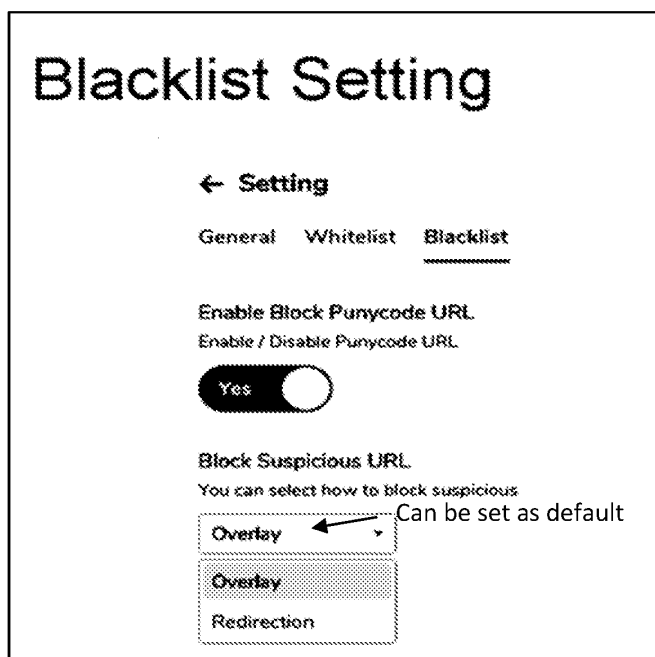


Figure 13

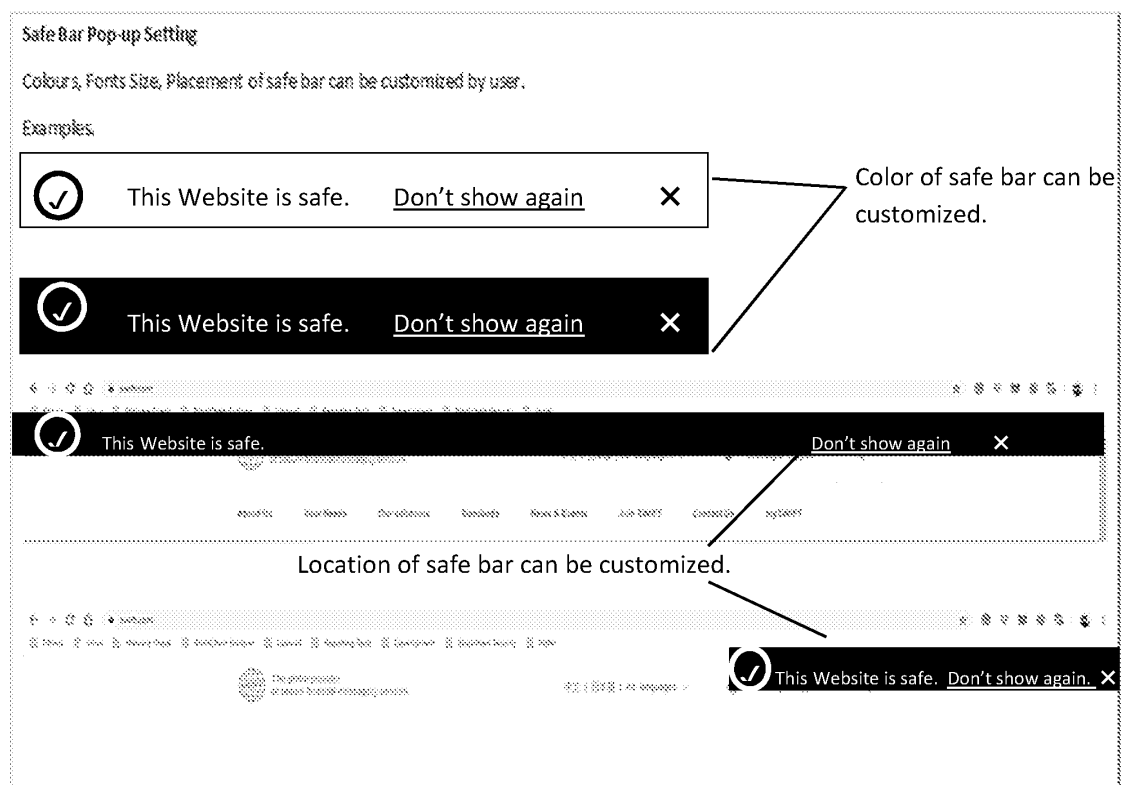


Figure 15

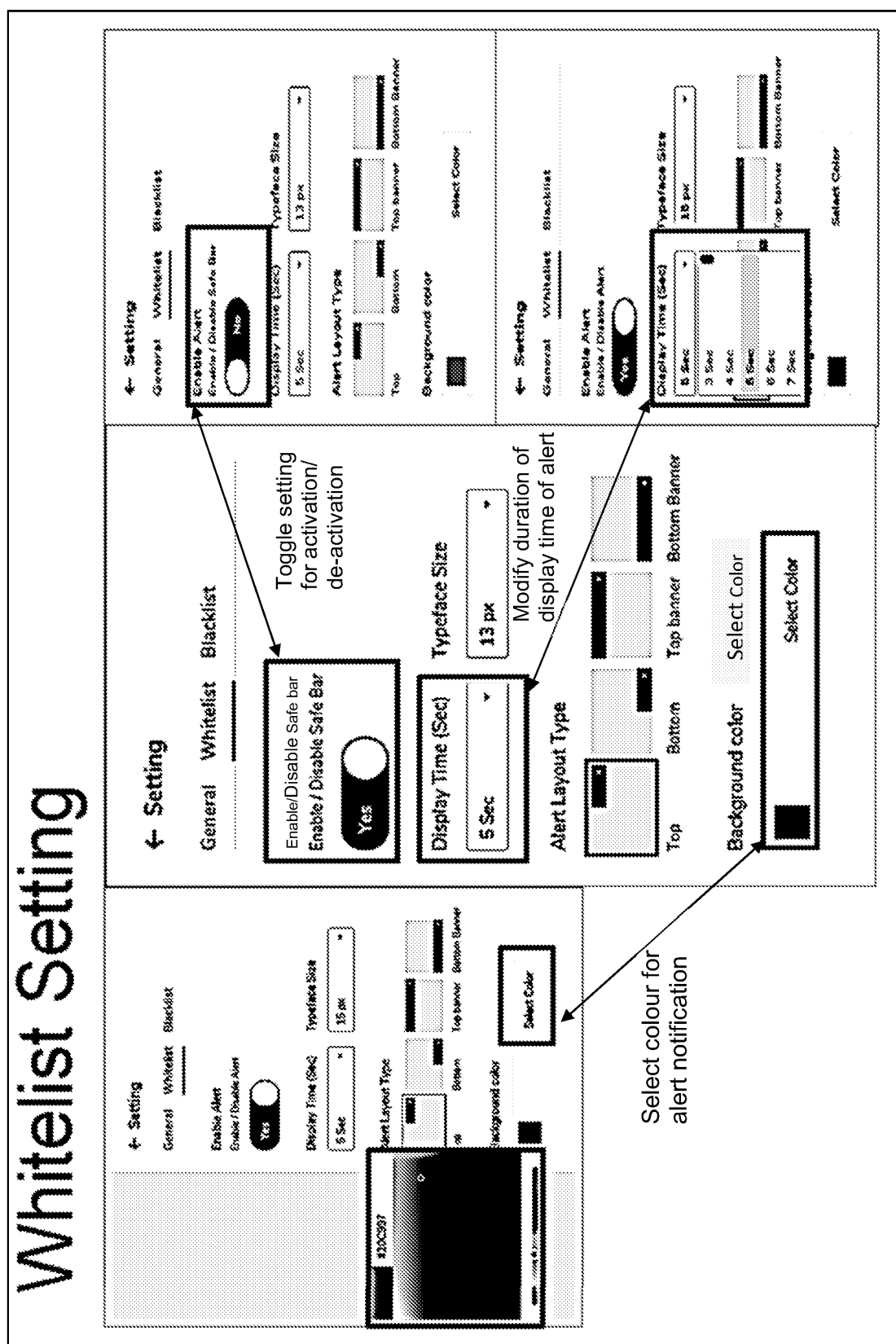


Figure 14

SUBSTITUTE SHEET RULE 26

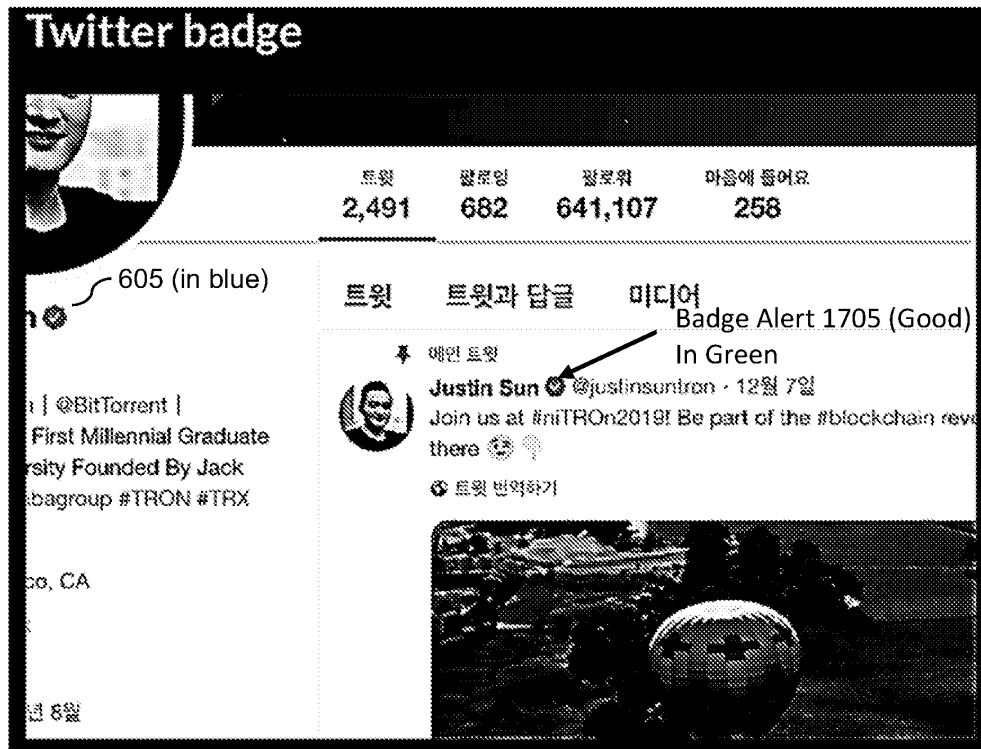


Figure 17A

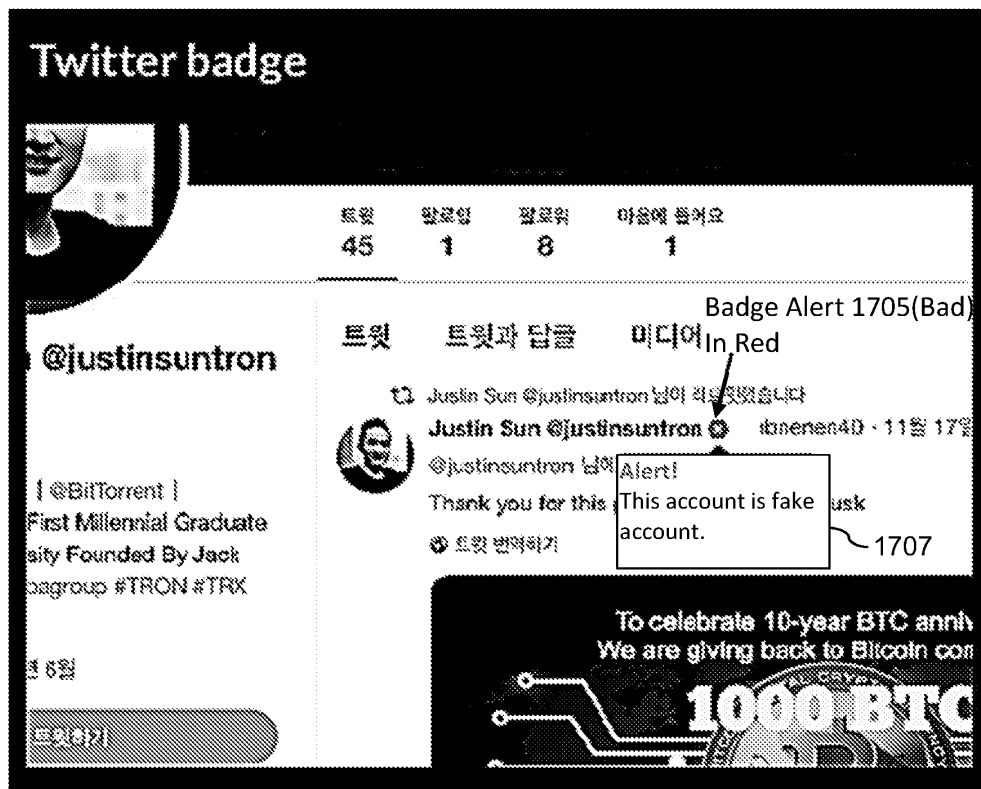


Figure 17B

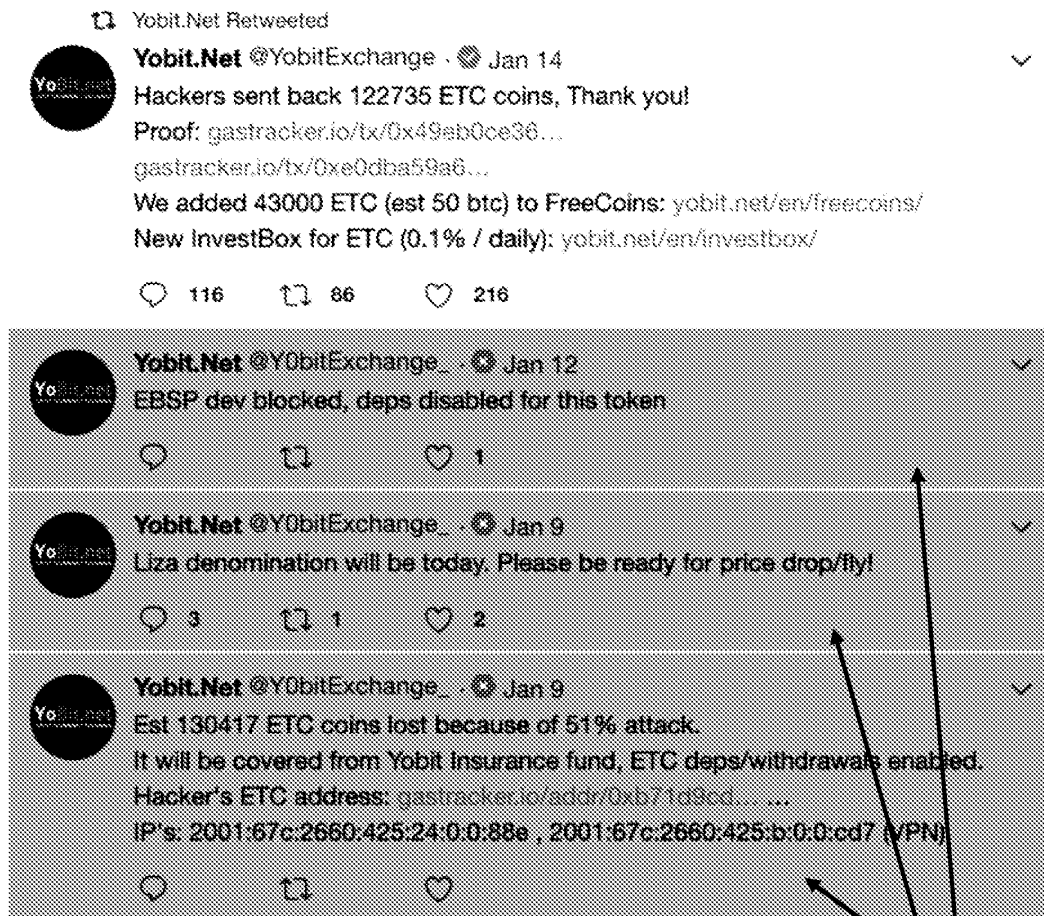


Figure 18

Tweeter Overlay In Red
(indicating Untrusted
account tweets)

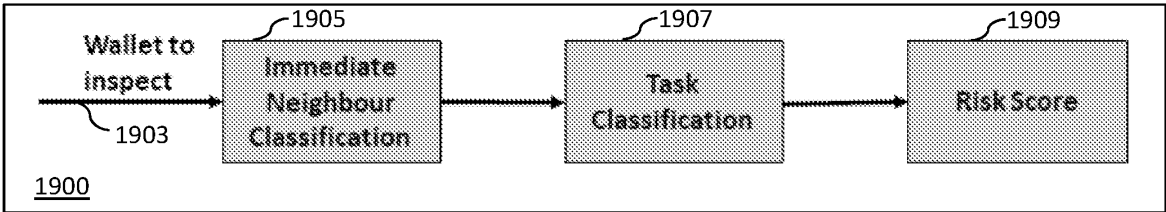


Figure 19A

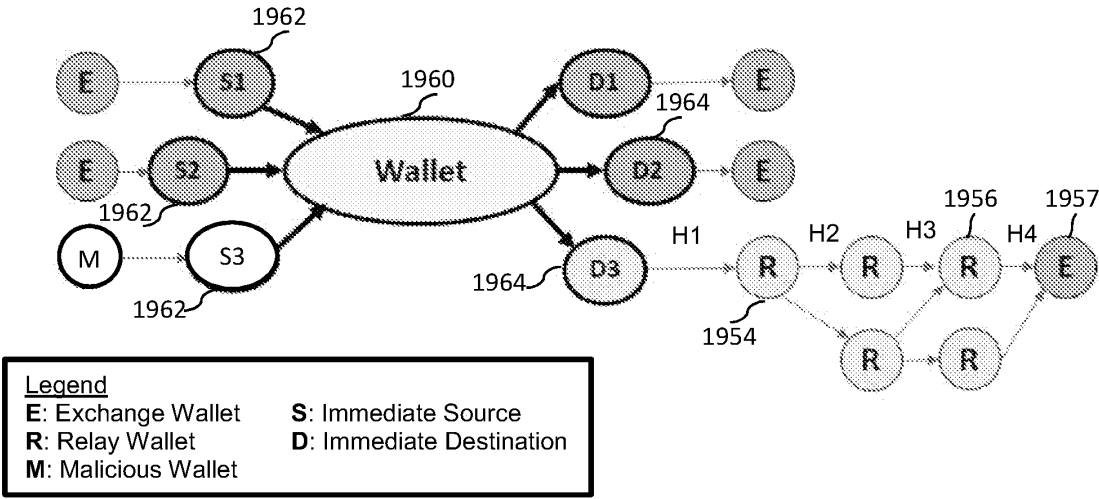
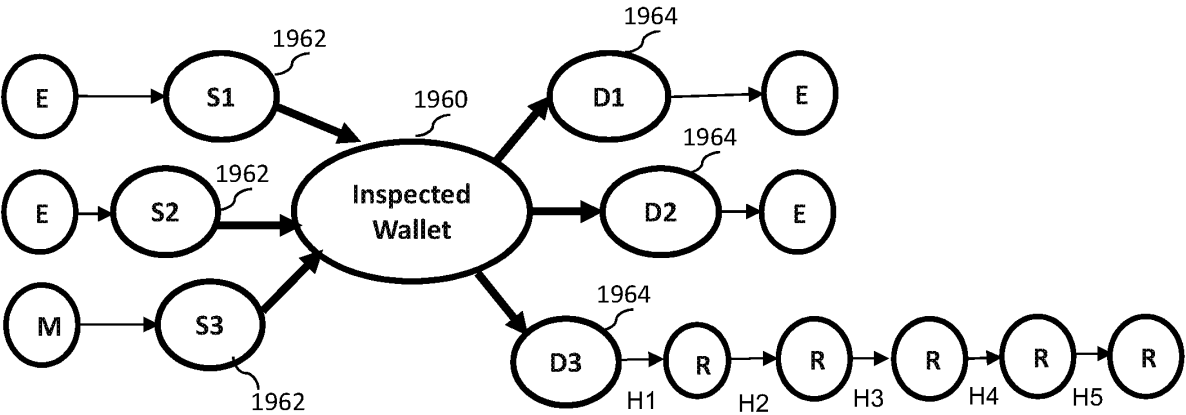


Figure 19B



SUBSTITUTE SHEET RULE 26

Figure 20A

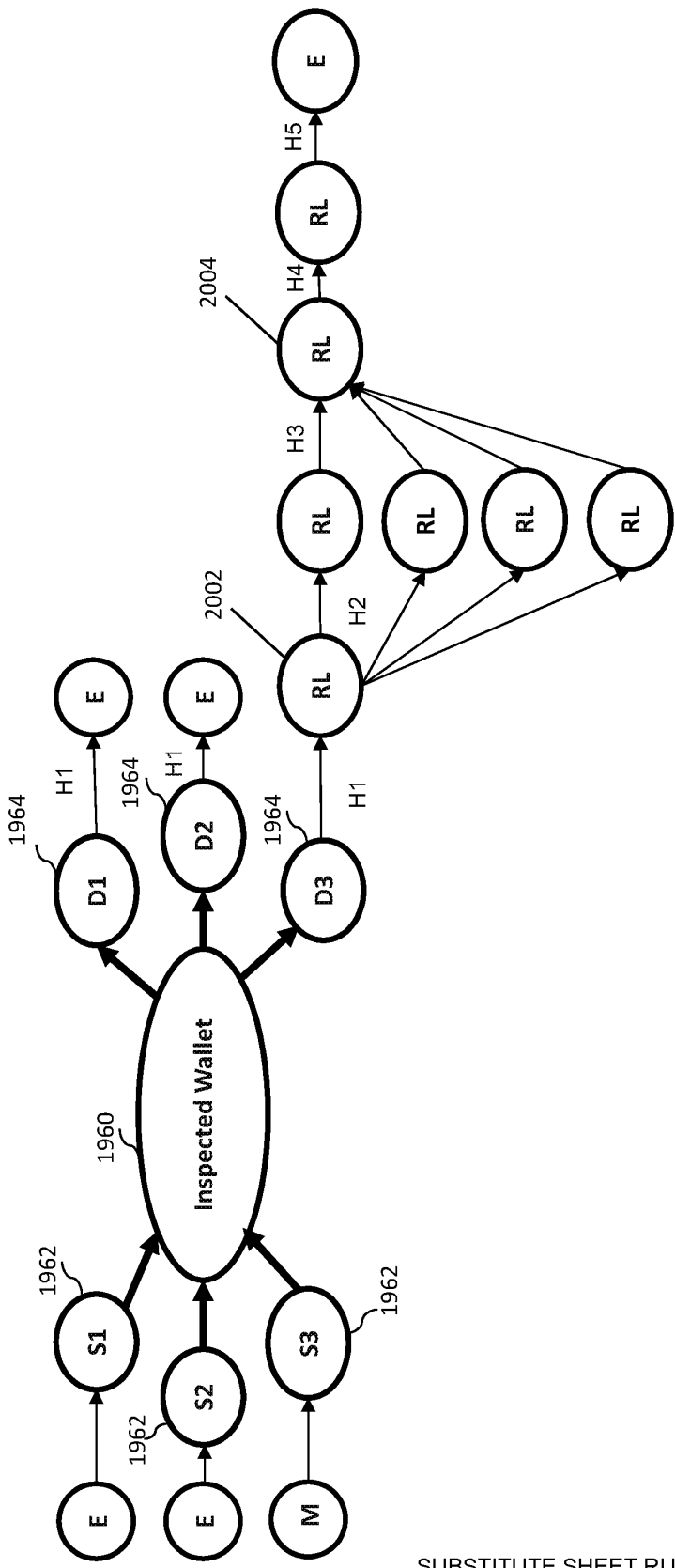
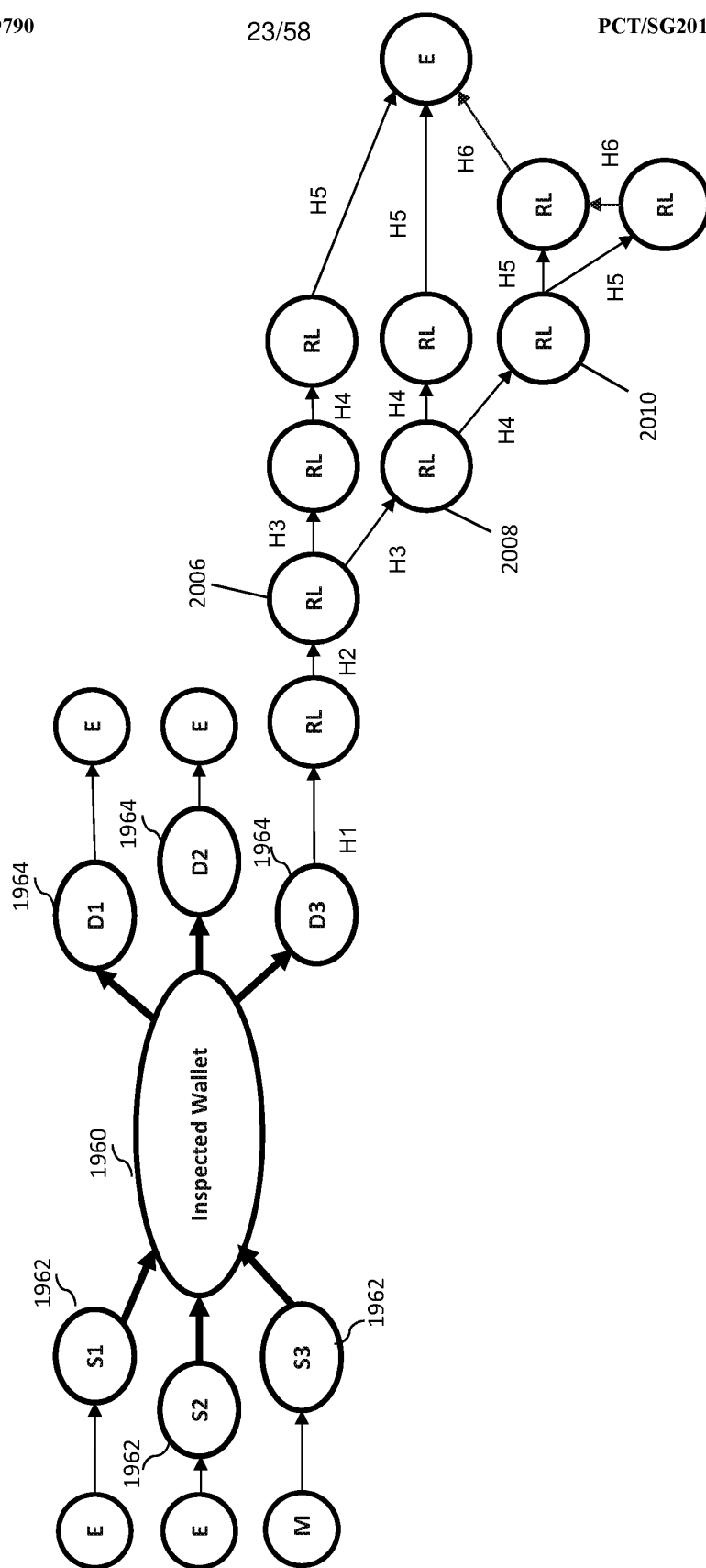


Figure 20B

Figure 20C



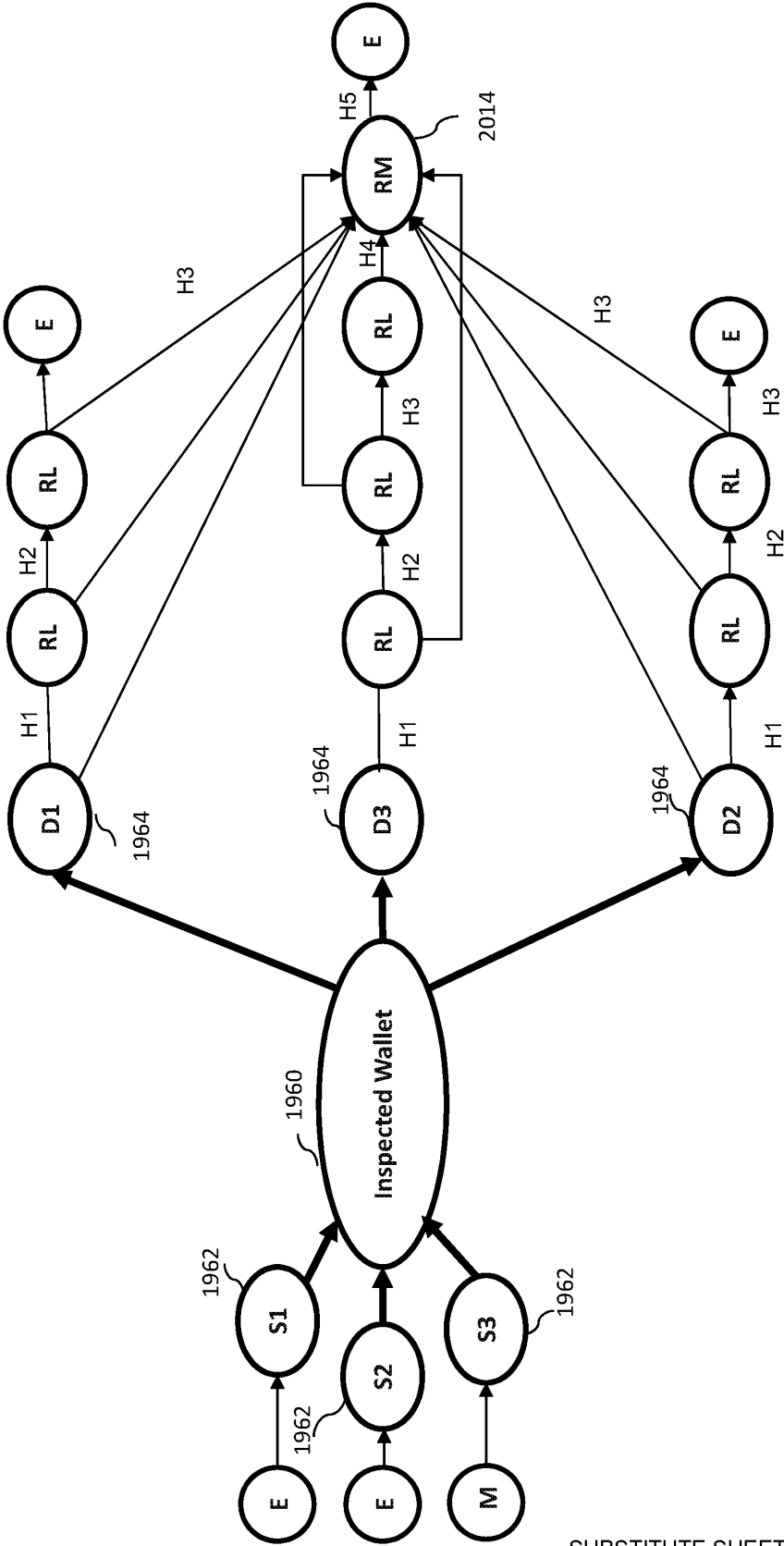


Figure 20D

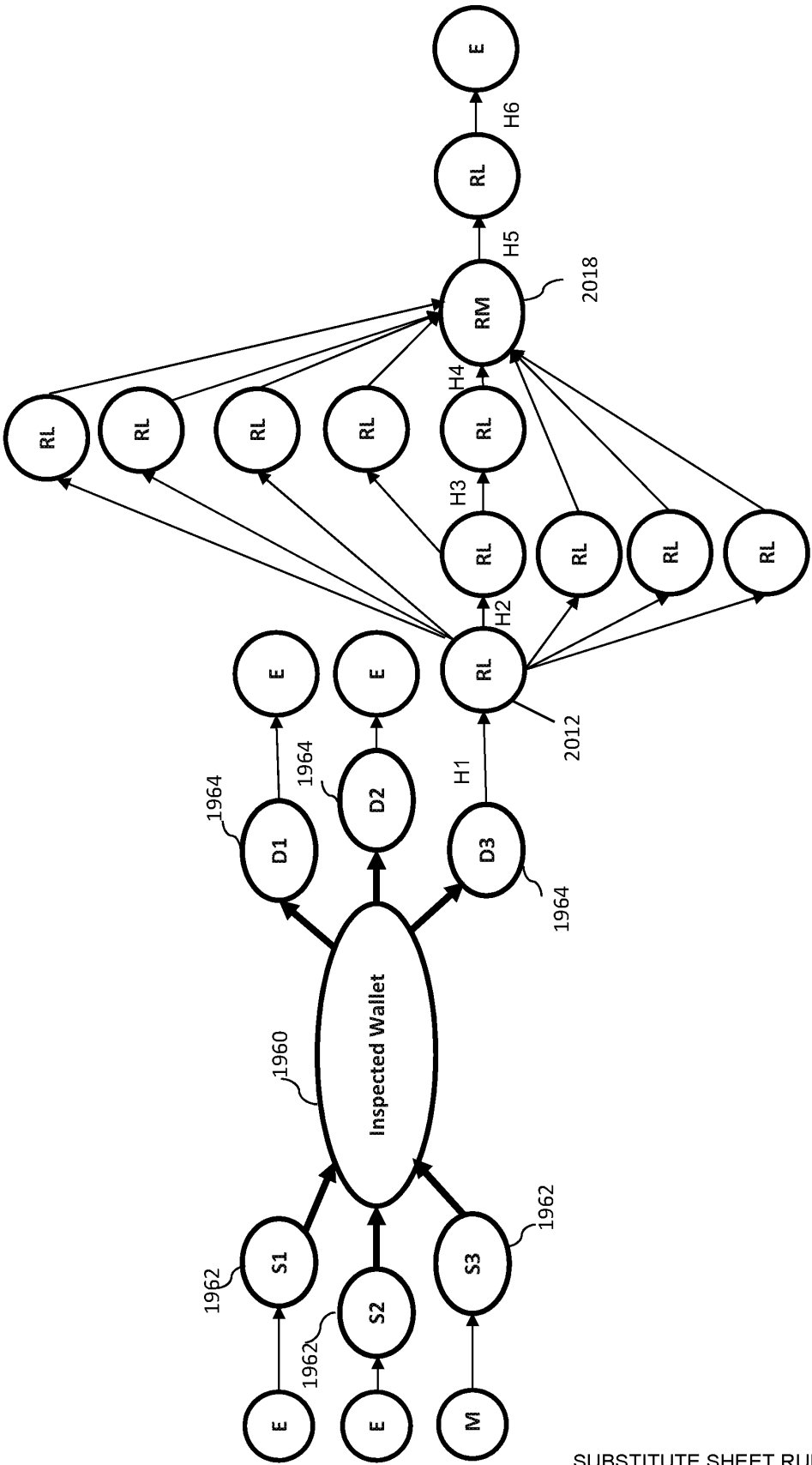
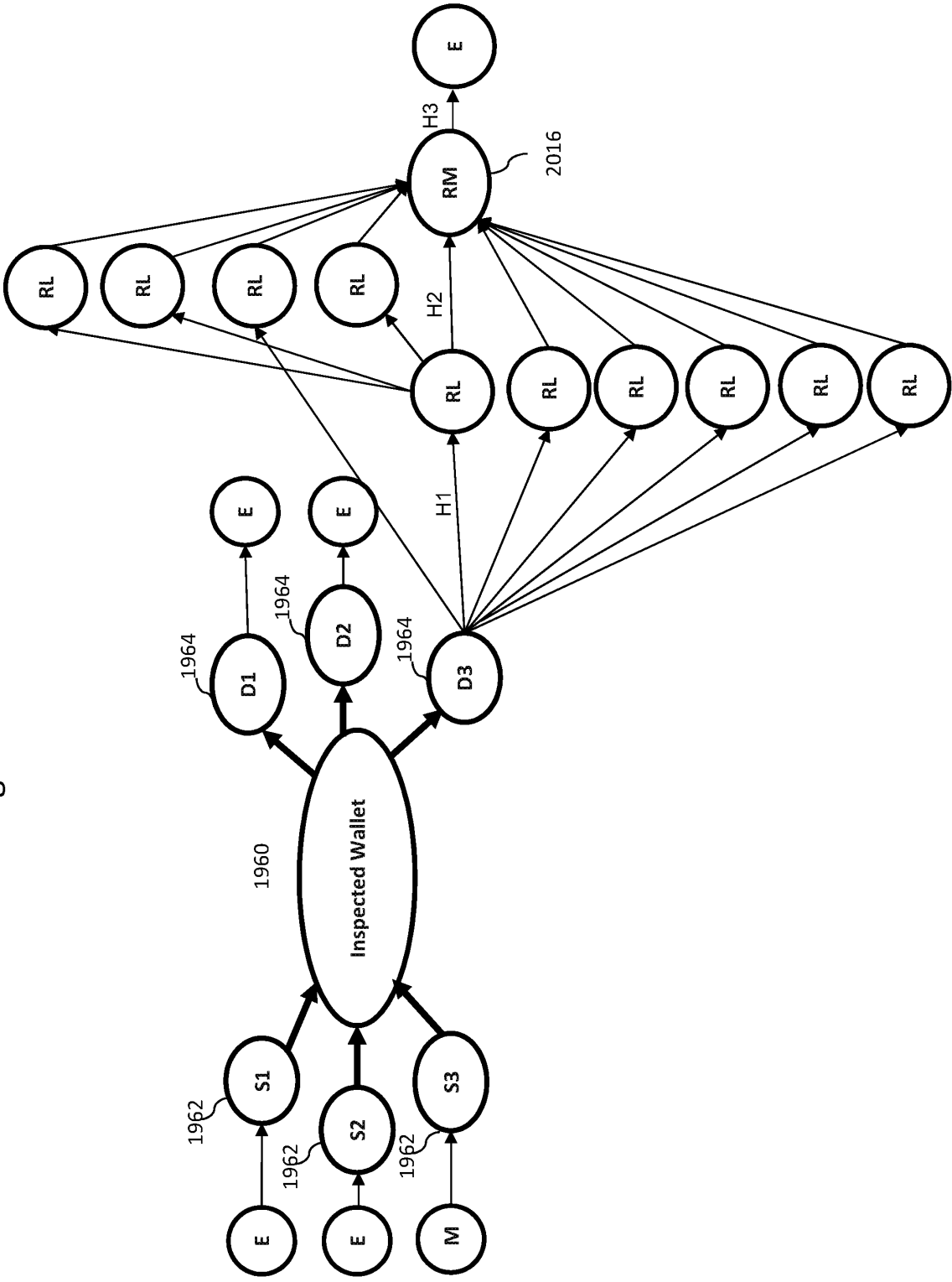


Figure 20E

Figure 20F



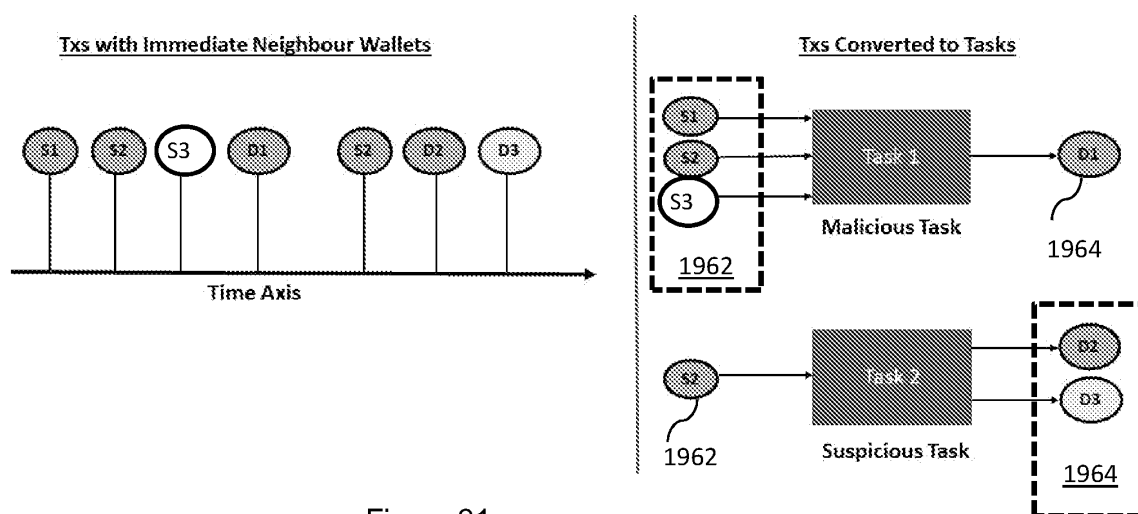


Figure 21

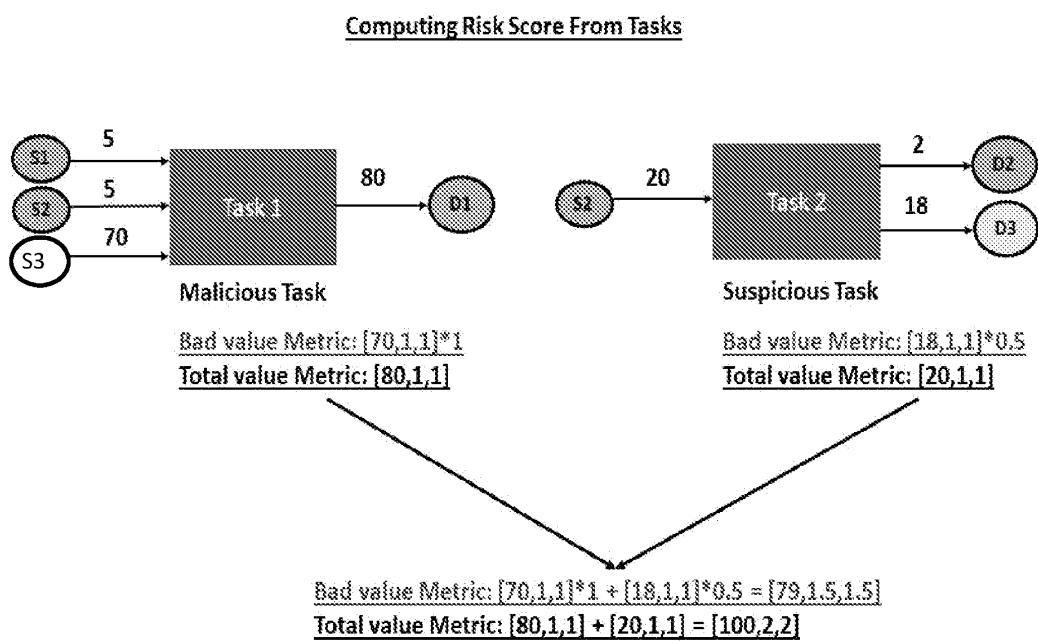


Figure 22

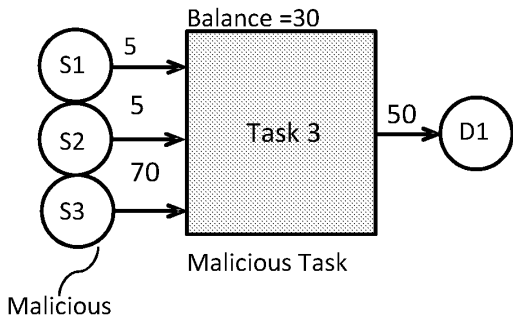


Figure 23A

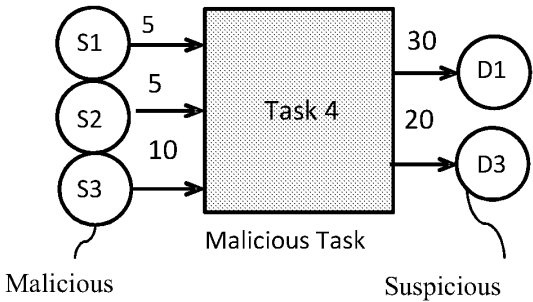


Figure 23B

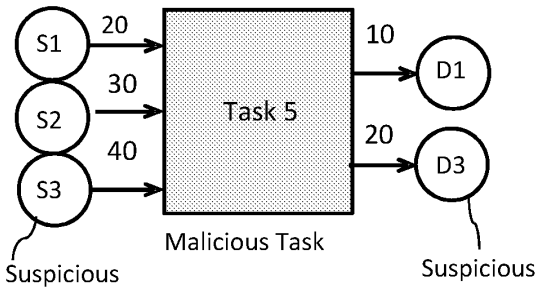


Figure 23C

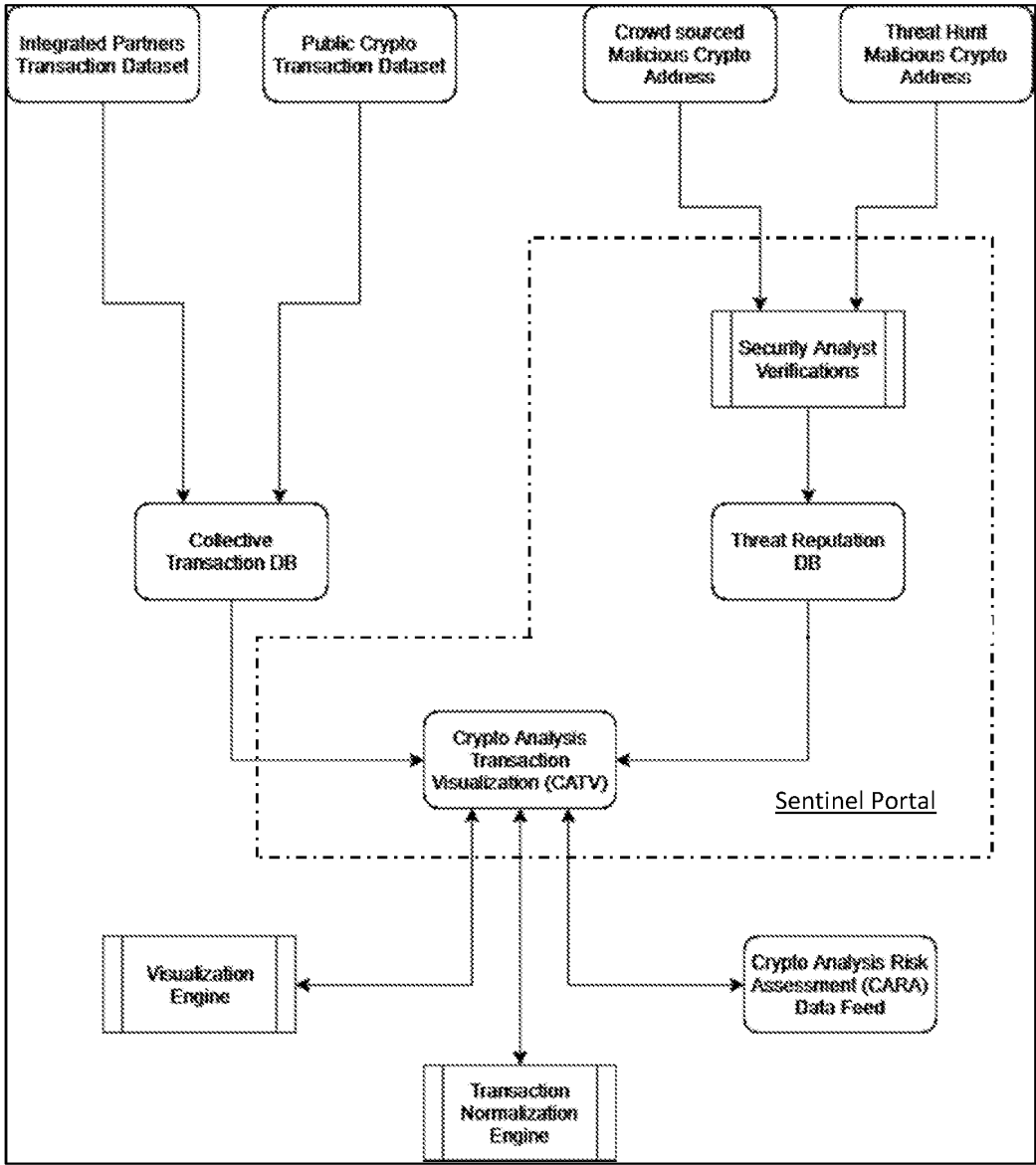


Figure 24: System Architecture of Crypto Analysis Transaction Visualization (CATV) Application hosted on Sentinel Portal (Gateway)

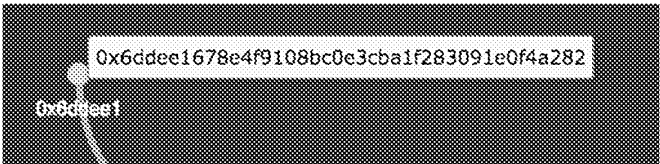


Figure 25: Mouse-over a node shows full address of the node.

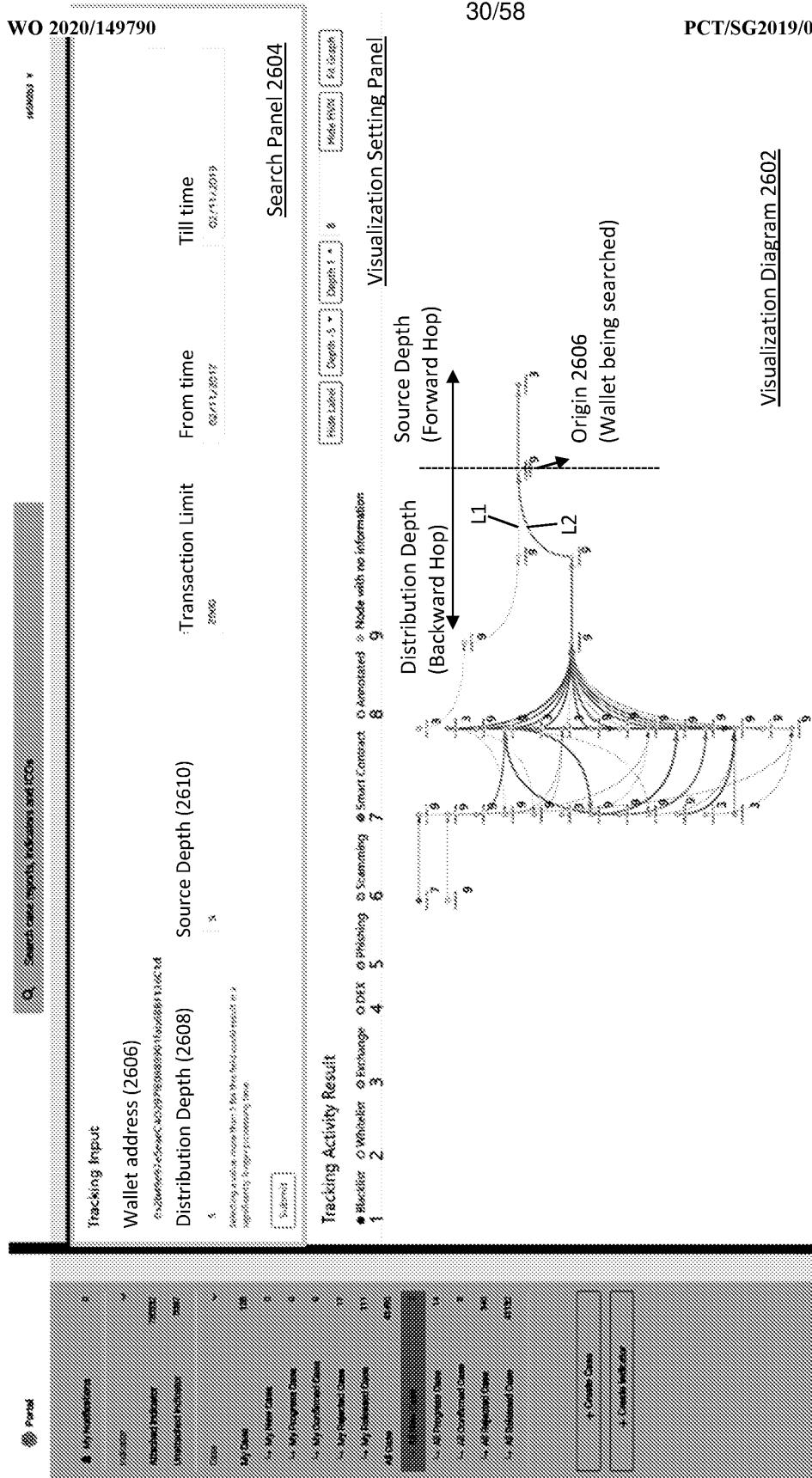


Figure 26: Visualization flow of transactions of a crypto wallet address being searched.

Transaction (37)									
Date	Transaction	From	To	Order Description	Received Description	Value	Order		
1	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	1	2018-04-05 08:54		
1	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	0.8	2018-04-23 05:19		
1	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	518.99	2018-05-10 04:19		
1	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	1	2018-04-05 08:28		
1	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	0.8	2018-04-23 05:07		
1	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	0.1	2018-05-10 04:50		
1	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	518.99	2018-05-10 04:58		
2	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	1.8	2018-04-05 08:20		
2	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	518.99	2018-04-23 05:06		
3	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	1.8	2018-04-05 08:18		
3	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	0.17	2018-04-20 10:10		
3	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	5	2018-04-21 03:17		
3	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	1	2018-04-21 04:03		
3	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	5	2018-04-22 05:27		
3	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	5	2018-04-22 09:43		
3	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	5	2018-04-22 10:22		
3	Order 453230...	(Walter)	Order 453230...	Order 453230...	Order 453230...	43	2018-04-22 07:19		

Figure 27: Transaction table showing search results of all nodes involved with a crypto wallet address being searched.

WO 2020/149790

Wallet address (2606)

Enter the wallet address you wish to track.

(No. of Forward Hops)

Distribution depth

5

Selecting a value more than 5 for this field could result in a significantly longer processing time.

(No. of Backward Hops)

Source depth

0

Transaction limit

2000

From time

01/01/2011

Till time

28/03/2011

2616

2614

2612

2610

2608

Submit

Search Panel 2604

Figure 28: Search panel

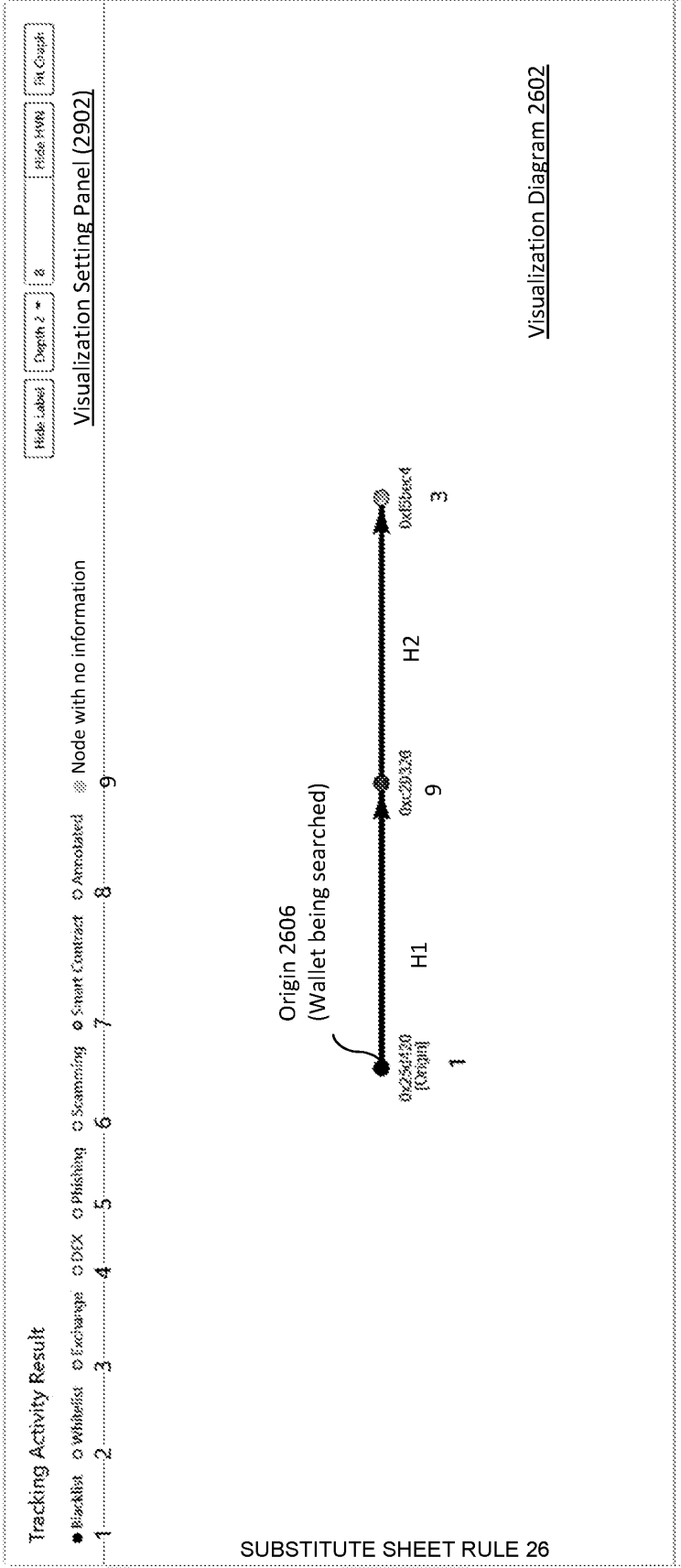


Figure 29

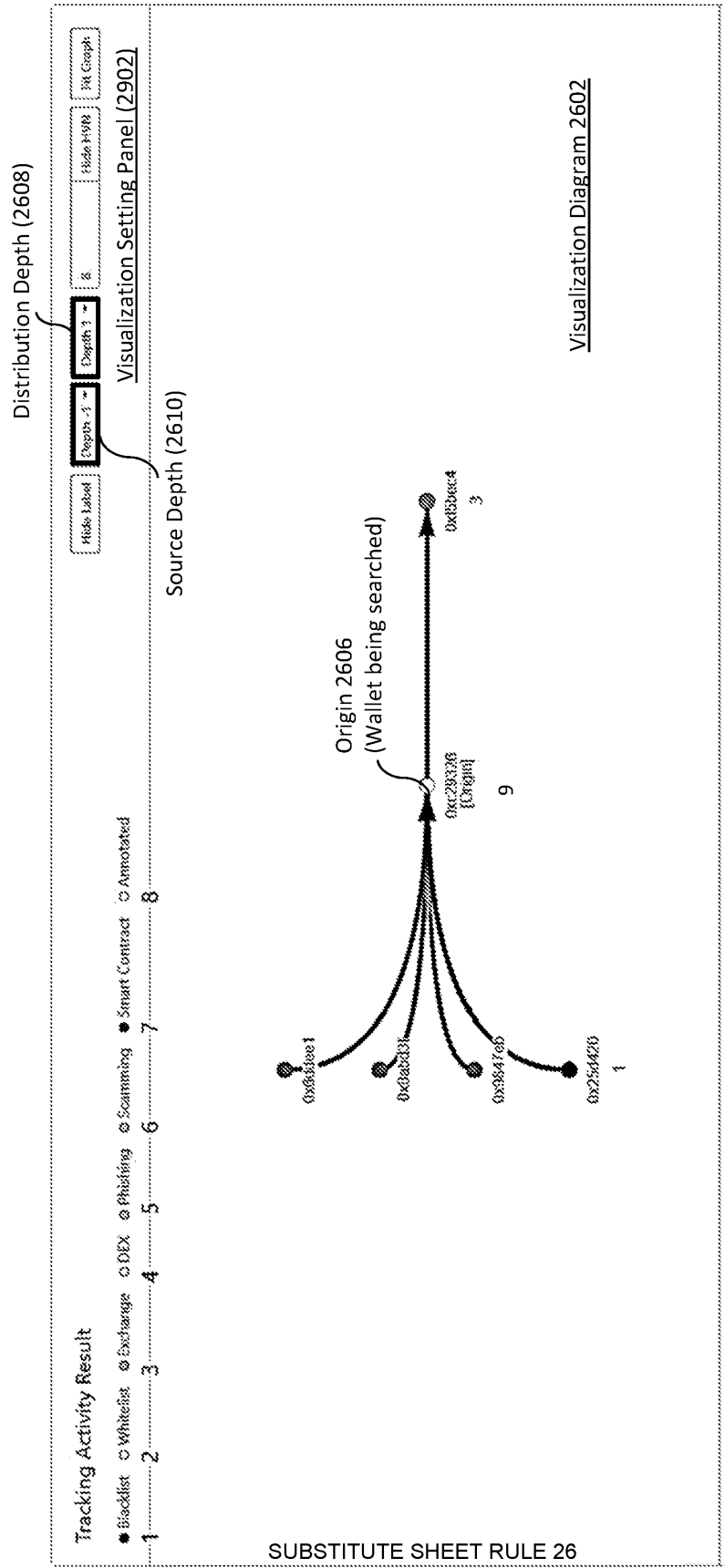


Figure 30

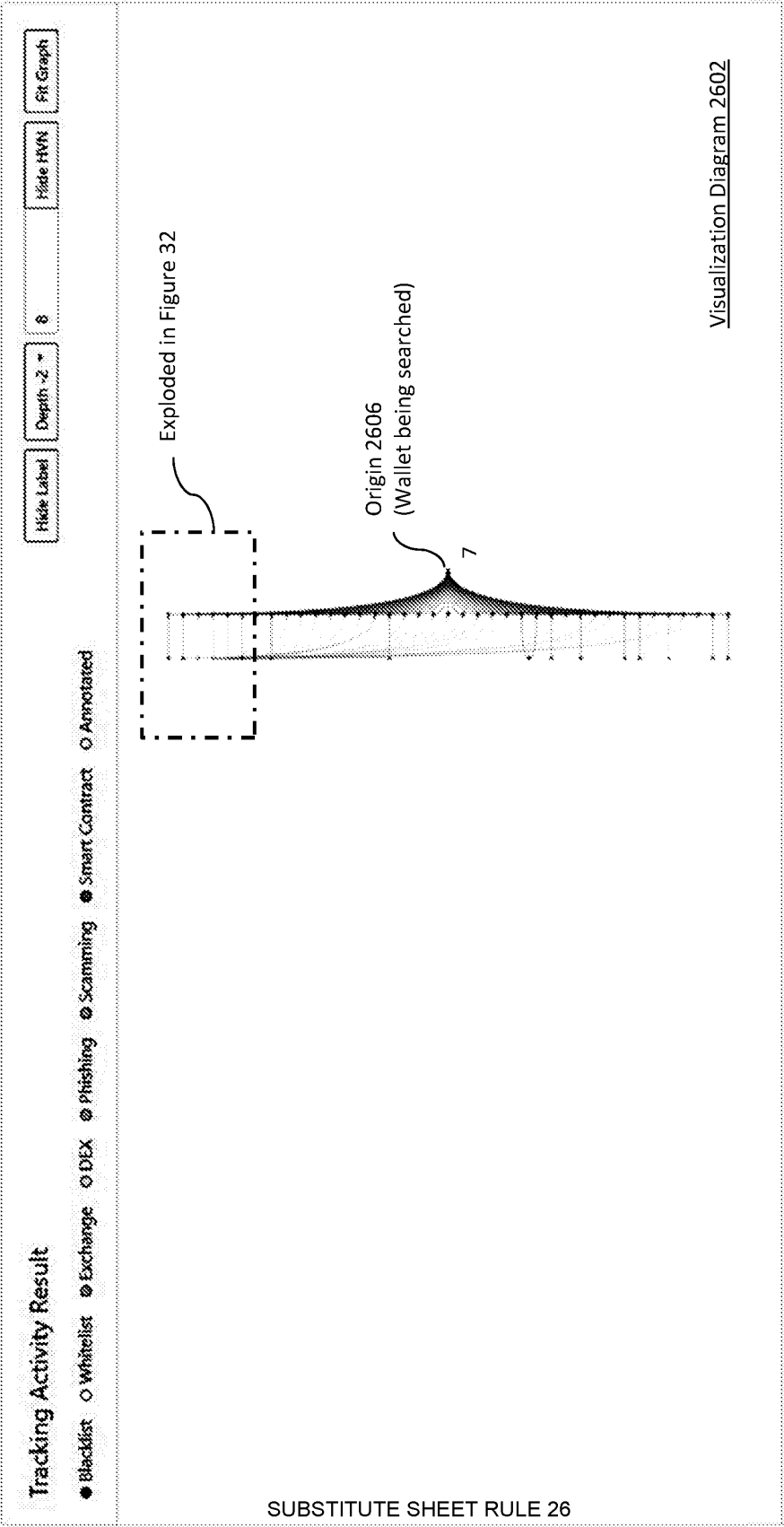
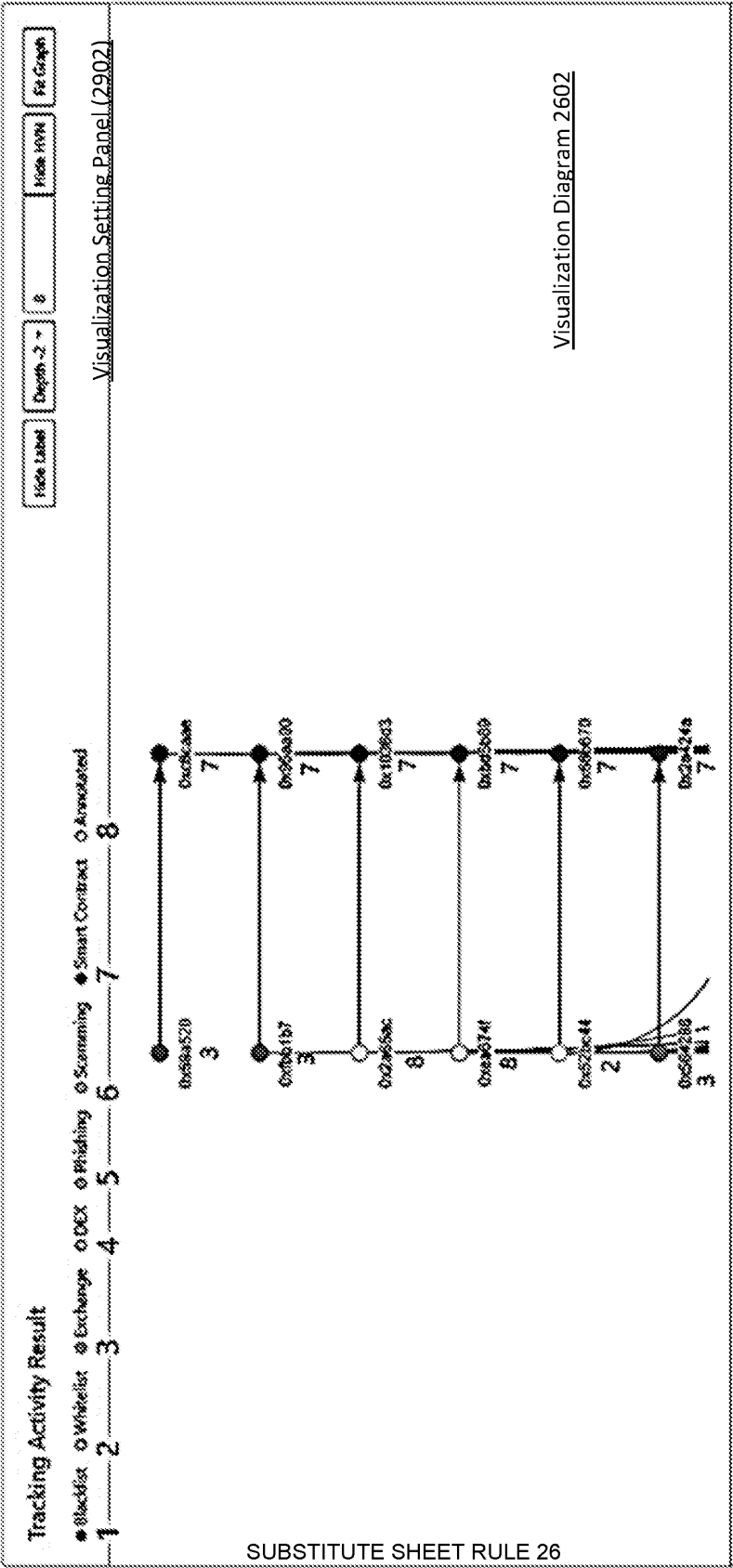


Figure 31



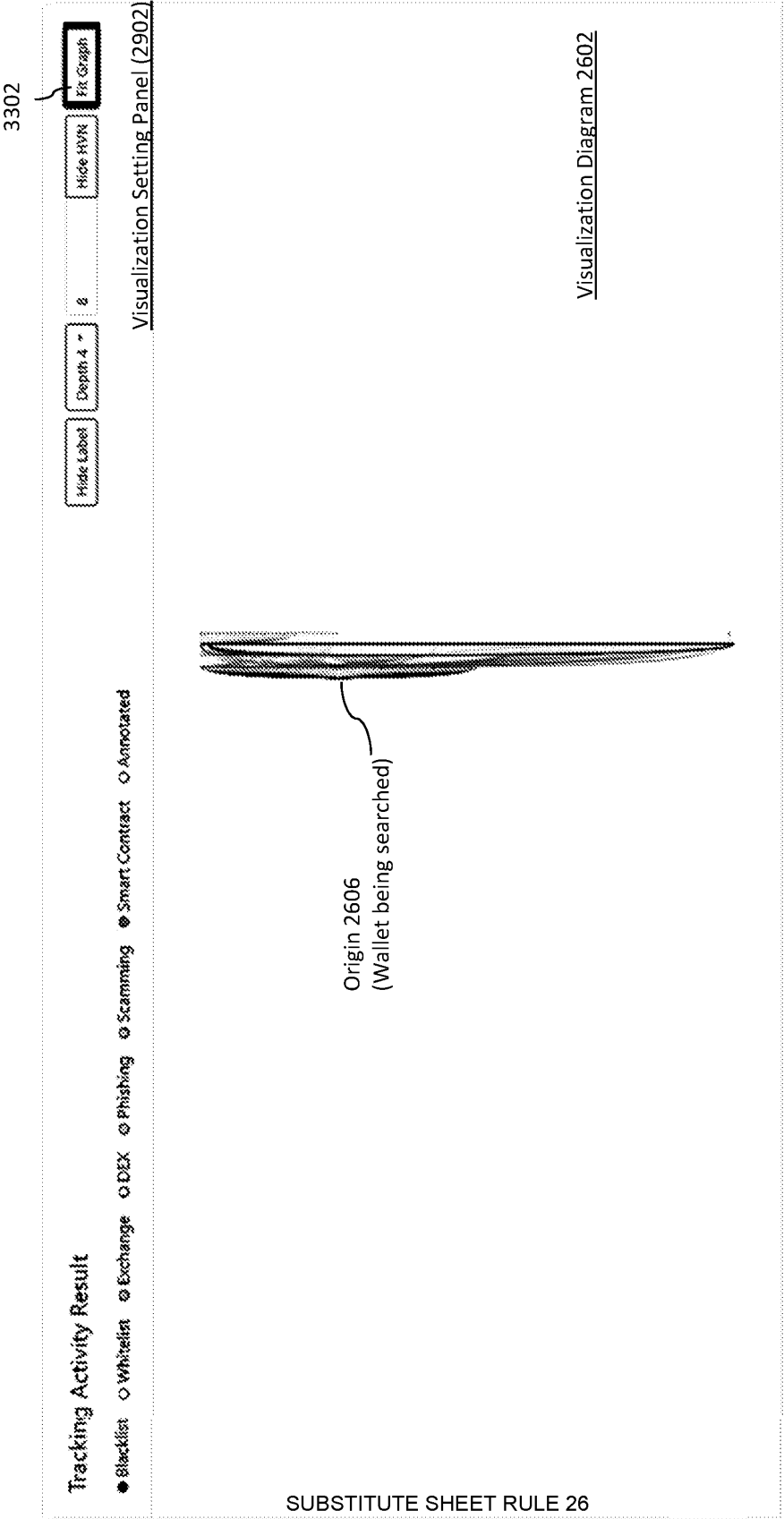


Figure 33

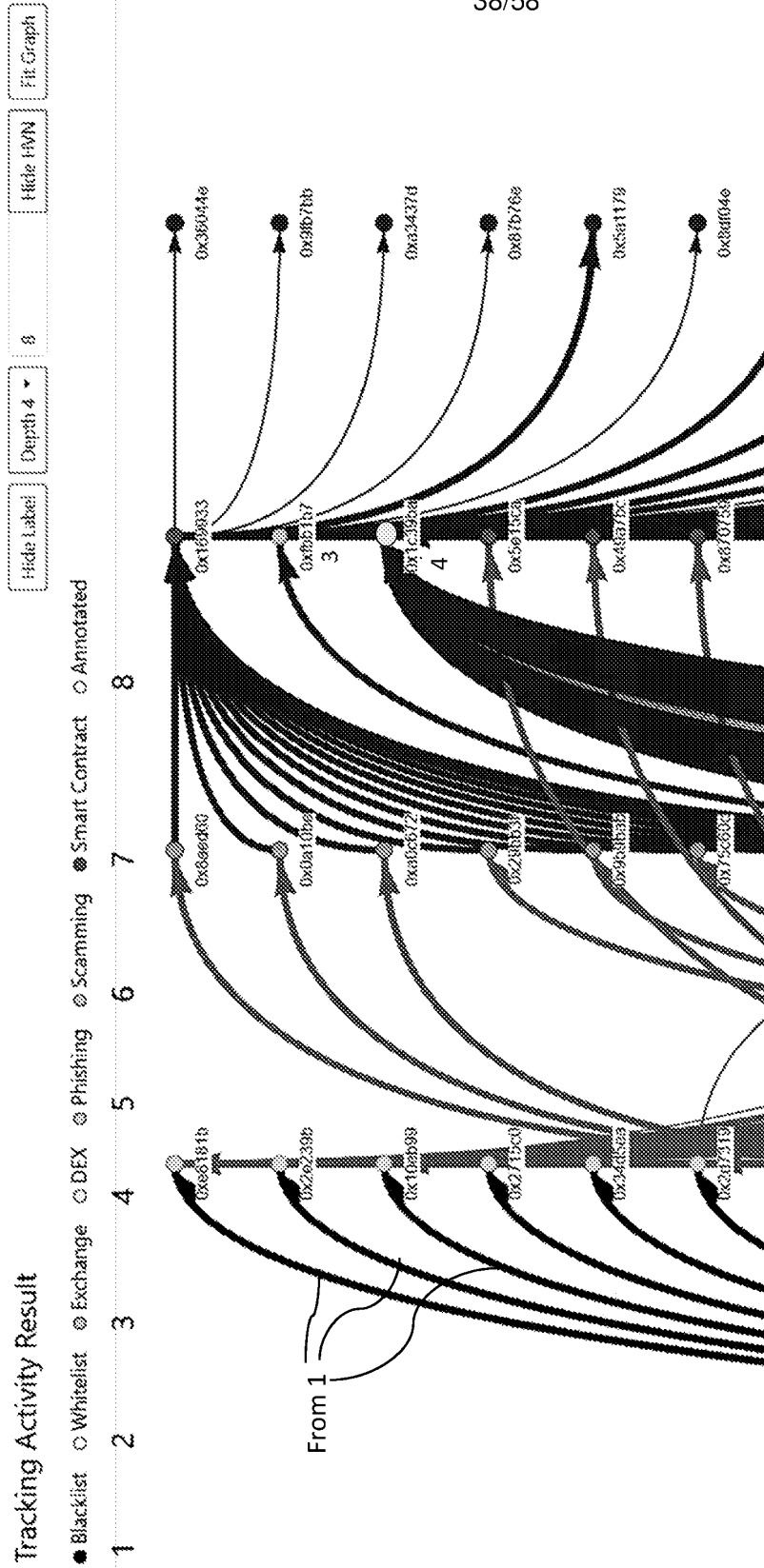


Figure 34

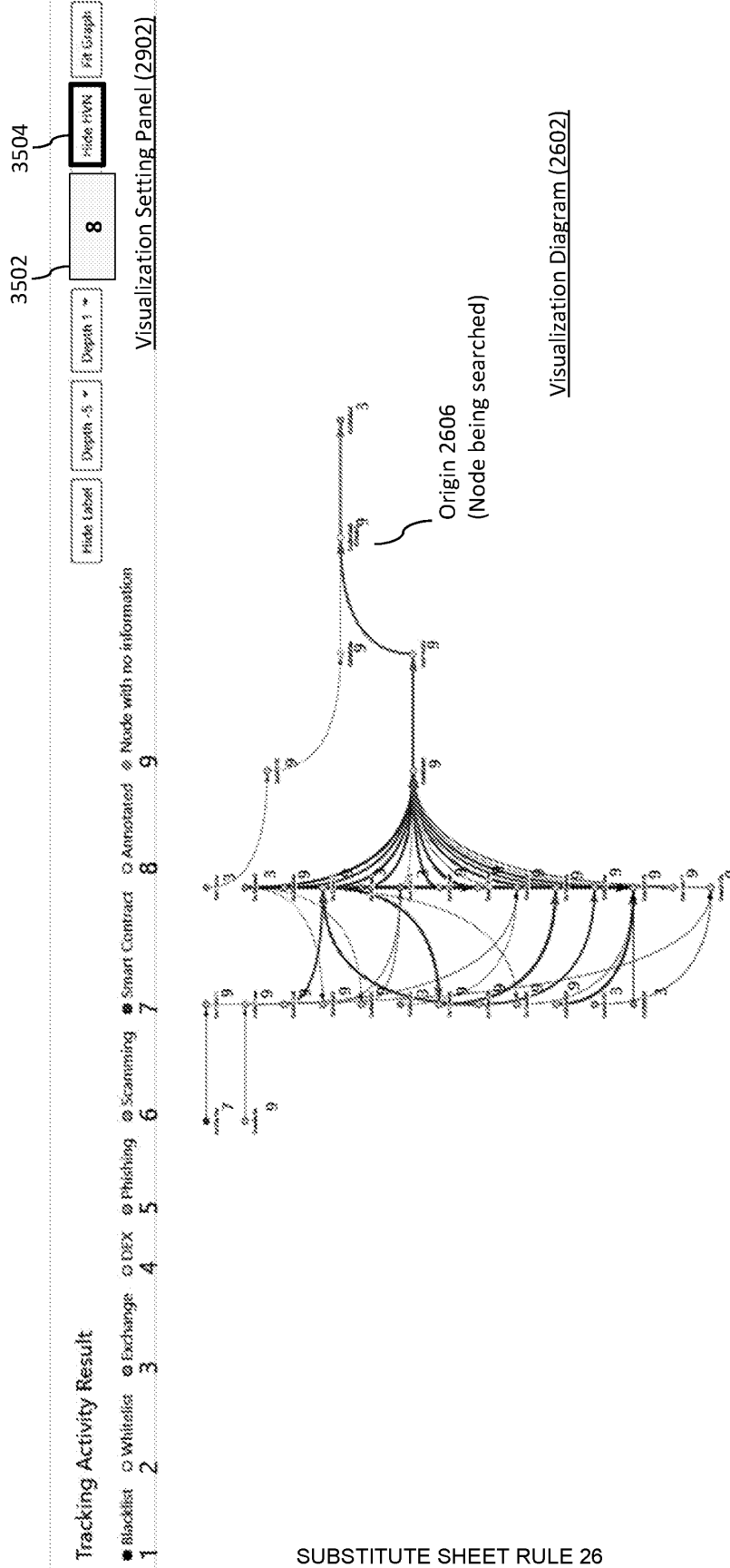


Figure 35

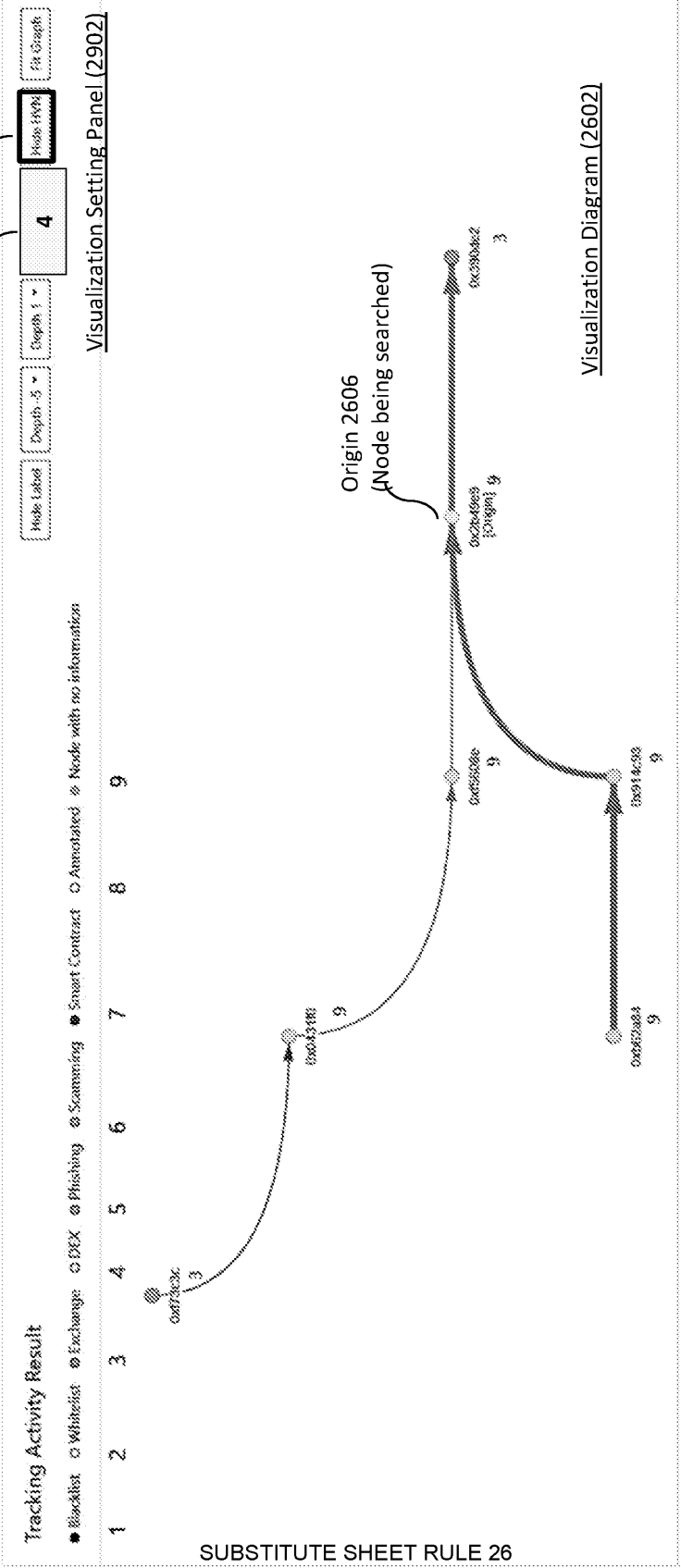


Figure 36

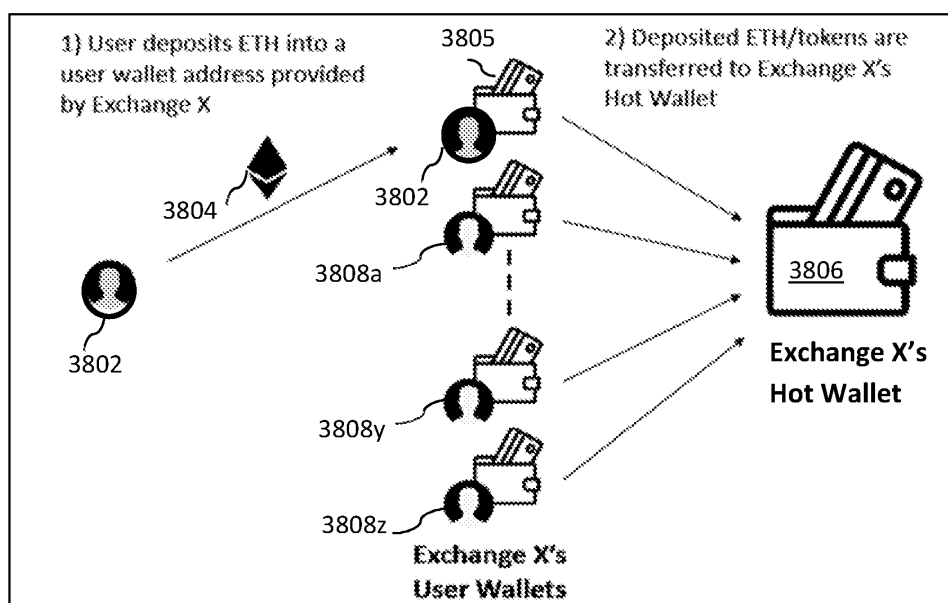


Figure 38A

	From	To	Value
t2	0x64db1b94a0304e...	OUT 0xc257274276a4e5...	0.00152183 Ether
t1	0xbb6b14026136fc...	IN 0x64db1b94a0304e...	0.00160583 Ether

Figure 38B

	From	To	Value
	0x64db1b94a0304e...	IN 0xc257274276a4e5...	0.00152183 Ether
	0x20fcfdde7838884...	IN 0xc257274276a4e5...	0.01 Ether
	0x8fed6d0ad578b7f...	IN 0xc257274276a4e5...	0.00366834 Ether
	0x88607688292791...	IN 0xc257274276a4e5...	0.00424344 Ether
	0x2140efd7ba3116...	IN 0xc257274276a4e5...	0.01 Ether
	0xfe1b99e1df1e34...	IN 0xc257274276a4e5...	76.99811 Ether
	0x90469a6b903d0d...	IN 0xc257274276a4e5...	0.49841839 Ether

Figure 38C

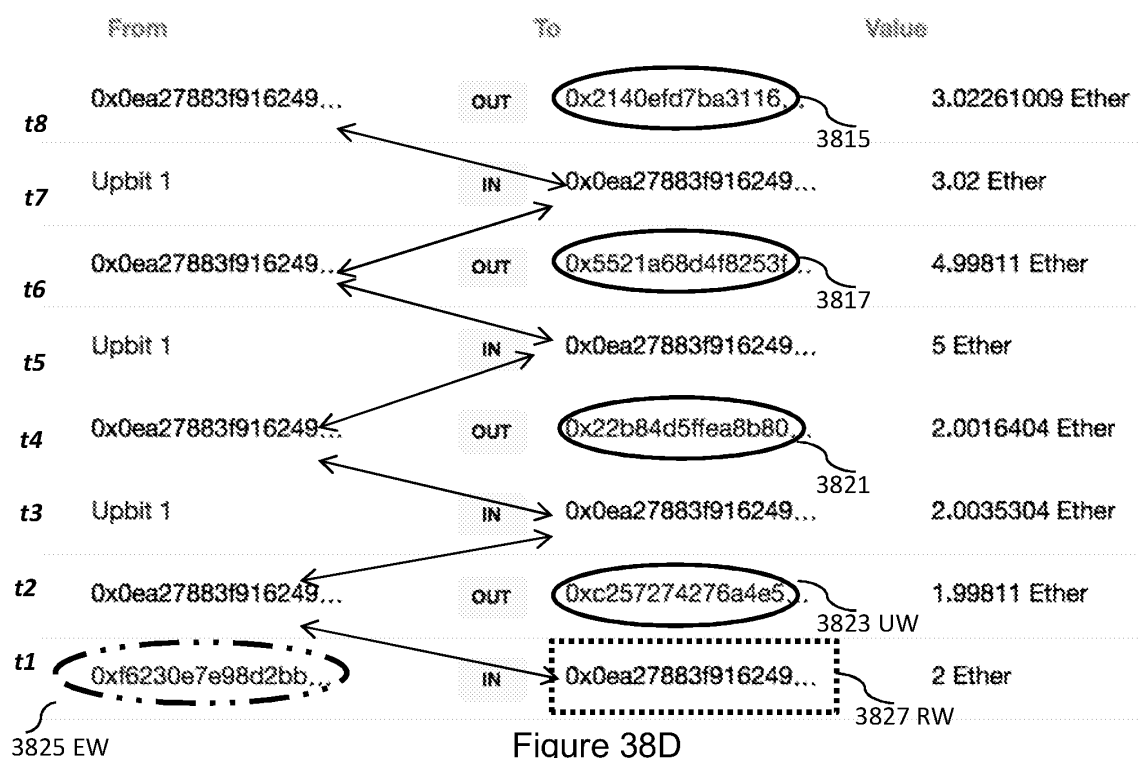
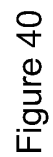


Figure 38D

From	To	Value
0xe4c10e1b6c0c0e...	OUT 0x2c41b8e152d8b1...	9.998866 Ether
0xe4c10e1b6c0c0e...	OUT 0x00d7f2709c7b305...	3.97606 Ether
0xe4c10e1b6c0c0e...	OUT Upbit 1	1.986052 Ether
0xe4c10e1b6c0c0e...	OUT Upbit 1	15.006052 Ether
0xe4c10e1b6c0c0e...	OUT Upbit 1	27.99672334375 Ether
0xe4c10e1b6c0c0e...	OUT Upbit 1	11.9966988 Ether
0xe4c10e1b6c0c0e...	OUT Upbit 1	7.995926 Ether
0xe4c10e1b6c0c0e...	OUT Upbit 1	9.996682 Ether
0xe4c10e1b6c0c0e...	OUT Upbit 1	1.9976648 Ether
0xe4c10e1b6c0c0e...	OUT Upbit 1	18.9976774 Ether

Figure 38E



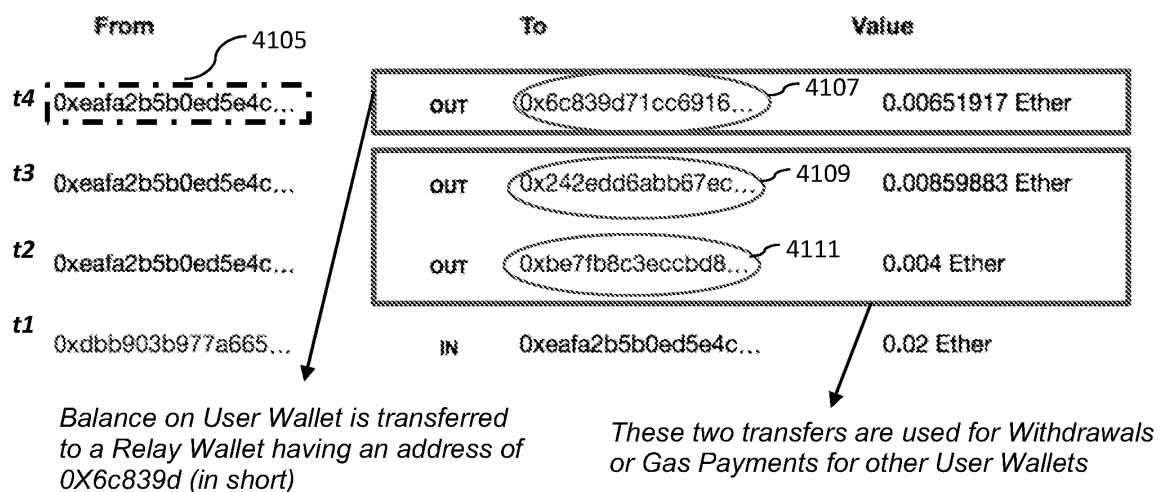


Figure 41A (identification of relay wallet)

From	To	Value
0x2ed62af7df45f0c...	IN 0x6c839d71cc6916... 4107	0.006479877945154 Ether
0xbacc399c711cf40...	IN 0x6c839d71cc6916...	0.00648917 Ether
0x57ddc0db156a59...	IN 0x6c839d71cc6916...	0.0064809 Ether
0x7aab1637053627...	IN 0x6c839d71cc6916...	0.0064926 Ether
0xa718dc5fd78017...	IN 0x6c839d71cc6916...	0.006489 Ether

Figure 41B (identification of user wallet)

From	To	Value
0x242edd6abb67ec...	OUT 0x869939a578d994...	0.00817883 Ether
0xeafa2b5b0ed5e4c... 4105	IN 0x242edd6abb67ec... 4109	0.00859883 Ether

Figure 42A (identification of withdrawal relay wallet)

Balance on User Wallet is transferred to a Relay Wallet

From	To	Value
0xbe7fb8c3eccbd8...	out 0x058b022501fe91...	4210 0.00321716 Ether
0xbe7fb8c3eccbd8...	out ZRX Token	0 Ether
0xeafa2b5b0ed5e4c...	in 0xbe7fb8c3eccbd8...	4105 4111 0.004 Ether

Figure 42B (identification of other relay wallet)

From	To	Value
0xd2a228a61cf14a8...	out 0x160fb77021df6a2...	4214a 0.00096 Ether
0xd2a228a61cf14a8...	out 0xcfd0b95f76516f98...	4214b 21.184888438824687 Ether
0xd2a228a61cf14a8...	out 0x49bafcd3b72f09f...	4214c 79.610320291175312 Ether
0xd2a228a61cf14a8...	out 0xa2aa3f50ba3e7a1...	4212 0.20215127 Ether

Splitting to 3 other Relay Wallets Withdrawal to User Specified Wallet

Figure 42C (DEX: splitting to 3 relay wallets)

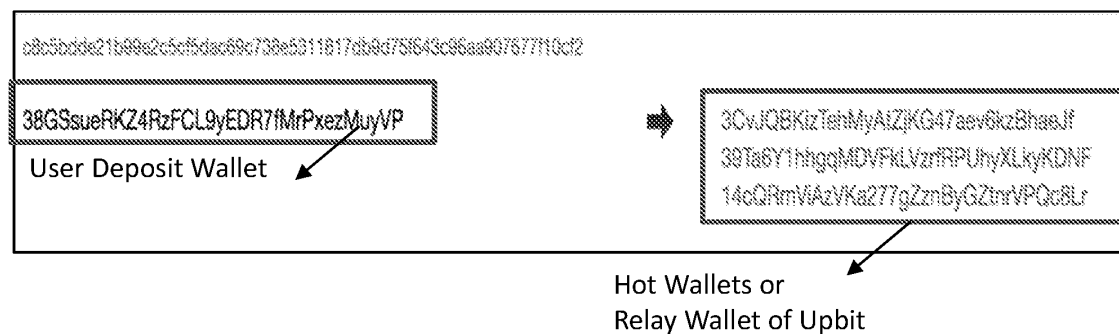


Figure 42D (Upbit Example)

Summary

Address 3CvJQBKizTehMyAtZjKQ47aev6kzBhaeJf
 Hash 160 7b2c8b84373ba959189263477f652c3bebee9679

Transactions

No. 2
 Transactions
 Total 49.87448144 BTC
 Received
 Final 0 BTC
 Balance

Summary

Address 39Ta6Y1hhgqMDVFkLVzrfRPuhyXLkyKDNF
 Hash 160 553609f30f893d3610bb7293b078f4afc93ef81

Transactions

No. 2
 Transactions
 Total 0.59755761 BTC
 Received
 Final 0 BTC
 Balance

Figure 42E

84538a587f03677b9fb62d692b385b0710993223b5a8b42135a7034c806b44b		
39Ta6Y1hhgqMDVFkLVzrfRPuhyXLkyKDNF	➡	3PZQj4o2fzWZ7XZ2UN956bpyp5o9T2cyG 14cQFmViAzVKa277gZznByGZtnrVPQc8Lr 3LoPJv266j91K25vWujW1D9utmGwu2u32P

Figure 42F

Summary

Address 14cQFmViAzVKa277gZznByGZtnrVPQc8Lr
 Hash 160 279a7ded82665d7c6844277b690555f6e812918b

Transactions

No. 24351
 Transactions
 Total 410,160.39983373 BTC
 Received
 Final 738.55837387 BTC
 Balance

Figure 42G

57004:cn1124fc7a231530:0515fd08D085fe05236:4e9907:02d12481fa593c

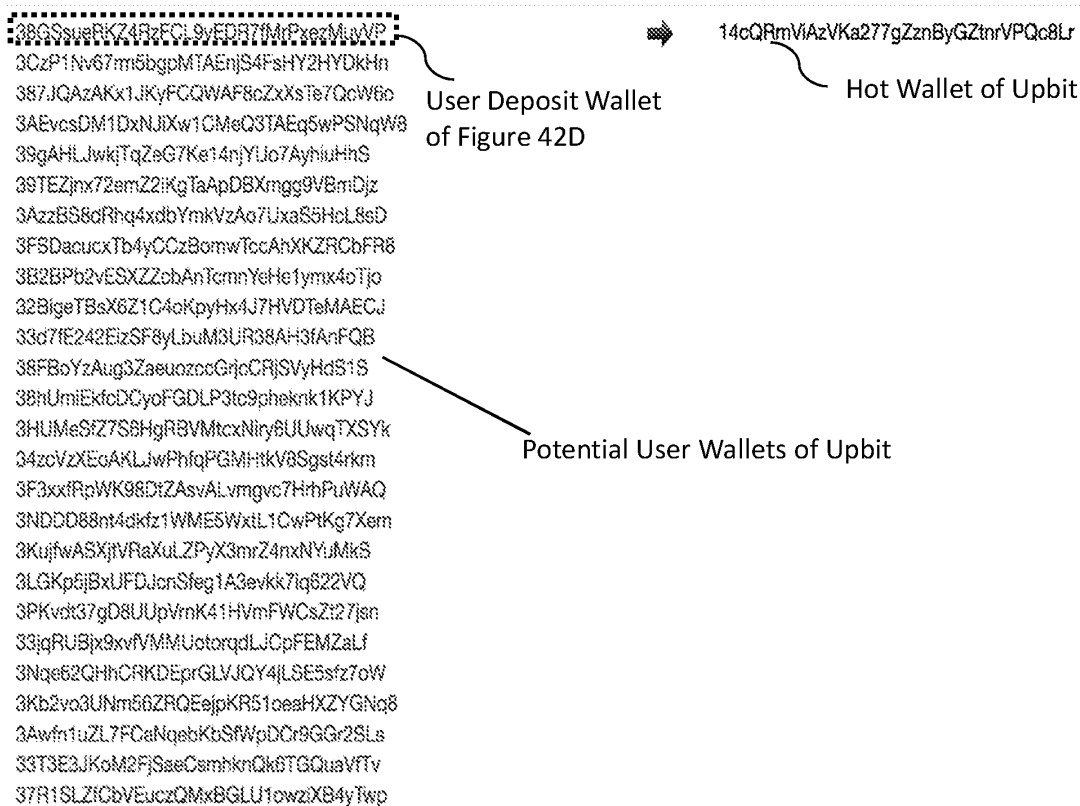


Figure 42H (Continuation of Figure 42D)

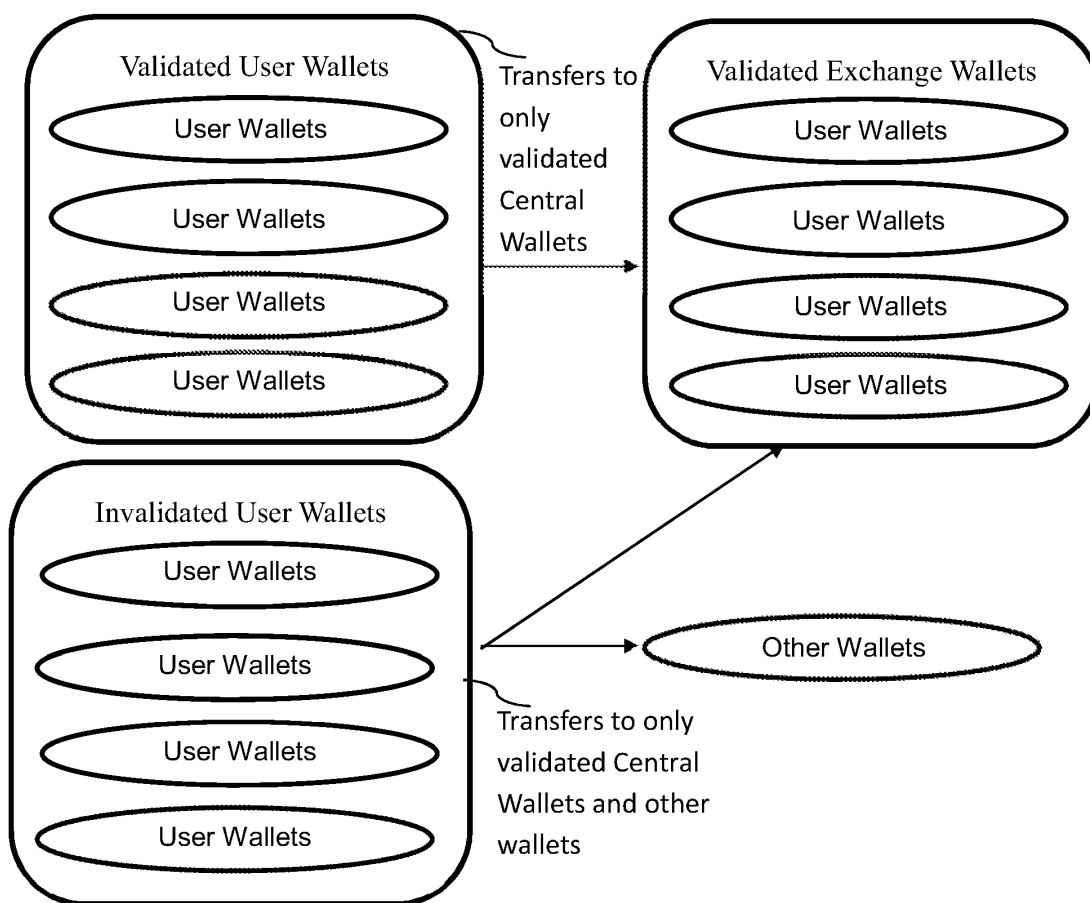


Figure 43

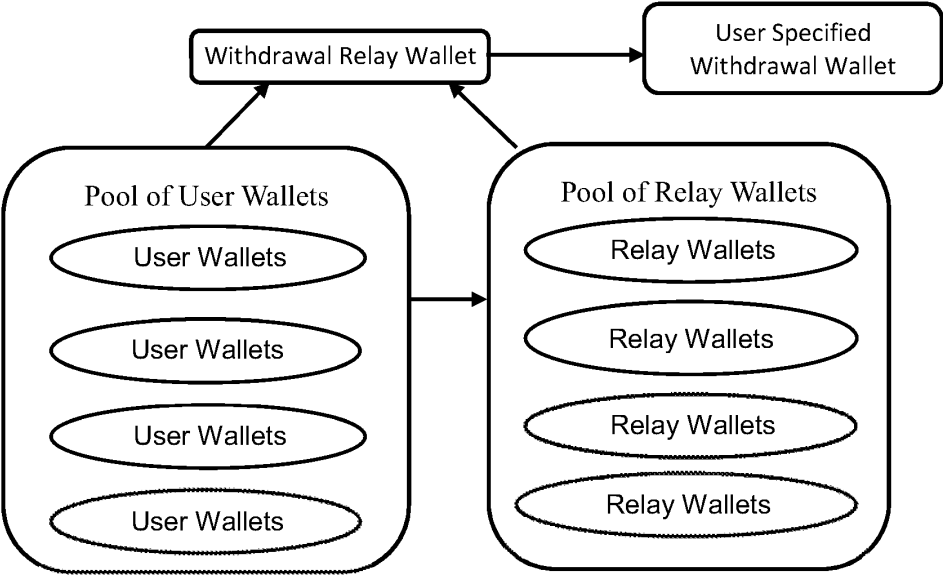


Figure 44

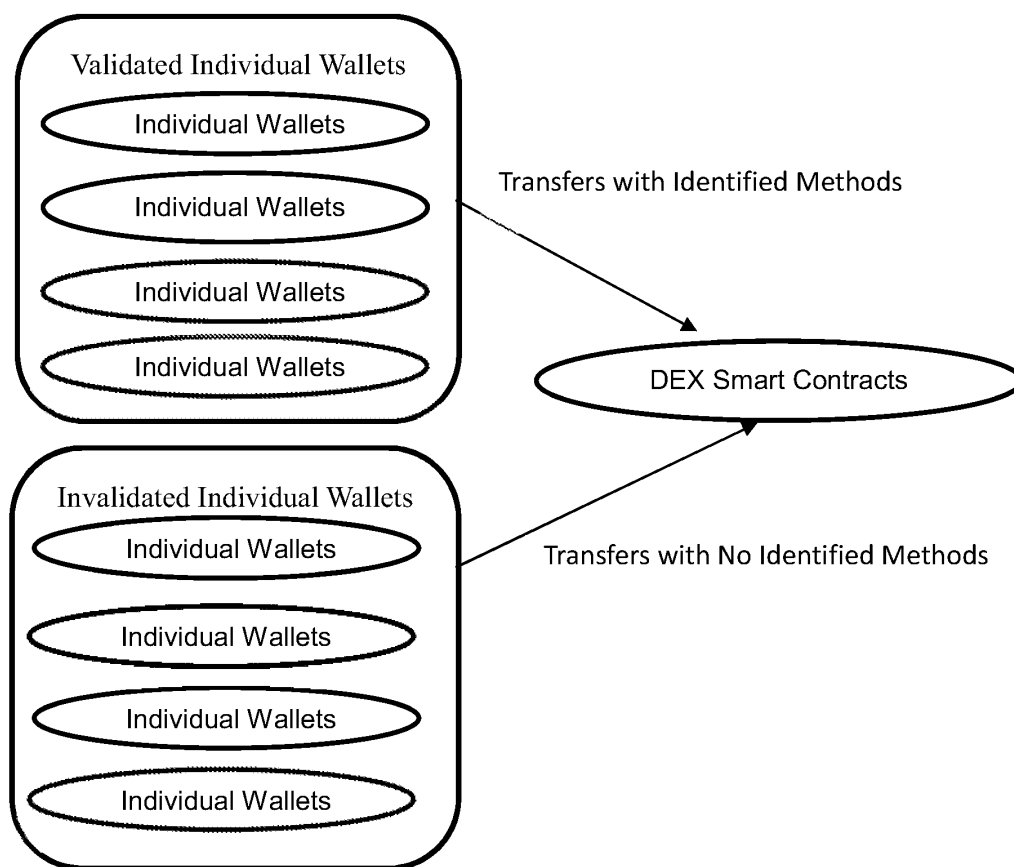


Figure 45

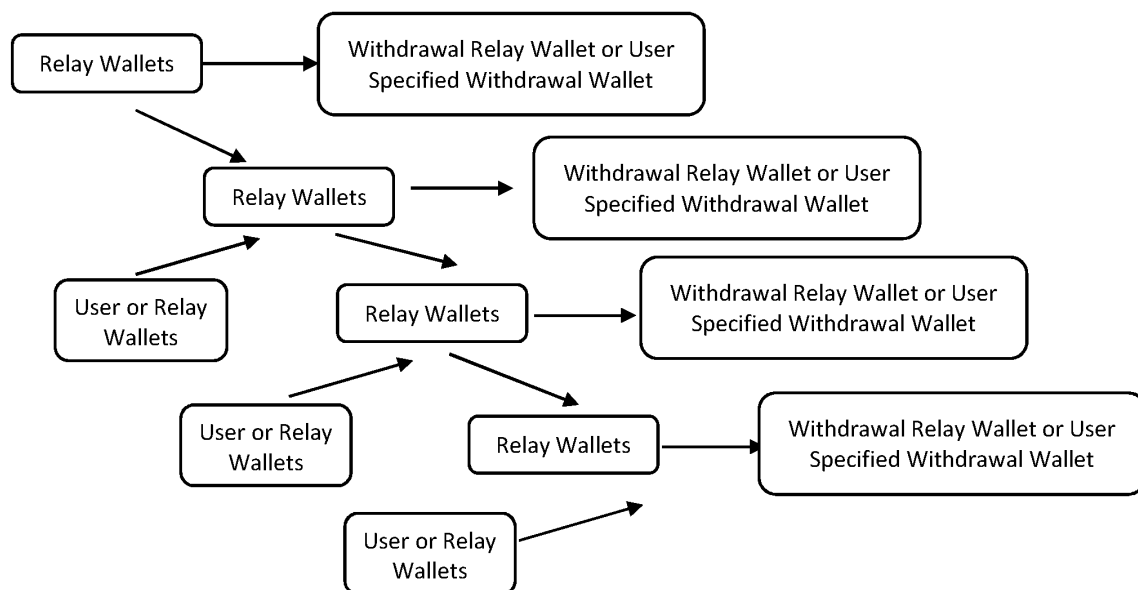


Figure 46

```

***** CURRENT RUNNING PROCESSES *****

-----
| run_id | type                | exchange | wallet                                | filepath | initiator |
-----
| 31 | Wallet Creator Crawl | Bitbay   | 0xeec02515a59f4369ad3d9fc7aa7049585b5589db5 | -        | Donovan   |
-----

Operations Menu

1. Add & Crawl (New) Wallet Creator Address
2. Add & Crawl (New) Exchange Wallet Address
3. Add User Wallets With R/S via .csv file
4. Add User Wallets via .txt file
5. Add Non-Exchange Wallets With R/S via .txt file
6. List all Exchanges
7. Add Exchange
8. List all Wallet Creator Addresses
9. List all DEX
10. Add DEX
11. List all OTC
12. Add OTC
13. List all Exchange-Owned Wallets
14. Add Exchange-Owned Wallet
15. Add Exchange-Owned Wallet (Bulk)
16. Edit Exchange-Owned Wallet
17. List all Token Contract Address
18. Add Token Contract Address
19. List all Unidentified Wallets
20. Handle Unidentified Wallets
21. Exchange - Token Relationships
22. Exchange - User Wallets
23. User Wallet validity check (Exchange)
24. User Wallet validity check (Big Tx)
25. List all User Wallets requiring revalidation
26. Handle User Wallets requiring revalidation
27. Flag spam broadcast addresses
28. Flag invalid user wallets
29. Handle failed/stopped runs
30. Exit

> Choose option:

```

Figure 47 (Main menu of wallet crawler system)

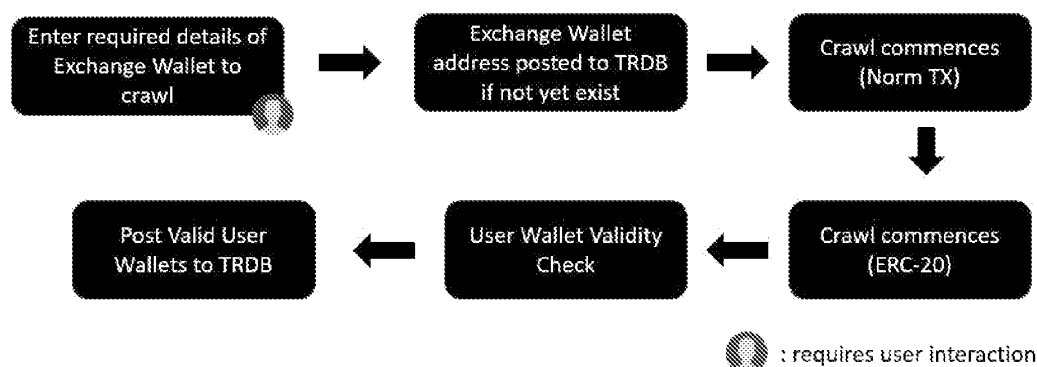


Figure 48

HANDLE UNIDENTIFIED WALLETS

Format: (ID) Address [Possibly related exchange]

These are unknown addresses which received tokens from addresses previously labelled as user wallets.

Choose an unidentified wallet to see more details & decide what to do with it.

id	address	exchange?	# LW rcdvd from
3993	0x2bb97b6cf6ffe53576032c11711d59bd056830ee	Kraken	434
5625	0xx97511b9af934c6acb44bai10c24783f57fb4cbb	Bitbay	470

```
Select unidentified wallet(id):
```

Figure 49A (Handle Unidentified Wallets)

```
Select unidentified wallet(id): 5625
```

```
#####
SELECTED WALLET: 0x097511b9af934c6acb44ba110c24783f57fb4cbb
```

Possibly exchange wallet of: Bitbay

Total Number of unique, prev identified User Wallet received from: 470

```
-- Breakdown --
```

> Bitbay, #wallets: 470

Show User Wallets in breakdown? (y/n): y

exchange	#addresses	addresses
Bitbay	478	0xc3a319fef732dd5a01c160e6bea06d021fb13435 0x454a6b803714df668982ab3130f5a37bb11beb2e 0xa4d1f18c896f098c43b65b83b90141ce51d49a25 0xcfc2d2ece2d24e133644a2882fd43eb264eef2982 0xd6194361fe5c23a0d9bc9ffe231ce7bc6b6d8de7 0xa468335479c73bb5edc293cedd7f73b91929dbc 0x836e385b2706cc7e75245cf940982bdf727d833b

Figure 49B

Possible actions:

> Yes(y): Unidentified wallet will be reclassified as Exchange wallet.
All user wallets that sent to this address will remain as valid user wallets.

> No(n): Unidentified wallet will be rejected as Exchange wallet.
[IMPORTANT] All prev identified user wallets that sent to this address CANNOT be user wallets.
They will be sent to IRDS and re-annotated as "Non-Exchange".

```
> No, but User Wallets Valid (nv): Unidentified wallet will be rejected as Exchange wallet, but User Wallets that sent to it still valid.
Choose this for special cases, e.g. when unidentified wallet is for token swap.
```

> leave(1): Leave Unidentified wallet in list & XIV.
Select this option if investigation still under way & decision cannot be made yet.

Accept Unidentified Wallet as Exchange Wallet? (y/n/nv/l):

Figure 49C

A total of 133,406 links found
(Showing the last 10,000 records only)

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Txn Hash	Age	From		To	Value	Token
0x45b860d6265a5c...	227 days 19 hrs ago	0xd3b15b285e5c52...	IN	0xab632e544b16b7...	0.0000000437184	↗ ElectrifyAsi... (ELEC)
0xa1130a2c170943...	227 days 19 hrs ago	0xd3b15b285e5c52...	IN	0xab632e544b16b7...	0.00001158	↗ ElectrifyAsi... (ELEC)
0x21d34a9b37340fa...	227 days 19 hrs ago	0xd3b15b285e5c52...	IN	0xab632e544b16b7...	9.4863	↗ ElectrifyAsi... (ELEC)
0x1dc94aeb872536...	234 days 4 hrs ago	0xab632e544b16b7...	OUT	0x15e9c0f0cd0abe...	555.423773	↗ ElectrifyAsi... (ELEC)
0x1dc94aeb872536...	234 days 4 hrs ago	0xab632e544b16b7...	OUT	0x2818951a2a70c8...	553.940025	↗ ElectrifyAsi... (ELEC)
0x1dc94aeb872536...	234 days 4 hrs ago	0xab632e544b16b7...	OUT	0xd8580c75403b63...	565.826797	↗ ElectrifyAsi... (ELEC)
0x1dc94aeb872536...	234 days 4 hrs ago	0xab632e544b16b7...	OUT	0xf4384ee8506f138...	551.757014	↗ ElectrifyAsi... (ELEC)

Figure 50 (Example of Spam address – ElectrifyAsia)

Overview [ERC-20]

PRICE

\$0.0000 @ 0.0000 ETH

FULLY DILUTED MARKET CAP @

\$0.00

Total Supply:

0 blockwell.ai KYC Casper Token

Holders:

0 addresses

Transfers:

596,247

Profile Summary

Token Name:

blockwell.ai KYC Casper Token

Contract:

0x212d95fcd00368343350f486bda10a1d0x2d63

Decimals:

18

Social Profiles:

Not Available, Update ?

Transfers

Holders

Info

Read Contract

Write Contract

Analytics

Comments (13)

A total of 596,247 transactions found

(Showing the last 100k records)

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Figure 51 (Example of Spam address– blockwell.ai KYC Casper token)

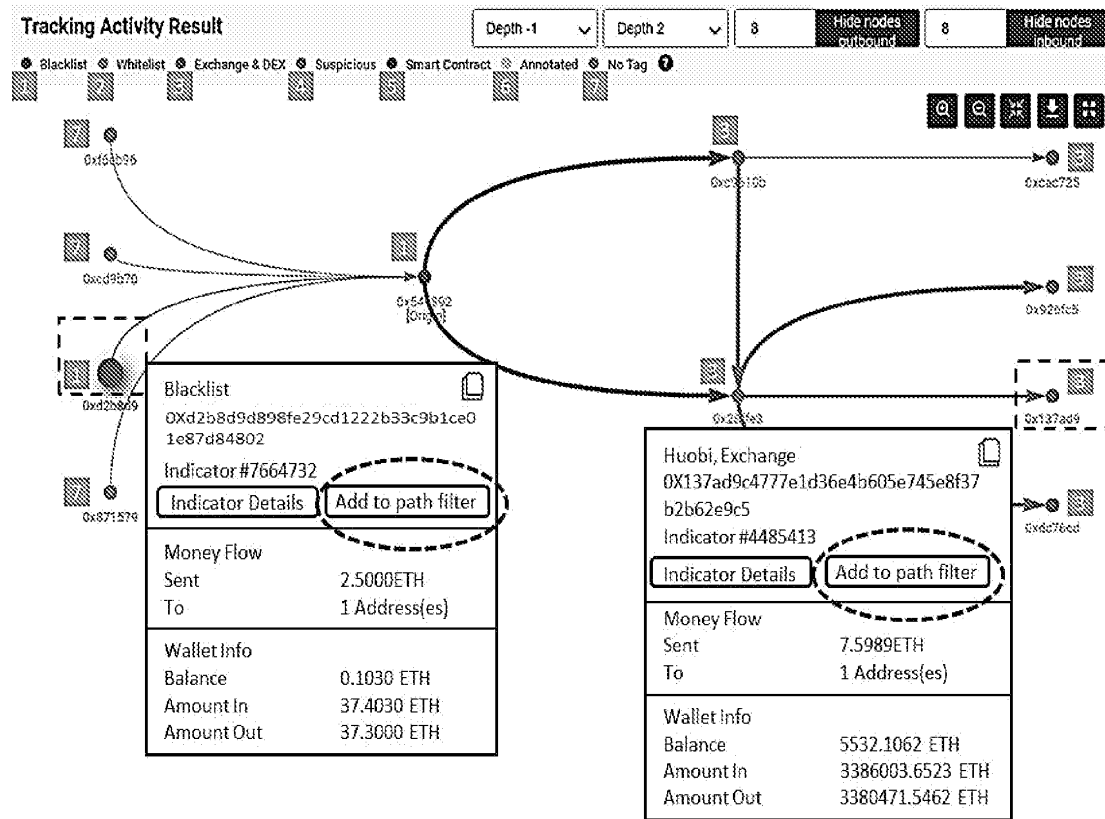


Figure 52 (Before Path filter)

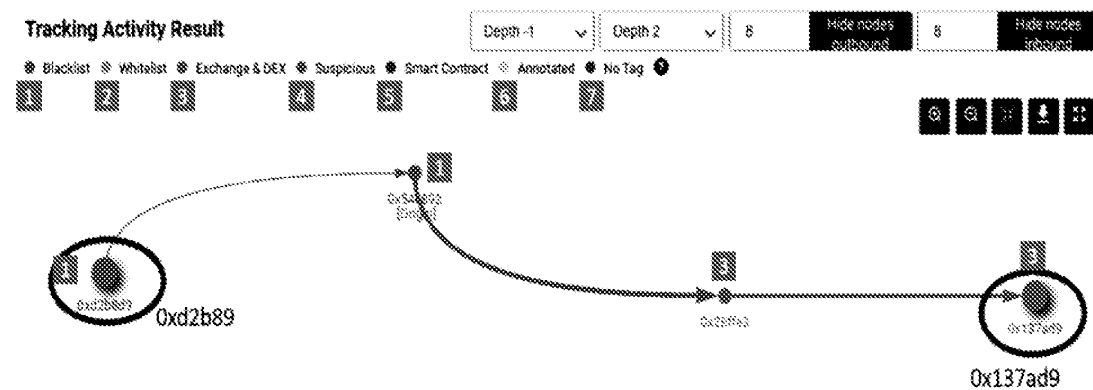


Figure 53 (After Path filter)

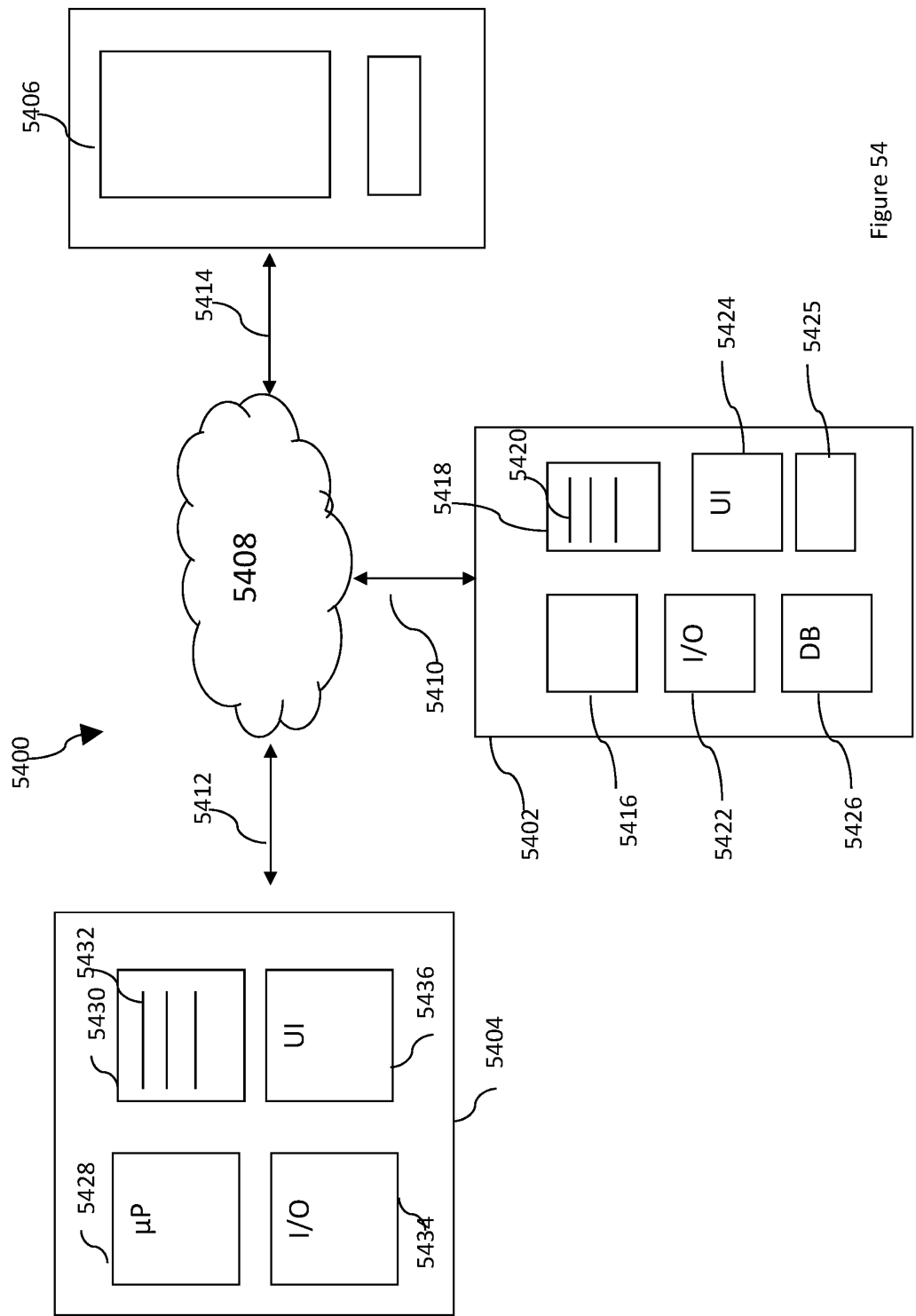


Figure 54

TYPE	ADDRESS	ANNOTATION	SECURITY CATEGORY	DETAILS
ETH	0xcc2a61901cb2a11e0d3348b578a3e6e551b1b50e	Bithumb, Exchange	Graylist	
ETH	0xcc2a61901cb2a11e0d3348b578a3e6e551b1b50e	Bithumb, Exchange, Token	Graylist	
ETH	0x921adfc666a564b2991464c394c2aa43911834b4	Bithumb, User Wallet	Graylist	Relationship with 0xa6cb6c3f12d03b57c9086c6ecd046d37abed0b7c
ETH	0x6829dcac96d016f40f175cbdb76b92d6cdffa6240	Bithumb, User Wallet	Graylist	Relationship with 0xc257274276a4e539741ca11b590b9447b26a8051 Relationship with 0x2140efd7ba31169c69dfff6cdc66c542f0211825

Figure 55