

CLAIMS:

1. An electronic trading system, comprising:

at least one memory having a monitored database of a dynamically changing set of stored electronic trading orders for a tradable instrument corresponding to a variant inventory, each electronic trading order being in the form of a record having a plurality of attributes including a first set of unitary-valued attributes and a second set of set-valued attributes, wherein each unitary-valued attribute in the first set has exactly one data item specified in the record as its value, and at least one of the set-valued attributes of the second set has more than one data item specified in the record as its value;

a hardware-based network interface configured to receive, from one or more external computing devices, incoming electronic trading orders for the tradable instrument; and

a processing system, including at least one hardware-based processor, configured to:

execute operations of a matching engine, wherein the matching engine is configured to perform continuous matching, and wherein the operations of the matching engine include identifying a transaction for a first incoming electronic trading order from the incoming electronic trading orders for the variant inventory, wherein the operations include:

comparing a first record corresponding to the first incoming electronic trading order to a plurality of second records each corresponding to one of the stored electronic trading orders in the monitored database in real-time, wherein the comparing the first record to a second record from the plurality of second records includes:

comparing the first set of unitary-valued attributes from the first record to the second set of unitary-valued attributes from the second record; and

only if said comparing the first set of unitary-valued attributes from the first record to the second set of unitary-valued attributes from the second record results in a

successful match for unitary-valued attributes in the first record, comparing the second set of set-valued attributes from the first record to the second set of set-valued attributes of the second record, wherein at least one of the set-valued attributes in each of the first record and the second record specify a delivery requirement or a delivery commitment for the variant inventory;

wherein the transaction is identified when:

for each of one or more second records from the plurality of second records, said comparing the first record to the second record includes determining a successful match of the first record to the second record where:

(A) the exactly one data item specified as the value of a particular unitary-valued attribute in the first set of unitary-valued attributes of the first record is identical to the exactly one data item specified as the value of a corresponding unitary-valued attribute in the first set of unitary-valued attributes of the second record; and

(B) at least one data item in the set of multiple data items specified as the value of a particular set-valued attribute of the first record is identical to a data item in the set of multiple data items specified as the value of the corresponding set-valued attribute in the second set of set-valued attributes of the second record; and

a volume requirement specified in the first record is satisfied by an aggregate of volume commitments specified in the one or more second records providing a successful and complete match between the first record and the one or more second records;

update the monitored database in accordance with the identified transaction;

transmit, from the matching engine to at least one server, information corresponding to the identified transaction; and

execute operations of the at least one server to:

keep track of successfully matched orders of the identified transaction transmitted by the matching engine; and

store, upon said successful and complete match, said information associated with the identified transaction at least until delivery corresponding to the identified transaction has been completed according to the delivery requirement specified in the first record.

2. The electronic trading system according to claim 1, wherein the comparing the first record to the second record results in the transaction for the first incoming electronic trading order being identified if the comparing the first record to the second record includes further determining that the set of multiple data items specified as the value of the particular set-valued attribute in the second set of set-valued attributes of the second record is not identical to the set of multiple data items specified as the value of a corresponding set-valued attribute in the second set of set-valued attributes of the second record.

3. The electronic trading system according to claim 1, wherein the comparing the first record to the second record results in the transaction for the first incoming electronic trading order being identified if the comparing the first record to the second record includes further determining that, for each attribute in corresponding second sets of set-valued attributes, a non-zero intersection between said first record and the second record.

4. The electronic trading system according to claim 3, wherein the comparing the first record to the second record results in the transaction for the first incoming electronic trading order being identified if the comparing the first record to the second record further includes, when another particular attribute is designated in the first record as a whitelist, determining that all data items specified as a value of the particular attribute in the second record is a subset of data items specified as a value of the particular attribute in the first record.

5. The electronic trading system according to claim 3, wherein the comparing the first record to the second record results in the transaction for the first incoming electronic trading order being identified if the comparing the first record to the second record further includes, when another particular attribute is designated in the first record as a blacklist, determining that no data items specified as a value of the particular attribute in the first record matches any data item of the particular attribute in the second record.

6. The electronic trading system according to claim 3, wherein the comparing the first record to the second record results in the transaction for the first incoming electronic trading order being identified if the comparing the first record to the second record further includes, when another particular attribute is designated in the first record as a defined list, determining that all data items specified as a value of the particular attribute in the first record matches data items specified as a value of the particular attribute in the second record.

7. The electronic trading system according to claim 1, wherein the comparing the first record to the second record further comprises performing said comparing the second set of set-valued attributes of the first record to the second set of set-valued attributes of the second record only if said comparing the first set of unitary-valued attributes from the first record to the second set of unitary-valued attributes from the second record results in a successful match for all unitary-valued attributes in the first record.

8. The electronic trading system according to claim 1, wherein one or more attributes of the second set of set-valued attributes represent delivery aspects of a tradable instrument.

9. The electronic trading system according to claim 8, wherein the tradable instrument represents an advertising in one or more delivery medium, and wherein the delivery aspects specified in the incoming electronic trading order include a plurality of values for a delivery dates requirement, gender requirements, marital status requirements, education level requirements, or geography requirements, of a target audience for the advertising.

10. The electronic trading system according to claim 9, wherein the delivery aspects specified in the incoming electronic trading order include a plurality of data items specified as a value for a delivery dates requirement specified in a bitmap.

11. The electronic trading system according to claim 9, wherein the delivery aspects

specified in the incoming electronic trading order include a geographic attribute for which values are specified at a first level of a multi-level hierarchy, and wherein the delivery aspects specified in the stored electronic trading order include the geographic attribute for which values are specified at a second level of the multi-level hierarchy.

12. The electronic trading system according to claim 8, wherein the tradable instrument represents an advertising in one or more delivery medium, and wherein the delivery aspects specified in the incoming electronic trading order include a plurality of data items specified as a value for an attribute representing ad size requirements, ad publisher sites, display creatives, pacing of advertisements, or brands associated with the advertising.

13. The electronic trading system according to claim 7, wherein the second set of set-valued attributes of the stored electronic trading order is stored separately from the first set of unitary-valued attributes of the stored electronic trading order in the at least one memory and/or the monitored database, and is retrieved if said comparing the first set of unitary-valued attributes from the first record to the second set of unitary-valued attributes from the second record results is a successful match and is not retrieved if said comparing the first set of unitary-valued attributes from the first record to the second set of unitary-valued attributes from the second record results is not a successful match.

14. The electronic trading system according to claim 1, wherein the monitored database includes stored electronic trading orders for a second tradable instrument, and wherein the first set of unitary-valued attributes of the second tradable instrument is different in a number of attributes and/or a type of attributes, from the first set of unitary-valued attributes of the first tradable instrument.

15. The electronic trading system according to claim 14, wherein the second set of set-valued attributes of the second tradable instrument is different in a number of attributes and/or a type of attributes, from the second set of set-valued attributes of the first tradable instrument.

16. The electronic trading system according to claim 1, wherein the first set of unitary-valued attributes include a first subset of instrument family level attributes that are common to two or more tradable instruments in the electronic trading system, and a second subset of instrument level attributes, wherein a combined first subset and the second subset form a unique instrument descriptor in the electronic trading system.

17. The electronic trading system according to claim 1, wherein said comparing the first record to the second record is performed in accordance with matching rules, wherein the matching rules include one or more rules specifying that an incoming electronic trading order is matched in accordance with a type of the tradable instrument, a family of the tradable instrument, a price of the incoming electronic trading order, one or more set-valued attributes of the tradable instrument, and on a quantity of the incoming electronic trading order, according to a predetermined ordering.

18. The electronic trading system according to claim 1, wherein the matching engine identifies the transaction in real-time or near real-time with receiving corresponding incoming electronic trading orders, while executing electronic continuous trading.

19. The electronic trading system according to claim 1, wherein the stored electronic trading orders include orders for inventories of at least one of advertising futures, container shipment futures, stock swaps, designer CDOs, extended sets of oil and industrial chemicals varieties futures, FLEX options, reinsurance, food products, alcoholic or non-alcoholic beverages, mining products, paper and pulp products, automotive products, lumber and wood products, satellite services, and unstructured debt obligations.

20. A method performed by at least one processor of an electronic trading system, comprising:

accessing, using the at least one processor, a dynamically changing set of stored electronic trading orders for a tradable instrument corresponding to a variant inventory, in a monitored database, each electronic trading order being in the form of a record having a plurality of attributes including a first set of unitary-valued attributes and a second set of set-valued attributes, wherein each unitary-valued attribute in the first set has exactly one data item specified in the record as its value, and at least one of the set-valued attributes of the second set has more than one data item specified in the record as its value;

receiving, using the at least one processor and via a network, incoming electronic trading orders for the tradable instrument from one or more external computing devices;

comparing, by operations performed by a matching engine executed on the at least one processor and configured to perform continuous matching in accordance with a plurality of matching rules, a first record corresponding to the first set of unitary-valued attributes and the second set of set-valued attributes of an incoming electronic order with a plurality of second records each corresponding to the first set of unitary-valued attributes and the second set of set-valued attributes of at least one of said stored electronic orders in the monitored database in real time, wherein the comparing the first record to the a second record from the plurality of second records includes:

comparing the first set of unitary-valued attributes from the first record to the second set of unitary-valued attributes from the second record; and

only if said comparing the first set of unitary-valued attributes from the first record to the second set of unitary-valued attributes from the second record results in a successful match for unitary-valued attributes in the first record, comparing the second set of set-valued attributes from the first record to the second set of set-valued attributes of the second record, wherein at least one of the set-valued attributes in each of the first record and the second record specify a delivery requirement or a delivery commitment for the variant inventory;

identifying, by operations performed by the matching engine, a transaction for the variant inventory when:

for each of one or more second records from the plurality of second records said comparing the first record to the second record includes determining a successful match of the first record to the second record where:

(A) the exactly one data item specified as the value of a particular unitary-valued attribute in the first set of unitary-valued attributes of the first record is identical to the exactly one data item specified as the value of a corresponding unitary-valued attribute in the first set of unitary-valued attributes of the second record; and

(B) at least one data item in the set of multiple data items specified as the value of a particular set-valued attribute of the first record is identical to a data item in the set of multiple data items specified as the value of the corresponding set-valued attribute in the second set of set-valued attributes of the second record; and

a volume requirement specified in the first record is satisfied by an aggregate of volume commitments specified in the one or more second records providing a successful and complete match between the first record and the one or more second records;

updating, using the at least one processor, the monitored database in accordance with the identified transaction;

transmitting, from the matching engine to at least one server, information corresponding to the identified transaction; keep track, by operations performed by the at least one server, of successfully matched orders of the identified transaction transmitted by the matching engine; and

store, by operations performed by the at least one server, upon said successful and complete match, said information associated with the identified transaction at least until delivery corresponding to the identified transaction has been completed according to the delivery requirement specified in the first record.

21. A non-transitory computer readable storage medium storing program instructions that, when executed by a processor of a computer, causes the computer to perform operations, comprising:

accessing a dynamically changing set of stored electronic trading orders for a tradable instrument corresponding to a variant inventory in a monitored database, each electronic trading order being in the form of a record having a plurality of attributes including a first set of unitary-valued attributes and a second set of set-valued attributes, wherein each unitary-valued attribute in the first set has exactly one data item specified in the record as its value, and at least one of the set-valued attributes of the second set has more than one data item specified in the record as its value;

receiving, via a network, incoming electronic trading orders for the tradable instrument from one or more external computing devices;

comparing, by operations performed by a matching engine configured to perform continuous matching in accordance with a plurality of matching rules, a first record corresponding to the first set of unitary-valued attributes and the second set of set-valued attributes of an incoming electronic order with a plurality of second records each corresponding to the first set of unitary-valued attributes and the second set of set-valued attributes of at least one of said stored electronic orders in the monitored database in real time, wherein the comparing the first record to a second record from the plurality of second records includes:

comparing the first set of unitary-valued attributes from the first record to the second set of unitary-valued attributes from the second record; and

only if said comparing the first set of unitary-valued attributes from the first record to the second set of unitary-valued attributes from the second record results in a successful match for unitary-valued attributes in the first record, comparing the second set of set-valued attributes from the first record to the second set of set-valued attributes of the second record, wherein at least one of the set-valued attributes in each of the first record and the second record specify a delivery requirement or a delivery commitment for the variant inventory;

identifying, by operations performed by the matching engine, a transaction for the variant inventory when:

for each of one or more second records from the plurality of second records, said comparing the first record to the second record includes determining a successful match of the first record to the second record where:

- (A) the exactly one data item specified as the value of a particular unitary-valued attribute in the first set of unitary-valued attributes of the first record is identical to the exactly one data item specified as the value of a corresponding unitary-valued attribute in the first set of unitary-valued attributes of the second record; and
- (B) at least one data item in the set of multiple data items specified as the value of a particular set-valued attribute of the first record is identical to a data item in the set of multiple data items specified as the value of the corresponding set-valued attribute in the second set of set-valued attributes of the second record; and

a volume requirement specified in the first record is satisfied by an aggregate of volume commitments specified in the one or more second records providing a successful and complete match between the first record and the one or more second records;

updating the monitored database in accordance with the identified transaction;

transmitting, from the matching engine to at least one server, information corresponding to the identified transaction;

- keep track, by operations performed by the at least one server, of successfully matched orders of the identified transaction transmitted by the matching engine; and
- store, by operations performed by the at least one server, upon said successful and complete match, said information associated with the identified transaction at least until delivery corresponding to the identified transaction has been completed according to the delivery requirement specified in the first record.