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(54) Title: COMMODITIES EXCHANGE SYSTEM AND METHOD
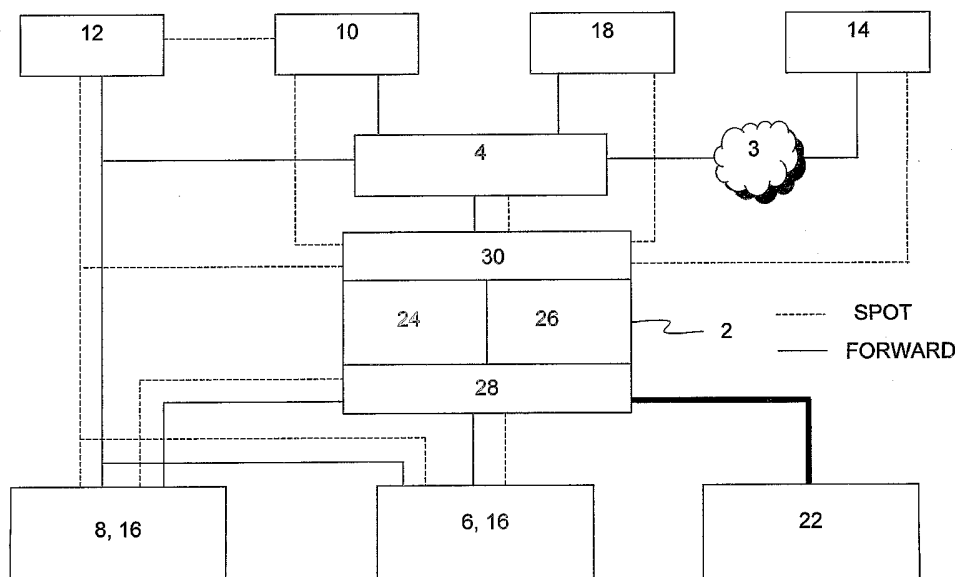
(57) **Abstract:** An electronic commodities exchange system (2) for trading physical commodities between buyers and sellers on a
commodities market via a communications network comprises at least one interface (30) through which buyers submit orders to buy
a commodity and sellers submit orders to sell a commodity, a trading engine (24) for matching the orders to sell with the orders to
buy at least on the basis of a common commodity type and a common price between the orders, a settlement and clearing engine
(26) for managing the settlement and clearance of deals created from matched orders to sell and orders to buy. The exchange system
cooperates with a holder (6) of the commodity to arrange for delivery of the commodity according to the deal.

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ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

COMMODITIES EXCHANGE SYSTEM AND METHOD

FIELD OF THE INVENTION

5   The invention relates to a commodities exchange system and method. In particular, although not exclusively, the invention relates to a commodities exchange system and method that provides a complete audit trail of transactions between suppliers and buyers, quality control of traded commodities and logistics management.

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BACKGROUND TO THE INVENTION

Physical commodities such as agricultural products, petroleum and metals are still traded on a personal contact basis, such as via telephone, facsimile or email, whereas futures contracts are traded on dedicated futures exchanges,

15   such as the Chicago Board of Trade (CBOT) and Minneapolis futures exchanges in a similar manner to financial instruments such as stocks and shares. However, in contrast to financial instruments, with physical commodities such as grain, a physical product is traded and a particular type, quality and amount of the product must be delivered to a specific destination by a certain date.

20   The trading of physical commodities by personal contact is labour intensive and inefficient since many processes involved in the trade are carried out manually, including transferring title of the commodity from the seller to the buyer. Such inefficient commodity trading mechanisms are often a consequence of, and are still hindered by, outmoded legislation. Such legislation has resulted

25   in highly regulated "single desk" selling for exports of many commodities such as

grains and oilseeds and local and international grain trading houses have had no incentive to develop infrastructures for the purpose of direct trading from the producer to the purchaser. Grain trading companies, for example, have focused on conversion or value adding. Furthermore, in many countries there are

5   contractual destination restrictions imposed on export cargoes purchased by international trading houses from government or semi-government commodity marketing boards.

However, some countries have witnessed significant deregulation in commodity industries, such as the grain industry in Australia, which has led to

10   the privatisation of some commodity marketing boards. Additionally, trade in commodities has become more diverse due to the transparency of market information and the departure of government buying agencies from international trade in many major importing countries. Increasingly, buyers and sellers are seeking improved efficiencies in supply chains to increase their returns and cut

15   costs.

State of the art technology has been implemented to an extent in commodities trading, which has resulted in various Internet accessible commodities auction sites. However, existing commodities auction sites do not execute trades and the current models for operating Internet based commodities

20   exchanges fail because there are no clearing and settlement methods. As with conventional financial instrument exchanges, sellers need to be guaranteed payment and, of particular importance with commodities, buyers need to be guaranteed delivery of the contracted or purchased commodity at the right time.

Hence, there is clearly a need for a system and/or method of making and

25   settling physical commodities transactions that addresses or at least ameliorates

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the aforementioned problems of the prior art commodity trading systems and methods.

In this specification, the terms "comprises", "comprising" or similar terms are intended to mean a non-exclusive inclusion, such that a method, system or

5   apparatus that comprises a list of elements does not include those elements solely, but may well include other elements not listed.

SUMMARY OF THE INVENTION

In one form, although it need not be the only or indeed the broadest form,

10   the invention resides in an electronic commodities exchange system for trading physical commodities between buyers and sellers on a commodities market via a communications network, the exchange system comprising:

at least one interface through which buyers submit orders to buy a commodity and sellers submit orders to sell a commodity;

15   a trading engine for matching the orders to sell with the orders to buy at least on the basis of a common commodity type and a common price between the orders;

a settlement and clearing engine for managing the settlement and clearance of deals created from matched orders to sell and orders to buy;

20   wherein the exchange system cooperates with a holder of a commodity to arrange for delivery of the commodity according to the deal.

The commodities market may be a spot market or a forward market.

The at least one interface may comprise a trading interface coupled to be in communication with the trading engine.

25   Orders submitted on the spot market may be submitted via the at least

one trading interface.

Orders submitted on the forward market may be submitted via a clearing participant and via the trading interface.

The system may further comprise a partial indicator associated with an order, which, if activated, allows the associated order to be matched with another order to create a deal if the volumes of the orders do not match.

Where a deal is created between two orders where the volumes of the orders do not match, the trading engine may adjust the order with a larger volume such that a remaining unmatched volume of the order is available for matching by the trading engine with another order.

The trading engine may match orders on one or more of the following bases: a time of receipt of an order by the trading engine, buy orders with a highest price, sell orders with a lowest price.

The interface may issue a warning to the buyer or seller if, respectively, a price of a submitted order to buy is more than a best open sell order by a pre-defined amount or a price of a submitted order to sell is less than a best open buy order by a pre-defined amount.

The at least one trading interface may automatically calculate one or more of the following when an order is being placed: a cost of transporting the commodity from the holder of the commodity to a delivery point, an administration fee, a price per contract, a shrink cost, an insurance cost.

Upon receipt of funds from a buyer, the settlement and clearing engine may instruct the holder of the commodity to transfer title in the commodity from the seller to the buyer.

In another form, the invention resides in a method of trading physical

commodities on a commodities market via an electronic commodities exchange system. The method includes the steps of:

receiving an order to sell a commodity via an interface of the commodities exchange system;

5   receiving an order to buy a commodity via an interface of the commodities exchange system;

creating a deal by matching an order to sell with an order to buy at least on the basis of a common commodity type and a common price between the orders; and

10   arranging for delivery of the commodity according to the deal following cooperation of the exchange system with a holder of the commodity.

The commodities market may be a spot market or a forward market.

The orders may be submitted to the commodities exchange system via a clearing participant.

15   An order may be checked for compliance with market rules prior to submitting the order to a trading engine of the exchange system.

The method may further include a step wherein the commodities exchange system reserves funds sufficient to cover the order to buy prior to submitting the order to the trading engine of the exchange system.

20   The method may further include a step wherein the commodities exchange system requests a physical hold (lien) to be placed on the commodity sufficient to cover the order to sell prior to submitting the order to the trading engine of the exchange system.

Further features of the present invention will become apparent from the

25   following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

To assist in understanding the invention and to enable a person skilled in the art to put the invention into practical effect preferred embodiments of the invention will be described by way of example only with reference to the accompanying drawings, wherein:

FIG 1 shows a schematic representation of the system of the present invention and participants therein;

FIG 2 is a screenshot of an interface showing some of the options for traders when using the system shown in FIG 1;

FIG 3 is a screenshot of an interface showing some of the method steps involved in the offer process when using the system shown in FIG 1;

FIG 4 is a screenshot of an interface showing further method steps involved in the offer process;

FIG 5 is a screenshot of an interface showing further method steps involved in the offer process;

FIG 6 is a screenshot of an interface showing some of the method steps involved in the buy process when using the system shown in FIG 1;

FIG 7 is a screenshot of an interface showing further method steps involved in the buy process;

FIG 8 is a screenshot of an interface showing further method steps involved in the buy process;

FIG 9 is a flow chart showing the steps involved in a purchase on the spot market by a non-market maker;

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FIG 9A is a flow chart showing the vetting rules that must be adhered to for the process depicted in FIG 9;

FIG 10 is a flow chart showing the steps involved in a sell on the spot market by a non-market maker;

5   FIG 10A is a flow chart showing the vetting rules that must be adhered to for the process depicted in FIG 10;

FIG 11 is a flow chart showing the steps involved in a sell or buy on the forward market;

FIG 12 is a representation of different trading accounts for different

10   participants and their access privileges;

FIG 13 is a flowchart showing steps in the spot market settlement cycle; and

FIG 14 is a flowchart showing steps in the forward market settlement cycle.

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DETAILED DESCRIPTION OF THE INVENTION

In accordance with the present invention, an electronic commodities exchange system is provided for the efficient and cost effective buying and selling of commodities between suppliers, such as farmers, and purchasers,

20   such as end users.   The system brings together all sectors of an industry relevant to a particular commodity and enables purchasers to buy directly from suppliers.   Although the present invention will be described in relation to the trading of grain, it will be appreciated that the present invention is applicable to the trading of other commodities.

25   With reference to FIG 1, the exchange system 2 has a stock market style

environment that enables participants to trade in commodity spot and forward

contracts as well as providing clearing services and logistics management. All

market participants have the ability to trade directly in the spot market whilst

trading in the forward market is limited to clearing participants 4.

5   The spot market is for immediate delivery of the commodity in exchange

for immediate payment. This involves trading the physical commodity and the

resulting contracts are to be settled in a predetermined time frame, such as T+2

days, T+3 days, where T is the date of the trade. As described below, trading in

the spot market is based on auto-matching by a trading engine 24 of the

10   exchange 2. Trading participants place buy and/or sell orders on the market and

trading engine 24 automatically matches orders at least on the basis of price on

a first in, first out (FIFO) basis. Settlement is guaranteed by placing a

reservation, such as a hold or lien, on the commodity being sold when the offer

is entered and on the buyer's funds when a bid is accepted. Settlement and

15   clearing is controlled by settlement and clearing engine 26 of the exchange 2.

The forward market involves a purchase or sale of a physical commodity

for deferred delivery at some agreed future date. Trading is based on auto-

matching by trading engine 24 on a FIFO basis as with the spot market. Trades

in the forward market can only be placed through clearing participants 4 who

20   guarantee settlement. Examples of clearing participants include Grain Handling

Companies (GHCs) 6 and large commodity brokers/banks 8. In FIG 1, for the

sake of clarity, GHC 6 and commodity broker/bank 8 are shown separately from

clearing participant 4, although it will be appreciated that GHC 6 and commodity

broker/bank 8 could act as the clearing participant 4 in a trade.

With reference to FIG 1, possible trading participants in the exchange system of the invention include:

Clearing Participants (Clearers) 4, who can trade on behalf of others or for themselves in both the spot and forward markets;

5   Grain Handling Companies (GHCs) 6, who hold or store commodities on behalf of producers/suppliers and purchase commodities from producers to sell on to other parties, such as end users. GHCs also trade on commodity futures markets such as the Chicago Board of Trade (CBOT) and Winnipeg Commodity Exchange (WCE) to reduce their exposure to the underlying physical market. In

10   the present invention, GHCs will be able to trade on their own behalf in both the spot and forward markets and are therefore clearing participants. They will also be able to advise and trade on behalf of other participants such as producers 12. GHCs may also be market makers;

Commodity Trading Firms 8 currently trade on the international futures

15   markets on their own behalf and on behalf of others. In the present invention, commodity trading firms 8 will be able to trade on their own behalf in both the spot and forward markets and advise and trade on behalf of other participants such as producers 12. Commodity trading firms 8 will be clearing participants and may be market makers;

20   Agents 10, such as country agents, currently sell producers' commodities on their behalf. In the present invention, agents will be able to advise and trade on behalf of a producer 12 or themselves in the spot market directly, and will be able to trade on the forward market via clearing participants 4. Producers 12 need to guarantee any orders placed through agents directly with the exchange

2, i.e. have a physical grain holding for sell orders or available funds for buy orders;

Producers 12 and end users 14 are participants who are interested in trading commodities on their own behalf and will be able to do so directly in the

5   present invention on the spot market. They will need to guarantee any orders they place with the exchange 2 directly. Producers and end users are only able to trade on the forward market through a clearing participant 4.

Market Makers 16 can trade for themselves in both the spot and forward markets and one of their functions is to maintain liquidity in the markets.

10   Examples of Market Makers include GHCs 6 and commodity brokers/banks 8;

Market speculators 18 trade on the commodities market in order to make profits and can trade on their own behalf in the spot market and in the forward market through a clearing participant 4.

With reference to FIG 1, further participants of the exchange 2 of the

15   present invention include:

Custodians – this role will be undertaken by GHCs 6 for the settlement of deals. Interface 28 between the exchange 2 and the GHCs 6 is required to enable the exchange to check physical commodity holdings, place liens on the physical commodity holding to guarantee settlement and to request transfer of

20   ownership of the commodity during settlement. Interface 28 preferably provides a real-time link to the GHCs 6 own back office systems;

Financial Institutions such as banks 8 are required participants for the settlement of deals. Interface 28 enables the exchange 2 to transfer funds for settlement via real-time transfers or via overnight batch transfers. Reconciliation

25   of bank accounts held by the exchange 2 may also be performed;

National Grower Registries (NGRs) 22 are non-trading participants and a typical registry maintains a database that includes contact and bank account details of commodity producers 12. The exchange 2 may request information from the NGR via interface 28 and employ this information to streamline

5   processing of trades. A single interface 28 may operate between the exchange 2 and GHCs 6, commodity brokers 8 and NGRs 22, as shown in FIG 1. Alternatively, a dedicated interface may operate between each of these participants and the exchange 2.

With reference to FIG 1, access to the exchange 2 is via a global

10   communications network 3 such as the World Wide Web and trading interface 30. It will be appreciated that each spot and forward connection between entities shown in FIG 1 may occur via communications network 3. An example of the communications network 3 is shown in FIG 1 coupling end users 14 to be in communication with clearing participants 4. However, for the sake of clarity, FIG

15   1 does not show the communications network 3 coupling all entities.

At an access website for the exchange, user information such as a User ID and password are entered by a user to gain access to their accounts, market information and trading facilities. New users are able to register online by responding to requests for information and the information supplied has been

20   verified. Information required includes the user's name, contact details, password or other security information, and a user type, such as clearing participant 4, commodity trading firms 8, agent 10, producer 12 and the other participants identified above.

In response to information received by the system 2, further information

25   may be requested. For example, where a user type is a producer 12, an NGR

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number and security reference are requested. Only one online account may be linked with a single NGR number and the NGR number is assigned to this account. Where a user type is a market maker or clearing participant, a code and password are assigned by the system 2. Entities assigned such status by the system 2 are assigned a code and password that activates the extra functionality available to these participants. The code is assigned to the participant, which is provided with the functionality to manage all users of that code belonging to that participant.

Once access is permitted, full market information is available to the user. Fore example, when a user initially enters the spot market, a single line market summary may be displayed for all traded spot commodity contracts. The following information is required for each traded commodity contract: previous day's closing price, opening price, last traded price, % change, best bid and offer, today's highest and lowest prices and today's volume. Drilling down on a single commodity contract will display more detailed information such as all open orders with the best bids and offers displayed first, historical market and market research information. Once access is granted, permitted activities include creating new trading accounts, creating and/or administering new trades and viewing account information. The user may also permit other participants access to their trading accounts. Access may be trading access or view only access. For example, with reference to FIG 12, a producer 12, such as a farmer, may grant trading access to their spot trading account (with NGR number 123) to their agent 10, such as a country agent, but the producer 12 will have viewing only access to their forward (futures) trading account (also with NGR number 123) created by their clearing participant. FIG 12 also shows the country agent 10

with trading access to their own spot trading account (with NGR number 234) and the clearing participant with trading access to their own futures trading account and that of the producer.

Where a participant wishes to trade in both the spot and forward markets and requires a clearing participant to trade in the forward markets, it is undesirable for the clearing participant to be able to view their spot transactions. Therefore, a preferred approach to address this issue is the requirement for separate trading accounts for the spot and forward market. Creating a new trading account will require the user to specify an account type (spot or forward), an NGR number and a security prompt, such as a current delivery receipt reference, registration details with the NGR, which is required when transferring title, and name and contact details. Once the necessary information is provided and the user requests creation of their account, the details are verified by the system and the account is activated. Where a trading account will be buying on the spot market or transacting on the forward market, cash management account (CMA) is required where a hold can be placed on funds. If the trading account will only be selling on the spot market, the NGR bank account details will be sufficient. The owner of the NGR number should be able to at least view all accounts that reference the NGR number.

Trading interface 30 enables traders to access the exchange 2 in order to view market information, initiate and manage orders and view account information. Trading interface 30 requires the functionality to support market information, client management, order management, client and account information and management and administration such as security access.

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With additional reference to FIGS 2-7, general examples of the offer and buying processes in accordance with the present invention will now be described with reference to the trading of wheat in Australia. However, it will be appreciated that the present invention is not limited to this particular example

5   and is applicable to the trading of other commodities in other countries.

FIG 2 shows a screenshot of trading interface 30 showing an extract of information available to users of exchange 2 and the options available for spot trades. With reference to FIGS 3-5, an offer to sell may be made directly by, for example, a wheat producer 12 such as a farmer, or by an agent 10 on behalf of

10   the producer. With reference to FIG 4, if the offer price is unacceptable to the producer, the offer price can be changed. As shown in FIG 3, the offer price per unit 30, such as cents/dollars per kilo/metric tonne/lot and the number of contracts 32 is specified for delivery at a particular delivery point or location 34. Specifying the delivery location results in automatic calculation and deduction of

15   delivery costs 36 from data provided by participating hauliers and/or GHCs. Deductions 38 such as commissions and administration fees are also automatically calculated and deducted. When the offer is confirmed by the seller, for example, by clicking confirm offer icon 40, details of the offer are transmitted to the appropriate GHC 6 by the exchange 2 to check that the

20   holding is available. The GHC verifies the authenticity of the offer and once verified, the exchange 2 accepts the offer and it is shown as being confirmed by icon 42. In doing so, a lien is placed on the holding to secure it and prevent that holding from being sold again.

With reference to FIGS 6-8, an offer to buy may be made by a

25   trader/buyer in which the number of desired contracts 44 at a particular price 46

is specified. Additional costs are automatically calculated, such as the shrink cost 48, insurance 50 and the administration fee 52 resulting in a total cost 54 to the buyer. With reference to FIG 8, once the trader/buyer confirms the purchase, the buyer's account at their bank or other financial institution 58 is checked to verify that the requisite funds are available. If the funds are not available, the transaction is rejected. If the funds are available, the GHC 6 is authorised to transfer title in the wheat to the exchange 2 and the trader's bank 58 is authorised to transfer the requisite funds to the exchange's bank 60. Once funds have been transferred, the GHC is notified by the exchange 2 and the GHC 6 transfers title via exchange 2 to the buyer. The net proceeds of the buy are credited to the producer's account of their bank 62 and the transport, shrink, insurance and administration fees are credited to the exchange's bank account with their bank 60. The GHC 6 is sent instructions regarding the delivery of the grain to the required delivery point, which may be an end user such as a mill or another transport point such as a port. The GHC is also provided with insurance and storage requirements for the buyer. Upon instructions from the settlement and clearing engine 26 of the exchange 2, the GHC arranges for delivery of the grain from a storage silo to the agreed delivery point forming part of the contract.

Once settlement of a transaction is guaranteed, the transaction is checked against market limits and rules. Limits ensure that the market exposure of participants is regulated and the rules preserve an orderly and fair market. Any transactions outside the rules and/or limits are rejected and the trader is notified.

Since the spot market is a lot market, order quantities need to be in multiples of the lot size of the commodity contract.

Spot market orders are automatically matched by trading engine 24 of the exchange 2. Trading engine 24 employs an algorithm that matches orders of opposite types, i.e. buys with sells, of the same price taking into account the volume and partial indicators. Partial indicators denote whether partially matching a buy with a sell or vice versa in terms of, for example, volume is permitted. Orders of the same type and price are queued according to their time of receipt and order matching occurs on a FIFO basis. According to one embodiment, for buy orders, the top of the queue is the buy order with the highest price. If more than one order has this price, the earliest received order will take precedence. For sell orders, the top of the queue is the sell order with the lowest price and where two or more orders have the same lowest price, the earliest received order will be placed at the top.

If buy and sell orders for the same commodity type match on price, but not on volume, the order will only be matched if a partial indicator of the larger volume order is set to "yes", or some other affirmative indication, such as a box being checked. The lower volume will be matched and the order with the larger volume will be adjusted and remain open for the extra units. For example, if a buy order exists for 10 lots and a price matched sell order exists for 6 lots, providing the larger volume partial indicator is "yes", the resulting deal will be for 6 lots. The buy order will be adjusted to be for 4 lots and remain open and the sell order, being satisfied, will be removed from the market. If the partial indicator is "no", only a sell order with the same price and sufficient units to satisfy the buy order will be matched against it.

If a buy or sell order is amended, this may affect its position in the queue. Where price has been altered, the position in the queue is revised to reflect the

new price and amendment time. Where an order is cancelled or expires, the order is removed from the queue and the positions in the queue of remaining orders updated. Expiry of an order occurs when the order has not been matched within a specified time of being placed on the market.

5   Once a deal is created, it cannot be cancelled. Before confirming orders, users will be shown an order confirmation screen including total value calculations. A check on the price entered by the user will be performed. If the price is outside the market by a pre-defined amount, such as 5%, or less than the market price than is currently available, the user will be notified. For

10   example, if the best open buy order is $25.00 and a user enters a sell order for less than $25.00, a warning will be displayed to the user via interface 30 before the user can place that order on the market.

In the above example, for each grain contract traded on the spot market, the information required includes: type of grain; the market standard grade of the

15   grain; the pricing point; the contract unit being the lot size; the form of the quotation, e.g. dollars per metric tonne; the minimum price fluctuation; a daily price movement limit (if this amount is exceeded trading is ceased); delivery tolerance (specification of maximum and minimum grain requirements for indicators such as moisture and protein).

20   Orders in the forward market are similar to those in the spot market except for a number of significant differences. As shown in FIG 1, only clearing participants 4 are permitted to trade on exchange 2 in forward contracts and retail clients must use a clearing participant 4 to enter this market. This is to ensure guaranteed settlement and to protect the exchange. In addition to the

25   contract details required for spot market trades, for forward market trades, the

delivery months, the notice period and delivery period and the last trading day are also required.

When orders are matched in the spot market, a deal is created. The deal is represented by a crossing with the buy contract note posted to the buying account and the sell contract note posted to the selling account. Consideration for the deal is based on the volume of the commodity multiplied by the price, based on the price per unit mass and the contract lots, e.g. 50 tonnes per lot. Taxes, such as Goods and Services Tax (GST), may be administered by the exchange 2 and therefore included in the consideration with the buyer paying such taxes to the seller who remits the taxes to the government. Alternatively, handling of taxes may be left to the participants, who may be provided with the necessary documentation by the exchange 2, for example, electronically, to attend to this.

Funds settlement takes place via conventional electronic banking and physical settlement of the commodity is coordinated by the exchange 2 via the applicable GHC 6. The trading interface 30 automatically calculates transaction charges, such as freight and insurance costs levied by GHCs 6. These are added to buy contract note totals and subtracted from sell contract note totals. Buyers' funds held and sellers' physical grain lien are updated to reflect final settlement amounts and deal details are forward to buyers and sellers via any suitable means, such as email, letter, fax, telex.

Deals are also created in the forward market when orders are matched, except that there is no consideration for this deal. The initial margin is calculated by multiplying the initial margin for the commodity contract by the number of contracts. The net amount of a forward deal depends on whether the deal is

opening a new position or closing out an existing position. If the former, the net amount is the initial margin plus charges. Here, both the buyer and the seller owe the initial margin and charges to the exchange 2. If the latter, the net amount is the initial margin minus the charges. Here, the exchange owes the

5   buyer and the seller the initial margin less any charges.

Initial and daily variation margins will be applied to the forward market. Initial margins are calculated using the Standard Portfolio Analysis of Risk (SPAN) as developed by the Chicago Mercantile Exchange (CME) and is the industry standard for calculating performance bond requirements (margins) on

10   the basis of overall portfolio risk. Initial margins are returned to the client when the position is either closed out (an opposite forward position undertaken) or the forward contract is delivered. Daily variations are required to ensure the market is covered against adverse price movements. Daily variation margins are only returned if the forward contract is delivered. If a forward position is closed out

15   then the daily variation margin is the profit/loss made on that position.

Forward deals are deliverable on expiry of the contract, i.e. when the settlement date is reached. The seller must deliver the specified quantity of the specified commodity and the buyer must accept and pay for the amount specified on the forward contract. Effectively, at expiry, the forward contract

20   becomes a spot deal that must be settled. Hence, holds are placed on the funds and the physical grain holdings as with a spot deal as described above. However, further information such as bank account details, a location of the commodity and delivery details are still required, since these would not originally have been specified with the forward contract. Therefore, a notification period is

25   set in which all open positions are notified to clearing participants 4. The

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clearing participants verify the intentions of the buyer and seller, update any revised details of the contracts and when the forward deal expires, the spot deal is created. The deal is then settled as per a standard spot deal.

The processes involved for trades by specific types of traders will now be described with reference to FIGS 9-11. As described above, trades may be buys or sells on either the spot or forward market and these may be made by market maker participants or non-market makers. Market makers ensure market liquidity and examples of market makers include CHCs 6 and large commodity brokers 8. Examples of non-market makers include agents 10 and producers 12.

FIG 9 is a flow chart showing the steps involved in a purchase on the spot market by a non-market maker. The trading account may be for a producer 12, agent 10 or clearing participant 4, each of which may trade directly with exchange 2. In step 100, the spot market buy option is selected by the user via trading interface 30 and in step 102 a check is made to verify that the Cash Management Account (CMA) is in the trader's name. If not, the process is discontinued and the trader notified via trading interface 30, as represented by step 104. If the account is in the trader's name, the process continues and in step 108, the trader specifies the commodity type, grade and pricing point. A quantity is specified in step 108 and a price limit (e.g. in $/tonne) is entered in step 110. With reference to step 112 in FIG 9, the trader may specify via a partial indicator that partial fills of their order can be accepted if the entire order cannot be filled at the stipulated price. Alternatively, the trader can specify that only a complete fill of their order be accepted by checking the all or nothing step tick box. In step 114, a duration of the order is specified from a predetermined

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list, the duration being the period for which the spot deal is valid. Any notes may be appended to the order in step 116 before it is submitted to the exchange 2 in step 118.

With reference to step 120, before any funds are reserved or the buy order is placed on the market, vetting rules must be adhered to, which are shown in FIG 9A. With reference to steps 122, 124 and 126, if the market is closed, or the trade represents a duplicate of an earlier trade, or the price step is invalid, the trader will be notified via trading interface 30 and given the option to amend the details. With reference to steps 128 and 130, if the limit price exceeds an absolute amount or a predetermined percentage of the last traded price for that particular commodity, or the limit price is too high or too low to permit matching, the trader will be notified and given the option to amend the details. In step 132, a check is performed to verify whether there are sufficient funds available. Returning to FIG 9, if none of the above vetting rules are violated, the funds necessary for the buy are reserved in step 134 and the buy order is placed on the market, as represented by step 136, ready to be matched by trading engine 24.

FIG 10 is a flow chart showing the steps involved in a sell on the spot market by a non-market maker. The spot market sell option is selected by the user via trading interface 30 in step 150. In step 152, a check is made to verify whether the trader wishes to offset an open buy position. If not, with reference to step 154, the exchange 2 performs a check via interface 28 that the seller has the physical holding with, in the example of selling grain, a grain holding company (GHC) 6. If not, the process is discontinued at step 156 and the trader informed via trading interface 30. If the trader possesses the physical holding,

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the trader is permitted to specify details regarding the particular commodity, pricing point and grade at step 160. If the trader wishes to offset an open buy position, in step 158 the trader nominates a buy contract before proceeding to specify a particular commodity, pricing point and grade in step 160. No check with the GHC 6 is carried out in this case. The seller specifies a delivery point in step 162 and quantity in step 164. A number of combinations of delivery point and quantity may be specified, depending on the contracts governing the particular market. For example, in Australia, the governing National Agricultural Commodities Marketing Association (NACMA) contracts permit up to five (5) combinations of delivery point and quantity. The steps 168-176 up to the submission of the sell order proceed as with steps 110-118 in FIG 9A in the buy order example described above.

With reference to step 178, the vetting rules are then processed and the sell vetting rules for the spot market are shown in FIG 10A. Steps 180-186 of the vetting rules shown in FIG 10A are the same as steps 122, 124, 126 and 130 for the buy order described above regarding market status, order duplication, price step validity, and price limits required for matching. For a sell on the spot market, the sufficiency of the seller's physical holding must be verified in step 188 and, in step 190, the sufficiency of the holding on the open buy contract must also be verified. Returning to FIG 10, if the specified vetting rules are not violated, a hold is placed on the physical holding or the open buy contract offsetting the sell, as shown in step 192 and in step 194 the sell order is placed on the market ready to be matched by trading engine 24.

The process for a market maker to place a buy order on the spot market is the same as that shown in FIG 9 for a non-market maker except that no CMA

check is made (step 102) and no funds are reserved when the order is placed on the market (step 134). The vetting rules for a market maker to place a buy order on the spot market are the same as shown in FIG 9A, except that a funds sufficiency check (step 132) is not performed. Instead, checks are made: a) to

5   ensure that a predetermined trading limit for the market maker is not exceeded; b) on the level of the market maker organisation; and c) on the level of the market maker's trading account. If the specified vetting rules are not violated, the sell order is placed on the market ready to be matched by trading engine 24.

The process for a market maker to place a sell order on the spot market is

10   the same as that shown in FIG 10 for a non-market maker except that no check on any physical holdings is made (step 154). The vetting rules for a market maker to place a sell order on the spot market are the same as those for a market maker to place a buy order on the spot market as described above.

With reference to FIG 11, which is a flow chart showing the steps involved

15   in trading on the forward market, the trading account must be that of a market maker or a clearing participant, as shown in step 200. The forward market option is selected by the user via trading interface 30, as represented by step 202. In step 204, the option of whether a buy or sell order is to be placed is selected by the user via trading interface 30. With reference to step 206, the

20   relevant commodity contract code is specified by the user, such as SW for spot wheat contracts or FW for forward wheat contracts. The required criteria for the trade, such as commodity type, grade, grain, pricing point, contract unit, quotation, daily price limit, delivery grade and month, last trading day, notice day and the initial margin, as shown in step 208 in FIG 11 and described above, are

25   then specified. In step 210, the number of contracts and total quantity are

24

specified. Placement of the forward buy or sell then proceeds in steps 212-220

as in steps 110-120 of FIG 9 for the placement of a spot market buy or sell for a

market maker as described above. In step 222, the vetting rules are checked,

which are also substantially the same as for a spot market buy for a market

5   maker as described above. Steps 122-130 shown in FIG 9A are followed, but

instead of the sufficiency of funds check in step 132, checks are made: a) to

ensure that a predetermined trading limit for the market maker is not exceeded;

b) on the level of the market maker organisation; and c) on the level of the

market maker's trading account. If the specified vetting rules are not violated,

10   the order is placed on the forward market ready to be matched by trading engine

24.

The settlement cycle in the spot market will now be described with

reference to FIG 13. In step 230, deal details are received by settlement and

clearing engine 26 from trading engine 24 on the trade day. On the settlement

15   day, settlement and clearing engine 26 requests funds for all buy deal c/notes

due for settlement on that day, as represented by step 232. In step 234, any

string physical settlements that are due to settle on the same date are contra'ed.

(A string settlement is when a client buys on the market then proceeds to sell the

open buy position on the same day.) As represented by step 236, instructions

20   are sent by settlement and clearing engine 26 to the GHC 6 to transfer title from

the seller to the buyer. The GHC is also sent instructions on the delivery of the

commodity to the required destination, such as a port or mill, and insurance

requirements for buyer. Instructions will only be sent when the buy funds are

confirmed. If the buy funds transfer fails then the transfer of title will not occur for

25   the failed line. In step 238, once confirmation is received on the title transfer,

25

settlement and clearing engine 26 transfers funds for all the sell deal c/notes due

for settlement (title transfer successful). In step 240, the GHC 6, on instructions

from the settlement and clearing engine 26, will arrange for delivery of the

commodity from the delivery silo to the appropriate destination.

5   The settlement cycle in the forward market will now be described with

reference to FIG 14. In step 242, deal details for the current day are received

from the trading engine 24 by settlement and clearing engine 26. This includes

the deal's initial margin and any charges. In step 244, at the end of the trading

day, the daily variation margins for all open forwards positions are calculated by

10   settlement and clearing engine 26. In step 246, the initial margins and

commission on all deals each clearing participant 4 initiated and the daily

variation margins relating to all the open positions each clearing participant

initiated are netted. This will give one settlement amount per clearing participant

(organisation). In step 248, each clearing participant is notified of their net

15   settlement amount. This will also include a detailed report of the breakdown of

the net settlement amount, by trading account and by open position within the

account. In step 250, the net settlement funds are transferred to/from the

clearing participant. This funds settlement will occur in real-time as it comprises

a few, large settlement amounts (one per organisation). Timing of the settlement

20   will most likely be the next morning before the market opens. In step 252, after

settlement, settlement and clearing engine 26 transfers the margin portion of the

settlement funds to the margin bank account (or if a net funds out movement has

occurred from the margin bank account to the settlement account). Reports will

detail the breakdown of the amount held in the margin account. This is so

25   settlement and clearing engine 26 has the ability to reconcile the funds in the

26

margin account to the open positions and to ensure the correct amount is being

held. In step 254, after settlement, settlement and clearing engine 26 transfers

the commission portion to a revenue account. Reports will be available to detail

the breakdown of the commission amounts by trading account, clearing

5   participant and commodity contract for statistical purposes.

Although settlement obligations are guaranteed at deal creation, there is

still a possibility of settlement failure, for example, if a silo is destroyed and the

physical holding of the commodity pledged against an unsettled transaction is no

longer available. If an unsettled position fails settlement on the due date a close-

10   out process occurs.   This involves reversing the failed position, financially

compensating the non-default party if the market has moved against them and

informing both parties of details of the close-out.   Regarding financial

compensation, if the market has moved up and the buyer was the non-defaulting

party or the market has moved down and the seller was the non-defaulting party,

15   the non-defaulting party will be compensated. No financial compensation will be

paid if the market has moved to the advantage of the non-defaulting party.

However, financial compensation for the seller will also include compensation for

extra storage and insurance costs, irrespective of whether the market has moved

to their advantage because they will still have to hold the physical grain until the

20   new transaction settles. Settlement of financial compensation will occur on the

next settlement day, which may need to be covered by the clearing house if it

cannot be retrieved from the defaulting party.

The system and method of the present invention hence addresses the

prior art problems by providing an independent electronic platform that facilitates

25   the trading of physical commodities on both spot and forward markets with

guaranteed settlements, subject to the above settlement failure scenarios. Deals are created for specific types and qualities of commodities for delivery on particular dates at specific locations. The transactions may take place in real-time in any currency, thus facilitating both domestic and overseas trading. The
5   status of trades may be tracked and reported upon to allow for extensive account management and planning. Buyers are provided with easy access to sellers with commodities in the desired locations. Title to the commodity can be immediately transferred to the buyer allowing more trading to occur if desired, the increased efficiency reducing transaction costs. Producers are given greater control of the
10   marketing of their commodity and their bank accounts are credited immediately upon transfer of title.

Throughout the specification the aim has been to describe the invention without limiting the invention to any one embodiment or specific collection of features. Persons skilled in the relevant art may realize variations from the
15   specific embodiments that will nonetheless fall within the scope of the invention.

CLAIMS:

1.   An electronic commodities exchange system for trading physical commodities between buyers and sellers on a commodities market via a communications network, the exchange system comprising:

at least one interface through which buyers submit orders to buy a commodity and sellers submit orders to sell a commodity;

a trading engine for matching the orders to sell with the orders to buy at least on the basis of a common commodity type and a common price between the orders;

a settlement and clearing engine for managing the settlement and clearance of deals created from matched orders to sell and orders to buy;

wherein the exchange system cooperates with a holder of a commodity to arrange for delivery of the commodity according to the deal.

2.   The system of claim 1, wherein the commodities market is one of a spot market or a forward market.

3.   The system of claim 1, wherein the at least one interface comprises a trading interface coupled to be in communication with the trading engine.

4.   The system of claim 1, wherein orders submitted on the spot market are submitted via the at least one trading interface.

5. The system of claim 1, wherein orders submitted on the forward market are submitted via a clearing participant and via the trading interface.

5   6. The system of claim 1, further comprising a partial indicator associated with an order, which, if activated, allows the associated order to be matched with another order to create a deal if the volumes of the orders do not match.

10   7. The system of claim 6, wherein the trading engine adjusts the order with a larger volume such that a remaining unmatched volume of the order is available for matching by the trading engine with another order.

8. The system of claim 1, wherein the trading engine matches orders on
15   one or more of the following bases: a time of receipt of an order by the trading engine, buy orders with a highest price, sell orders with a lowest price.

9. The system of claim 1, wherein the interface issues a warning to the
20   buyer or seller if, respectively, a price of a submitted order to buy is more than a best open sell order by a pre-defined amount or a price of a submitted order to sell is less than a best open buy order by a pre-defined amount.

10. The system of claim 1, wherein the at least one trading interface automatically calculates one or more of the following when an order is being placed: a cost of transporting the commodity from the holder of the commodity to a delivery point, an administration fee, a price per contract,

5   a shrink cost, an insurance cost.

11. The system of claim 1, wherein, upon receipt of funds from a buyer, the settlement and clearing engine instructs the holder of the commodity to transfer title in the commodity from the seller to the buyer.

10

12. A method of trading physical commodities on a commodities market via an electronic commodities exchange system, the method including the steps of:

       receiving an order to sell a commodity via an interface of the
15   commodities exchange system;

       receiving an order to buy a commodity via the interface of the commodities exchange system;

       creating a deal by matching an order to sell with an order to buy at least on the basis of a common commodity type and a common price
20   between the orders; and

       arranging for delivery of the commodity according to the deal following cooperation of the exchange system with a holder of the commodity.

13. The method of claim 12, wherein the commodities market is one of a spot market or a forward market.

14. The method of claim 12, wherein, for a forward market, the orders are submitted to the commodities exchange system via a clearing participant.

15. The method of claim 12, further including the step of checking an order for compliance with market rules prior to submitting the order to a trading engine of the exchange system.

16. The method of claim 12, further including the step of the commodities exchange system reserving funds sufficient to cover an order to buy prior to submitting the order to a trading engine of the exchange system.

17. The method of claim 12, further including the step of the commodities exchange system requesting a physical hold to be placed on the commodity sufficient to cover the order to sell prior to submitting the order to the trading engine of the exchange system.

18. The method of claim 12, wherein the step of creating a deal includes matching an order to buy with an order to sell where the volumes of each order do not match providing a partial indicator permitting such a match associated with at least one of the orders is activated.

32

19. The method of claim 18, further including the step of adjusting the order with a larger volume such that a remaining unmatched volume of the order is available for matching by the trading engine with another order.

5   20. The method of claim 12, further including the step of checking whether a price of a submitted order to buy is more than a best open sell order by a pre-defined amount or whether a price of a submitted order to sell is less than a best open buy order by a pre-defined amount and issuing a warning if either condition is satisfied.

10

21. The method of claim 12, further including the step of automatically calculating one or more of the following when an order is being placed: a cost of transporting the commodity from the holder of the commodity to a delivery point, an administration fee, a price per contract, a shrink cost,

15   an insurance cost.

20

FIG 1

SPOT ---------

FORWARD ————

FIG 2

FIG 3

30
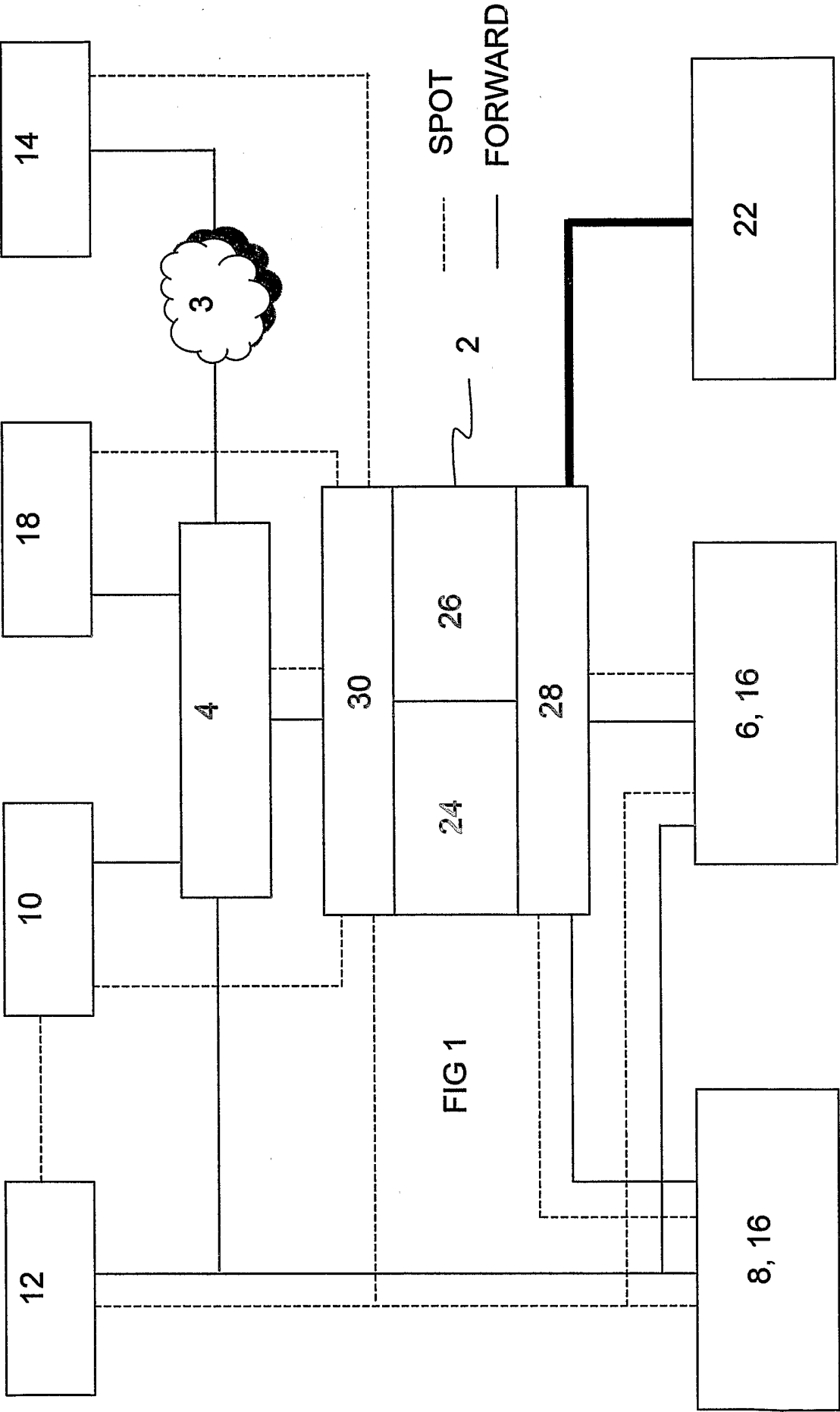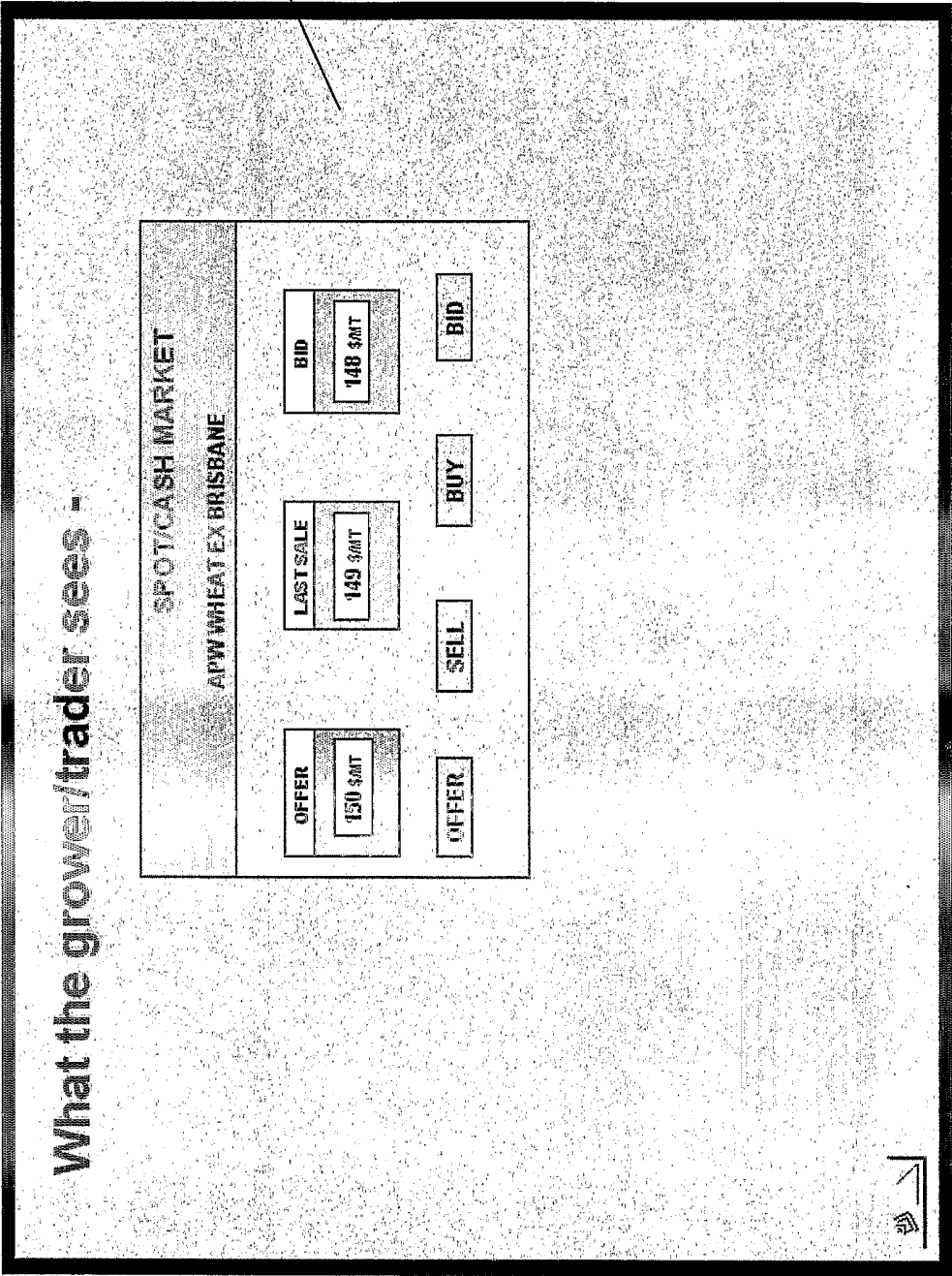
SPOT/CASH MARKET

APW WHEAT EX BRISBANE

OFFER	LAST SALE	BID
150 $/MT	149 $/MT	148 $/MT

SELL   BUY   BID

OFFER

FARMER/OFFER

- FARMER HITS OFFER KEY (IF THE CURRENT BID IS UNACCEPTABLE). OFFER BOX OPENS
- FARMER DETAILS NO. OF CONTRACTS OFFERED & TICKET NO. TO COVER CONTRACTS
- FARMER CHANGES PRICE OFFERED
- AUTOMATICALLY CHOOSES DELIVERY POINT – TRANSPORT COST APPEARS
- NET PRICE AND COMMISSION IS CALCULATED AUTOMATICALLY

No. of Contracts

Ticket Nos.

Offer Price   152 $/mt

Delivery Point   ROMA

Less Transport   22 $/mt
to port

Plus Admin. Fee $ ....
@ 1%

Price per contract $ ....
to Seller

CONFIRM OFFER

OFFER PROCESS

40

FIG 4

FIG 5

30

SPOT/CASH MARKET

AFW WHEAT EX BRISBANE

OFFER	LAST SALE	BID
150 $/MT	149 $/MT	148 $/MT

| OFFER | SELL | BUY | BID |

No. of Contracts wanted

Offer Price　　150 $/mt

Plus think @ 0.3%　　$......

Plus Insurance @ 0.0126%　　$......

Plus Admin. Fee @ 1%　　$......

Total cost to buyer　　$......

CONFIRM BUY

44

46

48

50

52

54

BUY PROCESS

FIG 6

30

SPOT/CASH MARKET

PW WHEAT EX BRISBANE

OFFER	LAST SALE	BID
150 $/MT	149 $/MT	148 $/MT

OFFER	SELL	BUY	BID

No. of Contracts wanted: 20

Offer Price: 150$/mt

Plus shrink @ 0.3%: $450

Plus Insurance @ 0.0125%: $187

Plus Admin. Fee @ 1%: $1500

Total cost to buyer: $152,137

CONFIRM BUY

TRADER/BUYER

- TRADER DETAILS NUMBER OF CONTRACTS WANTED
- "SHRINK" COST IS CALCULATED
- "INSURANCE" IS CALCULATED
- "ADMIN FEE" IS CALCULATED
- "TOTAL COST" IS CALCULATED

BUY PROCESS

FIG 7

FIG 8

9/16

Trading account - Traders, Agents
and CP with full trading privileges

SPOT Market
BUY Order   ⟋ 100

Discontinue   CMA in
processing and show ──No──   traders name?   ⟋ 102
message on screen

⟋ 104

                               Yes

Commodity
Grade   ⟋ 106
Pricing piont

Enter quantity
(tonnes)   ⟋ 108

110 ⟋   Enter Price Limit   All or Nothing
         ($ per tonne)   tick box   ⟋ 112

Order duration
Predetermined list ⟋ 114

Notes   ⟋ 116

Submit Order   ⟋ 118

See Process   Process vetting
flow V1   rules (order)   ⟋ 120

Reserve Funds   ⟋ 134

FIG 9   Place order on
                     the Market   ⟋ 136

V1

Market closed? — 122

Duplicate order? — 124

Valid price step?
Warning to client
to re-enter — 126

Limit price is more
than x% or $ absolute
from last traded price — 128

Limit price is
higher/lower than
necessary fior
matching. — 130

Sufficient Funds? — 132

FIG 9A

```
                          ┌─────────────────────────────────┐
                          │ Trading account - Traders, Agents and CP │
                          │      with full trading privileges │
                          └─────────────────────────────────┘
                                          │
              154                 ┌──────────────┐
                                  │ SPOT Market  │ ╾── 150
                                  │  SELL Order  │
                                  └──────────────┘
                                          │
┌──────────────┐      ◇◇◇◇◇◇◇◇◇◇      ◇◇◇◇◇◇◇◇◇◇
│ Discontinue  │      ◇         ◇      ◇         ◇
│ processing and show │◀─No──◇ Physical ◇◀─No─◇ Offset open buy ◇ ╾── 152
│ message on screen │      ◇ Holdings at ◇    ◇  position?  ◇
└──────────────┘      ◇   GHC?  ◇      ◇         ◇
                      ◇◇◇◇◇◇◇◇◇◇      ◇◇◇◇◇◇◇◇◇◇
      156                   │                 │
                          Yes               Yes
                            │                 │
                            │         ┌──────────────┐
                            │         │ Nominate Buy │ ╾── 158
                            │         │  Contract    │
                            │         └──────────────┘
                            │                 │
                            │         ┌──────────────┐
                            └────────▶│  Commodity   │ ╾── 160
                                      │    Grade     │
                                      │ Pricing piont│
                                      └──────────────┘
                                             │
              162         ┌ ─ ─ ─ ─┌──────────────┐─ ─ ┐
                          │╾──    │ Select Delivery│
                          │        │    point     │    │
                          │        └──────────────┘        Up to 5 combinations
                          │               │            │  of delivery point and
              164         │        ┌──────────────┐       quantity.
                          │╾──    │ Enter quantity │    │
                          │        │   (tonnes)   │
                          └ ─ ─ ─ ─└──────────────┘─ ─ ┘
                                          │
              168         ┌──────────────┐   ┌──────────────┐
                       ╾──│ Enter Price Limit│──│"All or Nothing"│ ╾── 170
                          │  ($ per tonne)  │   │   tick box   │
                          └──────────────┘   └──────────────┘
                                          │
                                  ┌──────────────┐
                                  │ Order duration│ ╾── 172
                                  │Predetermined list│
                                  └──────────────┘
                                          │
                                  ┌──────────────┐
                                  │    Notes     │ ╾── 174
                                  └──────────────┘
                                          │
                                  ┌──────────────┐
                                  │ Submit Order │ ╾── 176
                                  └──────────────┘
                                          │
            ┌─────────────┬──────────────┐
            │ See Process │ Process vetting│ ╾── 178
            │  flow V2    │  rules (order) │
            └─────────────┴──────────────┘
                                          │
                                  ┌──────────────┐
                                  │ Place hold on │ ╾── 192
                                  │Physical/Open buy│
                                  │   contract   │
                                  └──────────────┘
                                          │
      FIG 10                      ┌──────────────┐
                                  │ Place order on│ ╾── 194
                                  │  the Market  │
                                  └──────────────┘
```

FIG 10

V2

Market closed?	180

Duplicate order?	182

Valid price step? Warning to client to re-enter	184

Limit price is higher/lower than necessary fior matching.	186

Sufficient Physical Holdings	188

Sufficient holdings on open buy contract	190

FIG 10A

Trading account - Market Makers and
Clearing Participants ⌇— **200**

FORWARD
Market ⌇— **202**

204

Buy/Sell
Contract
(Long/Short) — **BUY**   **SELL** — **204**

Contract
Commodity code

206

Commodity
Grain
Grade
Pricing piont
Contract Unit
Quotation
Daily Price Limit
Delivery grade
Delivery month
Last trading day
Notuice day
Initial margin ⌇— **208**

Number of
contracts and total
quantity ⌇— **210**

212 —⌇ Enter Price Limit
($ per tonne)

All or Nothing
tick box ⌇— **214**

Order duration
Predetermined list ⌇— **216**

Notes ⌇— **218**

Submit Order ⌇— **220**

See Process
flow V5   Process vetting
rules (order) ⌇— **222**

Place order on
the Market ⌇— **224**

FIG 11

EGE Online Login
(Farmer - NGR 123)

12

Trading Access

**Spot
Trading A/c
(NGR 123)**

Trading Access

View Only Access

**Forward
Trading A/c
NGR 123**

Trading Access

**Spot
Trading A/c
(NGR 234)**

Trading Access

**Forward
Trading A/c
(Speculator)**

Trading Access

EGE Online Login
(Country Agent)

10

EGE Online Login
(Clearing Participant)

4

FIG 12

FIG 13

```
          ┌─────────────────┐
          │ 1. Receive deal │
          │ details (initial│ ∼  242
          │ margins and     │
          │ charges)        │
          └─────────────────┘
                   │
                   ▼
          ┌─────────────────┐
          │ 2. Calculate    │ ∼  244
          │ daily variation │
          │ margins         │
          └─────────────────┘
                   │
                   ▼
          ┌─────────────────┐
          │ 3. Net margins  │
          │ and commission  │ ∼  246
          │ per clearing    │
          │ participant     │
          └─────────────────┘
                   │
                   ▼
          ┌─────────────────┐
          │ 4. Notify       │
          │ clearing        │ ∼  248
          │ participant of  │
          │ net funds       │
          └─────────────────┘
                   │
                   ▼
          ┌─────────────────┐
          │ 5. Transfer     │ ∼  250
          │ funds           │
          └─────────────────┘
              ╱        ╲
             ▼          ▼
    ┌──────────────┐  ┌──────────────┐
    │ 6. Transfer  │  │ 7. Transfer  │
252 ∼│ margins      │  │ commission   │∼ 254
    │ portion to   │  │ portion to   │
    │ margin a/c   │  │ revenue a/c  │
    └──────────────┘  └──────────────┘
```

FIG 14

A.	CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7]: G06F 17/60

According to International Patent Classification (IPC) or to both national classification and IPC

B.	FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WPAT: G06F 17/60 + keywords: COMMODIT+; TRAD+; BUY; SELL; EXCHANG+; SETTL+; CLEAR+; INTERFACE; AUDIT+; LOGISTICS; DELIVERY; ORDER+; MATCH+

C.	DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	*www.ebay.com/*. "Welcome to eBay";-Buying new items, brand names, and collectibles ... < web.archive.org/web/**19970614** 001443/http://www.ebay.com/>	1-21
X Y	WO 2002/33835 A (CONOCO INC.) 25 April 2002 Entire document, see Abstract, claims and drawings Entire document	1-4, 8-10, 12-15, 20 5-7, 11, 16-19, 21
X Y	WO 2001/41084 A (ULTIMATE MARKETS INC.) 7 June 2001 Entire document , see page 4 line 14 to page 5 line 3 Entire document	1-4, 8-10, 12-15, 20 5-7, 11, 16-19, 21
X Y	US 6058379 A (ODOM et al) 2 May 2000 Entire document Entire document	1, 8 2-7, 9-21

X	Further documents are listed in the continuation of Box C	X	See patent family annex

*	Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search	Date of mailing of the international search report
11 May 2004	1 7 MAY 2004

Name and mailing address of the ISA/AU	Authorized officer
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	CHARLES BERKO Telephone No : (02) 6283 2169

Form PCT/ISA/210 (second sheet) (January 2004)

C (Continuation).	DOCUMENTS CONSIDERED TO BE RELEVANT	
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2002/0069125 A (BRUCK et al) 2 May 2000 Entire document	1-21
Y	US 2001/0032171 A (Brink et al) 18 October 2001 Entire document	1-21
Y	WO 2002/07024 A (MITSUI & CO,. LTD) 24 January 2002 Abstract & drawings	1-21
X A	KR 2001099243 A (KIM) 9 November 2001 Abstract - *Thomson Derwent - image* Abstract - *Thomson Derwent - image*	1, 8 2-7, 9-21
X A	KR 2001109643 A (INTERNETPLAZACITY CO) 12 December 2001 Abstract - *Thomson Derwent - image* Abstract - *Thomson Derwent - image*	1, 8 2-7, 9-21
X A	KR 2001113158 A (SAMSUNG CAPITAL CO LTD) 28 December 2001 Abstract - *Thomson Derwent - image* Abstract - *Thomson Derwent - image*	1, 8 2-7, 9-21

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member		
WO	0233835	AU	13247/02			
WO	0141084	AU	43074/01			
US	6058379	US	2002046137	US	2002072978	
US	20020069125	CA	2349096			
US	20010032171	NONE				
WO	0207024	JP	2002032599			
KR	2001099243	NONE				
KR	2001109643	NONE				
KR	2001113158	NONE				

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX