



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
02.05.2001 Bulletin 2001/18

(51) Int Cl.7: **G06F 17/60, G07C 11/00**

(21) Application number: **99120835.6**

(22) Date of filing: **25.10.1999**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

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(54) **Wireless auctioning system**

(57) A method for determining a final leading price offer for a good using an auction center and a plurality of cellular telephones of a plurality of users, wherein each of said plurality of cellular telephones is assigned to one of said plurality of users, and wherein each of said plurality of cellular telephones has a telephone number, comprising the following steps:

- a) sending a bidding invitation for said good from said auction center to said plurality of cellular telephones,
- b) informing said plurality of users about said bidding invitation for said good by means of an acoustical or optical display function of said plurality of cellular telephones,
- c) returning from at least one of said plurality of cellular telephones price offers for said good to said auction center in response to said bidding invitation on demand of at least one of said plurality of users,
- d) registering in said auction center each of said price offers and the arrival time at said auction center

er for each of said price offers,

e) determining a present leading price offer for said good by identifying the highest of said price offers having the earliest arrival time at said auction center,

f) communicating said present leading price offer to said plurality of cellular telephones,

g) repeating at least the above steps c) to f) until a closing criterion is reached, and

h) fixing a final leading price offer, which is identical with said present leading price offer which was last determined in a repetition of step e) before said closing criterion was reached.

Description

[0001] The present invention relates to a method and a system for implementing an auction process involving at least one user with a cellular telephone and an auction center.

[0002] Auctions as a sales process are well known. In auctions a group of participants has the possibility to buy an offered good by successively issuing price offers, so called bids. At the start of an auction a minimum selling price is frequently presented by the organizer of the auction. Then, every participant of the auction has the possibility to place an offer for this good. The offers of the participants increase, either by predetermined amounts or by free amounts. If no participant wants to increase his price offer anymore, the participant with the highest offer obtains the good for the offered price.

[0003] To buy goods in an auction requires physical presence at a certain location. This is true for personal auctions, where the participants physically gather, as well as for online auctions on the internet, where each of the participants still must be present around a computer connected to the internet. Furthermore, these auctions require permanent monitoring of the auctioning process in order to know the status of the auction and the necessity for further action. Finally, online auctions regularly require identification and registration processes of the participants, since the identity and authorization of an internet user cannot be clarified as easily as this can be done in auctions requiring physical presence. This identification and registration process may deter potential participants of the auction.

[0004] Therefore, one object of the present invention is to enable individuals to participate in an auction at an arbitrary location, without being bound to the availability of a certain computer or internet equipment. It is another object of the invention to allow such participant to follow the relevant portions of an auction without the need to monitor the whole bidding process. Finally, it is an object to provide a simple and convenient method for carrying out auctions and for participating in such auctions.

[0005] These and other objects are achieved by a method for determining a final leading price offer for a good using an auction center and a plurality of cellular telephones of a plurality of users, wherein each of said plurality of cellular telephones is assigned to one of said plurality of said users, and wherein further each of said plurality of cellular telephones has a telephone number, comprising the following steps:

- a) sending a bidding invitation for said good from said auction center to said plurality of cellular telephones,
- b) informing said plurality of users about said bidding invitation for said good by means of an acoustical or optical display function of said plurality of cellular telephones,
- c) returning from at least one of said plurality of cel-

lular telephones price offers for said good to said auction center in response to said bidding invitation on demand of at least one of said plurality of users, d) registering in said auction center each of said price offers and the arrival time at said auction center for each of said price offers,

e) determining a present leading price offer for said good by identifying the highest of said price offers having the earliest arrival time at said auction center,

f) communicating said present leading price offer to said plurality of cellular telephones,

g) repeating at least the above steps c) to f) until a closing criterion is reached, and

h) fixing a final leading price offer, which is identical with said present leading price offer which was last determined in a repetition of step e) before said closing criterion was reached.

[0006] The cellular telephones used in the present invention may be any standard mobile phones. The cellular telephones must be able to display acoustically or visually messages, such as a bidding invitation or a leading price offer. SMS messages may also be supported by these cellular telephones.

[0007] Each cellular telephone naturally has a telephone number. Furthermore, each cellular telephone is assigned to a user, that means behind each telephone is a user. It is understood that a user may have more than one cellular telephone assigned to him or her. It may also be possible for several users to share one telephone in the sense that this group of users is collectively responsible for the use of this telephone.

[0008] The auction center of the present invention organizes and administrates the auction. Its tasks include sending bidding invitations, receiving price offers, administering these price offers, informing participants in the auction about other price offers, determining leading price offers, acknowledging a final leading price offer, and closing the auction. For this purpose the auction center comprises the respective means for sending bidding invitations, etc.. These means may be realized by any suitable technology. Typically, the auction center will comprise a computer system on which a software program is implemented in order to perform the above mentioned steps and tasks.

[0009] The auction center is connected to the cellular telephones of the users via a cellular telephone network supported by a network provider. The price offers returned from cellular telephones may be manually input into an auction center's computer system by telephone operators or automatically by using means for converting messages of cellular telephones to computer compatible information. The auction center may further be connected or connectable to the internet, to other auction centers or to outside databases, in order to accomplish various business goals. For example, the auction center may be connected with the internet, so that an

auction may be carried out partially via cellular telephones and partially via the internet. In another example, the auction center may communicate with another auction center in order to coordinate several auctions, which are, for example, conducted in different territories. Furthermore, in yet another example, the auction center may contact outside databases, for example, in order to provide information about possible customers or about actual bidders, like marketing information or even bank account numbers.

[0010] When a new auction starts the auction center issues a bidding invitation to customers. This bidding invitation may contain a description of the good to be auctioned, the starting price and the closing time of the auction, or payment requirements.

[0011] The customers, that means the plurality of users receiving the bidding invitation, may be chosen from the totality of users of cellular telephones. This group of users may be determined according to any suitable criterion. For example, only users of a certain cellular telephone network may be chosen, based on business as well as technical requirements. Furthermore, the present location, the interests, the age, the credit card ownership or any other marketing relevant information about individual customers may be used as the choosing criterion. However, the customer need not be registered with the auction center, although it is possible to provide such a registration for ease of payment or even for business purposes, like the implementation of discount schemes.

[0012] The cellular telephone of the user will present the user the content of the message in an acoustical or in an optical way. For example, the offered good can be described by words displayed in a display of the cellular telephone. However, the describing words can also be read by a natural or a computer voice to the user, so that the user may even take part in an auction while driving his car. If the data line allows, it is also imaginable to display a picture of the good on the display of the cellular telephone.

[0013] Each addressed customer, i.e. user of a cellular telephone, has the possibility to give a bid, that means a price offer, for the good which is auctioned. This bid can exceed the last offer for this good by an allowed predetermined value or by any other value, depending on the auction scheme used. The user's actual price offer is returned to the auction center.

[0014] The auction center registers all incoming bids, in particular the amount of the bid and its arrival time. The arrival time is important if two bids having the same amount are received. The registration step may also include a registration of the telephone number of each cellular telephone from which a price offer was returned to the auction center and which transmits its telephone number to said auction center. The auction scheme may provide that only cellular telephones may be used for the wireless auction which actually send their own telephone number with the price offer to the auction center,

because otherwise identification of users utilizing the cellular telephone for participating in the auction may become difficult. However, it is also imaginable that the users do not have to send their telephone numbers and that only the user with the highest final leading price offer, that means the user who wins the auction, is asked for identification. This identification request may be made by any suitable means, including messages to be displayed on the user's display.

[0015] In this context, the user who gave the final leading price offer or who initiated any other price offer of interest may be identified by contacting a database containing correlated information about the plurality of users to which at least one of the cellular telephones is assigned, wherein the users can be identified by means of the telephone number of the cellular telephones.

[0016] This identification may be performed automatically, that means the bidder does not have to apply with the auction center in order to take part in the auction.

For this purpose of identification the auction center may be connected to a customer database of the cellular network provider which provides the auction center with the necessary information about the bidder, in particular his name, address and billing information, like credit card number or bank account number, based on the telephone number of the user.

[0017] If the cellular telephone of a user does not send its telephone number with a bid, a special identification process may be initiated, depending on the business scheme of the auction. This identification process may be initiated at the time of closing the auction and may require a direct contact of the user with the auction center, via his cellular telephone or via any other means, in order to convey his or her relevant identification information, like name, address, credit card number. However, the identification process may also be performed at an earlier stage, for example after first returning a price offer, and consist in sending the telephone number of the cellular telephone to enable the auction system to communicate with this cellular telephone, i.e. the user. The information gained in this identification process may then be stored in a user database. If such identification schemes are used, rather than the above automatic identification schemes using sent telephone numbers, it is also possible to assign access code numbers to registered users of an auction system.

[0018] The auction center processes all incoming bids. The bids for an auction are sorted according to price and arrival time. The arrival time is important if two or more price offers are identical in price. This sorting process allows the determination of a present leading price offer. This is the highest price offer, and, if more than one price offer with the highest price exist, the price offer with the earlier arrival time.

[0019] This present leading price offer is then communicated to the cellular telephones of the above mentioned customers, or only to the sub-group of such customers who have responded to the bidding invitation by

sending in a price offer. This communication may have several forms. For example, a message may be sent showing the present leading price offer in this auction. Instead or in addition, a message may be sent individually to all bidders, except for the bidder having given the present leading price offer, which tells the bidder that his bid has been topped by a higher or earlier bid. The latter would give the participants the possibility to return a higher offer. It is also possible to send the bidder with the present leading price offer a message that he is leading the field presently.

[0020] Such a bidding process can be carried out several times, that means several rounds of bidding may be carried out. When a certain closing criterion is reached, the auction center does not accept any new bids. It then specifies the final leading price offer, which is the present leading price offer last determined in a bidding round. The closing criterion may be the expiration of a time period, the number of bids, a desired price, or any other suitable criterion.

[0021] Thereafter, the auction center may initiate an automatic delivery and debiting process if the user having given the final leading price offer has already been identified and if the auction center thereby has obtained the required billing and delivery information. Otherwise, the auction center and this user must communicate in order to pay and deliver the auctioned good.

[0022] In one embodiment of the present invention the auction center sends a confirmation request after the fixing of the final leading price offer to the cellular telephone which returned the final leading price offer. This confirmation request informs the user that he has returned the final leading price offer, i.e. that he has won the auction. The confirmation request may be combined with a request concerning the payment modalities, if necessary. For example, the bank account or the number of the credit card may be requested by the auction center.

[0023] If a confirmation request is sent, a reminder message may be sent from the auction center to the cellular telephone which returned said final leading price offer in case the auction center has not received a confirmation from said cellular telephone within a certain time period. The auction center may also send more than one reminders, with the same or different content.

[0024] The auction center may then also send a bid acceptance message to the cellular telephone which returned the final leading price offer, if said cellular telephone has positively reacted to said confirmation request.

[0025] If finally no reaction is obtained from this cellular telephone in response to a confirmation request, the user who gave the final leading price offer may be contacted directly by telephone or mail and requested to fulfill the obligations of his or her bid. However, it is also imaginable, and in instances where this user has not and cannot be identified, to exclude the final leading bid and to contact the user who submitted the next clos-

er bid.

[0026] In the scope of the present invention it may be desirable to auction several pieces of the same item, for example, ten discmen, at the same time. In this case the method according to the present invention could include the step of determining in the auction center a sequence of a number of final price offers for the good by identifying the highest price offer, excluding the final leading price offer, having the earliest arrival time, and by repeating this process until the desired number of final price offers has been determined, for example, the ten highest price offers for discmen. The auction center will then inform the ten winning bidders accordingly and initiate debiting and delivery, as described above for a single item bidding process.

[0027] Regardless of whether the bidding process is carried out for one or for several pieces of a good, it may be desirable to send a message to the user who had sent the last present leading price offer that his price offer has been topped, if a higher present leading price offer has been determined. By means of such a message the user who had shown particular interest in the bidding may be selectively contacted so that he or she may return another, higher price offer.

[0028] In an embodiment of the present invention the auction center and the plurality of cellular telephones communicate via the Cell Broadcast Center (CBC) system. This system enables the auction center to communicate in an advantageous way with the cellular telephones. In particular, the users do not have to lock-in to a certain service.

[0029] In another embodiment of the present invention the auction center may be an interface to an online auction server. In this case, the online auction server is a server in which an auction on the internet is generated and proceeded. The interface function of the auction center enables the user of the cellular telephone to participate in this online auction. The auction center may monitor any of the actions of the bidding process and inform and communicate with the user of a cellular telephone as described above for wireless auctions.

[0030] Other features and advantages of the present invention will become apparent in the following detailed description of an embodiment.

[0031] In order to sell a good the auction center will initiate an auction. This good may be, for example, a certain new music CD. The auction center may be a computer system comprising a processor, storage medium and an i/o interface. Via this i/o interface the auction center may be connected to a telephone provider. The auction center comprises or is connected to a customer database. This database comprises information about the customers which have already returned a bid to the auction center. Within this database or in an separate database information about potential customers, like all customers of a telephone provider may be stored.

[0032] First, the auction center will generate a message, which describes the offered music CD. This may

be made by the auction center automatically as well as with support of the administrator of the auction center. This message, the so called bidding invitation, may be sent to cellular telephones assigned to a certain group of customers. The decision which customers will get a bidding invitation may be made based on all information available to the auction center or the administrator thereof. It is also possible that several different bidding invitations may be generated, for example, one for a certain group of customers and a special one for all customers which have returned a bid in the last auctions with music CDs. The bidding invitation may comprise information about the number of offered goods, in this example, the number of offered samples of this music CD. This will be interesting for the user in order to know that, if, for example, five CDs are offered, he will get a CD even if his price offer is only the fifth highest offer.

[0033] The bidding invitation may be a data message, which comprises all kind of data which could be presented to the user of the cellular telephone in an acoustical or in an optical way. This means written text messages, spoken messages and pictures as well as a film, for example, wherein the acoustical and the optical way are combined. This bidding invitation may include specific identification information of this specific auction. For example, a telephone number and/or a certain key may accompany the bidding invitation in order to distinguish the incoming price offers of different auctions. This bidding invitation may be sent from the auction center to the addressed cellular telephones via a suitable channel. Such channels may be SMS, CBC, WAP, GPRS and UMPs.

[0034] The addressed cellular telephones may receive the sent message and may inform the user about this bidding invitation in the foreseen way. The user may listen to or otherwise access this information immediately or at a later point of time, depending on his or her desires and upon the technical possibilities.

[0035] In addition, the bidding invitation may include the information that additional descriptions about the offered good, in this example the music CD, are available. This allows the user in this special example to ask the auction center to present, for example, a sample piece of music from the offered music CD.

[0036] After receiving the bidding invitation the cellular telephone may be able to return a price offer to the auction center. For this returning of the price offer several different ways are possible. In order to simplify this bidding process the cellular telephone may offer the user a bid which is higher than the last present leading price offer or the starting price. Then the user of the cellular telephone has only to press one or more buttons on his cellular telephone to return this new price offer. This returning of the price offer can be sent via all possible channels between the cellular telephone and the auction center.

[0037] This returning message may furthermore comprise information about the specific auction, if there are

several auctions going on at the same time, for example, by using a certain telephone number for contacting the auction center and/or by using a key. It may also contain information which allows to identify the user, for example, the telephone number of the cellular telephone from which the message of the user was sent if this telephone number permits the identification of the user, for example, via a database. At any rate, the telephone number is unique and can be employed by the auction center to distinguish the incoming price offers. If the cellular telephone transmits no telephone number the user of the cellular telephone will have to carry out an identification process. In this process the user may determine or may get assigned an access code. In this case the access code will be transmitted by the cellular telephone in order to distinguish this user from other users.

[0038] The auction center may register the incoming returned message including the new price offer. The auction center will be able to store this incoming message in any suitable way, so that the auction center can process the information.

[0039] This processing of the incoming information can comprise an analyzing of the bidding user by comparing the identification information with a corresponding entry in a customer database. If in this database, for example, several open bills are registered in connection with this user, the auction center may be able to ignore this new price offer. If the user participates for the first time in an auction and there is no information about the user in the customer database, it is also possible that the auction center processes the incoming new price offer, but asks parallelly the new user for additional information, like the age or the bank account in order to allow an easy debiting in the future.

[0040] Each incoming price offer is registered with respect to its value and its arrival time. In the next step the auction center determines the present leading price offer. If a number of goods are offered in one auction, frequently a certain number of price offers are determined by the auction center which are all leading the auction in the sense that they all entitle to a purchase of one piece of the auctioned good.

[0041] The auction center communicates regularly with the plurality of cellular telephones in order to inform them about the present leading price offer. This may be a message to all customers with the information that a new present leading price offer with a certain value has reached the auction center. In addition or alternatively the auction center may send a message to the user who returned the last leading price offer, in which the auction center informs this user that his price offer has been topped. Other comparable communication between the auction center and the cellular telephones may be also possible.

[0042] After a certain closing criterion has been reached the auction center may not accept new price offers anymore. Such a closing criterion may be a certain point in time, but other suitable criteria may also

be possible. After closing the auction the auction center will fix at least one final leading price offer.

[0043] In this embodiment the auction center will determine the user to whom this cellular telephone is assigned and will debit the amount of the final leading price offer to the bank account specified in the customer database. In another embodiment the user may first be informed by a confirmation request about the end of the auction and that he has returned the final leading price offer. The user is asked to confirm this request in order to confirm that he wants to buy the good for the offered price. This confirmation communication can be realized in various ways.

[0044] All described functions of the auction center may be realized in a common computer system, but other solutions are possible as well.

[0045] In another embodiment of the present invention the auction center does not initiate auctions on its own. However, it is able to monitor other auctions, like online auctions via the internet. The auction center may provide the customers with the relevant information about these auctions and may be able to forward the bids returned from the customers in the above mentioned way to the corresponding online auction.

[0046] Therefore, the present invention provides an auction system which enables the user of this system to participate at any location where his cellular telephone may be reachable together with an improved user-friendly method for communicating the relevant information.

Claims

1. A method for determining a final leading price offer for a good using an auction center and a plurality of cellular telephones of a plurality of users, wherein each of said plurality of cellular telephones is assigned to one of said plurality of users, and wherein each of said plurality of cellular telephones has a telephone number, comprising the following steps:
 - a) sending a bidding invitation for said good from said auction center to said plurality of cellular telephones,
 - b) informing said plurality of users about said bidding invitation for said good by means of an acoustical or optical display function of said plurality of cellular telephones,
 - c) returning from at least one of said plurality of cellular telephones price offers for said good to said auction center in response to said bidding invitation on demand of at least one of said plurality of users,
 - d) registering in said auction center each of said price offers and the arrival time at said auction center for each of said price offers,
 - e) determining a present leading price offer for

said good by identifying the highest of said price offers having the earliest arrival time at said auction center,

- f) communicating said present leading price offer to said plurality of cellular telephones,
- g) repeating at least the above steps c) to f) until a closing criterion is reached, and
- h) fixing a final leading price offer, which is identical with said present leading price offer which was last determined in a repetition of step e) before said closing criterion was reached.

2. A method according to claim 1, characterized by the following additional step: registering the telephone number of each of said plurality of cellular telephones from which a price offer was returned to said auction center and which transmits its telephone number to said auction center.
3. A method according to claim 2, characterized by the following additional step: identifying users which have initiated a price offer by contacting a database containing correlated information about each said registered telephone number and each of said plurality of users to which at least one of said plurality of cellular telephones is assigned.
4. A method according to claim 3, characterized by the following additional step: identifying a bank account of the user having been identified as having initiated said final leading price offer and debiting the amount of said final leading price offer to said bank account.
5. A method according to any of the preceding claims, characterized by the following additional step:
 - sending a confirmation request after said fixing of said final leading price offer from said auction center to the cellular telephone of said plurality of cellular telephones which returned said final leading price offer.
6. A method according to claim 5, characterized by the following additional step:
 - sending a reminder message from said auction center to said cellular telephone which returned said final leading price offer, if the auction center has not received a confirmation from said cellular telephone within a certain time period.
7. A method according to claim 5 or 6, characterized by the following additional step:
 - sending a bid acceptance message from said auction center to said cellular telephone which returned said final leading price offer, if said cellular telephone has positively reacted to said confirmation request.

8. A method according to any of the preceding claims, characterized by the following additional step:
determining in said auction center a sequence of a number of final price offers for said good by identifying the highest of said price offers, excluding said final leading price offer, having the earliest arrival time, and by repeating this process until said number of final price offers has been determined. 5
9. A method according to any of the preceding claims, characterized by the following additional step:
sending a message to the user who had sent the last present leading price offer that his price offer has been topped, if a higher present leading price offer has been determined. 10 15
10. A method according to any of the preceding claims, characterized in that said auction center and said plurality of cellular telephones communicate via the Cell Broadcast Center (CBC) system. 20

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European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 99 12 0835

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 99 12 0835

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