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Datasheet for the decision of 11 October 2024

Case Number: T 0374/21 - 3.5.01

Application Number: 14800192.8

Publication Number: 3063724

IPC: G06Q40/04

Language of the proceedings: EN

Title of invention:
ELECTRONIC TRADING SYSTEM UTILIZING USER-CUSTOMIZED IMPLIED PROBABILITY DISTRIBUTIONS AND GRAPHICAL USER INTERFACE FOR SAME

Applicant:
Interactive Brokers Llc

Headword:
User interface for option trading/INTERACTIVE BROKERS

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - customising probability distribution of prices (no - no technical effect)

Decisions cited:
T 0641/00, T 1185/13, T 1802/13, T 0336/14

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Case Number: T 0374/21 - 3.5.01

D E C I S I O N
of Technical Board of Appeal 3.5.01
of 11 October 2024

Appellant: (Applicant)	Interactive Brokers Llc One Pickwick Plaza Greenwich, CT 06830 (US)
Representative:	Piotrowicz, Pawel Jan Andrzej Venner Shipley LLP 406 Cambridge Science Park Milton Road Cambridge CB4 0WW (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 1 December 2020 refusing European patent application No. 14800192.8 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	W. Chandler
Members:	A. Wahrenberg
	D. Rogers

Summary of Facts and Submissions

I. The applicant appealed the examining division's decision to refuse the European patent application No. 14800192.8 for lack of inventive step (Article 56 EPC).

II. In the grounds of appeal, the appellant requested that the decision to refuse the application be set aside and that a patent be granted on the basis of the main request, or one of the first to fourth auxiliary requests, all filed on 18 September 2020 and refused in the decision under appeal. The appellant requested oral proceedings if none of the requests was allowable.

III. The Board arranged for oral proceedings to be held on 21 March 2024. In the communication accompanying the summons, the Board set out its preliminary view agreeing with the examining division that all the requests appeared to lack inventive step.

IV. In a letter filed electronically on 19 March 2024, the appellant informed the Board that it would not attend the oral proceedings.

V. On 20 March 2024, the Board cancelled the oral proceedings and informed the appellant that a decision would be issued in writing.

VI. Claim 1 of the main request reads:

A computer-implemented method for applying implied probability distributions to generate user customizable electronic orders, the method comprising:

electronically receiving prices of options on an

underlying asset from one or more electronic data providers;

computing, using one or more processors and based on the option prices, a market implied probability distribution MIPD of the price for the underlying asset as of a future date, wherein computing the MIPD comprises (a) converting the quotes of options into a set of implied volatilities, one per listed strike price; (b) smoothing the set of implied volatilities to reduce noise; and (c) converting the set of implied volatilities into the market implied probability distribution;

trimming the market implied probability distribution to only certain strike prices and displaying the trimmed market implied probability distribution (MIPD) on a graphical user interface of a user computing device;

receiving a user input from the graphical user interface, the user input modifying at least one probability for a given price interval of the MIPD in a first direction;

generating, using one or more processors, a customized probability distribution (CPD) based on the user input, wherein generating the CPD comprises automatically adjusting probabilities other than the modified probability to maintain a total probability of 1.0 and a reasonable curve, including by (a) automatically adjusting probabilities for prices intervals nearby the given price interval in the first direction and (b) automatically adjusting probabilities for prices intervals other than nearby prices intervals in a second direction, opposite the first direction;

displaying the CPD;

generating, using one or more processors, one or more trading strategies based on the CPD, the trading strategies including multiple component trades;

presenting the one or more trading strategies to the user; receiving a selection of one of the trading strategies; and

initiating electronic orders to one or more electronic marketplaces for the component trades of the selected strategy.

VII. The first auxiliary request adds the following to claim 1:

"wherein displaying the MIPD comprises displaying the MIPD as a bar graph comprising a plurality of bars, each bar having a width defined by two prices of the asset, and a height representing the probability the price of the asset falling into the two prices, wherein the height of one or more bars is adjustable by the user" at the end of the "trimming..." feature; and

"wherein the user input is received via a user activation of a preset control element on the graphical user interface" at the end of the "receiving..." feature.

VIII. Claim 1 of the second auxiliary request has the first additional feature of the first auxiliary request, and also the additional "and adjusting the height of one or more bars near the bar whose height is adjusted by the use" between "modified probability" and "maintain" in

the "generating..." feature.

IX. The third auxiliary request adds to claim 1 of the second auxiliary request the following at the end of the "trimming..." feature:

"and wherein the MIPD graph is scaled when generated and displayed, with the height of each price interval segment of the bar graph corresponding to a probability, and wherein the user's moving the bar a certain distance corresponding to a number of pixels changes the probability an amount corresponding to the distance moved based on the scale".

X. Claim 1 of the fourth auxiliary request comprised the first additional feature of the first auxiliary request and adds the following after it:

"and wherein the MIPD graph is scaled when generated and displayed, with x number of vertical pixels in each bar corresponding to a probability such that the height of each bar corresponds to a probability, and wherein the user's moving the bar a certain distance corresponding to a number of pixels changes the probability an amount corresponding to the distance moved based on the scale".

Reasons for the Decision

1. *Main request*

1.1 The invention concerns a computer-implemented trading tool for generating and displaying trading information and trading strategies for an option. For the

technically skilled reader who is not familiar with option trading, an option is a financial instrument which gives the holder the opportunity to buy or sell an underlying asset such as a stock at a fixed price at a future date.

The trading tool (Figures 2-5) calculates and displays, in a graphical user interface, the probability distribution of prices of the underlying asset for the option based on market data (Market Implied Probability Distribution MIPD). The MIPD is "trimmed" to include only some strike prices (the price at which the underlying asset can be bought or sold by the option holder). The user may customise the probability distribution based on their own estimates (Customized Probability Distribution CPD). Also the CPD is displayed. The tool presents a number of trading strategies for the option based on the CPD, and the user can select a trading strategy to initiate an order.

1.2 Under the "Comvik approach" (T 641/00 - *Two identities/ COMVIK*), an inventive step can be based only on features which contribute to the solution of a technical problem by providing a technical effect. Features which make no such contribution do not count towards inventive step, but are instead considered as being part of the problem to be solved within the framework of the problem and solution approach.

1.3 Applying the Comvik approach, the examining division considered that the subject-matter of claim 1 was an obvious implementation of a (non-technical) business method on a notoriously known general purpose networked computer system.

The technical character of the claim was considered to reside solely in the execution of a number of processing steps on a computer. The steps themselves did not contribute to inventive step as they were business related and did not interact with the computer system to provide a technical effect. Therefore, an inventive step was denied.

1.4 The appellant did not contest that option trading and the display of price information were non-technical *per se*. However, the appellant submitted that the examining division had overlooked interactions between the technical and non-technical features of the claims. In the appellant's view, the invention was a "technical tool" in the form of a graphical user interface providing a continued and guided human-machine interaction process assisting the user in performing the technical task of adapting a probability distribution of a continuous random variable in a manner which maintained normalisation. The potential for user interfaces providing such functionality to be technical had previously been acknowledged by the Boards of Appeal in, for example, T 336/14 - *Presentation of operating instructions/GAMBRO,* T 1802/13 - *Brain stimulation/CLEVELAND,* and T 1185/13.

The appellant argued that the technical problem to be solved was "how to provide a user with an efficient, intuitive mechanism for customising, in a probability density distribution of a continuous random variable, the probability of the random variable at a specified time". The solution to this problem was not obvious in view of the prior art.

1.5 The Board is not convinced by the appellant's arguments that the invention provides a technical tool which has

technical character beyond the computer implementation. The claimed invention assists the user in customising a probability distribution of prices in order to find a trading strategy. In the Board's view, this is a non-technical task.

In T 336/14 (at point 1.2.4), a distinction was made between information indicating an operation state, a condition, or an event internal to the underlying technical system, prompting the system user to interact with it in a continued and/or guided way for enabling its proper functioning on the one hand, and information representing a state of a non-technical application run on that technical system on the other hand. The former was considered to be technical whereas the latter was not. In the context of the present invention, the underlying technical system would be the computer system. However, the user rather interacts with data relating to the price of an asset i.e. cognitive data which lacks technical function and character. Thus, the Board judges that the present invention rather falls in the second, non-technical category of information mentioned in T 336/14.

The Board does not not see any technical effect of the claimed invention other than the implementation (in very general terms) of a set of non-technical requirements related to the presentation of information. This implementation would have been obvious to the skilled person. Therefore, the Board agrees with the examining division that the subject matter of claim 1 of the main request lacks an inventive step (Article 56 EPC).

2. *First auxiliary request*

2.1 Claim 1 of the first auxiliary request adds that:

- displaying the MIPD comprises displaying the MIPD as a bar graph comprising a plurality of bars, each bar having a width defined by two prices of the asset, and a height representing the probability of the price of the asset falling into the two prices, wherein the height of one or more bars is adjustable by the user, and

- the user input is received via a user activation of a preset control element on the graphical user interface.

2.2 The Board does not consider that this adds anything technical. Displaying the MIPD as a bar graph is presentation of information. While receiving input is technical, this, *per se*, is part of the known computer system which has input means for receiving user input. Merely providing preset control elements does not appear to have a technical effect beyond this, and in any case, is standard GUI design as the examining division argued in the decision under appeal. Thus, the Board judges that the first auxiliary request is not inventive (Article 56 EPC).

3. *Second auxiliary request*

3.1 Claim 1 of the second auxiliary request comprises the first additional feature of the first auxiliary request but not the second one. Instead, it has the additional feature that generating the CPD comprises adjusting the height of one or more bars near the bar whose height is adjusted by the user.

3.2 The Board does not consider that this additional feature has a technical effect. The appellant argues that the feature provides further details on the human-machine interface which assists the user in performing a technical task, but as for the main request, the Board does not see that there is any technical task involved in adjusting the probability distribution of asset prices. Therefore, the second auxiliary request does not add anything inventive.

4. *Third auxiliary request*

4.1 Claim 1 of the third auxiliary request includes that: "... the MIPD graph is scaled when generated and displayed, with the height of each price interval segment of the bar graph corresponding to a probability, and wherein the user's moving the bar a certain distance corresponding to a number of pixels changes the probability an amount corresponding to the distance moved based on the scale".

4.2 In the Board's view, this does not add anything technical. It is presentation of information. The appellant's argument regarding the third auxiliary request is not convincing for the same reasons as for the previous requests.

5. *Fourth auxiliary request*

5.1 The fourth auxiliary request adds to the main request the following feature:

"wherein displaying the MIPD comprises displaying the MIPD as a bar graph comprising a plurality of bars, each bar having a width defined by two prices of the asset, and a height representing a probability that the price of the asset falls into the two prices, wherein

the height of one or more bars is adjustable by the user, and wherein the MIPD graph is scaled when generated and displayed, with x number of vertical pixels in each bar corresponding to a probability such that the height of each bar corresponds to a probability, and wherein the user's moving the bar a certain distance corresponding to a number of pixels changes the probability an amount corresponding to the distance moved based on the scale".

5.2 The Board agrees with the examining division that this does not go beyond the implementation of a graphical user interface for representing non-technical data and allowing the user to interact with it. The appellant's arguments seem to be essentially the same as for previous requests and those have already been dealt with above.

6. As none of the appellant's requests are allowable it follows that the appeal is dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

T. Buschek W. Chandler

Decision electronically authenticated