

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY**

NASDAQ, INC.; NASDAQ
TECHNOLOGY AB,

Plaintiffs,

v.

IEX GROUP, INC.; INVESTORS
EXCHANGE LLC,

Defendants.

Civil Action No.: 3:18-cv-03014-
BRM-DEA

Filed Electronically

Demand for Jury Trial

**DEFENDANTS IEX GROUP, INC. AND INVESTORS EXCHANGE LLC'S
ANSWER TO PLAINTIFFS' AMENDED COMPLAINT
FOR PATENT INFRINGEMENT**

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*Attorneys for Defendants
IEX Group, Inc. and
Investors Exchange LLC*

Defendants IEX Group, Inc. (“IEX Group”) and Investors Exchange LLC (“Investors Exchange”; collectively with IEX Group, “IEX”), by and through their attorneys, hereby respond to the Amended Complaint for Patent Infringement (“Amended Complaint”) filed by Plaintiffs Nasdaq, Inc. and Nasdaq Technology AB (“Nasdaq Technology”; collectively with Nasdaq, Inc., “Plaintiffs” or “Nasdaq”). IEX denies all averments in the Amended Complaint except as specifically admitted below. To the extent that the headings in the Amended Complaint, repeated herein solely for ease of reference, contain factual or legal averments, IEX denies such averments.

INTRODUCTION

1. IEX denies the allegations of Paragraph 1, except admits that Nasdaq asserts claims for alleged patent infringement and that Nasdaq’s allegations relate, in part, to electronic trading technologies.
2. IEX lacks knowledge or information sufficient to form a belief as to the truth of the allegations of Paragraph 2 and on that basis denies them.
3. IEX lacks knowledge or information sufficient to form a belief as to the truth of the allegations of Paragraph 3 and on that basis denies them.
4. IEX admits the allegations of Paragraph 4, except IEX denies Nasdaq’s characterization of IEX’s development of the Investors Exchange platform as “quick[.]” Investors Exchange is based on IEX’s proprietary “speed

bump” technology — a 38-mile fiber optic coil which is designed to level the playing field and negate the speed advantage exploited by high-frequency trading firms and other professional intermediaries on Nasdaq.

5. IEX denies the allegations of Paragraph 5, and states that Nasdaq does not identify the source of the alleged quotes attributed to IEX in Paragraph 5 and IEX refers to its public statements for their contents.

6. IEX denies the allegations of Paragraph 6.

7. IEX denies the allegations of Paragraph 7.

8. IEX denies the allegations of Paragraph 8, except admits that Nasdaq launched an electronic closing auction in 2004 and that Nasdaq purports to disseminate auction information including a Net Order Imbalance Indicator or NOII. Nasdaq did not invent closing auctions, electronic auctions, or the dissemination of auction information. For example, and without limitation, the London Stock Exchange and Archipelago Exchange implemented electronic closing auctions and disseminated auction information before Nasdaq. The New York Stock Exchange, Paris Bourse, and Frankfurt Stock Exchange also implemented auctions and disseminated auction information before Nasdaq.

9. IEX denies the allegations of Paragraph 9, except states that it lacks knowledge or information sufficient to form a belief as to the truth of the allegations in the second sentence of Paragraph 9 and on that basis denies them.

10. IEX denies the allegations of Paragraph 10, except admits that it made certain statements regarding its closing process in SEC Release No. 34-80583, Notice of Filing of Proposed Rule Change Related to Auctions in IEX-Listed Securities, Dissemination of Auction-Related Market Data, and Provisions Governing Trading Halts and Pauses, filed by IEX with the SEC on April 20, 2017. Nasdaq's allegation that IEX stated that its closing auction process was "designed based on an extensive review of" Nasdaq's patented process" is false. IEX's closing auction process was not designed based on a review of, and does not embody any alleged inventions claimed in, any Nasdaq patents.

11. IEX denies the allegations of Paragraph 11, except admits that IEX has never obtained, nor sought, a license to any of the Nasdaq patents asserted in this action. Investors Exchange was built on IEX's own proprietary technology and does not embody any alleged inventions claimed in any Nasdaq patents.

12. IEX denies the allegations of Paragraph 12, except admits that Nasdaq purports to seek enhanced damages for willful infringement.

NATURE OF THE ACTION

13. IEX denies the allegations of Paragraph 13, except admits that Nasdaq asserts claims for alleged infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1, *et seq.* for alleged infringement of one or more claims of

U.S. Patent Nos. 7,647,264; 7,933,827; 8,117,609; 8,244,622; 8,280,797; and 8,386,362 (collectively, “Asserted Patents”).

PARTIES

14. IEX lacks knowledge or information sufficient to form a belief as to the truth of the allegations of Paragraph 14 and on that basis denies them.

15. IEX lacks knowledge or information sufficient to form a belief as to the truth of the allegations of Paragraph 15 and on that basis denies them.

16. IEX denies the allegations of Paragraph 16, except admits that IEX Group is a corporation organized under the laws of the State of Delaware, with its principal place of business at 3 World Trade Center, 58th Floor, 175 Greenwich Street, New York, New York 10007.

17. IEX denies the allegations of Paragraph 17, except admits that Investors Exchange, a wholly-owned subsidiary of IEX Group, is a limited liability company organized in Delaware, with its principal place of business at 3 World Trade Center, 58th Floor, 175 Greenwich Street, New York, New York 10007.

JURISDICTION AND VENUE

18. IEX denies that it infringes any claims of the Asserted Patents, but admits that the Court has subject matter jurisdiction over Nasdaq’s claims for alleged patent infringement pursuant to 35 U.S.C. § 101 *et seq.* and 28 U.S.C. §§ 1331 and 1338(a).

19. IEX denies the allegations of Paragraph 19, except admits that the Court has personal jurisdiction over IEX for purposes of this action.

20. IEX denies the allegations of Paragraph 20, except admits that the Investors Exchange data center is located in Weehawken, New Jersey, that the Investors Exchange point of presence is located in Secaucus, New Jersey, and that venue is proper for purposes of this action.

THE PATENTS-IN-SUIT

21. IEX denies the allegations of Paragraph 21, except admits that U.S. Patent No. 7,647,264 (the “’264 Patent”) on its face has a date of issue of January 12, 2010, is entitled “Closing in an Electronic Market,” and lists as named inventors Frank Hatheway, Daniel F. Moore, Timothy E. Cox, Peter J. Martyn, Dan Barnard Franks, Adam Seth Nunes, and Oliver Albers.

22. IEX denies the allegations of Paragraph 22, except admits that U.S. Patent No. 7,933,827 (the “’827 Patent”) on its face has a date of issue of April 26, 2011, is entitled “Multi-Parallel Architecture and A Method of Using the Same,” and lists as named inventors James N. Richmann, Daniel F. Moore, John T. Hughes, Jr., Stuart Serkin, Timothy Vincent, Peter J. Martyn, and Mark DeNat.

23. IEX denies the allegations of Paragraph 23, except admits that U.S. Patent No. 8,117,609 (the “’609 Patent”) on its face has a date of issue of

February 14, 2012, is entitled “System and Method for Optimizing Changes of Data Sets,” and lists as named inventors Staffan Lantz and Lars Jansson.

24. IEX denies the allegations of Paragraph 24, except admits that U.S. Patent No. 8,244,622 (the “’622 Patent”) on its face has a date of issue of August 14, 2012, is entitled “Order Matching Process and Method,” and lists as named inventors John T. Hughes, Daniel F. Moore, Bruce E. Friedman, and Timothy Vincent.

25. IEX denies the allegations of Paragraph 25, except admits that U.S. Patent No. 8,280,797 (the “’797 Patent”) on its face has a date of issue of October 2, 2012, is entitled “Closing in an Electronic Market,” and lists as named inventors Frank Hatheway, Daniel F. Moore, Timothy E. Cox, Peter J. Martyn, Dan Barnard Franks, Adam Seth Nunes, and Oliver Albers.

26. IEX denies the allegations of Paragraph 26, except admits that U.S. Patent No. 8,386,362 (the “’362 Patent”) is entitled “Information Distribution Process and Method,” the ’362 Patent on its face has a date of issue of February 26, 2013 and lists as named inventors Santino Failla, Georgia Bilis, George David Easterbrook, Jr., and Timothy Vincent.

27. IEX lacks knowledge or information sufficient to form a belief as to the truth of the allegations of Paragraph 27 and on that basis denies them.

IEX'S KNOWLEDGE OF THE PATENTS-IN-SUIT

28. IEX denies the allegations of Paragraph 28. Investors Exchange was built on IEX's own proprietary technology and does not embody any alleged inventions claimed in any Nasdaq patents.

29. IEX denies the allegations of Paragraph 29, except admits that IEX was founded in 2012. Investors Exchange was built on IEX's own proprietary technology and does not embody any alleged inventions claimed in any Nasdaq patents.

30. IEX denies the allegations of Paragraph 30. Investors Exchange was built on IEX's own proprietary technology and does not embody any alleged inventions claimed in any Nasdaq Patents.

31. IEX denies that it obtained knowledge of the Patents-in-Suit by the participation of any former employees of Nasdaq in the filing of Nasdaq-owned patent applications that incorporated by reference one or more of the Patents-in-Suit or the underlying applications.

32. IEX denies the allegations of Paragraph 32, except admits that certain employees who formerly worked at Nasdaq contributed to development of an alternative trading system run by a subsidiary of IEX Group starting in 2012 and that launched in 2013. IEX states that Investors Exchange was built on IEX's own

proprietary technology and does not embody any alleged inventions claimed in any Nasdaq patents.

33. IEX admits the allegations of Paragraph 33.

34. IEX admits that one employee who formerly worked at Nasdaq contributed to the development of IEX's closing auction process, but states that Investors Exchange's closing auction process is not the same as Nasdaq's closing auction process, is not based on Nasdaq technology, and does not practice or embody any alleged inventions claimed in any Nasdaq patents.

35. IEX denies the allegations of Paragraph 35, except admits that it has made certain statements regarding its closing process in SEC Release No. 34-80583, Notice of Filing of Proposed Rule Change Related to Auctions in IEX-Listed Securities, Dissemination of Auction-Related Market Data, and Provisions Governing Trading Halts and Pauses, filed by IEX with the SEC on April 20, 2017. Investors Exchange's closing auction process is not the same as Nasdaq's closing auction process, is not based on Nasdaq technology, and does not practice or embody any alleged inventions claimed in any Nasdaq patents.

RESPONSE TO COUNT I: INFRINGEMENT OF THE '264 PATENT

36. IEX incorporates by reference herein its answers to Paragraphs 1-35 as if fully set forth herein.

37. IEX states that the '264 Patent claims have not yet been construed and that IEX therefore denies the allegations of Paragraph 37, except IEX admits that the '264 Patent claims are directed to the patent-ineligible abstract idea of executing an electronic call auction for securities and disseminating auction information.

38. IEX states that the '264 Patent claims have not yet been construed and that IEX therefore denies the allegations of Paragraph 38, including that distribution of closing auction information was not well-understood, routine, or conventional. IEX further states that the London Stock Exchange and Archipelago Exchange implemented electronic closing auctions and disseminated auction information before the priority date of the '264 Patent. Nasdaq did not disclose the London Stock Exchange as prior art to the United States Patent and Trademark Office ("PTO") during prosecution of the application leading to the '264 Patent.

39. IEX denies the allegations of Paragraph 39.

40. IEX denies the allegations of Paragraph 40.

41. IEX denies the allegations of Paragraph 41.

42. IEX denies the allegations of Paragraph 42 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual

includes the quoted language, and IEX refers to the IEX User Manual for its contents.

43. IEX denies the allegations of Paragraph 43 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the U.S. Patent Publication No. 2015/0073967 ("IEX Speed Bump Application"), but IEX admits that the IEX Speed Bump Application includes the quoted language and refers to the IEX Speed Bump Application for its contents.

44. IEX admits the allegations of Paragraph 44.

45. IEX denies the allegations of Paragraph 45 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Auction Process Specification, but IEX admits the IEX Auction Process Specification includes the quoted language and refers to the IEX Auction Process Specification for its contents.

46. IEX denies the allegations of Paragraph 46 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange, but IEX admits that the IEX Operational Guide includes the reproduced figure and indicates that certain auction information is disseminated each second during specified periods of time, and IEX refers to the IEX Operational Guide for its contents.

47. IEX denies the allegations of Paragraph 47 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange and IEX Auction Process Specification, but IEX admits that the IEX Operational Guide and IEX Auction Process Specification include the quoted language, and IEX refers to the IEX Operational Guide and IEX Auction Process Specification for their contents.

48. IEX denies the allegations of Paragraph 48, except admits that it made certain statements regarding its closing process in SEC Release No. 34-80583, Notice of Filing of Proposed Rule Change Related to Auctions in IEX-Listed Securities, Dissemination of Auction-Related Market Data, and Provisions Governing Trading Halts and Pauses, filed by IEX with the SEC on April 20, 2017. Nasdaq's allegation that IEX stated that its closing auction process was ““designed based on an extensive review of” Nasdaq's patented process” is false. IEX's closing auction process was not designed based on a review of, and does not embody any alleged inventions claimed in, any Nasdaq patents.

49. IEX denies the allegations of Paragraph 49 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide, but IEX admits that the IEX Operational Guide discloses accepting certain orders within a certain price range after the

dissemination of auction information begins, and IEX refers to the IEX Operational Guide for its contents.

50. IEX denies the allegations of Paragraph 50 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book discloses determining an official closing price, and IEX refers to the IEX Rule Book for its contents.

51. IEX denies the allegations of Paragraph 51.

52. IEX denies the allegations of Paragraph 52 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

53. IEX denies the allegations of Paragraph 53 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Auction Process Specification, but IEX admits that the IEX Auction Process Specification includes the quoted language and discloses storing certain orders in an auction book or continuous book, and IEX refers to the IEX Auction Process Specification for its contents.

54. IEX denies the allegations of Paragraph 54 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange, but IEX admits that the IEX Operational Guide indicates that certain auction information is disseminated each second during specified periods of time, and IEX refers to the IEX Operational Guide for its contents.

55. IEX denies the allegations of Paragraph 55 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange and IEX Auction Process Specification, but IEX admits that the IEX Operational Guide and IEX Auction Process Specification include the quoted language, and IEX refers to the IEX Operational Guide and IEX Auction Process Specification for their contents.

56. IEX denies the allegations of Paragraph 56, except admits that it made certain statements regarding its closing process in SEC Release No. 34-80583, Notice of Filing of Proposed Rule Change Related to Auctions in IEX-Listed Securities, Dissemination of Auction-Related Market Data, and Provisions Governing Trading Halts and Pauses, filed by IEX with the SEC on April 20, 2017. Nasdaq's allegation that IEX stated that its closing auction process was "designed based on an extensive review of" Nasdaq's patented process" is false. IEX's

closing auction process was not designed based on a review of, and does not embody any alleged inventions claimed in, any Nasdaq patents.

57. IEX denies the allegations of Paragraph 57 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in IEX's Operational Guide, but IEX admits that the IEX Operational Guide discloses accepting certain orders within a certain price range after the dissemination of certain auction information begins, and IEX refers to the IEX Operational Guide for its contents.

58. IEX denies the allegations of Paragraph 58 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book discloses determining an official closing price, and IEX refers to the IEX Rule Book for its contents.

59. IEX denies the allegations of Paragraph 59.

60. IEX denies the allegations of Paragraph 60 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

61. IEX denies the allegations of Paragraph 61 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Auction Process Specification, but IEX admits the IEX Auction Process Specification includes the quoted language and discloses storing certain orders in an auction book or continuous book, and IEX refers to the IEX Auction Process Specification for its contents.

62. IEX denies the allegations of Paragraph 62 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange, but IEX admits that the IEX Operational Guide indicates that certain auction information is disseminated each second during specified periods of time, and IEX refers to the IEX Operational Guide for its contents.

63. IEX denies the allegations of Paragraph 63 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange and IEX Auction Process Specification, but IEX admits that the IEX Operational Guide and IEX Auction Process Specification include the quoted language, and IEX refers to the IEX Operational Guide and IEX Auction Process Specification for their contents.

64. IEX denies the allegations of Paragraph 64, except admits that it made certain statements regarding its closing process in SEC Release No. 34-80583, Notice of Filing of Proposed Rule Change Related to Auctions in IEX-Listed Securities, Dissemination of Auction-Related Market Data, and Provisions Governing Trading Halts and Pauses, filed by IEX with the SEC on April 20, 2017. Nasdaq's allegation that IEX stated that its closing auction process was "designed based on an extensive review of" Nasdaq's patented process" is false. IEX's closing auction process was not designed based on a review of, and does not embody any alleged inventions claimed in, any Nasdaq patents.

65. IEX denies the allegations of Paragraph 65 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in IEX's Operational Guide, but IEX admits that the IEX Operational Guide discloses accepting certain orders within a certain price range after the dissemination of certain auction information begins, and IEX refers to the IEX Operational Guide for its contents.

66. IEX denies the allegations of Paragraph 66 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book discloses determining an official closing price, and IEX refers to the IEX Rule Book for its contents.

67. IEX denies the allegations of Paragraph 67.

68. IEX denies the allegations of Paragraph 68 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

69. IEX denies the allegations of Paragraph 69 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Auction Process Specification, but IEX admits that the IEX Auction Process Specification includes the quoted language and discloses storing certain orders in an auction book or continuous book, and IEX refers to the IEX Auction Process Specification for its contents.

70. IEX denies the allegations of Paragraph 70 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange, but IEX admits that the IEX Operational Guide discloses that certain auction information is disseminated each second during specified periods of time, and IEX refers to the IEX Operational Guide for its contents.

71. IEX denies the allegations of Paragraph 71 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize

statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange and IEX Auction Process Specification, but IEX admits that the IEX Operational Guide and IEX Auction Process Specification include the quoted language, and IEX refers to the IEX Operational Guide and IEX Auction Process Specification for their contents.

72. IEX denies the allegations of Paragraph 72, except admits that it made certain statements regarding its closing process in SEC Release No. 34-80583, Notice of Filing of Proposed Rule Change Related to Auctions in IEX-Listed Securities, Dissemination of Auction-Related Market Data, and Provisions Governing Trading Halts and Pauses, filed by IEX with the SEC on April 20, 2017. Nasdaq's allegation that IEX stated that its closing auction process was "designed based on an extensive review of" Nasdaq's patented process" is false. IEX's closing auction process was not designed based on a review of, and does not embody any alleged inventions claimed in, any Nasdaq patents.

73. IEX denies the allegations of Paragraph 73 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in IEX's Operational Guide, but IEX admits that the IEX Operational Guide discloses accepting certain orders within a certain price range after the dissemination of certain auction information begins, and IEX refers to the IEX Operational Guide for its contents.

74. IEX denies the allegations of Paragraph 74 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book includes the quoted language, and IEX refers to the IEX Rule Book for its contents.

75. IEX denies the allegations of Paragraph 75 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book includes the quoted language, and IEX refers to the IEX Rule Book for its contents.

76. IEX denies the allegations of Paragraph 76 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book discloses determining the official closing price, and IEX refers to the IEX Rule Book for its contents.

77. IEX denies the allegations of Paragraph 77.

78. IEX denies the allegations of Paragraph 78 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

79. IEX denies the allegations of Paragraph 79 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Speed Bump Application, but IEX admits that the IEX Speed Bump Application includes the quoted language, and IEX refers to the IEX Speed Bump Application for its contents.

80. IEX denies the allegations of Paragraph 80 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Auction Process Specification, but IEX admits that the IEX Auction Process Specification includes the quoted language and discloses storing certain orders in an auction book or continuous book, and IEX refers to the IEX Auction Process Specification for its contents.

81. IEX denies the allegations of Paragraph 81 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange, but IEX admits that the IEX Operational Guide indicates that certain auction information is disseminated each second during specified periods of time, and IEX refers to the IEX Operational Guide for its contents.

82. IEX denies the allegations of Paragraph 82 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing

Exchange and IEX Auction Process Specification, but IEX admits that the IEX Operational Guide and IEX Auction Process Specification include the quoted language, and IEX refers to the IEX Operational Guide and IEX Auction Process Specification for their contents.

83. IEX denies the allegations of Paragraph 83, except admits that it made certain statements regarding its closing process in SEC Release No. 34-80583, Notice of Filing of Proposed Rule Change Related to Auctions in IEX-Listed Securities, Dissemination of Auction-Related Market Data, and Provisions Governing Trading Halts and Pauses, filed by IEX with the SEC on April 20, 2017. Nasdaq's allegation that IEX stated that its closing auction process was "designed based on an extensive review of Nasdaq's patented process" is false. IEX's closing auction process was not designed based on a review of, and does not embody any alleged inventions claimed in, any Nasdaq patents.

84. IEX denies the allegations of Paragraph 84 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book includes the quoted language, and IEX refers to the IEX Rule Book for its contents.

85. IEX denies the allegations of Paragraph 85 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize

statements in the IEX Rule Book, but IEX admits that the IEX Rule Book includes the quoted language, and IEX refers to the IEX Rule Book for its contents.

86. IEX denies the allegations of Paragraph 86 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book discloses determining the official closing price, and IEX refers to the IEX Rule Book for its contents.

87. IEX denies the allegations of Paragraph 87.

88. IEX denies the allegations of Paragraph 88 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

89. IEX denies the allegations of Paragraph 89 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Auction Process Specification, but IEX admits that the IEX Auction Process Specification includes the quoted language and discloses storing certain orders in an auction book or continuous book, and IEX refers to the IEX Auction Process Specification for its contents.

90. IEX denies the allegations of Paragraph 90 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange, but IEX admits that the IEX Operational Guide indicates that certain auction information is disseminated each second during specified periods of time, and IEX refers to the IEX Operational Guide for its contents.

91. IEX denies the allegations of Paragraph 91 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange and IEX Auction Process Specification, but IEX admits that the IEX Operational Guide and IEX Auction Process Specification include the quoted language, and IEX refers to the IEX Operational Guide and IEX Auction Process Specification for their contents.

92. IEX denies the allegations of Paragraph 92, except admits that it made certain statements regarding its closing process in SEC Release No. 34-80583, Notice of Filing of Proposed Rule Change Related to Auctions in IEX-Listed Securities, Dissemination of Auction-Related Market Data, and Provisions Governing Trading Halts and Pauses, filed by IEX with the SEC on April 20, 2017. Nasdaq's allegation that IEX stated that its closing auction process was "designed based on an extensive review of Nasdaq's patented process" is false. IEX's

closing auction process was not designed based on a review of, and does not embody any alleged inventions claimed in, any Nasdaq patents.

93. IEX denies the allegations of Paragraph 93 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book includes the quoted language, and IEX refers to the IEX Rule Book for its contents.

94. IEX denies the allegations of Paragraph 94 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book includes the quoted language, and IEX refers to the IEX Rule Book for its contents.

95. IEX denies the allegations of Paragraph 95 insofar as Nasdaq suggests that IEX infringes any claim of the '264 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book discloses determining the official closing price, and IEX refers to the IEX Rule Book for its contents.

96. IEX denies the allegations of Paragraph 96.

97. IEX denies the allegations of Paragraph 97.

98. IEX denies the allegations of Paragraph 98.

99. IEX denies the allegations of Paragraph 99.

100. IEX denies the allegations of Paragraph 100.

101. IEX denies the allegations of Paragraph 101.

RESPONSE TO COUNT II: INFRINGEMENT OF THE '797 PATENT

102. IEX incorporates by reference herein its answers to Paragraphs 1-101 as if fully set forth herein.

103. IEX states that the '797 Patent claims have not yet been construed and that IEX therefore denies the allegations of Paragraph 103, except IEX admits that the claims of the '797 Patent are directed to the patent-ineligible abstract idea of executing an electronic call auction for securities and disseminating auction information.

104. IEX states that the '797 Patent claims have not yet been construed and that IEX therefore denies the allegations of Paragraph 104, including the allegation that distribution of the claimed "order imbalance indicator" was not well-understood, routine, or conventional. IEX further states that the London Stock Exchange and Archipelago Exchange implemented electronic closing auctions and disseminated auction information before the priority date of the '797 Patent. Nasdaq did not disclose the London Stock Exchange as prior art to the PTO during prosecution of the application leading to the '797 Patent.

105. IEX denies the allegations of Paragraph 105.

106. IEX denies the allegations of Paragraph 106.

107. IEX denies the allegations of Paragraph 107.

108. IEX denies the allegations of Paragraph 108 insofar as Nasdaq suggests that IEX infringes any claim of the '797 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

109. IEX denies the allegations of Paragraph 109 insofar as Nasdaq suggests that IEX infringes any claim of the '797 Patent or purports to characterize statements in the IEX Auction Process Specification, but IEX admits that the IEX Auction Process Specification includes the quoted language and discloses storing certain orders in an auction book or continuous book, and IEX refers to the IEX Auction Process Specification for its contents.

110. IEX denies the allegations of Paragraph 110 insofar as Nasdaq suggests that IEX infringes any claim of the '797 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange, but IEX admits that the IEX Operational Guide indicates that certain auction information is disseminated each second during specified periods of time, and IEX refers to the IEX Operational Guide for its contents.

111. IEX denies the allegations of Paragraph 111 insofar as Nasdaq suggests that IEX infringes any claim of the '797 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing

Exchange and IEX Auction Process Specification, but IEX admits that the IEX Operational Guide and IEX Auction Process Specification include the quoted language, and IEX refers to the IEX Operational Guide and IEX Auction Process Specification for their contents.

112. IEX denies the allegations of Paragraph 112, except admits that it made certain statements regarding its closing process in SEC Release No. 34-80583, Notice of Filing of Proposed Rule Change Related to Auctions in IEX-Listed Securities, Dissemination of Auction-Related Market Data, and Provisions Governing Trading Halts and Pauses, filed by IEX with the SEC on April 20, 2017. Nasdaq's allegation that IEX stated that its closing auction process was ““designed based on an extensive review of’ Nasdaq’s patented process” is false. IEX’s closing auction process was not designed based on a review of, and does not embody any alleged inventions claimed in, any Nasdaq patents.

113. IEX denies the allegations of Paragraph 113 insofar as Nasdaq suggests that IEX infringes any claim of the ’797 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book discloses determining the official closing price, and IEX refers to the IEX Rule Book for its contents.

114. IEX denies the allegations of Paragraph 114.

115. IEX denies the allegations of Paragraph 115 insofar as Nasdaq suggests that IEX infringes any claim of the '797 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

116. IEX denies the allegations of Paragraph 116 insofar as Nasdaq suggests that IEX infringes any claim of the '797 Patent or purports to characterize statements in the IEX Auction Process Specification, but IEX admits that the IEX Auction Process Specification discloses storing certain orders in an auction book or continuous book and includes the quoted language, and IEX refers to the IEX Auction Process Specification for its contents.

117. IEX denies the allegations of Paragraph 117 insofar as Nasdaq suggests that IEX infringes any claim of the '797 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing Exchange, but IEX admits that the IEX Operational Guide indicates that certain auction information is disseminated each second during specified periods of time, and IEX refers to the IEX Operational Guide for its contents.

118. IEX denies the allegations of Paragraph 118 insofar as Nasdaq suggests that IEX infringes any claim of the '797 Patent or purports to characterize statements in the IEX Operational Guide for IEX Transition to Primary Listing

Exchange and IEX Auction Process Specification, but IEX admits that the IEX Operational Guide and IEX Auction Process Specification include the quoted language, and IEX refers to the IEX Operational Guide and IEX Auction Process Specification for their contents.

119. IEX denies the allegations of Paragraph 119, except IEX admits that it has made certain statements regarding its closing process in SEC Release No. 34-80583, Notice of Filing of Proposed Rule Change Related to Auctions in IEX-Listed Securities, Dissemination of Auction-Related Market Data, and Provisions Governing Trading Halts and Pauses, filed by IEX with the SEC on April 20, 2017. Nasdaq's allegation that IEX stated that its closing auction process was ““designed based on an extensive review of' Nasdaq's patented process” is false. IEX's closing auction process was not designed based on a review of, and does not embody any alleged inventions claimed in, any Nasdaq patents.

120. IEX denies the allegations of Paragraph 120 insofar as Nasdaq suggests that IEX infringes any claim of the '797 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book discloses determining the official closing price, and IEX refers to the IEX Rule Book for its contents.

121. IEX denies the allegations of Paragraph 121.

122. IEX denies the allegations of Paragraph 122 insofar as Nasdaq suggests that IEX infringes any claim of the '797 Patent or purports to characterize statements in the IEX Auction Process Specification, but IEX admits that the IEX Auction Process Specification discloses dissemination of a reference price, and IEX refers to the IEX Auction Process Specification for its contents.

123. IEX denies the allegations of Paragraph 123 insofar as Nasdaq suggests that IEX infringes any claim of the '797 Patent or purports to characterize statements in the IEX Auction Process Specification, but IEX admits that the IEX Auction Process Specification discloses dissemination of paired shares, imbalance shares, and imbalance side, and IEX refers to the IEX Auction Process Specification for its contents.

124. IEX denies the allegations of Paragraph 124.

125. IEX denies the allegations of Paragraph 125.

126. IEX denies the allegations of Paragraph 126.

127. IEX denies the allegations of Paragraph 127.

128. IEX denies the allegations of Paragraph 128.

129. IEX denies the allegations of Paragraph 129.

RESPONSE TO COUNT III: INFRINGEMENT OF THE '827 PATENT

130. IEX incorporates by reference herein its answers to Paragraphs 1-129 as if fully set forth herein.

131. IEX states that the '827 Patent claims have not yet been construed and that IEX therefore denies the allegations of Paragraph 131, except IEX admits that the claims of the '827 Patent are directed to the patent-ineligible abstract idea of using a messages content to route the message for processing.

132. IEX denies the allegations of Paragraph 132.

133. IEX denies the allegations of Paragraph 133.

134. IEX denies the allegations of Paragraph 134.

135. IEX denies the allegations of Paragraph 135.

136. IEX denies the allegations of Paragraph 136.

137. IEX denies the allegations of Paragraph 137 insofar as Nasdaq suggests that IEX infringes any claim of the '827 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

138. IEX denies the allegations of Paragraph 138 insofar as Nasdaq suggests that IEX infringes any claim of the '827 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

139. IEX denies the allegations of Paragraph 139 insofar as Nasdaq suggests that IEX infringes any claim of the '827 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

140. IEX denies the allegations of Paragraph 140 insofar as Nasdaq suggests that IEX infringes any claim of the '827 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

141. IEX denies the allegations of Paragraph 141.

142. IEX denies the allegations of Paragraph 142 insofar as Nasdaq suggests that IEX infringes any claim of the '827 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

143. IEX denies the allegations of Paragraph 143 insofar as Nasdaq suggests that IEX infringes any claim of the '827 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual

includes the quoted language, and IEX refers to the IEX User Manual for its contents.

144. IEX denies the allegations of Paragraph 144 insofar as Nasdaq suggests that IEX infringes any claim of the '827 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

145. IEX denies the allegations of Paragraph 145.

146. IEX denies the allegations of Paragraph 146 insofar as Nasdaq suggests that IEX infringes any claim of the '827 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

147. IEX denies the allegations of Paragraph 147 insofar as Nasdaq suggests that IEX infringes any claim of the '827 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

148. IEX denies the allegations of Paragraph 148 insofar as Nasdaq suggests that IEX infringes any claim of the '827 Patent or purports to characterize

statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

149. IEX denies the allegations of Paragraph 149.

150. IEX denies the allegations of Paragraph 150.

151. IEX denies the allegations of Paragraph 151.

152. IEX denies the allegations of Paragraph 152.

153. IEX denies the allegations of Paragraph 153.

RESPONSE TO COUNT IV: INFRINGEMENT OF THE '622 PATENT

154. IEX incorporates by reference herein its answers to Paragraphs 1-153 as if fully set forth herein.

155. IEX states that '622 Patent claims have not yet been construed and that IEX therefore denies the allegations of Paragraph 155, except IEX admits that the claims of the '622 Patent are directed to the patent-ineligible abstract idea of receiving an incoming buy or sell order for a security, matching that buy/sell order with another sell/buy order, and storing information about the processing of orders in a log.

156. IEX states that the '622 Patent claims have not yet been construed and that IEX therefore denies the allegations of Paragraph 156, except IEX admits that the claims of the '622 Patent are directed to the patent-ineligible abstract idea of

receiving an incoming buy or sell order for a security, matching that buy/sell order with another sell/buy order, and storing information about the processing of orders in a log. IEX further states that the use of a memory-based order book was known and used at the London Stock Exchange before the priority date of the '622 Patent. Nasdaq was aware of but did not disclose the London Stock Exchange as prior art to the PTO during prosecution of the application leading to issuance of the '622 Patent.

157. IEX denies the allegations of Paragraph 157.

158. IEX denies the allegations of Paragraph 158.

159. IEX denies the allegations of Paragraph 159.

160. IEX denies the allegations of Paragraph 160.

161. IEX denies the allegations of Paragraph 161.

162. IEX denies the allegations of Paragraph 162 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

163. IEX denies the allegations of Paragraph 163 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual

includes the quoted language, and IEX refers to the IEX User Manual for its contents.

164. IEX denies the allegations of Paragraph 164 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual refers to a “continuous, automated matching function,” and IEX refers to the IEX User Manual for its contents.

165. IEX denies the allegations of Paragraph 165 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the U.S. Patent Publication No. 2015/0302441 (“IEX True Price Application”), but IEX admits that the IEX True Price Application discloses, *inter alia*, storage of an order book in memory, and IEX refers to the IEX True Price Application for its contents.

166. IEX denies the allegations of Paragraph 166 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize “‘True Price’ technology,” but IEX admits that it has implemented certain inventions disclosed in the IEX True Price Application.

167. IEX denies the allegations of Paragraph 167 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that Figure 1 of the

IEX True Price Application discloses certain features, and IEX refers to the IEX True Price Application for its contents.

168. IEX denies the allegations of Paragraph 168 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that the IEX True Price Application includes the quoted language, and IEX refers to the IEX True Price Application for its contents.

169. IEX denies the allegations of Paragraph 169 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX FIX Specification, but IEX admits that the IEX FIX Specification discloses execution reports, and IEX refers to the IEX FIX Specification for its contents.

170. IEX denies the allegations of Paragraph 170 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the U.S. Patent Publication No. 2015/ 0261625 ("IEX Message Retransmission Application"), but IEX admits that the IEX Message Retransmission Application includes the quoted language and refers to the IEX Message Retransmission Application for its contents.

171. IEX denies the allegations of Paragraph 171 on the ground that the intended meaning of "the technology described in the Message Retransmission

Application” is unclear, but IEX admits that it has implemented IEX inventions disclosed in the IEX Message Retransmission Application.

172. IEX denies the allegations of Paragraph 172 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX Speed Bump Application, but IEX admits that Figure 5A of the IEX Speed Bump Application depicts, *inter alia*, a “journal” and IEX refers to the IEX Speed Bump Application for its contents.

173. IEX denies the allegations of Paragraph 173.

174. IEX denies the allegations of Paragraph 174 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

175. IEX denies the allegations of Paragraph 175 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

176. IEX denies the allegations of Paragraph 176 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize

statements in the IEX User Manual, but IEX admits that the IEX User Manual references a “continuous, automated matching function,” and IEX refers to the IEX User Manual for its contents.

177. IEX denies the allegations of Paragraph 177 insofar as Nasdaq suggests that IEX infringes any claim of the ’622 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that the IEX True Price Application indicates, *inter alia*, storage of an order book in memory, and IEX refers to the IEX True Price Application for its contents.

178. IEX denies the allegations of Paragraph 178 insofar as Nasdaq suggests that IEX infringes any claim of the ’622 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that Figure 1 of the IEX True Price Application discloses certain features, and IEX refers to the IEX True Price Application for its contents.

179. IEX denies the allegations of Paragraph 179 insofar as Nasdaq suggests that IEX infringes any claim of the ’622 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that the IEX True Price Application includes the quoted language, and IEX refers the IEX True Price Application for its contents.

180. IEX denies the allegations of Paragraph 180 insofar as Nasdaq suggests that IEX infringes any claim of the ’622 Patent or purports to characterize

statements in the IEX FIX Specification, but IEX admits that the IEX FIX Specification discloses execution reports, and IEX refers to the IEX FIX Specification for its contents.

181. IEX denies the allegations of Paragraph 170 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX Message Retransmission Application, but IEX admits that the IEX Message Retransmission Application includes the quoted language and refers to the IEX Message Retransmission Application for its contents.

182. IEX denies the allegations of Paragraph 182 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX Speed Bump Application, but IEX admits that Figure 5A of the IEX Speed Bump Application depicts, *inter alia*, a “journal” and IEX refers to the IEX Speed Bump Application for its contents.

183. IEX denies the allegations of Paragraph 183.

184. IEX denies the allegations of Paragraph 184 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

185. IEX denies the allegations of Paragraph 185 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

186. IEX denies the allegations of Paragraph 186 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual refers to a “continuous, automated matching function,” and IEX refers to the IEX User Manual for its contents.

187. IEX denies the allegations of Paragraph 187 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that the IEX True Price Application indicates, *inter alia*, storage of an order book in memory, and IEX refers to the IEX True Price Application for its contents.

188. IEX denies the allegations of Paragraph 188 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX Rule Book, but IEX admits that the IEX Rule Book includes the quoted language, and IEX refers to the IEX Rule Book for its contents.

189. IEX denies the allegations of Paragraph 189 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that Figure 1 of the IEX True Price Application discloses certain features, and IEX refers to the IEX True Price Application for its contents.

190. IEX denies the allegations of Paragraph 190 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the True Price Application, but IEX admits that the IEX True Price Application includes the quoted language, and IEX refers the IEX True Price Application for its contents.

191. IEX denies the allegations of Paragraph 191 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX FIX Specification, but IEX admits that the IEX FIX Specification discloses execution reports, and IEX refers to the IEX FIX Specification for its contents.

192. IEX denies the allegations of Paragraph 192 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX Message Retransmission Application, but IEX admits that the IEX Message Retransmission Application includes the quoted language, and IEX refers to the IEX Retransmission Application for its contents.

193. IEX denies the allegations of Paragraph 193 insofar as Nasdaq suggests that IEX infringes any claim of the '622 Patent or purports to characterize statements in the IEX Speed Bump Application, but IEX admits that Figure 5A of the IEX Speed Bump Application depicts, *inter alia*, a “journal” and IEX refers to the IEX Speed Bump Application for its contents.

194. IEX denies the allegations of Paragraph 194.

195. IEX denies the allegations of Paragraph 195.

196. IEX denies the allegations of Paragraph 196.

197. IEX denies the allegations of Paragraph 197.

198. IEX denies the allegations of Paragraph 198.

199. IEX denies the allegations of Paragraph 199.

RESPONSE TO COUNT V: INFRINGEMENT OF THE '362 PATENT

200. IEX incorporates by reference herein its answers to Paragraphs 1-199 as if fully set forth herein.

201. IEX states that the '362 Patent claims have not yet been construed and that IEX therefore denies the allegations of Paragraph 201, except IEX admits that the claims of the '362 Patent are directed to the patent-ineligible abstract idea of receiving an incoming buy or sell order for a security, matching that buy/sell order with another sell/buy order, and storing information about the processing of orders in a log to be queried.

202. IEX states that the '362 Patent claims have not yet been construed and that IEX therefore denies the allegations of Paragraph 202, except IEX admits that the claims of the '362 Patent are directed to the patent-ineligible abstract idea of receiving an incoming buy or sell order for a security, matching that buy/sell order with another sell/buy order, and storing information about the processing of orders in a log to be queried. IEX further states that the use of a memory-based order book was known and used at the London Stock Exchange before the priority date of the '362 Patent. Nasdaq was aware of but did not disclose the London Stock Exchange as prior art to the PTO during prosecution of the application leading to issuance of the '362 Patent.

203. IEX denies the allegations of Paragraph 203.

204. IEX denies the allegations of Paragraph 204.

205. IEX denies the allegations of Paragraph 205.

206. IEX denies the allegations of Paragraph 206.

207. IEX denies the allegations of Paragraph 207.

208. IEX denies the allegations of Paragraph 208 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

209. IEX denies the allegations of Paragraph 209 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

210. IEX denies the allegations of Paragraph 210 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual refers to a “continuous, automated matching function,” and IEX refers to the IEX User Manual for its contents.

211. IEX denies the allegations of Paragraph 211 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that the IEX True Price Application depicts, *inter alia*, storage of an order book in memory, and IEX refers to the IEX True Price Application for its contents.

212. IEX denies the allegations of Paragraph 212 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that IEX's Figure 1 of the IEX True Price Application discloses certain features, and IEX refers to the IEX True Price Application for its contents.

213. IEX denies the allegations of Paragraph 179 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the True Price Application, but IEX admits that the IEX True Price Application includes the quoted language, and IEX refers the IEX True Price Application for its contents.

214. IEX denies the allegations of Paragraph 214 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX FIX Specification, but IEX admits that the IEX FIX Specification discloses execution reports, and IEX refers to the IEX FIX Specification for its contents.

215. IEX denies the allegations of Paragraph 215 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX Message Retransmission Mechanism Application, but IEX admits that the IEX Message Retransmission Application includes the quoted language, and IEX refers to the IEX Message Retransmission Mechanism Application for its contents.

216. IEX denies the allegations of Paragraph 216 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX Speed Bump Application, but IEX admits that Figure 5A of

the IEX Speed Bump Application depicts, *inter alia*, a “journal” and IEX refers to the IEX Speed Bump Application for its contents.

217. IEX denies the allegations of Paragraph 217.

218. IEX denies the allegations of Paragraph 218.

219. IEX denies the allegations of Paragraph 219 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

220. IEX denies the allegations of Paragraph 220 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

221. IEX denies the allegations of Paragraph 221 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual refers to a “continuous, automated matching function,” and IEX refers to the IEX User Manual for its contents.

222. IEX denies the allegations of Paragraph 222 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that the IEX True Price Application depicts, *inter alia*, storage of an order book in memory, and IEX refers to the IEX True Price Application for its contents.

223. IEX denies the allegations of Paragraph 223 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that Figure 1 of the IEX True Price Application discloses certain features, and IEX refers to the IEX True Price Application for its contents.

224. IEX denies the allegations of Paragraph 179 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the True Price Application, but IEX admits that the IEX True Price Application includes the quoted language, and IEX refers the IEX True Price Application for its contents.

225. IEX denies the allegations of Paragraph 225 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX FIX Specification, but IEX admits that the IEX FIX Specification discloses execution reports, and IEX refers to the IEX FIX Specification for its contents.

226. IEX denies the allegations of Paragraph 226 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX Message Retransmission Mechanism Application, but IEX admits that the IEX Message Retransmission Application includes the quoted language, and IEX refers to the Message Retransmission Application for its contents.

227. IEX denies the allegations of Paragraph 227 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX Speed Bump Application, but IEX admits that Figure 5A of the IEX Speed Bump Application depicts, *inter alia*, a “journal” and IEX refers to the IEX Speed Bump Application for its contents.

228. IEX denies the allegations of Paragraph 228.

229. IEX denies the allegations of Paragraph 229.

230. IEX denies the allegations of Paragraph 230 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

231. IEX denies the allegations of Paragraph 231 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize

statements in the IEX User Manual, but IEX admits that the IEX User Manual includes the quoted language, and IEX refers to the IEX User Manual for its contents.

232. IEX denies the allegations of Paragraph 232 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX User Manual, but IEX admits that the IEX User Manual refers to a “continuous, automated matching process,” and IEX refers to the IEX User Manual for its contents.

233. IEX denies the allegations of Paragraph 233 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that the IEX True Price Application depicts, *inter alia*, storage of an order book in memory, and IEX refers to the IEX True Price Application for its contents.

234. IEX denies the allegations of Paragraph 234 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX True Price Application, but IEX admits that Figure 1 of the IEX True Price Application discloses certain features, and IEX refers to the IEX True Price Application for its contents.

235. IEX denies the allegations of Paragraph 235 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize

statements in the True Price Application, but IEX admits that the True Price Application includes the quoted language, and IEX refers the True Price Application for its contents.

236. IEX denies the allegations of Paragraph 236 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX FIX Specification, but IEX admits that the IEX FIX Specification discloses execution reports, and IEX refers to the IEX FIX Specification for its contents.

237. IEX denies the allegations of Paragraph 237 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX Message Retransmission Mechanism Application, but IEX admits that the IEX Message Retransmission Application includes the quoted language, and IEX refers to the IEX Message Retransmission Application for its contents.

238. IEX denies the allegations of Paragraph 238 insofar as Nasdaq suggests that IEX infringes any claim of the '362 Patent or purports to characterize statements in the IEX Speed Bump Application, but IEX admits that Figure 5A of the IEX Speed Bump Application depicts, *inter alia*, a “journal” and IEX refers to the IEX Speed Bump Application for its contents.

239. IEX denies the allegations of Paragraph 239.

240. IEX denies the allegations of Paragraph 240.

241. IEX denies the allegations of Paragraph 241.

242. IEX denies the allegations of Paragraph 242.

243. IEX denies the allegations of Paragraph 243.

244. IEX denies the allegations of Paragraph 244.

245. IEX denies the allegations of Paragraph 245.

RESPONSE TO COUNT VI: INFRINGEMENT OF THE '609 PATENT

246. IEX incorporates by reference herein its answers to Paragraphs 1-245 as if fully set forth herein.

247. IEX states that the '609 Patent claims have not yet been construed and that IEX therefore denies the allegations of Paragraph 247, except IEX admits that the claims of the '609 Patent are directed to the patent-ineligible abstract idea of comparing a first (*e.g.*, earlier) data set and a second (*e.g.*, later) data set to determine the actions necessary to transform (*e.g.*, update) the first data set to reflect the second data set.

248. IEX denies the allegations of Paragraph 248.

249. IEX denies the allegations of Paragraph 249.

250. IEX denies the allegations of Paragraph 250.

251. IEX denies the allegations of Paragraph 251.

252. IEX denies the allegations of Paragraph 252 insofar as Nasdaq suggests that IEX infringes any claim of the '609 Patent or purports to characterize statements in the IEX DEEP Specification, but IEX admits that IEX disseminates a Depth of Book and Last Sale Feed (DEEP), admits that the IEX DEEP Specification includes the quoted language and certain other statements, and IEX refers to the IEX DEEP Specification for its contents.

253. IEX denies the allegations of Paragraph 253 insofar as Nasdaq suggests that IEX infringes any claim of the '609 Patent or purports to characterize statements in the IEX DEEP Specification, but IEX admits that the IEX DEEP Specification includes the quoted language and certain other statements, and IEX refers to the IEX DEEP Specification for its contents.

254. IEX denies the allegations of Paragraph 254 insofar as Nasdaq suggests that IEX infringes any claim of the '609 Patent or purports to characterize statements in the IEX DEEP Specification, but IEX admits that IEX sends updated data via its Depth of Book and Last Sale Feed (DEEP), that the IEX DEEP Specification includes the quoted language and other statements, and IEX refers to the IEX DEEP Specification for its contents.

255. IEX denies the allegations of Paragraph 255 insofar as Nasdaq suggests that IEX infringes any claim of the '609 Patent, denies that any “pre- and post-change IEX order books correspond to the first and second data sets”

described in any '609 Patent claim, but admits that new orders received by IEX may impact the IEX order book.

256. IEX denies the allegations of Paragraph 256, except IEX admits that the IEX DEEP Specification includes the quoted language and other statements, and IEX refers to the IEX DEEP Specification for its contents.

257. IEX denies the allegations of Paragraph 257, except IEX admits that the IEX DEEP Specification includes the quoted language and other statements, and IEX refers to the IEX DEEP Specification for its contents.

258. IEX denies the allegations of Paragraph 258.

259. IEX denies the allegations of Paragraph 259 insofar as Nasdaq suggests that IEX infringes any claim of the '609 Patent or purports to characterize statements in the IEX DEEP Specification, but IEX admits that IEX disseminates a Depth of Book and Last Sale Feed (DEEP), that the IEX DEEP Specification includes the quoted language and certain other statements, and IEX refers to the IEX DEEP Specification for its contents.

260. IEX denies the allegations of Paragraph 260 insofar as Nasdaq suggests that IEX infringes any claim of the '609 Patent or purports to characterize statements in the IEX DEEP Specification, but IEX admits that the IEX DEEP Specification includes the quoted language and other statements, and IEX refers to the IEX DEEP Specification for its contents.

261. IEX denies the allegations of Paragraph 261 insofar as Nasdaq suggests that IEX infringes any claim of the '609 Patent or purports to characterize statements in the IEX DEEP Specification, but IEX admits that IEX sends updated data via its Depth of Book and Last Sale Feed (DEEP), that the IEX DEEP Specification includes certain statements, and IEX refers to the IEX DEEP Specification for its contents.

262. IEX denies the allegations of Paragraph 262 insofar as Nasdaq suggests that IEX infringes any claim of the '609 Patent, denies that any “pre- and post-change IEX order books correspond to the first and second data sets” described in any '609 Patent claim, but admits that new orders received by IEX may impact the IEX order book.

263. IEX denies the allegations of Paragraph 263, but IEX admits that the IEX DEEP Specification includes certain statements and refers to the IEX DEEP Specification for its contents.

264. IEX denies the allegations of Paragraph 264, except IEX admits that the IEX DEEP Specification includes the quoted language and other statements, and IEX refers to the IEX DEEP Specification for its contents.

265. IEX denies the allegations of Paragraph 265.

266. IEX denies the allegations of Paragraph 266.

267. IEX denies the allegations of Paragraph 267.

268. IEX denies the allegations of Paragraph 268.

269. IEX denies the allegations of Paragraph 269.

270. IEX denies the allegations of Paragraph 270.

RESPONSE TO PLAINTIFFS' PRAYER FOR RELIEF

IEX denies that Plaintiffs are entitled to any relief in this action and asks the Court to deny any and all of the relief requested by Plaintiffs in their Amended Complaint.

ADDITIONAL DEFENSES

IEX hereby asserts the following separate additional defenses to the claims and averments contained in Plaintiffs' Amended Complaint, without admitting or acknowledging that IEX bears the burden of proof as to any of them. IEX reserves the right to seek leave to amend this Answer to plead additional defenses and/or to plead counterclaims and/or to supplement existing defenses if information developed through discovery, trial, or otherwise merits such additional defenses, counterclaims, or supplementation.

FIRST ADDITIONAL DEFENSE **(Failure To State A Claim)**

Plaintiffs' claims for alleged patent infringement fail to state a claim upon which relief can be granted.

SECOND ADDITIONAL DEFENSE
(Non-Infringement)

IEX does not infringe and has not infringed any valid and enforceable claim of the Asserted Patents, whether directly or indirectly, literally, or under the doctrine of equivalents.

THIRD ADDITIONAL DEFENSE
(Invalidity (35 U.S.C. § 101))

The claims of the Asserted Patents are invalid under 35 U.S.C. § 101 on the ground that they claim patent-ineligible abstract ideas.

FOURTH ADDITIONAL DEFENSE
(Invalidity (35 U.S.C. §§ 102, 103))

The claims of the Asserted Patents are invalid on the ground that they are anticipated (35 U.S.C. § 102) and/or rendered obvious (35 U.S.C. § 103) in view of the prior art.

FIFTH ADDITIONAL DEFENSE
(Invalidity (35 U.S.C. § 112))

One or more claims of the Asserted Patents are invalid on the ground that they fail to comply with 35 U.S.C. § 112 based on at least indefiniteness, lack of written description, and/or lack of enablement.

SIXTH ADDITIONAL DEFENSE
(Prosecution History Estoppel)

Plaintiffs' requested relief is barred, in whole or in part, by the doctrine of estoppel, including, but not limited to, the doctrine of prosecution history estoppel

arising from the patentee's actions, representations, and/or conduct before the PTO during prosecution of the Asserted Patents, including Plaintiffs' defense of petitions for Covered Business Method review and/or *Inter Partes* Review of the Asserted Patents.

SEVENTH ADDITIONAL DEFENSE
(35 U.S.C. § 287)

Plaintiffs' claims for damages as to all Asserted Patents are barred, in whole or in part by, 35 U.S.C. § 287.

EIGHTH ADDITIONAL DEFENSE
(35 U.S.C. § 286)

Plaintiffs' claims for damages as to all Asserted Patents are barred, in whole or in part by, 35 U.S.C. § 286.

NINTH ADDITIONAL DEFENSE
(Estoppel and/or Waiver)

Plaintiffs' claims are barred, in whole or in part, by estoppel and/or waiver.

TENTH ADDITIONAL DEFENSE
(No Entitlement to Injunctive Relief)

Plaintiffs are not entitled to injunctive relief because they have, at a minimum, no irreparable injury and have an adequate remedy at law for IEX's alleged infringement of the Asserted Patents. Plaintiffs will be unable to establish that (1) they have suffered any injury, let alone an irreparable injury; (2) remedies available at law, such as monetary damages, would be inadequate to compensate

for any alleged injury; (3) the balance of hardships between Plaintiffs and Defendants, tips in their favor such that a remedy in equity is warranted; and (4) the public interest would be served by a permanent injunction.

ELEVENTH ADDITIONAL DEFENSE
(No Enhanced Damages)

Plaintiffs have not shown that they are entitled to enhanced damages under 35 U.S.C. § 284 at least because they have not shown that any alleged infringement is willful. Plaintiffs have also failed to show this is an exceptional case in favor of Plaintiffs under 35 U.S.C. § 285.

TWELFTH ADDITIONAL DEFENSE
(Improper Inventorship)

The '362 and '622 Patents are invalid and unenforceable based on non-joinder and/or misjoinder of inventors. 35 U.S.C. §§ 115, 116. One or more persons who contributed to the conception of one or more of the alleged inventions claimed in the '362 and '622 Patents were not named as inventors on the patent. One or more persons named as an inventor on the '362 and '622 Patents did not contribute to one or more of the alleged inventions claimed in the '362 and '622 Patents.

THIRTEENTH ADDITIONAL DEFENSE
(Unclean Hands)

Plaintiffs' claims are barred, in whole or on part, by the doctrine of unclean hands.

FOURTEENTH ADDITIONAL DEFENSE
(Inequitable Conduct)

The '622 Patent and '362 Patent are unenforceable due to inequitable conduct before the PTO as further described with particularity in Counterclaim XIII below.

PRAYER FOR RELIEF

WHEREFORE, Defendants IEX Group, Inc. and Investor Exchange LLC demand judgment on Plaintiffs' Amended Complaint as follows:

- A. that Plaintiffs take nothing and are denied any relief whatsoever;
- B. that the Amended Complaint be dismissed on the merits and with prejudice with respect to IEX;
- C. that IEX be awarded the costs incurred in connection with this action;
- D. that this case be deemed exceptional pursuant to 35 U.S.C. § 285 and that IEX be awarded reasonable attorneys' fees; and
- E. that IEX be awarded such other and further relief as the Court may deem just and proper.

COUNTERCLAIMS

IEX Group, Inc. (“IEX Group”) and Investors Exchange LLC (“Investors Exchange”; collectively with IEX Group, “IEX”) for their counterclaims (“Counterclaims”) against Nasdaq, Inc. and Nasdaq Technology AB (collectively, “Nasdaq”) allege as follows:

PARTIES

1. IEX Group is a corporation organized under the laws of the State of Delaware, with its principal place of business at 3 World Trade Center, 58th Floor, 175 Greenwich Street, New York, New York 10007.

2. Investors Exchange is a corporation organized under the laws of the State of Delaware, with its principal place of business at 3 World Trade Center, 58th Floor, 175 Greenwich Street, New York, New York 10007. Investors Exchange is a wholly-owned subsidiary of IEX Group.

3. Nasdaq, Inc. is a corporation organized and existing under the laws of the State of Delaware, with its principal place of business at One Liberty Plaza, 165 Broadway, New York, New York 10006.

4. Nasdaq Technology is a corporation organized under the laws of Sweden, with its principal place of business at Tullvaktsvägen 15, SE-105 78 Stockholm, Sweden. Nasdaq Technology is a wholly-owned subsidiary of Nasdaq, Inc.

JURISDICTION AND VENUE

5. This Court has subject matter jurisdiction over these Counterclaims pursuant to 28 U.S.C. §§ 1331, 1338, 2201 and/or 2202 and Rule 13 of the Federal Rules of Civil Procedure.

6. By filing its Complaint and Amended Complaint, and prosecuting its claims against IEX in this Court, Nasdaq, Inc. and Nasdaq Technology have consented to the personal jurisdiction of this Court.

7. Venue is proper in this judicial district under 28 U.S.C. § 1391(b).

INVESTORS EXCHANGE

8. IEX was founded in 2012 and its subsidiary Investors Exchange now operates an award-winning stock exchange built on the principles of simplicity, fairness, and transparency.

9. IEX is focused on serving the needs of long-term investors such as mutual funds and pension funds.

10. The story of IEX's founding was featured in Michael Lewis's bestselling book *Flash Boys: A Wall Street Revolt* and on an episode of CBS's television show *60 Minutes*, which precipitated intense and sustained scrutiny into the distortive conflicts in the U.S. stock exchange ecosystem.

11. IEX began, through a subsidiary, operating an alternative trading system, charged with a mandate to create a trading venue both less conflicted and better performing than the existing exchanges operated by Nasdaq and others.

12. IEX believed that Nasdaq and other exchange operators had shifted towards prioritizing selling advantages to high speed traders at the expense of the needs and interests of long-term investors.

13. Over the past decade, the stock market has been dominated by high-speed trading firms, some of which exploit a fragmented market, detailed order book information, and preferential access to stock exchanges' computers by using computer algorithms to react to market movements and buy and sell stock within a fraction of a second — hundreds of millions of times per day — to the detriment of ordinary long-term investors.

14. Nasdaq enables select high-speed trading firms, and profits handsomely, by providing a fragmented market, selling their customers' order information at various speeds, and selling preferential access to Nasdaq's servers.

15. For example, Nasdaq sells re-packaged order information that provides high-speed trading firms and other market participants with a complete order-by-order view of Nasdaq's order books for hundreds of thousands of dollars per year. IEX, which has to subscribe to this data so it can protect investors trading on its exchange, pays Nasdaq over \$300,000 per year for this

data, while other market participants can pay much more for this same data depending on their needs.

16. Nasdaq also sells direct physical connections to its data centers, allowing high-speed trading firms a speed advantage over ordinary long-term investors. IEX, which connects directly to Nasdaq's data centers to send and receive order information, pays Nasdaq \$240,000 per year for its two connections to Nasdaq's data center. Nasdaq makes faster connections available to high-speed participants at even higher fees.

17. Nasdaq also sells co-location services, which allow high-speed trading firms to place their servers right inside Nasdaq's data center space and alongside Nasdaq's own computers.

18. IEX exposed and challenged Nasdaq's conflicted business model by offering the marketplace an economically viable alternative stock exchange. Unlike Nasdaq, which sells technology that "speeds up" professional intermediaries to the detriment of long-term investors, Investors Exchange utilizes a proprietary "speed bump" — a 38-mile fiber optic coil designed to level the playing field and negate the speed advantage sold by Nasdaq and exploited by certain professional intermediaries on the Nasdaq stock exchanges.

19. IEX, unlike Nasdaq, provides proprietary market data, technology services, and connectivity for free to its users, does not offer computer co-location services, and applies a simple fee structure to trading.

20. In August 2015, after establishing itself as one of the fastest-growing trading venues in history, IEX applied to the United States Securities and Exchange Commission (“SEC”) to become a national securities exchange. IEX’s application attracted a record number of supportive comment letters, many from long-term investors bemoaning the erosion in trading quality on the existing exchanges.

21. Despite overwhelming support from such investors for the Investors Exchange, Nasdaq vigorously opposed IEX’s application and, in particular, attacked IEX’s proprietary “speed bump” technology.

22. Nasdaq sent three letters to the SEC, held two meetings with the SEC, and contended that the SEC “lack[ed] the authority to approve the IEX pending application.” Nasdaq went so far as to file a comment through its counsel laying the groundwork to sue the SEC if it approved IEX’s application to become a national securities exchange implementing the proposed speed bump.

23. Notwithstanding Nasdaq’s opposition, on June 17, 2016, the SEC approved Investors Exchange as a national stock exchange. In its press release announcing the decision, the SEC proclaimed “today’s actions promote

competition and innovation” Investors Exchange began operating as a national securities exchange in September 2016.

24. Over the subsequent year, Investors Exchange’s business continued to break ground and gain momentum. In October 2017, Investors Exchange cleared the final regulatory hurdle to launch a corporate listings business, a business in which Nasdaq has enjoyed a duopoly with the New York Stock Exchange for over forty years.

25. By November 2017, Investors Exchange had grown to handle over 2.5% of average daily stock trading in the U.S., larger than two of Nasdaq’s three equity exchanges.

26. In a groundbreaking report on capital markets released in October 2017, the U.S. Treasury Department identified the incumbent exchanges’ offering of “rebates” to attract orders and selling of expensive market data as creating conflicts of interest in the market that should be addressed. The Investors Exchange further increased regulatory and public pressure on Nasdaq not just by being the first exchange to operate, profitably and successfully, without engaging in either business practice, but also by lending its support to reform efforts endorsed by a broad consensus of investors and the brokerage industry and gaining momentum with the SEC.

27. In November 2017, Investors Exchange became the only U.S. stock exchange to support the proposal that ultimately became the SEC Transaction Fee Pilot, which is aimed at shedding light on the byzantine and costly system of fee tiers and “rebates” used by the incumbent exchanges to attract orders. Investors Exchange’s recommendations for the pilot, also overwhelmingly endorsed by mutual fund and public pension managers, were eventually ratified by the SEC in December 2018, against strenuous opposition and legal threats from Nasdaq.

28. In December 2017, Investors Exchange escalated the years-long debate over market data and connectivity fees by being the only securities exchange to co-sign a petition to the SEC requesting more transparency from exchanges on the costs, revenues, and profits of market data and connectivity services. Other signatories to the petition included 23 major market participants representing retail investors and institutional brokers.

29. IEX has also been vocal about conflicts of interest specific to Nasdaq’s business model. In November 2017, IEX became another public voice — and the only exchange — to criticize Nasdaq’s decade-long commercialization of non-public investor information, via a market data product named Market Pathfinders. In December 2017, Nasdaq withdrew Market Pathfinders from the

market, a rare admission reflecting the widespread controversy around this business practice.

30. Less than three months later, and just five months after IEX launched its corporate listings business, Nasdaq filed this patent infringement suit against IEX.

31. Nasdaq's lawsuit is simply its latest attempt to hinder an emerging competitor that has succeeded without engaging in controversial business practices, to slow down the march toward a fairer and more transparent market, and to prevent even more widespread awareness of its own conflicts of interest.

32. Just like Nasdaq's failed attempt to prevent Investors Exchange from obtaining SEC approval, its attempt to use this Court to shut down Investors Exchange is baseless.

33. The founding of IEX was motivated by a desire to create a stock exchange with a unique mission and innovative technology. IEX's success thus far is attributable to that mission and proprietary technology, not to any alleged copying of Nasdaq and other exchanges. There is no part of IEX that would benefit from being similar to Nasdaq, and IEX does not use any Nasdaq technology or any of the alleged inventions claimed in the Asserted Patents. The patents asserted by Nasdaq in this case are invalid, unenforceable, and not infringed by IEX.

COUNT I

(Declaration of Invalidity of the '622 Patent)

34. IEX reasserts and re-alleges the allegations in Paragraphs 1-33 of these Counterclaims as if fully set forth herein.

35. An actual and justiciable controversy exists between IEX and Nasdaq regarding the alleged validity of U.S. Patent No. 8,244,622 (“’622 Patent”).

36. Nasdaq, Inc. contends that it is the assignee and owner of all right, title and interest in the ’622 Patent and that the ’622 Patent was validly and legally issued by the United States Patent and Trademark Office (“PTO”).

37. IEX disputes that the ’622 Patent was validly and legally issued by the PTO.

38. The claims of the ’622 Patent are invalid under 35 U.S.C. § 101 because they are directed to the patent-ineligible abstract idea of receiving an incoming buy or sell order for a security, matching that buy/sell order with another sell/buy order, and storing information about the processing of orders in a log. The claims of the ’622 Patent do not include any inventive concept that transforms them into a patent-eligible application of this abstract idea. Instead, the ’622 Patent claims purport to implement this abstract idea using only conventional computer components and well-known techniques

39. The claims of the '622 Patent are also invalid as anticipated and/or obvious, and are invalid under 35 U.S.C. §§ 102, 103, and/or 112.

40. IEX seeks judgment from the Court that the claims of the '622 Patent are invalid.

COUNT II

(Declaration of Non-Infringement of the '622 Patent)

41. IEX reasserts and re-alleges the allegations in Paragraphs 1-40 of these Counterclaims as if fully set forth herein.

42. An actual and justiciable controversy exists between IEX and Nasdaq regarding alleged infringement of the '622 Patent.

43. Nasdaq, Inc. contends that IEX directly and indirectly infringes various claims of the '622 Patent.

44. IEX does not directly or indirectly infringe, and has not directly or indirectly infringed, the '622 Patent.

45. IEX seeks judgment from the Court that it does not directly or indirectly infringe, and has not directly or indirectly infringed, the '622 Patent.

COUNT III

(Declaration of Invalidity of the '362 Patent)

46. IEX reasserts and re-alleges the allegations in Paragraphs 1-45 of these Counterclaims as if fully set forth herein.

47. An actual and justiciable controversy exists between IEX and Nasdaq regarding the alleged validity of U.S. Patent No. 8,386,362 (“’362 Patent”).

48. Nasdaq, Inc. contends that it is the assignee and owner of all right, title and interest in the ’362 Patent and that the ’362 Patent was validly and legally issued by the PTO.

49. IEX disputes that the ’362 Patent was validly and legally issued by the PTO.

50. The claims of the ’362 Patent are invalid under 35 U.S.C. § 101 because they are directed to the patent-ineligible abstract idea of receiving an incoming buy or sell order for a security, matching that buy/sell order with another sell/buy order, and storing information about the processing of orders in a log to be queried. The claims of the ’362 Patent do not include any inventive concept that transforms them into a patent-eligible application of this abstract idea. Instead, the ’362 Patent claims purport to implement this abstract idea using only conventional computer components and well-known techniques.

51. The claims of the ’362 Patent are also invalid as anticipated and/or obvious, and are invalid under 35 U.S.C. §§ 102, 103, and/or 112

52. IEX seeks judgment from the Court that the claims of the ’362 Patent are invalid.

COUNT IV

(Declaration of Non-Infringement of the '362 Patent)

53. IEX reasserts and re-alleges the allegations in Paragraphs 1-52 of these Counterclaims as if fully set forth herein.

54. An actual and justiciable controversy exists between IEX and Nasdaq regarding alleged infringement of the '362 Patent.

55. Nasdaq, Inc. contends that IEX infringes various claims of the '362 Patent.

56. IEX does not directly or indirectly infringe, and has not directly or indirectly infringed, the '362 Patent.

57. IEX seeks judgment from the Court that it does not directly or indirectly infringe, and has not directly or indirectly infringed, the '362 Patent.

COUNT V

(Declaration of Invalidity of the '827 Patent)

58. IEX reasserts and re-alleges the allegations in Paragraphs 1-57 of these Counterclaims as if fully set forth herein.

59. An actual and justiciable controversy exists between IEX and Nasdaq regarding the alleged validity of U.S. Patent No. 7,933, 827 ("827 Patent").

60. Nasdaq, Inc. contends that it is the assignee and owner of all right, title and interest in the '827 Patent and that the '827 Patent was validly and legally issued by the PTO.

61. IEX disputes that the '827 Patent was validly and legally issued by the PTO.

62. The claims of the '827 Patent are invalid under 35 U.S.C. § 101 because they are directed to the patent-ineligible abstract idea of using a message's content to route the message for processing. The '827 Patent claims do not include any inventive concept that transforms this abstract idea into patent-eligible subject matter. Rather, they claim the use of "securities processors" and an "order routing system" that are nowhere described in the specification as any kind of specialized hardware, software, or combination thereof.

63. The claims of the '827 Patent are also invalid as anticipated and/or obvious, and are invalid under 35 U.S.C. §§ 102, 103, and/or 112.

64. IEX seeks judgment from the Court that the claims of the '827 Patent are invalid.

COUNT VI

(Declaration of Non-Infringement of the '827 Patent)

65. IEX reasserts and re-alleges the allegations in Paragraphs 1-64 of these Counterclaims as if fully set forth herein.

66. An actual and justiciable controversy exists between IEX and Nasdaq regarding the alleged infringement of the '827 Patent.

67. Nasdaq, Inc. contends that IEX infringes various claims of the '827 Patent.

68. IEX does not directly or indirectly infringe, and has not in the past directly or indirectly infringed, the '827 Patent.

69. IEX seeks judgment from the Court that it does not directly or indirectly infringe, and has not directly or indirectly infringed, the '827 Patent.

COUNT VII

(Declaration of Invalidity of the '609 Patent)

70. IEX reasserts and re-alleges the allegations in Paragraphs 1-70 of these Counterclaims as if fully set forth herein.

71. An actual and justiciable controversy exists between IEX and Nasdaq regarding the alleged validity of U.S. Patent No. 8,117,609 ("'609 Patent").

72. Nasdaq Technology contends that it is the assignee and owner of all right, title and interest in the '609 Patent and that the '609 Patent was validly and legally issued by the PTO.

73. IEX disputes that the '609 Patent was validly and legally issued by the PTO.

74. The claims of the '609 Patent are invalid under 35 U.S.C. § 101 because they are directed to the patent-ineligible abstract idea of comparing a first (*e.g.*, earlier) data set and a second (*e.g.*, later) data set to determine the actions necessary to update the first data set. The claims of the '609 Patent do not include any inventive concept that transforms them into a patent-eligible application of this abstract idea. Instead, claim 1 recites a generic “computer system” and claim 12 fails even to recite that much.

75. The claims of the '609 Patent are also invalid as anticipated and/or obvious, and are invalid under 35 U.S.C. §§ 102, 103, and/or 112.

76. IEX seeks judgment from the Court that the claims of the '609 Patent are invalid.

COUNT VIII

(Declaration of Non-Infringement of the '609 Patent)

77. IEX reasserts and re-alleges the allegations in Paragraphs 1-76 of these Counterclaims as if fully set forth herein.

78. An actual and justiciable controversy exists between IEX and Nasdaq regarding alleged infringement of the '609 Patent.

79. Nasdaq, Inc. contends that IEX infringes various claims of the '609 Patent.

80. IEX does not directly or indirectly infringe, and has not directly or indirectly infringed, the '609 Patent.

81. IEX seeks judgment from the Court that it does not directly or indirectly infringe, and has not directly or indirectly infringed, the '609 Patent.

COUNT IX

(Declaration of Invalidity of the '264 Patent)

82. IEX reasserts and re-alleges the allegations in Paragraphs 1-81 of these Counterclaims as if fully set forth herein.

83. An actual and justiciable controversy exists between IEX and Nasdaq regarding the alleged validity of U.S. Patent No. 7,647,264 ("264 Patent").

84. Nasdaq, Inc. contends that it is the assignee and owner of all right, title and interest in the '264 Patent and that the '264 Patent was validly and legally issued by the PTO.

85. IEX disputes that the '264 Patent was validly and legally issued by the PTO.

86. The claims of the '264 Patent are invalid under 35 U.S.C. § 101 because they are directed to the patent-ineligible abstract idea of executing an electronic call auction for securities and disseminating auction information. The '264 Patent claims do not include any inventive concept that transforms this unpatentable abstract idea into patent-eligible subject matter. To the contrary, the

specification confirms that the alleged inventions may be implemented in “any computing or processing environment.”

87. The claims of the '264 Patent are also invalid as anticipated and/or obvious, and are invalid under 35 U.S.C. §§ 102, 103, and/or 112.

88. IEX seeks judgment from the Court that the claims of the '264 Patent are invalid.

COUNT X

(Declaration of Non-Infringement of the '264 Patent)

89. IEX reasserts and re-alleges the allegations in Paragraphs 1-88 of these Counterclaims as if fully set forth herein.

90. An actual and justiciable controversy exists between IEX and Nasdaq regarding alleged infringement of the '264 Patent.

91. Nasdaq, Inc. contends that IEX directly and indirectly infringes various claims of the '264 Patent.

92. IEX does not directly or indirectly infringe, and has not directly or indirectly infringed, the '264 Patent.

93. IEX seeks judgment from the Court that it does not directly or indirectly infringe, and has not directly or indirectly infringed, the '264 Patent.

COUNT XI

(Declaration of Invalidity of the '797 Patent)

94. IEX reasserts and re-alleges the allegations in Paragraphs 1-93 of these Counterclaims as if fully set forth herein.

95. An actual and justiciable controversy exists between IEX and Nasdaq regarding the alleged validity of U.S. Patent No. 8,280,797 (“’797 Patent”).

96. Nasdaq, Inc. contends that it is the assignee and owner of all right, title and interest in the ’797 Patent and that the ’797 Patent was validly and legally issued by the PTO.

97. IEX disputes that the ’797 Patent was validly and legally issued by the PTO.

98. The claims of the ’797 Patent are invalid under 35 U.S.C. § 101 because they are directed to the patent-ineligible abstract idea of executing an electronic call auction for securities and/or disseminating auction information. The ’797 Patent claims do not include any inventive concept that transforms this unpatentable abstract idea into patent-eligible subject matter. To the contrary, the specification confirms that the alleged inventions may be implemented in “any computing or processing environment.”

99. The claims of the '797 Patent are invalid as anticipated and/or obvious, and are invalid under 35 U.S.C. §§ 102, 103, and/or 112.

100. IEX seeks judgment from the Court that the claims of the '797 Patent are invalid.

COUNT XII

(Declaration of Non-Infringement of the '797 Patent)

101. IEX reasserts and re-alleges the allegations in Paragraphs 1-100 of these Counterclaims as if fully set forth herein.

102. An actual and justiciable controversy exists between IEX and Nasdaq regarding the alleged infringement of the '797 Patent.

103. Nasdaq, Inc. contends that IEX directly and indirectly infringes various claims of the '797 Patent.

104. IEX does not directly or indirectly infringe, and has not directly or indirectly infringed, the '797 Patent.

105. IEX seeks judgment from the Court that it does not directly or indirectly infringe, and has not directly or indirectly infringed, the '797 Patent.

COUNT XIII

(Declaration of Unenforceability of the '622 and '362 Patents Due to Inequitable Conduct)

106. IEX reasserts and re-alleges the allegations in Paragraphs 1-105 of these Counterclaims as if fully set forth herein.

107. The '622 Patent and '362 Patent are unenforceable because Nasdaq's counsel and the named inventors committed inequitable conduct during prosecution of the applications leading to the issuance of those patents.

108. As further detailed below, the inequitable conduct committed during prosecution of these patents included the following:

- (a) withholding the OptiMark electronic trading platform ("Optimark Trading Platform"), London Stock Exchange platform ("LSE Platform"), and inventorship non-joinder and misjoinder during prosecution of the applications leading to the '362 Patent and '622 Patent;
- (b) withholding U.S. Patent No. 6,012,046 ("Lupien '046") during prosecution of the application leading to issuance of the '622 Patent; and
- (c) withholding U.S. Patent No. 6,408,282 ("Buist '282") and U.S. Patent No. 5,546,575 ("Potter '575") during prosecution of the application leading to issuance of the '622 Patent.

109. IEX seeks judgment from the Court that the '622 Patent and '362 Patent are unenforceable due to inequitable conduct.

A. Nasdaq's Counsel's and Named Inventors' Withholding of the OptiMark Trading Platform, London Stock Exchange Platform, and Inventorship Non-joinder and Misjoinder

110. The '622 Patent and '362 Patent are unenforceable because Nasdaq's counsel and the named inventors on those patents committed inequitable

conduct by failing to disclose to the PTO during prosecution (1) the OptiMark Trading Platform; (2) the LSE Platform; and (3) inventorship non-joinder and misjoinder.

1. Nasdaq Filed the Matching Patent Applications After Collaborating with OptiMark and Accenture to Develop the SuperMontage Platform

111. By 2001, Nasdaq had lost substantial trading share to competitor exchanges, like the New York Stock Exchange, and advanced and automated electronic communications networks (“ECN”) and electronic pools, such as Instinet, Island, and Archipelago.

112. These electronic trading platforms offered speed and efficiency that was appealing to traders and that Nasdaq lacked. Nasdaq was increasingly losing trading volume and fees to these more advanced electronic platforms, and Nasdaq needed to try to catch up.

113. Nasdaq could not catch up and ultimately spent almost \$2 billion to acquire Instinet (which had acquired Island).

114. But Nasdaq first tried to build a more advanced electronic platform by collaborating with OptiMark and Accenture contractors who had worked to implement technology on the LSE Platform and other exchanges. Nasdaq collaborated with OptiMark and Accenture contractors on what became known as the “SuperMontage” platform.

115. At the time, Nasdaq was already well aware of the OptiMark Trading Platform. In September 1998, the National Association of Securities Dealers, Inc. (“NASD”), Nasdaq’s then-parent corporation, entered into an agreement with OptiMark to adapt the OptiMark Trading Platform so that it could be offered as a new service of Nasdaq. Nasdaq touted OptiMark’s advanced technology:

The OptiMark system is an electronic equity trading process that offers traders and investors a “third dimension” to their trading criteria Using *powerful supercomputers and patented algorithms*, the OptiMark system matches profiles of buying and selling desires in a manner that maximizes the mutual satisfaction of all buy and sell interests. . . . *OptiMark was developed by experts in electronic trading after extensive consultation with institutional investors, brokers, and stock markets.*

(9/9/1998 NASD Press Release (emphasis added).)

116. Frank G. Zarb, Chairman and CEO of the NASD, touted the innovative technology embodied in the OptiMark Trading Platform:

The agreement to integrate *OptiMark technology* into Nasdaq is part of an ongoing effort to offer investors and the trading community increased access to the market through *innovative technology*.

(*Id.* (emphasis added).)

117. In September 1999, the SEC approved Nasdaq’s request to offer trading on the OptiMark Trading Platform and by October 1999, Nasdaq integrated the OptiMark Trading Platform into the Nasdaq exchange.

118. Then, in October 2000, Nasdaq entered into an agreement with OptiMark pursuant to which OptiMark would provide advanced software development services to Nasdaq in connection with developing the SuperMontage platform.

119. Nasdaq also brought in contractors from Accenture to support the development of SuperMontage. These Accenture contractors had practical experience building the LSE Platform and other advanced electronic trading system architectures.

120. Nasdaq's collaboration with OptiMark and Accenture on the SuperMontage platform led to Nasdaq's filing of provisional patent applications in June 2002.

121. On June 5, 2002, Nasdaq, by one of its prosecuting attorneys ("Prosecution Counsel"),¹ filed U.S. Provisional Patent Application No. 60/685,988, entitled "Security Processor." That same day, Nasdaq, by the one of its Prosecution Counsel, filed U.S. Provisional Patent Application No. 60/385,979, entitled "SuperMontage Architecture." These applications are referred to collectively as the "June 2002 Provisional Applications."

¹ "Prosecution Counsel" refers to the Nasdaq's outside counsel of record in the prosecution of the '316 Application, '810 Application, and '151 Application and who are identified in the file histories for those applications.

122. On July 25, 2002, Nasdaq, by its Prosecution Counsel, filed U.S. Patent Application No. 10/206,316 (“’316 Application”). The ’316 Application claimed priority to the June 2002 Provisional Applications. PTO Examiners for the ’316 Application included Matthew C. Osborne, Ella Colbert, Brian E. Fertig, and Mary Cheung (“’316 Application Examiners”). The ’316 Application led to the issuance of U.S. Patent No. 7,895,112 (“’112 Patent”). The named inventors on the ’112 Patent are James N. Richmann, Stuart Serkin, Timothy Vincent, Fred Stiening, John T. Hughes, Jr., and Daniel F. Moore.

123. Nasdaq originally asserted the ’112 Patent in this action, but then proposed to dismiss it. On October 19, 2018, the Court dismissed Nasdaq’s claim of infringement of the ’112 Patent with prejudice. (D.I. No. 37.)

124. On July 25, 2002, Nasdaq, by its Prosecution Counsel, filed U.S. Patent Application No. 10/206,810 (“’810 Application”). The ’810 Application claimed priority to the June 2002 Provisional Applications. PTO Examiners for the ’810 Application included Paul W. Shumate and Kenneth Bartley (“’810 Application Examiners”). The ’810 Application led to issuance of U.S. Patent No. 8,386,362 (“’362 Patent”). The named inventors on the ’362 Patent are Santino Failla, Georgia Bilis, George David Easterbrook, Jr., and Timothy Vincent (collectively, the “’362 Patent Named Inventors”).

125. On July 25, 2002, Nasdaq, by its Prosecution Counsel, filed U.S. Patent Application No. 10/206,151 (“’151 Application”). The ’151 Application claimed priority to the June 2002 Provisional Applications. PTO Examiners for the ’151 Application included Chuks N. Onyezia and Hani M. Kazimi (“’151 Application Examiners”). The ’151 Application led to issuance of U.S. Patent No. 8, 244,622 (“’622 Patent”). The named inventors on the ’622 Patent are John Hughes, Jr., Daniel F. Moore, Timothy Vincent, and Bruce E. Friedman (collectively, the “’622 Patent Named Inventors”).

126. Each of the ’316, ’810, and ’151 Applications, as explained above, were filed on the same day, by the same Prosecution Counsel, and claimed priority to the same June 2002 Provisional Applications.

127. The ’316, ’810, and ’151 Applications, and the patents that issued from them, share a substantially similar specification. The ’316, ’810, and ’151 Applications also disclosed and claimed substantially similar alleged inventions, and the patents that issued from them disclose and claim substantially similar alleged inventions.

128. For example, the independent claims of the ’112, ’362, and ’622 Patents all claim alleged inventions in which (1) an “order book” is stored in main memory; and (2) a “matching” process (or code, or instructions) that has exclusive access to that order book.

129. In its Complaint, Nasdaq characterized the alleged inventions disclosed and claimed in these related patents as follows:

- “The technology described in [the ’112 Patent] involves, among other features, managing an *order book that is stored in main memory*, limiting how the order book is accessed in the main memory (*i.e.*, ‘*order book isolation*’), and storing other data in media that are not subject to the same access limitation.” (Compl. ¶ 160 (Dkt. No. 1) (emphasis added).)
- “The technology described in [the ’622 Patent] involves, among other features, managing an *order book that is stored in main memory*, limiting how the order book is accessed in the main memory (*i.e.*, ‘*order book isolation*’), and storing other data in media that are not subject to the same access limitation. (Compl. ¶ 206 (Dkt. No. 1) (emphasis added); *see also* Am. Compl. ¶ 156 (Dkt. No. 55).)
- “The technology described in [the ’362 Patent] involves, among other features, managing an *order book that is stored in main memory*, limiting how the order book is accessed in the main memory (*i.e.*, ‘*order book isolation*’), storing other data in media that are not subject to the same access limitation, and providing a means to query this other stored data.” (Compl. ¶ 251 (Dkt. No. 1) (emphasis added); *see also* Am. Compl. ¶ 202 (Dkt. No. 55).)

130. Similarly, in its Patent Owner Preliminary Responses to IEX’s Petitions for Covered Business Method Review of the patents, Nasdaq emphasized the main-memory order book and order book isolation as the alleged technological innovation behind all three patents:

- “The ’112 Patent sought to differentiate from prior art systems by *placing the order book in main memory*, speeding up processing [T]he ’112 patent proposes a new architecture where a *matching process* — referred to as

matching process 62 — *has exclusive access to the order book.*” (POPR at 25-27, CBM2018-00038 (emphasis added).)

- “The ’622 patent sought to differentiate from prior art systems by placing the *order book in main memory*, speeding up processing [T]he ’622 patent proposes a new architecture where a *matching process* — referred to as matching process 62 — *has exclusive access to the order book.*” (POPR at 29-30; CBM2018-00041 (emphasis added).)
- “The ’362 patent sought to differentiate from prior art systems by placing the *order book in main memory*, speeding up processing [T]he ’362 patent proposes a new architecture where a *matching process* — referred to as matching process 62 — *has exclusive access to the order book.*” (POPR at 31-32; CBM2018-00041 (emphasis added).)

2. Nasdaq’s Counsel and the Named Inventors Knew About the OptiMark Trading Platform, the LSE Platform, and the Inventor Non-joinder and Misjoinder

131. The ’362 Patent Named Inventors and ’622 Patent Named Inventors knew about the OptiMark Trading Platform, the LSE Platform, and the non-joinder and misjoinder of inventors on the ’362 and ’622 Patents.

132. The ’362 Patent Named Inventors and ’622 Patent Named Inventors collaborated with OptiMark on the SuperMontage project leading to the alleged inventions claimed in the ’316, ’810, and ’151 Applications. These named inventors also received OptiMark Trading Platform documentation that was distributed to the entire “design team,” and they were aware of Nasdaq’s integration of OptiMark technology beginning in 1998. Therefore, the ’362 Patent

Named Inventors and '622 Patent Named Inventors were aware of the OptiMark Trading Platform.

133. There was also significant discussion among the design team, including the '362 Patent Named Inventors and '622 Patent Named Inventors, regarding the LSE Platform's memory-based order book and whether or not to include a memory-based order book in the SuperMontage platform. Therefore, the '362 Patent Named Inventors and '622 Patent Named Inventors were aware of the LSE Platform and its memory-based order book.

134. By virtue of their collaboration together, the '362 Patent Named Inventors and '622 Patent Named Inventors also were aware of who contributed (and did not contribute) to the conception of the alleged inventions claimed in the '316, '810, and '151 Applications and that issued in the '362 and '622 Patents.

135. Nasdaq Prosecution Counsel also knew about the OptiMark Trading Platform, the LSE Platform, and the non-joinder and misjoinder of inventors on the '362 and '622 Patents based on their working with the '362 Patent Named Inventors and '622 Patent Named Inventors in connection with preparing, filing, and prosecuting the applications leading to those patents.

136. Stiening, Nasdaq's then-Director of Software Design (Order Execution Systems) from September 1997 through January 2002 ("Nasdaq Director"), also told Nasdaq's counsel about all of these issues and expressed his

concern regarding their impact on the filing and prosecution of applications claiming Nasdaq's alleged inventions.

137. Nasdaq Director, along with the '362 Patent Named Inventors and the '622 Patent Named Inventors, was part of the design team collaborating with OptiMark and Accenture contractors to develop the SuperMontage platform. Nasdaq Director, a named inventor on the '112 Patent, contributed to alleged inventions disclosed in the June 2002 Provisional Applications.

138. On January 21, 2003, an attorney working with Nasdaq Prosecution Counsel, sent an email to Nasdaq Director. He asked Nasdaq Director to execute and return a Combined Declaration and Power of Attorney in connection with the '316 Application.

139. On January 22, 2003, Nasdaq Director responded by email, copying Nasdaq Prosecution Counsel ("Nasdaq Director Email"). Nasdaq Director refused to execute the Combined Declaration and Power of Attorney in connection with the '316 Application.

140. In his email, Nasdaq Director told Nasdaq Prosecution Counsel, that OptiMark had built an electronic trading system that "overlap[s] [with] many of the claims" in Nasdaq's patent applications:

OptiMark built a functional prototype based on their architecture which Nasdaq's management evaluated and subsequently decided not [to] incorporate into the

Supermontage system — *but their prototype does overlap many of the claims in the application I’ve read.*

(’316 Application, File History, Petition by Assignee Under 37 C.F.R. 1.47(a) To Proceed in the Absence of an Inventor), dated February 12, 2003 (“2/12/03 Petition”), Appendix A at 4 (emphasis added).)

141. Nasdaq Director also told Nasdaq Prosecution Counsel that OptiMark had “publish[ed]” descriptions of OptiMark’s electronic trading system and that OptiMark’s publications could “be considered relevant prior art” to Nasdaq’s claimed inventions:

OptiMark . . . *publish[ed] other truly original documents of their own*, proposing a similar architecture based on their prior art of a system that they were running in Jersey City Those documents were made available to all of the design team (including non-Nasdaq participants), and also *might be considered relevant prior art* I have knowledge that the documents existed and were distributed, but as an ex-employee I did not retain any of that type of documentation. Jim Richman and others should have copies.

(*Id.* at 4 (emphasis added).)

142. Nasdaq Director further told Nasdaq Prosecution Counsel that the LSE Platform integrated an order book stored in main memory:

Accenture probably might also oppose these applications as their prior involvement with the London Stock Exchange and Eurex trading systems (and others) brought their significant experience with *using a memory based order book based electronic trading system* to the project team. The use of a memory book was a significant point of disagreement within the project team (Stu Serkin being the primary opponent), and

Accenture's real life experience implementing similar trading system architectures was a significant factor in management ultimately shifting the direction of the design to rely on a memory-based order book. I doubt that they are so brash as to assert having creat[ed] the concept of a memory based order book themselves, though.

(*Id.* at 4-5 (emphasis added).)

143. Nasdaq Director also told Nasdaq Prosecution Counsel that (1) non-Nasdaq employees who contributed “key ideas” of the claimed inventions had not been named as inventors on Nasdaq’s patent applications; and (2) Nasdaq employees who had not contributed to the claimed inventions had been improperly named as inventors on Nasdaq’s patent applications. (*Id.* at 5.)

144. Nasdaq Director further told Nasdaq’s counsel that Accenture employees contributed to the alleged inventions but were not identified as inventors and that Nasdaq employees who joined the project after the work was complete had been named as inventors:

At least on the applications I’ve seen so far, there is *no mention of any Accenture person and they played a role in formulating and benchmarking many of the key ideas*, yet people who joined the project a year after the publication of the high level design document that became the core of these patent applications *were not only not involved, but actively working against the efforts at the time — now are listed as co-inventors.*

(*Id.* at 5 (emphasis added).) Nasdaq Director was referring to the alleged inventions claimed in the ’316, ’810, and ’151 Applications and those that were

claimed in the issued '112, '362, and '622 Patents. Nasdaq Director was referring to his review of the '316, '810, and '151 Applications.

145. On February 12, 2003, in connection with prosecution of the '316 Application, Nasdaq Prosecution Counsel submitted to the PTO a Petition by Assignee Under 37 C.F.R. 1.47(a) To Proceed in the Absence of an Inventor, dated February 12, 2003, *i.e.*, the 2/12/03 Petition. Pursuant to 37 C.F.R. 1.47(a) requiring the submission of “proof of the pertinent facts,” Nasdaq Prosecution Counsel also submitted a copy of the Nasdaq Director Email.

146. Nasdaq, by its Prosecution Counsel, told the PTO that Nasdaq Director “expressly refused to execute the declaration” for the '316 Application and “asserted that he cannot support the claims made in the patent application.” (2/13/03 Petition at 2.) Nasdaq sought permission to proceed with prosecution of the '316 Application under 37 C.F.R. §1.47(a). (*Id.* at 3.) Nasdaq’s application was granted and the '316 Application was accorded Rule 1.47(a) status. ('316 Application, File History, 4/16/03 Petition Decision.)

147. Nasdaq Prosecution Counsel did not file a copy of the 2/12/03 Petition or the Nasdaq Director Email through an Information Disclosure Statement (“IDS”) or otherwise bring the Nasdaq Director Email to the attention of the '316 Application Examiners.

148. Nasdaq Prosecution Counsel also did not disclose to the '316 Application Examiners through an IDS or otherwise the OptiMark Trading Platform of the LSE Platform. Nasdaq Prosecution Counsel also did not bring the non-joinder and misjoinder issues raised by Nasdaq Director to the attention of the '316 Application Examiners.

3. Nasdaq's Counsel and the Named Inventors Owed a Duty of Candor to the PTO and an Obligation to Disclose Information Material to Patentability

149. All persons associated with the filing and prosecution of patent applications before the PTO owe a duty of candor and must disclose information material to patentability:

Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section.

(37 C.F.R. § 1.56; MPEP § 2001.)

150. This duty of candor to the PTO extends to: (1) each inventor named in the application; (2) each attorney or agent who prepares or prosecutes the claim; and (3) every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, the applicant, an assignee, or anyone to whom there is an obligation to assign the application. (37 C.F.R. § 1.56; MPEP § 2001.)

151. Accordingly, the following persons, among others, owed a duty of candor to the PTO in connection with prosecution of the '151 Application and were obligated to disclose information material to patentability: (1) the '622 Patent Named Inventors; and (2) Nasdaq Prosecution Counsel. (37 C.F.R. § 1.56; MPEP § 2001(c).)

152. The following persons, among others, owed a duty of candor to the PTO in connection with prosecution of the '810 Application and were obligated to disclose information material to patentability: (1) the '362 Patent Named Inventors; and (2) Nasdaq Prosecution Counsel. (37 C.F.R. § 1.56; MPEP § 2001(c).)

153. The '622 Patent Named Inventors and the '362 Patent Named Inventors were aware of the duty of candor that they owed to the PTO and their obligation to disclose all information material to patentability.

154. In October 2002, the '622 Patent Named Inventors executed a Combined Declaration and Power of Attorney in connection with the '151 Application that clearly stated:

As a below named inventor, I hereby declare that . . . I acknowledge the duty to disclose all information I know to be material to patentability in accordance with Title 37, Code of Federal Regulations, § 1.56.

(’151 Application, File History, Response to Notice to File Missing Parts of Application, Combined Declaration and Power of Attorney at 1, dated November 20, 2002.)

155. In October 2002, the ’362 Patent Named Inventors executed a Combined Declaration and Power of Attorney in connection with the ’810 Application that clearly stated:

As a below named inventor, I hereby declare that . . . I acknowledge the duty to disclose all information I know to be material to patentability in accordance with Title 37, Code of Federal Regulations, § 1.56.

(’810 Application, File History, Response to Notice to File Missing Parts of Application, Combined Declaration and Power of Attorney at 1, dated November 20, 2002.)

156. Nasdaq Prosecution Counsel were prosecuting attorneys barred with the PTO and were also well aware of their duty of candor and obligation to disclose all information known to be material to patentability.

4. Nasdaq’s Counsel and Named Inventors Withheld the OptiMark Trading Platform with a Specific Intent to Deceive the PTO

157. The OptiMark Trading Platform is prior art to the ’362 and ’622 Patents under at least 35 U.S.C. § 102(a) and 102(b). The first trade of listed equities on the OptiMark Trading Platform occurred on the California-based Pacific Exchange by no later than January 1999, more than three years before

Nasdaq filed the June 2002 Provisional Applications. Accordingly, the OptiMark Trading Platform was known and used by others in the United States, and in public use in the United States, more than one year prior to the filing date of the June 2002 Provisional Applications.

158. The OptiMark Trading Platform was material to the patentability of the alleged inventions claimed in the '151 and '810 Applications and that issued in the '622 and '362 Patent, and, but for its non-disclosure, the PTO would not have issued one or more claims in each of those patents.

159. The OptiMark Trading Platform included, among other features, a memory-based order book; a trade matching engine that had exclusive access to the order book; and a trade matching engine that accessed the memory-based order book to execute trades.

160. The OptiMark Trading Platform included an order book in main memory. Nasdaq Prosecution Counsel, the '362 Patent Named Inventors, and the '622 Patent Named Inventors, while withholding the OptiMark Trading Platform, repeatedly distinguished prior art cited during prosecution of the '810 Application and '151 Application on the ground that the prior art did not disclose an order book in main memory:

- “Allen . . . does not teach that the order book is stored in main memory.” ('151 Application, File History, 2/21/2008 Amendment in Reply to Office Action, at 7.)

- “Allen would not teach to store the order book in main memory” (’151 Application, File History, 10/19/2010 Amendment in Reply to Office Action, at 9.)
- “The combination of Silverman and Crudele does not teach that the order book is stored in main memory. . . .” (’151 Application, File History, 11/10/2011 Appeal Brief, at 20.)
- “Potter does not explicitly teach the feature of ‘a main memory that holds an order book for processing’” (’810 Application, File History, 2/25/2008 Response to Office Action, at 8.)
- “Buist fails to describe or suggest ‘a main memory that holds an order book for processing of orders.’” (’810 Application, File History, 1/9/2009 Amendment in Reply to Office Action, at 10.)
- “One of ordinary skill would not read Potter and Buist as teaching an order book residing in RAM (main memory).” (’810 Application, File History, 10/27/2011 Response to Office Action, at 11.)

(*See also* ’151 Application, File History, 8/17/2007 Amendment in Reply to Office Action, at 8; 2/21/2008 Amendment in Reply to Office Action, at 8; 10/21/2008 Amendment in Reply to Office Action, at 8; 6/4/2009 Amendment in Reply to Office Action, at 9-10; 10/19/2010 Amendment in Reply to Office Action, at 13; 1/19/2011 Appeal Brief, at 12, 18, 20; ’810 Application, File History, 2/25/2008 Response to Office Action, at 9; 6/12/2009 Amendment in Reply to Office Action, at 15; 1/9/2009 Request for Continued Examination, at 10, 12; 10/27/2011 Response to Office Action, at 8.)

161. In addition, every independent claim of the issued '362 and '622

Patents recites one of the following limitations:

- “a main memory that stores: an order book” (Claim 1, '622 Patent.)
- “an order book that resides in a main memory of the computer system” (Claims 11, 21, '622 Patent.)
- “a main non-transitory memory that holds an order book” (Claim 1, '362 Patent.)
- “an order book that resides in a main non-transitory memory of a computer system” (Claims 10, 19, '362 Patent.)

162. The OptiMark Trading Platform included a matching process that had exclusive access to the order book. Nasdaq Prosecution Counsel, the '362 Patent Named Inventors, and the '622 Patent Named Inventors, while withholding the OptiMark Trading Platform, repeatedly distinguished prior art cited during prosecution of the '810 Application and '151 Application on the ground that the prior art did not disclose a matching process having exclusive access to an order book:

- “Applicant has amended claim 10 to recite that the instructions to match have exclusive access to the order book in the main memory. Allen neither describes nor suggests this feature.” ('151 Application, File History, 8/17/2007 Amendment in Reply to Office Action, at 8.)
- “Allen does not describe a computer program having a first portion that has exclusive access to the order book and a remaining portion that accesses a log stored in a persistent storage device to process activities related to processing of securities other than to match the received order. By

providing one portion of the program with exclusive access to the order book, *i.e.*, the portion that handles supervisory commands does not get direct access to the order book, which enables faster order execution.” (’151 Application, File History, 1/19/2011 Appeal Brief, at 13.)

- “This feature of the first portion of the program having exclusive access is not taught by the combination of Silverman and Crudele.” (’151 Application, File History, 11/10/2011 Appeal Brief, at 16.)
- “The dependent claims add additional distinct features. For example claim 4 requires the order book is exclusively accessible by the computer program for matching incoming orders and distributing information. Buist neither describes nor suggests this feature.” (’810 Application, File History, 1/9/2009 Amendment in Reply to Office Action, at 10.)
- “Further, Buist does not teach ‘. . . during matching, the processor exclusively accessing the order book for matching without interruptions from other processes.’ Potter and Silverman do not cure this deficiency.” (’810 Application, File History, 10/27/2011 Amendment in Reply to Office Action, at 9.)
- “Applicant contends that for reasons given above it is quite clear that the combination of Buist, Potter and Silverman does not teach ‘. . . during matching, the processor exclusively accessing the order book for matching without interruptions from other processes.’” (’810 Application, File History, 10/27/2011 Amendment in Reply to Office Action, at 11.)

(*See also* ’151 Application, File History, 2/21/2008 Request for Continued Examination, at 9; 3/15/2010 Amendment in Reply to Office Action, at 9; 11/10/2011 Appeal Brief, at 13.)

163. In addition, every independent claim of the issued '362 and '622

Patents recites one of the following limitations:

- “the first portion of the computer program having exclusive access to the order book” (Claim 1, '622 Patent.)
- “accessing to the order book in the main memory only through the first portion of the computer program product” (Claim 11, '622 Patent.)
- “first portion of instructions of the computer program product that limit access to the order book to the first instructions” (Claim 21, '622 Patent.)
- “the processor accessing the order book for matching wherein other processes are restricted by said processor from accessing the order book” (Claim 1, '362 Patent.)
- “wherein during matching other processes are restricted by said processor from accessing the order book” (Claims 10, 19, '362 Patent.)

164. The OptiMark Trading System disclosed a file in persistent storage including information relating to buy and sell orders. Applicants, while withholding the OptiMark Trading Platform, repeatedly distinguished prior art cited during prosecution of the '810 Application and '151 Application on the ground that it did not disclose reporting securities trading activity to a log file in a persistent storage medium.

- “No such feature is taught by Allen, because Allen does not have the order book in memory but in storage and there is not any need to maintain an execution log file because Allen would update the order book in persistent storage, unlike Applicant's claim where the order book is in memory, e.g., RAM or cache, which is known to one of skill to be

volatile.” (’151 Application, File History, 2/21/2008 Amendment in Reply to Office Action, at 8-9.)

- ““This feature of the log stored in the persistent storage device to process activities other than activities to match, also is not taught by any combination of Silverman and Crudele.” (’151 Application, File History, 11/10/2011 Appeal Brief, at 16.)
- “Allen does not describe the execution log file. Reporting to a consolidated tape for publication of executions does not describe the execution log file stored in persistent storage.” (’151 Application, File History, 11/10/2011 Appeal Brief, at 24.)
- “Moreover, Buist taken separately or in combination with Potter does not describe or suggest to insert into a persistent store information representing an activity relating to a security interest stored in an order book in the main memory.” (’810 Application, File History, 6/12/2009 Amendment in Reply to Office Action, at 15.)
- “The Examiner maps the claimed log file feature to the heartbeat server in Moshal and cites paragraph [0080] which explains that Moshal uses a database for recovery data. But this is not what is recited in claim 1. Moshal’s heartbeat server and recovery database does not teach the claimed log file that is stored in a one memory, which exists in parallel with but separate from an order book stored in a different memory, where the log file stores information representing an activity relating to a security interest stored in the order book.” (’810 Application, File History, 7/31/2012 Amendment in Reply to Office Action, at 12.)

(*See also* ’810 Application, File History, 2/25/2008 Amendment in Reply to Office Action, at 9; 7/31/2012 Amendment in Reply to Office Action, at 11-13.) (*See also* ’151 Application, File History, 3/15/2010 Amendment in Reply to Office Action, at 10, 12; 1/19/2011 Appeal Brief, at 13-16; 11/10/2011 Appeal Brief, at 13-14, 17,

23; '810 Application, File History, 2/25/2008 Amendment in Reply to Office Action, at 9.)

165. In addition, every independent claim of the issued '362 and '622 Patents recites one of the following limitations:

- “a log stored in a persistent storage device” (Claims 1, 21, '622 Patent.)
- “an execution log stored in a persistent, computer readable storage medium” (Claim 11, '622 Patent.)
- “a log file that resides in a non-transitory storage medium” (Claims 1, 19, '362 Patent.)
- “a log file that resides in a sequential non-transitory access storage medium” (Claim 10, '362 Patent.)

166. The OptiMark Trading Platform alone and/or in combination with prior art of record, anticipates and/or renders obvious claims of the '362 Patent. For example, the OptiMark Trading Platform disclosed all of the elements of claim 1 of the '362 Patent. The Optimark Trading Platform is also material to every claim of the '362 Patent because it discloses the main memory, exclusive access, and log file limitations recited in all independent claims.

167. The OptiMark Trading Platform, alone and/or in combination with prior art of record, anticipates and/or renders obvious claims of the '622 Patent. For example, the OptiMark Trading Platform disclosed all of the elements of claim 1 of the '622 Patent. The Optimark Trading Platform is also material to

every claim of the '622 Patent because it discloses the main memory, exclusive access, and log file limitations recited in all independent claims.

168. The OptiMark Trading Platform was not cumulative of other prior art before the '810 and '151 Application Examiners during prosecution of the '810 and '151 Applications. For example, the '810 and '151 Application Examiners did not cite to or rely on a single 35 U.S.C. § 102(a) or 102(b) prior art reference that clearly, expressly, and indisputably disclosed, *inter alia*, an order book in main memory, a matching process having exclusive access to an order book, and reporting securities trading activity to a log file in a persistent storage medium.

169. Accordingly, one or more claims of the '362 Patent would not have issued had the OptiMark Trading Platform been disclosed to the '810 Application Examiners in connection with prosecution of the '810 Application. One or more claims of the '622 Patent would not have issued had the OptiMark Trading Platform been disclosed to the '151 Application Examiners in connection with prosecution of the '151 Application.

170. The '622 Patent Named Inventors knew about the OptiMark Trading Platform and that it was material to the patentability of the alleged inventions claimed in the '151 Application and that issued in the '622 Patent. The '622 Patent Named Inventors collaborated with OptiMark on the SuperMontage project, received OptiMark Trading Platform documentation that was distributed to the

entire “design team,” and were aware of Nasdaq’s integration of OptiMark technology beginning in and around 1998. Accordingly, they knew that the OptiMark Trading Platform included, among other features, a memory-based order book; a trade matching engine, which had exclusive access to the order book; a trade matching engine accessing the memory-based order book to execute trades; and a persistent storage device with a database that stores buy and sell profiles.

171. The ’362 Patent Named Inventors also knew about the OptiMark Trading Platform and that it was material to the patentability of the alleged inventions claimed in the ’810 Application and that issued in the ’362 Patent. The ’362 Patent Named Inventors collaborated with OptiMark on the SuperMontage project, received OptiMark Trading Platform documentation that was distributed to the entire “design team,” and were aware of Nasdaq’s integration of OptiMark technology beginning in and around 1998. Accordingly, they knew that the OptiMark Trading Platform included, among other features, a memory-based order book; a trade matching engine, which had exclusive access to the order book; a trade matching engine accessing the memory-based order book to execute trades; and a persistent storage device with a database that stores buy and sell profiles.

172. Nasdaq Prosecution Counsel also knew about the OptiMark Trading Platform and that it was material to the patentability of the alleged inventions claimed in both the ’151 and ’810 Applications and that issued in the ’362 and

'622 Patents. Nasdaq Prosecution Counsel knew this based on their working with the '622 Patent Named Inventors and '362 Patent Named Inventors in connection with preparing, filing, and prosecuting the applications that led to issuance of these patents. In addition, Nasdaq Director, a named inventor on the related and co-pending '316 Application, told Nasdaq Prosecution Counsel that the OptiMark Trading Platform "overlap[s] [with] many of the claims" in Nasdaq's applications and that descriptions of the OptiMark Trading Platform may be "considered relevant prior art." (2/12/03 Petition, Appendix A, Nasdaq Director Email at 4.)

173. Despite their awareness of the OptiMark Trading Platform and its materiality, the '622 Patent Named Inventors and Nasdaq Prosecution Counsel deliberately withheld and did not disclose the OptiMark Trading Platform to the '151 Application Examiners in connection with prosecution of the '151 Application (which issued as the '622 Patent).

174. The '622 Patent Named Inventors and Nasdaq Prosecution Counsel withheld the OptiMark Trading Platform from the PTO during prosecution of the '151 Application with the specific intent to deceive the PTO. For example, the Nasdaq Director Email, which described the '622 Patent Named Inventors' (and entire design team's) collaboration with OptiMark and Nasdaq Director's belief that the OptiMark Trading Platform was prior art, was filed with the PTO in connection with the '316 Application in order to proceed with prosecution of that

application, but the Nasdaq Director Email was not filed in connection with the related '151 Application that was filed the same day and claimed priority to the same June 2002 Provisional Applications, but was pending before different Examiners. Moreover, Nasdaq Prosecution Counsel and the '622 Patent Named Inventors were distinguishing prior art cited by the examiner based on its alleged failure to disclose elements that they knew to be present in the OptiMark Trading System.

175. Despite their awareness of the OptiMark Trading Platform and its materiality, the '362 Patent Named Inventors and Nasdaq Prosecution Counsel deliberately withheld and did not disclose the OptiMark Trading Platform to the '810 Application Examiners in connection with prosecution of the '810 Application (which issued as the '362 Patent).

176. The '362 Patent Named Inventors and Nasdaq Prosecution Counsel withheld the OptiMark Trading Platform from the PTO during prosecution of the '810 Application with the specific intent to deceive the PTO. For example, the Nasdaq Director Email, which described the '362 Patent Named Inventors' (and the entire design team's) collaboration with OptiMark and Nasdaq Director's belief that the OptiMark Trading Platform was prior art, was filed with the PTO in connection with the '316 Application but was not filed in connection with the related '810 Application that was filed the same day and claimed priority to the

same June 2002 Provisional Applications, but was pending before different Examiners. Moreover, Nasdaq Prosecution Counsel and the '362 Patent Named Inventors were distinguishing prior art cited by the examiner based on its alleged failure to disclose elements that they knew to be present in the OptiMark Trading System.

177. One or more claims of the '622 Patent would not have issued but for the '622 Patent Named Inventors and Nasdaq Prosecution Counsel's deliberate and deceitful withholding of the OptiMark Trading Platform in connection with prosecution of the '151 Application. Their misconduct constitutes inequitable conduct and renders the '622 Patent unenforceable.

178. One or more claims of the '362 Patent would not have issued but for the '622 Patent Named Inventors and Nasdaq Prosecution Counsel's deliberate and deceitful withholding of the OptiMark Trading Platform in connection with prosecution of the '810 Application. Their misconduct constitutes inequitable conduct and renders the '362 Patent unenforceable.

5. Nasdaq's Counsel and the Named Inventors Withheld the LSE Platform With a Specific Intent to Deceive the PTO

179. The LSE Platform is prior art to the '622 and '362 Patents under 35 U.S.C. § 102(a) or 102(b). The LSE Platform was launched by no later than October 1997, more than five years before Nasdaq filed the June 2002 Provisional Applications. The LSE Platform was accessible to persons in the United States to

place orders, known and used by persons in the United States, and in public use in the United States more than one year prior to the filing date of the June 2002 Provisional Applications.

180. The LSE Platform was material to the patentability of the alleged inventions claimed in the '151 and '810 Applications, and, but for its non-disclosure, the PTO would not have issued one or more claims in each of those patents.

181. The LSE Platform stored an order book in main memory. The LSE Platform, therefore, included a critical feature that applicants repeatedly relied on to try to distinguish over the prior art being cited by the '151 and '810 Application Examiners during prosecution of the '151 and '810 Applications (as described above).

182. In addition, every independent claim of the issued '362 and '622 Patents recites one of the following limitations:

- “a main memory that stores: an order book” (Claim 1, '622 Patent.)
- “an order book that resides in a main memory of the computer system” (Claims 11, 21, '622 Patent.)
- “a main non-transitory memory that holds an order book” (Claim 1, '362 Patent.)
- “an order book that resides in a main non-transitory memory of a computer system” (Claims 10, 19, '362 Patent.)

183. The LSE Platform disclosed a file in persistent storage including information relating to buy and sell orders. The LSE Platform, therefore, included a critical feature that applicants repeatedly relied on to try to distinguish over the prior art being cited by the '151 and '810 Application Examiners during prosecution of the '151 and '810 Applications (as described above).

184. In addition, every independent claim of the issued '362 and '622 Patents recites one of the following limitations:

- “a log stored in a persistent storage device” (Claims 1, 21, '622 Patent.)
- “an execution log stored in a persistent, computer readable storage medium” (Claim 11, '622 Patent.)
- “a log file that resides in a non-transitory storage medium” (Claims 1, 19, '362 Patent.)
- “a log file that resides in a sequential non-transitory access storage medium” (Claim 10, '362 Patent.)

185. The LSE Platform, alone and/or in combination with the prior art of record, also anticipated and/or rendered obvious claims of the '362 Patent. For example, the LSE Platform disclosed all of the elements of claim 1 of the '362 Patent. The LSE Platform is also material to every claim of the '362 Patent because it discloses the main memory and log file limitations recited in all claims.

186. The LSE Platform, alone and/or in combination with the prior art of record, anticipated and/or rendered obvious claims of the '622 Patent. For example, the LSE Platform disclosed all of the elements of claim 1 of the

'622 Patent. The LSE Platform is also material to every claim of the '622 Patent because it discloses the main memory and log file limitations recited in all claims.

187. The LSE Platform was not cumulative of other prior art before the '810 and '151 Application Examiners during prosecution of the '810 and '151 Applications. For example, the '810 and '151 Application Examiners did not cite to or rely on a single 35 U.S.C. § 102(a) or 102(b) prior art reference that clearly, expressly, and indisputably disclosed, *inter alia*, an order book in main memory and reporting securities trading activity to a log file in a persistent storage medium.

188. Accordingly, one or more claims of the '362 Patent would not have issued had the LSE Platform been disclosed to the '810 Application Examiners in connection with prosecution of the '810 Application. One or more claims of the '622 Patent would not have issued had the LSE Platform been disclosed to the '151 Application Examiners in connection with prosecution of the '151 Application.

189. The '622 Patent Named Inventors knew about the LSE Platform and that it was material to the patentability of the alleged inventions in the '151 Application and that issued in the '622 Patent. The '622 Patent Named Inventors collaborated with Accenture contractors who discussed the LSE Platform memory-based order book and, in fact, the use of a memory-based order book and implementation of that design was a point of significant discussion within the design team before the filings of the June 2002 Provisional Applications.

190. The '362 Patent Named Inventors also knew about the LSE Platform and that it was material to the patentability of the alleged inventions in the '810 Application and that issued in the '362 Patent. The '362 Patent Named Inventors collaborated with Accenture contractors who discussed the LSE Platform memory-based order book and, in fact, the use of a memory-based order book and implementation of that design was a point of significant discussion within the design team before the filings of the June 2002 Provisional Applications.

191. Nasdaq Prosecution Counsel also knew about the LSE Platform and that it was material to the patentability of the alleged inventions claimed in both the '151 and '810 Applications and that issued in the '362 and '622 Patents based on their working with the '362 Patent Named Inventors and the '622 Patent Named Inventors. In addition, Nasdaq Director, a named inventor on the related and co-pending '316 Application, told Nasdaq's counsel that the LSE Platform included an order book in main memory (*i.e.*, a "memory-based order book") and reminded them that this was a significant point of discussion during development work with Accenture and OptiMark. (2/12/03 Petition, Appendix A, Nasdaq Director Email at 4.)

192. Despite their awareness of the LSE Platform and its materiality, the '622 Patent Named Inventors and Nasdaq Prosecution Counsel deliberately withheld and did not disclose the LSE Platform to the '151 Application Examiners

in connection with prosecution of the '151 Application (which issued as the '622 Patent).

193. The '622 Patent Named Inventors and Nasdaq Prosecution Counsel withheld the LSE Platform from the PTO during prosecution of the '151 Application with the specific intent to deceive the PTO. For example, the Nasdaq Director Email, which described the '622 Patent Named Inventor's awareness of the LSE Platform and its order book in main memory, was filed with the PTO in connection with the '316 Application in order to proceed with prosecution of that application, but the Nasdaq Director Email was not filed in connection with the '151 Application that was filed the same day and claimed priority to the same June 2002 Provisional Applications, but was pending before different examiners. Moreover, Nasdaq Prosecution Counsel and the '622 Patent Named Inventors were distinguishing prior art cited by the examiner based on its alleged failure to disclose an order book in main memory despite knowledge that the LSE Platform embodied that alleged improvement.

194. Despite their awareness of the LSE Platform and its materiality, the '362 Patent Named Inventors and Nasdaq Prosecution Counsel deliberately withheld and did not disclose the LSE Platform in connection with the prosecution of the '810 Application (which issued as the '362 Patent).

195. The '362 Patent Named Inventors and Nasdaq Prosecution Counsel withheld the LSE Platform from the PTO during prosecution of the '810 Application with the specific intent to deceive the PTO. For example, the Nasdaq Director Email, which described the '362 Patent Named Inventor's awareness of the LSE Platform and its order book in main memory, was filed with the PTO in connection with the '316 Application in order to proceed with prosecution of that application, but the Nasdaq Director Email was not filed in connection with the '810 Application that was filed the same day and claimed priority to the same June 2002 Provisional Applications, but was pending before different examiners. Moreover, Nasdaq Prosecution Counsel and the '362 Patent Named Inventors were distinguishing prior art cited by the examiner based on its alleged failure to disclose an order book in main memory despite knowledge that the LSE Platform embodied that alleged improvement.

196. One or more claims of the '622 Patent would not have issued but for the '622 Patent Named Inventors and Nasdaq Prosecution Counsel's deliberate and deceitful withholding of the LSE Platform prior art in connection with the prosecution of the '151 Application. Their misconduct constitutes inequitable conduct and renders the '622 Patent unenforceable.

197. One or more claims of the '362 Patent would not have issued but for the '362 Patent Named Inventors and Nasdaq Prosecution Counsel's deliberate and

deceitful withholding of the LSE Platform prior art in connection with the prosecution of the '810 Application. Their misconduct constitutes inequitable conduct and renders the '362 Patent unenforceable.

6. Nasdaq's Counsel and the Named Inventors Withheld the Inventor Non-joinder and Misjoinder with a Specific Intent to Deceive the PTO

198. Any person who conceived of a claimed invention, or any part thereof, is an inventor and must be named as an inventor in a patent application. (35 U.S.C. § 101; 35 U.S.C. § 102(f) (pre-AIA); MPEP § 2137.01.) Persons who did not conceive of a claimed invention, or any part thereof, is not an inventor and must not be named as an inventor in a patent application. (35 U.S.C. § 101; 35 U.S.C. § 102(f) (pre-AIA); MPEP § 2137.01.)

199. Examiners are required to reject applications on the basis of improper inventorship. (MPEP § 2137.01) Inventorship is material to patentability. (*See* 35 U.S.C. § 101; 35 U.S.C. § 102(f) (pre-AIA); 35 U.S.C. § 116; 37 C.F.R. § 1.56; MPEP § 2001.06(c) (inventorship disputes are material information); MPEP § 2004 (suggesting applicants carefully consider inventorship in the duty to disclose context).)

200. The '622 Patent Named Inventors collaborated together on the alleged inventions claimed in the '622 Patent, knew that Accenture persons contributed to the conception of one or more of those alleged inventions, and knew that those

Accenture persons had not been named as inventors. The '622 Patent Named Inventors also knew that Nasdaq employees who had not contributed to the conception of one or more of the alleged inventions had been named as inventors.

201. The '622 Patent Named Inventors all reviewed and signed a Combined Declaration and Power of Attorney that listed the named inventors and clearly stated at the top:

As a below named inventor, I hereby declare that: I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled ORDER MATCHING PROCESS AND METHOD, the specification of which was filed on July 25, 2002 as Application Serial No. 10/206,151.

('151 Application, File History, Response to Notice to File Missing Parts of Application, Combined Declaration and Power of Attorney at 1, dated November 20, 2002.) The Combined Declaration and Power of Attorney submitted in support of the '151 Application listed as named inventors Vincent, Moore, Hughes, Jr., and Friedman. (*Id.* at 2)

202. The '362 Patent Named Inventors collaborated together on the alleged intentions claimed in the '362 Patent, knew that Accenture persons contributed to the conception of one or more of those alleged inventions, and knew that those Accenture persons were not being named as inventors while only Nasdaq employees were being named as inventors. The '362 Patent Named Inventors also

knew that Nasdaq employees who had not contributed to the conception of one or more of the alleged inventions had been named as inventors.

203. The '362 Patent Named Inventors all reviewed and signed the Combined Declaration and Power of Attorney that listed the named inventors and clearly stated at the top:

As a below named inventor, I hereby declare that: I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled INFORMATION DISTRIBUTION PROCESS AND METHOD, the specification of which was filed on July 25, 2002 as Application Serial No. 10/206,810.

('810 Application, File History, Response to Notice to File Missing Parts of Application, Combined Declaration and Power of Attorney at 1, dated November 20, 2002.) The Combined Declaration and Power of Attorney submitted in support of the '810 Application listed as named inventors Vincent, Failla, Easterbrook, Jr., and Bilis. (*Id.* at 2)

204. Nasdaq Prosecution Counsel also knew about the non-joinder and misjoinder issues raised by Nasdaq Director and that they were material to patentability of the alleged inventions claimed in both the '151 and '810 Applications and that issued in the '362 and '622 Patents. Nasdaq Director, a named inventor on the related and co-pending '316 Application, told Nasdaq Prosecution Counsel that Accenture persons had not been named as inventors

despite formulating “many of the key ideas” and that Nasdaq employees who joined the project after the key design work was complete had been wrongly named as inventors. (2/12/03 Petition, Appendix A, Nasdaq Director Email at 4.)

205. Despite their awareness of the non-joinder and misjoinder with respect to alleged inventions disclosed and claimed in the ’151 Application, the ’622 Patent Named Inventors and Nasdaq Prosecution Counsel deliberately withheld and did not disclose that issue to the ’151 Application Examiners in connection with prosecution of the ’151 Application (which issued as the ’622 Patent). The ’622 Patent Named Inventors executed a Combined Declaration and Power of Attorney in which they falsely identified themselves as the sole, true, and rightful inventors. (’151 Application, File History, Response to Notice to File Missing Parts of Application, Combined Declaration and Power of Attorney at 1, dated November 20, 2002.) Nasdaq Prosecution Counsel filed the Combined Declaration and Power of Attorney with the PTO in connection with prosecution of the ’151 Application.

206. The ’622 Patent Named Inventors and Nasdaq Prosecution Counsel did not disclose the misjoinder and non-joinder with the specific intent to deceive the PTO as to the inventorship of the alleged inventions disclosed and claimed in the ’151 Application. The ’622 Patent Named Inventors and Nasdaq Prosecution Counsel knew and understood that other persons, including potentially Accenture

contractors, had contributed to the inventions and did not want to name any non-Nasdaq employees as inventors. The '622 Patent Named Inventors also knew that Nasdaq employees who had not contributed to conception of the claimed inventions had been named as inventors.

207. Despite their awareness of the non-joinder and misjoinder with respect to alleged inventions disclosed and claimed in the '810 Application, the '362 Patent Named Inventors and Nasdaq Prosecution Counsel deliberately withheld and did not disclose that issue to the '810 Application Examiners in connection with prosecution of the '810 Application (which issued as the '362 Patent). The '362 Patent Named Inventors executed a Combined Declaration and Power of Attorney in which they falsely identified themselves as the sole, true, and rightful inventors. ('810 Application, File History, Response to Notice to File Missing Parts of Application, Combined Declaration and Power of Attorney at 1, dated November 20, 2002.) Nasdaq Prosecution Counsel filed the Combined Declaration and Power of Attorney with the PTO in connection with prosecution of the '810 Application.

208. The '362 Patent Named Inventors and Nasdaq Prosecution Counsel did not disclose the misjoinder and non-joinder with the specific intent to deceive the PTO as to the inventorship of the alleged inventions disclosed and claimed in the '810 Application. The '362 Patent Named Inventors and Nasdaq Prosecution

Counsel knew and understood that other persons, including potentially Accenture contractors, had contributed to the inventions and did not want to name any non-Nasdaq employees as inventors. The '362 Patent Named Inventors also knew that Nasdaq employees who had not contributed to conception of the claimed inventions had been named as inventors.

209. One or more claims of the '622 Patent would not have issued but for the '622 Patent Named Inventors and Nasdaq Prosecution Counsel's deliberate and deceitful withholding of information concerning non-joinder and misjoinder in connection with prosecution of the '151 Application. Their misconduct constitutes inequitable conduct and renders the '622 Patent unenforceable.

210. One or more claims of the '362 Patent would not have issued but for the '362 Patent Named Inventors and Nasdaq Prosecution Counsel's deliberate and deceitful withholding of information concerning non-joinder and misjoinder in connection with prosecution of the '810 Application. Their misconduct constitutes inequitable conduct and renders the '362 Patent unenforceable.

**B. Nasdaq's Counsel's and the '622 Patent Named Inventor's
Withholding of Lupien '046 During Prosecution of the '622 Patent**

211. Nasdaq Prosecution Counsel and one of the named inventors on the '622 Patent who also is a named inventor on the '112 Patent ("'622 Patent Named

Inventor”)² deliberately withheld material information identified during prosecution of the ’810 Application from the ’151 Application Examiners in connection with prosecution of the ’151 Application. Their deliberate, deceitful, and inequitable conduct renders the ’622 Patent unenforceable.

212. On June 5, 2003, Nasdaq, by one or more of its Prosecution Counsel, filed International Patent Application No. PCT/US2003/17585 (“’585 Application”). The named inventors on the ’585 Application included the ’622 Patent Named Inventor.

213. The ’585 Application claimed priority to the June 2002 Provisional Applications and the ’810 Application. The ’585 Application claimed alleged inventions including a “process,” “method,” and “computer program product” implicating, *inter alia*, an “order book that resides in main memory” that was “accessible only by a matching process,” reporting securities trading activity to a “file that resides in a storage medium,” and receiving “a user query relating to the security interest stored in the file that resides in the storage medium.” (*See* ’585 Application, Claims 1-35.)

214. On January 15, 2004, the International Search Authority issued an International Search Report for the ’585 Application (“’585 Search Report”). The ’585 Search Report identified, among other prior art, Lupien ’046.

² The ’622 Patent Named Inventor is readily identifiable based on the face of the patents.

215. In the '585 Search Report, the International Search Authority designated Lupien '046 as an "X" reference. The "X" designation indicated that Lupien '046 was a:

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.

('810 Application, File History, 8/13/2004 IDS.)

216. Nasdaq subsequently abandoned the '585 Application. Nasdaq did not file any national phase applications claiming priority to that application after issuance of the '585 Search Report identifying Lupien '046.

217. Nasdaq, by its Prosecution Counsel disclosed Lupien '046 and the '585 Search Report during prosecution of the '810 Application. ('810 Application, File History, 8/13/2004 IDS.)

218. But Nasdaq Prosecution Counsel and the '622 Patent Named Inventor did not disclose Lupien '046 or the '585 Search Report in connection with the related and co-pending '151 Application that was being prosecuted before the different '151 Application Examiners.

219. Lupien '046 is prior art to the '622 Patent under at least 35 U.S.C. § 102(a) and § 102(b).

220. Lupien '046 was material to the patentability of the alleged inventions prosecuted in the '151 Application and that issued in the '622 Patent, and but for

its non-disclosure, the PTO would not have issued one or more claims of the '622 Patent.

221. Lupien '046 disclosed an order book in main memory. (*See, e.g.*, Lupien '046, FIG. 1, 19:33-38.) Nasdaq Prosecution Counsel and the '622 Patent Named Inventor, at and after the time that the '585 Search Report issued, were prosecuting in the '151 Application claims reciting an order book in main memory. They, while withholding Lupien '046, repeatedly distinguished prior art cited during prosecution of the '151 Application on the ground that it did not include an order book in main memory (as described above).

222. In addition, every independent claim of the issued '362 and '622 Patents recites one of the following limitations:

- “a main memory that stores: an order book” (Claim 1, '622 Patent.)
- “an order book that resides in a main memory of the computer system” (Claims 11, 21, '622 Patent.)
- “a main non-transitory memory that holds an order book” (Claim 1, '362 Patent.)
- “an order book that resides in a main non-transitory memory of a computer system” (Claims 10, 19, '362 Patent.)

223. Lupien '046 disclosed a matching process having exclusive access to the order book. (*See, e.g.*, Lupien '046, FIG. 1, 6:17-20.) Nasdaq Prosecution Counsel and the '622 Patent Named Inventor, after the '585 Search Report issued, amended their claims in the '151 Application to require that the matching process

have exclusive access the order book. ('151 Application, File History, 3/15/2010 Amendment at 2.) They then, while withholding Lupien '046, repeatedly distinguished prior art cited during prosecution of the '151 Application on the ground that it did not include a matching process having exclusive access to the order book (as described above).

224. In addition every independent claim of the issued '362 and '622 Patents recites one of the following limitations:

- “the first portion of the computer program having exclusive access to the order book” (Claim 1, '622 Patent.)
- “accessing to the order book in the main memory only through the first portion of the computer program product” (Claim 11, '622 Patent.)
- “first portion of instructions of the computer program product that limit access to the order book to the first instructions” (Claim 21, '622 Patent.)
- “the processor accessing the order book for matching wherein other processes are restricted by said processor from accessing the order book” (Claim 1, '362 Patent.)
- “wherein during matching other processes are restricted by said processor from accessing the order book” (Claims 10, 19, '362 Patent.)

225. Lupien '046, alone and/or in combination with the prior art of record, anticipated and/or rendered obvious claims of the '622 Patent. For example, Lupien '046 disclosed all of the elements of claim 1 of the '622 Patent. Lupien '046 is also material to every claim of the '622 Patent because it discloses a main

memory order book and a matching process having exclusive access to the order book.

226. Lupien '046 was not cumulative of other prior art before the '151 Application Examiners during prosecution of that patent. For example, the '151 Application Examiners did not cite to or rely on a single 35 U.S.C. § 102(a) or 102(b) prior art reference like Lupien '046 that clearly, expressly, and indisputably disclosed an order book in main memory and a matching process having exclusive access to an order book.

227. Accordingly, one or more claims of the '622 Patent would not have issued had Lupien '046 been disclosed to the '151 Application Examiners in connection with prosecution of the '151 Application.

228. As described above, Nasdaq Prosecution Counsel and the '622 Patent Named Inventor owed a duty of candor to the PTO and were obligated to disclose all information material to patentability of the alleged inventions claimed in the '151 Application. (37 C.F.R. § 1.56; MPEP § 2001.) They were aware of their duty of candor and obligation to disclose material information.

229. Nasdaq Prosecution Counsel and the '622 Patent Named Inventor knew about Lupien '046 and its materiality because they were involved in filing the '585 Application, received a copy of the '585 Search Report, and saw that the International Search Authority had designated Lupien '046 as a “document of

particular relevance” that by itself refuted the novelty of the alleged inventions claimed in the ’585 Application. (’810 Application, File History, 8/13/2004 IDS.)

230. Nasdaq Prosecution Counsel and the ’622 Patent Named Inventor also knew that Lupien ’046 was assigned to OptiMark (on its face) and that it described aspects of the OptiMark Trading Platform. The ’622 Patent Named Inventor knew and understood that OptiMark collaborated with Nasdaq on the SuperMontage work that led to the filing of the June 2002 Provisional Applications and the alleged inventions claimed in the ’151 Application. Nasdaq Prosecution Counsel also knew that Nasdaq Director had told them just one year before the ’585 Search Report that the OptiMark Trading Platform “overlap[ped] [with] many of the claims in the applications” and that OptiMark documentation “might be considered relevant prior art.” (2/12/03 Petition, Appendix A, Nasdaq Director Email at 4.)

231. Nasdaq Prosecution Counsel and the ’622 Patent Named Inventor also knew about Lupien ’046 and its materiality because they disclosed Lupien ’046 and the ’585 Search Report in an Information Disclosure Statement in connection with prosecution of the related co-pending ’810 Application on August 13, 2004. (’810 Application, File History, 8/13/2004 IDS.) At the time that they disclosed Lupien ’046 and the ’585 Search Report in connection with the ’810 Application, the then-pending claims of the ’810 Application and ’151 Application were substantially similar. For example, the following limitations overlapped:

Element	'810 Application	'151 Application
order book in main memory	“order book that resides in main memory” [E.g., Claim 1]	“order book that resides in main memory of a computer system” [E.g., Claim 1]
a matching process to match securities orders	“order book is accessible only by a matching process” [E.g., Claim 1]	“a matching process to match a portion of an order for a security against a security interest stored in an order book” [E.g., Claim 1]
log of trading information in persistent storage	“an insertion process to insert, in a file that resides in a storage medium, information representing an activity relating to a security interest” [E.g., Claim 1]	“a reporting process to report matching the portion of the received order to an execution log file” [E.g., Claim 1]

232. Despite their awareness of Lupien '046 and its materiality, Nasdaq Prosecution Counsel and the '622 Patent Named Inventor deliberately withheld and did not disclose Lupien '046 in connection with the prosecution in the related and co-pending '151 Application being prosecuted before the '151 Application Examiners — examiners that were different than the '810 Application Examiners.

233. Nasdaq Prosecution Counsel and the '622 Patent Named Inventor withheld Lupien '046 during the prosecution of the '151 Application with the specific intent to deceive the PTO. They knew that the International Search Authority had identified Lupien '046 as highly material to the '585 Application

that claimed priority to the June 2002 Provisional applications; that the '151 Application claimed priority to the same June 2002 Provisional Applications; and that the claims of the '585 Application and '151 Application all recited, *inter alia*, order books in main memory — a feature that Applicants touted as distinguishing over the prior art throughout the prosecution of the '151 Application.

234. Nasdaq Prosecution Counsel and the '622 Patent Named Inventor also knew that OptiMark had collaborated with Nasdaq in connection with the development work leading to the alleged inventions claimed in the '151 Application.

235. At least Nasdaq Prosecution Counsel also knew that Nasdaq Director believed that the OptiMark Trading Platform, and publications describing that platform, may be considered relevant prior art an overlapped with inventions being claimed by Nasdaq. Nasdaq Director had told them this long before the '575 Search Report identified Lupien '046 as a highly material prior art reference.

236. In sum, one or more claims of the '622 Patent would not have issued but for Nasdaq Prosecution Counsel and the '622 Patent Named Inventor's deliberate and deceitful withholding of Lupien '046 in connection with prosecution of the '151 Application. Their misconduct constitutes inequitable conduct and renders the '622 Patent unenforceable.

C. Nasdaq's Counsel's and the '622 Patent Named Inventor's Withholding of Buist '282 and Potter '575 During Prosecution of the '622 Patent

237. Nasdaq Prosecution Counsel and the '622 Patent Named Inventor deliberately withheld additional material information identified during prosecution of the '810 Application from the '151 Application Examiners in connection with prosecution of the '151 Application. Their deliberate, deceitful, and inequitable conduct renders the '622 Patent unenforceable.

238. During prosecution of the '810 Application, the Examiner repeatedly rejected claims as anticipated and/or obvious based Buist '282 and Potter '575.

239. In a July 9, 2008 Office Action, the Examiner rejected, *inter alia*, pending claims 1, 2, 4-12, 14-22, and 24-30 under 35 U.S.C. § 102(e) as anticipated by Buist '282. ('810 Application, File History, 7/9/2008 Office Action at 3-5.) Pending claims 1, 2, 4-12, 14-22, and 24-30 recited, *inter alia*, an order book stored in main memory and a matching process having exclusive access to the order book. ('810 Application, File History, 2/25/2008 Amendment at 2-6.) The Examiner found the order book in main memory did not distinguish over the prior art and that Buist '282 disclosed that the matching process had exclusive access to the order book:

Buist further teaches . . . the order book being accessible only by a matching process . . . The root server which stores and processes the market order book is only accessed when orders are submitted to the market for potential matching. When a

user wants to view, browse, or search current market information, their requests are routed to a replica server.

(’810 Application, File History, 7/9/2008 Office Action at 4.)

240. The claims were amended. (’810 Application, File History, 1/9/2009 Amendment, at 2-6.) But the Examiner again rejected pending claims 1, 2, 4-12, 14-22, and 24-30 under 35 U.S.C. § 103(a) as obvious based on Buist ’282 in view of Potter ’575. (’810 Application, File History, 3/19/2009 Office Action at 3-7.) The Examiner reiterated that Buist ’282 disclosed an “order book being accessible only by a matching process.” (*Id.* at 4-5.) The Examiner emphasized that Potter ’575 disclosed locating frequently accessed data, such as an order book, in main memory:

Potter teaches ways to improve database storage structure to improve system performance (see at least column 1 lines 9-10 and column 2 lines 23-26). One old and well known way is to allow data items which are accessed more frequently to be stored on the fastest storage devices (see at least column 1 lines 58-61). Although a database structure typically resides in mass storage, if it is small enough, it may be loaded into and reside entirely in RAM (see at least column 7 line 60 to column 8 line 6).

(’810 Application, File History, 3/19/2009 Office Action at 6.)

241. The claims were again amended. (’810 Application, File History, 6/12/2009 Amendment at 2-6.) But the Examiner yet again rejected pending claims 1, 2, 4-12, 14-22, 24-30 under 35 U.S.C. § 103(a) as obvious based on Buist ’282 in view of Potter ’575. (’810 Application, File History, 1/29/2010 Office

Action at 3-8.) The Examiner reiterated that Buist '282 disclosed the exclusive access feature:

Buist '282 further teaches . . . [an] order book being accessible *only* by a matching process Therefore the master database/order book is only accessed for matching and executing trades.

('810 Application, File History, 1/29/2010 Office Action at 4-6.) The Examiner also again emphasized that Potter '575 disclosed locating frequently accessed data, such as an order book, in main memory. (*Id.* at 7.)

242. The claims were amended yet again to require that order matching be performed by a “processor” that receives incoming orders and that is located in the same main memory as the order book. ('810 Application, File History, 7/28/2010 Amendment at 2-6.)

243. But the Examiner yet again rejected the pending claims 1, 2, 4-12, 14-22, and 24-30 under 35 U.S.C. § 103(a) as obvious based on Buist '282 in view of Potter '575. ('810 Application History, 6/23/2011 Office Action at 2-8.) The Examiner — for the fourth time — stated that Buist '282 disclosed that a matching process having exclusive access to the order book:

Buist '282 further teaches . . . [an] order book being accessible *only* by a matching process. . . . Therefore the master database/order book is only accessed for matching and executing trades.

(’810 Application, File History, 6/23/2011 Office Action at 4-6.) The Examiner also again emphasized that Potter ’575 disclosed the location of frequently accessed data, such as an order book, in main memory. (’810 Application, File History, 6/23/2011 Office Action at 8.)

244. Pending claims 1, 2, 4-12, 14-22, and 24-30 were subsequently amended to require that the main memory “hold[] the entire order book that stores unexecuted orders for at least one security trading on the electronic trading venue . . .” (’810 Application, File History, 10/27/2011 Amendment at 2-6.) Applicants argued that “Buist [’282] does not teach a main memory that holds an entire order book” and reiterated their argument that Buist [’282] also “does not ‘cause a processor to match a new order received by the processor against the unexecuted orders in the order book.’” (’810 Application, File History, 10/27/2011 Amendment at 7-10.) In response to these amendments, the Examiner dropped the rejection based on Buist ’282 in view of Potter ’575. (See ’810 Application, File History, 2/1/2012 Office Action.)

245. Although the Examiner in the ’810 Application prosecution repeatedly rejected claims based on Buist ’282, and Buist ’282 in view of Potter ’575, Nasdaq Prosecution Counsel and the ’622 Patent Named Inventor did not disclose Buist ’282 or Potter ’575 to the Examiner during prosecution of similar claims in the related ’151 Application pending before a different Examiner.

246. Buist '282 is prior art to the '622 Patent under at least 35 U.S.C. § 102(e). Potter '575 is prior art to the '622 Patent under at least 35 U.S.C. § 102(a) and § 102(b).

247. Buist '282 and Potter '575 were material to the patentability of the alleged inventions prosecuted in the '151 Application and that issued in the '622 Patent, and, but for their non-disclosure, the PTO would not have issued one or more claims of the '622 Patent.

248. Buist '282 discloses a matching process having exclusive access to an order book. (*See, e.g.*, Buist '282, 10:8-16.) Nasdaq Prosecution Counsel and the '622 Patent Named Inventor, after the Examiner first cited Buist '282 during prosecution of the '810 Application, amended their independent claims in the '151 Application to recite that the matching process has exclusive access to the order book. (*Compare* '810 Application, File History, 7/9/2008 Final Office Action *with* '151 Application, File History, 3/15/2010 Amendment at 2.) They, while withholding Buist '282, repeatedly distinguished prior art cited during prosecution of the '151 Application on the ground that it did not disclose a matching process with exclusive access to an order book:

- “Applicant has amended claim 10 to recite that the instructions to match have exclusive access to the order book in the main memory. Allen neither describes nor suggests this feature.” ('151 Application, File History, 8/17/2007 Amendment, at 8.)

- “Applicant’s claim 10 recites that the instructions to match have exclusive access to the order book in the main memory.” (’151 Application, File History, 2/21/2008 Amendment in Reply to Office Action, at 9.)
- “Whether or not Allen can be construed to teach that the main memory of the computer stores the order book, which Applicant does not concede, Allen is completely silent regarding features of the first portion of the computer program product having exclusive access to the order book and a remaining portion of a computer program product to access a log stored in a persistent storage device” (’151 Application, File History, 01/19/2011 Appeal Brief, at 12-13.)
- “Silverman is silent regarding the features of the first portion of the computer program product having exclusive access to the order book” (’151 Application, File History, 11/10/2011 Appeal Brief, at 13.)

249. In addition, every claim of the issued ’362 and ’622 Patents recites one of the following limitations:

- “the first portion of the computer program having exclusive access to the order book” (Claim 1, ’622 Patent.)
- “accessing to the order book in the main memory only through the first portion of the computer program product” (Claim 11, ’622 Patent.)
- “first portion of instructions of the computer program product that limit access to the order book to the first instructions” (Claim 21, ’622 Patent.)
- “the processor accessing the order book for matching wherein other processes are restricted by said processor from accessing the order book” (Claim 1, ’362 Patent.)

- “wherein during matching other processes are restricted by said processor from accessing the order book” (Claims 10, 19, ’362 Patent.)

250. Potter ’575 discloses an order book in main memory. (*See, e.g.*, Potter ’575, 1:9-10, 58-61, 2:23-26, 7:60-8:6.) Nasdaq Prosecution Counsel and the ’622 Patent Named Inventor, at and after Examiner first cited Potter ’575 during prosecution of the ’810 Application, prosecuted in the ’151 Application claims reciting an order book in main memory. (’810 Application, File History, 9/10/2007 Non-Final Office Action.) They, while withholding Potter ’575, repeatedly distinguished prior art cited during prosecution of the ’151 Application on the ground that it did not disclose an order book in main memory:

- “[Allen] mentions nothing about the order book in main memory. . . . Allen does not have the order book in memory . . .” (’151 Application, File History, 2/21/2008 Amendment in Reply to Office Action, at 8.)
- “Nowhere in this paragraph does Allen either describe an order book or that the memory stores the order book. Indeed, Allen discloses main memory, but Allen also discloses disk storage. Presumably, if Allen had intended to teach the feature of storing the order book in main memory, as opposed to the conventional disk or persistent storage, Allen would have mentioned it.” (’151 Application, File History, 10/21/2008 Amendment in Reply to Office Action, at 8; *see also* ’151 Application, File History, 6/4/2009 Amendment in Reply to Office Action, at 9.)
- “Silverman cannot be construed to teach that the main memory of the computer stores the order book.” (’151 Application, File History, 1/19/2011 Appeal Brief, at 18.)

251. In addition, every claim of the issued '362 and '622 Patents recites one of the following limitations:

- “a main memory that stores: an order book” (Claim 1, '622 Patent.)
- “an order book that resides in a main memory of the computer system” (Claims 11, 21, '622 Patent.)
- “a main non-transitory memory that holds an order book” (Claim 1, '362 Patent.)
- “an order book that resides in a main non-transitory memory of a computer system” (Claims 10, 19, '362 Patent.)

252. Buist '282 and Potter '575 were material to the patentability of the alleged inventions claimed in the '151 Application and that issued in the '622 Patent. For example, Buist '282 and Potter '575 disclosed all of the elements of, and rendered obvious, claim 1 of the '622 Patent. As explained above, Buist '282 and Potter '575 are also material to every claim of the '622 Patent because they disclose the main memory order book and exclusive access limitations recited in all claims.

253. Buist '282 and Potter '575 were not cumulative of other prior art before the PTO during prosecution of the '151 Application. For example, the '151 Application Examiners did not cite to or rely on a combination of 35 U.S.C. § 103(a) prior art references that clearly, expressly, and indisputably disclosed, *inter alia*, an order book in main memory and a matching process having exclusive access to an order book.

254. As described above, Nasdaq Prosecution Counsel and the '622 Patent Named Inventor owed a duty of candor to the PTO and were obligated to disclose all information material to patentability of the alleged inventions claimed in the '151 Application. (37 C.F.R. § 1.56; MPEP § 2001.) They were aware of their duty of candor and obligation to disclose material information.

255. Nasdaq Prosecution Counsel and the '622 Patent Named Inventor knew about Buist '282 and Potter '575, and their materiality, because they were cited to them by the Examiner during prosecution of the '810 Application. In fact, they were cited by the Examiner at least four times in rejecting claims in the '810 Application that were substantially similar to claims being prosecuted in the '151 Application. Nasdaq Prosecution Counsel and the '622 Patent Named Inventor also knew that they ultimately amended their claims in the '810 Application to avoid continued rejections based on Buist '282 and Potter '575.

256. Despite their awareness of Buist '282 and Potter '575, and their materiality, Nasdaq Prosecution Counsel and the '622 Patent Named Inventor deliberately withheld and did not disclose those references in connection with prosecution of the related and co-pending '151 Application being prosecuted before the '151 Application Examiners — Examiners that were different than the '810 Application Examiners.

257. Nasdaq Prosecution Counsel and the '622 Patent Named Inventor withheld Buist '282 and Potter '575 during prosecution of the '151 Application with the specific intent to deceive the PTO. They all knew of the substantial overlap between the then-pending claims in the '810 Application and '151 Application; that the '810 Application Examiners repeatedly rejected the pending claims in '810 Application until they amended around Buist '282 and Potter '575; and that they were distinguishing prior art cited against them during prosecution of the '151 Application based on alleged inventive concepts that the '810 Application Examiners repeatedly told them were disclosed by Buist '282 and Potter '575 during prosecution of the '810 Application.

258. In sum, one or more claims of the '622 Patent would not have issued but for Nasdaq Prosecution Counsel and the '622 Patent Named Inventor's deliberate and deceitful withholding of Buist '282 and Potter '575 in connection with prosecution of the '151 Application. Their misconduct constitutes inequitable conduct and renders the '622 Patent unenforceable.

PRAYER FOR RELIEF

WHEREFOR, IEX prays for judgment in its favor against Nasdaq granting IEX the following relief:

A. That this Court enter a declaratory judgment pursuant to 28 U.S.C. § 2201 that the asserted claims of the '362 Patent are invalid and unenforceable and that IEX does not infringe, and has not infringed, those claims either directly or indirectly;

B. That this Court enter a declaratory judgment pursuant to 28 U.S.C. § 2201 that the asserted claims of the '622 Patent are invalid and unenforceable and that IEX does not infringe, and has not infringed, those claims either directly or indirectly;

C. That this Court enter a declaratory judgment pursuant to 28 U.S.C. § 2201 that the asserted claims of the '827 Patent are invalid and that IEX does not infringe, and has not infringed, those claims either directly or indirectly;

D. That this Court enter a declaratory judgment pursuant to 28 U.S.C. § 2201 that the asserted claims of the '609 Patent are invalid and that IEX does not infringe, and has not infringed, those claims either directly or indirectly;

E. That this Court enter a declaratory judgment pursuant to 28 U.S.C. § 2201 that the asserted claims of the '264 Patent are invalid and that IEX does not infringe, and has not infringed, those claims either directly or indirectly;

F. That this Court enter a declaratory judgment pursuant to 28 U.S.C. § 2201 that the asserted claims of the '797 Patent are invalid and that IEX does not infringe, and has not infringed, those claims either directly or indirectly

G. That Plaintiffs take nothing and are denied any relief whatsoever;

H. That IEX be awarded the costs incurred by them in connection with this action;

I. That this Court adjudge and decree that this case is exceptional and award IEX its reasonable attorneys' fees, expenses and costs in this action pursuant to 35 U.S.C. § 285; and

J. That this Court grant IEX such other and further relief as this Court may deem just and proper.

JURY DEMAND

IEX demands a trial by jury on all claims, counterclaims, and issues so triable.

Dated: February 26, 2019

By: /s/Liza M. Walsh

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CERTIFICATION PURSUANT TO LOCAL CIVIL RULES 11.2 AND 40.1

Pursuant to Local Civil Rule 11.2 and 40.1, Defendants by their undersigned counsel, hereby certify that to the best of their knowledge, the six patents asserted in this action (U.S. Patent Nos. 7,647,264, 7,933,827, 8,117,609, 8,244,622, 8,280,797, and 8,386,362) also are involved in the following actions:

Investors Exchange LLC v. Nasdaq, Inc., No. CBM2018-00045 (P.T.A.B. Oct. 4, 2018)

Investors Exchange LLC v. Nasdaq, Inc., No. CBM2018-00039 (P.T.A.B. July 26, 2018)

Investors Exchange LLC v. Nasdaq Technology AB, No. IPR2018-01796 (P.T.A.B. Oct. 1, 2018)

Investors Exchange LLC v. Nasdaq, Inc., No. CBM2018-00041 (P.T.A.B. Aug. 24, 2018) (institution denied)

Investors Exchange LLC v. Nasdaq, Inc., No. CBM2019-00001 (P.T.A.B. Oct. 15, 2018)

Investors Exchange LLC v. Nasdaq, Inc., No. CBM2018-00042 (P.T.A.B. Sept. 14, 2018)

Miami International Holdings, Inc., Miami International Securities Exchange, LLC, MIAX Pearl, LLC, and Miami International Technologies, LLC v. Nasdaq Inc., No. CBM2018-00032 (P.T.A.B. Apr. 2, 2018)

Nasdaq, Inc., Nasdaq ISE, LLC, and FTEN, Inc. v. Miami International Holdings, Inc., Miami International Securities Exchange, LLC, MIAX Pearl, LLC, and Miami International Technologies, LLC, No. 17-cv-06664-BRM-DEA (D.N.J. Sept. 1, 2017)

Dated: February 26, 2019

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CERTIFICATION PURSUANT TO LOCAL CIVIL RULE 201.1

Pursuant to Local Civil Rule 201.1, Defendants by their undersigned counsel, hereby certify that this action seeks declaratory and injunctive relief, and therefore this action is not appropriate for compulsory arbitration.

Dated: February 26, 2019

By: /s/Liza M. Walsh
Liza M. Walsh, Esq.

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