

# EXHIBIT 16

**EXPERT REPORT OF DR. PAUL MILGROM REGARDING INVALIDITY OF  
U.S. PATENT NO. 7,225,151**

## I. Introduction

1. I have been retained by Defendants Google Inc. and AOL LLC to give my expert opinion as to the validity of the patent asserted by Bid For Position in *Bid For Position v. Google et al.* Case No. 2-07CV-582 in the Eastern District of Virginia. Below, I set forth the analysis supporting my opinion that this patent is invalid.

2. My analysis covers claims 1-4, 11-14, and 23 of U.S. Patent No. 7,225,151 (“the ‘151 patent”) (Ex. 2) for which I understand Bid For Position has alleged infringement (see Response to Google’s Interrogatory No. 4). It is my opinion that each of the asserted claims are invalid at least for anticipation and/or obviousness in light of the prior art.

3. I base my analysis on my review of the items listed in Exhibit 4. I reserve the right to amend or supplement my opinions in light of further documents, depositions, or discovery disclosures that may be presented to or exchanged by the parties in the future.

4. The matters referenced in this report are based upon my personal knowledge, and if called upon as a witness I could testify completely as to these matters.

## II. Qualifications

5. I am the **Shirley R. and Leonard W. Ely, Jr.** Professor of Humanities and Sciences in the [Department of Economics at Stanford University](#) and professor, by courtesy, at the [Stanford Graduate School of Business](#). I am a Senior Fellow (by courtesy) of the Stanford Institute for Economic Policy Research and I served as Director of the Stanford Institute for Theoretical Economics from 1989 to 1991. From 1982 to 1987, I was on the faculty at Yale University; from 1985 to 1987 I was the Williams Brothers Professor of Management Studies and Professor of Economics at Yale. From 1979 to 1983 I was on

the faculty at the Kellogg Graduate School of Management at Northwestern University. In 2000, I served as the Taussig Visiting Research Professor at Harvard University, and in 1987 I was the Ford Visiting Professor of Economics at the University of California - Berkeley.

6. I am also founder and director at Market Design, Inc., of which I served as the chairman from 1996 to 2002. I am a senior consultant for Charles Rivers Associates.

7. I received my A.B. degree in mathematics from University of Michigan in 1970. I received my M.S. degree in Statistics and was awarded a Ph.D. in Business from Stanford University in 1978 and 1979, respectively.

8. I received the [Erwin Plein Nemmers Prize in Economics](#) in 2008. The Prize is awarded every two years and recognizes “work of lasting significance.” So far, three of the seven previous winners have gone on to win Nobel Prizes in economics. In 2001, I was awarded an Honorary doctorate by the Stockholm School of Economics. In 2007, I was elected to the National Academy of Sciences. I was elected or appointed a Fellow of the Center for Advanced Study in the Behavioral Sciences (Stanford University) in 1998, a Senior Research Fellow of the Institute for Policy Reform in 1993, a Fellow of the American Academy of Arts and Sciences in 1992, a Fellow of the Institute for Advanced Studies (Hebrew University of Jerusalem) in 1985, a Fellow of the Econometric Society in 1984, a Fellow of Morse College (Yale University) in 1984, and a Fellow of the Society of Actuaries in 1974. In 1986, I was awarded a John Simon Guggenheim Fellowship to study “Economic Theories of Organization.” I have also been elected to the Council of the Game Theory Society (2003) and the Council of the Econometric Society (2004). I served as the President of Western Economic Association International from 2007 to 2008.

9. I served as co-editor of the *American Economic Review* from 1990 to 1993, and as associate editor from 1993-2000. I also served as associate editor of *Games and Economic Behavior* (1990 – current), the *Journal of Financial Intermediation* (1989-1992), *Econometrica* (1987-1990), the *Rand Journal of Economics* (1985-1989), and the *Journal of Economic Theory* (1983-1987). I have served on the Editorial Boards of the *AEJ Microeconomics* and the *Journal of Comparative Economics*.

10. In 1998, I participated in the founding of Perfect Commerce, Inc., a dot-com company formed to assist firms with supply-chain management using Internet-based procurement incorporating auction technology. I served as the chief economist at Perfect Commerce from 2000 to 2002.

11. I have carried out extensive research in the areas of game theory, auctions and bidding strategies. My publications have appeared in a number of leading economic journals, including *Econometrica*, *American Economic Review*, *Journal of Economic Theory*, *Journal of Mathematical Economics*, *Journal of Economic Perspectives*, *European Economic Review*, *Journal of Political Economy*, *International Journal of Game Theory*, and *Rand Journal of Economics* among others). I have 23 publications relating to auctions, and 15 publications on mathematical economics and game theory. Several papers have been reprinted, some more than once. These publications are separately listed in my curriculum vitae. I am also the author of three books, *The Structure of Information in Competitive Bidding*, Garland Press, 1979, *Economics, Organization and Management* (with John Roberts), (Prentice-Hall, 1992), and *Putting Auction Theory to Work* (Cambridge University Press, 2004).

12. In addition, I played the principal creative role in the design of the original U.S. radio spectrum auctions and my research and inventions are the basis of the new spectrum auction design adopted by Ofcom, the British communications regulator. I have advised spectrum regulators concerning auctions in Australia, Canada, Germany, and Hong Kong. I have also advised bidders in radio spectrum auctions in the US, UK, Holland and Israel. I advised the Oregon Public Utilities Commission concerning the sale by auction of assets of regulated utility companies. I advised Google on its IPO auction, MSN on its search auction, and Yahoo on auctions for display advertising.

13. In 1996, I delivered the Nobel prize lecture to the Royal Swedish Academy on behalf of deceased laureate William Vickrey on the subject of auction design. I have delivered invited lectures at several other well-known conferences both in the U.S. and abroad. A partial list of these invited lecturers is available in my curriculum vitae.

14. I am the co-inventor of the patent "[\*Method and System for Combinatorial Auctions with Bid Composition Restrictions\*](#)" (US Patent [6,718,312](#)) and "[\*Method, system and business model for a buyer's auction with near perfect information using the internet\*](#)" (US Patent [7,330,826](#)).

15. In sum, I have been involved in the study of multi-agent systems, game theory, and auction mechanisms for approximately 32 years. In this time, I have become intimately familiar with a wide variety of systems that utilize or rely on the aforementioned research fields.

16. My qualifications are stated more fully in my curriculum vitae, which is attached to this report as Exhibit 1.

## **IV. Background to the '151 Patent**

### **A. Background on Auctions**

#### **1. Types of Auctions**

23. There are many different types of auctions. For example, auctions may be ascending, in which a valid new bid must exceed the last entered bid, or descending, in which a valid new bid must be less than the last entered bid, or neither. Bids may be open, meaning that bidders are aware of each other's bids, or they may be sealed (as in, "sealed envelopes"), meaning bidders are not aware of each other's bids. There may be one item being auctioned or many items may be auctioned at once. A bid may apply to just one item (the auction of a Rembrandt) or to any or many of several items (flower auctions or Treasury bill auctions). Bidders may or may not be able to retract their bids. Auctions vary widely in their formats and rules, and a format that is appropriate for one economic setting may be inappropriate for other settings.

24. In addition to differing rules governing bidding, auctions may also differ in the rules determining the prices that bidders pay. There are so called "first-price" or "pay-as-bid" auctions, in which each winning bidder pays the amount it has bid, and so-called "second-price" auctions, in which each winning bidder pays a price based on other bidders' bids. Other pricing rules include uniform-price auctions, in which multiple identical items are sold at the price equal to the bid of the lowest winner, and so-called "all-pay auctions," in which all bidders—even losing bidders—must pay something.

25. Auctions typically implement combinations of rules. For instance, the "typical" auction to a layperson—the fast-talking auctioneer who intones "Going... going... gone"

while bidders shout out bids—is an *open ascending first-price* auction. The auction is open since bidders are aware of each other’s bids, it is ascending in that each bidder must beat the bid placed by the previous bidder, and it is first-price in that the winning bidder pays the amount of his bid. Other combinations of rules give rise to different auction formats. Each such combination defines the roles of the auctioneer, who conducts the auction, and the bidders, who compete for the items being auctioned.

## **2. Auction Management Systems vs. Bid Management Systems**

26. The auction management system differs from a bid management system. To make an analogy to paradigmatic “physical world” auctions, the role of the fast-talking auctioneer behind the podium is performed by the auction management. The bid management system performs the role of an agent in the audience who has the authority to bid on his principal’s behalf. The auctioneer (or auction system) is responsible for soliciting bids from the bidders (or their proxies), enforcing the rules of the auction,<sup>1</sup> and determining which bidder wins the good.

27. Since proxy bidders / bid management systems are “stand-ins” for the actual bidder, they are limited to actions that the bidders can perform. The auctioneer / auction management system is indifferent as to whether the bid is placed directly by the bidder or is entered on his behalf by another party.

28. Nothing prevents the same business entity from offering both the functionality of an auction management system and a bid management system. For instance, Sotheby’s

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<sup>1</sup> As I will describe later in this report, different auctions have different rules. For instance, in an ascending auction, the rules prescribe that a valid bid must exceed the previous maximum bid. If a bidder tried to break that rule—say (footnote continued)

<http://searchenginewatch.com/showPage.html?page=2166331>.  
Downloaded on June 9, 2008.

- m. Exhibit 13: The Impact of the Internet on Business, June 26, 1999,  
<http://crab.rutgers.edu/~goertzel/economistnetbusiness.htm>.

Dated this 10th day of June, 2008.



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Dr. Paul Milgrom