EXHIBIT 29

Page 1

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION
MIRROR WORLDS, LLC,
    Plaintif,
            Civil Action No. 6:08-cv-88 LED
    v
APPLE, INC.,,
    Defendant.

APPLE, INC.,
    Counterclaim Plaintiff,
    v
MIRROR WORLDS, LLC,
MIRROR WORLDS TECHNOLOGIES, INC.,

    Counterclaim Defendants.

            - - - -

DEPOSITION OF: PETER LUCAS, Ph.D.

            - - - -

            DEPOSITION DATE:
            June 16, 2010
            Wednesday, 9:09 a.m.

            LOCATION:
            MAYA Design
            2730 Sidney Street
            Suite 300
            Pittsburgh, PA

            TAKEN BY:
            Defendant/Counterclaim Plaintiff
            REPORTED BY:
            Pamela L. Beck
            Notary Public
            AKF Reference No. PB18390

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1   DEPOSITION OF PETER LUCAS, Ph.D.,
    a witness, called by the Defendant/Counterclaim
2   Plaintiff for examination, in accordance with the
    Federal Rules of Civil Procedure, taken by and
3   before Pamela L. Beck, a Court Reporter and Notary
    Public in and for the Commonwealth of Pennsylvania,
4   at MAYA Design, 2730 Sidney Street, Suite 300,
    Pittsburgh, Pennsylvania, on June 16, 2010,
5   commencing at 9:09 a.m.
6
    APPEARANCES:
7
        FOR THE PLAINTIFF/COUNTERCLAIM DEFENDANTS:
8   Alexander Solo, Esq.
    asolo@stroock.com
9   STROOCK & STROOCK & LAVAN, LLP
    1280 Maiden Lane
10 New York, NY 10038
    p 212-806-5400 f 212-806-6006
11
12   FOR THE DEFENDANT/COUNTERCLAIM PLAINTIFF:
    Allan M. Soobert, Esq.
13 allansoobert@paulhastings.com
    PAUL, HASTINGS, JANOFSKY AND WALKER, LLP
14 875 15th Street, N.W.
    Washington, DC 20005
15 p 202-551-1822 f 202-551-0222
16
        ALSO PRESENT:
17 Scott Roberts - Videographer
18
19
20
21
22
23
24
25

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1   - - - -
2   P-R-O-C-E-E-D-I-N-G-S
3   - - - -
09:08:19   4   VIDEO OPERATOR: Good morning. My
09:08:21   5   name is Scott Roberts on behalf of Merrill
09:08:22   6   Legal Solutions, San Francisco. I'm the
09:08:24   7   videographer. Today is the deposition of
09:08:26   8   Dr. Peter Lucas. The date is June 16, 2010.
09:08:30   9   The time on the screen is 9:09 a.m. If the
09:08:33   10   court reporter could please swear in the
09:08:35   11   witness, we may proceed.
09:08:36   12   - - - -
09:08:36   13   PETER LUCAS, Ph.D.,
09:08:36   14   having been duly sworn,
09:08:36   15   was examined and testified as follows:
09:08:36   16   - - - -
09:08:36   17   EXAMINATION
09:08:36   18   - - - -
            BY MR. SOOBERT:
09:08:36   19
            Q. Good morning, Dr. Lucas. I'm Allan Soobert,
09:08:51   20
                we met before. Nice to see you this morning.
09:08:54   21
                Thank you very much for agreeing to sit for
09:08:56   22
                the deposition today.
09:09:00   23
                    Could you state your full name for
09:09:01   24
                the record, please.
09:09:02   25
            A. Peter Anthony Lucas.

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09:09:04	1	Q. Do you live in Pittsburgh?
09:09:05	2	A. Yes, well, a Pittsburgh suburb, Indiana
09:09:10	3	Township.
09:09:10	4	Q. Do you understand that there is a litigation
09:09:15	5	between Mirror Worlds and Apple that's in the
09:09:20	6	Tyler Texas jurisdiction in which your
09:09:25	7	testimony today may be used and played to the
09:09:28	8	jury in this case?
09:09:28	9	A. I do.
09:09:29	10	Q. Could you take us through your educational
09:09:36	11	history since graduating high school.
09:09:37	12	A. Since graduating high school, I have an
09:09:43	13	undergraduate degree in secondary education
09:09:47	14	from Pennsylvania State University. I also
09:09:50	15	have a master's degree in educational
09:09:53	16	psychology from the same institution, and a
09:09:58	17	Ph.D. from Cornell University in educational
09:10:02	18	psychology and measurement with emphasis on
09:10:07	19	cognitive psychology and psycholinguistics.
09:10:13	20	Q. When did you get those respective degrees?
09:10:16	21	A. My undergraduate degree is '74. My Ph.D. I
09:10:23	22	believe was '81, and master's was between
09:10:28	23	there somewhere. I would have to guess
09:10:35	24	something like '79, but I'm not sure.
09:10:37	25	Q. Did you conduct any specific doctoral

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09:10:40	1	research?
09:10:43	2	A. Yes. My doctoral dissertation had to do with
09:10:51	3	the use of the measurement of eye movements
09:10:55	4	during normal reading in order to basically
09:11:02	5	investigate fundamental processes involved in
09:11:07	6	the comprehension of language during reading.
09:11:11	7	Q. What about postdoctoral research, did you do
09:11:20	8	any postdoctoral research?
09:11:23	9	A. Yes, I spent two years at the University of
09:11:26	10	Wisconsin, where I worked in a laboratory
09:11:36	11	where we explored letter and word perception,
09:11:40	12	very low level processes, the effects of
09:11:49	13	orthographic regularity, that is letter and
09:11:51	14	word frequency on how quickly one can process
09:11:56	15	texts in a very fundamental psychological
09:11:59	16	research. I was also a Sloan postdoctoral
09:12:02	17	fellow at Carnegie Mellon University where I
09:12:06	18	pursued somewhat similar work.
09:12:08	19	Q. After that research work, did you at some
09:12:16	20	point take on employment?
09:12:19	21	A. Yes, at the conclusion of my fellowship at
09:12:26	22	CMU, that's Carnegie Mellon, I was invited to
09:12:32	23	stay on at the University as a research
09:12:39	24	scientist, and later promoted to a senior
09:12:41	25	research scientist, where I pursued my

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09:12:44	1	research. And also I was the director of the
09:12:52	2	research computing facilities in the
09:12:54	3	psychology department at CMU. And at that
09:12:58	4	time I pursued research kind of at the
09:13:00	5	intersection between human cognition and human
09:13:06	6	computer interaction.
09:13:07	7	Q. Roughly what time frame was that?
09:13:13	8	A. That would have been I would guess 1982 or '83
09:13:18	9	at the beginning, and ending in a fuzzy period
09:13:25	10	around 1989, 1990. It's fuzzy because we -- I
09:13:31	11	left CMU to help found MAYA Design, our
09:13:36	12	present company. But I maintained a part-time
09:13:39	13	appointment at CMU. As I recall, it was about
09:13:44	14	one day a week for several years thereafter.
09:13:49	15	But we started MAYA Design, which
09:13:51	16	became my principal place of employment, in --
09:13:55	17	the company was founded in late 1989, and we
09:13:58	18	began full-time operation in I believe
09:14:01	19	February of 1990.
09:14:02	20	Q. Were you one of the founders of MAYA?
09:14:07	21	A. Yes, there were three of us.
09:14:11	22	Q. What was the purpose of forming MAYA?
09:14:16	23	A. Well, very early on we registered the
09:14:20	24	trademark taming complexity, which probably
09:14:23	25	captures as well as anything what the idea

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09:14:27	1	was. We had perceived at that time that
09:14:31	2	issues around the increasing complexity of
09:14:35	3	computer-based products were going to become
09:14:38	4	increasingly an issue. And so the business
09:14:41	5	plan was to put together an interdisciplinary
09:14:45	6	company where we brought together engineers
09:14:49	7	and computer scientists, human factors
09:14:54	8	psychologists and traditional designers,
09:14:57	9	graphic designers and industrial designers,
09:15:02	10	brought all three of those disciplines
09:15:05	11	together in order to -- the context of a
09:15:08	12	product design consultancy.
09:15:08	13	Q. So, this was roughly 1989?
09:15:12	14	A. Yeah, we were incorporated in '89. We really
09:15:16	15	kind of started full-time operation early
09:15:18	16	1990.
09:15:19	17	Q. So, can you give me some examples of some
09:15:22	18	projects, then, you started working on when
09:15:25	19	MAYA was founded.
09:15:26	20	A. Well, we funded our startup on the basis of a
09:15:33	21	single large project, and that was a contract
09:15:38	22	with Digital Equipment Corporation, which at
09:15:41	23	first was called HyperFax, it's sort of an
09:15:47	24	internal code name, and later went under the
09:15:51	25	name of Workscape.

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09:15:54	1	And the idea behind that project,
09:15:59	2	which ultimately went on for a number of years
09:16:02	3	and was funded at a level of several million
09:16:11	4	dollars, was to produce an innovative product,
09:16:19	5	computer product focused at integrating
09:16:24	6	information in the office. So, it was
09:16:28	7	essentially an office document management
09:16:31	8	system as it evolved. But it had the specific
09:16:34	9	goal of threading together information that
09:16:39	10	came from multiple sources and presenting it
09:16:42	11	in a unified set of visualizations for office
09:16:46	12	workers.
09:16:47	13	Q. How long did you work on the HyperFax or
09:16:55	14	Workscape project?
09:17:00	15	A. In total, it probably ended up being at least
09:17:05	16	five years. I would have to check the exact
09:17:08	17	date. But we worked on it continuously -- it
09:17:12	18	was essentially our only project for the first
09:17:13	19	year of our existence. And we started on,
09:17:17	20	started taking on additional clients, but we
09:17:20	21	continued with Workscape I'm pretty certain at
09:17:26	22	least through 1995, possibly a little longer.
09:17:32	23	Q. Now, did you describe aspects of Workscape in
09:17:42	24	any publications or presentations?
09:17:44	25	A. Only once. There was a rather stringent

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09:17:49	1	confidentiality agreement in place with
09:17:51	2	Digital, so we had very little freedom to do
09:17:54	3	so. However, Digital gave us permission to
09:18:01	4	publish a summary of our findings to date at
09:18:12	5	the conference called CHI '94, CHI being
09:18:18	6	Computer Human Interaction, which is the name
09:18:22	7	of a special interest group. It's an annual
09:18:28	8	meeting where work of this kind is presented.
09:18:32	9	Q. What did you present at that conference?
09:18:34	10	A. We submitted a number of proposed papers of
09:18:45	11	which I believe two were accepted for
09:18:51	12	publication. There was a methodological paper
09:18:58	13	by my colleague, Joe Balay, who described kind
09:19:04	14	of the process of developing the project.
09:19:15	15	There was also a formal
09:19:17	16	demonstration, which was one of the sort of
09:19:20	17	formats that was available to the show where
09:19:23	18	you actually would come before a live audience
09:19:26	19	and give a live demonstration of a prototype
09:19:30	20	system. And I gave such a demonstration for
09:19:33	21	the conference. We also prepared a formal
09:19:44	22	videotape exhibition of the work. It was not
09:19:52	23	accepted for the formal program, but it was
09:19:55	24	distributed informally at the conference.
09:19:58	25	Q. Roughly when was that CHI '94 conference, if

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09:20:02	1	you can recall?
09:20:03	2	A. Well, obviously it was 1994. I couldn't tell
09:20:13	3	you the exact date. I believe CHI is always
09:20:16	4	held in the spring, though. It's certainly a
09:20:18	5	matter of record and easily determined.
09:20:20	6	Q. Certainly sometime in 1994?
09:20:22	7	A. Yes.
09:20:24	8	Q. And the video, is that the same video that you
09:20:33	9	produced to Apple in this case?
09:20:36	10	A. I'm not sure I understand the question.
09:20:38	11	Q. Let me ask it another way. You mentioned a
09:20:42	12	videotape that was informally distributed at
09:20:44	13	the conference?
09:20:45	14	A. Yes.
09:20:45	15	Q. Is that video one of the things that you gave
09:20:49	16	to the lawyers in this case?
09:20:53	17	A. Oh, the lawyers in this case, yes, indeed.
09:20:57	18	Q. The materials that you provided in giving to
09:21:05	19	the lawyers in this case, are those maintained
09:21:08	20	in the ordinary course of your business and
09:21:11	21	were in your files?
09:21:12	22	A. That's correct.
09:21:12	23	Q. You mentioned there were two papers accepted
09:21:17	24	for publication, and then you gave a formal
09:21:21	25	live demonstration of the system.

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09:21:23	1	A. That was one of the two.
09:21:25	2	Q. Oh, one of the two?
09:21:27	3	A. Yeah. I believe our work appears twice in the
09:21:34	4	program, the Balay paper and my live
09:21:37	5	demonstration.
09:21:37	6	Q. So I understand, the live demonstration, was
09:21:41	7	that something different than the video
09:21:43	8	presentation?
09:21:43	9	A. It covered much the same material, but
09:21:50	10	obviously being live is a little more
09:21:52	11	extemporaneous, and I also had a fair amount
09:21:56	12	of time. So, it may probably went into
09:22:01	13	significant more detail than the video did.
09:22:04	14	But I should mention that the material that
09:22:11	15	was cleared by Digital for release in the
09:22:16	16	video, the live demonstration and the paper
09:22:27	17	basically defines what we have always, what
09:22:34	18	we've been allowed to disclose publicly about
09:22:38	19	the work. Everything remains confidential.
09:22:41	20	MR. SOLO: Counsel, if you don't
09:22:42	21	mind, I would just like to put an objection on
09:22:44	22	the record regarding the tape. Alex Solo for
09:22:50	23	Mirror Worlds, we received a late production
09:22:52	24	of the tapes somewhere within the past two
09:22:55	25	days, and Mirror Worlds reserves the right to

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09:22:57	1	continue this deposition at a later date. And
09:22:59	2	also a separate objection that Mirror Worlds
09:23:02	3	reserves this right to strike portions of this
09:23:04	4	deposition and preclude evidence adduced to
09:23:15	5	the subpoena based upon the pending motion
09:23:18	6	before Judge Davis. Sorry for the
09:23:22	7	interruption.
09:23:23	8	MR. SOOBERT: We obviously disagree
09:23:25	9	with that, but we don't have to deal with that
09:23:26	10	here.
09:23:27	11	BY MR. SOOBERT:
09:23:27	12	Q. So, the CHI '94 conference where you gave the
09:23:30	13	live demonstration and the video was
09:23:33	14	distributed, was the video actually played as
09:23:36	15	well at the conference?
09:23:37	16	A. There was a room set up where contributed
09:23:47	17	videos, they were on VHS tapes at the time,
09:23:52	18	were made available to attendees at the
09:23:57	19	conference who would come in and they would --
09:24:01	20	it was sort of a self-service arrangement.
09:24:03	21	They would pick the videos that interested
09:24:05	22	them, and then they would watch them one at a
09:24:08	23	time.
09:24:10	24	Q. Do you know approximately law many folks
09:24:16	25	attend that, or attended that CHI '94

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09:24:20	1	conference?
09:24:20	2	A. I believe that the number is in the thousands,
09:24:24	3	but I really wouldn't know for sure.
09:24:29	4	Q. I understand. What types of persons attend
09:24:35	5	that conference?
09:24:36	6	A. Well, people from various disciplines and
09:24:45	7	industries who are interested in the broad
09:24:47	8	area of human computer interaction. It tends
09:24:50	9	to be a mix of primarily three kinds of
09:24:56	10	people: People with a psychology background
09:25:02	11	who are working in the general HCI field,
09:25:06	12	engineers working on products in that space,
09:25:11	13	and people from industry who are engaged in
09:25:21	14	development, product development in area like
09:25:25	15	that.
09:25:25	16	Q. How about academics such as professors and the
09:25:29	17	like?
09:25:29	18	A. Oh, yes, the first two categories are
09:25:34	19	predominantly -- well, the first category I
09:25:36	20	think is predominantly academic. I didn't
09:25:40	21	mean to imply that these were only people in
09:25:42	22	industry, but. So, for instance, people with
09:25:49	23	the psychology backgrounds, many of them work
09:25:52	24	for industry, but many others are academics.
09:25:57	25	Q. So, let's talk a little bit more about

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09:25:59	1	Workscape generally from that time frame and
09:26:02	2	what had been presented in your live
09:26:04	3	demonstration and the video. And I'll ask
09:26:06	4	some more follow-up questions.
09:26:09	5	But for now, just generally, what
09:26:11	6	was the purpose of Workscape?
09:26:15	7	A. The purpose, as I mentioned earlier, was to
09:26:22	8	create a computer application targeted
09:26:28	9	primarily for the office, for office workers
09:26:31	10	that would provide a single integrated
09:26:35	11	environment for managing, retrieving and
09:26:44	12	searching documents across multiple formats.
09:26:49	13	The sort of observation that we started with
09:26:52	14	was that increasingly at that time, although
09:26:57	15	the introduction of computers into the office
09:27:00	16	obviously increased efficiency in many ways,
09:27:04	17	it was also creating a certain kind of chaos,
09:27:08	18	because each computer application essentially
09:27:16	19	defined a data silo.
09:27:18	20	You would have to run one
09:27:20	21	application to read your E-mail, another one
09:27:22	22	the deal with scanned FAX'es, a third one to
09:27:26	23	look at data from a spreadsheet, a fourth one
09:27:30	24	for a calendar. And the sort of sense of
09:27:34	25	ecology that the paper-based office had was

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09:27:44	1	starting to fall apart in our judgment. And
09:27:47	2	we wanted to regain that ecology, the
09:27:50	3	uniformity and integrity that came when paper
09:27:53	4	was the sole medium in the office, and yet
09:27:56	5	maintain the advantages of computerization
09:27:59	6	that were becoming increasingly apparent at
09:28:05	7	the time.
09:28:06	8	So, with that as the top-level goal,
09:28:12	9	the approach we took was to create a client-
09:28:15	10	server application in which a single client
09:28:22	11	could connect simultaneously to multiple
09:28:27	12	heterogenous servers and sort of patch up the
09:28:32	13	differences in the way information was
09:28:34	14	represented in those, in each of those servers
09:28:40	15	by casting them into a single uniformed
09:28:44	16	document model. Then using that model to
09:28:49	17	present all of these kinds of information in a
09:28:55	18	uniform directly manipulable way, and then to
09:29:02	19	use that environment to create visualizations
09:29:05	20	in which large numbers of documents could be
09:29:07	21	organized and arranged along various criteria.
09:29:18	22	Q. So, was the Workscape client designed to work
09:29:23	23	with any particular computer system or?
09:29:26	24	A. Well, remember, we were doing prototype
09:29:32	25	developments. The arrangement with Digital

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09:29:36	1	was that the final productization would have
09:29:38	2	been theirs and done by their engineering
09:29:43	3	staff, and they would make business decisions
09:29:47	4	as to what it would be targeted on.
09:29:53	5	But our initial prototypes were, the
09:29:59	6	very earliest ones were done in a system
09:30:01	7	called HyperCard, which was an Apple
09:30:06	8	prototyping environment. When we started
09:30:07	9	doing more substantial prototyping, they were
09:30:10	10	initially done in a system at that time called
09:30:16	11	Motif. And ultimately, but before the product
09:30:19	12	was over, there were versions running on
09:30:23	13	Microsoft Windows as well.
09:30:25	14	Q. You mentioned that Workscape allowed you to
09:30:32	15	handle a number of document types. Can you
09:30:38	16	elaborate on the types of documents or texts
09:30:40	17	or video that could be organized.
09:30:45	18	A. Well, as I mentioned, the first code name of
09:30:50	19	the project was HyperFax, because one of the
09:30:55	20	types that we were particularly interested in
09:30:57	21	was images of paper documents. And since at
09:31:05	22	that time most information still existed on
09:31:08	23	paper, and therefore, scanning it into image
09:31:14	24	form and then manipulating those images was
09:31:16	25	very important.

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09:31:23	1	But we certainly also focused
09:31:25	2	significantly on things like E-mail and
09:31:33	3	reminder notes of various kinds. Some of our
09:31:36	4	early research showed that real people in real
09:31:42	5	offices make very creative use of post-it
09:31:46	6	notes, for example. So, we imported the
09:31:50	7	yellow sticky metaphor very early on into the
09:31:53	8	prototypes so that casual annotations of
09:31:59	9	documents and the ability to attach one
09:32:02	10	document on to another and to organize them
09:32:07	11	and arrange them on to calendars, for example,
09:32:10	12	so that a temporal ordering can be used as a
09:32:16	13	retrievable means, was something that we
09:32:21	14	focused on.
09:32:25	15	We talked about and designed the
09:32:27	16	system to be very general in that regard.
09:32:29	17	However, I don't believe we ever actually
09:32:35	18	prototyped a spreadsheet application, but it
09:32:38	19	was certainly intended to extend towards
09:32:44	20	numeric information as well.
09:32:45	21	Q. I may have missed it, but did you mention
09:32:48	22	video as well?
09:32:49	23	A. Well, this was 1990s, so video on computers
09:32:58	24	was barely practical. By the time the project
09:33:04	25	was over, I can't say for sure whether we

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09:33:11	1	actually prototyped anything in video. We may
09:33:15	2	or may not have. I know we were doing web
09:33:18	3	pages by the time it was over. I specifically
09:33:21	4	remember example demonstrations that we gave
09:33:31	5	to Digital that involved searching for web
09:33:34	6	pages. Did we have live video? It was
09:33:38	7	certainly anticipated. Whether we did it, I'm
09:33:42	8	not sure.
09:33:42	9	Q. And you mentioned temporal ordering. Can you
09:33:46	10	elaborate on that. What was the focus of
09:33:49	11	that?
09:33:49	12	A. Well, that was really just one example of a
09:33:52	13	much more general architectural approach that
09:33:59	14	we had. The idea was that we modeled -- our
09:34:05	15	document model basically consisted of
09:34:08	16	collections of what are called attribute value
09:34:11	17	pairs, where you take the information in the
09:34:13	18	document and break it into different parts.
09:34:18	19	For instance, an E-mail message
09:34:22	20	could be broken into the from field, the to
09:34:25	21	field, subject field, the date field and the
09:34:27	22	content field. And each field has a name,
09:34:32	23	hence, that's the attribute name, and then it
09:34:36	24	has a value, which would be the respective
09:34:41	25	information.

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09:34:41	1	The idea, the fundamental idea of
09:34:43	2	Workscape was that you could use the values of
09:34:49	3	any attribute to arrange the information in a
09:34:54	4	three-dimensional workspace. The dates and
09:35:01	5	times are simply an instance of that. So, we
09:35:08	6	used a pile metaphor where piles of documents
09:35:13	7	receiving back into space was one of a number
09:35:20	8	of visualizations that we employed. And it
09:35:24	9	was a very easy matter to select any attribute
09:35:28	10	that happens to be available in your files --
09:35:32	11	I'm sorry, in the documents and sort that pile
09:35:36	12	by that attribute. So, naturally one of the
09:35:40	13	most useful applications of that technique
09:35:44	14	involved selecting a date field and then
09:35:47	15	sorting the documents in the pile by date and
09:35:50	16	time.
09:35:55	17	Q. Now, you mentioned that Workscape would
09:35:58	18	interact with various repositories. Can you
09:36:01	19	kind of explain how that operated.
09:36:03	20	A. Well, it was a typical client-server
09:36:08	21	application, which was well known by this time
09:36:12	22	in the industry. Client-server refers to
09:36:20	23	there being two different processes, most
09:36:25	24	likely but not necessarily running on
09:36:27	25	different computers. And the two computers,

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09:36:31	1	the so-called client would connect to the
09:36:33	2	server over a computer network, and the
09:36:37	3	client's job would be to fetch certain
09:36:41	4	information and display it to the user for
09:36:48	5	interaction. Whereas, the server's job was to
09:36:51	6	serve as a repository of that information, to
09:36:54	7	provide persistent storage and to serve it up,
09:36:59	8	or serve pieces of it up to the client on
09:37:02	9	demand.
09:37:03	10	As I say, this was a very common
09:37:09	11	design pattern in the industry by this time.
09:37:12	12	And in fact, a little later when the worldwide
09:37:16	13	web came along, that kind of epitomizes the
09:37:22	14	client-server design pattern, whereas, the web
09:37:25	15	browser is the client and the web server is
09:37:28	16	the server.
09:37:30	17	Workscape, however, took one
09:37:31	18	relatively novel approach, and I don't know
09:37:34	19	whether we were the first to do it, but I'm
09:37:36	20	unaware of any prior art in this area. And
09:37:43	21	that is the single Workscape client was
09:37:50	22	capable of connecting simultaneously to any
09:37:54	23	number of servers. This derived directly from
09:37:58	24	the goal, which I explained earlier of
09:38:00	25	bringing together information from

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09:38:04	1	heterogeneous sources and presenting it to the
09:38:07	2	user in a unified model.
09:38:11	3	There were significant technical
09:38:17	4	difficulties in doing this, primarily having
09:38:21	5	to do with the fact that different servers --
09:38:26	6	every server basically has its own idea of how
09:38:31	7	to model the data. There's a notion that
09:38:35	8	people in the trade refer to as metadata, data
09:38:39	9	about the data. For instance, the date an
09:38:43	10	E-mail was created could be considered
09:38:46	11	metadata about the E-mail. And metadata is
09:38:50	12	obviously very important if you're going to
09:38:52	13	find things. The problem is that if you have
09:38:59	14	two or three or four different servers, they
09:39:03	15	all have somewhat different metadata models.
09:39:09	16	And how you can unify those things and meet
09:39:11	17	the goals of the project were one of the major
09:39:16	18	sort of research goals of the Workscape
09:39:18	19	project.
09:39:18	20	Q. So, for example, if we had a, you know, a
09:39:23	21	repository that had thousands of documents on
09:39:26	22	it, could Workscape search and retrieve all of
09:39:33	23	those documents?
09:39:34	24	MR. SOLO: Objection, form.
09:39:36	25	A. Well, what would -- the basic answer is yes.

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09:39:45	1	You would typically not retrieve all of them,
09:39:48	2	but you certainly could. What would normally
09:39:51	3	happen was that a query would go to the server
09:39:56	4	and the server would find the subset of the
09:40:04	5	documents that matched that query or that
09:40:06	6	filter, if you will, and send them to the
09:40:11	7	client. Of course a trivial example of that
09:40:16	8	is a query that matched all documents, and
09:40:19	9	that would certainly be possible. And if you
09:40:22	10	did that, you would get them all back.
09:40:24	11	However, we were designing under the
09:40:26	12	assumption that there would be, ultimately be
09:40:29	13	very large number, extremely large numbers of
09:40:32	14	documents in the server. So, that was not the
09:40:36	15	typical case.
09:40:37	16	Q. But you could do that; right?
09:40:39	17	A. Yes.
09:40:40	18	Q. And how would you do that? I mean, is there a
09:40:43	19	particular search query that could generate
09:40:46	20	all of the documents from the repository?
09:40:48	21	A. Yeah, typically --
09:40:49	22	MR. SOLO: Objection, form.
09:40:50	23	A. Typically there would be what at that time was
09:40:56	24	called a wild card search, where I believe in
09:41:01	25	the Digital systems of the time, you would use

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09:41:05	1	an asterisk, and an asterisk was a so-called
09:41:10	2	wild card character that would match
09:41:13	3	anything. So, if you simply did a search for,
09:41:17	4	say, where the filter was give me every
09:41:21	5	document named asterisk, it would conclude
09:41:27	6	that you wanted all documents and would
09:41:32	7	retrieve them all.
09:41:32	8	Q. And what would happen once they were retrieved
09:41:36	9	from Workscape, how would they be presented?
09:41:37	10	A. Workscape was a highly scripted application,
09:41:45	11	so is there is no single answer to that
09:41:49	12	question. There could be a great number of
09:41:53	13	different visual presentations. But what was
09:41:57	14	fundamental was that the documents were always
09:42:01	15	presented to the user in what we called a
09:42:04	16	workspace, which is a three-dimensional
09:42:10	17	virtual space rendered to the user that
09:42:14	18	contained two dimensional representations of
09:42:18	19	each document.
09:42:22	20	So, basically each document was
09:42:24	21	presented as a two-dimensional rectangle with
09:42:30	22	some or all of the contents of the document
09:42:34	23	rendered within that rectangle. And they were
09:42:38	24	rendered in a three-dimensional perspective
09:42:41	25	arrangement, and the user was able to directly

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09:42:44	1	manipulate those documents. They could, just
09:42:47	2	as you can drag documents in two dimensions on
09:42:50	3	a conventional desktop, you could drag
09:42:55	4	documents in three dimensions in Workscape.
09:42:59	5	So, in addition to moving left, right and up,
09:43:02	6	down, you could pull them forward and push
09:43:04	7	them back, and they would occlude each other
09:43:07	8	and receive back into distance, according to a
09:43:11	9	perspective function, as if they were physical
09:43:13	10	objects arranged in a three-dimensional
09:43:17	11	space.
09:43:17	12	Q. Now, you mentioned a rectangle. Did those
09:43:22	13	represent a particular document?
09:43:24	14	A. Yeah, there was a one-to-one correspondence
09:43:27	15	between documents brought into the workspace
09:43:29	16	and the rectangles on the screen. So, each
09:43:33	17	document, within each workspace, and you could
09:43:37	18	have multiple workspaces on your screen if you
09:43:40	19	wanted to, but within each workspace, each
09:43:43	20	document was represented exactly once.
09:43:45	21	Q. Back to the example of pulling all of the
09:43:51	22	documents from the repository using the wild
09:43:55	23	card search, could those be returned and
09:43:58	24	displayed to the user in a temporal
09:44:02	25	chronological order?

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09:44:03	1	A. Yes, one of the typical initial visualizations
09:44:10	2	in which search results were presented in
09:44:14	3	Workscape was as a pile receding back into
09:44:18	4	three dimensions. There was a technical
09:44:25	5	device called a strand, which was basically a
09:44:32	6	programming abstraction that we developed for
09:44:36	7	this purpose.
09:44:39	8	What a strand is, is a
09:44:42	9	one-dimensional path defined through the
09:44:46	10	three-dimensional space. You could think of
09:44:51	11	it as a string upon which would you could
09:44:54	12	thread beads, where the strand was the string
09:44:57	13	and the documents were the beads. So, this
09:44:59	14	was essentially what's called a constraint
09:45:02	15	mechanism, which constrained where in the
09:45:04	16	workspace the documents were allowed to go.
09:45:09	17	It was a completely general mechanism. You
09:45:13	18	could create strands in any orientation.
09:45:16	19	If you made a strand that was
09:45:18	20	parallel to the screen, you would get a tiling
09:45:21	21	effect where the documents would be arranged
09:45:26	22	in columns or rows, depending on whether it
09:45:29	23	was a horizontal or vertical tile. However,
09:45:32	24	if the strand receded back into the third
09:45:36	25	dimension, the documents would follow it and

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09:45:39	1	you would get, you know, the effect of a
09:45:44	2	three-dimensional pile with the documents in
09:45:46	3	front, partially occluding the documents in
09:45:49	4	the back.
09:45:53	5	Very typically the standard way of
09:45:59	6	displaying a search result was by creating a
09:46:03	7	strand going straight back towards the back of
09:46:06	8	the workspace and, therefore, presenting the
09:46:13	9	documents in a pile. It was under the user
09:46:17	10	control how the resulting documents were
09:46:20	11	ordered. But typically the system would be
09:46:28	12	configured to order them by date and time.
09:46:30	13	So, for instance, you might have the most
09:46:33	14	recently created documents in the front and
09:46:36	15	the oldest documents in the box, although the
09:46:38	16	user could just flip a switch, which would
09:46:41	17	reverse that, and have the oldest documents in
09:46:44	18	the front. I want to emphasize that that was
09:46:47	19	by no means the only way that the documents
09:46:49	20	could be arranged, but it was an extremely
09:46:52	21	useful and a very common one.
09:46:56	22	Q. How would the Workscape system do that --
09:47:03	23	strike that.
09:47:04	24	Was there an attribute that
09:47:09	25	identified the time that each document was

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09:47:10	1	created?
09:47:11	2	A. There were no required attributes, at least
09:47:17	3	none that I could recall. Basically which
09:47:20	4	attributes were available on a given document
09:47:26	5	was a function of the metadata model from the
09:47:34	6	source repository, so that wasn't under our
09:47:38	7	control. We wanted to be able to accept
09:47:38	8	documents from the preexisting sources. So,
09:47:40	9	it was not possible for us to require any
09:47:45	10	given attribute. However, as a practical
09:47:53	11	matter, virtually all legacy repositories, and
09:47:58	12	certainly any purpose build repository we
09:48:05	13	might have created would maintain a date
09:48:08	14	attribute, and that is -- so, in almost all
09:48:18	15	cases, the date attribute would be available,
09:48:20	16	and therefore, the mechanism that I have just
09:48:23	17	described would work properly.
09:48:25	18	Q. So I'm clear, the example we were talking
09:48:30	19	about, retrieving all of the documents from a
09:48:33	20	repository and putting them in date order
09:48:37	21	presented to the user in the workspace on
09:48:40	22	Workscape, how would it go about determining
09:48:51	23	which documents go where based on date?
09:48:54	24	MR. SOLO: Objection, form.
09:48:55	25	A. I'm not sure I understand the question.

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09:48:59	1	Q. Let me try that again. How would the system
09:49:07	2	functionally put those documents that were
09:49:09	3	retrieved from the repository in the temporal
09:49:14	4	order?
09:49:14	5	MR. SOLO: Objection, form.
09:49:16	6	A. Well, each time a document -- the documents
09:49:18	7	would come in one by one from the repository.
09:49:26	8	The script that was managing the arrangement
09:49:28	9	of the documents in the workspace would
09:49:32	10	examine them, check to make sure, if, for
09:49:38	11	instance, it was arranged by date, it would
09:49:41	12	check to make sure that there was a date
09:49:43	13	field. If there wasn't, it would have to do
09:49:47	14	some exception mechanism, either ignore the
09:49:52	15	document or put it to the back of the pile or
09:49:55	16	whatever. That would just be up to the
09:49:57	17	scripter what to do in that case. But
09:49:59	18	typically the date field would be there.
09:50:01	19	It would then search the strand, and
09:50:08	20	the strand defined a specific ordering of the
09:50:14	21	developments, just as the beads on a string
09:50:17	22	are in a well-defined order, the documents on
09:50:19	23	the strand would be in a well-defined order.
09:50:22	24	And since it was maintaining that order by
09:50:25	25	date, all it would have to do would be to

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09:50:28	1	search from the beginning of the strand until
09:50:30	2	it found a document whose date was later than
09:50:33	3	the one that it was dealing, and it would
09:50:35	4	insert it in front of that, assuming of course
09:50:41	5	that we're talking about ascending order.
09:50:44	6	Q. And the most recent documents would be
09:50:45	7	presented at the front of the stack or pile?
09:50:49	8	A. Well, as I said, that was under user control.
09:50:52	9	There was just a switch that said forward or
09:50:55	10	reverse sort order, and the user could change
09:50:57	11	that at any time, in which case the order of
09:51:00	12	the documents would immediately reverse
09:51:04	13	themselves.
09:51:04	14	Q. If I as a user had the system set to have the
09:51:08	15	oldest ones towards the back, so they're
09:51:12	16	receding off into the distance, then the most
09:51:15	17	recent one would be in the front of the stack?
09:51:18	18	A. Correct.
09:51:18	19	Q. Was there any capability to add documents with
09:51:24	20	future dates to the front of the stack?
09:51:26	21	A. Oh, of course, it made no difference at all.
09:51:30	22	The dates were dates. If the most recent date
09:51:36	23	were far into the future, it would still be
09:51:41	24	the first one on the stack. But that made no
09:51:46	25	difference whatsoever. There were also

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09:51:52	1	situations where the date had to be in the
09:51:55	2	future, or at least in order to be useful, it
09:51:58	3	did. There was a feature in Workscape called
09:52:01	4	a reminder note, and it was a variant of the
09:52:05	5	yellow sticky mechanism, which I described
09:52:08	6	before, that had a field on it to put a date
09:52:11	7	and time that the user wished to be reminded
09:52:14	8	about something. And of course the only thing
09:52:18	9	that would make sense would be for the date
09:52:21	10	field of that to be in the future, at least
09:52:25	11	initially.
09:52:25	12	The way that worked is when that
09:52:28	13	point in time arrived, the yellow sticky would
09:52:33	14	move itself all the way forward to the front
09:52:35	15	of the workspace and possibly turn a different
09:52:37	16	color to attract attention. And since it was
09:52:41	17	a sticky note, it could have been attached to
09:52:44	18	another document as well, and that document
09:52:46	19	would have been pulled forward along with it.
09:52:52	20	So, I mention that because that's an example
09:52:54	21	of a situation in which the date would
09:52:57	22	necessarily be in the future. But again, I
09:53:02	23	want to emphasize the generality of the
09:53:06	24	architecture, dates are dates, past, present
09:53:08	25	or future.

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09:53:14	1	Q. Let's say I had retrieved all of those
09:53:17	2	documents from the repository and I had this
09:53:20	3	strand or stack ordered in this manner, with
09:53:24	4	the oldest ones towards the back and the
09:53:24	5	present and future ones towards the front, if
09:53:26	6	I as a user generated or created a new
09:53:31	7	document using or on workspace, would that get
09:53:34	8	added into the stack?
09:53:37	9	MR. SOLO: Objection, form.
09:53:38	10	A. Well, once again, that was under the user
09:53:41	11	control. Typically -- I shouldn't say
09:53:47	12	typically, because I guess they're both
09:53:50	13	typical. But in one case, if I simply created
09:53:52	14	a document, it would just stay where I put it
09:53:56	15	unless I dropped it on the stack, in which
09:54:00	16	case it would, the script that was managing
09:54:03	17	the stack would treat it as if it had come
09:54:06	18	from the repository and insert it in its
09:54:10	19	proper place in the stack.
09:54:12	20	However, it was also possible to
09:54:14	21	have what we called a persistent search in
09:54:17	22	which the script ran periodically, or even
09:54:24	23	technically constantly searching for new
09:54:26	24	documents that matched its search criteria.
09:54:31	25	And if you had that turned on for this

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09:54:34	1	particular pile, it would -- the document
09:54:40	2	would automatically get added to the pile.
09:54:42	3	Q. So, the document -- strike that.
09:54:51	4	The script was constantly running
09:54:54	5	you said?
09:54:54	6	A. Well, strictly speaking, periodically, but it
09:54:58	7	could be very frequent, several times a
09:55:02	8	second, for instance.
09:55:03	9	Q. Right, I didn't mean to misspeak. I'll say it
09:55:09	10	another way. The script would allow the
09:55:13	11	document stack to be constantly updated?
09:55:16	12	A. Yes, that was one option.
09:55:18	13	Q. Such that it was persistent?
09:55:19	14	A. Correct.
09:55:29	15	MR. SOOBERT: This would be a good
09:55:30	16	time to take a five-minute break.
09:55:33	17	VIDEO OPERATOR: We're going off the
09:55:34	18	record. The time is 9:56 a.m.
	19	- - - -
	20	(There was a recess in the
	21	proceedings.)
	22	- - -
10:04:12	23	(Deposition Exhibit No. 1 was
10:04:12	24	marked for identification.)
10:04:12	25	- - - -

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10:04:12	1	VIDEO OPERATOR: Back on the
10:04:18	2	record. The time is 10:05 a.m. You may
10:04:21	3	proceed.
10:04:21	4	BY MR. SOOBERT:
10:04:21	5	Q. I want to return to the rectangles that were
10:04:29	6	presented to workspace on the Workscape
10:04:35	7	viewer, were those abbreviated forms of the
10:04:39	8	documents?
10:04:40	9	MR. SOLO: Objection, form.
10:04:41	10	A. Often they were, yes. It depends on the
10:04:44	11	content of the document. If it was very
10:04:47	12	simple, say an entry for a calendar, it might
10:04:51	13	contain only the date. So, it could have been
10:04:54	14	the entirety of the document. But more
10:04:56	15	typically, if it was a multi-page scanned
10:04:59	16	document or a long E-mail, then it would have
10:05:02	17	to show some abbreviation, perhaps just the
10:05:05	18	name, perhaps the first page. Again, as in
10:05:09	19	everything else in the application, or almost
10:05:11	20	everything else, it is under the control of
10:05:13	21	the scripter. So, it's a very, very flexible
10:05:17	22	approach.
10:05:17	23	Q. Were users required to name documents that
10:05:24	24	were put into the stack or organized by
10:05:29	25	Workscape?

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10:05:30	1	MR. SOLO: Objection, form.
10:05:31	2	A. No, they were able to typically, but the
10:05:33	3	documents have what's called a unique
10:05:39	4	identifier, basically just a number that is
10:05:42	5	assigned only to that particular document.
10:05:47	6	And the identity of the document is determined
10:05:49	7	by the UID. There's a subtle distinction here
10:05:57	8	between an identifier and a name. In
10:06:02	9	Workscape, the identifiers had to be unique,
10:06:04	10	but users really never saw them. A document
10:06:09	11	could have a name, it didn't have to. It
10:06:13	12	could even have multiple names if you wanted
10:06:15	13	to. But it wasn't the name that was
10:06:18	14	important, it was the identifier.
10:06:25	15	Q. How was the identifier used, if at all, to
10:06:28	16	order documents in temporal?
10:06:30	17	A. It wasn't, the identifiers were just what's
10:06:34	18	technically called nominal, that is they had
10:06:37	19	no semantics to them at all. So, ordering
10:06:43	20	them wouldn't make any sense, because the
10:06:45	21	numbers are completely arbitrary, they might
10:06:49	22	as well just be random numbers.
10:06:55	23	Q. Does Workscape have any indexing capability of
10:06:59	24	those numbers?
10:07:00	25	A. Of which numbers?

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10:07:02	1	Q. The unique identifiers.
10:07:04	2	A. Well, the unique identifiers -- this gets a
10:07:11	3	little technical. The unique identifiers are
10:07:15	4	the handles that the program itself would use
10:07:21	5	to store and retrieve developments. So, yes,
10:07:33	6	in some sense, any practical implementation of
10:07:35	7	this design would maintain an index in order
10:07:39	8	to make that operation efficient. But if I
10:07:43	9	wanted to fetch a particular document from a
10:07:48	10	repository, the query that I would send to the
10:07:53	11	repository would include that UID, and
10:07:57	12	presumably any well-designed repository would
10:08:03	13	keep an index of that UID in order to make
10:08:05	14	that retrievable official.
10:08:07	15	Q. Let's talk about an example. Let's say a
10:08:14	16	repository has all of the documents for my
10:08:18	17	family, including my documents, my wife's
10:08:20	18	documents and my kid's documents. And I
10:08:26	19	could, based on what you've testified to, go,
10:08:29	20	using Workscape, and retrieve from the
10:08:32	21	repository all of my family's documents;
10:08:37	22	correct?
10:08:37	23	A. Yes.
10:08:37	24	Q. Could I return those and generate a stack of
10:08:44	25	the document rectangles in temporal order?

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10:08:53	1	MR. SOLO: Objection, form.
10:08:54	2	A. Sure.
10:08:54	3	Q. Once I have those documents, let's say my kids
10:08:57	4	would like to filter them just to organize and
10:09:03	5	retrieve my wife's documents, say mom's
10:09:06	6	documents, is that possible?
10:09:10	7	MR. SOLO: Objection, form.
10:09:11	8	A. Assuming there is some attribute in the
10:09:13	9	documents that defines mom's documents, for
10:09:17	10	instance, there could be an owner attribute or
10:09:20	11	you could retrieve every document whose title
10:09:28	12	contained the word mom, would be another way
10:09:30	13	of approaching it. So, if you stipulate that
10:09:35	14	there is some way to tell which is which, then
10:09:39	15	the answer is yes.
10:09:40	16	Q. So, can you walk me through how that process
10:09:45	17	might work from the initial query through the
10:09:48	18	presentation of mom's documents.
10:09:50	19	A. Are we assuming that all of the documents are
10:09:58	20	already in workspace?
10:09:59	21	Q. They're on the repository.
10:10:01	22	A. They're on the repository. Well, I would --
10:10:10	23	if I wanted to start by retrieving all of the
10:10:13	24	documents, I would do the wild card search
10:10:15	25	that we already described, all of the

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10:10:17	1	documents would be brought into the workspace,
10:10:19	2	presumably stored on a strand, so they would
10:10:26	3	be represented in a way that the user would
10:10:28	4	see as a pile. I would then use a tool called
10:10:36	5	the find tool. We haven't talked about tools
10:10:39	6	yet, but there's a special kind of document
10:10:45	7	that contains scripts in Workscape, and those
10:10:50	8	special documents are called tools. And one
10:10:53	9	example of a tool is the find tool. In fact,
10:10:56	10	I've already used the find tool to fetch the
10:11:00	11	documents from the repository.
10:11:01	12	I could then, however, apply the
10:11:04	13	find tool to the pile rather than to the
10:11:08	14	repository. So, I essentially point the find
10:11:11	15	tool at the pile that contains all of the
10:11:13	16	documents. Well, to use one of my
10:11:20	17	hypotheticals, suppose I wanted to retrieve
10:11:23	18	all of the documents whose title contained the
10:11:26	19	word mom, I would use the find tool to perform
10:11:31	20	a filter query that would say, retrieve all
10:11:35	21	documents whose title field contains the
10:11:46	22	string mom. And then all of those, the subset
10:11:51	23	of the documents would be designated and then
10:11:53	24	some operation could be performed on them.
10:12:03	25	I could do any number of things at

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10:12:05	1	that point. I could create a separate pile of
10:12:08	2	just those documents, I could simply mark
10:12:10	3	them, select them as it's known, or I could
10:12:16	4	tag them with sort of a small version of the
10:12:20	5	yellow sticky documents that we talked about
10:12:22	6	earlier that could be used as little tags on
10:12:25	7	the edge of the documents. All three of those
10:12:28	8	operations would be possible.
10:12:29	9	Q. Can you describe how mom's documents would be
10:12:39	10	temporally ordered.
10:12:39	11	A. Well, no different from the previous cases
10:12:43	12	we've described. Assuming that I chose to
10:12:48	13	move them into a separate strand, they would
10:12:51	14	be ordered whichever way the find tool was
10:12:53	15	configured to keep them sorted. It could be
10:12:58	16	the same temporal ordering as the original
10:13:01	17	pile or a different one.
10:13:02	18	Q. Functionally does that involve any filtering?
10:13:09	19	A. Well, the sub-string search that I described
10:13:12	20	is a kind of filtering, because I was taking
10:13:14	21	the large number of documents that appeared in
10:13:18	22	the original strand and I was running it
10:13:22	23	through what is effectively a filter to filter
10:13:27	24	out the documents that do not contain mom in
10:13:29	25	their title field.

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10:13:36	1	Q. And that -- strike that. Would that -- strike
10:13:41	2	that.
10:13:41	3	Do you recall discussing a few
10:13:44	4	minutes ago the persistent nature of the
10:13:48	5	sub-strings?
10:13:48	6	MR. SOLO: Objection, form.
10:13:51	7	A. Of the searches?
10:13:51	8	Q. Yes, of the searches. Can you describe to me
10:13:56	9	how new documents, if at all, might be added
10:14:01	10	to the sub-string.
10:14:03	11	A. Well, there are two ways that could have
10:14:12	12	happened: If I had a persistent search on the
10:14:16	13	repository and some other user or some other
10:14:20	14	client created a new document in the
10:14:25	15	repository, the persistent search would note
10:14:28	16	that immediately and then fetch the new
10:14:34	17	document into the workspace.
10:14:38	18	The user also could have created a
10:14:41	19	new document just within the workspace. There
10:14:43	20	was a kind of tool known as a dispenser, which
10:14:50	21	you could think of it metaphorically as a pad
10:14:54	22	of paper where I could tear off new documents
10:14:57	23	of various kinds. And the user could have
10:15:00	24	torn off a new document and then typed
10:15:04	25	something in the subject field, which may or

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10:15:08	1	may not contain the string mom. If it did, it
10:15:13	2	could be noted by the persistent query.
10:15:15	3	Q. You mentioned that Workscape, at least
10:15:22	4	initially, was designed to operate on an Apple
10:15:26	5	operating system; is that correct?
10:15:27	6	A. No. The first prototype was done on an Apple,
10:15:32	7	but it was not targeted for the Apple
10:15:35	8	platform. We were simply using the Apple
10:15:38	9	machines as a prototyping tool.
10:15:40	10	Q. I see.
10:15:41	11	A. There was nothing to preclude it. What I did
10:15:44	12	say is that it would have been a Digital
10:15:47	13	business decision, which platforms the final
10:15:49	14	product, was targeted for. That would have
10:15:52	15	been out of our domain.
10:15:53	16	Q. In terms of the repositories, can you describe
10:16:01	17	to me what types of operating systems those
10:16:03	18	repositories might be utilizing.
10:16:05	19	A. That was completely open. Remember the
10:16:10	20	initial goal was to bring together documents
10:16:13	21	of all kinds. That's one of the great
10:16:16	22	advantages of a client-server architecture, is
10:16:19	23	that you don't have to answer that question.
10:16:23	24	There's simply a protocol on the wire, as the
10:16:28	25	engineers say, that specifies the way that

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10:16:34	1	these query operations involving the unique
10:16:37	2	identifiers or filter strings would permit the
10:16:43	3	client, would permit Workscape to speak to any
10:16:48	4	repository. As long as that protocol was
10:16:52	5	matched, the servers could be on any
10:16:55	6	architecture whatsoever.
10:16:57	7	Q. Can you describe to me the extent in which
10:17:04	8	Workscape in that client-server configuration
10:17:08	9	would access, if at all, the subsystems of the
10:17:12	10	repository operating system.
10:17:14	11	MR. SOLO: Objection, form.
10:17:16	12	A. Could you define the term subsystem for me.
10:17:18	13	Q. Any functionality regarding the operating
10:17:23	14	systems.
10:17:25	15	MR. SOLO: Objection, form.
10:17:26	16	A. And you're asking about the repositories?
10:17:34	17	Q. Yes.
10:17:34	18	A. Or are you asking about Workscape?
10:17:37	19	Q. Let me back up. Can you describe to me how
10:17:44	20	Workscape, on the client-server configuration
10:17:48	21	we just described, might interact with the
10:17:51	22	repository.
10:17:52	23	A. Workscape would interact with the repository
10:18:00	24	exclusively through an abstract protocol,
10:18:08	25	often called a wire protocol. The only -- the

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10:18:12	1	communications that happen between the
10:18:18	2	Workscape client and the server is defined by
10:18:22	3	that protocol and is very limited. It has to
10:18:25	4	do with sending search queries and getting
10:18:32	5	responses back.
10:18:37	6	So, Workscape is isolated from the
10:18:43	7	details of the server machines. However, the
10:18:52	8	situation is different with respect to the
10:18:54	9	client machine, because Workscape itself is an
10:18:57	10	application running on top of some operating
10:19:01	11	system presumably, and therefore, like any
10:19:06	12	software application on an operating system,
10:19:08	13	it needs to access the resources of the
10:19:14	14	machine upon which it's running, memory and
10:19:17	15	the screen, et cetera.
10:19:18	16	Q. Can you describe for me how Workscape went --
10:19:28	17	strike that.
10:19:28	18	Can you describe for me how
10:19:31	19	Workscape might send a query to a repository
10:19:35	20	and what the repository, if at all, might do
10:19:38	21	to respond to that query.
10:19:40	22	A. There are basically two different fundamental
10:19:47	23	operations that are possible: If the client
10:19:50	24	already knows the unique identifier of the
10:19:53	25	document, it would send to, over the wire,

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10:20:00	1	over the network, it would send that unique
10:20:05	2	identifier and the names of the attributes
10:20:09	3	that it was interested in, or it could ask for
10:20:14	4	all of the attributes, in which case it would
10:20:17	5	get the entire document. And in response to
10:20:22	6	that, it would be the server's responsibility
10:20:22	7	to extract that information from whatever
10:20:27	8	internal persistent representation it has of
10:20:30	9	the document and return it to the client,
10:20:33	10	which the client would then use in rendering
10:20:37	11	the rectangles on the screen. So, that's the
10:20:39	12	first operation.
10:20:40	13	The second operation that is
10:20:41	14	necessary is a query, it's the filter
10:20:51	15	operation that we were discussing earlier, in
10:20:53	16	which I might send to the server a string
10:21:00	17	similar -- just to continue with the example
10:21:01	18	we used earlier, I would say, please send me
10:21:05	19	the unique identifiers of any documents that
10:21:08	20	you have whose title field contains the string
10:21:15	21	mom. That's an operation that a server might
10:21:18	22	well support. And in response to that query,
10:21:26	23	the Workscape client would receive a list of
10:21:31	24	UIDs of the documents that match that query.
10:21:35	25	And that's how the client would learn the UIDs

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10:21:40	1	of new documents in the first place, and it
10:21:42	2	would presumably use them to fetch the
10:21:45	3	documents.
10:21:45	4	Q. I'd like to play for you now the video that's
10:21:59	5	been marked as Lucas Exhibit 1, which is the
10:22:05	6	video that you produced in this case regarding
10:22:11	7	your Workscape demonstration. We'll run
10:22:23	8	through the video, it's about 12 minutes long,
10:22:26	9	and we'll have some questions about it.
10:22:42	10	A. Okay.
	11	- - - -
	12	(Video Being Played.)
	13	- - - -
10:22:58	14	Not long ago, nearly all office
10:23:01	15	information was stored on a common medium,
10:23:02	16	namely paper. It may not have been efficient,
10:23:05	17	but it was simple, consistent and intuitive.
10:23:08	18	The arrival of the computer changed all that.
10:23:12	19	Much information still resides on paper, but
10:23:15	20	increasingly office information is arriving in
10:23:18	21	the form of computer databases, E-mail,
10:23:20	22	scanned images and all electronic documents.
10:23:24	23	There are good computer tools for dealing with
10:23:27	24	each of these, but increasingly the grouping
10:23:29	25	and coordination of information from multiple

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10:23:30	1	sources has become difficult.
10:23:33	2	The work described in this video
10:23:35	3	represents an effort to regain the simplicity
10:23:38	4	and consistency of paper documents in the
10:23:39	5	context of the modern electronic office. The
10:23:43	6	work is embodied in a prototype office
10:23:46	7	information management product known as
10:23:49	8	Workscape. It was commissioned by Digital
10:23:52	9	Equipment Corporation and produced at MAYA
10:23:54	10	Design Group in collaboration with digital
10:23:57	11	engineering staff.
10:23:57	12	The project has the following
10:23:59	13	specific design goals: First, to provide a
10:24:02	14	single uniform computer application capable of
10:24:06	15	presenting information to office workers
10:24:08	16	without regard to the information source or
10:24:10	17	the form of its underlying representation.
10:24:13	18	Second, to define an interface paradigm, which
10:24:16	19	would permit users to organize and deal
10:24:20	20	meaningfully with hundreds of documents at
10:24:22	21	once. Third, to define a product which is
10:24:25	22	simple and intuitive enough to succeed as a
10:24:28	23	front office application, part of the fabric
10:24:31	24	of daily work, and not just a tool for back
10:24:33	25	room specialists.

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10:24:33	1	MAYA's design efforts began with a
10:24:35	2	series of field studies of workplace
10:24:38	3	environments in which such a product might be
10:24:40	4	used. A field research team consisting of a
10:24:43	5	human factors specialist and an industrial
10:24:46	6	designer conducted interviews and
10:24:49	7	observational studies of 22 individuals from 7
10:24:52	8	different work environments. The goal was to
10:24:54	9	broaden our understanding of how office
10:24:56	10	workers organized their workspaces to support
10:24:59	11	the access, storage and retrieval of
10:25:02	12	information.
10:25:03	13	Several robust findings emerged from
10:25:06	14	these studies. First, our subjects made
10:25:08	15	extensive use of spatial arrangements of paper
10:25:11	16	as a device for short-term storage and
10:25:13	17	organization of documents. For many users,
10:25:16	18	piles of documents were the dominant means of
10:25:19	19	organizing their world. Second, we observed
10:25:22	20	many instances of the extensive use of post-it
10:25:25	21	notes as a medium for capturing, arranging and
10:25:29	22	sharing small chunks of information, often in
10:25:33	23	creative ways.
10:25:34	24	A key advantage of this medium
10:25:35	25	appeared to be a flexibility and modularity

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10:25:37	1	for the manipulation of small units of
10:25:40	2	information. These concepts of data
10:25:43	3	modularity and spatial organization are
10:25:44	4	directly reflected in Workscape's interface
10:25:47	5	metaphor. This metaphor contains only a
10:25:52	6	single uniform data object known simply as a
10:25:53	7	document. Documents are represented to the
10:25:56	8	user as two-dimensional objects rendered in a
10:26:00	9	three-dimensional virtual workspace. This
10:26:04	10	HyperCard stack written in 1990 and known as
10:26:06	11	200 points of light was the first embodiment
10:26:09	12	of the interface concept.
10:26:11	13	Documents here represented as tiny
10:26:13	14	rectangles off in the distance can be
10:26:19	15	interactively arranged in three ways, either
10:26:19	16	by direct manipulation or by using scripted
10:26:22	17	stools. In this demonstration, the documents
10:26:25	18	are first sorted in the depth dimension by
10:26:29	19	date, with the newest documents moving forward
10:26:32	20	towards the viewer. Next, the documents are
10:26:34	21	sorted in the X dimension by type, with, for
10:26:37	22	example, E-mail messages in one column,
10:26:40	23	scanned documents in another, and so on.
10:26:44	24	Other tools can be used to form interactive
10:26:47	25	searches for documents along various

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10:26:49	1	dimensions.
10:26:49	2	For instance, this date slider can
10:26:51	3	be used to restrict the field of view to
10:26:54	4	documents which were created within a
10:26:55	5	specified range of dates. These simple
10:27:02	6	techniques form the basis of a powerful and
10:27:04	7	intuitive method of locating and organizing
10:27:05	8	on-line document of all types. Once the basic
10:27:10	9	interface paradigm was established, a series
10:27:13	10	of purely graphical studies were carried out,
10:27:16	11	exploring visual and aesthetic aspects of the
10:27:17	12	evolving design. These studies were done
10:27:20	13	early in the project so that the technical
10:27:23	14	implications and the graphical goals could be
10:27:26	15	anticipated early in the engineering cycle.
10:27:32	16	Architecturally, Workscape employs a
10:27:36	17	client-server model between a user
10:27:36	18	application, known as the viewer, and any
10:27:36	19	number of network data repositories. The
10:27:40	20	primary job of the viewer is to receive
10:27:43	21	documents from repositories and render them in
10:27:45	22	the user's workspace. Once the document is
10:27:49	23	fetched into the workspace, it remains there
10:27:51	24	until it is discarded by the user.
10:27:55	25	A document may appear only once

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10:27:58	1	within a given workspace, but may appear
10:28:00	2	simultaneously in different workspaces either
10:28:02	3	within or across users. The current Workscape
10:28:05	4	prototype exists as a motif application
10:28:07	5	running on a variety of Digital platforms.
10:28:10	6	This prototype serves as a test bed for the
10:28:13	7	development of end user applications within
10:28:14	8	the Workscape environment.
10:28:18	9	The number of primitive user
10:28:20	10	operations defined by the interface is very
10:28:23	11	small. A document may be dragged in the X, Y
10:28:26	12	plane much like the dragging of objects in
10:28:29	13	traditional GUIs. If a document is dragged by
10:28:31	14	one of its corners, however, the move occurs
10:28:34	15	in the Z dimension and moves the document
10:28:37	16	closer or further in the three-dimensional
10:28:40	17	workspace. Note that there is no modality
10:28:44	18	associated with opening or closing documents.
10:28:46	19	They may be near or far and thus appear to be
10:28:50	20	large or small. But they are not opened or
10:28:52	21	closed, they are just there.
10:28:53	22	Documents may contain icons in order
10:28:56	23	to make them more distinctive, but they never
10:28:59	24	become iconified. Double clicking on a
10:29:03	25	document will move it all the way forward

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10:29:05	1	rendering it at its true size. This is just a
10:29:08	2	shortcut for dragging it forward using corner
10:29:11	3	dragging. Another primitive manipulation of
10:29:14	4	documents is clipping. Dragging a document
10:29:17	5	edge may clip the edge in allowing the user to
10:29:20	6	make the document smaller while still being
10:29:23	7	able to read it.
10:29:25	8	These basic operations, X Y
10:29:27	9	dragging, Z dragging and clipping constitute a
10:29:31	10	basic vocabulary of actions which may be
10:29:33	11	applied to any kind of document, regardless of
10:29:35	12	its underlying representation or source on the
10:29:38	13	network. Collections of documents can be
10:29:41	14	grouped into tiles, piles and other spatial
10:29:45	15	configurations, which can then be manipulated
10:29:45	16	as a group.
10:29:49	17	The huge virtual space available in
10:29:51	18	the back of the workspace affords a visible
10:29:54	19	highly accessible data space for arranging and
10:29:58	20	storing work in progress. In order to support
10:30:02	21	more complex user actions, Workscape provides
10:30:06	22	a complete multi-threaded scripting
10:30:08	23	environment. Scripts are delivered to users
10:30:10	24	in special documents called tools.
10:30:15	25	Architecturally, tools are no different from

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10:30:17	1	any other document, but they have a
10:30:19	2	distinctive look, and their purpose is
10:30:21	3	primarily to perform actions rather than
10:30:21	4	contain information. This is the find tool,
10:30:24	5	whose purpose is to search for documents,
10:30:27	6	either within the workspace or in network
10:30:29	7	repositories. It contains an editable text
10:30:35	8	field into which the user types a search
10:30:36	9	expression. For instance, I may search for
10:30:39	10	all documents of type E-mail and from Lee. It
10:30:45	11	also contains a switch which activates the
10:30:48	12	tool.
10:30:48	13	As documents are found, they are
10:30:50	14	gathered into a pile immediately behind the
10:30:53	15	tool. Note that the interface is designed to
10:30:59	16	be completely non-blocking. A given tool may
10:31:00	17	be busy for an extended period, or even
10:31:03	18	continuously, but the user is always free to
10:31:05	19	invoke other tools or to perform other actions
10:31:08	20	elsewhere in the workspace.
10:31:17	21	Clipping is used to manage the
10:31:20	22	complexity of tools. The find tool has many
10:31:23	23	options, which are controlled by switches that
10:31:25	24	are normally clipped away in the bottom of the
10:31:30	25	tool. For example, I can indicate whether to

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10:31:30	1	search the workspace or specific
10:31:33	2	repositories. In a further clip area are less
10:31:38	3	frequently used controls, like those who
10:31:42	4	specify the sort order of documents within the
10:31:42	5	pile. The find tool is modular. It contains
10:31:48	6	a number of slots on to which I could drop
10:31:51	7	other tools, which like Unix filters, can be
10:31:55	8	strung together to augment the basic behavior
10:31:57	9	of a tool.
10:32:02	10	By convention, all tools have a help
10:32:06	11	text clipped off their top edge so users have
10:32:06	12	access to instructions without having to learn
10:32:09	13	to use a separate help facility. Certain
10:32:14	14	tools generate small tag documents, which are
10:32:17	15	attached to other documents as visual
10:32:19	16	markers. The find tool placed a new tag on
10:32:23	17	this E-mail message, since it's one that I
10:32:26	18	haven't seen before. Since the tag is just a
10:32:28	19	document, I can detach it and even drop it on
10:32:34	20	another document.
10:32:37	21	Documents may be annotated using the
10:32:39	22	sticker pad, which is a tool that generates
10:32:43	23	small yellow documents with a sticky back. I
10:32:45	24	can type a note on a sticker and then drop it
10:32:47	25	on to any other document. The sticker will

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10:32:49	1	attach itself to the document and remain there
10:32:52	2	until removed.
10:32:55	3	The system comes with a suite of
10:32:58	4	standard tools to perform generic system
10:33:02	5	actions. For example, the mail tool permits
10:33:04	6	the mailing of any document to another user in
10:33:06	7	the form of an E-mail message. I simply
10:33:11	8	select the document and press the mail
10:33:12	9	button. Since the tool needs to know where to
10:33:14	10	mail the document, it snaps forward, unclips
10:33:18	11	itself to the appropriate field and waits for
10:33:20	12	user input before sending the message.
10:33:30	13	The orthogonal spatial nature of the
10:33:33	14	interface makes it easy to script tools for
10:33:34	15	visualizing relationships among documents.
10:33:37	16	This arranger tool, for example, is capable of
10:33:40	17	organizing documents in three space, according
10:33:42	18	to user-specified criteria. For example, I
10:33:47	19	can assign the X dimension to the two field
10:33:50	20	and the Z dimension to creation date. Such
10:33:53	21	mapping of document attributes to spatial
10:33:56	22	dimension can be have a very powerful aid in
10:34:00	23	visualizing patterns in a collection of
10:34:02	24	documents.
10:34:16	25	Workscape documents are polymorphic,

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10:34:19	1	in that the contents of the documents are
10:34:21	2	decoubled from the way in which it is
10:34:24	3	rendered. For example, the sticker tab has a
10:34:28	4	control which can morph the notes in
10:34:28	5	dispensers into one of three forms, a generic
10:34:31	6	note, a reminder note and a phone message
10:34:36	7	form. Further, any Workscape document can be
10:34:40	8	morphed into these forms simply by dropping it
10:34:43	9	on the pad.
10:34:46	10	Although the design focus of the
10:34:48	11	Workscape prototype was office document
10:34:51	12	management, its interface paradigm is quite.
10:34:55	13	Workscape is like an application than it is a
10:34:57	14	medium for the retrieval of information,
10:35:00	15	objects and the development of scripted
10:35:02	16	applications to manipulate them. In uniform
10:35:06	17	object types, the three-dimensional workspace
10:35:08	18	metaphor and a powerful scripting language
10:35:12	19	provide a rich environment for the cost-
10:35:12	20	effective development of highly customized
10:35:16	21	applications in many test domains.
	22	- - - -
	23	(Video ended.)
	24	- - - -
10:35:51	25	BY MR. SOOBERT:

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10:35:51	1	Q. Dr. Lucas, is that the video that was publicly
10:35:57	2	disseminated at the CHI '94 conference?
10:35:59	3	A. It appears to be, yes.
10:36:01	4	Q. Is that an accurate representation of the
10:36:05	5	Workscape system we've been discussing?
10:36:07	6	A. It's not a complete representation, but it's
10:36:13	7	certainly accurate.
10:36:14	8	Q. At the end, I noticed it had a 1993 copyright
10:36:22	9	date. Is that about the time it was prepared?
10:36:24	10	A. Well, sure. We were preparing it for a
10:36:28	11	submittal to the CHI program committee for CHI
10:36:32	12	'95. And as I said, CHI is held in the
10:36:34	13	spring, so it would have been late '93 when we
10:36:37	14	would have been working on it.
10:36:52	15	MR. SOOBERT: I'd like to mark as
10:36:54	16	Exhibit 2 a copy of U.S. Patent 5,499,330.
10:37:38	17	- - - -
10:37:38	18	(Deposition Exhibit No. 2 was
10:37:38	19	marked for identification.)
10:37:38	20	- - - -
10:37:47	21	BY MR. SOOBERT:
10:37:47	22	Q. Dr. Lucas, do you recognize that document?
10:37:50	23	A. Yes, I do.
10:37:50	24	Q. What is that document?
10:37:52	25	A. It's one of the number of patents that were

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10:37:54	1	issued relating to the Workscape work. They
10:38:02	2	were issued by various MAYAs. This one is to
10:38:09	3	me and my colleague, Jeffrey Senn. And these
10:38:14	4	were all assigned to Digital Equipment
10:38:17	5	Corporation.
10:38:17	6	Q. And this was filed on September 17, 1993?
10:38:26	7	A. It looks like.
10:38:32	8	Q. Is the video that we just watched an
10:38:37	9	embodiment of this patent?
10:38:37	10	A. Of many aspects of it, yes.
10:38:58	11	Q. Are there any aspects in the video, to the
10:39:02	12	best of your recollection, which may not be
10:39:05	13	reflected in the patent?
10:39:06	14	A. Well, that's a very broad question. Workscape
10:39:14	15	was a rich and broad set of projects, and
10:39:18	16	there were many explorations in many
10:39:21	17	directions. A lot of stuff we considered
10:39:28	18	obvious to the trade, and I imagine there are
10:39:31	19	a few things that the patent attorney may have
10:39:35	20	missed or that we have neglected to mention.
10:39:41	21	It's only one of a number of patents. I
10:39:44	22	believe there were 11 in total that came out
10:39:48	23	of the project.
10:39:49	24	Q. Are you an inventor on all of those patents?
10:40:01	25	A. Certainly the majority of them. Were there

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10:40:04	1	any that I was not an inventor on? I'm not
10:40:07	2	sure. There may have been one or two. But
10:40:09	3	this was definitely a collaborative project.
10:40:41	4	Q. Before we dig into the patent a bit, I want to
10:40:45	5	ask you some questions about the video.
10:40:47	6	A. Okay.
10:40:47	7	Q. In the video, you described -- strike that.
10:41:04	8	In the video, was that you doing the
10:41:07	9	narrative?
10:41:07	10	A. Yes.
10:41:08	11	Q. In the video, you mentioned that "documents,
10:41:15	12	may be annotated using the sticker pad, which
10:41:18	13	is a tool that generates small yellow
10:41:21	14	documents with sticky backs."
10:41:26	15	Is that an example of how documents
10:41:32	16	might be generated in the Workscape viewer?
10:41:36	17	MR. SOLO: Objection, form.
10:41:38	18	A. Yes, the tool that was shown in the video was
10:41:41	19	an example of a dispenser document, as I had
10:41:45	20	mentioned earlier. The documents happened to
10:41:47	21	be of a particular form, but there were
10:41:49	22	dispensers of all kinds. There was also a
10:41:52	23	dispenser of new E-mail messages, for example.
10:41:59	24	Q. Can you think of other examples of how
10:42:02	25	documents can be generated in the Workscape

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10:42:04	1	viewer.
10:42:05	2	A. Well, one could write a script that is capable
10:42:09	3	of creating new documents. So, it would have
10:42:17	4	been possible to create a tool that
10:42:19	5	automatically generated new documents in
10:42:22	6	response to some event. In addition, new
10:42:30	7	information coming into a repository could
10:42:38	8	trigger the kind of persistent search response
10:42:42	9	that we talked about earlier, in which case
10:42:48	10	that document would appear to the user to be
10:42:53	11	created in some way other than direct
10:42:56	12	manipulation.
10:43:00	13	Q. In the video, you stated: "The system comes
10:43:04	14	with a suite of standard tools to perform
10:43:06	15	generic system actions. For example, the mail
10:43:10	16	tool permits the mailing of any document to
10:43:13	17	another user in the form of an E-mail
10:43:15	18	message."
10:43:17	19	What were you describing there?
10:43:18	20	A. It was a tool that you could apply to one or
10:43:34	21	more documents. It would establish a
10:43:37	22	connection to an E-mail server, which it would
10:43:40	23	model most likely as an example of a
10:43:44	24	repository. It would submit those documents
10:43:47	25	in the form of standard E-mail messages, and

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10:43:55	1	they would be delivered by normal SMPT mail
10:44:01	2	services.
10:44:08	3	Q. Can you describe how that tool would receive
10:44:10	4	messages as well.
10:44:11	5	A. Receiving would be the same as any other
10:44:13	6	document, if the E-mail server received new
10:44:20	7	mail, there would be a persistent search. The
10:44:22	8	persistent search would bring in the document,
10:44:25	9	and it would appear in some visualization,
10:44:34	10	most likely a pile. In the normal
10:44:36	11	configuration, I mean, you would have a
10:44:39	12	special instance of the find tool, which would
10:44:42	13	serve as an in box. So, again, it's
10:44:47	14	metaphorically analogous to a physical in box
10:44:51	15	that an office worker would expect to have on
10:44:55	16	his or her desk.
10:44:57	17	Q. In the video, you also said that "the project
10:45:12	18	has the following specific design goals", and
10:45:16	19	then you continued. Second, to define an
10:45:20	20	interface paradigm, which would permit users
10:45:22	21	to organize and deal meaningfully with
10:45:27	22	hundreds of documents at once.
10:45:34	23	Was that a purpose of Workscape?
10:45:36	24	A. Hundreds in the long run probably was an
10:45:42	25	understatement. That was certainly a short-

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10:45:45	1	term goal to deal with a few hundred, hence
10:45:49	2	the first protocol called for 200 points of
10:45:55	3	light. It's a political joke of the day. But
10:46:01	4	certainly we anticipated that as the power of
10:46:04	5	computers continued to increase, we would be
10:46:09	6	would be on hundreds to thousands of
10:46:10	7	documents.
10:46:24	8	MR. SOOBERT: We'll mark as Lucas
10:46:25	9	Exhibit 3 a set of screen shots from the
10:46:28	10	video.
10:47:05	11	- - - -
10:47:05	12	(Deposition Exhibit No. 3 was
10:47:05	13	marked for identification.)
10:47:05	14	- - - -
10:47:05	15	BY MR. SOOBERT:
10:47:05	16	Q. Dr. Lucas, this is a set of screen stills that
10:47:08	17	we've taken from the video.
10:47:10	18	Does it appear to be accurate based
10:47:12	19	on your ability to take a look at it now?
10:47:15	20	A. Yes.
10:47:18	21	Q. So, on the first page of this exhibit, the
10:47:24	22	screen says design goals, uniform interface to
10:47:34	23	heterogeneous document types.
10:47:34	24	Can you explain what you mean by
10:47:34	25	heterogeneous document types.

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10:47:35	1	A. That refers to the point that we discussed
10:47:38	2	earlier in which if you are connecting to
10:47:44	3	multiple data sources, each data source is
10:47:47	4	likely to have its own document model, its own
10:47:55	5	design for metadata. That is an impediment to
10:48:00	6	bringing together multiple kinds of electronic
10:48:03	7	documents in a uniform way. Traditionally
10:48:06	8	that problem is solved by having a different
10:48:10	9	application for each kind of document. Our
10:48:12	10	goal was to do better than that and to have a
10:48:17	11	single application that could deal with
10:48:19	12	documents that were heterogeneous in that
10:48:22	13	sense.
10:48:22	14	Q. Can you briefly describe how Workscape would
10:48:29	15	deal with those heterogeneous documents that
10:48:33	16	were in diverse formats.
10:48:37	17	MR. SOLO: Objection, form.
10:48:38	18	A. Basically by reducing all information to a
10:48:42	19	least common denominator form, that is the
10:48:46	20	attribute value pairs, groups of attribute
10:48:50	21	value pairs identified with a UID.
10:48:52	22	Essentially what this amounts to is denying
10:48:59	23	the distinction, or discarding the distinction
10:49:04	24	between data and metadata. Since everything
10:49:08	25	is an attribute value pair, you don't have to

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10:49:10	1	ask the question whether any given piece of
10:49:12	2	information is data or metadata, it's all the
10:49:16	3	same thing. And you can treat it as metadata
10:49:19	4	if you want to or you could treat it as data
10:49:23	5	if you want to. And by reducing all documents
10:49:29	6	to this common object model, you can eliminate
10:49:37	7	the problem that prevents the common handling
10:49:41	8	of heterogeneous document types.
10:49:59	9	Q. In the example where we had all of my family's
10:50:02	10	documents and mom's documents in particular
10:50:06	11	that had been filtered. Do you recall that
10:50:08	12	example?
10:50:09	13	A. Yes.
10:50:09	14	Q. And we discussed how mom's documents could be
10:50:21	15	placed in a chronological or temporal order;
10:50:24	16	right?
10:50:24	17	A. Yes.
10:50:26	18	Q. Could mom use that set of documents in a
10:50:32	19	temporal or chronological order as effectively
10:50:36	20	an electronic diary of her digital life?
10:50:39	21	MR. SOLO: Objection, form.
10:50:41	22	A. Sure.
10:50:45	23	Q. Can you describe how mom might be able to use
10:50:50	24	the documents as an electronic diary of her
10:50:55	25	digital life.

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10:50:55	1	MR. SOLO: Objection, form.
10:50:56	2	A. Well, there are many
10:50:59	3	potential answers to that. To give just one,
10:51:04	4	she could choose to keep -- to move that
10:51:09	5	subset of documents on to its own strand, keep
10:51:13	6	that strand ordered chronologically. But in
10:51:19	7	addition to that, the interface paradigm
10:51:26	8	supported certain direct manipulation
10:51:30	9	operations on the strand so that you could
10:51:33	10	slide the documents around the -- along the
10:51:36	11	strand, just as if you could slide beads along
10:51:41	12	a string. And the document would push each
10:51:44	13	other forward or backward just as the beads
10:51:48	14	would.
10:51:49	15	So, by leaving the documents on the
10:51:51	16	strand, grabbing one of them, you could slide
10:52:03	17	your basically view into the chronological
10:52:09	18	history of her life that way. And as
10:52:11	19	illustrated I believe in one of the patent
10:52:13	20	illustration, strands don't have to be
10:52:16	21	straight lines, so you could have a strand
10:52:18	22	that comes forward in space for awhile,
10:52:21	23	therefore, producing a pile, then moving a
10:52:24	24	certain distance parallel to the screen, in
10:52:26	25	which case a small number of documents would

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10:52:29	1	be fully visible and tiled, and then have
10:52:33	2	another strand going back in space.
10:52:36	3	The effect of this, if you slide the
10:52:39	4	documents along the strand, causes it to work
10:52:42	5	effectively like a Rolodex, so that you could
10:52:47	6	flip through the documents in chronological or
10:52:50	7	any other order, and that would seem to me to
10:52:54	8	be a fine way to use the documents as a
10:53:01	9	personal diary.
10:53:04	10	Q. You mentioned a figure in your answer. Could
10:53:07	11	you point me to that figure, please.
10:53:11	12	A. This is in the 330 patent. It's figure 3.
10:53:24	13	It's labeled pile and scroll, because that's
10:53:27	14	the name of the tool that we created to
10:53:30	15	realize that design.
10:53:32	16	Q. On the next page of that Exhibit 3 -- strike
10:53:40	17	that.
10:53:43	18	On the next page of Exhibit 2,
10:53:44	19	there's a figure 5. Can you describe to me
10:53:49	20	what that figure depicts.
10:53:54	21	A. It's intended to illustrate the fact that the
10:53:56	22	path that a strand takes through space is
10:54:01	23	completely arbitrary. In this case, the
10:54:08	24	strand is defined as a helical path that
10:54:10	25	recedes back into space, and therefore, when

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10:54:14	1	it's rendered in perspective, you get a kind
10:54:17	2	of a corkscrew-shaped pile.
10:54:25	3	Q. In the example where we searched and retrieved
10:54:29	4	all of my family's documents from a
10:54:31	5	repository, can you describe how those
10:54:37	6	documents could be represented in such a pile.
10:54:43	7	MR. SOLO: Objection, form.
10:54:44	8	A. Well, the results of the filter or the search,
10:54:51	9	however the documents were identified, would
10:54:55	10	be threaded on to the strand constrained by
10:55:01	11	whatever attribute was designated in the
10:55:05	12	example that you have been pursuing, that that
10:55:06	13	would be temporally, and therefore, depending
10:55:11	14	on the direction of the sort, either the
10:55:17	15	oldest or the newest document would be the one
10:55:20	16	whose face was fully visible.
10:55:22	17	Q. In Exhibit 3, the screen shots, if you turn to
10:55:35	18	page 9 and describe for me, if you will, how
10:55:51	19	this module refined functionality relates to
10:56:00	20	the example we just described.
10:56:03	21	MR. SOLO: Objection, form.
10:56:05	22	A. Well, the top part that says pattern
10:56:07	23	represents the search criteria and/or filter
10:56:14	24	criteria that the user entered. In this case,
10:56:20	25	it specified a filter on two attribute values,

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10:56:25	1	first an attribute called type, and it
10:56:27	2	restricted the search to documents whose value
10:56:34	3	was the string E-mail. And it further reduced
10:56:41	4	with an and, that is a conjunction operation,
10:56:45	5	to another attribute called from, whose value
10:56:49	6	was Lee. That would -- the presence of that
10:56:57	7	string configured defined tool to be a filter,
10:57:00	8	according to those criteria.
10:57:03	9	The second part where it says look
10:57:06	10	for documents in, and there are two toggle
10:57:09	11	switches, one is labeled workspace and the
10:57:11	12	other is labeled repository. That determines
10:57:17	13	whether the search would happen in the
10:57:20	14	repository, in the workspace or both. So, you
10:57:26	15	could use the same tool for both operations.
10:57:32	16	The field to sort by determines the
10:57:44	17	attributes of the retrieved documents, the
10:57:47	18	attribute of the retrieved documents that
10:57:49	19	would be used to determine the order of the
10:57:51	20	documents on the strand. And then order,
10:57:57	21	alphabetical, chronological or numerical
10:58:04	22	basically determined the type of sort that was
10:58:07	23	applied to that attribute.
10:58:13	24	So, there are slightly different
10:58:21	25	rules, for instance, for numeric sorts or date

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10:58:24	1	sorts than there are for alphabetic sorts.
10:58:27	2	So, to the best of my recollection, that order
10:58:30	3	was determining which set of sort rules to
10:58:35	4	apply. I don't -- I don't remember the
10:58:41	5	specific details of exactly how those two
10:58:46	6	things interacted, whether, for instance, when
10:58:51	7	you selected chronological, whether it would
10:58:53	8	apply to the date field by default. It
10:58:56	9	certainly could, I don't remember what we
10:58:58	10	actually did.
10:58:59	11	And then finally, there's another
10:59:02	12	toggle that's labeled reverse, and that's how
10:59:07	13	you determine whether the sort is in ascending
10:59:11	14	order or descending order.
10:59:23	15	Q. So, in the example we've been discussing
10:59:27	16	regarding mom's documents, what -- strike
10:59:33	17	that.
10:59:33	18	In the example we've been discussing
10:59:35	19	regarding mom's documents, can you describe
10:59:40	20	what happens when the user selects
10:59:45	21	chronological order here.
10:59:49	22	A. The strand, which is associated with this find
10:59:56	23	tool, and you can see the pile that is being
10:59:59	24	created by the strand extending behind the
11:00:03	25	modular find tool.

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11:00:05	1	Q. And that's at the bottom right-hand corner --
11:00:09	2	strike that. That's behind the find tool?
11:00:11	3	A. That's correct. In this particular view, you
11:00:15	4	can only see a little bit of it. But if you
11:00:17	5	moved it to change the perspective, you would
11:00:20	6	see the entire pile.
11:00:27	7	Sliding the control to alphabetical,
11:00:30	8	chronological, numerical and reverse, forward
11:00:33	9	or backward would immediately cause the order
11:00:38	10	of the documents in the pile to be
11:00:41	11	rearranged. So, for instance, if you had it
11:00:46	12	set to chronological, the newest document
11:00:52	13	would be in the front. And then if you
11:00:53	14	flipped the reverse switch, the order of the
11:00:56	15	documents would be reversed and the oldest
11:00:59	16	document would be in the front.
11:01:00	17	Q. On the next page of Exhibit 3 is a screen shot
11:01:08	18	on page 10. Can you describe what's depicted
11:01:15	19	here.
11:01:15	20	A. This is another tool called an arranger. This
11:01:18	21	tool created organizations of the documents in
11:01:27	22	the three-dimensional space, much in the
11:01:30	23	spirit of the original 200 points of light
11:01:33	24	demonstration. Unlike the find tool, this one
11:01:36	25	did not happen to use the strands mechanism,

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11:01:40	1	and therefore, the arrangements that were
11:01:42	2	created were not persistent.
11:01:44	3	But this was very powerful in
11:01:46	4	allowing users to sort through large numbers
11:01:52	5	of documents that have multi-dimensional
11:01:58	6	characteristics. So, if you're looking for
11:02:01	7	documents that are both of a certain subject
11:02:03	8	and in a certain date range, this would be a
11:02:05	9	very powerful way of doing that search in a
11:02:09	10	visual and intuitive way.
11:02:15	11	Q. In the video on this point, you stated: "In
11:02:19	12	this demonstration, the documents are first
11:02:22	13	sorted in the depth dimension by date with the
11:02:24	14	newest documents moving forward toward the
11:02:27	15	viewer."
11:02:28	16	Is that accurate and consistent with
11:02:31	17	your description?
11:02:32	18	A. Yes.
11:02:39	19	MR. SOOBERT: We'll mark as the next
11:02:42	20	exhibit some additional screen shots, 200
11:02:47	21	points of light demonstration. Let's take a
11:02:56	22	quick break to change the tape.
11:02:56	23	VIDEO OPERATOR: This marks the end
11:02:58	24	of disk 1 in the deposition of Peter Lucas.
11:02:59	25	going off the record. The time is 11:03 a.m.

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11:08:01	1	----
11:08:01	2	(Deposition Exhibit No. 4 was
11:08:01	3	marked for identification.)
11:08:01	4	----
11:08:13	5	VIDEO OPERATOR: This marks the
11:08:20	6	beginning of disk 2 in the deposition of
11:08:22	7	Dr. Peter Lucas. Going back on the record.
11:08:25	8	The time is 11:09 a.m. You may proceed.
11:08:28	9	BY MR. SOOBERT:
11:08:28	10	Q. Dr. Lucas, we've marked as Lucas Exhibit 4
11:08:32	11	another set of screen shots from the video we
11:08:35	12	just watched, which is the 200 points light
11:08:40	13	video.
11:08:41	14	Do you recognize that?
11:08:42	15	A. Yes.
11:08:42	16	Q. Does that appear to be a set of screen shots
11:08:48	17	as I described from that video?
11:08:50	18	A. Yes.
11:08:50	19	Q. The narration at this point in the video, you
11:08:56	20	state -- strike that.
11:08:57	21	In the narration of the video at
11:08:59	22	this point, you stated: "Other tools can be
11:09:06	23	used to perform interactive searches of
11:09:09	24	documents along various dimensions. For
11:09:12	25	instance, this date slider can be used to

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11:09:16	1	restrict the field of view to documents which
11:09:17	2	were created within a specified range of
11:09:20	3	dates."
11:09:28	4	With that in mind, could you walk us
11:09:30	5	through these slides and explain what they
11:09:34	6	depict, including the description of the use
11:09:38	7	of the date slider.
11:09:39	8	MR. SOLO: Objection, form.
11:09:40	9	A. Well, page 1 shows 200 documents, each
11:09:51	10	represented using just a few pixels each. Two
11:09:59	11	of them appear to have been selected, the user
11:10:03	12	can -- I can't remember what the interaction
11:10:06	13	was from this demo, but it doesn't really
11:10:09	14	remember. But there was some operation,
11:10:12	15	clicking or something that permitted the user
11:10:13	16	to select a subset of the documents.
11:10:16	17	Q. Let me stop you there.
11:10:17	18	MR. SOOBERT: What is your
11:10:19	19	objection, counsel?
11:10:20	20	MR. SOLO: Just based on the
11:10:21	21	introduction, you lost a little about the
11:10:25	22	date. But other than that, I don't have a
11:10:26	23	problem with that description.
11:10:27	24	BY MR. SOOBERT:
11:10:27	25	Q. Okay, keep going.

18 (Pages 69 to 72)

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11:10:29	1	A. The date slider at this point has -- there are
11:10:34	2	two thumbs, as they're sometimes called, on
11:10:37	3	the date slider, a minimum and a maximum
11:10:41	4	date. And the semantics of that are that it
11:10:51	5	defines a subset, a filter on the documents
11:10:55	6	that subsumes only the documents between the
11:11:00	7	two dates. The thumbs are now at their
11:11:05	8	extremes, the minimum is at the extreme left
11:11:08	9	and the maximum is at the extreme right, so
11:11:11	10	that all documents are included in that query
11:11:13	11	at the moment.
11:11:20	12	Page 2, the user clicked on one of
11:11:26	13	the tiny documents, which caused it to open so
11:11:29	14	that I could, so that the user could view the
11:11:34	15	contents. In this case, at least what's
11:11:41	16	visible on the image, there's only one
11:11:43	17	attribute on this particular document, and
11:11:45	18	it's an attribute called importance, whose
11:11:48	19	value is 3.
11:11:56	20	Page 3, I have clicked -- there are
11:12:00	21	one of two buttons in the upper left-hand
11:12:04	22	corner, select and arrange. The user has
11:12:07	23	clicked on the arrange button which caused a
11:12:10	24	submenu to appear that presented a set of
11:12:14	25	choices as to which attribute of the work

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11:12:24	1	space I wanted to control with this arrange
11:12:30	2	operation. These are basically dimensions of
11:12:32	3	the display. There are three spatial
11:12:35	4	dimensions, X, Y and Z. Height is the size,
11:12:40	5	the height of the document. Label, I'm not
11:12:47	6	sure, I don't remember what that was. Color
11:12:48	7	was, in this case, selected, there were only
11:12:51	8	two colors, black and white. And visibility
11:12:55	9	is whether I can, whether the documents can be
11:13:00	10	seen or not.
11:13:04	11	Page 4 is the next step in the
11:13:06	12	arrange process. I have selected one of the
11:13:15	13	dimensions, I believe it was the Z dimension,
11:13:19	14	if I remember the script, and the Z
11:13:23	15	dimensional is a dimension of the workspace.
11:13:29	16	Now I have to choose one of the attributes of
11:13:33	17	the document that I want to map on to this Z
11:13:41	18	dimension. From the position of the cursory,
11:13:48	19	it looks like I selected the date attribute.
11:13:50	20	But just to be clear, page 3, the
11:13:52	21	selection is referring to a dimension, some
11:13:56	22	dimension of the display, in this case,
11:13:59	23	depth. And page 4 is referring to selecting
11:14:02	24	one of the attributes of the documents, and
11:14:04	25	that's the fundamental operation here, it maps

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11:14:07	1	attributes of the documents on to dimensions
11:14:10	2	of the space.
11:14:15	3	Page 5 is the result of the
11:14:16	4	document. We discovered that the reason the
11:14:24	5	documents were so too tiny was that they were
11:14:27	6	all pushed very far back into the Z
11:14:31	7	dimension. I have now just pulled them
11:14:32	8	forward, and the distance they have come
11:14:35	9	forward was a function of the date attribute
11:14:41	10	of the documents. So, the newest, presumably
11:14:45	11	the newest documents are in the front and the
11:14:47	12	oldest documents are in the back.
11:14:54	13	On page 6, I performed a similar
11:14:58	14	operation. This time I choose the X
11:15:01	15	dimension, that is the width of the screen,
11:15:06	16	rather than the Z depth dimension. And the
11:15:11	17	attribute I pick is type in this little
11:15:17	18	demonstration. The documents have an
11:15:22	19	attribute called type where the values might
11:15:25	20	be E-mail message or FAX or whatever. So, I
11:15:33	21	want to map the X dimension of the display by
11:15:39	22	the type attribute, and page 8 shows the
11:15:42	23	result of that. I now have -- evidently there
11:15:46	24	were six different types of documents, so the
11:15:51	25	system arranged them in six columns going

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11:15:56	1	backwards and each still arranged by time.
	2	- - - -
	3	(There was an interruption in the
	4	proceedings.)
	5	- - - -
11:16:13	6	VIDEO OPERATOR: Going off the
11:16:14	7	record. The time is 11:17 a.m.
	8	- - - -
	9	(There was a discussion off the
	10	record.)
	11	- - - -
11:30:31	12	VIDEO OPERATOR: Back on the
11:30:31	13	record. The time is 11:20 a.m. You may
11:30:31	14	proceed.
11:30:31	15	BY MR. SOOBERT:
11:30:31	16	Q. When we broke, Doctor, with this, you were
11:30:31	17	describing what's depicted in Exhibit 4, which
11:30:31	18	is a set of screen shots from the 200 points
11:30:31	19	of light video. Before you continue, I
11:30:31	20	noticed a number of the document
11:30:31	21	representations are shaded dark.
11:30:31	22	Do you see that?
11:30:31	23	A. You're referring to the two black documents?
11:30:31	24	Q. Yes.
11:30:31	25	A. Yes.

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11:30:31	1	Q. What does that mean?
11:30:31	2	A. Well, I pointed out on page 1 that 2 of the
11:30:31	3	200 documents were selected, and that's what
11:30:31	4	the black means. It's the selection or color,
11:30:31	5	which is just another dimension of the
11:30:31	6	display. And since each of these operations
11:30:31	7	is independent, that is changing the mapping
11:30:31	8	of one dimension does not affect any other
11:30:31	9	dimension, the technical term for that is
11:30:31	10	orthogonal. Since these operations are
11:30:31	11	orthogonal, the two selected documents remain
11:30:31	12	selected and therefore, marked along that
11:30:31	13	dimension throughout this operation.
11:30:31	14	Page 9, what's happened is that the
11:30:31	15	right thumb of the flier was moved from its
11:30:31	16	initial value of July 30, 1990 to April 6,
11:30:31	17	1990. The effect of this is that any
11:30:31	18	documents that were -- which had a date
11:30:31	19	attribute greater than April 6th are rendered
11:30:31	20	invisible. They're still in the workspace,
11:30:31	21	they're just invisible, so they can't be seen
11:30:31	22	by the user.
11:30:31	23	Since we had already sorted the Z
11:30:31	24	dimension by date, we get the expected result,
11:30:31	25	is that all of the documents that were

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11:30:31	1	rendered invisible were the ones in the front,
11:30:31	2	because that was the sort order.
11:30:31	3	Page 10 shows the symmetrical
11:30:31	4	operation of filtering by earliest date. That
11:30:31	5	is, I took the right thumb and I slid it from
11:30:31	6	its initial value of August 1, 1989 to January
11:30:31	7	something, 1990. And then as expected, the
11:30:31	8	oldest documents, which are furthest back in
11:30:31	9	the display, are also rendered invisible.
11:30:31	10	Page 11 simply moves the sliders a
12:12:40	11	little bit further to illustrate that this
12:12:40	12	operation is under user control and can be
12:12:40	13	done incrementally and interactively. And
12:12:40	14	that's it.
12:12:40	15	Q. On page 11, is there a particular date segment
12:12:40	16	selected here?
12:12:40	17	A. Well, yes, because the filter slider has both
12:12:40	18	thumbs moved in from their extreme values.
12:12:40	19	The earliest date is January 28, 1990 and the
12:12:40	20	latest date is March 14, 1990. So, only
12:12:40	21	documents that have date fields in that
12:12:40	22	interval will be visible.
12:12:40	23	Q. So, if we turn back two pages to page 9, for
12:12:40	24	example, there's a broader interval selected?
12:12:41	25	A. Correct.

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12:12:41	1	Q. Can you describe how the document
12:12:41	2	representations are arranged in three-
12:12:41	3	dimensional space here.
12:12:41	4	A. Well, in this particular demonstration, there
12:12:41	5	is a orthogonal mapping of attributes on to
12:12:41	6	dimensions. And in particular, the depth
12:12:41	7	dimension, the so-called Z dimension has the
12:12:41	8	documents organized by date, and the X
12:12:41	9	dimension has the documents oriented by type,
12:12:41	10	and we aren't using the Y dimension.
12:12:44	11	Q. You mentioned receding before. Is that
12:12:44	12	reflected anywhere here?
12:12:44	13	A. Well, yes, these documents are rendered in a
12:12:44	14	perspective rendering, that means several
12:12:44	15	things. First of all, the front most
12:12:44	16	documents occlude both the ones behind them.
12:12:44	17	So, if a document is directly behind, or part
12:12:44	18	of a document is directly behind another, you
12:12:44	19	can't see it. Secondly, they recede towards
12:12:44	20	what an artist would call a vanishing point.
12:12:44	21	Just as the rails of a railroad track appear
12:12:44	22	to come closer towards each other as distance
12:12:45	23	increases, a similar thing happens when you
12:12:45	24	render documents.
12:12:45	25	And thirdly, the documents that are

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12:12:45	1	further away from the viewer's eye are
12:12:45	2	rendered smaller. All three of these are what
12:12:45	3	are called cues to depth, that is they're
12:12:45	4	things that an artist or a graphic designer or
12:12:45	5	a computer graphic specialist would employ in
12:12:45	6	order to give the illusion of depth on a
12:12:45	7	two-dimensional display.
12:12:45	8	Q. Can you describe on this page 9 what would
12:12:54	9	happen, if at all, if a new document within
12:12:54	10	this date range was received by the
12:12:54	11	workspace.
12:12:54	12	MR. SOOBERT: Objection, form.
12:12:54	13	A. Well, strictly speaking, on this particular
12:12:54	14	display, nothing would happen, because this
12:12:54	15	was a very early prototype of the interface,
12:12:54	16	and there was no repository involved, and
12:12:54	17	there was really no way to create new
12:12:54	18	documents. However, in the situation that
12:12:54	19	this was intended to illustrate, the document,
12:12:54	20	depending on the configuration of the system,
12:12:54	21	would appear in its appropriate pile both in
12:12:55	22	time and with respect to its document.
12:12:55	23	Q. Could you turn back to Exhibit 3, which is the
12:12:55	24	broader set of screen shots on the Workscape
12:12:55	25	system. Page 11, for example, how would new

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12:12:55	1	documents received by the system be addressed
12:12:55	2	here?
12:12:55	3	A. Again, assuming that the arranger tool was
12:12:55	4	configured to be persistent, which is
12:12:55	5	optional, but assuming that it was, a new
12:12:55	6	document would take its appropriate place in
12:12:55	7	the two-dimensional configuration that the
12:12:55	8	arranger was maintaining.
12:12:55	9	Q. Could that document have been retrieved from a
12:12:55	10	repository?
12:12:55	11	MR. SOOBERT: Objection, form.
12:12:55	12	A. Yes, there was a way to -- there's a facility
12:12:55	13	in Workscape to pass documents from one tool
12:12:55	14	to another. So, you would have a find tool
12:12:55	15	that would retrieve documents from a
12:12:55	16	repository, and it could pass it along to the
12:12:55	17	arranger tool to be organized.
12:12:55	18	Q. And how about a document created by the user
12:12:55	19	in workspace?
12:12:55	20	A. Again, the same answer, typically you would
12:12:55	21	want -- you wouldn't want to sort of snatch
12:12:55	22	the document up from under the user as soon as
12:12:55	23	it was created, but if you wanted to, you
12:12:56	24	could. And in addition, there was an
12:12:56	25	operation in which if one dropped a document

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12:12:56	1	on the button, the activation button of a
12:12:56	2	tool, it would -- the script in that tool
12:12:56	3	would be applied. So, for instance, if the
12:12:56	4	user chose to create a new document, drop it
12:12:56	5	on the yellow button shown on the arranger
12:12:56	6	tool, then it would be added to the arranger.
12:12:56	7	Q. In the video, you state: "Architecturally
12:12:56	8	Workspace employees -- strike that.
12:12:56	9	In the video, you state:
12:12:56	10	"Architecturally Workscape employs a client-
12:12:56	11	server model between a user application known
12:12:56	12	as the viewer and any number of network data
12:12:56	13	repositories. The primary job of the viewer
12:12:56	14	is to receive documents from repositories and
12:12:56	15	render them in the user's workspace."
12:12:56	16	Can you just briefly describe what
12:12:56	17	that means.
12:12:56	18	A. Well, it means that the purpose of the viewer
12:12:56	19	is to retrieve information from heterogeneous
12:12:56	20	servers, represent them in a uniformed way for
12:12:56	21	the user, and allow their viewing and
12:12:56	22	manipulation.
12:12:57	23	Q. In the video you state: "Certain tools
12:12:57	24	generate small tag documents which are
12:12:57	25	attached to other documents as visual

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12:12:57	1	markers." Then you go on: Since the tag is
12:12:57	2	just a document, I can detach it from its
12:12:57	3	parent and even drop it into another
12:12:57	4	document. Documents may be annotated by using
12:12:57	5	the sticker pad, which is a tool that
12:12:57	6	generates small yellow documents with sticky
12:12:57	7	backs. I can type a note on the sticker and
12:12:57	8	then drop it on to any other document.
12:12:57	9	Can you just briefly describe what
12:12:57	10	that means.
12:12:58	11	A. Well, there is a basic design decision that
12:12:58	12	there would only be one kind of thing in
12:12:58	13	Workscape, that's what we call it, a
12:12:58	14	document. So, there were a simple set of
12:12:58	15	rules that made it very easy for a user to
12:12:58	16	learn how to use Workscape. That is once they
12:12:58	17	understood the nature of documents, that is
12:12:58	18	you can drag them in X, Y and Z and drop them
12:12:58	19	on tools, that was basically everything that
12:12:58	20	you needed to know about the documents. And
12:12:58	21	since documents were all there is, that's
12:12:58	22	essentially everything you need to know about
12:12:58	23	Workscape, other than the existence of
12:12:58	24	specific tools for specific purposes.
12:12:58	25	The section that you just read

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12:12:58	1	illustrates an example of how you could live
12:12:58	2	within those seemingly severe constraints and
12:12:58	3	still create a very rich user experience. The
12:12:58	4	example was that we, you could create special
12:12:58	5	kinds of documents that are still documents
12:12:58	6	and follow all of the rules that all documents
12:12:58	7	follow, but have some additional behaviors.
12:12:58	8	For instance, a yellow sticky document had the
12:12:58	9	property that if you dropped it on any other
12:13:01	10	document, it would stick to it so that you
12:13:01	11	could, the user could associate extra
12:13:01	12	information on a document even if, for
12:13:01	13	example, they didn't have the ability to
12:13:01	14	modify that document, perhaps they didn't own
12:13:01	15	it.
12:13:01	16	In addition, documents could be used
12:13:01	17	as markers on other documents. The little
12:13:01	18	tabs in the video are an example of that. And
12:13:01	19	you could imagine other kinds of documents
12:13:01	20	that can serve a similar function.
12:13:01	21	Q. What is the purpose of a marker?
12:13:01	22	A. Well, it provides another visual dimension for
12:13:01	23	search. In the example that we used in the
12:13:01	24	video, the yellow tags marked new would bring
12:13:01	25	the user's attention to E-mail messages that

21 (Pages 81 to 84)

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12:13:01	1	they happened to have not seen before. But
12:13:01	2	that's just an example of a much more general
12:13:01	3	mechanism. There was a different kind of
12:13:01	4	visual search tool that I'm not sure appeared
12:13:01	5	in the video, but certainly existed in the
12:13:01	6	prototype, that allowed me to say, find all of
12:13:01	7	the documents that were created within a
12:13:01	8	certain time period and put a red tag on them,
12:13:01	9	then find all of the documents that were sent
12:13:02	10	to me by Fred Lee and put a green tag on
12:13:02	11	that. Then you could immediately and
12:13:02	12	intuitively see the results of that search,
12:13:02	13	because the user could look for documents that
12:13:02	14	contain both red and green tags. And you
12:13:02	15	could write additional tools that could filter
12:13:02	16	by, bring all of the documents that have two
12:13:02	17	tags forward, for example. So, it was a very
12:13:02	18	intuitive visual query mechanism.
12:13:02	19	Q. In the video, you also stated: "The project
12:13:02	20	has the following specific design goals:
12:13:02	21	First to provide a single uniform computer
12:13:02	22	application capable of presenting information
12:13:02	23	to office workers without regard to the
12:13:02	24	information source or the form of its
12:13:02	25	underlying representation.

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12:13:02	1	What did you have mean by that?
12:13:02	2	A. Once again, it goes back to the difficulty
12:13:02	3	that traditional systems have with dealing
12:13:02	4	with metadata. If I'm an office worker and
12:13:02	5	I'm looking for a particular piece of
12:13:02	6	information, I don't necessarily remember or
12:13:02	7	care whether that information came into my
12:13:02	8	life as an E-mail message, as a little yellow
12:13:02	9	sticky, as a FAX message that had been sent
12:13:03	10	through an OCR machine or a sale of a
12:13:03	11	spreadsheet, I just want the information.
12:13:03	12	So, in traditional systems, the user
12:13:03	13	would have to do multiple searches. They
12:13:03	14	would have to search their E-mail, they would
12:13:03	15	have to search their spreadsheets and so on.
12:13:03	16	And this was -- the goal stated here was to
12:13:03	17	unify that so that the user can only focus on
12:13:03	18	their task and not have to worry about
12:13:03	19	irrelevant details, such as the form in which
12:13:03	20	the document originally came into their lives.
12:13:03	21	Q. Or the name of the document?
12:13:03	22	A. Or the name of the document, the document may
12:13:03	23	not have a name.
12:13:03	24	Q. Did Workscape require users to name documents?
12:13:03	25	A. No, certainly not. They allowed them to in

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12:13:03	1	most cases, but many documents, the yellow
12:13:03	2	sticky notes, for example, did not have names.
12:13:03	3	Q. You also stated during the video: For
12:13:03	4	example, the sticker pad has a control which
12:13:03	5	can morph the notes it dispenses into one of
12:13:03	6	three forms: A generic note, a reminder note
12:13:03	7	and a phone message form. Further, any
12:13:04	8	Workscape document can be morphed into these
12:13:04	9	forms simply by dropping it on the pad.
12:13:04	10	Can you describe again for me what a
12:13:04	11	reminder note is.
12:13:04	12	A. A reminder note was rendering of a document
12:13:04	13	that had a script associated with it that
12:13:04	14	would cause its date field, which would
12:13:04	15	typically be a date in the future, a date and
12:13:04	16	time in the future, to be constantly
12:13:04	17	monitored. And the document would, by various
12:13:04	18	techniques, bring itself to the user's
12:13:04	19	attention when that future date and time
12:13:05	20	arrived.
12:13:05	21	Q. During the video, you also mentioned
12:13:05	22	manipulation of documents by clipping.
12:13:05	23	A. Yes.
12:13:05	24	Q. What do you mean by clipping?
12:13:05	25	A. Clipping allowed the selective hiding and

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12:13:05	1	revealing of parts of the document by direct
12:13:05	2	manipulation. If you, if the user put the
12:13:05	3	mouse over one of the edges of the document
12:13:05	4	and dragged that edge, it would, depending on
12:13:05	5	the direction of the drag, it would either
12:13:05	6	hide or reveal some of the surface of the
12:13:05	7	document.
12:13:05	8	So, a primary example of the use of
12:13:05	9	clipping was to manage the complexity of
12:13:05	10	tools. You saw in the video that a tool
12:13:05	11	normally showed just a small amount of its
12:13:05	12	information and the most commonly used
12:13:05	13	features. But when the user dragged the
12:13:05	14	bottom edge of the tool, it would unclip
12:13:05	15	revealing more of the more specialized and
12:13:05	16	complex features of the tool.
12:13:05	17	Similarly, by convention, every tool
12:13:05	18	had a help text associated with it that was
12:13:05	19	normally clipped off the top. You don't want
12:13:06	20	to normally see the help, because most of the
12:13:06	21	time you don't need it, so it's clipped away
12:13:06	22	and out of the user's attention span. But if
12:13:06	23	and when it's needed, the user can simply
12:13:06	24	unclip the top edge of any tool and read the
12:13:06	25	help text associated with it.

22 (Pages 85 to 88)

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12:13:06	1	Q. Could Workscape be used -- strike that.
12:13:06	2	Could the clipping function you just
12:13:06	3	describe in Workscape be used to present a
12:13:06	4	document representation in abbreviated form?
12:13:06	5	MR. SOOBERT: Objection, form.
12:13:06	6	A. Well, when a -- every document layout had a
12:13:06	7	default clipping, so the designer of that
12:13:06	8	layout would decide which information was
12:13:06	9	visible by default. So, for instance, if the
12:13:06	10	document had, the documents say -- for
12:13:06	11	example, was a patent document, for example,
12:13:06	12	the designer of a renderer for a patent might
12:13:06	13	choose to show the title of the patent and its
12:13:06	14	abstract only; whereas, the rest of the first
12:13:06	15	page of the document could be clipped away.
12:13:06	16	So, in that sense, I guess so.
12:13:06	17	Q. In that case of the rendering of the patent,
12:13:06	18	would the patent -- strike that.
12:13:07	19	In the example that you gave of the
12:13:07	20	rendering of the patent, would the document
12:13:07	21	representation display an abbreviated version
12:13:07	22	of the patent?
12:13:07	23	A. Well, if you define the title and the abstract
12:13:07	24	as an abbreviated version, then yes. But
12:13:07	25	again, that's just an arbitrary example. The

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12:13:07	1	designer of the particular document renderer
12:13:07	2	could choose any subset of the document as the
12:13:07	3	default.
12:13:07	4	Q. On the video, you used a quote: "These
12:13:07	5	concepts of data modularity and spatial
12:13:08	6	organization are directly reflected in
12:13:08	7	Workscape's interface metaphor. This metaphor
12:13:08	8	contains only a single uniform data object
12:13:08	9	known simply as a document.
12:13:08	10	Can you explain what that means.
12:13:08	11	A. Well, there are two facets to that statement:
12:13:08	12	The information architecture and the visual
12:13:08	13	architecture of the interface, and they're
12:13:08	14	sort of two sides to a coin. The information
12:13:08	15	architecture is how the system represents the
12:13:08	16	document abstractly, this is the attribute
12:13:08	17	value pairs with the unique identifiers
12:13:08	18	model. But no matter how the document is
12:13:08	19	represented in the legacy repositories, by the
12:13:08	20	time it makes it into the Workscape system,
12:13:08	21	everything has been reduced to this standard
12:13:08	22	abstract data model with the value pair with
12:13:08	23	the unique identifier. So that's the
12:13:08	24	information architecture side of it.
12:13:08	25	The visual design side of it is

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12:13:08	1	similar, in the sense that these rectangular
12:13:08	2	two-dimensional objects arranged in a three-
12:13:09	3	dimensional screen are the only entity that
12:13:09	4	the user needs to concern his or herself
12:13:09	5	with. There are no modal dialogue boxers,
12:13:09	6	there are no pop-up menus or any of the other
12:13:09	7	sort of complexities that computers were
12:13:09	8	introducing to the user's world at that time.
12:13:09	9	There are merely documents, and all of those
12:13:09	10	other functions are built out of documents,
12:13:09	11	which all behave in a very uniform manner.
12:13:09	12	Q. I think earlier we talked about the types of
12:13:09	13	documents and their formats, which were
12:13:09	14	accommodated by the Workscape system,
12:13:09	15	including texts and video?
12:13:09	16	A. Potential.
12:13:09	17	Q. Do you recall that?
12:13:09	18	MR. SOOBERT: Objection, form.
12:13:09	19	A. Yes.
12:13:09	20	Q. And web pages I believe you mentioned?
12:13:09	21	A. Yes.
12:13:09	22	Q. How about pictures?
12:13:09	23	A. Well, pictures were just an element that could
12:13:09	24	be arranged on the document. You know, we
12:13:09	25	talked about one of the very early target

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12:13:09	1	theme scanned documents. Scanned documents
12:13:09	2	are just pictures, and so there's really no
12:13:09	3	conceptual difference between that and
12:13:09	4	photographs. The face of a document, even
12:13:12	5	though the document itself was always
12:13:12	6	rectangular and two dimensions, there was no
12:13:12	7	limitation to what could be represented on
12:13:12	8	that face. There could and was
12:13:12	9	representations of texts and images and
12:13:12	10	controls, such as dynamic query sliders and
12:13:12	11	buttons and toggles and so on, and there could
12:13:12	12	just as well have been a video, just as
12:13:12	13	today's web pages are heterogeneous in that
12:13:12	14	regard. The web pages are rectangular too,
12:13:12	15	but they can contain video or controls or
12:13:12	16	sounds or whatever.
12:13:12	17	Q. So, just to recap, to make it clear, could you
12:13:12	18	just briefly list the types of documents we've
12:13:12	19	just discussed.
12:13:12	20	A. Well, remembering that the types of documents
12:13:12	21	was unbounded because the application was
12:13:12	22	scripted, it was specifically designed to be
12:13:12	23	ostensible to new document types. Given that,
12:13:12	24	the demonstrations that I can remember doing
12:13:12	25	for Digital certainly involved texts,

23 (Pages 89 to 92)

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12:13:12	1	certainly involved pictures, involved web
12:13:12	2	pages of the day, which were very primitive.
12:13:13	3	I cannot remember whether we actually ever
12:13:13	4	implemented video or not. I wouldn't be
12:13:13	5	surprised if we did, but I frankly don't
12:13:13	6	remember. We certainly discussed it and
12:13:13	7	anticipated it in the design.
12:13:13	8	Q. Let's turn back to Exhibit 2, which is your
12:13:13	9	patent, the 330 patent. The patent is titled
12:13:13	10	Document Display System For Organizing and
12:13:13	11	Displaying Documents as Screen Objects --
12:13:13	12	strike that.
12:13:13	13	The patent is titled Document
12:13:13	14	Display System For Organizing and Displaying
12:13:14	15	Documents as Screen Objects Organized Along
12:13:14	16	Strand Paths.
12:13:14	17	Is that a general summary of what's
12:13:14	18	described in the patent?
12:13:14	19	MR. SOLO: Objection, form.
12:13:14	20	A. This particular one, yes.
12:13:14	21	Q. Can we turn to figure 1. What is this figure
12:13:14	22	depicting here?
12:13:14	23	A. It's depicting a find tool that has a strand
12:13:14	24	associated with it. The strand is receiving
12:13:14	25	back into the Z dimension, however, since the

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12:13:14	1	rendering is in perspective, it appears -- the
12:13:14	2	two-dimensional representation of the strand,
12:13:14	3	which is No. 20 in the illustration, appears
12:13:14	4	to be a diagonal line. But in fact, in free
12:13:14	5	space, it is going straight back in Z. And it
12:13:14	6	has a number of documents threaded on to it,
12:13:14	7	the strand does.
12:13:14	8	The other thing this is illustrating
12:13:14	9	apparently is No. 24 illustrates a constraint,
12:13:14	10	which is maintaining a certain distance
12:13:14	11	between the documents on the strand. That was
12:13:14	12	the parameter of the strand mechanism. So, by
12:13:14	13	manipulating that parameter, you could
12:13:14	14	determine whether the documents in the pile,
12:13:15	15	individual pile were densely packed very close
12:13:15	16	together or widely spread apart. The further
12:13:15	17	you spread them apart, the more of the
12:13:15	18	documents are visible, but it takes up more
12:13:15	19	space in the workspace.
12:13:15	20	Q. Let's turn to column 1 in your patent. At
12:13:15	21	lines 48 through 54, it states: The disclosed
12:13:15	22	system provides a similar visually rich
12:13:15	23	environment for handling documents with a
12:13:15	24	computer system. Documents may be typed,
12:13:15	25	scanned or FAX'es sent by remote users. The

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12:13:15	1	system allows the user to organize and browse
12:13:15	2	documents in an environment that resembles the
12:13:15	3	real world of piles and paper.
12:13:15	4	Is that an accurate representation
12:13:15	5	of how the Workscape system in 1994 operated?
12:13:15	6	A. It's a representation of some of the facets of
12:13:15	7	it, yes, and it certainly accurately reflects
12:13:15	8	our attention to use a relatively realistic
12:13:15	9	three-dimensional object metaphor.
12:13:15	10	Q. Continuing in that column, line 57, it
12:13:15	11	states: The system displays documents either
12:13:15	12	in a complete free-form, user controlled
12:13:15	13	configuration or at stands such that documents
12:13:15	14	in a strand follow a strand path. The strand
12:13:16	15	path is a two-dimensional line through three-
12:13:16	16	dimensional display space.
12:13:16	17	Is that consistent with how the
12:13:16	18	workspace system in 1994 operated?
12:13:16	19	A. Yes, assuming that by line you mean an
12:13:16	20	arbitrary path through space as opposed to the
12:13:16	21	geometric definition of line would be only a
12:13:16	22	single straight line. And we did not apply
12:13:16	23	that, because the paths can be complicated.
12:13:16	24	Q. In column 3 at the very top, it states: A
12:13:16	25	screen object is the visual representation of

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12:13:16	1	a document. Is that consistent with the use
12:13:16	2	of the term -- strike that.
12:13:16	3	Is this consistent with your
12:13:17	4	understanding of the use of objects as
12:13:17	5	document representations in the Workscape
12:13:17	6	system as of 1994?
12:13:17	7	MR. SOOBERT: Objection.
12:13:17	8	A. Yes. Again, though, there are two kinds of
12:13:17	9	objects, there are screen objects and there
12:13:17	10	are abstract objects in the information
12:13:17	11	architecture. This is referring to the
12:13:17	12	former. But yes, it's consistent.
12:13:17	13	Q. Starting on line 11, there's a discussion of
12:13:17	14	attribute value pairs. It says an attribute
12:13:17	15	is a piece of data stored in a document. Each
12:13:17	16	attribute has an attribute name and an
12:13:17	17	attribute value. An attribute name uniquely
12:13:17	18	identifies an attribute value within a
12:13:17	19	document.
12:13:17	20	Is date and time information an
12:13:17	21	example of an attribute?
12:13:17	22	A. It can be, yes.
12:13:17	23	Q. In the Workscape system as of 1994, was date
12:13:17	24	and time information used as an attribute?
12:13:17	25	A. Frequently, but not necessarily, because there

24 (Pages 93 to 96)

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12:13:17	1	were no required attributes. But it's very
12:13:17	2	common.
12:13:17	3	Q. Now, on column 4, line 46 through 48, it
12:13:17	4	states: Each scan document has an information
12:13:17	5	sticker across its top displaying the name of
12:13:17	6	the owner and the date it was scanned.
12:13:17	7	Can you describe what that means.
12:13:17	8	A. Just give me a minute. So, this is describing
12:13:18	9	an example embodiment of the idea in which one
12:13:18	10	would choose to annotate the scanned images
12:13:18	11	with these information stickers, which would
12:13:18	12	be these other documents that had had
12:13:18	13	auxiliary information associated with the
12:13:18	14	document. As we've already discussed, it was
12:13:18	15	very common to use a sticker metaphor to
12:13:18	16	associate auxiliary information of various
12:13:18	17	kinds. In this suggested embodiment, this
12:13:18	18	extra data about the scan images was treated
12:13:18	19	in that way.
12:13:18	20	Q. In column on 5, lines 14 through 21, it
12:13:18	21	states: The system uses a three-dimensional
12:13:18	22	workspace to provide a useful display of
12:13:18	23	potentially thousands of documents. The
12:13:18	24	workspace may display thousands of documents.
12:13:18	25	In a preferred embodiment of a workspace, the

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12:13:18	1	workspace is wrapped at the edges giving a
12:13:18	2	fisheye lens effect so that every screen
12:13:18	3	object that is not invisible has at least some
12:13:18	4	portion of its rectangle within a screen
12:13:18	5	display no matter what its position is in
12:13:18	6	three-dimensional workspace.
12:13:19	7	Do you know what that means?
12:13:19	8	A. Sure. There was a feature of the design that
12:13:19	9	guaranteed that no matter how many documents
12:13:19	10	there were in the workspace and no matter
12:13:19	11	where they were positioned, there would be
12:13:19	12	some visual indication of the documents along
12:13:19	13	the edges.
12:13:19	14	So, for instance, if you had a pile
12:13:19	15	sorted by date and it had many thousands of
12:13:19	16	documents, that pile could recede back a great
12:13:19	17	distance into the virtual workspace. And
12:13:19	18	furthermore, depending on the perspective
12:13:20	19	function, the vanishing point of that line
12:13:20	20	could be off of the screen. If that were the
12:13:20	21	case, a strict perspective rendering would
12:13:20	22	cause some of those documents to be
12:13:20	23	invisible. However, we considered that
12:13:20	24	undesirable since it might lead the user to
12:13:20	25	the false conclusion that those invisible

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12:13:20	1	documents weren't present. So, we invented a
12:13:20	2	technique that is analogous to a fisheye lens
12:13:20	3	that would essentially bend the edges of the
12:13:20	4	workspace artificially. So, the effect was
12:13:20	5	that a hint of the documents would accumulate
12:13:20	6	along the four edges of the view into the
12:13:20	7	workspace, even if strictly speaking they
12:13:20	8	wouldn't be visible by a true perspective.
12:13:20	9	That way the user was never misled into
12:13:20	10	thinking there were fewer documents than there
12:13:20	11	really were.
12:13:20	12	Q. Can I direct your attention to column 7 at the
12:13:20	13	bottom starting at line 58, and I won't read
12:13:20	14	all of this paragraph. But it starts: The
12:13:20	15	computer network that the system is connected
12:13:21	16	to may have one repository available or it may
12:13:21	17	have many. Some repositories are generic
12:13:21	18	places to put documents while others may be
12:13:21	19	specialized.
12:13:21	20	And a few lines down, it says: The
12:13:21	21	user may choose to maintain a private
12:13:21	22	repository on the local computer. Most
12:13:21	23	repositories are on remote machines and the
12:13:21	24	system gets documents from them over the
12:13:21	25	network.

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12:13:21	1	Can you briefly summarize what this
12:13:21	2	is explaining.
12:13:21	3	A. It's just an implication of the fact that
12:13:21	4	Workscape is one client that connected to many
12:13:21	5	servers. These servers are often specialized
12:13:21	6	for particular purposes. The example given
12:13:21	7	here is that a machine that would accept
12:13:21	8	FAX'es, modern FAX machines even back then
12:13:21	9	didn't produce documents on paper, they
12:13:21	10	captured them as computerized images.
12:13:21	11	Workscape was intended, among many other
12:13:21	12	things, to be able to connect such a device
12:13:21	13	such that the incoming FAX'es could be
12:13:21	14	rendered in the workspace along with any other
12:13:21	15	documents.
12:13:21	16	On the other hand, if you are
12:13:21	17	creating new documents or making copies of
12:13:22	18	documents from legacy sources, you may well
12:13:22	19	want to store them on your local machine, so
12:13:22	20	that, for instance, if the machine were a
12:13:22	21	laptop, you could take the documents with you
12:13:22	22	and work with them while on an airplane.
12:13:22	23	Therefore, it is, it anticipates the existence
12:13:22	24	of a local, what you might call a native
12:13:22	25	repository that simply stores documents in

25 (Pages 97 to 100)

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12:13:22	1	their attribute value model, according to
12:13:22	2	Workscape's document model. And that
12:13:22	3	repository, even though it has the same
12:13:22	4	logical relationship with the client as any
12:13:23	5	other repository would, happens to be running
12:13:23	6	on the same computer as the client and,
12:13:23	7	therefore, becomes portable, it guarantees
12:13:23	8	that the documents are always available.
12:13:23	9	Q. Is that description you just gave consistent
12:13:23	10	with the way the Workscape system operated in
12:13:23	11	1994?
12:13:23	12	A. Yes.
12:13:23	13	Q. In column 8 starting at line 7 through 11 --
12:13:23	14	strike that. Column 8, starting at line 7 and
12:13:23	15	continuing through line 11, it states: Each
12:13:23	16	user may configure a special find tool (which
12:13:23	17	serves as their in box) that constantly
12:13:23	18	watches the repositories for documents marked
12:13:23	19	for their attention and brings them into their
12:13:23	20	workspace.
12:13:23	21	Can you briefly describe what this
12:13:23	22	means.
12:13:23	23	A. It's the in box functionality that we referred
12:13:23	24	to earlier. It is simply a find tool. The
12:13:23	25	only way that it's special is that it's

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12:13:23	1	configured with a certain search query that
12:13:23	2	filters documents that the user desires to
12:13:23	3	have automatically brought into his or her
12:13:23	4	workspace. So, for instance, new E-mail
12:13:24	5	messages or documents that my secretary has
12:13:24	6	scanned for me could be marked in the
12:13:24	7	repository such that they would satisfy the
12:13:24	8	criterion of the search that the special in
12:13:24	9	box find tool is configured for. And the end
12:13:24	10	result would be that these documents would
12:13:24	11	automatically appear in my in box strand in a
12:13:24	12	way that's highly analogous to the way they
12:13:24	13	would be brought into a physical in box in a
12:13:24	14	traditional office.
12:13:24	15	Q. Does this have any relationship to the
12:13:24	16	persistence issue we discussed earlier?
12:13:24	17	A. Yes, this search would be an example of a
12:13:24	18	persistence search, because you want new
12:13:24	19	documents that are created in the future to be
12:13:24	20	subject to the operation.
12:13:24	21	Q. And you mentioned in your prior response
12:13:24	22	automatic updating I believe.
12:13:24	23	A. That's right, that's what persistence means,
12:13:24	24	that the search doesn't just search for
12:13:24	25	documents that exist at a particular period of

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12:13:24	1	time, but the search itself is ongoing, so
12:13:24	2	that future documents would appear as well.
12:13:24	3	MR. SOOBERT: Do you want to take a
12:13:24	4	short break for lunch?
12:13:24	5	VIDEO OPERATOR: Going off the
12:13:24	6	record. The time is 12:09 p.m.
12:32:24	7	- - - -
12:32:24	8	(Luncheon recess at 12:09 p.m. At
12:32:24	9	1:33 p.m., the deposition was reconvened as
12:32:24	10	follows):
12:32:24	11	- - - -
12:32:24	12	VIDEO OPERATOR: Back on the
12:32:34	13	record. The time is 12:33 p.m. You may
12:32:40	14	proceed.
12:32:42	15	MR. SOOBERT: I'd like to mark as
12:32:44	16	the next exhibit, Exhibit 5 a document bearing
12:32:47	17	Bates Nos. APMW75775 through 76. It's a
12:33:04	18	publication entitled Workscape Scriptable
12:33:08	19	Document Management Environment by Peter
12:33:11	20	Lucas.
12:33:35	21	- - - -
12:33:35	22	(Deposition Exhibit No. 5 was
12:33:35	23	marked for identification.)
12:33:35	24	- - - -
12:33:36	25	BY MR. SOOBERT:

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12:33:36	1	Q. Dr. Lucas, do you recognize this document?
12:33:38	2	A. Yes.
12:33:38	3	Q. What is this document?
12:33:39	4	A. This is the entry from the CHI conference
12:33:47	5	proceedings corresponding to the demonstration
12:33:50	6	that I alluded to earlier.
12:33:52	7	Q. Does this refresh your recollection as to the
12:33:56	8	date of the CHI '94 conference?
12:33:59	9	A. Yeah, it was April 24th through 28th, 1994.
12:34:03	10	Q. So, is that about the time that you publicly
12:34:07	11	disseminated the Workscape video that we've
12:34:10	12	been discussing today?
12:34:11	13	A. Yes.
12:34:11	14	Q. Do you recall the purpose of this document?
12:34:32	15	A. Well, yes, CHI publishes an extensive
12:34:38	16	proceedings of the papers and the other events
12:34:42	17	that were presented. Since this particular
12:34:46	18	event was a live demonstration, their habit
12:34:52	19	was to have a one- or two-page abstract of
12:34:56	20	what was shown at the demonstration for the
12:35:01	21	record in the proceedings. You note that in
12:35:03	22	the upper right what happened corner, it says
12:35:05	23	demonstration, that's how we know it's the
12:35:12	24	section of the proceedings.
12:35:23	25	MR. SOOBERT: I'd like to mark as

26 (Pages 101 to 104)

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12:35:24	1	the next exhibit a document bearing the Bates
12:35:27	2	Nos. MD1007 through MD1023, which has a title
12:35:40	3	in the upper left-hand corner as CHI Workscape
12:35:45	4	Film Script Draft August 9, 1993.
12:36:32	5	- - - -
12:36:32	6	(Deposition Exhibit No. 6 was
12:36:32	7	marked for identification.)
12:36:32	8	- - - -
12:36:32	9	Q. Do you recognize this document, Dr. Lucas?
12:36:34	10	A. Well, it appears to be the script of the film
12:36:40	11	that we just saw earlier. This is in a style
12:36:44	12	that I would have produced, therefore, I
12:36:49	13	assume that it reflects my personal work.
12:36:51	14	Q. On the first page of this document, it has the
12:36:56	15	date there, August 9, 1993, and then the
12:37:01	16	letters PAL. Do you know what that means?
12:37:04	17	A. PAL are my initials.
12:37:08	18	Q. Did you create this document?
12:37:10	19	A. Very likely, yes.
12:37:11	20	Q. Without comparing it line for line with the
12:37:14	21	video, I mean, does it more or less reflect,
12:37:17	22	to the best of your knowledge, the narration
12:37:19	23	that accompanies the video?
12:37:23	24	A. This is a random sampling, it certainly
12:37:32	25	appears to. I imagine that the video was

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12:37:36	1	probably headed for length after it was shot,
12:37:42	2	I'm almost certain it accurately reflects the
12:37:46	3	script, the original script.
12:37:52	4	MR. SOOBERT: I'd like to mark as
12:37:54	5	the next exhibit an article entitled Data
12:37:57	6	Mountain Using Spatial Memory For Document
12:38:01	7	Management. The author George Robertson of
12:38:10	8	Microsoft.
12:38:27	9	- - - -
12:38:27	10	(Deposition Exhibit No. 7 was
12:38:27	11	marked for identification.)
12:38:27	12	- - - -
12:38:27	13	MR. SOLO: Do you know whether this
12:38:28	14	was produced to Mirror Worlds?
12:38:32	15	MR. SOOBERT: I believe it was.
12:38:48	16	BY MR. SOOBERT:
12:38:48	17	Q. Do you know George Robertson by chance?
12:38:51	18	A. I know him professionally. I suspect we've
12:38:52	19	met, but I don't know him personally.
12:38:58	20	Q. Who he is he?
12:39:00	21	A. He's a researcher. He was a colleague of
12:39:08	22	Stuart Card, who is a very well-known kind of
12:39:11	23	pioneer in computer interaction. I believe
12:39:14	24	they both worked together at Xerox PARC back
12:39:18	25	in the early days of development of graphical

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12:39:22	1	user interfaces. He's been very active in the
12:39:31	2	information, visualization and document
12:39:34	3	management systems. He left -- if I have his
12:39:40	4	biography straight, he left Xerox at some
12:39:44	5	point, and the last I heard was an employee at
12:39:47	6	Microsoft Research.
12:39:49	7	Q. What is Xerox PARC, if you know?
12:39:53	8	A. Xerox PARC was a very famous laboratory that
12:39:59	9	was run by the Xerox Corporation in I guess
12:40:07	10	the '70s and the '80s, probably through the
12:40:12	11	'90s. And the reason for its fame, it was the
12:40:17	12	place where the so-called WIMP paradigm, WIMP
12:40:24	13	stands for windows, icons, menus and pointers,
12:40:30	14	which is basically the fundamental design of
12:40:32	15	the modern graphical user interface, was
12:40:35	16	developed in the context of an experimental
12:40:39	17	machine called a Xerox Alto.
12:40:43	18	Many of the seminal ideas that made
12:40:48	19	it into the modern user interface paradigm of
12:40:54	20	computers were invented at Xerox PARC.
12:40:59	21	Famously Steve Jobs visited Park, saw the work
12:41:02	22	that was being done there, specifically the
12:41:04	23	Alto, and went back and produced the Lisa and
12:41:14	24	then ultimately the Macintosh. The work had
12:41:20	25	been basically derivative from the early Xerox

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12:41:23	1	PARC Park work. And Stuart Card was one of
12:41:27	2	the central figures in that era, extremely
12:41:32	3	well esteemed, and Robertson was a colleague
12:41:35	4	of his I believe.
12:41:40	5	Q. Can I direct your attention to page 154 in
12:41:43	6	this document. About little less than halfway
12:42:00	7	down the page, there's a section that begins
12:42:04	8	belated work document management systems. Do
12:42:04	9	you see that?
12:42:05	10	A. Yes.
12:42:05	11	Q. And then there is a description in the first
12:42:10	12	two paragraphs and continuing that mentions a
12:42:13	13	number of document management systems and the
12:42:24	14	companies that produced them.
12:42:25	15	Do you see that?
12:42:25	16	A. Yes, I do.
12:42:26	17	Q. The first one mentioned is the Apple Macintosh
12:42:37	18	(cira 1984).
12:42:38	19	A. Yes.
12:42:38	20	Q. Were you aware of -- strike that.
12:42:44	21	And it continues a couple of lines
12:42:48	22	down saying the Apple Macintosh (circa 1984)
12:42:52	23	included list views and a spatial layout (icon
12:42:58	24	view). The spatial layout allowed the user to
12:43:00	25	place icons in whatever grouping the user

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12:43:03	1	desired. Apple later added expandable lists
12:43:08	2	for hierarchies and piles. And it continues
12:43:11	3	describing the piles.
12:43:20	4	Were you aware of Apple's work in
12:43:25	5	that space?
12:43:25	6	A. Generally, yes. I had no privileged
12:43:30	7	knowledge.
12:43:30	8	Q. No, generally was Apple's work in this space
12:43:36	9	fairly well known?
12:43:36	10	A. Sure.
12:43:39	11	Q. It continues on down and mentions a couple of
12:43:44	12	other companies in the second paragraph. It
12:43:47	13	mentions the information visualizer project at
12:43:50	14	Xerox PARC.
12:43:51	15	Do you see that?
12:43:52	16	A. Yes.
12:43:53	17	Q. This is the same Xerox PARC that you described
12:44:00	18	as being famous a few minutes ago?
12:44:03	19	A. Correct.
12:44:04	20	Q. And then following that, it mentions your
12:44:08	21	company, I believe MAYA, stating in 1994, MAYA
12:44:13	22	Design Group introduced Workscape as the first
12:44:18	23	example of a 3D spatial layout of documents
12:44:21	24	under the user's control.
12:44:32	25	Did you consider Workscape to be an

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12:44:34	1	example of 3D spatial layout of documents
12:44:38	2	under the user's control?
12:44:39	3	MR. SOLO: Objection, form.
12:44:41	4	A. Certainly.
12:44:42	5	Q. And this evolution of the development work in
12:44:48	6	this space would, would you characterize this
12:45:04	7	as generally well known to folks who would be
12:45:04	8	attending the CHI '94 conference?
12:45:05	9	MR. SOLO: Objection, form.
12:45:06	10	A. A subset of them. Certainly there was at that
12:45:08	11	time a relatively small community of people
12:45:11	12	who were doing this kind of work, kind of at
12:45:19	13	the intersection of what are called direct
12:45:22	14	manipulation interfaces and the information
12:45:24	15	visualization, and there weren't that many of
12:45:28	16	us. But certainly the people that were within
12:45:32	17	that group, the work would be quite limited.
12:45:34	18	Q. Do you know Dr. David Gelernter at Yale?
12:45:41	19	A. Once again, I certainly know him by
12:45:44	20	reputation, I know of his work; I met him
12:45:48	21	once.
12:45:49	22	Q. Would he be the type of work that would be
12:45:54	23	aware of this type of work?
12:45:56	24	MR. SOLO: Objection, form.
12:45:57	25	A. Certainly.

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12:45:58	1	Q. Certainly?
12:45:59	2	MR. SOLO: Objection, form.
12:46:00	3	A. I would certainly think so.
12:46:21	4	MR. SOOBERT: That's all of the
12:46:22	5	questions that I have at this time. I'll
12:46:24	6	probably have a few more after Mr. Solo goes.
12:46:34	7	MR. SOLO: I will ask for literally
12:46:35	8	two minutes off the record to formulate my
12:46:38	9	thoughts and then we'll go.
12:46:40	10	VIDEO OPERATOR: We're going off the
12:46:41	11	record. The time is 12:47 p.m.
09:11:41	12	- - - -
09:11:41	13	(There was a recess in the
09:11:41	14	proceedings.)
09:11:41	15	- - - -
12:54:41	16	VIDEO OPERATOR: Back on the
12:54:50	17	record. The time is 12:55 p.m. You may
12:54:56	18	proceed.
12:54:57	19	- - - -
12:54:57	20	EXAMINATION
12:54:57	21	- - - -
12:54:57	22	BY MR. SOLO:
12:54:57	23	Q. Hi, Mr. Lucas. Before one of the items we
12:55:00	24	were discussing were the attributes that the
12:55:02	25	documents would have.

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12:55:03	1	Do you remember that?
12:55:03	2	A. Yes.
12:55:04	3	Q. Was there a uniform format for the attributes?
12:55:10	4	A. Well, as I said, everything was reduced to
12:55:19	5	attribute value pairs, and the attributes were
12:55:24	6	simply text strings and the values were
12:55:30	7	arbitrary strings of bites. So, yes, it was a
12:55:32	8	very simple format, but yes.
12:55:34	9	Q. Let me ask the -- strike that.
12:55:42	10	You mentioned that a lot of legacy
12:55:44	11	systems had dates as part of the attributes on
12:55:48	12	the documents; is that correct?
12:55:50	13	A. Yes.
12:55:50	14	Q. Would those dates, depending on the legacy
12:55:58	15	system, have different formats?
12:56:00	16	A. Yes.
12:56:03	17	Q. If the workspace included documents from
12:56:11	18	different legacy systems that had the
12:56:13	19	different date formats, how would sorting by
12:56:18	20	date function?
12:56:18	21	A. There were basically two ways to address that
12:56:25	22	problem: You could arrange the input process
12:56:32	23	that interfaced the client and the server to
12:56:40	24	chronologize those dates, or you could have
12:56:43	25	scripts at a higher level that would take the

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12:56:46	1	platform-specific dates and then chronologize
12:56:50	2	them at that level. So, that by the time that
12:56:52	3	they were viewed by the higher-level scripts
12:56:57	4	that did the sorting, they would be in a
12:56:59	5	chronological format.
12:57:00	6	Q. Do you know if any of your articles described
12:57:05	7	either one of those methods?
12:57:07	8	A. My articles?
12:57:08	9	Q. Strike that. Do you know if any of the
12:57:10	10	exhibits you've seen today describe either one
12:57:13	11	of those methods?
12:57:14	12	A. I do not know.
12:57:15	13	Q. Could you please describe to me -- strike
12:57:30	14	that.
12:57:37	15	Throughout today's deposition,
12:57:38	16	you've described the various functionality
12:57:41	17	that could be provided by scripts; is that
12:57:43	18	correct?
12:57:43	19	A. Yes.
12:57:43	20	Q. Who would create those scripts?
12:57:48	21	A. Some of them would come packaged with the
12:57:54	22	system as it was shipped, but a great many
12:57:57	23	additional ones would be created by end users
12:58:02	24	or so-called power users on behalf of end
12:58:07	25	users. It would work much in the same way

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12:58:12	1	that spreadsheets work. The idea of scripting
12:58:18	2	is that it bridges the gap between the
12:58:20	3	developers of software and the end user.
12:58:27	4	Q. Now, you've described the persistent
12:58:33	5	searches. Were those scripts packaged with
12:58:37	6	the software, or?
12:58:39	7	A. There were instances of it that were packaged
12:58:46	8	with the software, yes, the find tool, for
12:58:50	9	instance, was packaged.
12:58:51	10	Q. Could you describe how the find tool -- strike
12:59:05	11	that.
12:59:06	12	In what context did the find tool
12:59:11	13	support persistent searching?
12:59:13	14	A. It had the ability to repeatedly query any of
12:59:25	15	the repositories that it was connected to,
12:59:29	16	such that when new documents appeared, they
12:59:32	17	would, that matched the search criteria and
12:59:38	18	that weren't already in workspace, it would be
12:59:42	19	find it.
12:59:42	20	Q. Where was that option located -- strike that.
12:59:51	21	In the find tool -- strike that.
13:00:29	22	Dr. Lucas, allow me to direct your
13:00:31	23	attention to what was marked as Lucas Exhibit
13:00:34	24	3, which were a series of screen shots. The
13:00:39	25	front page starts out design goals?

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13:00:41	1	A. Yes.
13:00:42	2	Q. Allow me to direct your attention to page No.
13:00:51	3	9. In this particular screen shot of the
13:00:59	4	modular find, I did not see an option for
13:01:03	5	making that search persistent.
13:01:05	6	Do you know how the search would
13:01:07	7	have been made persistent?
13:01:08	8	A. Well, you should understand, first of all,
13:01:15	9	that there were many different prototypes of,
13:01:21	10	as I said, this happens to be a sample in
13:01:24	11	time. So, all these years later, I can't
13:01:33	12	remember every detail of every tool that we
13:01:37	13	prototyped, but it is certainly possible. You
13:01:39	14	can see that there is something that I can't
13:01:42	15	quite read. In fact, the first word looks
13:01:45	16	like it might be auto. I'm not sure.
13:01:48	17	But the general answer would be
13:01:51	18	conformant with the architecture, one of two
13:01:56	19	things, either there was a separate species of
13:01:59	20	find tool that had this characteristic, or if
13:02:01	21	it was under end user control under a single
13:02:05	22	tool, it could have been clicked down further
13:02:08	23	there.
13:02:08	24	Q. You've mentioned that when you were creating
13:02:10	25	this system from DEC, you were under a

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13:02:15	1	confidentiality agreement; is that correct?
13:02:16	2	A. Yes.
13:02:18	3	Q. Besides the presentations of the prototype
13:02:23	4	that we've seen today, were there any other
13:02:26	5	public displays of the prototype that your
13:02:30	6	group made?
13:02:31	7	A. There were none that revealed anything that
13:02:41	8	was not disclosed at the CHI presentations,
13:02:49	9	because the CHI, the active disclosure at CHI
13:02:52	10	relieved us of the confidentiality for that
13:03:00	11	information but not others. So, yes, there
13:03:02	12	were, but they disclosed no additional
13:03:04	13	information.
13:03:05	14	Q. So, to the extent there were prototypes that
13:03:11	15	showed certain aspects of persistent searching
13:03:15	16	that were not shown at the CHI presentation,
13:03:19	17	they were not revealed publicly before 1996;
13:03:24	18	is that correct?
13:03:25	19	MR. SOOBERT: Objection, form.
13:03:34	20	Q. Let me rephrase that. If there were
13:03:36	21	prototypes of the Workscape program that
13:03:41	22	included persistent searching that were not
13:03:44	23	disclosed at the CHI '94 presentation, would
13:03:48	24	they have been publicly disclosed before 1996?
13:03:51	25	A. Not given your stipulation, but I never said

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13:03:55	1	that the persistent search wasn't disclosed at
13:04:00	2	the CHI presentation.
13:04:01	3	Q. One of the examples that you discussed today
13:04:31	4	with Mr. Soobert involved the ability
13:04:37	5	persistently search for all items created by
13:04:39	6	Mr. Soobert's family; is that accurate?
13:04:42	7	A. Yes.
13:04:43	8	Q. The example I believe involved creating an
13:05:00	9	asterisk-type search that first brought in all
13:05:04	10	of the documents from a repository into the
13:05:06	11	workspace; is that correct?
13:05:07	12	A. Yes.
13:05:08	13	Q. And then there would be a secondary persistent
13:05:13	14	search on those documents; is that correct?
13:05:16	15	A. There could be, yes.
13:05:18	16	Q. Was there a find function that allowed for
13:05:29	17	persistent searching on documents in the
13:05:32	18	Workscape by default -- strike that.
13:05:37	19	Was there a find function included
13:05:41	20	in the Workscape that allowed for persistent
13:05:46	21	searching of documents in the Workscape?
13:05:49	22	A. I do not have a direct memory of that. I have
13:06:08	23	to infer that the answer is probably yes,
13:06:12	24	because most likely of the two options that I
13:06:19	25	mentioned of having a separate species of find

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13:06:25	1	tool and one with an option, most likely we
13:06:29	2	did the latter. And since the find tool
13:06:34	3	certainly had persistent search against the
13:06:37	4	repository, under that assumption, you would
13:06:40	5	have it in the workspace as well.
13:06:42	6	Q. Just to confirm, you don't remember for
13:06:45	7	certain, though?
13:06:46	8	MR. SOOBERT: Objection, form.
13:06:52	9	A. There is an inference involved in my answer.
13:06:55	10	Q. I'd like to talk a little bit about the notes,
13:07:11	11	documents in the Workscape system. Did the
13:07:22	12	yellow notes have a date field associated with
13:07:25	13	them?
13:07:25	14	A. Some of them did. The reminder note did.
13:07:29	15	Q. Could you please describe to me the
13:07:32	16	distinctions between the reminder note and
13:07:34	17	just the yellow note.
13:07:36	18	A. Well, as shown in the video, they were
13:07:45	19	variants that were intended for different
13:07:46	20	purchases. They all were notes, in the sense
13:07:49	21	that they had this stickiness behavior.
13:07:55	22	However, the generic note was just
13:07:59	23	metaphorically the same as a blank post-it
13:08:03	24	note. It consisted only of a text field and
13:08:08	25	had no active scripts associated with it. The

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13:08:10	1	reminder note had an additional field, which
13:08:13	2	was the date field, which allowed the user to
13:08:17	3	edit the attribute, and also had a script in
13:08:23	4	it that had a behavior, which reminded the
13:08:28	5	user of the date and time that the -- that the
13:08:37	6	entered date indicated.
13:08:38	7	Q. How would notes be stored in repositories?
13:08:44	8	A. Again, there are two options: They would --
13:08:49	9	well, first of all, everything that is stored
13:08:52	10	everywhere is stored according to the uniform
13:08:56	11	object models, so they would be documents like
13:08:57	12	the others, it was be attribute value pairs
13:08:59	13	with unique identifiers.
13:09:01	14	There was a notion in addition to
13:09:05	15	that that is mentioned in the patents of what
13:09:08	16	were called femoral documents. So, there was
13:09:11	17	the option of having documents that were
13:09:17	18	stored only in the workspace, but the
13:09:18	19	workspace itself was a document, and
13:09:21	20	therefore, it was stored in some other
13:09:23	21	repository was.
13:09:51	22	Q. Was there an option to save -- strike that.
13:10:06	23	Did the user have an option to save
13:10:08	24	the femoral documents?
13:10:10	25	A. What do you mean by save?

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13:10:12	1	Q. Strike that. Let me go back a little bit,
13:10:21	2	perhaps I'm not understanding.
13:10:30	3	Could you briefly describe for me
13:10:32	4	what happens to the documents when they go
13:10:35	5	from a repository to the workspace and back.
13:10:38	6	A. Before that can happen, the workspace needs to
13:10:48	7	be holding the UID of the document. There's a
13:10:53	8	transaction between the client and the
13:10:56	9	repository, in which some or all of the
13:11:01	10	attribute value pairs of the documents are
13:11:04	11	fetched into the workspace. And then if the
13:11:11	12	user edits those documents in any way, they
13:11:14	13	are persistently written back to the
13:11:18	14	repository.
13:11:40	15	Q. What would happen if a -- strike that.
13:11:52	16	While documents were open in the
13:11:53	17	workspace, could they be simultaneously edited
13:11:59	18	in the repository?
13:12:00	19	A. You mean by another client? The repository
13:12:09	20	does not have a user interface, so, no. They
13:12:19	21	might be edited by another client, and if so,
13:12:22	22	if your question is what would happen under
13:12:26	23	that case, that would be up to the
13:12:29	24	implementation of the repository. There are
13:12:31	25	rather difficult issues around concurrency and

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13:12:40	1	atomic operations since there are techniques
13:12:43	2	well known in the industry about how you can
13:12:50	3	support transactional communications between a
13:12:54	4	server and a client.
13:13:00	5	If the server supported those, made
13:13:03	6	those proper transactional guarantees, then
13:13:07	7	you could achieve global consistency. But
13:13:10	8	those are specific features that the specific
13:13:13	9	server would have to offer. Workscape itself
13:13:18	10	doesn't address that issue.
13:13:19	11	Q. One of the embodiments you described involved
13:13:46	12	the user having a local repository in the
13:13:47	13	workspace system.
13:13:49	14	How would the user store the
13:13:51	15	documents in the local repository?
13:13:53	16	A. The same way it was stored in any other
13:13:56	17	repository. The screen object was associated
13:14:01	18	with a specific instance of the document and a
13:14:05	19	specific repository, therefore, if the
13:14:07	20	document came from the local repository, it
13:14:12	21	would be returned to that same repository.
13:14:18	22	Now, if the user created a new
13:14:20	23	document, the dispenser tool which caused that
13:14:27	24	document to come into existence would have to
13:14:30	25	be associated with a particular repository, or

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13:14:33	1	else have some script to determine which
13:14:39	2	repository it went into it.
13:14:40	3	Q. Did the user have to select which repository
13:14:45	4	to save his newly created documents to?
13:14:47	5	A. Well, no, because there's no notion of save.
13:14:51	6	Again, you haven't defined that term.
13:14:58	7	Workscape had persistence in all cases, and
13:14:59	8	therefore, the documents were intrinsically
13:15:03	9	associated with the given repository, so
13:15:06	10	there's no user interaction implied. Now, one
13:15:15	11	could make a copy of a document, there was a
13:15:17	12	copy tool, and in that case, the copy tool
13:15:21	13	either has to have a default or the user would
13:15:24	14	have to specify where that copy would go. But
13:15:27	15	that was not a common operation.
13:15:35	16	Q. I guess what I'm wondering about is a
13:15:39	17	situation where you have so many documents in
13:15:45	18	the workspace that you want to close some out
13:15:47	19	of the workspace.
13:15:48	20	Where would you put those documents
13:15:51	21	that you wanted to close out at the workspace?
13:15:53	22	A. There was a trash tool, and the trash tool
13:16:06	23	would remove the documents from the
13:16:07	24	workspace. That doesn't necessarily imply
13:16:11	25	deleting them from the repository.

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13:16:13	1	Q. Could you please describe for me how the trash
13:16:18	2	tool worked.
13:16:19	3	A. It contained the script that would simply
13:16:24	4	delete the reference to the document from the
13:16:27	5	data structures that were part of the
13:16:30	6	implementation in the workspace. In fact, it
13:16:37	7	was implemented, and most implementations of
13:16:41	8	it, remembering there were many
13:16:44	9	implementations of all the things we're
13:16:46	10	describing.
13:16:47	11	In typical implementation, the trash
13:16:51	12	tool itself had a strand, and therefore, there
13:16:53	13	was a pile of documents waiting to be
13:16:56	14	discarded, and then there was an empty trash
13:17:00	15	button that would irate through the documents
13:17:05	16	on the strand and delete their references from
13:17:07	17	the workspace.
13:17:07	18	Q. Did the users have the ability to edit all of
13:17:37	19	the different documents present in the
13:17:39	20	workspace?
13:17:40	21	A. That depended on the rendering that was
13:17:49	22	applied to them. Remember we're seeing this
13:17:53	23	polymorphic, so the same document could be
13:17:56	24	rendered in many different ways. Some
13:17:59	25	rendering supported editing of some documents

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13:18:02	1	and others didn't. In the extreme case, for
13:18:10	2	instance, any document could have been morphed
13:18:13	3	into being, say, the little new tag, to use an
13:18:17	4	example that we saw before. The new tag
13:18:20	5	displayed -- didn't need to display any
13:18:21	6	information from the document, and therefore,
13:18:24	7	certainly would support editing it. Other
13:18:31	8	encodings, potential encodings were designed
13:18:34	9	specifically to support the editing of
13:18:36	10	documents.
13:18:36	11	Q. What would be done to ensure consistency
13:18:43	12	between the edited document and the document
13:18:45	13	on a repository?
13:18:47	14	A. I think I've already answered that. The
13:18:49	15	document would be written back to the
13:18:51	16	repository and it would be up to the
13:18:53	17	repository to implement whatever transactional
13:19:00	18	guarantees that it saw fit to provide. That's
13:19:06	19	not a question that was particularly relevant
13:19:11	20	to our design.
13:19:12	21	Q. I guess my question is: When a user edits a
13:19:47	22	document in the Workscape, is he editing the
13:19:50	23	document that was in the repository, or a copy
13:19:52	24	of the document that was formatted for
13:19:58	25	Workscape?

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13:19:59	1	A. You must be very careful in defining the term
13:20:04	2	copy. In a world in which documents have
13:20:06	3	unique identifiers, a copy has a different
13:20:12	4	identifier. If I may introduce some of our
13:20:19	5	standard terminology, we talk about copies
13:20:21	6	versus replicas. A replica had -- and that's
13:20:26	7	not necessarily industry standard terminology,
13:20:29	8	but this is a distinction that is often missed
13:20:33	9	in the industry.
13:20:34	10	Two replicas of the same document
13:20:37	11	had the same identifier, two copies have
13:20:40	12	different identifiers. With that as context
13:20:45	13	for answering your question, one could think
13:20:51	14	of the instance of the document in the
13:20:53	15	repository and the instance in the workspace
13:20:57	16	as being replicas, since they have the same
13:21:00	17	identifier. Of course the thing literally
13:21:10	18	being edited is a replica in the workspace,
13:21:15	19	it's not a copy, but it is a replica. But
13:21:17	20	that can be written back to the persistent
13:21:24	21	repository with whatever degree of
13:21:28	22	aggressiveness the designer of the tool has
13:21:30	23	decided.
13:21:31	24	So, you could attempt to be as
13:21:35	25	transactionally consistent across the system

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13:21:36	1	as you choose to at the expensive of
13:21:39	2	computational and network resources. But
13:21:41	3	again, I repeat, the difficult part of that
13:21:47	4	story has to do with transitional guarantees,
13:21:50	5	but that's a question about repositories, not
13:21:53	6	about clients.
13:21:57	7	Q. Was there any sort of default that the
13:22:01	8	prototype had with respect to the writing back
13:22:06	9	to the repository?
13:22:07	10	A. There were many prototypes. Probably, but I
13:22:14	11	have no specific memory. Almost certainly we
13:22:17	12	did much experimenting on that question since
13:22:22	13	it has a since significant effect on the
13:22:27	14	behavior and the overall system. But what
13:22:33	15	kind of right answer to that depends very much
13:22:36	16	on what kind of application you're building
13:22:38	17	and what the purpose is.
13:22:52	18	Q. Was there a concern that having too much
13:22:54	19	documents in the workplace could overwhelm the
13:23:00	20	screen space?
13:23:00	21	A. That's why we went to use the third dimension
13:23:05	22	very early on in the process. We asked
13:23:11	23	ourselves the question, how can we deal
13:23:14	24	simultaneously with thousands of documents at
13:23:16	25	once, and the only answer we could think of is

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13:23:20	1	only a few pixels per document. Following
13:23:26	2	that reasoning, it led to the realization that
13:23:31	3	if you model the documents in three dimensions
13:23:33	4	rather than two, you have kind of an
13:23:35	5	essentially unbounded space for documents,
13:23:41	6	therefore, you don't run out of screen space,
13:23:46	7	the rendering in perspective. You may run out
13:23:49	8	of computing power, but we knew even back then
13:23:53	9	that that would just get better over time, so
13:23:57	10	we designed for the future.
13:23:59	11	Q. Was there a concern that having so many
13:24:01	12	documents on the screen could overwhelm a
13:24:04	13	user?
13:24:04	14	A. No. I think we took great pride in addressing
13:24:12	15	those problems by using people's spatial
13:24:15	16	reasoning abilities to minimize that problem.
13:24:29	17	The beauty of a pile is that it is cognitively
13:24:34	18	dealt with as a single object and not as many
13:24:40	19	objects. And that vastly reduces the
13:24:44	20	cognitive load of the user perceiving it and
13:24:48	21	dealing with the pile.
13:24:49	22	Q. What would happen in you run a search --
13:25:17	23	strike that.
13:25:28	24	You've testified that you could pull
13:25:32	25	all of the documents in from all of the

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13:25:33	1	repositories by using a query with a wild
13:25:36	2	card; is that correct?
13:25:37	3	A. Yes.
13:25:40	4	Q. Having pulled those documents into the
13:25:42	5	workspace, what would happen to that strand if
13:25:46	6	you ran a find on it?
13:25:48	7	A. Well, it depends on what the find was. It
13:26:00	8	would filter the contents of the strand and
13:26:06	9	select a subset of the strand that matched the
13:26:11	10	find criteria.
13:26:14	11	Q. Visually would the documents that matched the
13:26:21	12	find criteria still remain in the strand that
13:26:24	13	included all of the documents?
13:26:27	14	A. It depends on how it was configured. You'll
13:26:30	15	recall from the video that there was a plug-in
13:26:38	16	section clipped off to the right of the find
13:26:40	17	tool. And the idea is that you would put
13:26:42	18	various modules in there, which also could
13:26:45	19	either come prepackaged with the system or
13:26:49	20	written by end users. They would contain
13:26:53	21	scripts.
13:26:58	22	And the verb that is the action that
13:27:00	23	would take place as a result of the search,
13:27:04	24	the actions that would be performed on the
13:27:07	25	filtered subset would be entirely under the

32 (Pages 125 to 128)

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13:27:11	1	control of those scripts. It could be pulled
13:27:14	2	into another pull, they could be simply
13:27:19	3	selected, they could be made larger, they
13:27:22	4	could have tags attached to them. All of
13:27:25	5	those things were prototypes at various times.
13:27:37	6	Q. Do you know which version was prepackaged in
13:27:40	7	the prototype shown at CHI '94?
13:27:43	8	A. Most of those options were. There were two
13:27:47	9	different tools, there was the find, the
13:27:49	10	generic find tool itself, which would have
13:27:55	11	created another pile. But there was also a
13:27:58	12	visual search tool, which was a minor variant
13:28:01	13	of the find tool that put, that attached those
13:28:10	14	little tabs on to the edge of the document.
13:28:14	15	So, you would end up with the same pile, but a
13:28:17	16	subset of them would have tags on them. I can
13:28:19	17	remember specifically that that was shown in
13:28:21	18	the demonstration. I don't know that there
13:28:29	19	was specifically one that merely did a
13:28:32	20	selection, but there easily could have been.
13:28:35	21	Q. Could you have had a command that searched the
13:28:50	22	pile that included all of the documents,
13:28:54	23	created a second pile that matched the
13:28:56	24	criteria and still left all of the documents
13:29:00	25	that matched the criteria in their original

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13:29:03	1	pile?
13:29:03	2	A. We made a user interface design decision not
13:29:10	3	to support that, and it wasn't that it
13:29:15	4	couldn't be done, it's that we thought that it
13:29:17	5	was undesirable to do so. There's a rule that
13:29:21	6	a document can appear only once within a given
13:29:27	7	workspace. So, we forbade, as a matter of
13:29:34	8	policy, not as a matter of mechanism, more
13:29:39	9	multiple replicas of the same document to
13:29:43	10	appear in the same workspace. We were
13:29:46	11	concerned about a false implicature where the
13:29:50	12	user my conclude that there existed more
13:29:52	13	documents than there really were.
13:29:55	14	However, the prototype supported
13:29:58	15	multiple simultaneous workspaces open at the
13:30:03	16	same time. So, if you allowed the other pile
13:30:09	17	to be in a separate workspace, you could have
13:30:13	18	performed such an operation.
13:30:14	19	Q. Do data workspaces communicate with one
13:30:20	20	another?
13:30:21	21	A. They certainly could at minimum. I frankly
13:30:29	22	can't recall whether we developed specific
13:30:31	23	mechanisms to have direct communication. But
13:30:35	24	they certainly could have mediated through a
13:30:38	25	document in a repository, since they could

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13:30:41	1	have -- so you can have access to the same
13:30:42	2	repository, therefore, you could have written
13:30:45	3	back to the same document. My guess is we
13:30:48	4	probably did also have direct communication,
13:30:51	5	but I frankly don't remember.
13:31:23	6	Q. Did the Workscape system provide for archiving
13:31:26	7	of documents?
13:31:27	8	A. What does that mean?
13:31:30	9	Q. Let me rephrase the question.
13:31:37	10	Did the Workscape system provide a
13:31:39	11	user with an interface that would permit him
13:31:43	12	to move the documents from one repository to
13:31:46	13	another repository?
13:31:47	14	A. Yes. As I mentioned previously, there's a
13:31:50	15	copy tool, and the copy tool would have been
13:31:55	16	reconfigured as to which repository the copy
13:31:58	17	went in, and therefore, by simply making a
13:32:01	18	copy of the document using that copy tool
13:32:07	19	directed towards a different repository, that
13:32:09	20	operation could be accomplished.
13:32:11	21	Q. Was there an automated system that would do it
13:32:15	22	every certain period of time?
13:32:23	23	A. I don't remember. But it would have been
13:32:26	24	extremely easy to script such a thing, it
13:32:29	25	would just be a matter of putting certain

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13:32:31	1	modules together.
13:32:37	2	Q. Do you know if there was a function that
13:32:41	3	performed such a copy on all documents that
13:32:43	4	were older than a certain period of time?
13:32:45	5	A. Probably not. But again, our focus was on
13:32:54	6	generality and scriptability. We did not much
13:32:58	7	play the game of guessing what end users would
13:33:03	8	want, we put our emphasis on making it easy
13:33:08	9	for end users to create anything like that
13:33:11	10	that they wanted. I doubt that that
13:33:13	11	particular feature was implemented, but I'm
13:33:15	12	not sure.
13:33:18	13	And again, I'm answering only with
13:33:20	14	respect to the prototypes that were produced
13:33:23	15	here at MAYA. No doubt many other things
13:33:25	16	happened within Digital.
13:33:34	17	Q. Was most of the functionality left for the
13:33:37	18	users to implement through scripts -- strike
13:34:18	19	that.
13:34:18	20	You've previously stated that the
13:34:21	21	reminder notes had future dates as the date
13:34:25	22	that they were scripted to come back to the
13:34:28	23	user and remind them of something; is that
13:34:29	24	correct?
13:34:30	25	A. Yes.

33 (Pages 129 to 132)

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13:34:30	1	Q. Do you know whether putting reminder notes in
13:34:36	2	time order would have provided the reminder
13:34:41	3	note's future date or the date they were
13:34:43	4	created?
13:34:44	5	A. Well, it could be both. If the designer of
13:34:56	6	the note created both attributes, you would
13:34:58	7	have been able to choose which one that you
13:35:03	8	wanted. Most likely the prototype simply
13:35:08	9	created a generic date field, it probably did
13:35:12	10	not support both, and therefore, it would have
13:35:16	11	been in the reminder date. But that was a
13:35:20	12	fairly arbitrary choice. And again, I'm
13:35:23	13	speculating, I don't remember the details of
13:35:28	14	that.
13:35:28	15	Q. Did the Workscape system support -- strike
13:36:04	16	that. Did the Workscape system support user's
13:36:18	17	installation of applications that may
13:36:21	18	perform -- strike that. Did the Workscape --
13:36:33	19	strike that.
13:36:33	20	Did the Workscape application permit
13:36:36	21	users to install applications on to it?
13:36:40	22	A. Well, that's what the tools were. Workscape
13:36:45	23	was essentially a platform, and each tool
13:36:49	24	could be used. And since the tools were just
13:36:53	25	documents, everything that we have said so far

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13:36:55	1	about bringing documents into the workspace
13:36:58	2	was applied to tools. For instance, a user
13:37:02	3	could use the E-mail tool to E-mail a
13:37:05	4	configured copy of the find tool from one user
13:37:09	5	to another.
13:37:12	6	Q. You've described that tools were made through
13:37:15	7	scripting language?
13:37:16	8	A. Yes.
13:37:16	9	Q. Were tools capable of being made as robust as,
13:37:24	10	for example, Microsoft word?
13:37:26	11	A. You're asking -- robust is a characterization
13:37:44	12	of an implementation, not of a design. Most
13:37:47	13	of our work was prototype being of user
13:37:51	14	interface ideas, for robustness was not a
13:37:54	15	goal. But assuming a complete and stable
13:37:56	16	implementation of the design, yes, certainly.
13:37:59	17	Now, tools, philosophically or from
13:38:04	18	a design perspective, the tools in Workscape
13:38:08	19	should not have ever gotten nearly as
13:38:10	20	complicated as Microsoft word. The biggest
13:38:15	21	advantage of a scripted environment is that
13:38:17	22	you create things with specificity rather than
13:38:22	23	generality. So, I think it's kind of an
13:38:25	24	apples and oranges comparison. But if you're
13:38:34	25	asking in my judgment, is there any reason why

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13:38:40	1	a tool can't be as robust as Word, sure.
13:38:46	2	VIDEO OPERATOR: We're under five
13:38:46	3	minutes. This is the end of disk 2 in the
13:38:47	4	deposition of Dr. Peter Lucas. Going off the
13:38:50	5	record. It is 1:39 p.m.
	6	- - - -
	7	(There was a recess in the
	8	proceedings.)
	9	- - - -
13:44:30	10	VIDEO OPERATOR: This marks the
13:44:31	11	beginning of disk 3 in the deposition of
13:44:33	12	Dr. Peter Lucas. Going back on the record.
13:44:36	13	The time is 1:45 p.m. You may proceed.
13:44:39	14	BY MR. SOLO:
13:44:39	15	Q. Mr. Lucas, I'd like to direct you to Exhibit
13:44:44	16	No. 5, which is the CHI '94 demonstration
13:44:52	17	paper. I'd like to direct you to page No. 10,
13:45:02	18	Bates No. 75776. I'd like to direct you to
13:45:18	19	the No. 2 in the middle of that page and the
13:45:20	20	second paragraph under it starting with
13:45:21	21	Workscape. That paragraph reads: Workscape's
13:45:25	22	non-modal documents-always-open interface
13:45:26	23	paradigm lets users see at a glance many
13:45:31	24	things about a document, which would be
13:45:33	25	invisible in a tradition interface.

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13:45:35	1	Could you describe what that means.
13:45:39	2	A. Well, if you continue, it says: I can see
13:45:47	3	that one document is a scanned image, another
13:45:50	4	contains tabular data, and the third is a
13:45:53	5	two-column text, even when the documents are
13:45:57	6	too far away to read. So, the idea is there
13:57:47	7	could be hundreds of documents open on the
13:57:47	8	screen, each of them could be postage stamp
13:57:47	9	size, and yet the user would, for example, be
13:57:47	10	able to see in a glance that ten of those
13:57:47	11	documents have photographs embedded in them,
13:57:47	12	or that five of them were one big picture, or
13:57:47	13	that all of them were formatted to columns
13:57:47	14	with newspaper headlines. So, there's
13:57:47	15	pragmatic information, and by pragmatic I mean
13:57:47	16	information that one probably would not
13:57:47	17	explicitly encode.
13:57:47	18	You don't typically put a tag on a
13:57:47	19	document saying that it's got three pictures,
13:57:47	20	you might, but you typically wouldn't. And
13:57:47	21	yet the information is directly visible
13:57:47	22	because of the non-model nature of things on
13:57:47	23	it.
13:57:47	24	Q. Let me ask you about the part that's in
13:57:47	25	quotes, which says documents always open.

34 (Pages 133 to 136)

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13:57:47	1	Could you describe what that means.
13:57:47	2	A. Yeah, that was making a specific distinction
13:57:47	3	that was current in the day between, I guess
13:57:47	4	it still is, in traditional interfaces, you --
13:57:47	5	when you look at say a desktop, you don't see
13:57:47	6	the document, you see an icon representing the
13:57:47	7	document. And you have to, for example,
13:57:47	8	double click on a word file in order to
13:57:47	9	actually see the contents. There was no
13:57:47	10	notion of that in Workscape, it was completely
13:57:47	11	non-modal. I'll use the words that were in
13:57:47	12	the video script, the documents are neither
13:57:47	13	open or closed, they're just there.
13:57:47	14	Q. Dr. Lucas, I'd like to direct you to Exhibit
13:57:47	15	No. 2, which is your patent 5,499,330. And
13:57:47	16	I'd like to direct you to page Bates numbered
13:57:47	17	720, column No. 1, lines 51 through 54. That
13:57:47	18	section states: The system allows the user to
13:57:47	19	organize and browse documents in an
13:57:47	20	environment that resembles the real world of
13:57:47	21	piles and papers. Is that -- strike that.
13:57:47	22	Was that an accurate description of
13:57:47	23	the system?
13:57:47	24	A. The previous statement, real world is
13:57:47	25	non-model. Do I need to define the term

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13:57:47	1	modal? It's a term of art.
13:57:47	2	Q. Please.
13:57:47	3	A. A modal interface is one in which there is
13:57:47	4	more than one mode or more than one state that
13:57:47	5	the interface can be in with different
13:57:47	6	behaviors indifferent modes. So, there are
13:57:47	7	things you can do with a Word document when
13:57:47	8	it's open that you can't do to it when it's
13:57:47	9	closed, and therefore, that represents a model
13:57:47	10	interface.
13:57:47	11	Q. Thank you I'd like to direct you to page Bates
13:57:47	12	numbered 723, column No. 7, lines 22 through
13:57:47	13	25. It states, a development can only be
13:57:47	14	moved forward a certain distance. When it is
13:57:47	15	as far as it will get, it is plastered against
13:57:47	16	the work space window and can then not be
13:57:47	17	moved any closer. Is that an accurate
13:57:47	18	description of how workspace functioned?
13:57:47	19	A. It's an accurate description of revert
13:57:47	20	implementation.
13:57:47	21	Q. I'd like to direct you to column 8 on the same
13:57:47	22	page, lines 46 through 47. That section
13:57:47	23	states, strands are not containers but rather
13:57:47	24	are a mechanism for arranging screen objects
13:57:47	25	without hiding them. Could you please

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13:57:47	1	describe what that means?
13:57:47	2	A. A strand, as we said, is a one-dimensional
13:57:47	3	path and a three dimensional space. It a
13:57:47	4	effectively a programming construct for
13:57:47	5	complying restraints on the positions of the
13:57:47	6	documents. The details of each constraints
13:57:47	7	were possible, and when they were used, it was
13:57:47	8	rather a complex subject. But in the simplest
13:57:47	9	case, it was like -- as I said earlier, it was
13:57:47	10	analogous to beads on a string. Or you could
13:57:47	11	also think of it as being analogous as a
13:57:47	12	string of railroad cars in a train where they
13:57:47	13	are, where the cars are not completely rigidly
13:57:47	14	attached to each other, there is a certain
13:57:47	15	play between them. And that play represents a
13:57:47	16	constraint on where the trail cars are with
13:57:47	17	respect to its neighbors. But it's not a
13:57:47	18	rigid constraint. And analogous features were
13:57:47	19	incorporated into the strand design. So, that
13:57:47	20	basically provided a very rich programming
13:57:47	21	tool for causing documents to be arranged in
13:57:47	22	useful ways on the screen is that were still
13:57:47	23	subject to direct manipulation by the user.
13:57:47	24	Q. It states that -- strike that. One of the
13:57:47	25	aspects of the strand is that it arranges

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13:57:47	1	screen objects without hiding them. Could you
13:57:47	2	describe what that means.
13:57:47	3	A. The strand itself is invisible, it's a
13:57:47	4	mathematical relationship. This paragraph was
13:57:47	5	intended to be in contradistinction with say a
13:57:47	6	folder metaphor in traditional graphical user
13:57:47	7	interfaces in which a closed folder acts,
13:57:47	8	although it may contain and group documents,
13:57:47	9	it does it in a way that hides them so that
13:57:47	10	they can't be seen. When the folder is
13:57:47	11	closed, that is, because again, opening and
13:57:47	12	closing a folder is an example of a modal
13:57:47	13	interface. So, we wanted Workscape to be as
13:57:47	14	radically non-modal as we could when new
13:57:47	15	developments of the piles metaphor and the
13:57:47	16	strands mechanism, which were basically,
13:57:47	17	reverse implementation technique for the piles
13:57:47	18	met for that allowed all of the documents in
13:57:47	19	the pile to now be visible essentially.
13:57:47	20	Q. Were there instances when all of the document
13:57:47	21	were not visible?
13:57:47	22	A. Not by virtue of the strand, by virtue of the
13:57:47	23	respective rendering, sure. If you're looking
13:57:47	24	straight back at a document and you have a
13:57:47	25	pile rather as opposed to a brief angle, the

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13:57:47	1	rules of perspective would imply that only the

13:57:47 1 rules of perspective would imply that only the
13:57:47 2 front one would be visible. But since the
13:57:47 3 whole pile was trivially dragable by the end
13:57:47 4 user, a problem like that is correctable.
13:57:47 5 Q. Was a digital rendering of the documents on a
13:57:47 6 strand configured to ensure that they don't
13:57:47 7 run off the screen?
13:57:47 8 A. Not in itself, but there was a separate
13:57:47 9 mechanism that provided for that, that was the
13:57:47 10 fisheye lens technique that was discussed
13:57:47 11 earlier.
13:57:47 12 Q. I'd like to direct your attention to Lucas
13:57:47 13 Exhibit 4. On the page No. 1, at the bottom
13:57:47 14 of the screen, there's what looks like a
13:57:47 15 timeline control.
13:57:47 16 A. Yes.
13:57:47 17 Q. The timeline control is limited by the points
13:57:47 18 of August 1st of '89 and July 30, 1990. Is
13:57:47 19 that correct?
13:57:47 20 A. In this picture?
13:57:47 21 Q. Yes.
13:57:47 22 A. Yes.
13:57:47 23 Q. How were those two points determined?
13:57:47 24 A. This was an extremely early protocol that its
13:57:52 25 only purpose was to communicate some

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13:57:52 1 fundamental user interface concepts. This was
13:57:54 2 very early in the project. This was done in
13:57:56 3 July of 1990. The issue wasn't addressed.
13:58:03 4 Q. And the prototype shown in the CHI '94
13:58:12 5 conference, were -- strike that.
13:58:15 6 In the prototype shown in the CHI
13:58:18 7 '94 conference, was the time line control ever
13:58:21 8 unbounded?
13:58:22 9 A. I don't remember.
13:58:25 10 Q. Dr. Lucas, I would like to direct your
13:58:47 11 attention to the other set of screen shots,
13:58:49 12 which is Lucas Exhibit 3. I'd like to direct
13:59:07 13 your attention to page 11.
13:59:19 14 Was the arranger tool configured to
13:59:23 15 be persistent by default?
13:59:26 16 A. I don't remember. You're asking about this
13:59:36 17 particular demonstration?
13:59:42 18 Q. Yes, in the prototype disclosed in the CHI '94
13:59:47 19 conference, do you know whether the arranger
13:59:52 20 tool was configured to be persistent?
13:59:54 21 A. I don't remember.
13:59:55 22 Q. Do you remember whether it would have been
13:59:58 23 options to make it persistent?
13:59:59 24 A. The only thing I would be able to say with
14:00:02 25 high probability is that if you dropped

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14:00:05 1 additional documents on the control, it would
14:00:11 2 very likely add them to the arrangement. So,
14:00:16 3 that would represent a kind of persistence, I
14:00:19 4 don't know if that's the kind you have in mind
14:00:21 5 or not.
14:00:22 6 Q. And if you just brought in new documents from
14:00:24 7 a repository and not put them on the control?
14:00:28 8 A. Well, once again, the plug-in mechanism
14:00:37 9 permits tools to be strung together
14:00:40 10 arbitrarily. So, if you wanted to do that,
14:00:43 11 you would have used the persistent find tool
14:00:50 12 and fed the results of that find tool in to
14:00:52 13 the arranger tool, and that would do exactly
14:00:52 14 what you described. Whether the arranger tool
14:00:55 15 by itself was designed that way, I don't know,
14:00:59 16 but I think that's kind of incidental.
14:01:02 17 Q. Did the user have to configure scripts to have
14:01:09 18 the tools talk to one another?
14:01:10 19 A. The user had the opportunity to do so.
14:01:23 20 Q. Could the user create scripts that executed
14:01:37 21 all of the user's workspaces at once?
14:01:42 22 A. You would have to define all of the user's
14:01:47 23 workspaces. You mean all of the workspaces
14:01:50 24 that were currently open? There's an
14:01:55 25 unbounded number of workspaces. You would

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14:01:57 1 have to put some bounds on the question for me
14:02:00 2 to be able to answer it.
14:02:01 3 Q. Yes, I'll be glad to do so. Could the user
14:02:05 4 create a script to execute on all workspaces
14:02:11 5 open to the user?
14:02:12 6 A. To the best of my memory, the answer is yes.
14:02:25 7 I'm less than 100 percent certain that that
14:02:29 8 feature was implemented, but I'm perhaps 90
14:02:32 9 percent certain. This is a question about the
14:02:35 10 semantics of the scripting language. Because
14:02:39 11 the scripting language has a sophisticated
14:02:39 12 notion of iteration. So, for instance, you
14:02:44 13 could write a script that said for each
14:02:46 14 document in this workspace do so and so.
14:02:56 15 Your question reduces to whether we
14:02:58 16 had implemented an iterator that would iterate
14:03:05 17 over all open workspaces. And I don't
14:03:07 18 remember for certain, my guess is that it
14:03:10 19 probably did.
14:03:11 20 Q. Do you know if the scripting language was ever
14:03:17 21 publicly shown?
14:03:18 22 A. The scripting language itself? Probably only
14:03:27 23 incidentally. I do not recall any publication
14:03:30 24 of the formal specifications of the scripting
14:03:33 25 Language. There were probably glances of it

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14:03:37	1	in the live demo.
14:04:17	2	Q. Did the users have the ability to edit
14:04:22	3	attributes of documents?
14:04:26	4	A. Yes.
14:04:26	5	Q. Let me try to specify the question. Could the
14:04:35	6	user have edited the -- strike that.
14:04:47	7	How would a user edit attributes of
14:04:50	8	a document?
14:04:50	9	A. The encoder is the screen representation of it
14:04:56	10	would be designed in a way to do that. Any
14:04:58	11	time someone typed anything in the text field,
14:05:00	12	they were editing attributes of documents,
14:05:03	13	since the attributes of documents were the
14:05:06	14	only persistence mechanism that consists,
14:05:09	15	there was no other state. Therefore, any
14:05:14	16	editing of a document constituted editing the
14:05:17	17	attributes.
14:05:18	18	Q. Were there any attributes that were hidden
14:05:21	19	from the user?
14:05:22	20	A. For a given encoder, there could have been,
14:05:25	21	but none that were intrinsically hidden.
14:05:32	22	Q. Were there documents where, for example, the
14:05:37	23	date created attribute would have been hidden
14:05:39	24	from the user?
14:05:40	25	A. Yes. Remember we gave an example earlier of

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14:05:48	1	the little tabs with all of the attributes,
14:05:51	2	for example.
14:05:51	3	Q. Thank you.
14:06:16	4	A. I should qualify that last answer. When we're
14:06:20	5	attributes, I assume we're talking about what
14:06:24	6	we call intrinsic attributes, that is
14:06:25	7	attributes of the documents themselves that's
14:06:25	8	stored in the repository. There is also a
14:06:27	9	notion of extrinsic attributes as disclosed in
14:06:33	10	the patent. Extrinsic attributes have to do
14:06:37	11	with the relationship between documents and
14:06:37	12	their workspace. For example, X, Y and Z were
14:06:40	13	the location of the documents, they were not
14:06:43	14	stored in the documents themselves, and they
14:06:45	15	were known as extrinsic. But answering your
14:06:49	16	questions, assuming you're talking about
14:06:52	17	intrinsic attributes.
14:06:59	18	Q. With respect to the extrinsic attributes,
14:07:02	19	would they have been stored somewhere if the
14:07:04	20	document was closed out of the workspace --
14:07:07	21	strike that.
14:07:20	22	Were extrinsic attributes stored in
14:07:23	23	the repositories?
14:07:24	24	A. They were stored in the workspace documents
14:07:30	25	themselves, and therefore, yes.

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14:07:35	1	Q. Would they still exist if the document was
14:07:40	2	closed out of the workspace?
14:07:41	3	A. Removed from the workspace?
14:07:44	4	Q. For example.
14:07:45	5	A. Well, we need to be precise here. By closed
14:07:56	6	out, do you mean removed?
14:07:58	7	Q. Let me try to be precise. Let's say a user
14:08:03	8	had a document they took from a repository,
14:08:07	9	they did some operation on it and they no
14:08:09	10	longer wanted to see it on their workspace,
14:08:12	11	and they wanted to close it out of the
14:08:14	12	workspace?
14:08:15	13	A. Remove it from the workspace?
14:08:17	14	Q. Remove it from the workspace.
14:08:19	15	A. Well, then the question is kind of
14:08:22	16	meaningless, because if the document isn't in
14:08:25	17	the workspace, it has no position in the
14:08:27	18	workspace, and therefore, the extrinsic
14:08:32	19	attributes no longer exist. That's the nature
14:08:34	20	of the intrinsic/extrinsic documents.
14:08:38	21	Intrinsic attributes are absolute to the
14:08:40	22	document, extrinsic attributes are relative to
14:08:42	23	the workspace. I don't know if I'm being
14:08:52	24	clear, but you can't talk about the exposition
14:08:54	25	of a document that's not there.

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14:08:56	1	Q. You are being perfectly clear, let me ask it
14:09:02	2	in a different way. You described at one
14:09:08	3	point a situation where the document and the
14:09:11	4	repository -- strike that.
14:09:13	5	You described a situation where the
14:09:16	6	document in the workspace as a replica of a
14:09:20	7	document in the repository would be written
14:09:23	8	back to ensure consistency. Would those
14:09:26	9	external attributed be written back to the
14:09:30	10	repository, or would they exist only in the
14:09:32	11	workspace?
14:09:33	12	A. Well, they exist only in the workspace, but
14:09:35	13	the workspace itself is written back to the
14:09:38	14	repository, so I'm not quite sure how to
14:09:42	15	answer that. They are stored in a repository,
14:09:48	16	not necessarily the same repository that the
14:09:51	17	document itself is stored in.
14:09:52	18	Q. I guess this may be the one link I may need
14:09:56	19	clarification on. How is the workspace
14:10:00	20	stored?
14:10:00	21	A. It's a document, it's stored in attribute
14:10:06	22	value pairs, like any other document. I said
14:10:08	23	several times, and I don't mean to belabor,
14:10:13	24	but it's quite important, that there is only
14:10:15	25	one kind of persistent storage in Workscape,

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14:10:20	1	and that is attribute value pairs of
14:10:22	2	documents.
14:10:27	3	Q. I guess I'm confused about a small nuisance.
14:10:31	4	A workspace could pull documents from various
14:10:34	5	repositories; is that correct?
14:10:36	6	A. Yes.
14:10:36	7	Q. Which repository would the workspace be stored
14:10:39	8	in?
14:10:39	9	A. It could be stored in any repository.
14:10:42	10	Q. So, the storage of the workspace is not
14:10:46	11	related to which repository it takes documents
14:10:50	12	from; is that correct?
14:10:51	13	A. Well, a workspace can take documents from many
14:10:59	14	repositories. There's really nothing special
14:11:03	15	about a workspace document, it's simply a
14:11:06	16	document. So, anything that is true of any
14:11:06	17	other document is true of workspaces as well.
14:11:10	18	They are in some repository. In a typical
14:11:13	19	implementation, they would be stored in local
14:11:16	20	repositories so that they were guaranteed to
14:11:19	21	be present on startup, but that's not a
14:11:22	22	requirement.
14:11:27	23	Q. Dr. Lucas, when were you first contacted by
14:11:30	24	Apple in connection with this deposition?
14:11:33	25	A. I really don't know. I have an assistant who

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14:11:43	1	helps manage my E-mail. I believe that there
14:11:54	2	was -- there may have been a phone message
14:11:57	3	left several months ago that I'm not sure I
14:12:01	4	returned. Beyond that, I do not -- and I'm
14:12:11	5	not even certain of that since I didn't recall
14:12:13	6	the call. And beyond that, I could certainly
14:12:18	7	look at my E-mail.
14:12:19	8	Q. Did you confer with Apple's counsel in
14:12:24	9	preparation for today's deposition?
14:12:26	10	A. Yes.
14:12:26	11	Q. Could you describe for me how you prepared for
14:12:33	12	today's deposition.
14:12:33	13	A. I answered the questions about the patent
14:12:42	14	relating very similar to what we did today.
14:12:45	15	Q. How many meetings did you have with Apple's
14:12:48	16	counsel?
14:12:48	17	A. It was one phone call.
14:12:50	18	Q. How long was that phone call?
14:12:51	19	A. Several hours.
14:12:53	20	Q. Was that your only conversation with Apple's
14:13:02	21	counsel?
14:13:02	22	A. Yes.
14:13:10	23	Q. Did Apple's counsel ask you to review your
14:13:13	24	publications in preparation for today's
14:13:15	25	deposition?

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14:13:15	1	A. Yes -- wait, I'm sorry, there were two
14:13:21	2	meetings. There was one physical meeting, but
14:13:24	3	it was not with counsel.
14:13:28	4	Q. Could you tell me who you met with.
14:13:30	5	A. Joseph is his first name, I don't remember his
14:13:34	6	last name. I would have to check my
14:13:39	7	calendar. But yes, last week I believe, he
14:13:44	8	came, and we had a similar conversation and he
14:13:47	9	left behind the documents for my review.
14:13:50	10	Q. And do you know what his position is at Apple?
14:13:55	11	MR. SOOBERT: Objection, form.
14:13:56	12	A. No, I'm not even sure he works at Apple.
14:14:27	13	Q. What is Mr. Joseph's connection to Apple, to
14:14:30	14	the best of your knowledge?
14:14:37	15	A. My impression is that he was a technical
14:14:40	16	consultant of some kind. He may be an
14:14:42	17	employee of the law firm, I'm not sure.
14:14:46	18	Q. Did he give you any instructions when he
14:14:54	19	provided you with the materials to review?
14:14:57	20	A. Instructions, you mean about my testimony?
14:15:01	21	Q. Well, just in general, what were the
14:15:08	22	instructions he provided to you?
14:15:11	23	MR. SOOBERT: Objection, form.
14:15:12	24	A. He gave me the documents and suggested that I
14:15:17	25	review them in preparation for this

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14:15:20	1	deposition.
14:15:28	2	Q. Let me try to get the timeline down. You were
14:15:35	3	first contacted by Apple or its counsel by
14:15:37	4	E-mail a couple of months ago?
14:15:42	5	MR. SOOBERT: Objection, form.
14:15:43	6	A. I didn't say that.
14:15:44	7	Q. Okay. Perhaps you could restate it better
14:15:51	8	than I can restate it to you.
14:15:53	9	A. I believe, and my memory of this is very
14:15:56	10	fuzzy, I believe there may have been a voice
14:15:59	11	mail left that I did not reply to, so there
14:16:06	12	was no communication at that time. The next
14:16:14	13	thing that I'm aware of is that a subpoena was
14:16:16	14	served, which I did not deal directly with.
14:16:30	15	The subpoena was not to me, it was to the
14:16:32	16	business, to MAYA. MAYA prepared to, complied
14:16:41	17	with the document requests and prepared to
14:16:48	18	comply with the deposition request.
14:16:57	19	That was not -- I did not intend to
14:16:59	20	personally do that deposition. And then not
14:17:07	21	very, I think a negotiation ensued that I
14:17:14	22	wasn't particularly involved in, except at a
14:17:20	23	very high level, that led to this, to a
14:17:26	24	meeting that I believe was last week followed
14:17:30	25	by a phone conversation, and then this

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14:17:34	1	deposition.
14:17:34	2	Q. And the meeting was with the technical
14:17:41	3	advisor?
14:17:42	4	A. Was with the person whose name was Joseph, who
14:17:45	5	I believe was a technical advisor.
14:17:47	6	Q. Approximately how long did that meeting last?
14:17:51	7	A. Hour and a half I would guess, two hours
14:17:58	8	perhaps.
14:17:58	9	Q. How long did you spend reviewing the documents
14:18:06	10	that the person whose name was Joseph left
14:18:08	11	with you?
14:18:08	12	A. Five minutes. I was reasonably familiar with
14:18:16	13	them to begin with, except for the Mirror
14:18:22	14	Worlds' patent, which I only skimmed.
14:18:24	15	Q. Do you know why you were asked to review
14:18:43	16	Mirror Worlds' patent?
14:18:45	17	A. No. I could presume it was just so that I had
14:18:54	18	a general background as to what was going on.
14:18:57	19	There was a dispute.
14:19:05	20	Q. When you had the phone call with Apple's
14:19:12	21	counsel, did you go through the various
14:19:21	22	exhibits you've seen today?
14:19:22	23	A. To some extent, but I mostly just answered
14:19:28	24	questions, very similar in form to the
14:19:31	25	questions I answered today.

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14:19:32	1	Q. Were you instructed on how to phrase your
14:19:46	2	answers?
14:19:46	3	A. No.
14:19:47	4	Q. Did you go -- strike that.
14:20:00	5	Was one of the lines of questioning
14:20:05	6	that you talked about over the phone related
14:20:07	7	to the diary and the pile and scroll
14:20:14	8	embodiment?
14:20:16	9	A. Probably -- well, diary, I don't recall the
14:20:31	10	concept of a diary coming up. We certainly
14:20:39	11	didn't talk about the woman and her children
14:20:44	12	and separating her things, that example was
14:20:48	13	not used. Pile and scroll was probably
14:20:51	14	touched on.
14:20:52	15	Q. Was the term diary used in your conversation
14:20:55	16	over the phone?
14:20:56	17	A. Not to my memory.
14:21:22	18	Q. How are you being compensated for your
14:21:26	19	deposition preparation?
14:21:27	20	A. I will be billing my hourly rate.
14:21:31	21	Q. Could you tell me what your hourly rate is.
14:21:36	22	A. I don't know.
14:21:37	23	Q. Can you estimate.
14:21:41	24	A. Some number of hundreds of dollars an hour.
14:21:48	25	It's readily available, I just don't know. I

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14:21:51	1	don't bill, I just write down hours.
14:21:56	2	Q. Do you know how many hours you spent preparing
14:21:59	3	for this deposition?
14:22:00	4	A. Five or seven I guess.
14:22:08	5	Q. Were you promised anything by Apple other than
14:22:15	6	your regular billable rate?
14:22:19	7	A. Nothing tangible certainly. If we're
14:22:30	8	talking -- the only exception might be we did
14:22:36	9	negotiate the terms under which, for instance,
14:22:40	10	the part of the subpoena that required MAYA
14:22:43	11	Design to do a deposition was withdrawn. But
14:22:50	12	that's the only thing I can think of.
14:22:53	13	Q. Do you own any stock in Apple?
14:22:57	14	A. Probably, but I don't manage my own
14:23:10	15	investments, so.
14:23:10	16	Q. Has MAYA ever done any work for Apple?
14:23:13	17	A. Not to my memory.
14:23:35	18	Q. Did you know anything about the lawsuit prior
14:23:37	19	to being contacted by Apple?
14:23:39	20	A. I knew it existed. I followed the trade
14:23:44	21	press, and it caught our attention because
14:23:47	22	Workscape was not lost on us. But I didn't
14:23:52	23	pay much attention.
14:24:01	24	Q. Did Apple tell you that they were seeking to
14:24:07	25	invalidate Mirror Worlds' patent?

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14:24:08	1	A. Probably not in so many words, but it was
14:24:19	2	fairly obvious. I assumed it in any event.
14:24:46	3	MR. SOLO: I'd like to take one last
14:24:50	4	30-second break.
14:24:51	5	VIDEO OPERATOR: We're going off the
14:24:52	6	record. The time is 2:25 p.m.
09:11:41	7	- - - -
09:11:41	8	(There was a recess in the
09:11:41	9	proceedings.)
09:11:41	10	- - - -
14:25:12	11	VIDEO OPERATOR: Back on the
14:29:34	12	record. The time is 2:30 p.m. You may
14:29:37	13	proceed.
14:29:37	14	BY MR. SOLO:
14:29:37	15	Q. Dr. Lucas, you've -- I'd like to direction
14:29:57	16	your attention to Lucas Exhibit 7, the article
14:30:01	17	titled Data Mountain. I believe you've
14:30:19	18	previously testified that a group of people
14:30:22	19	were involved in graphic interfaces would have
14:30:25	20	been aware of the piles project and the Xerox
14:30:31	21	PARC as well as I believe some of the other
14:30:36	22	interfaces.
14:30:37	23	Do you remember that?
14:30:37	24	A. Yes.
14:30:38	25	Q. How would you describe that group of people?

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14:30:51	1	Let me rephrase the question.
14:30:53	2	Do you think average computer
14:31:01	3	scientists would have been aware of the Apple
14:31:06	4	piles project?
14:31:07	5	A. Of the Apple piles project?
14:31:10	6	Q. Strike that. Do you think that average
14:31:14	7	computer scientists would have been aware of
14:31:16	8	the projects described in this article?
14:31:20	9	MR. SOOBERT: Objection, form.
14:31:21	10	A. Average computer scientists probably not. But
14:31:33	11	a computer -- but the community of computer
14:31:39	12	scientists who are interested in leading edge
14:31:44	13	user interface design, I would think in
14:31:47	14	general probably.
14:31:56	15	Q. Dr. Lucas, do you have any personal feelings
14:32:00	16	regarding Dr. Gelernter?
14:32:01	17	A. I have a great respect for him.
14:32:03	18	Q. Do you have any personal feelings regarding
14:32:11	19	Mirror Worlds?
14:32:11	20	A. The company or the book?
14:32:19	21	Q. Let me rephrase the question.
14:32:21	22	Do you have any personal feelings
14:32:23	23	towards Mirror Worlds Technologies, which was
14:32:27	24	the company that was around in the late '90s?
14:32:30	25	A. Personal feelings, not particularly. I

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14:32:52	1	perhaps tended to think they were somewhat
14:32:58	2	overreaching in some innovative claims, but
14:33:02	3	that's just business. So, I don't think I
14:33:05	4	would count it as a particularly negative
14:33:09	5	feeling.
14:33:21	6	MR. SOLO: I have no further
14:33:22	7	questions.
14:33:23	8	- - - -
14:33:23	9	RE-EXAMINATION
14:33:23	10	- - - -
14:33:23	11	BY MR. SOOBERT:
14:33:23	12	Q. Dr. Lucas, we appreciate your patience, and
14:33:31	13	I'll try to be brief. I do want to address a
14:33:34	14	number of points that Mr. Solo raised.
14:33:41	15	Number one, to the extent there's --
14:33:43	16	strike that.
14:33:44	17	You don't have a financial stake in
14:33:47	18	the outcome of this litigation, do you?
14:33:49	19	A. Certainly not.
14:33:50	20	Q. And your testimony today has been your
14:33:55	21	complete, honest and independent attempts to
14:34:02	22	relay the development work that was conducted
14:34:04	23	at MAYA in the early '90s; is that right?
14:34:08	24	A. Absolutely.
14:34:09	25	Q. And no one at Apple or on behalf of Apple has

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14:34:13	1	suggested that you deliver your answers or
14:34:16	2	your testimony in any particular way; isn't
14:34:18	3	that right?
14:34:19	4	A. That is correct.
14:34:20	5	Q. I want to return briefly so this is clear
14:34:36	6	because it's important, and I want it to be
14:34:38	7	clear to the Court and the jury. I want to
14:34:38	8	return to my example that we started with
14:34:42	9	earlier today about my family. Let's return
14:34:47	10	to the repository where my family's documents
14:34:50	11	are stored, and the documents there are texts,
14:34:55	12	E-mails, pictures and reminder notes.
14:35:02	13	Do all of those types of documents
14:35:04	14	include date attributes?
14:35:06	15	A. One would expect them to because it's routine
14:35:16	16	when such documents are captured to have
14:35:20	17	them. But I want to be clear that Workscape
14:35:23	18	does not require such an attribute. But as a
14:35:33	19	practical matter, the answer is probably yes.
14:35:36	20	Q. Let's take the example, and I want to
14:35:44	21	specifically refer to the functionality of
14:35:46	22	what I'll call the 1994 Workscape system,
14:35:52	23	which is, as we've seen in the video and as
14:35:55	24	further described in your patent; is that
14:35:57	25	fair?

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14:35:57	1	A. Yes.
14:35:58	2	Q. So, using the Workscape system in 1994, could
14:36:08	3	a user search and retrieve all of those
14:36:11	4	documents stored on that repository related to
14:36:16	5	my family?
14:36:16	6	A. As long as there is a well-defined definition
14:36:29	7	of what related to my family means that can be
14:36:33	8	expressed in a search expression, yes.
14:36:35	9	Q. Let me try this another way. Could a user use
14:36:41	10	a wild card search query to retrieve all of
14:36:44	11	those documents from that repository in the
14:36:47	12	1994 Workscape system?
14:36:49	13	A. Yes.
14:36:50	14	Q. And all of those documents, including the
14:36:55	15	texts, E-mails, pictures and the reminder
14:36:59	16	notes, would be presented then to the user
14:37:04	17	through the workspace user interface; isn't
14:37:10	18	that correct?
14:37:11	19	A. Workscape user, yes.
14:37:13	20	Q. I know Workscape, as of 1994, had lots of
14:37:23	21	elegant features and functionality, but I
14:37:27	22	again want to focus on the time-ordered
14:37:29	23	sequencing of documents.
14:37:37	24	Could a user use that wild card
14:37:40	25	search function, query the repository and

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14:37:43	1	return all of the documents in a time-ordered
14:37:47	2	sequence into Workscape?
14:37:51	3	A. This may be splitting hairs, but they're not
14:37:57	4	necessarily returned in a time-ordered
14:37:59	5	sequence. They're returned in some sequence
14:38:02	6	that's determined by the repository and then
14:38:05	7	displayed in a time-ordered sequence.
14:38:07	8	Q. Okay, fair enough. All of the documents from
14:38:10	9	the repository would be returned and displayed
14:38:13	10	to the user in the 1994 Workscape system in a
14:38:16	11	time-ordered chronological sequence; is that
14:38:19	12	correct?
14:38:20	13	A. Correct. The only additional assumption is
14:38:23	14	that the repository support wild card
14:38:28	15	searches, which is typical.
14:38:29	16	Q. So, now in Workscape, I would have all of the
14:38:32	17	documents that were on the repository
14:38:40	18	presented to the user through the viewer;
14:38:42	19	correct?
14:38:42	20	A. Yes.
14:38:42	21	Q. Now, if I wanted to perform that filtering
14:38:51	22	search function, which we described earlier,
14:38:54	23	to produce a sub-string of my wife's
14:38:56	24	documents, how could I do that?
14:38:59	25	A. There would have been many ways that that

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14:39:10	1	could have been done. I could have used the
14:39:17	2	tag search tool to put a tag document on the
14:39:22	3	ones that matched it. I could have used the
14:39:25	4	find tool to filter it and create a separate
14:39:29	5	pile and so on. The possible ways of
14:39:38	6	splitting the results of that are limited only
14:39:40	7	by the imagination of the scripter. But the
14:39:44	8	things that I just mentioned could have been
14:39:47	9	done out of the box.
14:39:48	10	Q. Terrific. So, using the 1994 Workscape
14:39:52	11	system, then my wife could return -- strike
14:39:56	12	that.
14:39:57	13	Using the 1994 Workscape system, a
14:39:59	14	user could filter and generate a sub-string of
14:40:09	15	my wife's documents in a time-ordered
14:40:11	16	sequence; is that correct?
14:40:12	17	A. Sub-thread.
14:40:16	18	Q. Sub-thread?
14:40:18	19	A. Yes.
14:40:20	20	Q. And those documents would be presented as a
14:40:23	21	subset of the entire collection that existed
14:40:28	22	on the repository; is that correct?
14:40:29	23	A. Yes.
14:40:30	24	Q. And those could be displayed in the Workscape
14:40:35	25	system as of 1994 also in a time-ordered

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14:40:40	1	sequence chronologically; is that correct?
14:40:42	2	A. Yes.
14:40:42	3	Q. Do you recall we mentioned at the start of the
14:40:50	4	example that those would include reminder
14:40:53	5	notes? Do you recall that?
14:40:55	6	A. Yes.
14:40:55	7	Q. I believe you testified earlier that reminder
14:40:59	8	notes had the capability to include future
14:41:02	9	dates; is that correct?
14:41:03	10	A. By definition.
14:41:05	11	Q. By definition. So, both the original strand
14:41:12	12	or sequence of documents that were presented
14:41:15	13	to the user, and then the subset of documents
14:41:22	14	that only relate to my wife's documents, would
14:41:30	15	be including past, present and future
14:41:34	16	documents; is that correct?
14:41:35	17	A. Yes.
14:41:38	18	Q. And again, all of those different types of
14:41:46	19	documents, to the extent she had created them,
14:41:49	20	whether they were texts or E-mails, pictures,
14:41:56	21	what have you, they would be in that subset of
14:41:59	22	documents; is that correct?
14:42:01	23	MR. SOLO: Objection, form.
14:42:02	24	A. Assuming they all had date attributes, yes.
14:42:05	25	Q. And that sequence of documents is also

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14:42:16	1	persistent in the sense that the Workscape
14:42:19	2	system, as it existed in 1994, would
14:42:23	3	continually and automatically update the
14:42:26	4	string with new documents; is that correct?
14:42:28	5	MR. SOLO: Objection, form.
14:42:30	6	A. Yes.
14:42:30	7	Q. And when those sequences and strings of
14:42:38	8	documents were presented to the user, there
14:42:40	9	were a number of different ways to present
14:42:42	10	those in a three-dimensional perspective. But
14:42:50	11	one of which we've seen is that they could be
14:42:52	12	presented in one single receding stack of
14:42:56	13	documents that fade into the depth of the
14:42:59	14	screen; is that correct?
14:43:01	15	A. Correct.
14:43:01	16	Q. And I believe you testified that those
14:43:05	17	document icons partially occluded the ones
14:43:08	18	behind them?
14:43:09	19	A. They're not icons.
14:43:11	20	Q. I'm sorry, what are they?
14:43:12	21	A. Documents.
14:43:13	22	Q. Documents, yes.
14:43:16	23	A. Yes.
14:43:16	24	Q. And they partially occluded the documents
14:43:22	25	behind those earlier documents; correct?

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14:43:25	1	A. Correct.
14:43:26	2	Q. And would those documents, document
14:43:34	3	representations, to be exact, actually get
14:43:37	4	smaller as they receded into the screen?
14:43:40	5	MR. SOLO: Objection, form.
14:43:41	6	A. The two-dimensional representations of them
14:43:45	7	would get smaller. You have to distinguish
14:43:52	8	what we call the distal from the proximal
14:43:54	9	side. So, logically they're the same size,
14:43:59	10	but when they're rendered on the screen,
14:44:01	11	they're smaller.
14:44:01	12	Q. So, from the user's perspective, they would
14:44:04	13	appear to be smaller and receding into the
14:44:07	14	screen?
14:44:07	15	A. Yes.
14:44:07	16	Q. We mentioned a, or you discussed a clipping
14:44:21	17	feature. Do you recall that?
14:44:22	18	A. Yes.
14:44:25	19	Q. And the clipping feature could, as of 1994 in
14:44:29	20	the Workscape system, present an abbreviated
14:44:32	21	form of the document representation; is that
14:44:35	22	correct?
14:44:35	23	MR. SOLO: Object, form.
14:44:37	24	A. If abbreviated means showing less of the
14:44:42	25	information that is available, the answer is

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14:44:44	1	yes.
14:44:44	2	Q. With that definition, the Workscape system as
14:44:49	3	of 1994 could display an abbreviated version
14:44:55	4	of the document representations; correct?
14:44:57	5	A. Yes.
14:44:57	6	Q. And again, so we're clear, a user wasn't
14:45:01	7	required to name any documents in the system;
14:45:06	8	is that correct?
14:45:07	9	A. That's correct.
14:45:07	10	Q. One of the benefits of the Workscape system
14:45:14	11	was that it presented a user interface to
14:45:17	12	display these document representations to the
14:45:20	13	user without having the user be concerned as
14:45:29	14	to how or where or specifically how the
14:45:32	15	documents are stored in the system; is that
14:45:33	16	correct?
14:45:34	17	MR. SOLO: Objection, form.
14:45:36	18	A. In general, yes, there are situations where
14:45:40	19	you might want to point to a specific
14:45:45	20	repository. But in general, those
14:45:47	21	distinctions were invisible in the documents
14:45:51	22	in the workspace.
14:45:52	23	Q. So, in other words, from a user perspective in
14:45:56	24	the 1994 Workscape system, the nature of the
14:46:00	25	storage technique within the file system was

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14:46:04	1	transparent to the user; is that correct?
14:46:06	2	MR. SOLO: Objection, form.
14:46:08	3	A. Yes.
14:46:08	4	Q. And I believe you testified that the Workscape
14:46:17	5	system as of 1994 had the ability to tag or
14:46:21	6	mark documents that might be new or incoming
14:46:25	7	E-mails; is that correct?
14:46:27	8	A. Sure.
14:46:29	9	Q. We discussed briefly that the Workscape
14:46:36	10	viewer -- strike that.
14:46:36	11	We discussed briefly that the
14:46:38	12	Workscape system was architecturally
14:46:45	13	configured to be in a client-server
14:46:48	14	configuration; correct?
14:46:49	15	A. Yes.
14:46:49	16	Q. And the Workscape client would sit presumably
14:46:54	17	on a user's machine that had its own operating
14:46:58	18	system; is that correct?
14:46:59	19	A. Yes.
14:47:00	20	Q. And then on the server side, or the repository
14:47:06	21	side, whatever operating system was being used
14:47:08	22	by the repository was distinct from the
14:47:15	23	operating system on the client side; is that
14:47:20	24	right?
14:47:20	25	A. Assuming the repository was on a different

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14:47:23	1	machine, yes.
14:47:24	2	Q. Now, Mr. Solo asked you a couple of questions
14:47:37	3	about archiving documents and whether they're,
14:47:40	4	you know, whether scripting to do that
14:47:42	5	automatically was specifically described. And
14:47:49	6	you I believe testified that to the extent
14:47:52	7	it's not described is very easy to do; is that
14:47:54	8	correct?
14:47:55	9	MR. SOLO: Objection, form.
14:47:56	10	A. Sure. If archiving means making copies of the
14:48:00	11	documents in another repository, certainly.
14:48:02	12	Q. With that definition, making copies in another
14:48:06	13	repository, how long do you think it would
14:48:12	14	have taken someone with your skill in this
14:48:15	15	technology area to develop a script like that?
14:48:19	16	A. To automatically archive things?
14:48:21	17	Q. Yes.
14:48:22	18	A. 15 minutes.
14:48:24	19	Q. 15 minutes?
14:48:24	20	A. (Nodding head up and down.) That's assuming I
14:48:33	21	still remembered how scripting language
14:48:35	22	worked. I was answering in 1990.
14:48:38	23	Q. How about the same question for one of your
14:48:43	24	developers as of 1994?
14:48:46	25	A. It's the same, it's just a few lines of

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14:48:53	1	script.
14:48:53	2	Q. I believe Mr. Solo also asked you about the
14:49:12	3	contents of the document representations that
14:49:14	4	the user could see and distinguish the
14:49:18	5	specific documents in the Workscape system.
14:49:21	6	Do you recall that?
14:49:21	7	A. Yes.
14:49:25	8	Q. Did those documents or document
14:49:28	9	representations essentially provide a glance
14:49:31	10	view into the contents of those documents?
14:49:33	11	MR. SOLO: Objection, form.
14:49:34	12	A. I think that that would be a reasonable
14:49:45	13	statement.
14:49:45	14	Q. You indicated I believe during Mr. Solo's
14:49:59	15	questioning that Workscape was intended as of
14:50:05	16	1994 to operate in conjunction with a number
14:50:08	17	of tools; is that correct?
14:50:09	18	A. Well, its usage is implied using tools. We
14:50:19	19	didn't do anything without the tools, so the
14:50:22	20	tools are integral to the concept.
14:50:25	21	Q. Were the tools like applications or?
14:50:28	22	A. Yes, they were -- essentially you could think
14:50:36	23	of the Workscape client as being a platform
14:50:39	24	for the development of applications in the
14:50:43	25	forms of tools.

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14:50:48	1	Q. Did the Workscape client effectively manage
14:50:52	2	those tools and applications?
14:50:54	3	MR. SOOBERT: Objection, form.
14:50:55	4	A. Did the client manage them, I'm not sure in
14:50:59	5	what sense you mean. It managed documents,
14:51:02	6	and the applications were documents. So, if
14:51:05	7	that's the sense in what you mean, the answer
14:51:08	8	is yes.
14:51:27	9	Q. There was some suggestion that parts of the
14:51:35	10	Workscape development process at one point was
14:51:38	11	confidential. Do you recall that?
14:51:40	12	A. Yes.
14:51:40	13	Q. However, I believe you testified that the
14:51:45	14	video and the publication and then the
14:51:50	15	presentation that you gave live, that had been
14:51:54	16	cleared and was done without any restriction
14:51:57	17	on confidentiality, is that correct?
14:51:59	18	A. Well, we had permission for public disclosure,
14:52:10	19	and with almost all confidentiality
14:52:14	20	agreements, public information is excluded.
14:52:16	21	Q. And you did, in fact, again, just so we're
14:52:19	22	clear, publicly disseminate and disclose the
14:52:22	23	information found on the 1994 Workscape system
14:52:28	24	video at that conference; is that correct?
14:52:30	25	A. Yes.

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14:52:30	1	Q. And then I believe you testified that your
14:52:37	2	presentation that you gave live elaborated on
14:52:40	3	those features, and to the conference, which
14:52:43	4	included perhaps as many as thousands of
14:52:49	5	attendees, was disclosed to that group?
14:52:55	6	MR. SOLO: Objection, form.
14:52:56	7	A. There probably weren't thousands at my
14:53:02	8	demonstration because there were multiple
14:53:04	9	simultaneous presentations, but it was a large
14:53:07	10	room and there were certainly hundreds.
14:53:09	11	Q. And those hundreds included some of the key
14:53:19	12	players in the computer human interface space
14:53:24	13	at that time; is that correct?
14:53:25	14	A. That would be an assumption on my part. I
14:53:35	15	should leave it at that. It was a long time
14:53:38	16	ago.
14:53:38	17	Q. But you did testify earlier that the attendees
14:53:44	18	generally at that meeting included various
14:53:47	19	industry participants and leading researchers
14:53:52	20	and professors in that space?
14:53:53	21	A. Certainly.
14:53:54	22	Q. And it's a very well-known conference for any
14:54:00	23	of those entities that might be working in
14:54:03	24	human interface development; correct?
14:54:06	25	A. Yes, at the time it was probably the most

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14:54:08	1	important one.
14:54:09	2	Q. And again, that was in, as we confirmed, in
14:54:12	3	April of 1994?
14:54:13	4	A. Yes.
14:54:15	5	MR. SOOBERT: I've got no further
14:54:17	6	questions.
14:54:29	7	- - - -
14:54:29	8	RE-EXAMINATION
14:54:29	9	- - - -
14:54:29	10	BY MR. SOLO:
14:54:29	11	Q. I have very few.
14:54:30	12	The example that Mr. Soobert just
14:54:35	13	gave was -- strike that.
14:54:37	14	The example Mr. Soobert just gave
14:54:40	15	involved taking his family's documents from
14:54:42	16	the repository, and those documents included
14:54:45	17	reminder notes; is that correct?
14:54:47	18	A. Yes.
14:54:48	19	Q. Would reminder notes be stored on repository
14:54:55	20	if they're not shown in the workspace?
14:54:57	21	A. Yes, because they're documents, and all
14:55:04	22	documents are stored in a repository.
14:55:09	23	Q. Let me rephrase the question. Are reminder
14:55:22	24	notes of the Mirror documents or not?
14:55:29	25	A. Well, they could be femoral documents,

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Time	#	Text
14:55:34	1	however, the -- I have no certain memory that
14:55:42	2	the implementation that we're talking about
14:55:46	3	even made use of the femoral documents. It
14:55:49	4	might have, but it certainly wasn't a major,
14:55:53	5	major feature. To be completely honest, I had
14:56:00	6	forget about the existence of femoral
14:56:03	7	documents till I reviewed the patent.
14:56:06	8	So, if they were present, they
14:56:08	9	weren't -- they weren't typical, and there was
14:56:12	10	certainly nothing to prevent the reminders
14:56:20	11	from existing in the repository. My best
14:56:25	12	guest is they probably did, and they certainly
14:56:28	13	could have.
14:56:28	14	Q. How would reminders that exist in a repository
14:56:32	15	but not in a workspace function as reminders?
14:56:38	16	A. They would if they weren't in the repository.
14:56:45	17	But the typical usage pattern is that they
14:56:49	18	would be kept in the workspace, and whenever
14:56:51	19	the workspace was opened, the scripts of all,
14:56:56	20	of what we have been calling persistence, the
14:57:01	21	documents with persistence behaviors would
14:57:04	22	execute. And at the time that they're open,
14:57:06	23	that the workspace is open, it iterates
14:57:10	24	through all of the documents in the workspace
14:57:12	25	that have scripts and sends initialization

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Time	#	Text
14:57:17	1	messages to it so you can start executing.
14:57:21	2	If you wanted a reminder of a
14:57:27	3	document that's not in the workspace, that
14:57:27	4	would be out of the scope for Workscape, that
14:57:29	5	would be a repository feature, which you
14:57:32	6	certainly could have. But that would have
14:57:33	7	nothing do with Workscape.
14:57:35	8	Q. With respect to persistence searches, the
14:57:43	9	persistent effect was not enabled by default;
14:57:48	10	is that correct?
14:57:49	11	A. I have no idea. There's no single answer to
14:57:56	12	that. There were so many different
14:57:59	13	prototypes. If you're talking about the
14:58:02	14	version that was demonstrated at CHI '94, I
14:58:04	15	have no idea. And that would be a per tool
14:58:07	16	question as well, so I don't know. That's a
14:58:13	17	very specific question.
14:58:18	18	Q. But a persistence search was not actually
14:58:21	19	demonstrated at the CHI '94; is that correct?
14:58:23	20	A. I think I recall testifying that I don't
14:58:29	21	remember.
14:58:29	22	Q. I believe Mr. Soobert asked you if the user
14:58:39	23	had to name documents, and you responded in
14:58:41	24	the negative; is that correct?
14:58:43	25	A. Correct.

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Time	#	Text
14:58:43	1	Q. If a user created a document in the workspace
14:58:50	2	and then wanted to close it out of the
14:58:53	3	workspace but keep it in the repository, would
14:58:56	4	the user have to name that document?
14:58:58	5	A. No.
14:58:59	6	Q. How would that document be stored in the
14:59:01	7	repository?
14:59:02	8	A. Just as any other document. All documents
14:59:04	9	were given unique identifiers automatically
14:59:09	10	transparent by the system. So, whatever
14:59:13	11	attributes, if any, the document had, would
14:59:18	12	simply be stored as attribute value pairs
14:59:21	13	associated with UID. Indeed, as far as I can
14:59:26	14	think, it would be possible to create a
14:59:28	15	document that had no attributes at all, just
14:59:30	16	mere identity.
14:59:31	17	Q. Mr. Soobert also asked you how easy it would
14:59:46	18	be to create a script that automatically
14:59:49	19	archives your documents for you. And that was
14:59:52	20	defined as copied to another repository.
15:00:00	21	What would happen to those documents
15:00:02	22	with respect to the workspace if they were
15:00:04	23	copied to another repository?
15:00:06	24	A. It depends on how you wrote the script. You
15:00:23	25	could, for instance, keep another strand that

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Time	#	Text
15:00:27	1	showed the copies, or they could be discarded,
15:00:29	2	the copies could be discarded from the
15:00:32	3	repository entirely. It make no difference.
15:00:36	4	Either of them would have worked equally
15:00:40	5	easily.
15:00:41	6	Q. But to your knowledge, that was never
15:00:44	7	implemented?
15:00:54	8	A. There certainly was a copy tool, and very
15:00:57	9	likely, the copy tool had the feature for
15:01:00	10	directing the copy to a repository. So,
15:01:03	11	that's very near to what you're describing.
15:01:17	12	MR. SOLO: I have no further
15:01:18	13	questions.
15:01:19	14	MR. SOOBERT: Nor do I. Thank you
15:01:21	15	very much.
15:01:22	16	VIDEO OPERATOR: With there being no
15:01:23	17	further questions, this deposition is now
15:01:24	18	concluded. The time is 3:02 p.m.
	19	- - - -
	20	(The proceedings were concluded at 3:02 p.m.)
	21	- - - -
	22	
	23	
	24	
	25	

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1   COMMONWEALTH OF PENNSYLVANIA)   CERTIFICATE

2   COUNTY OF ALLEGHENY   )   SS:

3   I, Pamela L. Beck, a Court Reporter and Notary

4   Public in and for the Commonwealth of Pennsylvania,

5   do hereby certify that the witness, PETER LUCAS,

6   Ph.D., was by me first duly sworn to testify to the

7   truth; that the foregoing deposition was taken at

8   the time and place stated herein; and that the said

9   deposition was recorded stenographically by me and

10 then reduced to printing under my direction, and

11 constitutes a true record of the testimony given by

12 said witness.

13   I further certify that the inspection, reading

14 and signing of said deposition were waived by

15 counsel for the respective parties and by the

16 witness.

17   I further certify that I am not a relative or

18 employee of any of the parties, or a relative or

19 employee of either counsel, and that I am in no way

20 interested, directly or indirectly, in this action.

21   IN WITNESS WHEREOF, I have hereunto set my

22 hand and affixed my seal of office this 18th day of

23 June, 2010.

24 _____

25 Notary Public

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