US009082126B2

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Nielsen et al.

(10) **Patent No.: US 9,082,126 B2**
(45) **Date of Patent: Jul. 14, 2015**

(54) **SERVICE PLAN WEB CRAWLER**

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(73) Assignee: **National Electronics Warranty, LLC**, Sterling, VA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 434 days.

(21) Appl. No.: **12/851,447**

(22) Filed: **Aug. 5, 2010**

(65) **Prior Publication Data**

US 2011/0078487 A1 Mar. 31, 2011

Related U.S. Application Data

(60) Provisional application No. 61/245,923, filed on Sep. 25, 2009, provisional application No. 61/272,707, filed on Oct. 23, 2009.

(51) **Int. Cl.**
G06F 17/30 (2006.01)
G06Q 30/02 (2012.01)

(52) **U.S. Cl.**
CPC ***G06Q 30/02*** (2013.01); ***G06Q 30/0243*** (2013.01); ***G06Q 30/0246*** (2013.01); ***G06Q 30/0251*** (2013.01); ***G06Q 30/0277*** (2013.01)

(58) **Field of Classification Search**
CPC G06Q 30/02
USPC 707/706, 707, 708, 709, 710, 713, 722, 707/736, 758, 781, 999.005–999.006; 705/27
See application file for complete search history.

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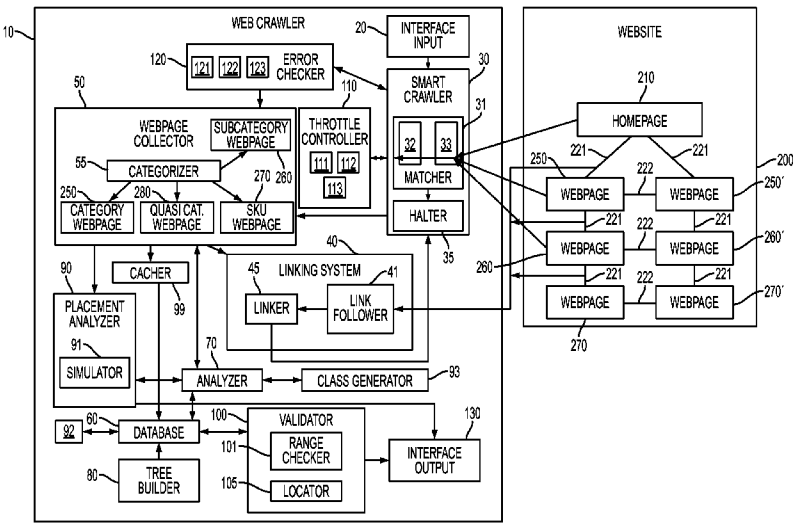
Primary Examiner — Syling Yen
(74) *Attorney, Agent, or Firm* — Hogan Lovells US LLP

(57) **ABSTRACT**

A web crawler for downloading and analyzing the contents of a merchant's website. The web crawler may analyze the products advertised and determine whether a service plan is properly associated. The crawler may also analyze the placement of the service plans on the website, and store the information in a database. A dynamic mapper is also provided which can determine what service plan should be associated with a particular product. The dynamic mapper may also suggest what type of control to use for a particular customer. A webserver containing software for updating a webpage is also disclosed. A process for updating a webpage is also disclosed.

33 Claims, 18 Drawing Sheets



IPR2025-01397
CrowdStrike EX1037 Page 1

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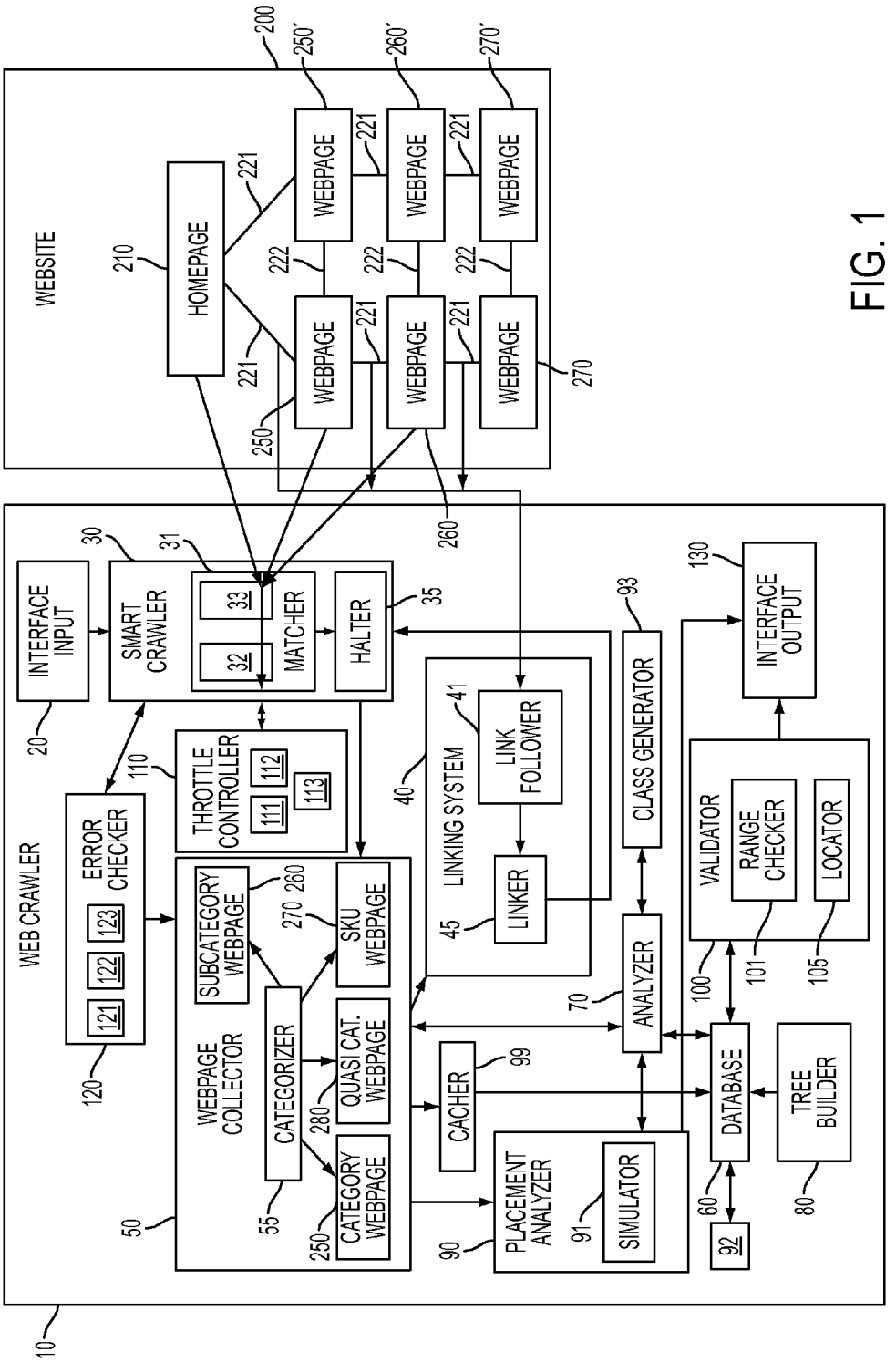

WEBSITE
200
HOMEPAGE
210
WEBPAGE
221
222
250'
260'
270'
250
260
270
WEB CRAWLER
10
INTERFACE INPUT
20
SMART CRAWLER
30
31
MATCHER
32
33
HALTER
35
THROTTLE CONTROLLER
110
111
112
113
ERROR CHECKER
120
121
122
123
WEBPAGE COLLECTOR
50
SUBCATEGORY WEBPAGE
SKU WEBPAGE
CATEGORIZER
55
QUASI CAT. WEBPAGE
280
CATEGORY WEBPAGE
LINKING SYSTEM
40
LINK FOLLOWER
41
LINKER
45
CACHER
99
PLACEMENT ANALYZER
90
SIMULATOR
91
CLASS GENERATOR
93
ANALYZER
70
VALIDATOR
RANGE CHECKER
100
LOCATOR
101
105
INTERFACE OUTPUT
130
DATABASE
92
60
TREE BUILDER
80

FIG. 1

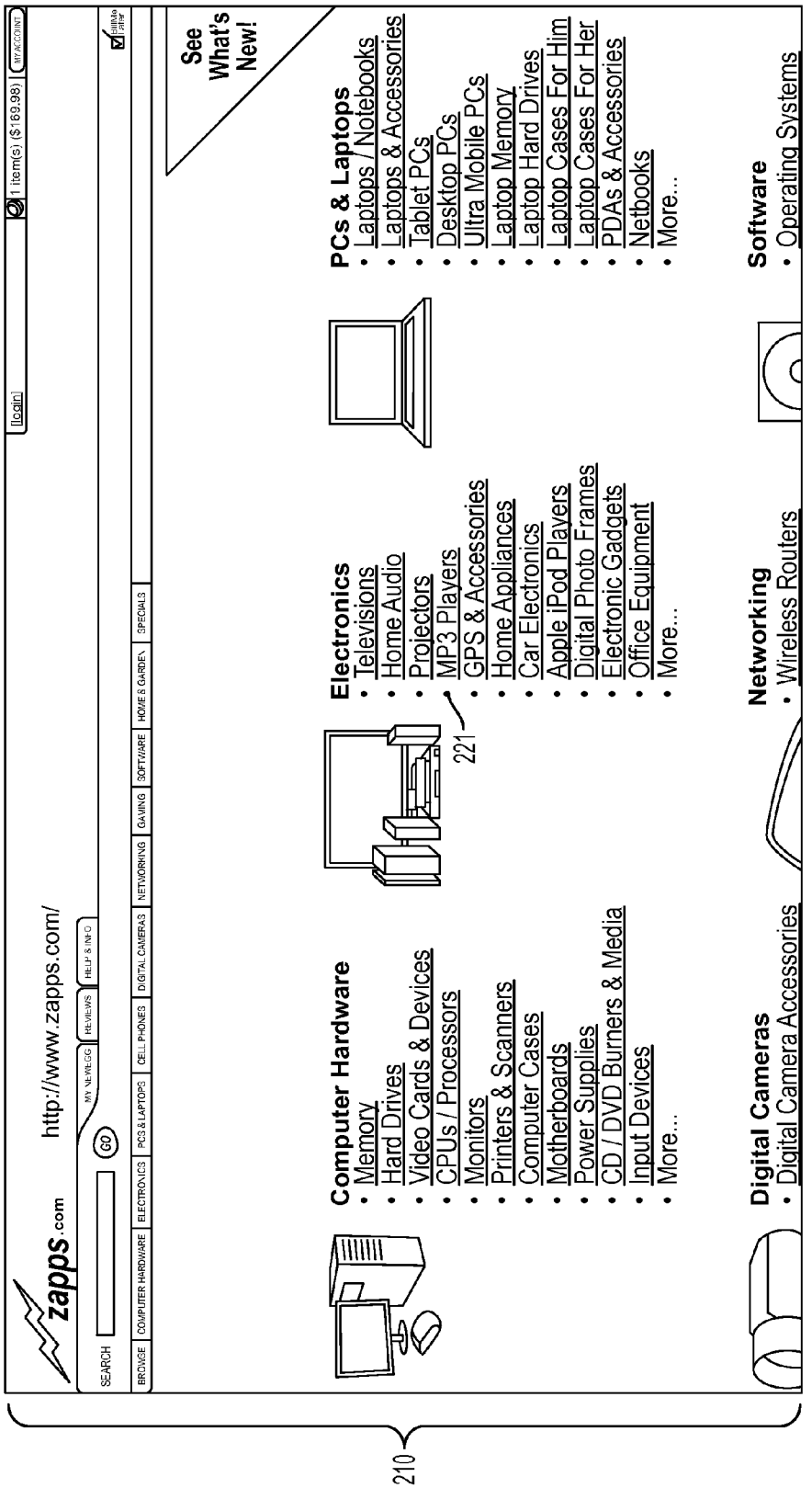

zapps.com
http://www.zapps.com/
[login]
1 item(s) ($ 69.98)
MY ACCOUNT
MY NEWEGG
REVIEWS
HELP & INFO
SEARCH
GO
BROWSE
COMPUTER HARDWARE
ELECTRONICS
PCS & LAPTOPS
CELL PHONES
DIGITAL CAMERAS
NETWORKING
GAMING
SOFTWARE
HOME & GARDEN
SPECIALS
See What's New!
Computer Hardware
Memory
Hard Drives
Video Cards & Devices
CPUs / Processors
Monitors
Printers & Scanners
Computer Cases
Motherboards
Power Supplies
CD / DVD Burners & Media
Input Devices
More...
Electronics
Televisions
Home Audio
Projectors
MP3 Players
GPS & Accessories
Home Appliances
Car Electronics
Apple iPod Players
Digital Photo Frames
Electronic Gadgets
Office Equipment
More...
221
PCs & Laptops
Laptops / Notebooks
Laptops & Accessories
Tablet PCs
Desktop PCs
Ultra Mobile PCs
Laptop Memory
Laptop Hard Drives
Laptop Cases For Him
Laptop Cases For Her
PDAs & Accessories
Netbooks
More...
Digital Cameras
Digital Camera Accessories
Networking
Wireless Routers
Software
Operating Systems
210

FIG. 2

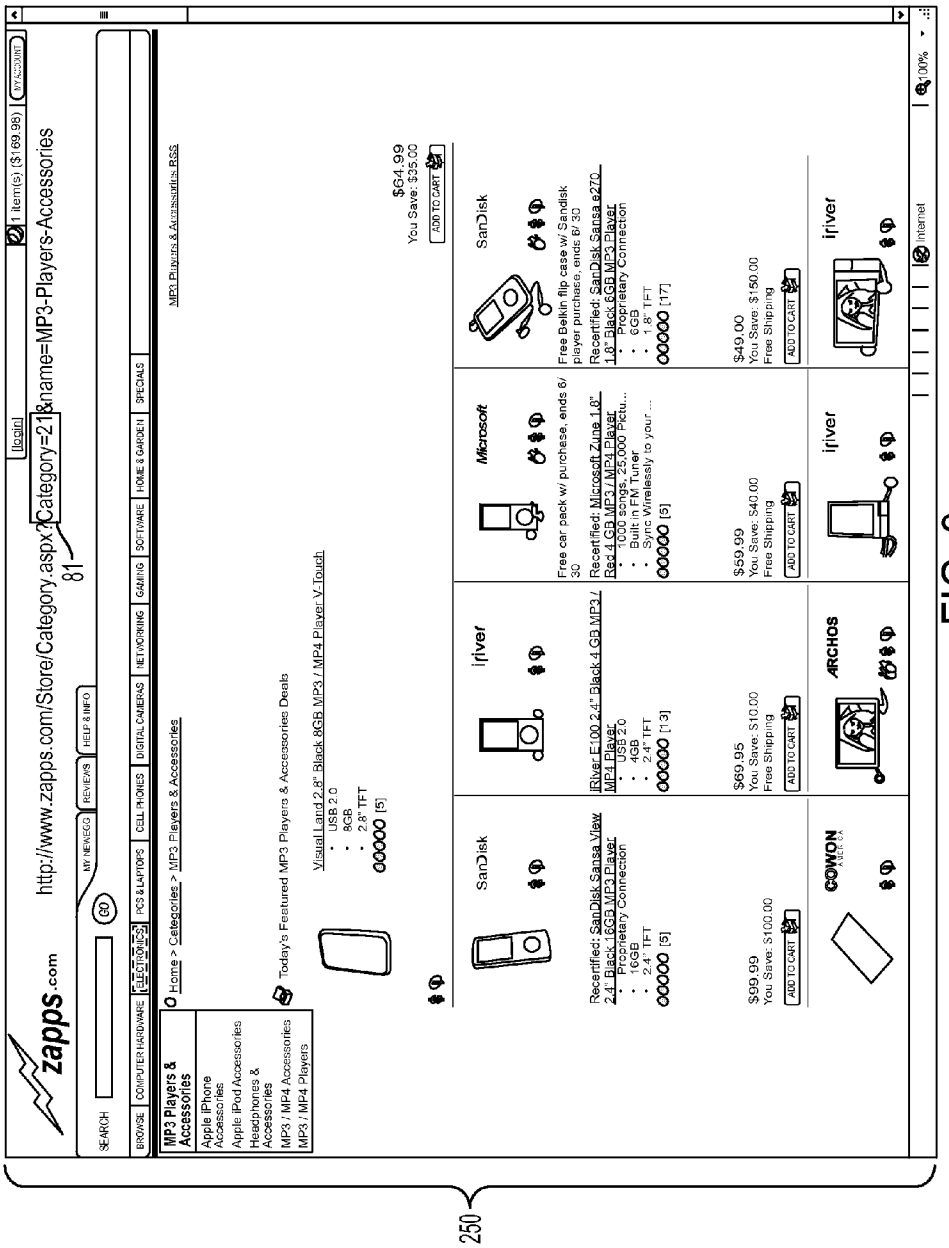

250
81
http://www.zapps.com/Store/Category.aspx?Category=21&name=MP3-Players-Accessories
zapps.com
Login
1 Item(s) ($169.98)
MY ACCOUNT
SEARCH
MY MENEGO
REVIEWS
HELP & INFO
BROWSE
ELECTRONICS
COMPUTER HARDWARE
PCS & LAPTOPS
CELL PHONES
DIGITAL CAMERAS
NETWORKING
GAMING
SOFTWARE
HOME & GARDEN
SPECIALS
MP3 Players & Accessories
Apple iPhone Accessories
Apple iPod Accessories
Headphones & Accessories
MP3 / MP4 Accessories
MP3 / MP4 Players
Home > Categories > MP3 Players & Accessories
MP3 Players & Accessories RSS
Today's Featured MP3 Players & Accessories Deals
Visiual Land 2.8" Black 8GB MP3 / MP4 Player V-Touch
• USB 2.0
• 8GB
• 2.8" TFT
[5]
$64.99
You Save: $55.00
ADD TO CART
SanDisk
Recertified: SanDisk Sansa View 2.4" Black 8GB MP3 Player
• 16GB
• Proprietary Connection
• 2.4" TFT
[5]
$99.99
You Save: $100.00
ADD TO CART
iriver
iRiver E100 2.4" Black 4 GB MP3 / MP4 Player
• 4GB
• USB 2.0
• 2.4" TFT
[13]
$69.95
You Save: $10.00
Free Shipping
ADD TO CART
Microsoft
Free car pack w/ purchase, ends 6/30
Recertified: Microsoft Zune 1.8" Red 4 GB MP3 / MP4 Player
• Built in FM Tuner
• Sync Wirelessly to your ...
[5]
$59.99
You Save: $40.00
Free Shipping
ADD TO CART
SanDisk
Free Belkin flip case w/ Sandisk player purchase, ends 6/30
Recertified: SanDisk Sansa e270 1.6" Black 6GB MP3 Player
• 6GB
• Proprietary Connection
• 1.8" TFT
[17]
$49.00
You Save: $150.00
Free Shipping
ADD TO CART
COWON
ARCHOS
iriver
Internet
100%

FIG. 3

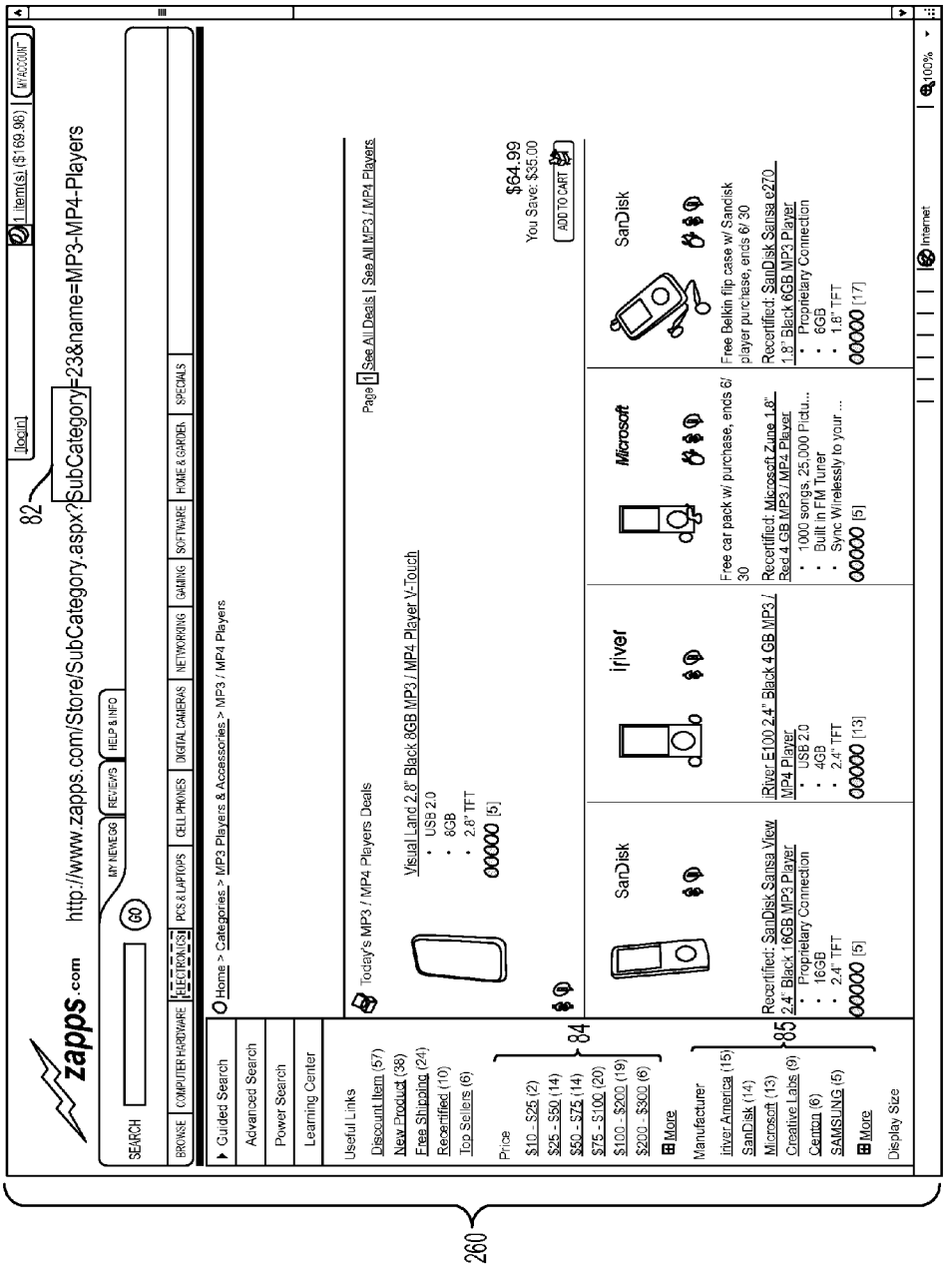

260
zapps.com
http://www.zapps.com/Store/SubCategory.aspx?SubCategory=23&name=MP3-MP4-Players
82
Login
1 item(s) ($169.96)
MY ACCOUNT
SEARCH
GO
MY NEWEGG
REVIEWS
HELP & INFO
BROWSE
COMPUTER HARDWARE
ELECTRONICS
PCS & LAPTOPS
CELL PHONES
DIGITAL CAMERAS
NETWORKING
GAMING
SOFTWARE
HOME & GARDEN
SPECIALS
Guided Search
Advanced Search
Power Search
Learning Center
Home > Categories > MP3 Players & Accessories > MP3 / MP4 Players
Useful Links
Discount Item (57)
New Product (38)
Free Shipping (24)
Recertified (10)
Top Sellers (6)
Price
$10 - $25 (2)
$25 - $50 (14)
$50 - $75 (14)
$75 - $100 (20)
$100 - $200 (19)
$200 - $300 (6)
More
84
Manufacturer
iriver America (15)
SanDisk (14)
Microsoft (13)
Creative Labs (9)
Cenon (6)
SAMSUNG (5)
More
Display Size
Today's MP3 / MP4 Players Deals
Page 1 See All Deals | See All MP3 / MP4 Players
Visual Land 2.8" Black 8GB MP3 / MP4 Player V-Touch
USB 2.0
8GB
2.8" TFT
[5]
$64.99
You Save: $35.00
ADD TO CART
SanDisk
iriver
Microsoft
SanDisk
Free car pack w/ purchase, ends 6/30
Free Belkin flip case w/ Sandisk player purchase, ends 6/30
Recertified: SanDisk Sansa View 2.4" Black 16GB MP3 Player
Proprietary Connection
16GB
2.4" TFT
[5]
85
iRiver E100 2.4" Black 4 GB MP3 / MP4 Player
USB 2.0
4GB
2.4" TFT
[13]
Recertified: Microsoft Zune 1.8" Red 4 GB MP3 / MP4 Player
1000 songs, 25,000 Pictu...
Built in FM Tuner
Sync Wirelessly to your ...
[5]
Recertified: SanDisk Sansa e270 1.8" Black 6GB MP3 Player
Proprietary Connection
6GB
1.8" TFT
[17]
Internet
100%

FIG. 4

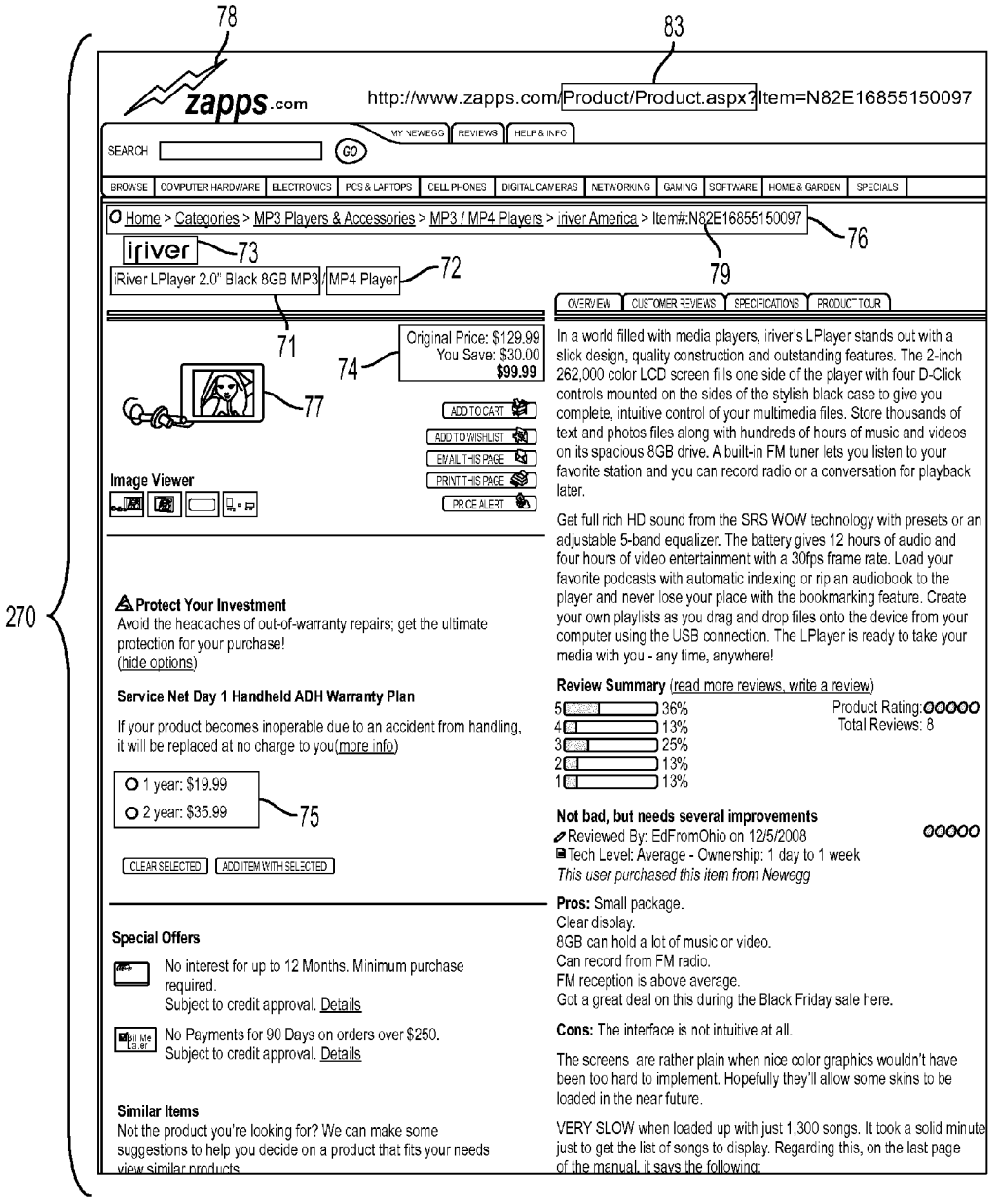

78
83
zapps.com
http://www.zapps.com/Product/Product.aspx?Item=N82E16855150097
MY NEWEGG
REVIEWS
HELP & INFO
SEARCH
GO
BROWSE
COMPUTER HARDWARE
ELECTRONICS
PCS & LAPTOPS
CELL PHONES
DIGITAL CAMERAS
NETWORKING
GAMING
SOFTWARE
HOME & GARDEN
SPECIALS
Home > Categories > MP3 Players & Accessories > MP3 / MP4 Players > iriver America > Item#:N82E16855150097
76
79
iriver
73
iRiver LPlayer 2.0" Black 8GB MP3/MP4 Player
72
71
OVERVIEW
CUSTOMER REVIEWS
SPECIFICATIONS
PRODUCT TOUR
Original Price: $129.99
You Save: $30.00
$99.99
74
77
ADD TO CART
ADD TO WISHLIST
EMAIL THIS PAGE
PRINT THIS PAGE
PRICE ALERT
Image Viewer
In a world filled with media players, iriver's LPlayer stands out with a slick design, quality construction and outstanding features. The 2-inch 262,000 color LCD screen fills one side of the player with four D-Click controls mounted on the sides of the stylish black case to give you complete, intuitive control of your multimedia files. Store thousands of text and photos files along with hundreds of hours of music and videos on its spacious 8GB drive. A built-in FM tuner lets you listen to your favorite station and you can record radio or a conversation for playback later.
Get full rich HD sound from the SRS WOW technology with presets or an adjustable 5-band equalizer. The battery gives 12 hours of audio and four hours of video entertainment with a 30fps frame rate. Load your favorite podcasts with automatic indexing or rip an audiobook to the player and never lose your place with the bookmarking feature. Create your own playlists as you drag and drop files onto the device from your computer using the USB connection. The LPlayer is ready to take your media with you - any time, anywhere!
270
Protect Your Investment
Avoid the headaches of out-of-warranty repairs; get the ultimate protection for your purchase!
(hide options)
Service Net Day 1 Handheld ADH Warranty Plan
If your product becomes inoperable due to an accident from handling, it will be replaced at no charge to you(more info)
1 year: $19.99
2 year: $35.99
75
CLEAR SELECTED
ADD ITEM WITH SELECTED
Review Summary (read more reviews, write a review)
5 36%
4 13%
3 25%
2 13%
1 13%
Product Rating:
Total Reviews: 8
Not bad, but needs several improvements
Reviewed By: EdFromOhio on 12/5/2008
Tech Level: Average - Ownership: 1 day to 1 week
This user purchased this item from Newegg
Pros: Small package.
Clear display.
8GB can hold a lot of music or video.
Can record from FM radio.
FM reception is above average.
Got a great deal on this during the Black Friday sale here.
Cons: The interface is not intuitive at all.
The screens are rather plain when nice color graphics wouldn't have been too hard to implement. Hopefully they'll allow some skins to be loaded in the near future.
VERY SLOW when loaded up with just 1,300 songs. It took a solid minute just to get the list of songs to display. Regarding this, on the last page of the manual, it says the following:
Special Offers
No interest for up to 12 Months. Minimum purchase required.
Subject to credit approval. Details
No Payments for 90 Days on orders over $250.
Subject to credit approval. Details
Similar Items
Not the product you're looking for? We can make some suggestions to help you decide on a product that fits your needs
view similar products

FIG. 5

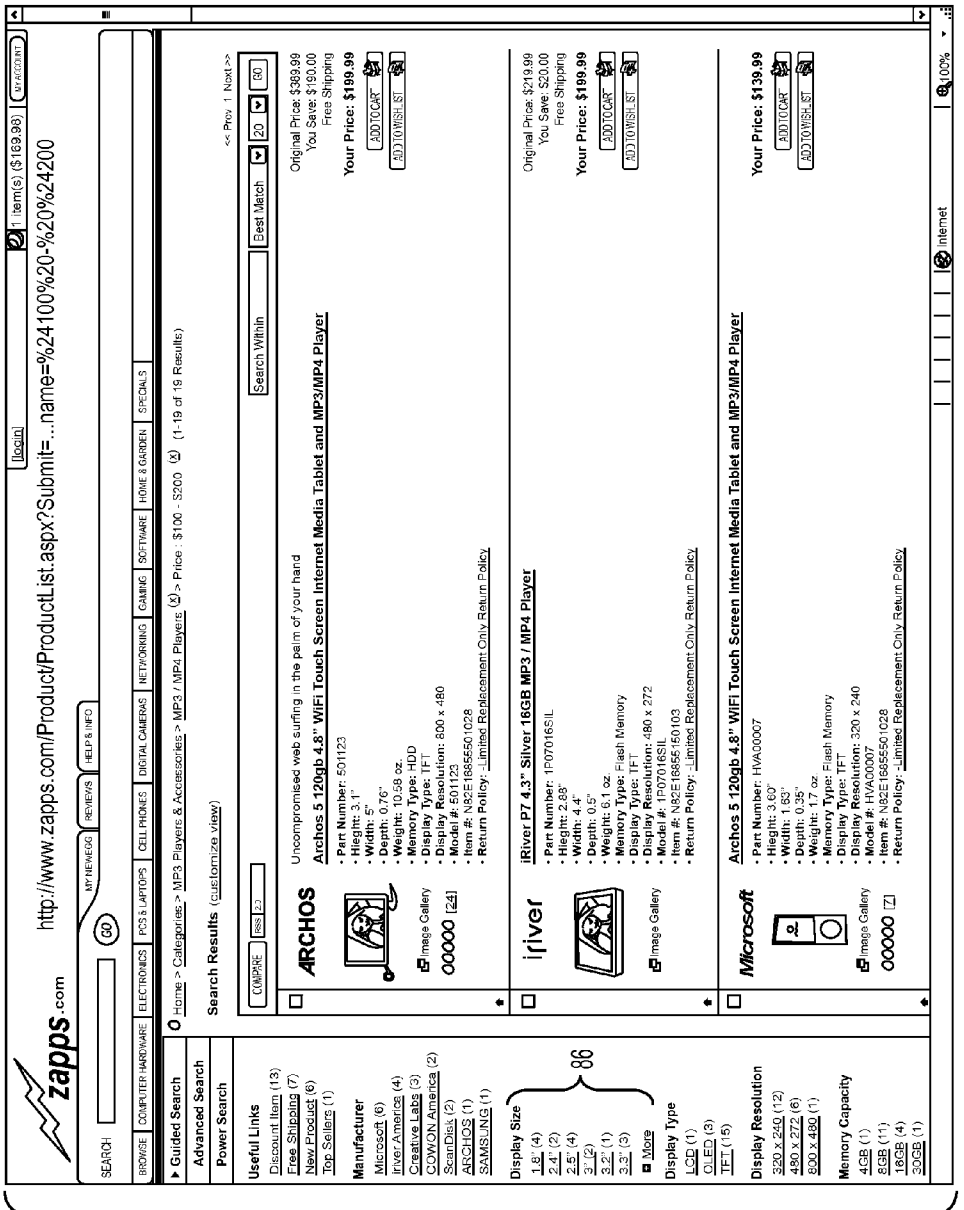
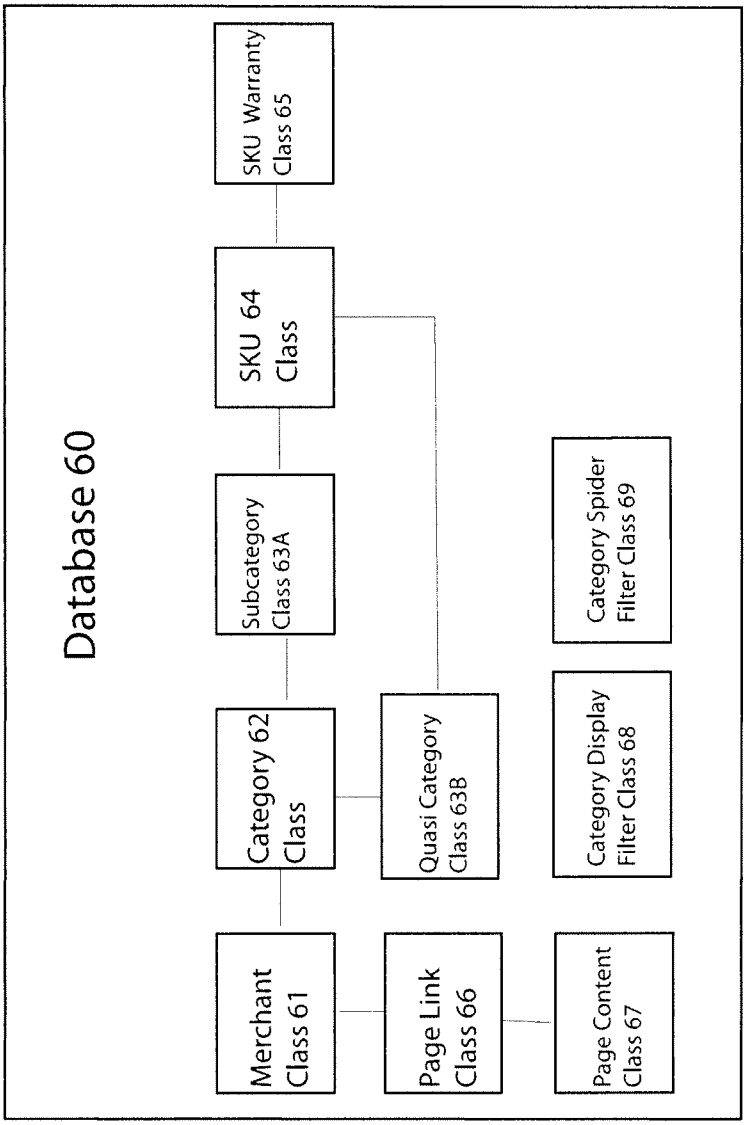

280
zapps.com
http://www.zapps.com/Product/ProductList.aspx?Submit=...name=%24100%20-%20%24200
Login
1 item(s) ($169.98)
Checkout
SEARCH
GO
MY REVIEWS
REVIEWS
HELP & INFO
BROWSE
COMPUTER HARDWARE
ELECTRONICS
PCS & LAPTOPS
CELL PHONES
DIGITAL CAMERAS
NETWORKING
GAMING
SOFTWARE
HOME & GARDEN
SPECIALS
Guided Search
Advanced Search
Power Search
Home > Categories > MP3 Players & Accessories > MP3 / MP4 Players > Price : $100 - $200 (1-19 of 19 Results)
Search Results (customize view)
<< Prev 1 Next >>
Useful Links
Discount Item (13)
Free Shipping (7)
New Product (6)
Top Sellers (1)
Manufacturer
Microsoft (6)
Iriver America (4)
Creative Labs (3)
COWON America (2)
SanDisk (2)
ARCHOS (1)
SAMSUNG (1)
Display Size
1.8" (4)
2.4" (2)
2.5" (4)
3" (2)
3.2" (1)
3.3" (3)
More
Display Type
LCD (1)
OLED (3)
TFT (15)
Display Resolution
320 x 240 (12)
480 x 272 (6)
800 x 480 (1)
Memory Capacity
4GB (1)
8GB (11)
16GB (4)
30GB (1)
86
COMPARE
Rss
Search Within
Best Match
GO
ARCHOS
Uncompromised web surfing in the palm of your hand
Archos 5 120gb 4.8" WiFi Touch Screen Internet Media Tablet and MP3/MP4 Player
Part Number: 501123
Height: 3.1"
Width: 5"
Depth: 0.76"
Weight: 10.58 oz.
Memory Type: HDD
Display Type: TFT
Display Resolution: 800 x 480
Model #: 501123
Item #: N82E16856501028
Return Policy: Limited Replacement Only Return Policy
Original Price: $389.99
You Save: $190.00
Free Shipping
Your Price: $199.99
ADD TO CART
ADD TO WISH LIST
Image Gallery
(24)
iriver
iRiver P7 4.3" Silver 16GB MP3 / MP4 Player
Part Number: 1P07016SIL
Height: 2.83"
Width: 4.4"
Depth: 0.5"
Weight: 6.1 oz.
Memory Type: Flash Memory
Display Type: TFT
Display Resolution: 480 x 272
Model #: 1P07016SIL
Item #: N82E16856150103
Return Policy: Limited Replacement Only Return Policy
Original Price: $219.99
You Save: $20.00
Free Shipping
Your Price: $199.99
ADD TO CART
ADD TO WISH LIST
Image Gallery
Microsoft
Archos 5 120gb 4.8" WiFi Touch Screen Internet Media Tablet and MP3/MP4 Player
Part Number: HVA00007
Height: 3.60"
Width: 1.83"
Depth: 0.35"
Weight: 1.7 oz.
Memory Type: Flash Memory
Display Type: TFT
Display Resolution: 320 x 240
Model #: HVA00007
Item #: N82E16856501028
Return Policy: Limited Replacement Only Return Policy
Your Price: $139.99
ADD TO CART
ADD TO WISH LIST
Image Gallery
(7)
Internet
100%

FIG. 6

Fig. 7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SKU Warranty Class 65
SKU 64 Class
Subcategory Class 63A
Category 62 Class
Merchant Class 61
Quasi Category Class 63B
Page Link Class 66
Category Display Filter Class 68
Page Content Class 67
Category Spider Filter Class 69

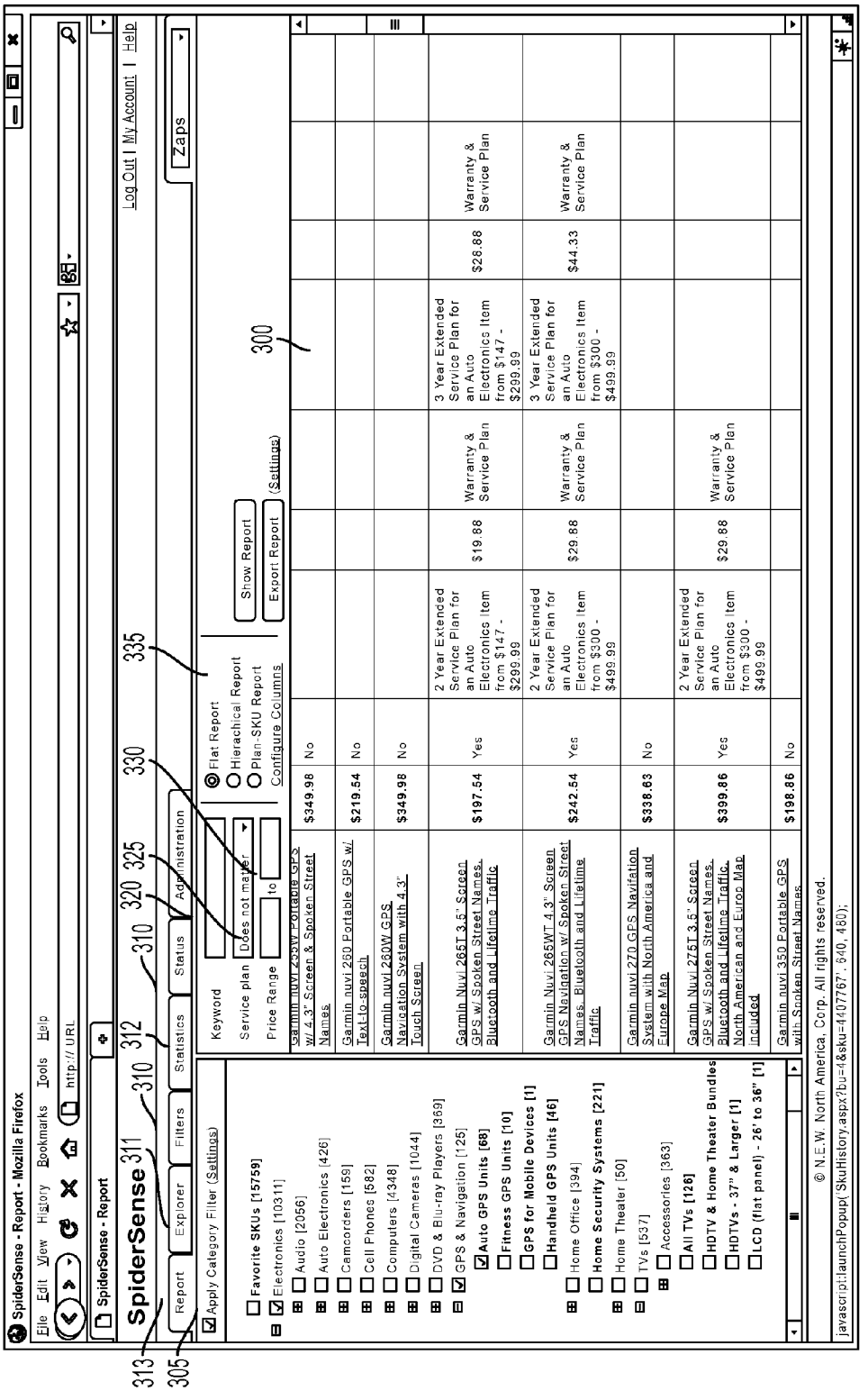
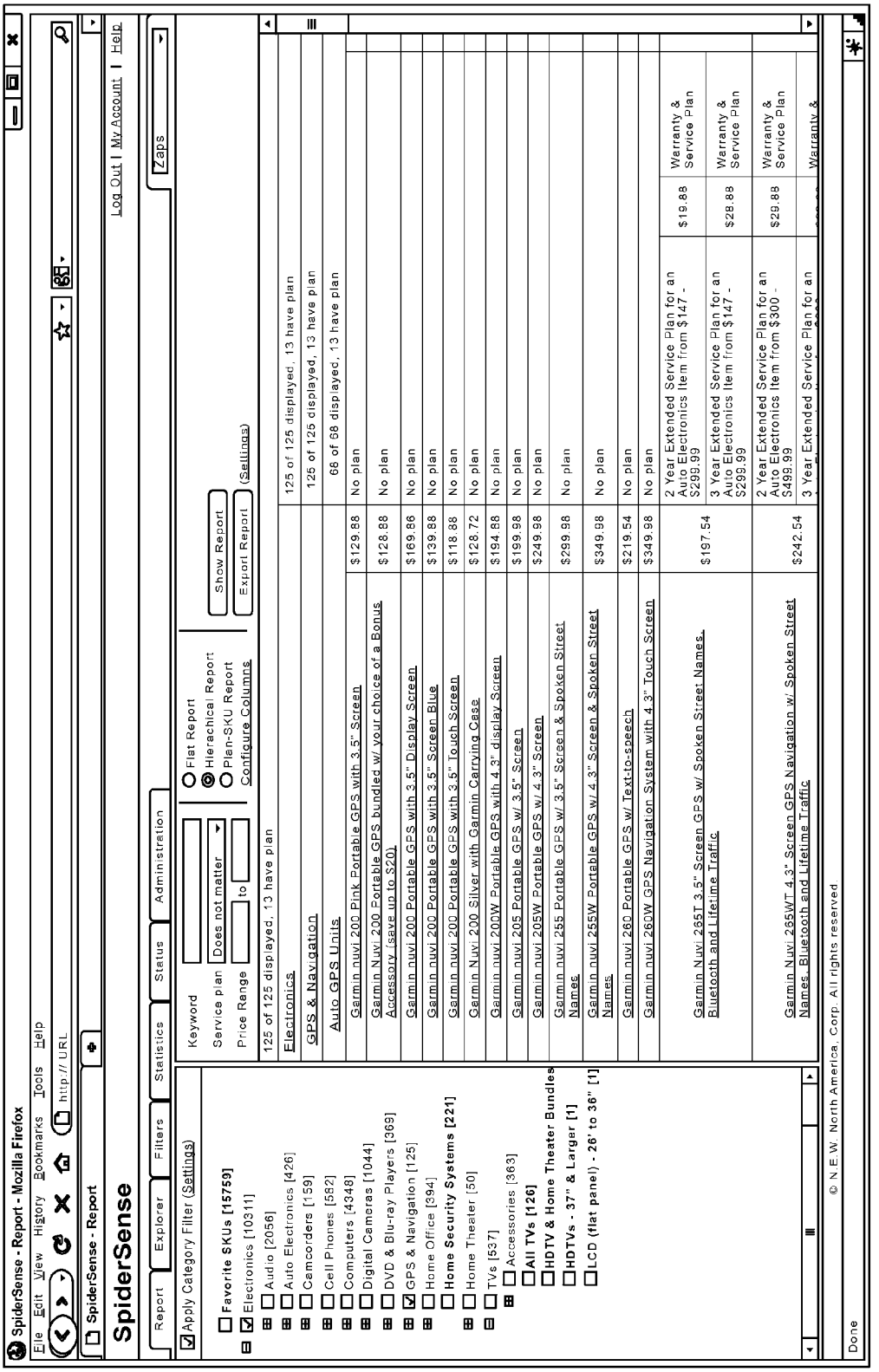

SpiderSense - Report - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://URL
SpiderSense - Report
SpiderSense
Log Out | My Account | Help
Report
Explorer
Filters
Statistics
Status
Administration
Zaps
Apply Category Filter (Settings)
Favorite SKUs [15759]
Electronics [10311]
Audio [2056]
Auto Electronics [426]
Camcorders [159]
Cell Phones [582]
Computers [4348]
Digital Cameras [1044]
DVD & Blu-ray Players [369]
GPS & Navigation [125]
Auto GPS Units [68]
Fitness GPS Units [10]
GPS for Mobile Devices [1]
Handheld GPS Units [46]
Home Office [394]
Home Security Systems [221]
Home Theater [50]
TVs [537]
Accessories [363]
All TVs [126]
HDTV & Home Theater Bundles
HDTVs - 37" & Larger [1]
LCD (flat panel) - 26" to 36" [1]
Keyword
Service plan
Does not matter
Price Range
to
Flat Report
Hierachical Report
Plan-SKU Report
Configure Columns
Show Report
Export Report
(Settings)
300
310
311
312
313
320
325
330
335
305
Garmin nuvi 255W Portable GPS w/ 4.3" Screen & Spoken Street Names
$349.98
No
Garmin nuvi 260 Portable GPS w/ Text-to-speech
$219.54
No
Garmin nuvi 260W GPS Navigation System with 4.3" Touch Screen
$349.98
No
Garmin Nuvi 265T 3.5" Screen GPS w/ Spoken Street Names, Bluetooth and Lifetime Traffic
$197.54
Yes
2 Year Extended Service Plan for an Auto Electronics Item from $147 - $299.99
$19.88
Warranty & Service Plan
3 Year Extended Service Plan for an Auto Electronics Item from $147 - $299.99
$28.88
Warranty & Service Plan
Garmin Nuvi 265WT 4.3" Screen GPS Navigation w/ Spoken Street Names, Bluetooth and Lifetime Traffic
$242.54
Yes
2 Year Extended Service Plan for an Auto Electronics Item from $300 - $499.99
$29.88
Warranty & Service Plan
3 Year Extended Service Plan for an Auto Electronics Item from $300 - $499.99
$44.33
Warranty & Service Plan
Garmin nuvi 270 GPS Navigation System with North America and Europe Map
$338.63
No
Garmin Nuvi 275T 3.5" Screen GPS w/ Spoken Street Names, Bluetooth and Lifetime Traffic, North American and Europ Map included
$399.86
Yes
2 Year Extended Service Plan for an Auto Electronics Item from $300 - $499.99
$29.88
Warranty & Service Plan
Garmin nuvi 350 Portable GPS with Spoken Street Names
$198.86
No
© N.E.W. North America, Corp. All rights reserved.
javascript:launchPopup('SkuHistory.aspx?bu=4&sku=4407767', 640, 480);

FIG. 8


SpiderSense - Report - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://URL
SpiderSense - Report
SpiderSense
Log Out | My Account | Help
Report Explorer Filters Statistics Status Administration
Zaps
Apply Category Filter (Settings)
Favorite SKUs [15759]
Electronics [10311]
Audio [2056]
Auto Electronics [426]
Camcorders [159]
Cell Phones [582]
Computers [4348]
Digital Cameras [1044]
DVD & Blu-ray Players [369]
GPS & Navigation [125]
Home Office [394]
Home Security Systems [221]
Home Theater [50]
TVs [537]
Accessories [363]
All TVs [126]
HDTV & Home Theater Bundles
HDTVs - 37" & Larger [1]
LCD (flat panel) - 26" to 36" [1]
Keyword
Service plan Does not matter
Price Range to
Flat Report
Hierachical Report
Plan-SKU Report
Configure Columns
Show Report
Export Report
(Settings)
125 of 125 displayed, 13 have plan
Electronics
GPS & Navigation
Auto GPS Units
Garmin nuvi 200 Pink Portable GPS with 3.5" Screen
Garmin Nuvi 200 Portable GPS bundled w/ your choice of a Bonus Accessory (save up to $20)
Garmin nuvi 200 Portable GPS with 3.5" Display Screen
Garmin nuvi 200 Portable GPS with 3.5" Screen Blue
Garmin nuvi 200 Portable GPS with 3.5" Touch Screen
Garmin Nuvi 200 Silver with Garmin Carrying Case
Garmin nuvi 200W Portable GPS with 4.3" display Screen
Garmin nuvi 205 Portable GPS w/ 3.5" Screen
Garmin nuvi 205W Portable GPS w/ 4.3" Screen
Garmin nuvi 255 Portable GPS w/ 3.5" Screen & Spoken Street Names
Garmin nuvi 255W Portable GPS w/ 4.3" Screen & Spoken Street Names
Garmin nuvi 260 Portable GPS w/ Text-to-speech
Garmin nuvi 260W GPS Navigation System with 4.3" Touch Screen
Garmin Nuvi 255T 3.5" Screen GPS w/ Spoken Street Names, Bluetooth and Lifetime Traffic
Garmin Nuvi 255WT 4.3" Screen GPS Navigation w/ Spoken Street Names, Bluetooth and Lifetime Traffic
125 of 125 displayed, 13 have plan
125 of 125 displayed, 13 have plan
66 of 68 displayed, 13 have plan
$129.88 No plan
$128.88 No plan
$169.86 No plan
$139.88 No plan
$118.88 No plan
$128.72 No plan
$194.88 No plan
$199.98 No plan
$249.98 No plan
$299.98 No plan
$349.98 No plan
$219.54 No plan
$349.98 No plan
$197.54 2 Year Extended Service Plan for an Auto Electronics Item from $147 - $299.99
3 Year Extended Service Plan for an Auto Electronics Item from $147 - $299.99
$242.54 2 Year Extended Service Plan for an Auto Electronics Item from $300 - $499.99
3 Year Extended Service Plan for an
$19.88 Warranty & Service Plan
$28.88 Warranty & Service Plan
$29.88 Warranty & Service Plan
Warranty &
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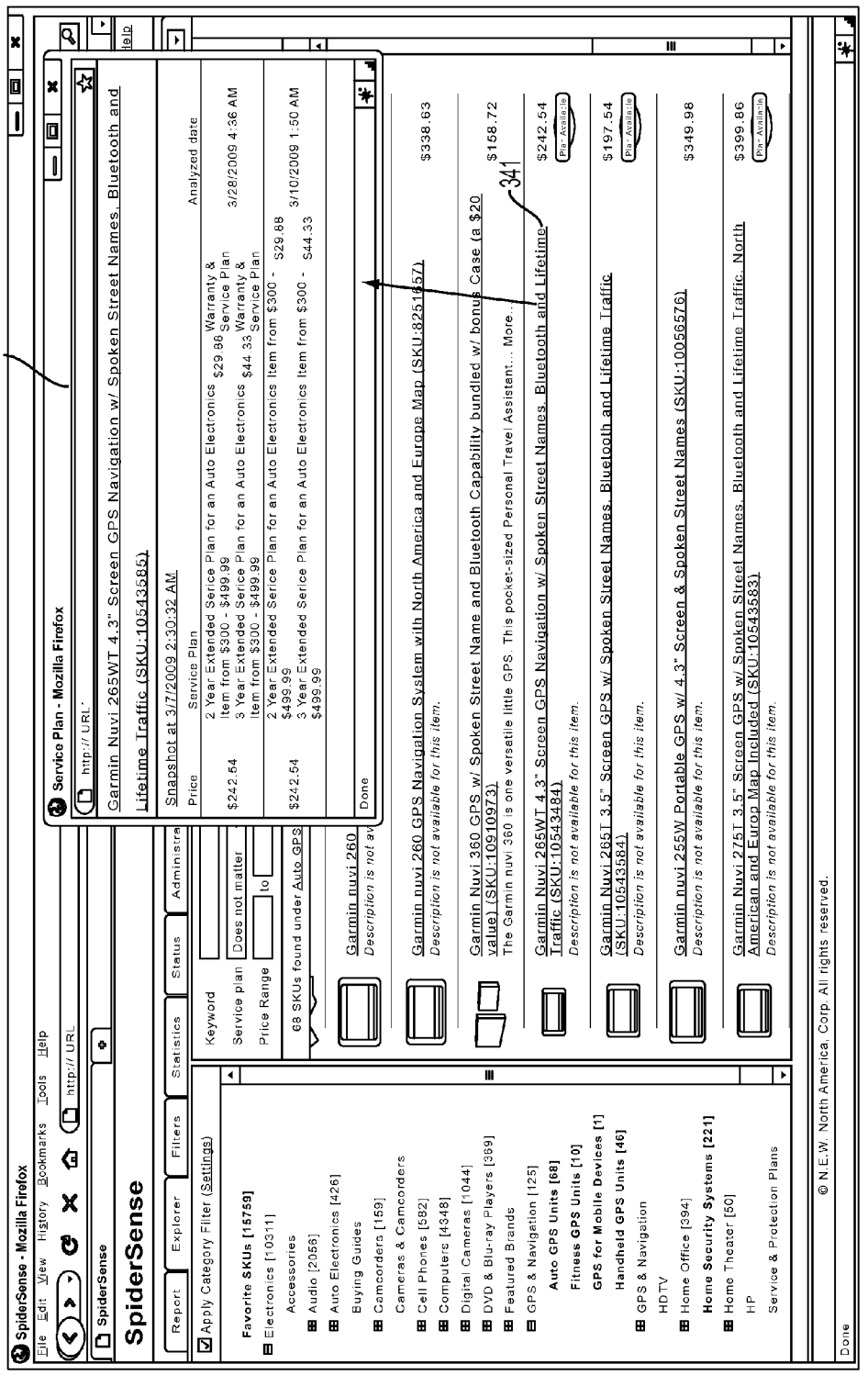
Done

FIG. 9


340
341
SpiderSense - Mozilla Firefox
Service Plan - Mozilla Firefox
SpiderSense
Garmin Nuvi 265WT 4.3" Screen GPS Navigation w/ Spoken Street Names, Bluetooth and Lifetime Traffic (SKU:10543585)
Snapshot at 3/7/2009 2:30:32 AM
Price
Service Plan
Warranty & Service Plan
Analyzed date
$242.54
2 Year Extended Serice Plan for an Auto Electronics Item from $300 - $499.99
$29.88
3/28/2009 4:36 AM
3 Year Extended Serice Plan for an Auto Electronics Item from $300 - $499.99
$44.33
3/10/2009 1:50 AM
Done
Garmin nuvi 260
Description is not available for this item.
Garmin nuvi 260 GPS Navigation System with North America and Europe Map (SKU:8251457)
$338.63
Garmin Nuvi 360 GPS w/ Spoken Street Name and Bluetooth Capability bundled w/ bonus Case (a $20 value) (SKU:10910973)
$158.72
The Garmin nuvi 360 is one versatile little GPS. This pocket-sized Personal Travel Assistant... More...
Garmin Nuvi 265WT 4.3" Screen GPS Navigation w/ Spoken Street Names, Bluetooth and Lifetime Traffic (SKU:10543484)
$242.54
Garmin Nuvi 265T 3.5" Screen GPS w/ Spoken Street Names, Bluetooth and Lifetime Traffic (SKU:10543584)
$197.54
Garmin nuvi 255W Portable GPS w/ 4.3" Screen & Spoken Street Names (SKU:10056576)
$349.98
Garmin Nuvi 275T 3.5" Screen GPS w/ Spoken Street Names, Bluetooth and Lifetime Traffic, North American and Europ Map Included (SKU:10543583)
$399.86
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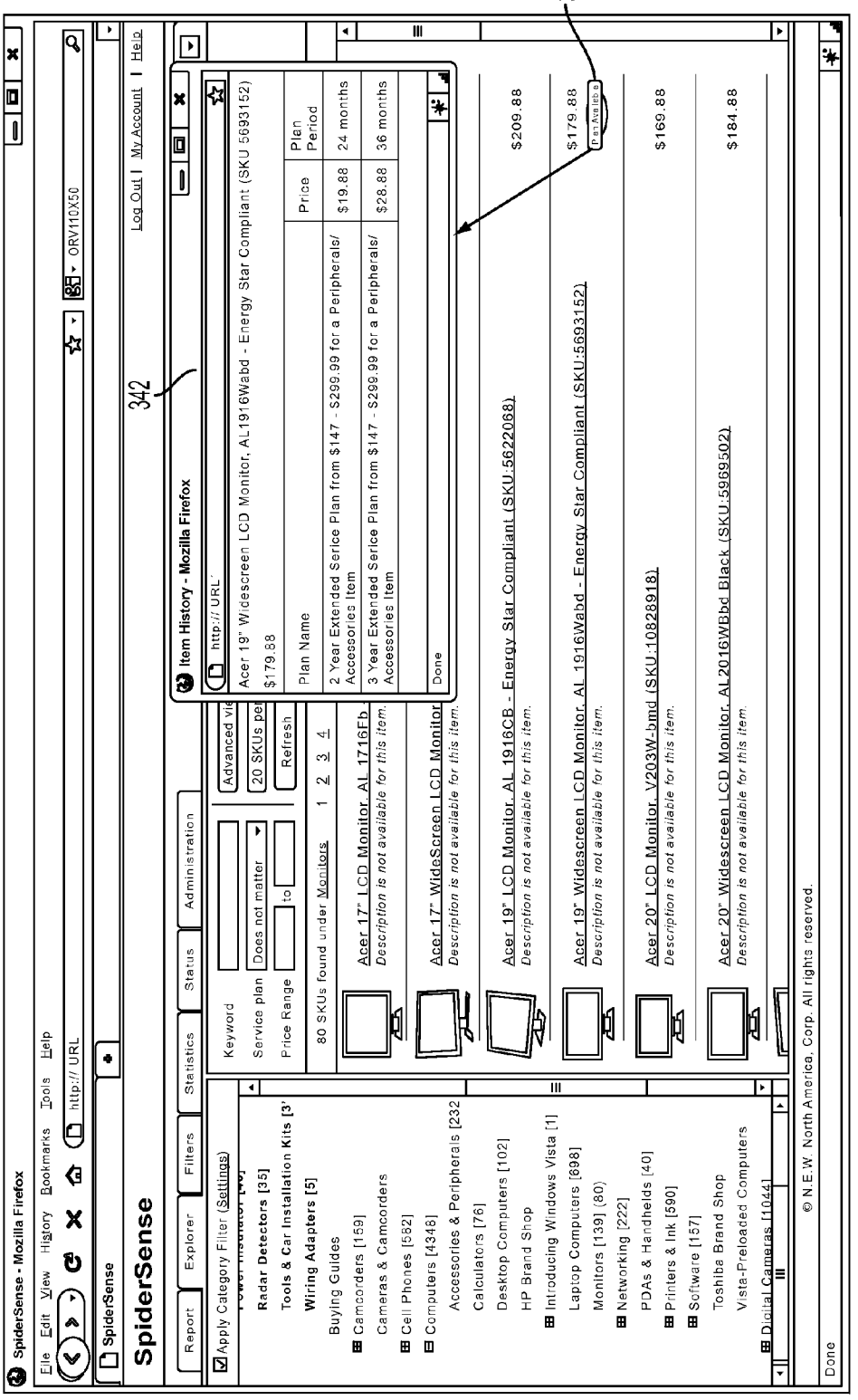
Done

FIG. 10


SpiderSense - Mozilla Firefox
SpiderSense
342
343
Item History - Mozilla Firefox
Acer 19" Widescreen LCD Monitor, AL1916Wabd - Energy Star Compliant (SKU 5693152)
$179.88
Plan Name
Price
Plan Period
2 Year Extended Serice Plan from $147 - $299.99 for a Peripherals/ Accessories Item
$19.88
24 months
3 Year Extended Serice Plan from $147 - $299.99 for a Peripherals/ Accessories Item
$28.88
36 months
Done
Report
Explorer
Filters
Statistics
Status
Administration
Keyword
Service plan
Does not matter
Price Range
to
Refresh
80 SKUs found under Monitors
Acer 17" LCD Monitor, AL 1716Fb
Description is not available for this item.
Acer 17" WideScreen LCD Monitor
Description is not available for this item.
Acer 19" LCD Monitor, AL 1916CB - Energy Star Compliant (SKU:5622068)
Description is not available for this item.
$209.88
Acer 19" Widescreen LCD Monitor, AL 1916Wabd - Energy Star Compliant (SKU:5693152)
Description is not available for this item.
$179.88
Acer 20" LCD Monitor, V203W-bmd (SKU:10828918)
Description is not available for this item.
$169.88
Acer 20" Widescreen LCD Monitor, AL2016WBbd Black (SKU:5999502)
Description is not available for this item.
$184.88
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Done

FIG. 11

Statistics - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http:// URL

Statistics

Log Out | My Account | Help

SpiderSense

Report | Explorer | Filters | Statistics | Status | Administration | Zaps

Summary

Total SKUs	Total SKUs with Plan	Total Categories	Total Pages	Total Cache Size	Traffic Size	Crawl End Date
144921	56811 (39%)	4875	725858	35.63 GB	7.59 GB (21%)	5/19/2009 1:27:01 AM

Snapshots

SKUs	SKUs with Plan	Categories	Pages	Cache Size	Traffic Size	Crawl Start Date	Crawl End Date
183	72 (39%)	2	895	98.38 MB	21.39 MB (22%)	1/30/2009 11:38:16 PM	5/15/2009 10:15:25 PM
181	69 (38%)	3	753	82.71 MB	18.00 MB (22%)	1/30/2009 11:38:21 PM	5/15/2009 10:07:50 PM
135	53 (39%)	2	610	67.08 MB	14.58 MB (22%)	1/30/2009 11:42:36 PM	5/15/2009 10:06:23 PM
99	45 (45%)	1	492	54.28 MB	11.80 MB (22%)	1/30/2009 11:43:05 PM	5/15/2009 10:03:17 PM
10	5 (50%)	0	68	7.49 MB	1.63 MB (22%)	2/7/2009 6:45:31 AM	5/15/2009 9:53:03 PM
6	1 (17%)	0	60	6.61 MB	1.44 MB (22%)	2/7/2009 7:22:52 AM	5/15/2009 10:06:57 PM
10	5 (50%)	0	54	5.99 MB	1.31 MB (22%)	2/7/2009 7:23:00 AM	3/28/2009 2:49:28 AM
3	0 (0%)	0	48	5.35 MB	1.17 MB (22%)	2/7/2009 7:23:06 AM	5/15/2009 10:00:08 PM
1	0 (0%)	0	13	1.50 MB	326.35 MB (22%)	2/22/2009 4:11:38 AM	3/8/2009 7:46:34 AM
0	0	0	12	1.41 MB	304.11 MB (22%)	2/22/2009 4:12:49 AM	3/8/2009 7:46:36 AM

1 2 3 4 5 6 7 8

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Done

FIG. 12

Fig 13

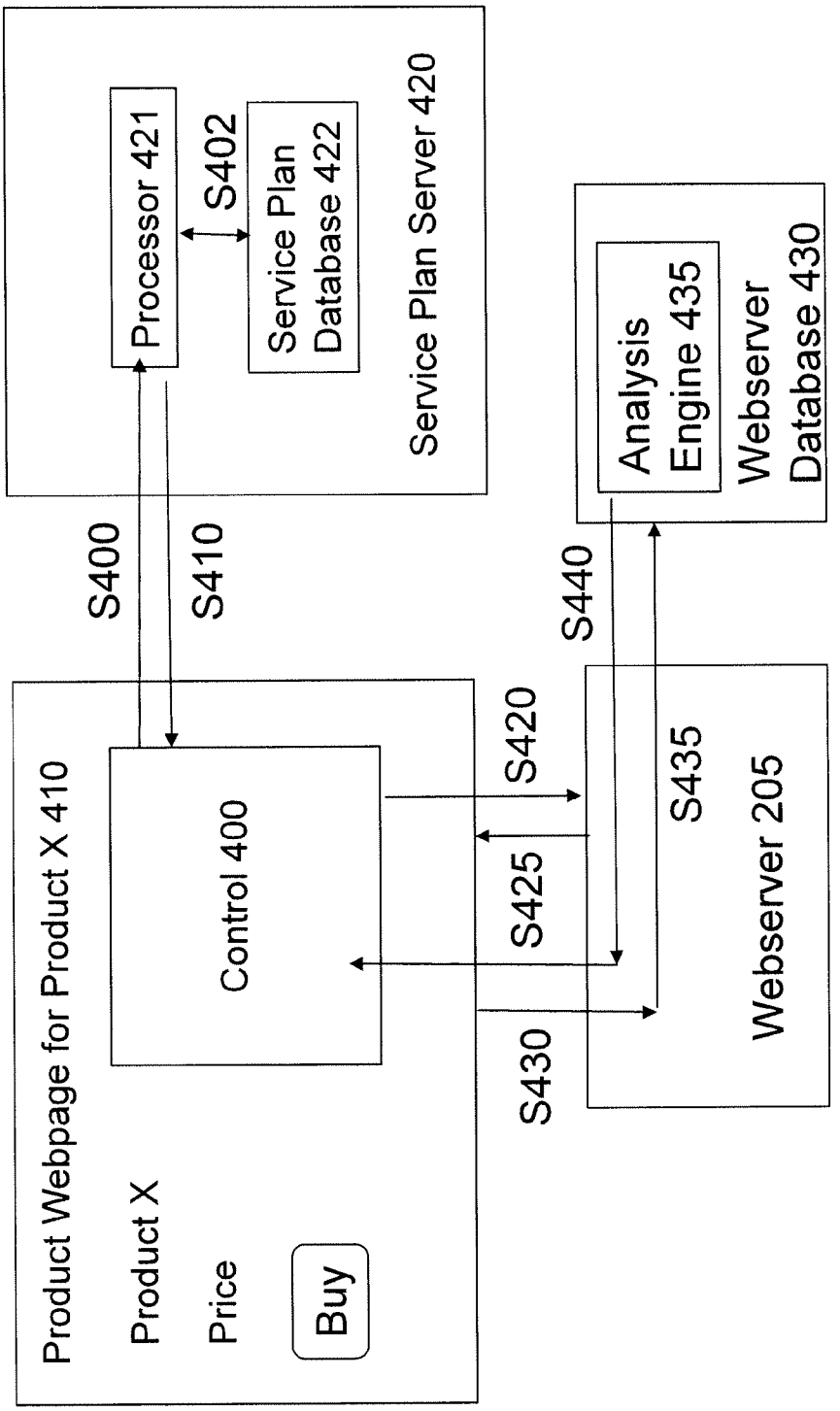

Service Plan Server 420
Processor 421
S402
Service Plan Database 422
Webserver Database 430
Analysis Engine 435
S400
S410
S440
Product Webpage for Product X 410
Product X
Price
Buy
Control 400
S420
S425
S435
S430
Webserver 205

Fig 14A

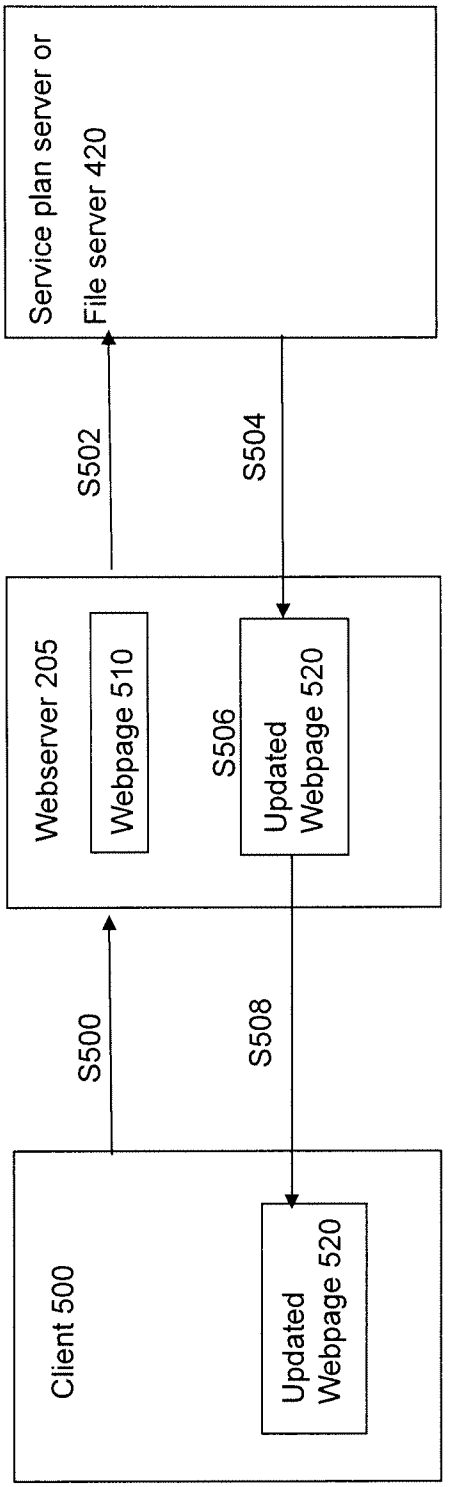

Service plan server or
File server 420
S502
S504
Webserver 205
Webpage 510
S506
Updated
Webpage 520
S500
S508
Client 500
Updated
Webpage 520

Fig 14B

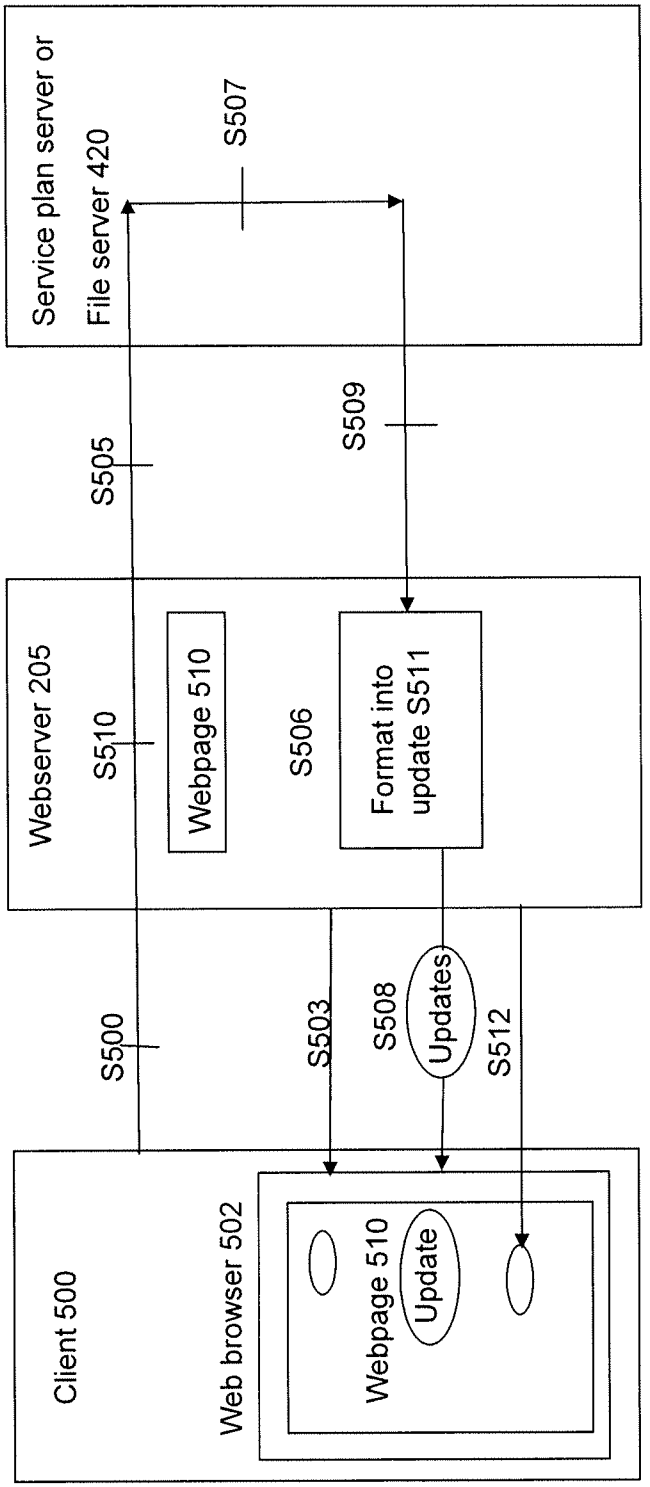

Service plan server or
File server 420
S507
S505
S509
Webserver 205
S510
Webpage 510
S506
Format into
update S511
S500
S503
S508
Updates
S512
Client 500
Web browser 502
Webpage 510
Update

Fig 14C

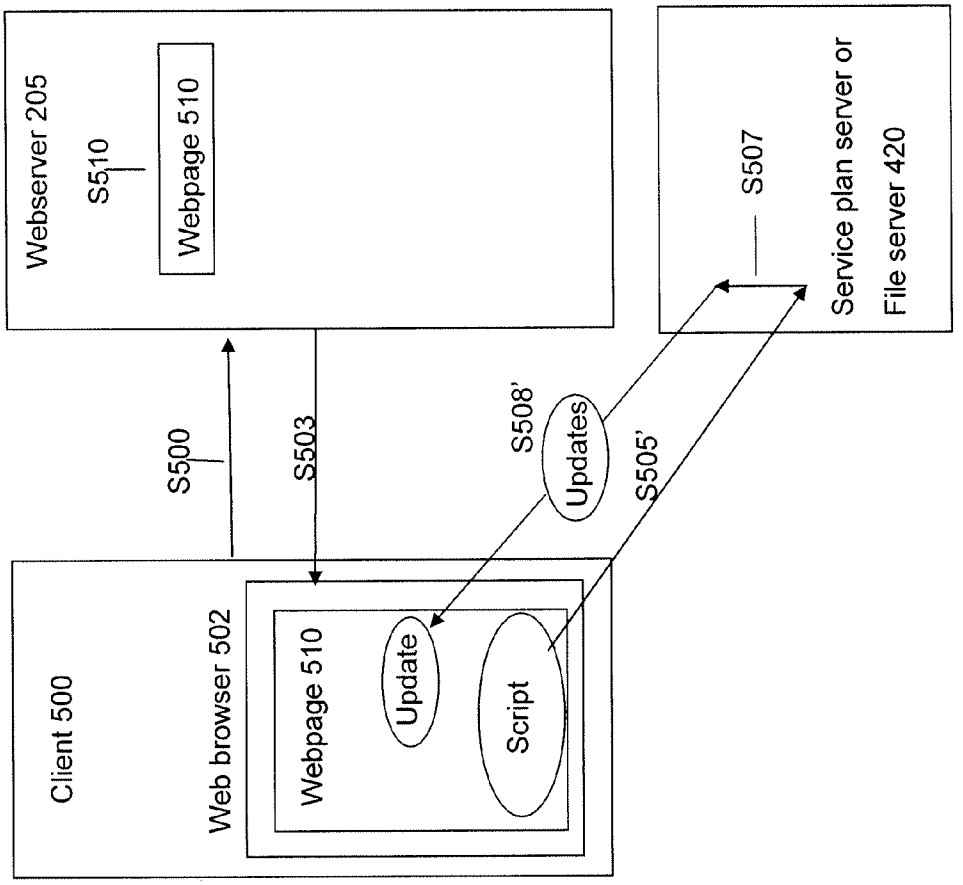

Webserver 205
S510
Webpage 510
Service plan server or
File server 420
S507
S500
S503
S508'
Updates
S505'
Client 500
Web browser 502
Webpage 510
Update
Script

Fig 14D

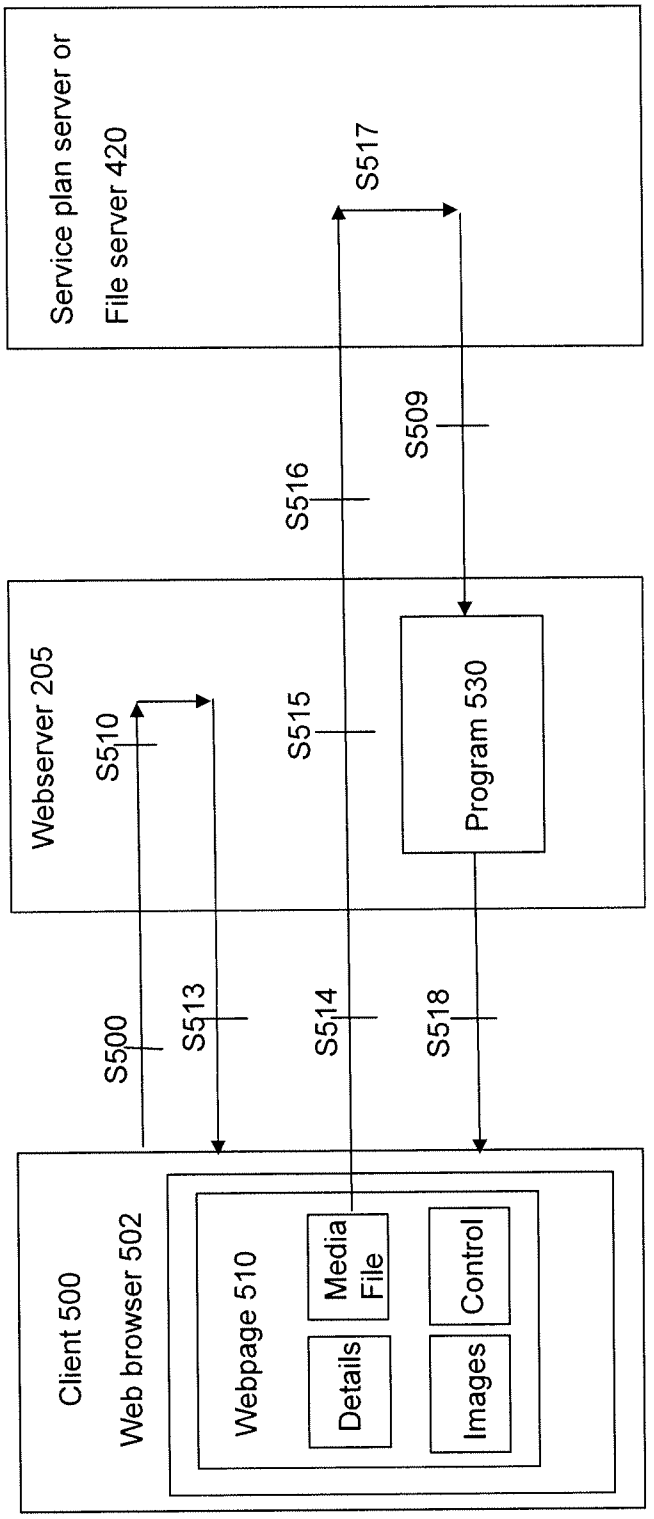
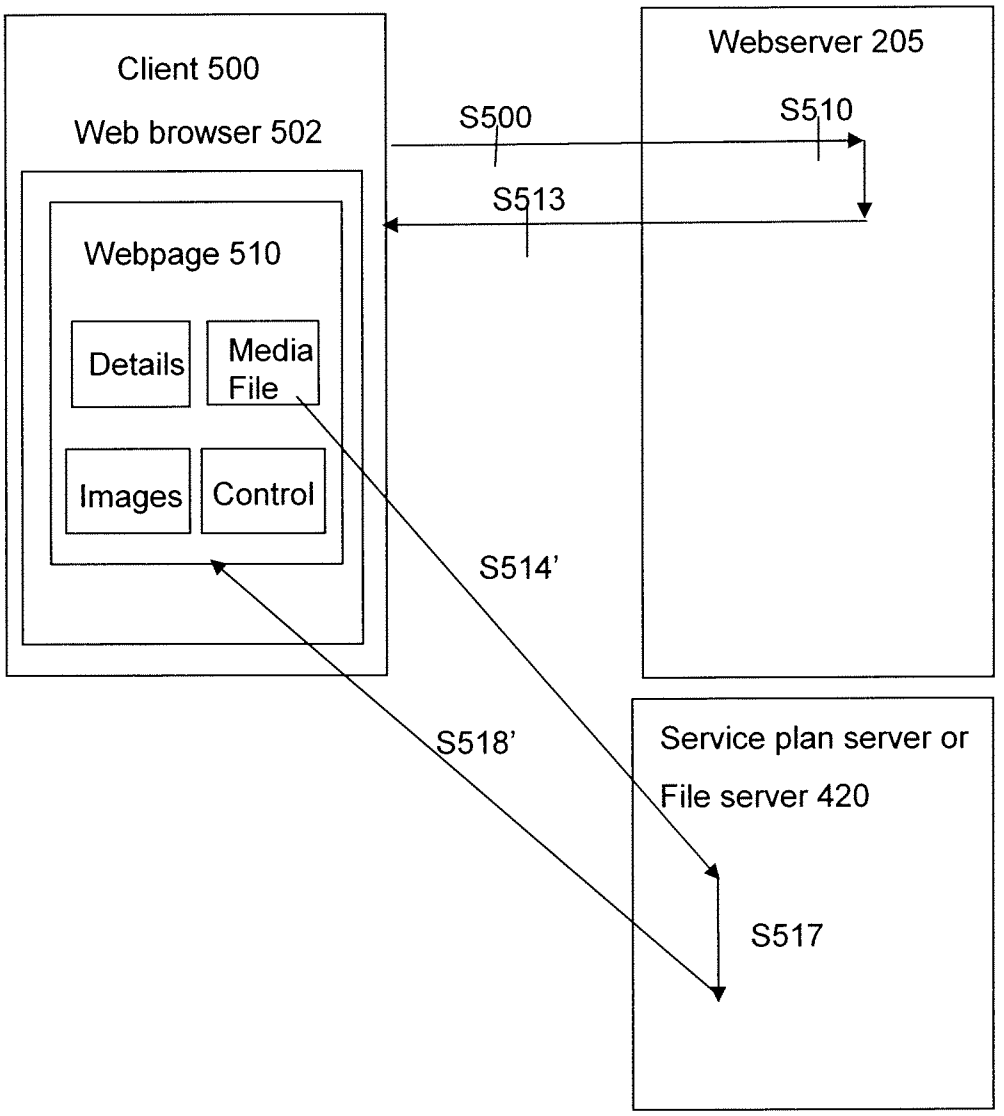

Service plan server or
File server 420
S517
S509
S516
Webserver 205
S510
S515
Program 530
S500
S513
S514
S518
Client 500
Web browser 502
Webpage 510
Media File
Control
Details
Images

Fig 14E


Client 500
Web browser 502
Webpage 510
Details
Media File
Images
Control
Webserver 205
S500
S510
S513
S514'
S518'
Service plan server or
File server 420
S517

SERVICE PLAN WEB CRAWLER

PRIORITY

This application claims the benefit of priority to U.S. Provisional Application 61/245,923 (filed Sep. 25, 2009) and 61/272,707 (filed Oct. 23, 2009); both of which are incorporated by reference in their entirety.

BACKGROUND OF THE INVENTION

Current trends in the market place have influenced merchants to include service plans for many of their products. Sometimes the service plans are offered directly by a merchant, such as BestBuy's GeekSquad and Office Depot's Tech Depot Services, and in other cases a third party may fulfill a merchant's service plan obligations. Customers may purchase these services to receive additional support for their product, ideally increasing their use and enjoyment of it.

Online merchants associate products with service plans or warranties so that a customer can buy an extended warranty or service plan when he or she purchases a product. Sometimes, however, a product should be listed as having a service plan, but an error in the listing causes the webpage on which the product is listed to not offer a service plan. Consequentially, the online merchant would not, in this case, offer the service plan to the customer. In other cases, the website of the online merchant may associate the product with an incorrect service plan. Because the sale of warranties or service plans may be a significant source of revenue for the merchant, merchants often expend considerable resources in checking their websites for mismatched warranties and products not having an associated warranty.

SUMMARY OF THE INVENTION

One aspect of the present invention may relate to providing a web crawler which can identify missing or misassociated service plans or warranties. A second aspect of the present invention may relate to providing a dynamic mapper for determining what service plan should be associated with a particular product. In an embodiment of the web crawler configuration, the web crawler may be constructed so that it follows links on a merchant's website to find at least one product on a merchant's webpage, identifies which service plan is associated with that product, and determines whether the correct service plan has been associated with the product. Additional features of the web crawler embodiment may include a placement analyzer for determining where on the webpage the warranty is located, and whether the placement is easily visible to the customer. Another feature the web crawler may provide is a class generator for populating a relational database with information downloaded by the web crawler. Moreover, the web crawler may contain a smart crawling routine for preventing the web crawler from crawling blacklisted webpages. Other features of the web crawler may include a throttle controller for managing the web crawler's impact and strain on the merchant's website, and an error checking routine for tracking errors returned by the website.

In an embodiment of a dynamic mapper configuration, a dynamic mapper is disclosed which allows a merchant to automatically map service plans to product webpages. This technique allows the merchant to avoid having to manually map the service plans with the product webpage, which may increase costs in personnel and also increase the number of incorrectly paired service plans to product pages. In an embodiment of the dynamic mapper, the merchant may send

the dynamic mapper a request to add a product webpage to the merchant's website. The dynamic mapper may analyze the product to be added, and return content to the merchant. In some embodiments, the content may simply be information regarding the service plan (such as a warranty SKU). In other embodiments, the dynamic mapper may return an advertisement for the service plan itself. In the latter case, the merchant may incorporate the advertisement directly into the product webpage. If there is no service plan associated with the product webpage, the dynamic mapper may determine that no service plan should be included. The dynamic mapper may be able to determine whether the product should have a warranty by comparing product information, category, bread crumbs, and price info (etc.) against a set of previously collected data. This previously collected data may be used to allow the dynamic mapper to implement a Bayesian filter. An implementation of this filter may allow the dynamic mapper to determine whether the product webpage it is currently analyzing should have a service plan based on whether or not similar product webpages have a service plan. Alternatively or in addition, the dynamic mapper could use a rule-based engine to determine whether a particular product webpage should have a service plan. Once the service plan or service plans are identified, the dynamic mapper may return the service plan information back to the merchant. In some embodiments, the service plan may be identified simply by an identifier unique to each service plan (e.g. a warranty SKU).

In an embodiment of the webserver, a webserver may be provided which contains instructions or software stored on computer readable media (hard drive/optical drive) and a processor (e.g. Intel or AMD microprocessor) for causing the webserver to perform a series of steps. The webserver may receive a request for a webpage containing details on a particular product from a client executing a web browser; determine the web browser version and type; and determine from the version and type whether the web browser supports asynchronous page loading. If the webserver determines that asynchronous page loading is supported by the web browser, the instructions in the computer readable media may cause the webserver to send a copy of the requested webpage to the client; send an update request to a file server; receive updated information to the file server; format the information from the file server so that it may be displayed by the web browser of the client; and send the formatted information to the web browser of the client. If the webserver determines that asynchronous page loading is not supported by the web browser, the instructions in the computer readable media may cause the webserver to send a request to the client to determine whether a media player such as Adobe Flash Media Player is installed. If the media player is installed, the instructions in the storage media of the webserver may cause the webserver to: send a webpage to the client containing details about a product, a control, and a media file; receive a transmission from a program executing the media file at the client; said transmission containing a request for updated information; send the request for updated information to the file server; receive a response from the file server which contains data; format the data so that it may be viewed by the web browser; and return the formatted data to the client.

In yet another configuration, the client, webserver, and server could be configured so that the service plan server sends updated information directly to the client (bypassing the webserver). One way to accomplish this configuration would be to instruct the webserver to send a script to the client. Upon execution of the script, the client may send a request to the service plan server for service plan information.

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In the two preceding paragraphs discussing webserver, client, and service plan topology, configurations of the invention may be constructed which are not limited to service plans or products. For example, the above topology may be used to update news articles, sports scores, directories, or other webpages which may need to be updated depending on the particular client requesting the information, or need to be updated on a frequent basis.

These and additional features are described in more detail in the detailed description of the invention.

BRIEF DESCRIPTION OF THE FIGURES

FIG. **1**: is a schematic view of an embodiment of the present invention.

FIG. **2**: is a screenshot of a merchant's homepage.

FIG. **3**: is a screenshot of a category webpage of a merchant.

FIG. **4**: is a screenshot of a subcategory webpage of a merchant.

FIG. **5**: is a screenshot of a product webpage of a merchant.

FIG. **6**: is a screenshot of a quasi category webpage of a merchant.

FIG. **7**: is a schematic view of a database designed to be used with an embodiment of the present invention.

FIG. **8**: is a screenshot of an example of the output of the interface output.

FIG. **9**: is a screenshot of an example of the output of the interface output.

FIG. **10**: is a screenshot of an example of the output of the interface output.

FIG. **11**: is a screenshot of an example of the output of the interface output.

FIG. **12**: is a screenshot of an example of the output of the interface output.

FIG. **13**: is a schematic view of the dynamic mapper.

FIG. **14**A: is a flow diagram illustrating how information may be sent between a client, webserver, and file server.

FIG. **14**B: is a flow diagram illustrating a second embodiment of how information may be sent between a client, webserver, and file server if the client's web browser can be configured to natively accept asynchronous page loading.

FIG. **14**C: is a flow diagram illustrating a third embodiment of how information may be sent between a client, webserver, and file server if the client's web browser can be configured to natively accept asynchronous page loading.

FIG. **14**D: is a flow diagram illustrating an embodiment of how information may be sent between a client, webserver, and file server if the client's web browser does not natively accept asynchronous page loading.

FIG. **14**E: is a flow diagram illustrating a second embodiment of how information may be sent between a client, webserver, and file server if the client's web browser does not natively accept asynchronous page loading.

DETAILED DESCRIPTION OF THE FIGURES

FIG. **1** illustrates a schematic view of the web crawler **10**. The web crawler has many utilities including, for example, allowing a user to learn which products on a merchant's website are correctly paired with a service plan, and whether the service plan is sufficiently visible to the customers browsing the webpages of the merchant's website. A service plan is generally an agreement between the customer and a service plan provider to repair or replace a product if a prespecified condition occurs (e.g. the product breaks, wears down, etc.) A warranty is a type of service plan. The web crawler **10** may be stored on computer readable media (such as memory or an optical or magnetic disc) and take the form of computer executable instructions or software that a computer can execute to generate an instance of the webcrawler object. The computer may contain a processor, hard drive, motherboard, I/O connections, memory, or other typical hardware. The web crawler **10** may contain an interface input **20** which can accept inputs from a user or another computer. For example, the interface **20** may allow a user to enter a URL of a homepage **210** of a desired webpage the user would like the web crawler **10** to analyzer. The interface **20** may contain a control or button for instructing the web crawler **10** to execute one or more the routines shown in FIG. **1**. For example, the interface may contain a webpage collector control and/or an analyzer control. In some embodiments, multiple routines may be combined into one control. The interface output **130** may contain inputs for receiving information from other routines (e.g. the placement analyzer **90** or validator **100**), and may be able to use information from these routines to generate an output for displaying results generated by the web crawler. An exemplary set of screenshots representing an embodiment of the invention is shown in FIGS. **8-12**. Interface output **130** may be a monitor or other display device, a printer, or a sound emission device. Interface **20** may send a request to the webpage collector **50** to tell the retriever to collect webpages from the merchant's website **200**. (The homepage **210** of zapps.com—an exemplary retailer—is shown as an example in FIG. **2**). As shown in FIG. **1**, vertical links **221** connect the homepage **210** to the webpages **250** and **250'** (which may be category webpages), while a horizontal link **222** links webpage **250** to webpage **250'**. Similarly in FIG. **2**, vertical link **221** links the homepage **210** to category webpage **250**, FIG. **3** (the link to mp3 players is indicated).

The web crawler **10** may also contain a smart crawler **30** for minimizing the number of webpages the downloader needs to download. The smart crawling routine **30** may contain a blacklist and/or a whitelist of items. A matcher **31** may contain a blacklist routine **32** or a whitelist routine **33**, or both. The matcher **31** will attempt to match breadcrumbs **76**, the name of the product **71**, etc. (see FIG. **5**) against the terms in the blacklist or whitelist. In the blacklist routine **32**, if the matcher **31** determines there is a match, the matcher **31** will allow the webpage collector **50** to save the webpage information in the database, but it will instruct a halter **35** which, if any item in the blacklist matches a breadcrumb, causes the smart crawler to download the current webpage and instructs the web crawler to avoid following any further links from the current webpage. In other embodiments, if the matcher **31** determines that some product information matches the blacklist, the matcher **31** will instruct the halter **35** to prevent the webpage collector from saving the webpage in the database **60**. In whitelist routine **33**, the matcher **31** will determine whether any of the product information matches any term in the whitelist. If the matcher **31** determines there is a match, the matcher **31** will allow the webpage collector **50** to save the webpage information, but if there is no match, the matcher **31** will instruct the halter **35** to prevent the current webpage from being saved. The smart crawler may also interact with a cacher **99** which saves copies of the webpages into the database **60**. The amount of caching performed may be set by the user via interface input **20**.

The web crawler **10** may contain a linking system **40** which may contain a link follower **41** and a linker **45**. The link follower **41** may retrieve and follow links **221-222** from the homepage **210** or from the webpage **250** or **250'** to other additional webpages **260** and **260'** (which may be subcategory webpages). FIG. **4** illustrates a subcategory webpage. A

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linker **45** may determine whether a particular link should be followed by matching a part of the link's URL against a regular expression. For example, the words "category" **81**, "subcategory" **82**, "product" **83**, or "catprop" may be used as terms to match against the URL to determine the type of page. Also, the linker **45** may monitor the sequence of links to determine the type of page (often webpages progress from homepage **210**→category page **250**→subcategory page **260**→product page **270**), or the linker **45** may rely on information determined from analyzer **70** such as breadcrumbs **76** (See FIG. **5**) to determine the type of page currently being analyzed.

The web crawler **10** may also contain a webpage collector **50** for collecting a current webpage associated with at least one of the links retrieved from the linking system. The collector may contain a categorizer **55** for categorizing the webpage as a category webpage **250**, a quasi category webpage **280** (FIG. **6**), or a SKU or product webpage **270**. Quasi category webpages may provide products within a certain price range **84**, brand **85**, or size **86** for example (See FIGS. **4** and **6**). In some embodiments categorizer may rely on information from analyzer **70** to help determine the type of webpage being collected.

The web crawler **10** may also contain a database **60** for storing webpages **250** retrieved from webpage collector **50**. An enlarged view of the database **60** is shown in FIG. **7**. A garbage collector **92** may remove unnecessary or empty classes in the database. In some embodiments a relational database may be used, and the database may comprise a number of classes such as a merchant class **61**, category class **62**, subcategory class **63**A, quasi category class **63**B, SKU class **64**, SKU warranty class **65**, page link class **66**, page content class **67**, category display filter class **68** (used for filtering down categories in the website), category spider filter class **69** (used for blacklisting certain specified websites). A class generator **93** may work in conjunction with the analyzer **70** to build classes based upon the information determined by analyzer **70**. A tree builder **80** may be used to establish relationships or links between these classes. For example, in the embodiment shown in FIG. **7**, the merchant class **61** is linked to the category class **62** and the page link class **66**. The category class **62** is liked to the subcategory class **63**A and the quasi category class **63**B, the subcategory class **63**A and the quasi category class **63**B are linked to the SKU class **64**. The SKU class is linked to the SKU warranty class. The page link class **66** is linked to the page content class **67**.

The web crawler **10** may also contain an analyzer **70** for collecting information about a particular product. Referring to FIG. **5**, the analyzer can collect a name of the product **71**, a category **72** and subcategory **73** of the class, pricing information on the product **74**, pricing information relating to a service plan of the product **75**, breadcrumbs **76**, and images of the product **77**. In FIG. **2**, the analyzer **70** (of FIG. **1**) has identified all seven types of information. Once identified, the analyzer may store this information in the database **60**. Breadcrumbs **76** provide contextual information for location of the product within a product page. As shown in FIG. **5**, the breadcrumbs are "Home>Categories>MP3 Players & Accessories>MP3/MP4 Players>iRiver America>Item#: N82E16855150095." On some webpage such as the one shown, the breadcrumbs **76** also provide the SKU **79**, the category **72**, and the subcategory **73** information. The analyzer may collect information such as the name of the merchant **78** from either the URL or merchant logo, and the SKU **79**.

The web crawler **10** may also contain a placement analyzer **90** for determining the quality of placement and location of the service plan on the current webpage. The placement analyzer **90** may have a simulator **91** for determining the service plan's visibility on the current webpage through simulating human interaction with the webpage to enable the analyzer **90** to locate placement of the service plan on the SKU webpage **270**, in a shopping cart, in a popup window, light box, or in a related items window (i.e. a window which suggests products other customers also bought.) In some embodiments, the placement analyzer may contain instructions for causing the web crawler **10** to determine whether the service plan is placed before the bend of a webpage (i.e. is the service plan visible on a customer's screen without requiring the customer to scroll the screen?).

The web crawler **10** may also contain a validator **100** for examining the information relating to the product **83** and its associated service plan **75**. The validator **100** may receive webpage information from the database **60** or directly from webpage collector **50**. The validator may comprise a range checker **101** and a missing service plan locator **105** for validating the product **83** and service plan **75**. The range checker **101** can be used with any product **83** having a service plan with a price range for products covered thereunder. For example, a service plan might generally cover products costing between 100-200 dollars. If the pricing information **74** for the product **83** is $240, the range checker **101** would determine the price of the product **83** is outside the range of the plan, optionally notify the crawler **10** of this event, and optionally send the results of its analysis to the interface output **130**. The missing service plan locator **105** may analyze products of a particular subcategory **73**, and determine whether any of the products in the same subcategory **73** have a service plan, and if the locator **105** determines that at least one of the products does have a service plan, the locator **105** may notify the web crawler **10** as to which products do not have an associated service plan. For example, if a product **83** such as a pink Ipod® Nano® (an MP3 player) has a service plan, but a black Ipod® Nano® does not, the locator **105** will determine that the black Ipod® Nano® is likely missing an associated service plan, and the locator **105** will notify the webcrawler that the black Ipod® Nano® does not have an associated service plan. The locator **105** may inform the crawler **10** of this event, and may send the results of its analysis to the interface output **130**. The locator **105** may utilize various algorithms for determining whether a particular product should have a service plan. In a first configuration, the locator **105** may utilize a string distance comparator to determine the Levenshtein distance between two product names **71**. The locator **105** may compare the string distance to a preestablished threshold value to enable the locator **105** to determine whether the strings are sufficiently close together such that an inference should be made that if one of the products **83** has a service plan **75**, then the second product should have a service plan. For example, if the validator **100** is examining two products (such as an "iPod Nano Pink" and an "iPod Nano Black") and the validator **100** determines that the Pink Ipod has a service and that the Black Ipod does not, the locator **105** may use its string distance comparator to determine the strings have a distance of four, and if the preestablished threshold value is 8 (for example), the locator **105** would determine that the string distance is less that the threshold value, thereby causing the locator **105** to inform the validator **100** (which may send the result to the interface output **130**) that the Black Ipod probably should have a service plan **75** because the Pink Ipod has a service plan **75**. To take the opposite example, if the locator were comparing a "Ipod Nano Pink" to a "Griffin Aerosport Nano Armband," the locator **105** would determine the string distance is 21, and

since 21>8, the locator **105** would not conclude that the Griffin Aerosport Nano Armband should have a service plan. As an additional step, the locator **105** may utilize category and/or subcategory matches to prevent nonsensical matches and deductions. For example, if the website offered both Cadillac cars and Cadillac dog food, the locator **105** may use category and subcategory information to avoid concluding that dog food should come with a service plan, because the Cadillac cars come with a service plan. In a second configuration, the locator **105** may use a Bayesian filter to classify products as having or not having service plan **75**. To perform this classification, the locator **105** may be trained to determine which products usually have a service plan **75**. To perform this training, the locator **105** may be provided with test data to process. The test data will contain product attributes such as name **71**, category **72**, price **74**, and breadcrumbs **76**. From these attributes, the locator **105** can develop a centroid that the locator **105** may use to classify the product **83** by its attributes as one which usually has a service plan **75** or one that does not usually have a service plan **75**. The web crawler **10** may also contain a throttle controller **110** which may have a connection limiter **111**, a bandwidth limiter **112**, and a request limiter **113**. Presets for the throttle controller **110** may be defaulted or set through the interface **20**. Connection limiter **111** may control the maximum number of simultaneous connections the web crawler **10** or webpage collector **50** may use while crawling the website. For example, the connection limiter **111** may allow 5 simultaneous connections. Bandwidth limiter **112** may control how much data per unit of time the web crawler may download from the website. For example, the connection limiter may limit the download speed to 2 megabytes per second. Request limiter **113** may control the frequency the web crawler sends requests or queries to the website. For example, the request limiter could limit the requester **50** to **20** requests per minute.

The web crawler **10** may also contain an error checker **120** which may have a stopping routine **121**, a total error threshold monitor **122**, and a frequency error monitor **123**. The webserver **205** (FIG. **13**), hosting the website **200**, may return errors indicating too many webpages **250** were requested, the webpages **250** were requested too quickly, the webpage **250** associated with a particular link **221** or **222** could not be found, etc. The error checker **120** may comprise presets that may be defaulted or set through the interface input **20**. Stopping routine **121** can control the crawler **10** or the retriever **50** by preventing either from downloading webpages for a period of time. Total error threshold monitor **122** is designed to monitor the amount of errors received from the website. The monitor may contain a preselected amount of errors per second, and may execute the stopping routine **121** to stop the crawler **10** or retriever **50** if the amount of errors exceeds a threshold value, such as 20 errors. Frequency error monitor **123** may monitor the frequency of errors per unit of time received from the website. The monitor **123** may execute the stopping routine to stop the crawler if the frequency of errors exceeds a threshold value, such as 5 errors/minute.

FIG. **1** also illustrates a process flow of information and interaction between the web crawler **10** and the website **200**. While a specific, sequenced process flow is shown in FIG. **1** and described herewith, various steps can be omitted or placed in a differing order than the one shown. Typically, when a user would like to use web crawler to crawl a website, he or she will access the interface input **20**. Interface input **20** may request the user enter the URL of the homepage of the website the user would like to crawl. Additionally interface input **20** may request other settings such as throttle, caching, or error settings.

Interface input **20** then may send the information to the smart crawler **30** which downloads the webpage. Smart crawler **30** may utilize its whitelist and/or blacklist to determine whether to process any links on the homepage. The smart crawler **30** then sends the homepage to webpage collector **50**. In some embodiments, the smart crawler **30** may send any errors received in conjunction with the homepage to the error checker **120**. Error checker **120** may monitor and regulate the actions of the smart controller depending on the amount or frequency of received errors. In some embodiments, the error checker **120** may send the results of its error analysis to the webpage collector **50**. Smart crawler **30** also may send bandwidth and network information to the throttle controller **110** which will monitor and regulate the network performance of the smart crawler **30**.

Webpage collector **50** may use its categorizer **55** to determine the type of webpage it is currently collecting. If the current webpage being collected is a category **250**, subcategory **260** or quasi category **280** webpage, the collector will send a request (and optionally the results of the categorizer's analysis) to the linking system **40**, which will access the website **200** to find and process further links to find the SKU webpage **270**. Linking **40** system may use its linker **45** and link follower **41** to determine which links to analyze and process. The results of the linking system's analysis are sent back to the smart crawler **30**, which downloads the next webpage specified by the linking system **40**.

If the webpage now being processed is a webpage **270** or **270'** (a SKU or product page), the webpage collector **50** may send the webpage to placement analyzer **90**, cacher **99**, and/or analyzer **70**. Placement analyzer **90** may evaluate the placement and visibility of the service plan, but it may need information from analyzer **70** to inform it of the positioning of the service plan. In some embodiments the analyzer **70** may send both the webpage and the results of its analysis to placement analyzer **90**. Cacher **99** may determine whether or not to save or cache the webpage in the database **60**. Analyzer **70** may determine the content and location of information such as category **72** or breadcrumbs **76** on the webpage, and then send the results of its analysis to the database **60**.

Database **60** may use its class generator **93** to create classes for database **60**. Tree builder **80** may establish relationships between the classes, and garbage collector **92** may remove blank or not needed classes. Validator **100** may request information from the database **60** (such as objects of the classes created by the class generator) and process the information to determine whether the product on the webpage should have a service plan, and whether the service plan offered is the correct service plan through using the locator **105** and the range checker **101**. Validator **100** may then send the results of its analysis to interface output **130**. Interface output **130** may generate an output to display the results gathered from the placement analyzer **90** and/or the validator **100** (or other routine). In some case, the computer processing the web-crawler software may transfer the output to a display or a monitor or print the results on paper to inform the user of the results of the analysis performed by web crawler **10**. In some embodiments, the details of these results may be customized by the user. FIG. **8** for example shows a flat report of a retailor's (Zaps) website. The report display **300** can show a number of different fields and in some embodiments the contents of the fields or their order can be customized by the user or by the software. In the embodiment shown, there is a description column, a price column, a Yes/No warranty indication column, a first warranty description column, a first price for the warranty column, a first warranty name column, a second warranty description column, a second price for the

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warranty column, and a second warranty name column. The category filter **305** may allow the interface output **130** to restrict its output to certain categories of items. Category, subcategory, and breadcrumb information may be determined by the analyzer **70** to populate this field. In this embodiment, the flat report view (FIG. **8**) has a number of tabs **310** for causing the interface output to switch the current view. These tabs include report **313**, explorer **311**, filters, statistics **312**, status, and administration. This embodiment of the output of the interface output **130** includes a search command **320** for searching for certain terms of keywords in the report display **300**. The search command, in this embodiment, can filter by the presence or absence of a warranty (using the warranty filter **325**) or by price (using the price filter **330**). The report generator function **335** may be used to switch the format of the report display. In FIG. **8**, the flat report display is shown, but in FIG. **9**, a hierarchical display is shown. Clicking on the radial button, causes the interface output **130** to switch the display format. The hierarchical display (FIG. **9**) shows category and subcategory information in the report display. Additionally, in this embodiment, the report display illustrates the number of products available in the present view. In this particular embodiment, a description, price, warranty description, warranty price, and warranty name columns are generated by the interface output **130**. One advantage of this layout as compared to the flat layout is that it shows products by their category information, but a disadvantage of this layout is that somewhat less detailed information about the warranty is displayed by interface output **130**. Clicking on the explorer tab **311** instructs the interface output **130** to display the explorer interface (see FIG. **10**). This interface provides additional information about the product being sold, and through popup windows provides detailed views of warranty information. FIG. **10** shows the first warranty window **340** the interface output **130** generates when the product hyper link (**341**) is clicked. FIG. **11** shows the second warranty window **342** the interface output **130** generates when the warranty icon **343** is clicked. Clicking the statistics tab **312** instructs the interface output **130** to display the statistics output (FIG. **12**.) In this example, crawling activity on Zaps webpage is shown. Various types of information is compiled and illustrated by the interface output **130** in this view. For example, the number of products having warranties can be calculated, the amount data pulled from the merchant's website can be displayed (this data may come from the throttle controller **110** for example), and the total number of webpages downloaded can be displayed.

The webcrawler **10** may be used to determine which products on a merchant's website have or should have warranties or service plans, and which products are correctly paired with the warranty or service plan. Once a user learns this information, he or she may relay it to the merchant (in some embodiments the merchant may be able to use the software directly). In such a case, the merchant may still need to have personnel update the merchant's website to add the missing warranties or service plans and update the incorrectly paired warranties or service plans.

One way to avoid having to pay personnel to update mismatched or missing service plans is to build a system which automatically selects a correct service plan when a product webpage is updated or added to a merchant's website **200**. A dynamic mapper may be used to select which service plan should be paired with a particular product. The dynamic mapper may be stored on computer readable media and comprise instructions for causing a processor of a computer to execute the instructions, thereby creating an instance of the dynamic mapper. The computer may contain a processor, hard drive, motherboard, I/O connections, memory, or other typical hardware.

As shown in FIG. **13**, in one embodiment for adding a dynamic mapper to a merchant's website involves adding a control **400** onto a product webpage **410**, search page, or shopping cart. Then, when a consumer views the product—or adds it to the shopping cart—the control **400** may send a request S**400** including the product name, price, category, SKU breadcrumbs, and/or other information to a service plan server **420**, to instruct a processor **421** in the server **420** to lookup S**402** which service plan should be associated with the particular product by accessing a database **422**. The processor **421** returns S**410** electronic data back to the control **400**. The electronic data may simply be html code which allows the control **400** to display warranty information or provide a selector to choose among multiple service plans (2 yr or 3 yr plans for example). In other configurations, the electronic information may include a sales pitch, service plan options, or an advertisement. The control **400** may display and/or process the electronic data so that the product webpage **410** and control **400** appear to be one integral page. Alternatively, the control **400** may store the electronic data locally, and send a request for updated information from the service plan server **420** when certain conditions are met. Such requests may be sent after a predetermined period of time elapses (e.g. once a year), or anytime the product information is modified. The electronic data may contain text, images, videos, popup panels, and other types of rich media. The control **400** may support chat functions to allow customers to ask questions about a service. If a customer wants to purchase the service plan, he or she may have the option to click a purchase button to add the service to their shopping cart. In a way, the content returned by the dynamic mapper may act like part of the underlying webpage; as opposed to a banner type advertisement. One way to allow a user to update his or her order, is to construct the control **400** so that the control **400** sends a request to the webserver **205** hosting the webpage when the user clicks a button or other element in the control. The request S**420** sent by the control **400** to the webserver **205** may contain information to allow the webserver **205** to display S**425** updated information such as a new combined price.

The dynamic mapper may also track customer behavior and sales outcome to determine a success rate of different embodiments of the control **400**. To do so, the webserver **205** may store S**435** the outcome of what happens in a webserver database **430** when alternative embodiments of the control **400** are used (sales pitch, radial box with options, chat popup, etc). In other words, the webserver database **430** may store a consumer's decision whether or not to purchase a service plan advertised through the control **400**. For example, when the consumer presses a "Buy" button **401**, the consumer's computer may submit S**430** information to the webserver **205** including the service plan selected, the current embodiment of the control **400**, and perhaps the total price. An analysis engine **435** may process this information, and determine which embodiments of the control **400** are more effective in persuading customers to purchase the service plan. In some configurations, the analysis engine **435** may take into account information about the purchaser including the location of the purchaser (obtainable from the purchaser's IP address), the merchant from which the customer is purchasing the item, the time of day or year of the purchase (during the workday or at Christmas time for example.) Moreover, if the merchant's website or the customer sends information about the customer to the webserver **205** or analysis engine **435** (such as the customer's phone number) this information can be cross-

referenced against a database to obtain additional information about the customer including gender, income, age, etc. The dynamic mapper may use this information to determine which type of advertisement for the service provider is most effective for the particular customer to maximize sales of the product and/or the service plan. The analysis engine may send S**440** an instruction back to the webserver to direct the webserver as to which type of control **400** to use to optimize the likelihood that a particular customer will purchase the service plan.

The service plan server **420** may use Bayesian algorithms, statistical analysis, rule-based engines, or other techniques to identify which service plans should be associated with a given product. Based on these techniques, the service plan server may determine what type of advertisement it should display to the customer, and return this advertisement to the control **400**.

The dynamic mapper may also be constructed so that the control **400** downloads dynamic content only after the product webpage **410** has been displayed to the customer. This prevents the advertisement for the service plan from increasing page load time. This may be significant as an increase in page load time may decrease sales of the underlying product. Additionally, the dynamic mapper may be constructed so that the control **400** cannot modify the underlying product webpage. This may be a valuable security benefit to the merchant. Additionally, if the control is restricted to a particular area of the webpage, a failure of the dynamic mapper to return the advertisement may cause displayer to display nothing, thereby making this failure transparent to a customer.

FIGS. **14**A-E show how information may be delivered to a client. In FIG. **14**A, a client **500** (utilizing a web browser) may send S**500** a request to a webserver **205** for a particular webpage adverting a particular product. The webserver **205** may determine the webpage **510** which is being requested, and may send S**502** a request to the service plan server **420** to update the service plan information stored in the webserver **205** for the particular product. The service plan server **420** may determine attributes about the service plan and send S**504** a service plan in the form of an executable program to the webserver **205** (although data may be sent instead or in addition). The webserver **205** may update S**506** the webpage, and then send S**508** the updated webpage **520** to the client **500**. While this approach works, it has several short-comings. First, this process will increase the amount of time it takes for the client to obtain the information, because it can take several seconds for the webserver **205** to negotiate the connection with the service plan server **420**. Second, sending a program (or other executable code (javascript, applets, etc.)) from the service plan server **420** exposes the webserver and the client to potential security risks. For example, a rogue employee working at the service plan server **420** could send malicious code to the webserver **205**. Or, a third party could hack into the service plan server **420** to transmit the malicious program. Recognizing the weaknesses in the FIG. **14**A's model, the following multistep approaches were devised.

FIGS. **14**B and **14**C show a process and system which utilizes asynchronous page loading. In general, older web browsers are not configured to accept asynchronous page transmissions. As shown in FIG. **14**B, a client **500** having a web browser **502** may send a request to a webserver **205** to send a webpage **510** having information on one or more products, images, and service plan information (in other configurations the webpage could contain information on news, sports, entertainment etc). When the request is sent, the webserver **205** may review the query string parameters (information included with the URL to provide server additional information) included within the client's request for the webpage **510**. Using HTTP request headers, the webserver may be able to determine S**510** the version and type of the browser making the request, and from that information, determine whether the browser supports asynchronous page loading. In alternate configurations, the webserver **205** may transmit a webpage to the client which contains a script (see FIG. **14**C). This script may attempt to send a request S**505'** to the service plan server **420** to update the webpage, if this procedure succeeds, an embodiment related to FIG. **14**C may be followed. (FIGS. **14**D and E illustrate examples of configurations of process flows if the script fails or the web browser does not support asynchronous page updating.)

If the browser supports asynchronous page loading (such as IE 8 or Firefox 3), the web browser may be able to receive updates to a webpage as the web browser is displaying the webpage. Under this approach, the webserver **205** may send S**503** the webpage to the client **500** and an update request S**505** to the service plan server **420**. The service plan server **420** may lookup S**507** the requested information, and transmit S**509** the retrieved information back to the webserver **205**. The webserver may receive the information from the server, format it S**511** into an update for the client, and transmit S**508** the update to the client. Under this model (FIG. **14**B), the client **500** can view product information on the webpage **510** quickly, while the service plan server sends updates for the webpage. Updates (shown schematically as ovals) may be implemented in any portion of the webpage and are not necessarily localized to a particular portion of the webpage. Images and other items having a large file size may also be sent asynchronously via update S**512**.

In FIG. **14**C, the webserver **205** may send a webpage **510** containing a script (e.g. a java script for instructing the web browser **502** to request additional information from a service plan server **420**) to the client. The web browser **502** may transmit S**505'** information about a particular product so the service plan server **420** can determine which service plan information to look-up. Once the service plan is determined, the service plan server **420** can send S**508'** service plan information back to the client **500**. Either FIG. **14**B or **14**C may be used to update a client webpage asynchronously. One advantage to FIG. **14**B is that the information that the client receives may appear to originate from the webserver **205**. This is effective in overcoming ad-blocking technology which may prevent 3rd party webservers from adding content to a webpage. Additionally, the embodiment of FIG. **14**B may be effective in distributing information to clients which have their web browser **502** settings set to high levels. Advantages of the topology of FIG. **14**C include reduced load time for information in the server plan server **420** because the information does not need to be sent through the webserver **205**. Additionally, the topology of FIG. **14**B requires the webserver to handle more processing tasks which may require more powerful webservers to implement.

FIGS. **14**D-**14**E illustrate two embodiments of a webserver process flow for a client that has a web browser which does not support asynchronous page loading (e.g. IE 3 or Firefox 1). In FIG. **14**D, the webserver **205** may send a request **5513** to determine whether a particular media player (e.g. Adobe Flash Media Player, Microsoft Silverlight, etc.) is installed. If the media player is installed, the webserver **205** can send S**503** a webpage **510** containing a media file (e.g. a Flash movie) to the client **500**. The media file may be very small and may be placed in a remote location of the webpage **510** so that it is unlikely an individual looking at the webpage will see it. The media file may also be very small in file length (<100 k) and movie length (<1 second). In this step, the transmitted

webpage may contain details about the product, possibly images, the media file, and a control. In some embodiments, the control may be written using Java script, an applet, or other programming code. The control may be configured so that it awaits information from the webserver **205** to cause the program to execute and display some type of service plan information.

As shown in step S**514** (FIG. **14**D), the program executing the media file may send S**514** a request for additional information to webserver **205** (e.g. updated service plan information). Alternatively, the request may be sent directly S**514'** to the service plan server **420**. In FIG. **14**D, the webserver **205** may receive S**515** the request, and send S**516** its own request to the service plan server **420** to lookup S**517** service plan information concerning the product the client is viewing. Once the service plan server **420** fetches the needed service plan information (utilizing the techniques explained above, rule engines/Bayesian filters, etc.), the server **420** may format the results it obtains (e.g. using XSLT template), and return S**518'** data or information back to the webserver **205**. To address security concerns that the service plan server **420** may send the webserver **205** a malicious program, the webserver **205** and service plan server **420** may be configured so that the service plan server **420** only sends data (for example XML code and XSLT template) to the webserver **205** (the webserver **205** may be configured only to receive data, i.e. not program code). The webserver **205** may contain a program for accepting the data. The webserver **205** may also contain a program **530** which will use the received data to generate an executable program, which the webserver **205** can send S**518** to the client **500**. In some embodiments, the webserver **205** may also send S**518** the information (e.g. XML and XSLT) to the client **500**. In the former option, once the client **500** has the executable program **530**, the browser can cause the program to be executed thereby displaying the service plan information. In the latter option, the information may be passed to the control and be executed by the control to display the service plan information. Also, the service plan server **420** may send the information or program directly to the client **500** (FIG. **14**E).

The configurations illustrated and described in FIG. **14**A-E may used independently or combined into a single multistep system/method. For example, the process/system illustrated and described in conjunction with FIGS. **14**A, B, and D could be combined into a multistep system/process. Namely, the webserver **205** could determine whether the browser of the client **500** natively supports (either as installed or with add-ins or extensions) asynchronous page loading. If so, the webserver **205** could implement the model shown and described in conjunction with FIG. **14**B. If asynchronous page loading is not supported, the webserver **205** could send a webpage containing a script for determining whether a particular media player is installed. If so, the webserver **205** could implement the model shown and described in conjunction with FIG. **14**D. If Adobe Flash is not installed (and the browser does not natively support asynchronous page loading), the webserver **205** could implement the model shown and described in conjunction with FIG. **14**A. Similarly, the process/system illustrated and described in conjunction with FIGS. **14**A, C, and E could be combined into a multistep system/process. Namely, the webserver **205** could send a webpage **510** to the client **500** containing a script. The script could attempt to update the webpage via a third party service plan server **420** (FIG. **14**C). If the script fails because asynchronous page updating is not supported (or is disabled), the script could attempt to use a media player to update the content of the webpage (FIG. **14**E). If that attempt fails because the media player is not installed, for example, the process of FIG. **14**A could be followed. One advantage to using these multi-tiered processes is that these processes identify an efficient way to deliver an updated webpage **520** to the client depending on the software (web browser, media player) installed on the client.

Although the preceding description of FIG. **14**A-E referenced in some locations a system and method designed for updating service plan information in relation to a product listing hosted on a webserver **205**, the preceding technology may be adapted to a number of general technical areas/uses. For example, in alternative configurations the service plan server **420** may be a generalized file server containing a database of information of interest to the client **500** or webserver **205**. The webserver **205** may be able to send a first version of a webpage to the client, while the file server sends updates to the webpage to the client **500**. Additionally, the preceding technology may be adapted to allow webserver **205** to update the webpage as data in the server **420** changes. For example, sports scores or stock prices may be updated on a webpage using this technology without the client refreshing the webpage. In some embodiments the server **420** may alert the webserver **205** that it contains updated information and push new data to the webserver **205**.

The current assignee of the present application was recently awarded an award by the Consumer Electronics Association for the technology described in the provisional application 61/245,923; and 61/272,707 (incorporated by reference). The Consumer Electronics Show (an annual awards presentation produced by the Consumer Electronics Association) reviewed a description of the technology underlying this patent application and awarded National Electronic Warranty Company (the current Assignee of this patent application) the "Design and Engineering Showcase Award for 2010. See New Corp's award in the IDS being filed on the same day as this application. CEA grants this award to the company which produces the most innovative developments in "online retail" technology. Also in the IDS are copies of a webpage from CEA announcing the award (currently listed on the web at http://www.cesweb.org/awards/innovations/2010honorees.asp?category=931397), and a copy of a webpage from NEW Corp discussing the award (currently listed on the web at http://www.businesswire.com/portal/site/home/permalink/?ndmViewId=news_view&newsId=20100105006253&newsLang=en). Consumer Electronics Association is widely regarded as one of the preeminent consumer electronics review organizations in the world, and CEA's decision to award NEW Corp with the award is evidence of the novelty and unobviousness of the below claimed invention. These three documents are hereby incorporated by reference in their entirety.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in respect as illustrative and not restrictive; the scope of the invention being indicated by the appended claims rather than by the foregoing description, and changes which come within the meaning and range of the equivalency of the claims are therefore intended to be embraced therein.

It is claimed:

1. A web crawler stored on non-transitory computer readable media for causing a processor of a computer to crawl a website having a webpage displaying a product, said web crawler comprising:

a. an interface input for receiving a URL of a homepage of the website, said homepage containing links;

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b. a linking system containing a link follower for retrieving and following the links on the homepage which leads to an additional webpage in the website;

c. a webpage collector for collecting the homepage and a current webpage associated with at least one of the links retrieved from the linking system; wherein the collector categorizes each homepage and webpage collected;

d. an analyzer for collecting at least one of the following: a name of the product, a category and subcategory of the product, pricing information on the product, pricing information relating to a service plan of the product, breadcrumbs, and images of the product;

e. a validator for examining webpage information including product information and the product's associated service plan;

wherein the validator comprises a range checker for service plans having price ranges for products covered under said service plans; said range checker containing:

instructions to cause the web crawler to determine whether a price of the product is within the price range of the service plan; and

f. an interface output for generating an output containing results generated by the web crawler.

2. The web crawler of claim **1** comprising a linker for determining whether a particular link from the homepage should be followed by determining whether at least a part of a link's URL matches a regular expression.

3. The web crawler of claim **2**, wherein the regular expression is "category" or "product ID."

4. The web crawler of claim **1**, comprising a relational database for storing the webpages collected by the webpage collector.

5. The web crawler of claim **1** wherein the analyzer comprises a class generator for generating classes in a database based upon information from the webpage; wherein the generator creates at least one of a merchant class, category class, subcategory class, quasi category class, SKU class, SKU warranty class, page link class, page content class, category display filter class, category spider filter class, or statistical data class.

6. The web crawler of claim **1** wherein the analyzer comprises a tree builder for constructing a relationship tree for establishing relationships between categories, and locating parent categories.

7. The web crawler of claim **6** wherein the tree builder is configured to link at least one of:

a. a merchant class to a category class and a page link class;

b. a category class to a subcategory class and a quasi category class;

c. a subcategory class and a quasi category class to a SKU class;

d. a SKU class to a SKU warranty class; or

e. a page link class to a page content class.

8. The web crawler of claim **1** comprising a placement analyzer for determining placement of the service plan on the current webpage.

9. The web crawler of claim **8** wherein the placement analyzer contains:

a. instructions for evaluating and rating the service plan's visibility on the current webpage;

b. an output for sending results to the interface output; and

c. a simulator for simulating human interaction with the webpage to enable the placement analyzer to locate placement of the service plan on the SKU webpage, in a shopping cart, or in a popup window.

10. The web crawler of claim **9** wherein the placement analyzer contains a routine for sending its results to the interface output, and said interface output contains a routine for displaying the results of the placement analyzer.

11. The web crawler of claim **1** wherein the validator comprises: a missing service plan locator containing instructions for causing the validator to:

a. analyze products of a particular subcategory;

b. determine whether any of the products in the subcategory have a service plan; and

c. if the locator determines that at least one of the products does have a service plan, send results to the interface output.

12. The web crawler of claim **1** comprising a smart crawler for crawling the current webpage.

13. The web crawler of claim **12** wherein the smart crawler comprises:

a. a matcher having a blacklist routine for matching a list of blacklisted items against the breadcrumbs collected by the analyzer; and

b. a halter which, if any item in the blacklist matches a breadcrumb, causes the smart crawler to download the current webpage in a database, and to instruct the linking system to avoid following any further links from the current webpage.

14. The web crawler of claim **12** wherein the smart crawler comprises:

a. a matcher having a whitelist routine for matching a list of whitelisted items against the breadcrumbs collected by the analyzer; and

b. a halter which, if no items in the whitelist match a breadcrumb, prevents the smart crawler from saving the current webpage in a database, and instructs the linking system to avoid following any further links from the current webpage.

15. The web crawler of claim **1** comprising a webpage cacher for caching webpages collected by the webpage collector.

16. The web crawler of claim **1** comprising a throttle controller for managing the web crawlers impact and strain on the website.

17. The web crawler of claim **16**, wherein the throttle controller contains:

a. a connection limiter for controlling a maximum number of simultaneous connections the web crawler may use while crawling the website;

b. a bandwidth limiter for controlling how much data per unit of time the web crawler may download from the website; and

c. a request limiter for setting how frequently the web crawler sends requests to the website.

18. The web crawler of claim **1** comprising an error checker for tracking errors returned by the website.

19. The web crawler of claim **18** wherein said error checker contains:

a. a stopping routine for stopping the web crawler for a period of time;

b. a total error threshold monitor for monitoring an amount of errors received from the website, said monitor executing the stopping routine to stop the web crawler if the amount of errors exceeds a threshold value; and

c. a frequency error monitor for monitoring a frequency of errors per unit of time received from the website, said monitor executing the stopping routine to stop the web crawler if the frequency of errors exceeds a threshold value.

20. A web crawler stored on non-transitory computer readable media for causing a processor of a computer to crawl a website having a webpage displaying a product, said web crawler causing the computer to perform the steps of:

a. receiving a URL of a homepage of the website, said homepage containing links;

b. downloading the homepage;

c. retrieving and following the links on the homepage;

d. determining whether a particular link from the homepage should be followed, by using a regular expression to determine whether at least a part of a link's URL matches at least part of a particular phrase;

e. retrieving a current webpage associated with at least one of the retrieved links;

f. collecting at least one of the following: a name of the product, a category and subcategory of the product, pricing information on the product, pricing information relating to a service plan of the product, breadcrumbs, and images of the product;

g. providing a validator for examining webpage information about a product and its associated service plan, wherein the validator executes a range checker for service plans having price ranges for products covered under said service plans, the range checker determining whether a price of the product is within the price range of the service plan; and

h. outputting results from the validator to a display.

21. The web crawler of claim 20 wherein the phrase is "category," "subcategory," "product ID," or "catprop."

22. The web crawler of claim 20 comprising the step of generating classes in a database based upon information from the webpage; wherein at least one of the classes is a merchant class, category class, SKU class, SKU warranty class, page link class, page content class, category display filter class, category spider filter class, or statistical data class.

23. The web crawler of claim 20 comprising the step of constructing a relationship tree for establishing relationships between categories, and locating parent categories.

24. The web crawler of claim 23 wherein the relationship tree is constructed so as to link at least one of:

a. a merchant class to a category class and a page link class;

b. a category class to a subcategory class and a quasi category class;

c. a subcategory class and a quasi category class to a SKU class;

d. a SKU class to a SKU warranty class; and

e. a page link class to a page content class.

25. The web crawler of claim 20 comprising the step of determining placement of the service plan on the current webpage.

26. The web crawler of claim 20 comprising the step of determining the service plan's visibility on the current webpage.

27. The web crawler of claim 20 comprising the step of simulating human interaction with the website to enable the web crawler to locate placement of the service plan on a SKU webpage, in a shopping cart, or in a popup window.

28. The web crawler of claim 20 comprising the steps of using the validator to analyze products of a particular subcategory and to determine whether any of the products in the subcategory have a service plan; using a locator to determine whether at least one of the products has a service plan; and, if the locator determines that at least one of the products had a service plan, using the validator to notify the web crawler as to which products do not have an associated service plan.

29. The web crawler of claim 20 comprising the step of matching a list of blacklisted items against the collected breadcrumbs, and, if any item in the blacklist matches a breadcrumb, causing the smart crawler to download the current webpage and instructing the web crawler to avoid following any further links from the current webpage.

30. The web crawler of claim 20 comprising the step of caching webpages retrieved by a webpage collector.

31. The web crawler of claim 20 comprising the step of providing a throttle controller for managing the web crawler's impact and strain on the website; said throttle controller performing the steps of: setting a maximum number of simultaneous connections the web crawler may use while crawling the website; setting how much data per unit of time the web crawler may download from the website; and setting how frequently the web crawler sends requests to the website.

32. The web crawler of claim 20 comprising the step of providing an error checking routine for tracking errors returned by the website, said error checking routine performing the steps of: monitoring an amount of errors received from the website, and stopping the crawler if the amount of errors exceeds a threshold value; and monitoring a frequency of errors per unit of time received from the website, and stopping the crawler if the frequency of errors exceeds a threshold value.

33. The web crawler of claim 20 comprising the step of outputting results from a placement analyzer to a display.

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